\*\*\*Science K – GDI Scholars 2011\*\*\*

[\*\*\*Science K – GDI Scholars 2011\*\*\* 1](#_Toc297077986)

[Science K 1NC Shell 3](#_Toc297077987)

[Science K 1NC Shell 4](#_Toc297077988)

[Science K 1NC Shell 5](#_Toc297077989)

[Science K 1NC Shell 6](#_Toc297077990)

[Science K 1NC Shell 7](#_Toc297077991)

[Science K 1NC Shell 8](#_Toc297077992)

[\*\*\*Links\*\*\* 9](#_Toc297077993)

[Science Bad – Link – “Science is the Best Ev” 10](#_Toc297077994)

[Science Bad – Link – “Science is the Best Ev” 11](#_Toc297077995)

[Science Bad – Link – Space 12](#_Toc297077996)

[Science Bad – Link – NASA 14](#_Toc297077997)

[Science Bad – Link – NASA 15](#_Toc297077998)

[Science Bad – Link – NASA 17](#_Toc297077999)

[Science Bad – Link – NASA 18](#_Toc297078000)

[Science Bad – Link – NASA 19](#_Toc297078001)

[Science Bad – Link – DOD 20](#_Toc297078002)

[Science Bad – Link – ET Search 21](#_Toc297078003)

[Science Bad – Link – Econ Adv 24](#_Toc297078004)

[Science Bad – Link – Econ Adv 25](#_Toc297078005)

[Science Bad – Link – Econ Adv 26](#_Toc297078006)

[Science Bad – Link – Econ Adv 27](#_Toc297078007)

[Science Bad – Link – Econ Adv 28](#_Toc297078008)

[Science Bad – Link – Environment Advs 29](#_Toc297078009)

[Science Bad – Link – Environment Advs 30](#_Toc297078010)

[Science Bad – Link – Warming Adv 31](#_Toc297078011)

[Science Bad – Link – Tech 32](#_Toc297078012)

[Science Bad – Link – Tech 33](#_Toc297078013)

[Science Bad – Link – Tech 34](#_Toc297078014)

[Science Bad – Link – Tech 35](#_Toc297078015)

[Science Bad – Link – Specific Tech Link 36](#_Toc297078016)

[Science Bad – Link – State 37](#_Toc297078017)

[Science Bad – Link – State 38](#_Toc297078018)

[Science Bad – Link – State 39](#_Toc297078019)

[Science Bad – Link – State 40](#_Toc297078020)

[\*\*\*Epistemology\*\*\* 41](#_Toc297078021)

[Science Bad – Fraud 42](#_Toc297078022)

[Science Bad – Fraud 43](#_Toc297078023)

[Science Bad – Bias 44](#_Toc297078024)

[Science Bad – Bias 45](#_Toc297078025)

[Science Bad – Bias Impact 46](#_Toc297078026)

[Science Bad – Not Objective 47](#_Toc297078027)

[Science Bad – Not Objective 48](#_Toc297078028)

[Science Bad – Not Objective 49](#_Toc297078029)

[Science Bad – Not Objective 50](#_Toc297078030)

[Science Bad – Not Objective – Political 51](#_Toc297078031)

[Science Bad – Not Objective – Political 52](#_Toc297078032)

[Science Bad – Not Objective – A2: Scientific Method 53](#_Toc297078033)

[Science Bad – Not Objective – Societal Pressures 54](#_Toc297078034)

[Science Bad – Not Objective – Societal Pressures 55](#_Toc297078035)

[Science Bad – Not Objective – Ideological 56](#_Toc297078036)

[Science Bad – Not Objective – Temporary 57](#_Toc297078037)

[Science Bad – Objectivity – Impact – VTL 58](#_Toc297078038)

[\*\*\*Impacts\*\*\* 59](#_Toc297078039)

[Science Bad – Impact – Solvency 60](#_Toc297078040)

[Science Bad – Impact – Extinction 61](#_Toc297078041)

[Science Bad – Impact – Environment 62](#_Toc297078042)

[Science Bad – Impact – Weapons 65](#_Toc297078043)

[Science Bad – Impact – Genocide 66](#_Toc297078044)

[Science Bad – Impact – Genocide – Terminal 67](#_Toc297078045)

[Science Bad – Impact – Genocide – Terminal 68](#_Toc297078046)

[Science Bad – Impact – Value to Life – General 69](#_Toc297078047)

[Science Bad – Impact – Calculation 70](#_Toc297078048)

[Science Bad – Impact – Calculation 71](#_Toc297078049)

[Science Bad – Impact – Calculation – ZPHC 72](#_Toc297078050)

[Science Bad – Impact – Calculation – VTL 73](#_Toc297078051)

[Science Bad – Impact – Calculation – VTL 74](#_Toc297078052)

[Science Bad – Impact – Democracy 75](#_Toc297078053)

[Science Bad – Impact – Democracy 76](#_Toc297078054)

[Science Bad – Impact – Democracy – Extinction 77](#_Toc297078055)

[Science Bad – Impact – Elitism 78](#_Toc297078056)

[Science Bad – Impact – Elitism 79](#_Toc297078057)

[Science Bad – Impact – Elitism – VTL 80](#_Toc297078058)

[Science Bad – Impact – Elitism – VTL 81](#_Toc297078059)

[Science Bad – Impact – Ethics 82](#_Toc297078060)

[Science Bad – Impact – Freedom 83](#_Toc297078061)

[Science Bad – Impact – Imperialism 84](#_Toc297078062)

[Science Bad – Impact – Imperialism – Terminal 85](#_Toc297078063)

[Science Bad – Impact – Sexism 86](#_Toc297078064)

[Science Bad – Impact – Sexism 87](#_Toc297078065)

[Science Bad – Impact – Sexism – Extinction 88](#_Toc297078066)

[\*\*\*AT: AT’s\*\*\* 89](#_Toc297078067)

[Science Bad – AT: Perm 90](#_Toc297078068)

[Science Bad – AT: Perm 91](#_Toc297078069)

[Science Bad – AT: Perm 92](#_Toc297078070)

[Science Bad – AT: Perm 93](#_Toc297078071)

[Science Bad – AT: “You Kill Science” 94](#_Toc297078072)

[Science Bad – AT: “You Kill Science” 95](#_Toc297078073)

[Science Bad – AT: Self-Correcting 96](#_Toc297078074)

[Science Bad – AT: Progress 97](#_Toc297078075)

[Science Bad – AT: Progress 98](#_Toc297078076)

[Science Bad – AT: Progress 99](#_Toc297078077)

[Science Bad – AT: Progress 100](#_Toc297078078)

[Science Bad – AT: Empiricism 101](#_Toc297078079)

[Science Bad – AT: Empiricism 103](#_Toc297078080)

[Science Bad – AT: Empiricism 104](#_Toc297078081)

[Science Bad – AT: Scientific Method 105](#_Toc297078082)

[Science Bad – AT: Scientific Method 106](#_Toc297078083)

[Science Bad – AT: Scientific Method 107](#_Toc297078084)

[Science Bad – AT: Peer Review 108](#_Toc297078085)

[Science Bad – AT: Peer Review 109](#_Toc297078086)

[Science Bad – AT: Falsifiability 110](#_Toc297078087)

[Science Bad – A2: Innovation Good 111](#_Toc297078088)

[Science Bad – AT: Sokal Affair 112](#_Toc297078089)

[Science Bad – AT: Medicine 113](#_Toc297078090)

[\*\*\*Alternative\*\*\* 114](#_Toc297078091)

[Science Bad – Alt Solves 115](#_Toc297078092)

[Science Bad – Alt Solves 116](#_Toc297078093)

[Science Bad – Alt Solves 117](#_Toc297078094)

[\*\*\*Aff Answers\*\*\* 118](#_Toc297078095)

[\*Impact Turns\* 119](#_Toc297078096)

[Science Good – Impact – General 120](#_Toc297078097)

[Science Good – Impact – General 121](#_Toc297078098)

[Science Good – Impact – General 122](#_Toc297078099)

[Science Good – Impact – Extinction 123](#_Toc297078100)

[Science Good – Impact – AT: Enviro 124](#_Toc297078101)

[Science Good – Impact – Genocide 125](#_Toc297078102)

[Science Good – Impact – Value to Life 126](#_Toc297078103)

[Science Good – Impact – Value to Life 127](#_Toc297078104)

[Science Good – Impact – Value to Life 128](#_Toc297078105)

[Science Good – Impact – AT: Calculation Bad 129](#_Toc297078106)

[Science Good – Impact – AT: Calculation Bad 130](#_Toc297078107)

[Science Good – Impact – AT: Calculation Bad 131](#_Toc297078108)

[Science Good – Impact – Democracy 132](#_Toc297078109)

[Science Good – Impact – Democracy 133](#_Toc297078110)

[Science Good – Impact – AT: Elitism 134](#_Toc297078111)

[Science Good – Impact – AT: Ethics 135](#_Toc297078112)

[Science Good – Impact – AT: Imperialism 136](#_Toc297078113)

[Science Good – Impact – AT: Freedom 137](#_Toc297078114)

[Science Good – Impact – AT: Freedom 138](#_Toc297078115)

[Science Good – Impact – AT: Sexism 139](#_Toc297078116)

[Science Good – Impact – AT: Sexism 140](#_Toc297078117)

[Science Good – Impact – AT: Sexism 141](#_Toc297078118)

[Science Good – Impact – Medicine 142](#_Toc297078119)

[Science Good – Impact – Growth 143](#_Toc297078120)

[Science Good – Impact – Overpopulation 144](#_Toc297078121)

[Science Good – Self-Correcting 145](#_Toc297078122)

[Science Good – Self-Correcting 146](#_Toc297078123)

[Science Good – Self-Correcting 147](#_Toc297078124)

[Science Good – Self-Correcting 148](#_Toc297078125)

[\*AT’s\* 149](#_Toc297078126)

[Science Good – Alt Fails – Science Inev 150](#_Toc297078127)

[Science Good – Alt Fails – Social Constructivism Bad 151](#_Toc297078128)

[Science Good – Alt Fails – K=Totalizing 152](#_Toc297078129)

[Science Good – Alt Fails – Fundamentalist Fill-in 153](#_Toc297078130)

[Science Good – Alt Fails – Fundamentalist Fill-in 154](#_Toc297078131)

[Science Good – Alt Fails – Pseudoscience Turn 155](#_Toc297078132)

[Science Good – AT: Feyerabend 156](#_Toc297078133)

[Science Good – AT: Feyerabend 157](#_Toc297078134)

[Science Good – AT: Feyerabend 158](#_Toc297078135)

[Science Good – AT: Feyerabend 159](#_Toc297078136)

[Science Good – AT: Feyerabend 160](#_Toc297078137)

[Science Good – AT: Feyerabend 161](#_Toc297078138)

[Science Good – AT: Inequality 162](#_Toc297078139)

[Science Good – AT: Inequality 163](#_Toc297078140)

[Science Good – AT: Tech Bad 164](#_Toc297078141)

[Science Good – AT: Tech Bad 165](#_Toc297078142)

[\*Perm\* 166](#_Toc297078143)

[Science Good – Perm – Solves VTL 167](#_Toc297078144)

[Science Good – Perm – Solves VTL 168](#_Toc297078145)

[Science Good – Perm – Solves VTL 169](#_Toc297078146)

[Science Good – Perm – AT: Crowds Out Alts 171](#_Toc297078147)

[\*Epistemology\* 172](#_Toc297078148)

[Science True – Generally 173](#_Toc297078149)

[Science True – AT: Fraud 174](#_Toc297078150)

[Science True – AT: Bias 175](#_Toc297078151)

[Science True – AT: Objectivity 176](#_Toc297078152)

[Science True – AT: Objectivity 177](#_Toc297078153)

[Science True – AT: Objectivity 178](#_Toc297078154)

[Science True – AT: Objectivity 179](#_Toc297078155)

[Science True – AT: Objectivity – AT: Gov’t/Econ 180](#_Toc297078156)

[Science True – AT: Objectivity – AT: Gov’t/Econ 181](#_Toc297078157)

[Science True – AT: Peer Review Bad 182](#_Toc297078158)

[Science True – AT: Relativism 183](#_Toc297078159)

[Science True – AT: Socially Constructed 184](#_Toc297078160)

[Science True – AT: Socially Constructed 185](#_Toc297078161)

[Science True – AT: Socially Constructed 186](#_Toc297078162)

[Science True – AT: Social Location 187](#_Toc297078163)

Science K 1NC Shell

Space exploration & development devalue life—a perspective that positions space as special and unique trivializes life on Earth

Arendt 61 (Hannah, American political philosopher, “The Conquest of Space and the Stature of Man” The New Atlantis Fall 2007 Pg. 52-54 JF)

It is at this point, it seems to me, that the humanist’s concern with man and the stature of man has caught up with the scientist. It is as though the sciences had done what the humanities never could have achieved, namely, to prove demonstrably the validity of this concern. The situation, as it presents itself today, oddly resembles an elaborate verification of a remark by Franz Kafka, written at the very beginning of this development: Man, he said, “found the Archimedean point, but he used it against himself; it seems that he was permitted to find it only under this condition.” For the conquest of space, the search for a point outside the earth from which it would be possible to move, to unhinge, as it were, the planet itself, is no accidental result of the modern age’s science. This was from its very beginnings not a “natural” but a universal science, it was not a physics but an astrophysics which looked upon the earth from a point in the universe. In terms of this development, the attempt to conquer space means that man hopes he will be able to journey to the Archimedean point which he anticipated by sheer force of abstraction and imagination. However, in doing so, he will necessarily lose his advantage. All he can find is the Archimedean point with respect to the earth, but once arrived there and having acquired this absolute power over his earthly habitat, he would need a new Archimedean point, and so ad infinitum. In other words, man can only get lost in the immensity of the universe, for the only true Archimedean point would be the absolute void behind the universe. Yet even if man recognizes that there might be absolute limits to his search for knowledge and that it might be wise to suspect such limitations whenever it turns out that the scientist can do more than he is capable of comprehending, and even if he realizes that he cannot “conquer space,” but at best make a few discoveries in our solar system, the journey into space and to the Archimedean point with respect to the earth is far from being a harmless or unequivocally triumphant enterprise. It could add to the stature of man inasmuch as man, in distinction from other living things, desires to be at home in a “territory” as large as possible. In that case, he would only take possession of what is his own, although it took him a long time to discover it. These new possessions, like all property, would have to be limited, and once the limit is reached and the limitations established, the new world view that may conceivably grow out of it is likely to be once more geocentric and anthropomorphic, although not in the old sense of the earth being the center of the universe and of man being the highest being there is. It would be geocentric in the sense that the earth, and not the universe, is the center and the home of mortal men, and it would be anthropomorphic in the sense that man would count his own factual mortality among the elementary conditions under which his scientific efforts are possible at all. At this moment, the prospects for such an entirely beneficial development and solution of the present predicaments of modern science and technology do not look particularly good. We have come to our present capacity to “conquer space” through our new ability to handle nature from a point in the universe outside the earth. For this is what we actually do when we release energy processes that ordinarily go on only in the sun, or attempt to initiate in a test tube the processes of cosmic evolution, or build machines for the production and control of energies unknown in the household of earthly nature. Without as yet actually occupying the point where Archimedes had wished to stand, we have found a way to act on the earth as though we disposed of terrestrial nature from outside, from the point of Einstein’s “observer freely poised in space.” If we look down from this point upon what is going on on earth and upon the various activities of men, that is, if we apply the Archimedean point to ourselves, then these activities will indeed appear to ourselves as no more than “overt behavior,” which we can study with the same methods we use to study the behavior of rats. Seen from a sufficient distance, the cars in which we travel and which we know we built ourselves will look as though they were, as Heisenberg once put it, “as inescapable a part of ourselves as the snail’s shell is to its occupant.” All our pride in what we can do will disappear into some kind of mutation of the human race; the whole of technology, seen from this point, in fact no longer appears “as the result of a conscious human effort to extend man’s material powers, but rather as a large-scale biological process.”27 Under these circumstances, speech and everyday language would indeed be no longer a meaningful utterance that transcends behavior even if it only expresses it, and it would much better be replaced by the extreme and in itself meaningless formalism of mathematical signs. The conquest of space and the science that made it possible have come perilously close to this point. If they ever should reach it in earnest, the stature of man would not simply be lowered by all standards we know of, but have been destroyed.

Science K 1NC Shell

Be skeptical of their scientific evidence – The privileging of science is corrupted by social, political, and economic imperatives that complicate its claims to truth – It is elitist

Cambell 9 (Nancy, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-23-2011, lido)

Embracing partisanship and struggle as they do, reconstructivists have taken to heart various critiques of objectivity, among which feminists figure prominently. Quoting Harding’s Science and Social Inequality (2006), Woodhouse and Sarewitz get the point that privilege is both a material advantage and an epistemological disadvantage: that “those advantaged by the status quo tend to operate in a state of denial about the maldistribution of costs and benefits of technoscience.”24 Taking “science-policy influentials” to task for failing to mention inequality except in toothless and conventional ways, Woodhouse and Sarewitz call for greater recognition of social conflict in the tussle over who gets what, when, and how that is science and technology policy and politics. They share with feminists the intention to “move equity considerations higher on science-policy agendas.” They share the suspicion that the social organization of technoscience exacerbates social inequality and consistently rewards the already affluent, while hurting the persistently poor. They call for refocusing R&D on “poor people’s problems” yet do not call upon feminist scholarship to explain precisely how welfare states and labor markets are structured to reproduce gendered and racialized poverty.25 How can it be that well intentioned and well informed scholars seeking to refocus technoscientific R&D on the needs of the poor, broaden participation in research priority-setting, and reorient technoscientific innovation toward the creation of public goods miss the feminist point that addressing inequity requires attending to how gender and power relations structure the world? How can those who set out to “level the playing field among diverse social interests so that all are represented fairly” miss the point that forms of “fairness” inattentive to power differentials lead to unfair processes and outcomes?26 The reconstructivist agenda is too important to be dismissed by feminists as not “getting it,” and thus it seems important to understand how reconstructivists propose to reshape inquiry by encouraging scholars to adopt projects that incorporate “normative, activist, or reconstructive intentions” into their research.27 Feminist activists and scholars have much to contribute to the analysis of phenomena on which reconstructivists work: trade liberalization, nanotechnology, stem cell research, climate change, agricultural biotechnology, oil and coal dependency, water rights, hunger, global health equity, environmental justice, and myriad other substantive arenas. Reconstructivists attempt to “counteract the skewing of technoscientific negotiations” toward those whose disproportionately greater access to financial resources and expertise grant them control over research agendas and an infrastructure within which to pursue questions relevant to the social groups from which they come. Skewed so that profits from technoscientific investment accrue largely to participants in the corporate sectors of the economy while shifting costs to overburdened populations who have little or no voice in decisionmaking processes, these negotiations and maldistributions nevertheless negatively affect upper- and middle-class people as well.28 Links between those who bear the costs and those who reap the benefits of R&D are broken by its corporate structure, state failure to provide any but the most technocratic regulatory oversight, institutional capture of governance by corporate interests, and many other asymmetries of information and influence that add up to socially irresponsible R&D. While the reconstructivists know all this, they don’t always spell it out with enough detail and nuance as they would if they had started from a grounding in feminist standpoint epistemology.

Science K 1NC Shell

Elitism causes extinction

Epler 7 (Christopher, blogger, http://www.democraticunderground.com/discuss/duboard.php?az=view\_all&address=103x312764, dw: 10-7-2007, da: 6-28-2011, lido)

The time has come to seriously examine the biological consequences of rampant immorality. If an alien life form was observing human civilization (and perhaps they are!), probably they would classify "disease" not only biologically, but socially. This would make sense if disease was defined as a "force of nature" which had the potential to lead to civilization death, if not species extinction. With such a definition in mind, elitist greed could certainly be the number one candidate for the death of human civilization and/or the extinction of the human race. We really don't have good definitions for such dynamics (even though we critically need them!), but clearly some variation of elitist greed could manifest in any "advanced" life form. A homey image is the choking of a dynamic ecosystem such as a country pond when it is steadily taken over by moss. It is a sad thing to behold, since the moss gradually suffocates the environment and a dead and stagnant pond is the result. The astrophysicist Carl Sagan used to worry about such things, fearing the discovery of atomic energy would be the inevitable beginning of the end of advanced civilizations in this or any other galaxy. He felt the universe was teeming with life, but that few if any of these civilizations could survive the combination of devastating atomic weaponry with the raw stupidity of the life forms. The jury is still out on Sagan's speculations, but perhaps he didn't live long enough to see that the limitless immoral greed of the planet’s elites is almost certainly far MORE dangerous than the morally neutral discovery of atomic energy. Consider the facts (and please forgive the general outline as this is not the place for a properly worked out monograph). The "elites" make up one percent or less of the human population, and yet they absolutely dominate the entire planet. This ratio also exists in America which a textbook example of a Dictatorship of the Rich. "Democracy" is a fairly tale on this planet. We love to talk and dream about it and even write "Constitutions" to support it, but this is like getting so carried away by a brain-dead television sitcom that you think it's actually happening. Well, the sitcom is NOT actually happening and neither is human Democracy. Many of you have probably had the experience of being in a company or university in which much ado was made in the construction of a "Mission Statement", which meant ABSOLUTELY NOTHING. It's construction made everyone feel wise and good, but its an empty paper game not even the walls pay any attention to. The same thing is true for Democratic Constitutions. Utterly, utterly, meaningless documents (however well intentioned), because the Greek God like elites are the true brains, sinus, and muscles of all major countries. Hence, if you want to know where the buck stops that completely explains the plummeting disintegration of human civilization and ballistic destruction of the human ecosystem, it is (of course) grounded in the ultimate power and control centers of human civilization, i.e., the vampire elites. And yes, the "vampire" elites, because they are literally draining the blood of our one and only planet, even though they make up a tiny percentage of humankind. Another take on the elites is that they are incarnations of humanity AT ITS WORST. Note that we're talking about the perennial have and have not distinction which has been the constant horror of human existence. Much, much more could be said about all this, but the theory argued for in this piece is that human civilization and even human existence may well be biologically doomed by our "evil deeds". In short, morality isn't just a religious preoccupation ("heaven", etc.), but a species survival necessity. Sagan's concerns also factor into this and the increasingly exploding human population, but the core survival truth is "how we behave", and the exponential greed repercussions of the planet's multi millionaire and multi billionaire elites are steadily pushing the human species into the eternal abyss of extinction.

Science K 1NC Shell

Scientific privilege is the centerpiece of genocide

Hinton 2 (Alexander Laban, prof at Rutgers, Ph.D. in Anthropology at Emory, Abstract, Annihilating Difference: The Anthropology of Genocide, p. 1-40, http://www.mendeley.com/research/dark-side-modernity-toward-anthropology-genocide-1/, JMB, accessed 6-26-11)

Hinton suggests that until recently anthropologists have been quiet on the topic of genocide. He goes on to suggest reasons for this. They include the concepts used by anthropologists have been used to justify genocide, and cultural relativism specifically which has seen anthropologists take a backward step. Hinton attempts to define genocide by going back to the genocide convention. He questions the anthropological usefulness of sticking to the UN convention since it is limiting. Hinton suggests a focus on the conceptual criterion of genocide, which is the intentional attempt to annihilate a social group that has been marked different. The ICTR has made some progress with the definition by expanding the coverage of the convention to include 'any stable and permanent group, whose membership is largely determined by birth' (p. 5). Nevertheless, it is a fuzzy convention with even seemingly concrete categories such as national, ethnical, racial and religious being notoriously hard to delineate. Hinton argues that genocides are distinguished by the process of othering that is at play (p. 6). Hinton evokes Anderson's notion of the imagined community. Defining violence as a force exerted by someone on another, Hinton moves on to distinguish genocidal violence from other forms of political violence by highlighting that the perpetrators are sustained and purposeful in their efforts to destroy a collectivity; the intention to annihilate the other. Hinton explains modernity (p.7 /8) as a way of thinking, which is symbolized by the French Revolution. Many of these ideas of the individual and scientific accuracy contributed to a key meta-narrative of modernity - the teleological myth of progress and civilization (p. 8). Although optimistic these narratives were only for a privileged few with indigenous populations often being devastated by such progress. But what of the right of the individual? The indigenous populations were effectively othered through a discourse full of binary oppositions (p. 9). Genocidal and violent acts against indigenous populations were framed in meta-narratives of modernity. In recent times the binary opposition of developed/underdeveloped has been used to equally devastating effect to indigenous populations (p. 10). Totten, Parsons, and Hitchcock (p. 11) delineate different 'cides' including ecocide and ethnocide. Similarly, narratives of development seem to justify the harming of indigenous populations as a by-product of the development. Hinton suggests that modernity thrives on the essentialization of difference, which is important in his view that genocide on grand scales is linked to modernity. Several factors have contributed to the essentializing tendency (p. 13). 1) In exploration the people that were encountered were not the same. The were primitive; Said's notion of Orientalism explains this. 2) The nation state craves homogeneity as we see with Anderson's notion of the imagined community. 3) Science searches for regularity. This leads to a quantitative view of the world, including the essentialisation of race in biology. 4) To have progress need people in a lesser state. Bauman and Hinton agree that these factors contributed to the paradigmatic genocide of the twentieth century - The Holocaust (p. 14). German anthropologists were at the forefront of essentialising (through science) differences, which could other the Jews (p. 15). Scientific and other myths (e.g. historical) are created to give 'truth' to difference (p. 16). Hinton (p. 18) reiterates that it is difficult for anthropologists to look at genocide because it thrives on the social categories that anthropologists analyze and deploy. Hinton is careful not to define modernity as a monolithic entity. He is careful to point out that modernity is a number of interrelated processes that give rise to local modernities (p .18). Modernity and genocide involve the essentialization of difference but vary considerably across place and time. It has been argued that the Rwandan genocide, for example, was deeply symbolic and embodied in cultural patterning, revolving around the obstruction vs. flow metaphor for health (p. 19/20). However, this is not necessarily uniform but the natural variation between official policies and local realities only serve to generate an atmosphere of fear and terror (p. 21). The local is also emphasized by Bringa (p. 21) who focuses on Bosnia. Bringa argues that all societies contain the potential for war and peace; these potentialities are actualized within shifting historical contexts. Various factors, including policy, contribute moves that seek to redefine social categories, which inevitably exclude certain individuals. Hinton also discusses the generational scars of genocide. The destructive force of such violence creates currents of calamity that flow through time. The Khmer Rouge in Cambodia fundamentally destroyed the family/household unit, with consequences still existing (p. 24). Similarly, key institutions that commanded popular loyalty were dismembered, such as Buddhism. Manz (p. 25) explores genocide in a Mayan village delineating coping mechanisms. Hinton suggests that modernity shapes the aftermath of genocide with terms such as trauma, suffering and cruelty being linked to such discourses of modernity; a certain subject is presumed (p. 25). But paradoxically the rights of the subject and his/her body are almost left by the wayside with the idea of the sovereign nation state (p. 26). The state may prevail over the individual. But genocide itself although a product of modernity challenges it at the same time; the refugees of such violence are in a liminal space that create diasporic communities that threaten modernity's culminating political incarnation - the nation-state (p. 26). Importantly, however, genocide is a product of modernity not an aberration; the episteme of essentialising tendencies underpin such violence at the level of the individual notwithstanding that genocide puts into question the nation-state (p. 27). Although genocidal behaviors have a pedigree, the concept, like anthropology, is thoroughly modern (p. 27). It starts from a particular notion of the human subject, as a container endowed with particular ingredients. The sovereignty of the individual is linked to the sovereignty of the nation state - through language, episteme etc. but doing this creates something akin to a category mistake in certain fields, thus creating paradoxes (for e.g. the natgion-state that is supposed to prevent genocide inevitably becomes the perpetrator). Although the very act of categorizing entails essentialization, anthropological expertise at unpacking local categories may counter popular views of ethnic violence (p. 28). Moreover, anthropology can focus on the processes at play that lead to genocide; genocidal priming (p. 28). Factors that heat up a situation include; 1) A socio-economic upheaval. 2) The deepening of social divisions e.g. through segregation. 3) Regime policy that deepens divisions. 4) Regime dissemination of hate. Anthropologists can also study emotions and other embodied discourses that can illuminate perpetrator motivation. Among other things, anthropologists can see how idioms vary from hot and cold situations of genocidal priming, perhaps contributing to a de-escalation of hate (p. 30). Scheper-Hughes employs the idea of a genocidal continuum to try to explain why genocidal violence occurs in the first place. Similarly, Nagengast discusses the genocidal potential of everyday symbolic violence (p. 32). The micro and the macro, however, should be linked. Concepts such as Foucault's 'microphysics' of power can elucidate such linkages. The etic and emic become linked (p. 33). It seems that anthropologists can help in answering a number of pressing concerns in relation to genocide. We are in a unique position to offer an ethno-historical perspective (p. 33)

Science K 1NC Shell

Genocide outweighs mass death – It’s categorically distinct

Card 3 (Claudia, Prof of Philosphy, U of Wisconsin-Madison, *Hypatia*, 18.1, p. 63-79, jam)

Genocide is not simply unjust (although it certainly is unjust); it is also evil. It characteristically includes the one-sided killing of defenseless civilians—babies, children, the elderly, the sick, the disabled, and the injured of both genders along with their usually female caretakers—simply on the basis of their national, religious, ethnic, or other political identity. It targets people on the basis of who they are rather than on the basis of what they have done, what they might do, even what they are capable of doing. (One commentator says genocide kills people on the basis of what they are, not even who they are). [End Page 72] Genocide is a paradigm of what Israeli philosopher Avishai Margalit (1996) calls "indecent" in that it not only destroys victims but first humiliates them by deliberately inflicting an "utter loss of freedom and control over one's vital interests" (115). Vital interests can be transgenerational and thus survive one's death. Before death, genocide victims are ordinarily deprived of control over vital transgenerational interests and more immediate vital interests. They may be literally stripped naked, robbed of their last possessions, lied to about the most vital matters, witness to the murder of family, friends, and neighbors, made to participate in their own murder, and if female, they are likely to be also violated sexually. 7 Victims of genocide are commonly killed with no regard for lingering suffering or exposure. They, and their corpses, are routinely treated with utter disrespect. These historical facts, not simply mass murder, account for much of the moral opprobrium attaching to the concept of genocide. Yet such atrocities, it may be argued, are already war crimes, if conducted during wartime, and they can otherwise or also be prosecuted as crimes against humanity. Why, then, add the specific crime of genocide? What, if anything, is not already captured by laws that prohibit such things as the rape, enslavement, torture, forced deportation, and the degradation of individuals? Is any ethically distinct harm done to members of the targeted group that would not have been done had they been targeted simply as individuals rather than because of their group membership? This is the question that I find central in arguing that genocide is not simply reducible to mass death, to any of the other war crimes, or to the crimes against humanity just enumerated. I believe the answer is affirmative: the harm is ethically distinct, although on the question of whether it is worse, I wish only to question the assumption that it is not. Specific to genocide is the harm inflicted on its victims' social vitality. It is not just that one's group membership is the occasion for harms that are definable independently of one's identity as a member of the group. When a group with its own cultural identity is destroyed, its survivors lose their cultural heritage and may even lose their intergenerational connections. To use Orlando Patterson's terminology, in that event, they may become "socially dead" and their descendants "natally alienated," no longer able to pass along and build upon the traditions, cultural developments (including languages), and projects of earlier generations (1982, 5-9). The harm of social death is not necessarily less extreme than that of physical death. Social death can even aggravate physical death by making it indecent, removing all respectful and caring ritual, social connections, and social contexts that are capable of making dying bearable and even of making one's death meaningful. In my view, the special evil of genocide lies in its infliction of not just physical death (when it does that) but social death, producing a consequent meaninglessness of one's life and even of its termination. This view, however, is controversial. [End Page 73]

Science K 1NC Shell

Resistance to science solves – It creates a space to rehumanize knowing and decenter scientific privilege

Smith 5 (Steven, University of San Diego, “Legal Scholarship as Resistance to ‘Science’” Pg. 5-7, 9-10 JF)

So here’s my thought. As academics today, we live in the imposing shadow of “science.” Science means many things, and nearly all of us admire and appreciate some of those things. And some of science’s effects on legal scholarship are probably beneficial as well. But I don’t think all of them are. On what might seem a trivial level, I think that not science, exactly, but what we might call the “image of science” or perhaps the “scientific aura” has had an unfortunate influence on the way legal scholarship is written. That is, I suspect that the tendency of law review editors to discourage personal or idiosyncratic styles in favor of a numbing standardization reflects a sense that the more homogenized and impersonal prose is somehow more objective and scientific. And the editors’ intermittent insistence that every sentence capable of being contradicted be burdened with a footnote mirrors the “scientific” understanding that propositions need to be supported by evidence. We all know that these norms are enforced in erratic and sometimes silly ways: the editors who won’t let me assert my own naked opinion in an article will usually be perfectly happy if I drop a footnote to an article in which a junior colleague expressed the same opinion, or even to an earlier article in which I myself expressed the opinion. But the overall effect of this attempt to make legal scholarship look scientific is that the actual human interest tends to get squeezed out. On a more substantive level, I believe that science (or the image of science) powerfully affects legal scholarship by sponsoring a sort of worldview within which we live and write--usually without paying much attention to it. In simple terms, that worldview goes something like this: the world is composed of particles and forces (which are studied by physicists), and these particles and forces interact and combine in complicated ways (which are studied by physicists and chemists), and over time some of these particles have combined to form complex systems that through processes of natural selection (which are studied by biologists, among others) have evolved into amazingly complicated creatures– including, of central concern to ourselves, us--with abilities to talk, think, plan, and produce all of the remarkable things you can see if you walk into a Barnes & Noble or a Circuit City. There is no particular point to our being here: we weren’t “put on earth” (as I put it a moment ago) for any “purpose.” Rather, our existence is (for us) a sort of happy, or sometimes unhappy, accident. Still, here we are, constituted as we are with “interests”– things we happen to want– including an interest in survival. So the sensible thing is to devote ourselves to surviving and to satisfying our interests as fully and efficiently as possible. And in this spirit legal scholars should do what we can to contribute to that enterprise of satisfying human interests with maximum efficiency. I’m not sure what to do about this situation, but my thought is that there is some value in trying to maintain a resistance– not to science, exactly, but to the domination of science and especially of the naturalistic worldview so often associated with science. There’s value in resisting the scientific worldview in favor of some other overarching view in which persons (of various sorts) have ontological primacy over particles. Just how legal scholarship can serve to resist the scientific worldview, and to preserve a more personalist worldview, presents a complicated question, which I can’t explore here (in part because I don’t know the answer). It’s a question that calls for experimentation. Sometimes the resistance may be direct and affirmative**,** but often, I suspect, it will be critical and oblique. Second, in this matter, substance and style may not be wholly separate. My own thought is that every time a law professor writes a book or article that some other person might actually want to read– might actually enjoy reading, and might think he or she actually benefitted from reading– that is a small victory for the resistance, and for persons. If that thought is right, then it poses a challenge that may provide us with at least a modest motive for caring about writing–even after we’ve been granted tenure.

\*\*\*Links\*\*\*

Science Bad – Link – “Science is the Best Ev”

Privileging the scientific method and quantitative data enframes solutions and causes serial policy failure

Amy 11 (Amy, graduate student in NC studying local ecological knowledge within the blue crab fishery, May 10, [www.southernfriedscience.com/?p=9616] AD: 6-28-11, jam)

Modern society has been called a technocracy, privileging standard scientific knowledge above other types and even extending additional authority to scientific knowledge. By emphasizing objectivity and downplaying uncertainty, scientific knowledge has claimed authority and expertise in policymaking (Hilgartner 2002). In order to maintain that sole authority, this scientific movement has defined what counts as “knowledge” – and types that did not follow the scientific method and cannot produce quantitative results do not. Once authority is claimed, however, experts holding certain types of knowledge have the capability to guide and shape policy. For example, since science supported alternative service delivery of water, Ontario decided to privatize their water services even though it was highly controversial (Bakker 2010). Problems defined by certain types of knowledge also then define what kinds of solutions are possible. For example, in the European Union, water quality is an issue defined largely by scientific monitoring and quantitative modeling, therefore the only solutions considered were technological, not political. This meant that responsibility for solutions was placed at the end of the watershed where the water quality problems aggregated by natural forces, not at the sources of the pollution (Jasanoff 2004).

Their privileging of science leads to uncritical acceptance which perverts the very purpose of science

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 224-225, jam)

The situation just described is important in cases where the belief in the soundness of a view or enterprise has led to institutional (and not only intellectual) measures against alternatives. 'Scientific' medicine is a good example. It is not a monolithic entity, it contains many departments, schools, ideas, procedures and a good deal of dissension. However, there are some widespread assumptions which influence research at many points but are never subjected to criticism. One is the assumption that illnesses are due to material disturbances which can be localized and identified as to their chemico-physiological nature, and that the proper treatment consists in removing them either by drugs or by surgery (including complex methods of surgery such as laser surgery). The question is whether the problems of scientific medicine - and there are many - have something to do with this assumption, or whether their origin lies elsewhere. Everybody knows that death rates in hospitals go down when doctors go on strike. Is this due to the incompetence of the physicians, or does it show a basic fault in the theoretical structure that guides their actions? Everybody knows that cancer research absorbs huge amounts of money and has few results. 18 Is this due to the fact that cancer researchers are mainly interested in theory, not in healing, or does it indicate a basic fault of the theories used? We do not know. To find out we must first make the basic assumptions (materi- alism, for example) visible, and then examine them in a more direct manner. To examine them in a more direct manner we have to compare the results of scientific medicine with those of forms of medicine based on entirely different principles. Democratic relativism permits and protects the practice of such different forms of medicine.19It makes the needed comparisons possible. Democratic relativism, therefore, not only supports a right, it is also a most usiful research instrumentfor any tradition that accepts it.

Science Bad – Link – “Science is the Best Ev”

Their perspective privileges scientific evidence irrationally

Priddy 99 (Robert, taught philosophy and sociology at the University of Oslo, [robertpriddy.com/lim/5.html] AD: 6-27-11, jam)

No science can do any research whatever without making a number of assumptions that may or may not be fruitful and may not even be wholly true. Most scientists have ignored this limitation and have developed a comprehensive belief in the efficacy of scientific method and of most of its generally-accepted conclusions as an answer to virtually all the intellectual questions of mankind. However, the nature of the limits to understanding that science sets and their consequences must be seen clearly - and be transcended. The most basic assumption of science is materialism or physicalism, which is built into its method... by demanding that all scientific hypotheses be tested by sensory observation. Natural science has developed to the point where all everything is regarded in theory as differing expressions and transformations of one and the same energy. This is assumed to be all that exists or can exist (i.e. ontological physicalism). This assumption therefore also generally defines in effect what experiences and ideas are to be blocked off from the elementary stages of any research onwards. Natural scientists are notoriously unable or unwilling to go beyond the basic assumption about the nature of reality as matter only, upon which physics rests. Yet physics cannot legitimise itself philosophically, it simply has no coherent meta-physic. Neither empiricism nor positivism or their variants can provide a rational explanation of the whys of the universe that the physical sciences and their imitators only analyse. Scientists hold that to be open to rethinking is always the best policy, but in practice this occurs only where rethinking does not disturb the foundations of science... which also means unproven and unprovable physicalistic assumptions upon which science rests.

Scientific evidence should not be privileged over lay opinions

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 224, jam)

A third argument follows directly from the second. Scientific views are not only incomplete, in that they omit important phenomena, they are often erroneous at the very centre of their competence. Routine arguments and routine procedures are based on assumptions which are inaccessible to the research of the time and often turn out to be either false or nonsensical. Examples are the views on space, time, and reality in eighteenth- and nineteenth-century physics and astronomy, the materialism ofmost medical researchers today, the crude empiricism that guided much of seventeenth- and eighteenth-century science and influenced even the debates about the Darwinian theory. These views are essential parts of important research traditions, and yet only few practitioners know them and can talk about them intelligently. And yet scientists show increased belligerence when the views are attacked, and they throw their whole authority behind ideas they can neither formulate nor defend: who does not remember how vigorously some scientists have defended a rather naIve form of empiricism without even being able to say what facts are or why anyone should take them seriously. The lesson to be learned from this phenomenon is that fundamental debates between traditions are debates between laymen which can and should be settled by no higher authority than again the authority of laymen, i.e. democratic councils.

Science Bad – Link – Space

Science is not self-correcting or objective – especially true in space research

Armstrong 89 (J. Scott, PhD from MIT, BA in Applied Science from Lehigh U, Prof of Marketing @ U of Pennsylvania, *Management Science*, Vol. 25, No. 5, May, pp. 423-428, jam)

Objectivity is the foundation of scientific work. The objective scientist is looked upon as the ideal to strive for. At least, that is the popular conception of the ideal scientist. Ian Mitroff [21] challenged this idealized conception. In a study of space scientists, Mitroff found that the scientists with the highest prestige did not live up to this ideal. Nor did they even try to live up to it. Instead, they adopted a dominant hypothesis and became advocates of this hypothesis. They sought evidence to confirm their hypothesis, and they presented this evidence in such a way as to put their hypothesis in the most favorable light. These findings suggested that successful scientists are not objective; they are biased advocates. What makes advocacy work, says Mitroff, is the marketplace for ideas. Different scientists advocate their hypotheses and, over time, the most useful hypotheses survive. Rather than viewing advocacy as a liability, Mitroff sees it as a legitimate and perhaps desirable approach to science. Mitroff's viewpoint struck a responsive chord among many scientists. On the other hand, some people, including myself, continue to view advocacy as a poor approach to science [1], [22]. In this paper, the advocacy strategy is compared with alternative approaches to science. Results are then presented on which scientific strategies are most popular in management science. Finally, published empirical evidence is examined to determine which scientific strategy should be used.

Space exploration represents the final advance of science to sever humanity from its original perception

Arendt 61 (Hannah, American political philosopher, “The Conquest of Space and the Stature of Man” The New Atlantis Fall 2007 Pg. 49-50 JF)

The sad truth of the matter, however, is that the lost contact between the world of the senses and appearances and the physical world view had been re-established not by the pure scientist but by the “ plumber.” The technicians, who account today for the overwhelming majority of all “researchers,” have brought the results of the scientists down to earth. And even though the scientist is still beset by paradoxes and the most bewildering perplexities, the very fact that a whole technology could develop out of his results demonstrates the “soundness” of his theories and hypotheses more convincingly than any merely scientific observation or experiment ever could. It is perfectly true that the scientist himself does not want to go to the moon; he knows that for his purposes unmanned spaceships carrying the best instruments human ingenuity can invent will do the job of exploring the moon’s surface much better than dozens of astronauts. And yet, an actual change of the human world, the conquest of space or whatever we may wish to call it, is achieved only when manned space carriers are shot into the universe, so that man himself can go where up to now only human imagination and its power of abstraction, or human ingenuity and its power of fabrication, could reach. To be sure, all we plan to do now is to explore our own immediate surroundings in the universe, the infinitely small place that the human race could reach even if it were to travel with the velocity of light. In view of man’s life span—the only absolute limitation left at the present moment—it is quite unlikely that he will ever go much farther. But even for this limited job, we have to leave the world of our senses and of our bodies not only in imagination but in reality. It is as though Einstein’s imagined “observer poised in free space”—surely the creation of the human mind and its power of abstraction—is being followed by a bodily observer who must behave as though he were a mere child of abstraction and imagination. It is at this point that all the theoretical perplexities of the new physical world view intrude as realities upon man’s everyday world and throw out of gear his “natural,” that is, earthbound, common sense. He would, for instance, be confronted in reality with Einstein’s famous “twin paradox,” which hypothetically assumes that “a twin brother who takes off on a space journey in which he travels at a sizable fraction of the speed of light would return to find his earthbound twin either older than he or little more than a dim recollection in the memory of his descendants.”21 For although many physicists had found this paradox difficult to swallow, the “clock paradox,” on which it is based, seems to have been verified experimentally, so that the only alternative to it would be the assumption that earthbound life under all circumstances remains bound to a time concept that demonstrably does not belong among “true realities,” but among mere appearances. We have reached the stage where the Cartesian radical doubt of reality as such, the first philosophical answer to the discoveries of science in the modern age, may become subject to physical experiments that would make short shrift of Descartes’ famous consolation, I doubt, therefore I am, and of his conviction that, whatever the state of reality and of truth as they are given to the senses and to reason, you cannot “doubt of your doubt and remain uncertain whether you doubt or not.”22

**Science Bad – Link – Space**

**Space sciences edge on sci fi because of the community’s pressure to be original**

**Priddy 99** (Robert, prof of Philosphy @ U of Oslo, “Science Limited” http://robertpriddy.com/lim/5.html JF)

At least since the 1960s**, the drive for scientific progress has become a widely recognised factor in economic competition in modern industrial states. One of several unfortunate side-effects of this is the increased demand for scientific 'originality'.** Of course, all new discoveries are original, and science aims to discover what was not known previously. At the same time, **it may seem paradoxical that much truly original work is excluded from the pale of scientific respectability, and hence from funding**. **The reasons for this are** all too often **that the work challenges existing work** **in which interests are already vested, or it has no obvious pay-off**, at least in the shorter term. However, **a modern-day fascination with the subjective processes of originality as 'creative thought' has brought about a leaning towards the unusual and the bizarre in some sciences.** That the newer and more unheard-of theory always attracts greater public interest than the known and true is now a fact of book marketing. **Eye-catching titles and exaggerated claims help to propagate this kind of work. Particularly in the kind of lucrative science writing in astrophysics**, micro-physics and biology, **the weirdness approaches science fiction. Much of it may well be sheer science fiction, though unwittingly so from the authors' viewpoint.** **The weaker a science in validated theory and strict methods, the greater the scope for theoretical 'originality'. To satisfy the demand for it, more and more peculiar hypotheses are mooted, new terminologies are cooked up** in the psychological field, **and a whole spectrum of doubtful partial theories abound**, especially on identity and selfhood. **These tend to run ahead of insight** through self-knowledge, **which is shown by their speculative intellectual content and the abstruseness of the language and argument usually employed to justify them.** Many have in recent years largely proven to be a product of free-floating fantasy based on the thinnest of empirical evidence, but supported by massive bibliographical documentation, which is the chief way in which the academic world measures ability in non-scientific or human studies. To satisfy the demand for originality of work that rates so highly in scientific and academic appointments and in publishing, more and more peculiar hypotheses are mooted, new terminologies are cooked up in the psychological field, such as a whole spectrum of doubtful partial theories abound especially on identity and selfhood. Eye-catching titles and exaggerated claims help to propagate this kind of work. These tend to run ahead of insight founded on experience or secure self-knowledge, which is shown by their speculative intellectual content and the abstruseness of the language and argument usually employed to justify them. **In recent years much speculative astronomy, physics and other science is the product of more of mathematical invention and often free-floating fantasy based on the thinnest of empirical evidence**. In the human sciences, such 'original' and hence publicity-creating ideas are supported by massive and often irrelevant bibliographical documentation, which is the chief way in which the academic world measures ability in non-scientific or human studies. **A striking idea and an extravagant claim**, it is evident, **will usually have a much better chance of publicity and eventual acceptance than a more mundane-seeming discovery**, **however true the facts or lasting the hypotheses are confirmed to be by history**. **The relative prominence that the more 'mind-boggling' astronomy and astro-physics have achieved in the Western mind is out of all proportion to the social, political or other importance of these fields.** **These models and theories have far less explanatory power concerning the human condition** and predicament **than** any of the deeper **philosophical** or mystical-theological **theories of the world.** Even the literary novel, poetry etc. has much more to offer in that respect. **The all-embracing theories of space, time and physical creation, of black holes and quasars and so on ad infinitum have practically no practical implications of any importance to human society other than the gigantic expenses incurred by the long list of multi-billion dollar experiments, from cyclotrons to space telescopes.**

**Space science incorporates implicit external values that compromise objectivity**

**Allchin 88** (Douglas, prof of history of science @ U of Minnesota, “Values in Science and in Science Education," International Handbook of Science Education JF)

**The** common **characterization of science as value-free or** value-**neutral can be misleading**. Scientists strongly disvalue fraud, error and "pseudoscience", for example. At the same time, scientists typically value reliability, testability, accuracy, precision, generality, simplicity of concepts and heuristic power. Scientists also value novelty, exemplified in the professional credit given for significant new discoveries (prestige among peers, eponymous laws, Nobel Prizes, etc.). **The pursuit of science as an activity is itself an implicit endorsement of the value of developing knowledge of the material world**. **While few would tend to disagree with these aims, they can become important in the context of costs and alternative values**. **Space science**, **the human genome initiative, dissection of subatomic matter through large particular accelerators or even better understanding of AIDS, for instance, do not come free. Especially where science is publicly funded, the values of scientific knowledge may well be considered in the context of the values of other social projects.**

Science Bad – Link – NASA

NASA’s science is biased and self-reinforcing

Cowing 11 (Keith, former NASA employee, biologist w/ M.A. and B.A. degrees, Jan 5, [www.spaceref.com/news/viewnews.html?id=1491] AD: 6-28-11, jam)

Until space policy wonks set aside their decades of bias and actually ask "real people" what they think, and integrate this information, this is all just guesswork. NASA, of course, is chronically addicted to conducting self-reinforcing studies - the proverbial self-licking ice cream cones, so to speak. That's why the public seems to have such an inexplicable (to NASA) understanding of what the agency does - and why it does it. The space community should stop talking to itself. The echoes, however logically sounding they may be, can be profoundly misleading.

Groupthink is endemic in NASA

Sadeh 8 (Eligar, Assistant Prof, Department of Space Studies, U of North Dakota, Jun 9, [www.thespacereview.com/article/1146/1] AD: 6-28-11, jam)

The space community today is too insular to get to a strategic vision. There are rigidities that stovepipe thinking and capabilities. This needs to be overcome with new approaches that integrate existing capabilities across all space sectors, including internationals.

NASA technical controls fail – Challenger proves

Vaughan 90 (Diane, Boston College, Administrative Science Quarterly, Vol. 35 No. 2, June, p. 225-227, JSTOR, JMB)

The Challenger disaster was an organizational-technical system accident. The immediate cause was technical failure. The O-rings—two 0.280-inch diameter rings of synthetic rubber designed to seal a gap in the aft field joint of the solid rocket booster—did not do their job. The Presidential Commission {1986,1: 72) investigating the incident stated that design failure interacted with "the effects of temperature, physical dimensions, the character of the materials, the effects of re-usability, processing, and the reaction of the joint to dynamic loading." The result of these interactive factors was, indeed, a technical system accident similar to those Perrow identified. But there was more. The post-accident investigations of both the Commission (1986, 1: 82-1501 and the U.S. House Committee on Science and Technology (1986a: 138-178} indicated that the NASA organization contributed to the technical failure. As Turner might have predicted, the technical failure had a long incubation period. Problems with the O-rings were first noted in 1977 (Presidential Commission, 1986, 1: 122). Thus, NASA might have acted to avert the tragedy. But the organizational response to the technical problem was characterized by poor communication, inadequate information handling, faulty technical decision making, and failure to comply with regulations instituted to assure safety (Presidential Commission, 1986, 1: 82-150; U.S. House Committee on Science and Technology, 1986a; 138-178). Moreover, the regulatory system designed to oversee the safety of the shuttle program failed to identify and correct program management and design problems related to the O-rings. NASA insiders referred to these omissions as "quality escapes": failures of the program to preclude an avoidable problem (Presidential Commission, 1986,1: 156,159). NASA's safety system failed at monitoring shuttle operations to such an extent that the Presidential Commission's report referred to it as "The Silent Safety Program" (1986. 1: 152). My purpose in this paper is to analyze NASA's safety regulatory system and specify the organizational bases of its ineffectiveness. NASA, like all organizations, is subject to restraint and control that occur as a consequence of interaction with other organizations in its environment acting as consumers, suppliers, competitors, and controllers (Pfeffer and Salancik, 1978: 40-54). In this analysis, I focus only on those organizations with (1) officially designated social control responsibilities, (2) safety assurance as the sole function, and (3) personnel with aerospace technical expertise. Although the uniqueness of this case requires the usual disclaimers about generalization, its uniqueness also allows analysis of a complex technical case perhaps not possible otherwise. The tragedy generated an enormous amount of archival information as well as much conflicting public discourse by people more technically competent than I, leading me to sources and questions that might not have occurred to me.

Science Bad – Link – NASA

NASA’s inappropriate objectivity uses a structure and method that uniquely compromises mission safety—caused the Challenger and Columbia

Feldman 4 (Steven, Assoc,Prof of Management Policy @ Case Western Reserve University, Human Relations Vol. 57.6 P. 692, 697-701 JF)

Following the data, I begin my analysis with a focus on the relations between time and objectivity. Pressures to increase and maintain the number of ﬂights were factors in both disasters (Columbia Accident Investigation Board, 2003; Report of the Presidential Commission on the Space Shuttle Challenger Accident, 1986). I show that time pressure interacted with the culture of objectivity at NASA in ways that made it difﬁcult to slow down the ﬂight schedule. Managers and engineers privileged quantitative measurements in such a way that other types of information were neglected, misunderstood or misused. Under conditions of time pressure, this gave a bias toward ﬂight because it took a considerable amount of time to create quantitative analyses of recent ﬂight experience to challenge decision-making in the short- or even medium-term. Indeed, time pressure was so great in both the Challenger and Columbia cases that it perversely reversed NASA safety requirements. In both cases, engineers had to prove it was not safe to ﬂy rather than safe to ﬂy as is stated in NASA regulations.In conclusion, the ‘culture of objectivity’ is an epistemic culture that is socially produced, more precisely, practiced in a particular time and place by a community of people whose interests, hence standards and goals, change with particular sociocultural and political situations. Speciﬁcally, the NASA ‘culture of objectivity’ claims the virtues of aperspectival objectivity, i.e. independence from individual and social inﬂuences and reliance on ‘hard,’ quantitative data and analysis. I show, however, that ‘objectivity’ involved an entire complex of cultural assumptions that created openings for disaster. Disregard of qualitative data, over-reliance on quantitative data, and reiﬁcation of safety standards led to underestimating uncertainty and risk. Also, compartmentalizing the decision-making process led to ignoring lessons from the past and blindly succumbing to pressures from organizational goals. All these beliefs infused notions such as ‘safety margin,’ ‘experience base,’ and ‘self-limiting phenomena,’ discursive bulwarks against the pressures of experiential data. It is exactly the social and cultural conditions that inﬂuence scientiﬁc practice and the construction of knowledge that social studies of science investigates. Scientiﬁc knowledge is seen as part of a social process and not the reﬂection of absolute truths about external reality. Given that knowledge is part of the social process, it must be seen as open in nature and related to many other elements in the social order, changing as these other elements change. Indeed, later scientiﬁc theories are better at solving contemporary problems, but usually are less equipped to address older problems embedded in a different social and cultural environment (Novick, 1988). No knowledge is ﬁnal nor is any system for producing knowledge ﬁnal (Restivo, 1994). Knowledge is merely a continually changing, socially constructed instrument for taking advantage of patterns found in an otherwise inﬁnitely unfolding and, as a whole, incomprehensible world. Second, the organizational culture in which the manager as neck of the hourglass was a core symbol was characterized by a strong commitment to positive science. Analytic models, bench tests, ﬁeld tests and comparisons of prediction with performance, all formulated quantitatively, were said to be the only legitimate currency of analysis and decision. To argue a point at the FRR was to argue it with quantitative measurements implying objective knowledge. The use of quantitative (objective) analyses thus became one way to regulate the speed of decision-making because carrying out quantitative analyses took time and without these analyses arguments for or against anything could not be voiced at the FRR (Feldman, 2000). Pressure from the aggressive ﬂight schedule meant it would take extremely well-documented evidence to stop the schedule. This resulted in a bias toward ﬂight. Hence, the quantitative (‘objective’) culture and the ‘neck of the hourglass’ mutually deﬁned each other: time pressures encouraged the reiﬁcation of some knowledge as objective, and this objective knowledge was used to transform the ‘neck’ of the hourglass into a fast-moving decision-making process. Objectivity became relative to time and place, as do all human institutions. Engineers sought ‘objective’ knowledge within the time frame speciﬁed by the ﬂight schedule. This means that they did not so much pursue knowledge independent of their own goals, but they pursued knowledge in order to accomplish their goals. These are very different things. The content of knowledge was inseparable from the organization that created it. This could not be publicly acknowledged because the prestige of science (and thus NASA’s justiﬁcation for control over substantial ﬁnancial and institutional resources) would be undermined (Bourdieu, 1975). Because the time pressures originated in the broader political environment, the conﬂict between societal and scientiﬁc (aperspectival) classiﬁcation systems inﬂuenced the meaning of ‘objectivity’ (Douglas, 1986). The notion of ‘experience base’ is an example of the scientiﬁc focus on the recurrent and quantiﬁably comparable aspects of experience (Merton,1970). Beyond its quantitative measurement, however, it implies safety because the experience it is measuring does not include disaster. But, as was stated, experience base – and safety margin – cannot explain or predict performance. Hence, this is an example of the quantiﬁcation of moral judgment: a quantitative measure is created that is said to establish safety. This deﬁnes as irrelevant individual and organizational experience that is outside the measure ‘experience base’. Related experiences from other rocket programs or airplane design or component technology experts that might have led to insights into the level of safety were excluded. These experiences were potentially helpful to decision-making because the quantitative measure ‘experience base’ had neither much empirical depth nor explanatory power.

**Science Bad – Link – NASA**

**NASA science bad – politically motivated**

**Flam 93** (Faye, science writer at the Philadelphia Inquirer “NASA PR: Hype or Public Education” Science, Vol. 260, No. 5113, p. 1416-1418, JSTOR, JMB)

You might think astronomers would have been ecstatic to see one of their objects of study in the popular press, but many of them grumbled. **As one astronomer put it: -It's NASA hype."** There were some caveats given in the press release and at the press conference announcing this finding, but **nothing compared to the skepticism that came from members of the community', who say they've seen other black hole candidates, and this one was nothing special. That this** dust cloud **signals a black hole is "largely wishful thinking"** **on the part of the observers and the hackers of the space telescope**, says one expert. Says another. Roger Blandford of Caltech. "Hubble Space Telescope has not told us whether or not there are black holes." Even one of the researchers responsible for this observation, Holland Ford of the Space Telescope Science Institute, agrees that it will take a repaired Hubble Telescope to pin down any black hole. Over the past year, **NASA and the scientists who depend on it have** **succeeded in getting a succession of spectacular astro-physical claims** based on images from NASA satellites **into the headlines:** other black holes lurking in distant galaxies, evidence that the universe will expand forever, evidence that the universe will collapse, and even clues to how the universe was born. In the process of getting these findings into the popular press and TV news, NASA's publicity\* machinery' has served a vital public service, in the view of those who are part of it by bringing people a taste of the excitement and wonder surrounding the findings their tax dollars have bought. "People have a right to see what their investment is returning," says Hubble Space Telescope program scientist Edward Weiler of NASA headquarters, who has taken an active role in publicity for the telescope. "If all the Hubble Telescope does is fill in the Astrophysical Journal and Astronomical Journal, that's a failure." A decade ago, NASA often failed to reach the press or the public, adds NASA astronomer Steve Maran, who handles publicity for the American Astronomical Society (AAS)—which is why he has tried to make the impact of astronomy and astrophysics clearer to the press. Though he publicizes a lull range of astronomical discoveries for the society, the ones that get big play often come from NASA satellites. But **researchers suspect that something else is** also **driving NASA's publicity efforts**. "It might be nice to enlighten the public but that's not the driving force," says physicist Robert Park, a spokesman for the American Physical Society I APS). **They want to keep the public interested so people don't criticize their congressmen for supporting these projects**." Indeed, often **good news coverage can make or break a big project**, says one former congressional staffer. He says **members of Congress and staffers alike show a gaping ignorance of matters scientific**, **and are therefore easily influenced by any support that might come from good press. They use newspaper stories to help them make decisions**, he says, **and if publicity gets people back in the home state to call or write**, even better for the project. In the process, some astronomers say **NASA is going too far.** "I feel these **NASA programs are being oversold,**" says one. "The science is exciting, so why oversell it.' I think **all of us would like to see some more humility, honest, and careful** enthusiastic **presentation of the science done by NASA**." Says another astronomer "What annoys me and other practicing scientists is that they [**NASA) exaggerate** otherwise interesting results." Caltech's Blandford adds: "The public deserves better."

**NASA pushes scientists to publicize without full validation**

**Flam 93** (Faye, science writer at the Philadelphia Inquirer “NASA PR: Hype or Public Education” Science, Vol. 260, No. 5113, p. 1416-1418, JSTOR, JMB)

Premature publication Besides overselling legitimate findings, astronomers say **NASA's publicity machine** sometimes **promotes results to the public before other researchers have had rime to evaluate them—and even before the investigators themselves know what they are seeing**. **Mushofsky says his team caught a mathematical error that forced them to change their claims** by a factor of two just **days before he was scheduled to announce them to his colleagues and the public**. Luckily, he says, his recalculation didn't alter his conclusion enough to call off the press conference., though at the time Mushotsky admitted to having trouble sleeping at night- **Complaints about premature announcements resounded after the 1992 AAS meeting in Atlanta, following media coverage of a striking Hubble Telescope image of a galaxy that looked like a huge black X.** **The researchers**, led by the Space Telescope Science Institute's Ford, who also reported the dust disk mentioned earlier, **guessed that the X might represent gas and dust surround ing a black hole—and that's how it was billed in the press release that went with the image. But most astronomers considered the image a mystery.** "It's another interesting observation," says Caltech's Blandford who studies such unusual galactic centers. "But there are better candidate black holes." And **many months later, astronomers say, there's still no paper in a journal explaining why he claims to see a black hole. "I don't know what his** [Ford's] **evidence is that there's a black hole**," says astronomer Sandra Fabcr of the University of California, Santa Crur. "It's frustrating."

Science Bad – Link – NASA

**Space science through NASA is politicized – competition for payload space**

**Collins 93** (Martin J., Curator, Civilian Applications: Satellites, National Air and Space Museum, The Public Historian, Vol. 15, No. 3, Summer, p. 78-81, JSTOR, JMB)

What brings this account of **the** evolution of **space science** into focus is a discrete, defining **problem: who would control and allocate- a scarce resource, the payload space available on rockets and satellites.** **That pay-load space was a scarce resource derived from the fact that the technologies required to reach space**, rockets, **were immensely expensive and could only be supported through the** resources of the **federal government**. Government had a monopoly. It also was a consequence of the fact that the primary use of rockets was as ballistic missiles capable of delivering nuclear warheads to the Soviet Union. Only a limited number were available for scientific use. And by virtue of the Cold War, that scarce payload space assumed substantial political significance. Payload space was a national asset, whose use and propaganda value was to be carefully assessed. **And within NASA, competition for access to space was rampant between the** more glamorous and more generously funded **manned space program and the smaller space science effort**. From the government perspective, **pay-load space, for science or for humans, was a resource to be managed in such a way that the civilian space program produced results that compared favorably with Soviet achievements**. At the root of the author's story on space science is a clash of cultures and goals. **The basic tension was between** the growing number of university-based **scientists interested in space research** (and the professional organizations that represented them such as the National Academy of Sciences) **and NASA, which had the** legal and **political mandate to execute the nation's civilian space program.** Scientists, in general, thought their own mechanisms and values for professional self-governance should prevail. After all, the goal was to advance our knowledge of the universe. Who better to plan and manage this than scientists? In their view, scientists could and should decide which programs of research were most appropriate to pursue, which experiments were meritorious, and which should have priority. **NASA,** on the other hand, **as an element of the executive branch, had to encompass a wider view, in which space science was not just science but also politics of the first order**. Additional tensions existed in the newly fanned NASA organization between headquarters and the research centers, such as the Goddard Space Flight Center and the Jet Propulsion Laboratory, over who would control the conduct of space science and how. The result was a contentious mix of elite university scientists, advisory' organizations such as the Space Science Board of the National Academy of Sciences. NASA and its component parts, and other government agencies, with congress and the president not far in the background. **This political struggle for control over scarce payload space found expression in the nitty-gritty trench warfare** of the contending bureaucracies; through redefinition of organizational structures and **of who was empowered to make decisions and control the purse strings.**

Science Bad – Link – NASA

**Science at NASA fails – management issues**

**Andrew 00** (Lawler, staff, Science, 4/7, Vol. 288, Iss. 5463, p. 32, Ebsco, JMB)

**The demanding** cost, schedule, and **science requirements proved even more toxic when mixed with** what Shirley calls the "**hubris" from Pathfinder's success**. Another problem was that the team of enthusiastic JPL and Lockheed Martin engineers and managers lacked direction from older mentors. Instead of one or two major missions, JPL was working on two dozen, and there was a shortage of experienced managers, the reports state. **Despite** this daunting combination of **pressure** from the top and inexperience at the bottom, **no one except Shirley squawked publicly. "It never occurred to anyone to say they couldn't do this**," says Maria Zuber, a Massachusetts Institute of Technology geophysicist and member of the Young panel. In April 1998, just months before she resigned, Shirley warned in an International Academy of Astronautics presentation of the dangers of "overoptimism engendered by successes," worker burnout, and increasing payloads without a corresponding growth in the budget. "In many areas we are at the limit," she said. NASA managers ignored the warning. Circling the wagons The failure of the Mars Climate Orbiter last September shook up the team, but confidence remained high on 3 December, the day the Polar Lander was slated to set down. The prospects seemed so rosy to space science chief Ed Weiler that television cameras were allowed in the operations room. But instead of recording triumph, the cameras recorded the indelible image of stunned mission controllers and a glum Goldin. Two separate software glitches are the likely immediate culprits in the failure of both the orbiter and lander. Both mistakes were made at Lockheed Martin's Denver plant, where the spacecraft were built. "There is no doubt that we are responsible for both these errors," says Ed Euler, the company's project manager for the mission. A poorly trained young engineer was given the job of coding navigational software for the orbiter. "The company felt [it] was a not-so-critical job," says Art Stephenson, director of NASA Marshall Space Flight Center in Huntsville, Alabama, who chaired the panel that investigated the orbiter failure. The engineer failed to use metric units in the coding of a ground software file. JPL, which was overseeing the company, did not catch the error. Once the orbiter was on its way to Mars, a JPL navigator--described by Stephenson as "reserved"--noticed a problem with the trajectory. But his e-mails to Lockheed Martin were ignored, and he did not pursue the matter with his superiors, says Stephenson. The leading theory on why the lander crashed is that a software error caused the engines to shut down prematurely during descent. But "other failure modes cannot be ruled out," states the Polar Lander investigation board chaired by retired JPL manager John Casani, because there are no corroborating flight data. A telemetry package that would have provided that information was deleted because of cost and size constraints, an omission that the Young panel calls "a major mistake." An incomplete test of the lander's leg before launch failed to uncover the problem. The glitch was noticed only during a recent test of the 2001 lander, which has the same design. **The cause of the failure of the small probes**--designed to be released by the lander in flight to bury into the martian soil--**remains unclear. What is clear is that they were inadequately tested.** "The microprobes were not ready for launch," states the Young report bluntly. But the technical glitches are only part of a much larger story. According to members of the investigative teams and the Young panel, Lockheed Martin also bid too low, forcing it to rely on younger and, thus, more affordable workers. Even then, the company was unable to hire them in a timely fashion. A stressed and overworked team at JPL could not oversee the contractor's effort properly. And the JPL team received little guidance from experienced system engineers and support from senior managers, the reports state. Both JPL and Lockheed took to "circling the wagons," states the Young report, at a time when they "deviated from accepted and well-established engineering and management practices." **There was,** the Young panel found, "**a failure to clearly communicate" between JPL and NASA headquarters.** Headquarters, for example, ordered new instruments to be added to the lander without boosting the budget. "JPL management did not effectively express their concerns" about the tight constraints, and "**NASA headquarters did not seem receptive to receiving bad news**," states the report. "**This combination of inadequate management oversight** and violations of fundamental engineering and management principles **became the underlying contributor to mission failure**," the Young panel concluded. **Those words harken back to the report of the commission that investigated the 1986 Challenger accident. Its authors cited Marshall Space Flight Center's penchant "to contain potentially serious problems and to attempt to resolve them internally rather than communicate them forward**." They also laid much of the blame for the shuttle disaster on NASA's insistence on an aggressive shuttle launch rate.

Science Bad – Link – NASA

NASA can’t control tech – Challenger proves

Vaughan 90 (Diane, Boston College, Administrative Science Quarterly, Vol. 35 No. 2, June, p. 225-227, JSTOR, JMB)

The tragic **loss of the** space shuttle **Challenger** on January 28. 1986 sent the nation into mourning and **forced a citizenry** ordinarily preoccupied with other **matters to confront again the risks of living in a technologically sophisticated age**. Preceded by the incidents at Three Mile Island and Union Carbide in Bhopal and soon followed by Chernobyl, **the Challenger accident left** in its aftermath **a** **deeply troubling question: Has our ability to create highly developed technological systems exceeded our ability to control and master them in practice?** Perrow (1984) addressed this question, arguing that **technological complexity has a tendency to result in "normal accidents." accidents that are inevitable for certain technical systems.** These accidents initially are caused by technical component failures but become accidents rather than incidents because of the nature of the system. The failure of one component interacts with others, triggering a complex set of interactions that can precipitate a technical system accident of catastrophic potential. Technology is not the only culprit, however. **The organizations that run these risky enterprises often contribute to their own technological failures**. Turner (1976. 1978) has investigated accidents and social disasters, seeking any systematic organizational patterns that might have preceded these events. He found that disasters had long incubation periods characterized by a number of discrepant events signaling danger. These events were overlooked or misinterpreted, accumulating unnoticed**. Among the organizational patterns contributing to these "failures of foresight"** (Turner, 1978: 51) **were norms and culturally accepted beliefs about hazards, poor communication, inadequate information handling in complex situations, and failure to comply with existing regulations instituted to assure safety** (Turner. 1976: 391).

**Space science doesn’t access the benefits of the scientific community – inequalities make it uniquely worse**

**Collins 93** (Martin J., Curator, Civilian Applications: Satellites, National Air and Space Museum, The Public Historian, Vol. 15, No. 3, Summer, p. 78-81, JSTOR, JMB)

Naugle should be commended for his basic analysis: that **a critical issue for space science**, then and even now, **was control of a scarce resource and that the resolution of this problem rested on negotiations between** two distinct cultures—**university-based science**, with its institutions and values, **and NASA, with its dominant engineering culture and sensitivity to national politics**. Yet he does not follow the implications of his own analysis far enough. The book's very title belies this problem. The expression, "first among equals." is an oxymoron in this case. **The relationship between NASA and the scientific community has not been one of equality. NASA has controlled the scarce resource scientists require to conduct research.** What has existed is an arrangement in which a monopoly seller (NASA) has to deal with organized groups of buyers (scientists and their professional organizations). Mutual interests could be negotiated and the values of science shared. Each could mobilize its considerable political support when disputes arose. But **the relationship has not been a simple one of collegial equality, where the values of scientific communitarianism are dominant. Points of access and venues for discussion have been limited. Inequities and differences in power have been built into the institutional arrangements** that the author so carefully lays out for us- The significance of this criticism is not just as a gloss on the author's account. **It points to a host of questions about how NASA**, like other government agencies with an interest in science and technology, such as the Department of Defense and the Department of Energy, **has sought to structure its relations with the private sector**, and what the consequences have been. If the impact on university science and scientific communities, in this case, has been as substantial as Naugle suggests, it has implications for public history. While we will still want to know about the history of public institutions, **we should** also **be analyzing the dramatic effects that government patronage and control have had on private institutions and professions,** recasting in fundamental ways the relationship between the state and the private sector.

Science Bad – Link – DOD

**DoD restricts scientific freedom – magnifies the link**

**Thompson 86** (Clark, Computer Sciences Division UC Berkeley, COMPUTERS and PEOPLE, March-April, p. 26, JMB)

**To the extent that academic research is correlated with military objectives, academic freedom suffers**. It's not hard to find the reason why. **Academic R&D thrives on openness, but militarily-sensitive data must be withheld from the enemy**. **For academicians doing basic research with military implications, the price is clear. We are ordered not to divulge our results to colleagues overseas**, especially if those colleagues happen to live in the Soviet Bloc. A case in point: a full professor refused to send a copy of his student's Ph.D. dissertation to my co-author on a recent research paper. His reason was that he didn't want to risk offending his military sponsor by sending a technical report to Czechoslovakia. Ironically, the report was classified "distribution unlimited". \* Over the last few years, I have noticed other areas of friction. **DoD keeps tightening the screws on pre-publication review clauses**. These were enforced for the first time, as far as I know, in the Strategic Computing project. Papers must be submitted to one's funding agent thirty, sixty, or even ninety days in advance of publication, presumably to give DoD time to react to any disclosure of sensitive information. In August 1985, a tighter restriction was announced by the director of the Strategic Defense Initiative, Lt. General James A. Abrahamson. He stated that SDI **researchers at universities may publish papers only after the subject matter passes "sensitivity checks"** by SDI officials. In 1981, DARPA asked the academic VLSI (very large scale integration: community to keep non-citizens (and especially one-year visiting faculty) away from our research equipment. CalTech agreed to do so, but fortunately the Berkeley, Stanford and MIT faculty refused to comply. **A final area of tension is that of technical conferences, the lifeblood of scientific comunication. DOD** (and NS.4) **reserve the right to cancel whole conferences** on rare occasions, **to "pull out" individual papers, and to require conference attendees to sign non-disclosure agreements**. Again, concerted collective action has so far saved the day. The presidents of Institute of Electric and Electronic Engineers, American Physical Society, and ten other major technical organizations sent a letter to Caspar Weinberger that resulted in some reassurances. (It is humiliating to report that the ACM was not a signatory to this letter.)

**DOD funding stifles criticism**

**Thompson 86** (Clark, Computer Sciences Division UC Berkeley, COMPUTERS and PEOPLE, March-April, p. 26, JMB)

Most scientists believe that their research is worthwhile, no matter who pays the bills. **The fact that DOD currently pays** **the bills is** usually viewed by academicians as **a** slightly **unfortunate accident** of history. **One problem with this state of affairs is that we are reluctant to criticize major** **R&D initiatives** like Strategic Computing and Strategic Defense. **To criticize one of these initiatives is**, at least in the short sun, **destructive to our field of research**. **We’re financially dependent** on these major DoD initiatives. **As a result, we can rationally support any major R&D initiative.** DoD's academic R&D initiatives are "blue sky" projects. Almost certainly, they won't deliver what was promised to Congress. They will, however, produce something: some scientific knowledge, some funding for us, some military payoffs, and perhaps even something of use to civilians.

Science Bad – Link – ET Search

Their application of Western science to ET search is anthropocentric – Our science is just *a* science

Marino 2 (Lori, Emory U, “Objectivity in the Study of Intelligence: The Cornerstone of New Methods and Discoveries” Bioastronomy 2002: Life among the stars IAU Symposium Vol. 213 JF)

Not unexpectedly, measures of intelligence that we tend to favor are those that place us at an advantage in relation to other species. Humans have the highest level of encephalizatoin on the planet and the most sophisticated technology. We tend to view our specific neuroanatomical attributes as evidence for “advancement” while the distinctive features of other species are often considered “primitive”. For instance, it is not uncommon for the visual sensory system to be depicted as advanced and the olfactory sensory system as primitive in neuroanatomy textbooks and papers. This is not merely coincidental with the fact that we, as primates, have a sophisticated visual system but a relatively diminished capacity for olfactory processing. The reasoning behind most of these notions about intelligence is circular and self-serving. For every human characteristic that we consider a criterion for the advanced state of our brains we would produce a list of features of the brains of other species that either exceed these criteria or defy the rationale behind choosing these features as indicative of the leading edge of intelligence. For example, dolphins can process sound information ten times faster than humans can, and they posses a perceptual system, based on echolocation, that is absent in us altogether. The neocortex in the dolphin brain is more highly convoluted and has more surface area than the human neocortex. We should acknowledge that these kinds for perceptual-cognitive and neuroanatomical differences make impossible for us to make definitive statements about any species being more advanced than another. In the context of thinking about extraterrestrial life forms, we can’t afford to view the human brain in other than an entirely objective comparitive light. All of the biases in thinking (the Scala naturae, the anthropic principle and the teleological assumption) have important implications for how we think about our place in the universe. These assumptions affect our thinking about extraterrestrial life and intelligence and therefore, the extent and kind of science we do. Although it may be flattering to separate ourselves from the rest of the biological evolution and to see our own existence as the pinnacle of some great hierarchy, the fact of the matter is stated straightforwardly by Flanagan (2002): “Humans don’t possess some animal parts or instincts. We are animals. A complex and unusual animal, but at the end of the day, another animal.” All of the major paradigm shifts in our understanding of the world have, in one way or another, reassigned our views about ourselves to a more objective stance. This is going to happen within bioastronomy in various domains – and in the most dramatic way if we find life somewhere else. One of the domains in which this is happening already is through the ever-growing realization that naturalistic Darwinian process are the bases for phenomena such as intelligence and complex behaviors. A more objective kind of scientific revolution is occurring in the study of these processes. This has resulted in the development of more rigorous, quantifiable, and objective investigative methodologies and knowledge in the domains of intelligence, brain evolution, behavior, and other complex processes. Once we get beyond the biases in a real fundamental sense the study of complex behavior and intelligence will form a much larger part of the science of bioastronomy.

**Science Bad – Link – Mars**

**Scientific construction of mars relies on paradoxical colonialist narrative that forces out opposition to missions**

**Jenkins 9** (Jae, Florida State U, Florida Philosophical Review Vol. 9.2 Winter P. 128 JF)

**The tenuous relationship between the empirical and the fictive lends science the availability to use other forms of knowledge, like narrative knowledge, to legitimate its activities**. **This narrative knowledge is often the kind of knowledge that scientists are believed to shun**—ostensibly, scientists don’t tell stories, they present facts. Thus, empirical knowledge is the proclaimed mandate of the scientist. Yet it is often a narrative, and not empirical knowledge, that is used to advocate and legitimate the activities of the scientific community and the authoritative presence of their government structures. Today, **scientists studying Mars use the tools of the narrative of colonialism—with the enthusiasm of nationalism, the promises of corporate success, and the desire to dominate new frontiers—all to legitimate the project of going to Mars**. **When one legitimates an activity, they are promoting said activity as authorized, validated, or normative.**33 Both scientific and governmental discourses are legitimated by narrative, and yet scientific discourse tends to push narrative aside as an inferior method of conveying knowledge. There also exists a vague correlation between legitimation and truth. Jean-François Lyotard explains, **“The language game of science desires its statements to be true but does not have the resources to legitimate their truth on its own**.”34 **The state tends to render science “understandable” by relating “scientific knowledge to ‘popular’ knowledge,” doing so by “spend[ing] large amounts of money to enable science to pass itself off as an epic.**”35 Scientific documentaries like MARS: Dead or Alive are saturated with narratives, from the anthropomorphic rovers to the “hostile” land, because **“scientific knowledge cannot know and make known that it is the true knowledge without resorting to the other, narrative, kind of knowledge, which from its point of view is no knowledge at all**.”**36This paradoxical viewpoint of scientific narratives threatens to render scientific accounts of Mars unchallengeable**. **Scientists attempt to explain what Mars is like, but then use** colonialist narratives**,** modernist narratives, and Hegelian **narratives of progress to induce the public into funding scientific projects**. Thus**, it becomes cumbersome to engage in dialogue concerning the legitimacy of Martian endeavors when scientists utilize narrative to legitimate what they do,** while dismissing narrative as non-science. Instead, **the scientific discourse of Mars should be seen for what it is—a changing, subjective, and complex exchange of the narrative and the empirical, influenced by historical context, bureaucratic powers, and the technological drive toward efficiency.**

**Science Bad – Link – Astronomy**

**Astronomy is biased by competition**

**Chaisson 94** (Eric, Research Associate @ Smithsonian Astrophysical Observatory, “The Hubble Wars” http://www.albany.edu/~scifraud/data/sci\_fraud\_3378.html JF)

**The widespread notion that the scientific method is unbiased and objective**, that scientists are and always have been lacking in human emotion in the course of their work, **is a farce**. **Today's science endeavor is as value- laden as most things in life. Even in the remote, wide- eyed, and largely impractical science of astronomy, elements of intense competition and concentrated ambition are ever-present, for some often all-consuming.** Alas, **there is no silver medal in science**, no second-place accolade.

**Astrophysics is subject to bias—historical example**

**Padmanabhan 5** (Thanu, Pune U, India, “The Dark Side of Astronomy” Nature 435 May 5 JF)

**Science,** unfortunately, **is done by humans. This makes scientific debates subject to the usual follies of human interaction, prejudices and lack of objectivity.** **One classic example in the modern history of astrophysics is the dispute between** Arthur **Eddington and** Subrahmanyan Chandrasekhar (also known as **Chandra**) **regarding the fate of stars with masses above a critical value**. In 1930, at the age of just 19, **Chandra made the pioneering discovery that such objects should continue to collapse to a singularity**, a mathematical point of infinite density. **Eddington, the leading authority in astrophysics at the time, ridiculed this conclusion**. And thereby hangs a tale. The fate of such massive objects is an extremely important question in astrophysics. Chandra was predicting the existence of black holes, although this idea was years away from reaching maturity. He reached his viewpoint by combining the laws of special relativity with those of quantum theory as applied to particles such as electrons when they are in a state in which they are said to be relativistically degenerate. Chandra's calculations, related to the pressure of the relativistically degenerate gas, led him to the conclusion that gravity will inexorably crush a sufficiently massive body to a point. **If Eddington had merely expressed discomfort at matter collapsing to a point-like singularity of infinite density, that would have been fair enough**. Even today we do not understand what actually happens to matter that falls into a black hole, and those of us who have thought about it are uncomfortable with the notion of a singularity. **But Eddington questioned Chandra's logic and his calculation, and raised irrelevant objections.** **Later work completely vindicated Chandra**, but the early humiliation left a deep scar. **We can only speculate about what would have happened if Eddington had taken the scientifically correct stand and helped to develop Chandra's ideas further.**

Science Bad – Link – Econ Adv

Economic rationality perverts & governs science – Their adv promote scientific privilege and error

Kellner 90 (Douglas, professor of education @ UCLA, Sociological Perspectives, Vol. 33, No. 1, Spring, JSTOR, http://www.jstor.org/stable/1388975, JMB, accessed 6-27-11)

Critical theorists privileged Marxist categories in their supradisciplinary discourse, arguing that Marx's concepts of commodity, money, value, exchange, and fetishism characterize not only the capitalist economy but also social relations under capitalism where human relations and all forms of life are governed by commodity and exchange relations and values. Building on Lukacs's theory of reification (1971), they argued that capitalist society produced a rigid, reified structure wherein human beings were transformed into things. On this theory, through the process of reification, the unnatural conditions of the capitalist economy and labor process, the com modification of all goods, services, and objects, and the new modes of thought promoted by the mass media and positivist science appear to be "natural" and to form a system impervious to human control or intervention. Horkheimer's essay- "Traditional and Critical Theory" (1972) provides the most systematic and comprehensive presentation of the Institute's conception of social theory, while spelling out the presuppositions of the project and its relation to traditional theory. Traditional theory from Descartes through positivism is characterized by what is now called "foundationalism," i.e., the attempt to ground theory in theoretical postulates which form the foundation upon which the traditional theorist builds theoretical constructions. Traditional theory tends to be deductive, privileging natural science and mathematics; its goal, Horkheimer claims, is unity and harmony, with mathematics as its model (1972:190)- Horkheimer suggests that traditional theory is thus a projection of the bourgeois ideal of the harmonious capitalist market unified by calculable laws of supply and demand. Critical theory frequently shows the relationships between ideas and theoretical positions and their social environment, and thus attempts to con-textualize or historicize ideas in terms of their roots within social processes. Following this line of inquiry, Horkheimer suggests that traditional theory is itself part of the social practices that constitute capitalism and bourgeois society. Its tendencies toward mechanistic materialism reproduced the mechanistic thought and practices of the industrial revolution according to which the world was conceptualized as a machine during an era in which machines came to dominate human beings. The dominant bourgeois trends of abstract and quantitative thought which informed traditional theory reproduced the tendencies toward abstraction and a mode of quantification that was based on exchange in the capitalist market where value was expressed in abstract, quantitative terms. Just as a bourgeois society governed by exchange value abstracted from values, goals, sentiments, and qualities, so too did traditional theory. And, finally, the fragmentation and division of the sciences reproduced the bourgeois division of labor under capitalism whereby specialization and fragmentation become dominant features of society's structure. Social theories, for critical theory, are thus forms of social practice which reproduce dominant forms of social activity.4 Traditional theory is, Horkheimer claims, unaware of the ways in which it is bound together with social processes and thus fails to see its lack of autonomy and social determination. As it became increasingly involved in social processes of production and reproduction, it became increasingly conformist, uncritically submitting to the dominant instrumental, quantitative, and capitalist values. Unaware of its social determination, "theory was absolutized . . . and became a reified, ideological category" (1972:194). Consequently, "The scholar and his science are incorporated into the apparatus of society; his achievements are a factor in the conservation and continuous renewal of the existing state of affairs, no matter what fine names he gives to what he does" (1972:96).

Science Bad – Link – Econ Adv

Their economic conception of science reduces items to usable, manipulable forms which promotes a catastrophic form of technology that destroys the enviro and the VTL

**Barnes 11** (Will, Institute for the Critical Study of Societies of Capital , “The Critique of Science: Historical, Materialist and Dialectical Studies on the Relation of the Modern Sciences of Nature to the Bourgeoise and Capital”)

The distinctions of primary and secondary qualities, etc., and, more fundamentally, the anticipatory ontological weighing of the former against the latter taken together constitute the scientific projection of the world of nature as object-like (merely the other, ideal side of the reality of societies of capital). Object-likeness is thought, in reductionist and crude materialist terms at least since Descartes, as essentially and simply extension, as contentless, infinitely malleable "matter" subsisting in homogenous space, devoid of any internal logic, life or subjectivity. But "matter" is not "real" at least in the sense modern physical science suggests, but, in fact, is the product of scientific analysis and reconstruction. All modern physical theory is analysis, conceptually decomposes its object, natural bodies. This is how understanding is arrived at. Once achieved, a whole can be reconstructed, this object can be reconstituted from the elemental, itself a construct, on up. For example, scientific understanding of a rock one might wish to quarry is reached only when it is conceptually dissolved into its chemical components, themselves understood in terms of their atomic structures and their interactions. Only then can we say we have understood what this rock is, an ore consisting in so much magnesium, aluminum, iron, etc., components which themselves have such and such atomic structures and are related (bonded) in such and such ways, all of which allows us to “understand” the object (rock), to grasp it in terms of a raw material (iron ore) to be used in commodity production (steel). Thus, scientific understanding is always attained abstractly, in the movement from a whole to the most elemental, itself a conceptual construct. Only then are these elemental constructs aggregated, a whole reconstructed. That whole is an abstract totality, a conceptual whole that is in a practical sense entirely homologous with its elementary, infinitely malleable material components: Precognitively, this understanding penetrates awareness permitting the objects science has constructed to function as ideal, manipulable moments of bourgeois practices in accumulation… It is here that the deep penetration of the value-form into the conceptual structure of science is disclosed, science with its reductionist method (analysis and decomposition of the object), its atomism (ontological primacy of indivisible, actually infinitely divisible, elementary particles) and its objectivism (nature absent productivity as its motive or its driving force; and subjectivity as a passively constituted and fully determined element, one element in the aggregate, lawfully governed whole that is nature) is fully homogenous, perfectly congruent, with capital, with its atomism (the commodity as the fundamental reality of bourgeois society), its reductionism (human activity rendered abstract, i.e., generalized, temporally quantified, materialized and objectified as "value,” existing solely as an elementary object that, with other such elementary objects collected in production, take the shape of mechanically assembled, socially combined labor power, as abstract labor) and its objectivism (society as a deterministic system subordinate to laws discovered by political economy, likes those alleged to rule nature): Governed by the anticipatory projection of nature as an assemblage of bodies in motion (itself precognitively motivated by the telos of nature domination), atomism, reductionism and objectivism are spontaneous modes of the bourgeois apprehension of reality, and scientific categories are, or more generally the overarching conceptual architecture of science is, an elaborate, multifarious and multifaceted mediation of this immediacy… Ideationally produced through scientific method, this mathematized world of natural phenomena is an anticipatory projection of a socio-historical lifeworld constructed through the subjugation of society and surrounding nature to the production of commodities for exchange, is the, albeit oblique, theoretical elaboration of “raw material” as it appears in commodity production, endlessly malleable natural objects ripped from decontextualized surrounding, visible nature. Science projects a nature that is flattened out and rendered a surveyable and manipulable object: Stripped of qualitative determination and reduced to a gross abstraction, it has become an a priori quantifiable series of points determined exhaustively by positions given with objective time and extended space. It is an abstraction without purpose or internal logic to its moments (bodies) and without inherent or defining characteristics apart from those mathematically projected. From the side of demystified daily experience, however, science's nature can be best comprehended as an ideational product masquerading as real. At the hands of (capital's) science, nature, appearing in history at once as its ground and as a product of a development inseparable from its interaction with social development, has become aesthetically ugly stuff. It is, in other words, a product of domination, of what science and capital have made of it. This is nature as matter, as raw material for commodity production on a capitalist basis... Science, then, is not only bourgeois in the narrow cultural sense. It is, historically, a theoretical mediation of the activity of capital in the utilitarian-pragmatic reduction of nature to raw material for capitalist production. This development was immanent to science itself. For the theoretical anticipation of this utilitarian-pragmatic, i.e., technological, reduction of nature is modern science: It is as science that the conceptual framework for this reduction is constituted, and out of which production of a capitalist world can be undertaken, a world in which science is at home and without which it would be a stranger without a home (hence, theoretically barren), i.e., which constitutes the societal presuppositions of science's full development and without which it would be undevelopable…

Science Bad – Link – Econ Adv

The way they tie science to economic productivity destroys the environment

**Barnes 11** (Will, Institute for the Critical Study of Societies of Capital , “The Critique of Science: Historical, Materialist and Dialectical Studies on the Relation of the Modern Sciences of Nature to the Bourgeoise and Capital”)

Second, we are required to trace out the internal connection or unitary structure that exhibits the inseparability of the internal conceptual structure of science and the bourgeois process of accumulation. This can be achieved largely by showing that this structure is indissolubly linked to the constitution of the socio-historical world we call capitalism by way of nature domination (and, in doing so, we shall also attempt to further exhibit the homologous identity of this conceptual structure with that of the intelligible structure of this world, that of the value-form). The development of productive forces is not what distinguishes the bourgeoisie as a class in history, particularly at its origins. Understood as a structure characterizing human history in its entirely, productive forces is a gross conceptual abstraction without real referent. The reality of productive forces is constituted during the course of capitalist development; but at its origins the latter cannot be understood in terms of the former. The fundamental social requirement for the emergence of productive forces, the productivity of labor, etc., is the institutional separation out of an economy from socially undifferentiated precapitalist formations, which in actual history rests on the social generalization of capital’s formal domination over labor in production.2 Until this development occurs, it is utter nonsense to speak about productive forces and their role in history or, here, at the origins of capitalism. What does distinguish the bourgeoisie as a class in history is the project of nature domination. At the same time, at its origins and prior to all explicit theorization and experimentation, the modern science of nature is motivated by the same telos of nature domination, an atheoretical yet comprehensive goal of scientific activity embedded in the internal conceptual structure of science as an anticipatory projection of a mathematized nature. (And it is the societal meaning of a mathematized nature that is at issue.) While reconstruction of this project as the hidden telos animating modern science can be undertaken from the standpoint of the technological achievements of scientific practice, it is important to recognize that it is not necessary to do so. Rather, this project, one that necessarily presupposes bourgeois life-practices centered on money (and later capital) accumulation, can be read off, as we are suggesting, the internal conceptual structure of science itself.

**Their innovation arguments are disingenuous – Science has been largely driven by public funding**

Nelson 3 (Richard, Philosophical transactions, vol 361, jstore, aug 15 2003, da: 6-27-2011, lido)

Modern capitalism has proved a remarkably powerful engine of technological progress. Much of the attention to its workings has focused on the businesses and entrepreneurs, operating in a market setting\* who are the central actors in developing and introducing new products and processes. This part of the capitalist engine is driven mostly by profit seeking efforts to develop proprietary capabilities. However, at the same time it is widely recognized that the power of market-stimulated and -guided invention and innovation is often dependent on the strength of the science base from which they draw. Thus science base largely is the product of publicly funded research, and the knowledge produced by that research is largely open and available for potential innovators to use. That is, the market part, of the capitalist engine rests on a publicly supported scientific commons (see the work on National Innovation Systems, e.g. Freeman 1988; Lundvall 1!)<)2; Nelson 1G93).

Science Bad – Link – Econ Adv

The use of science for economic gain leads to over-exploitation and standing reserve

Muller-Wille 3 (Staffan, PhD in philosophy @ U of Bielefeld, researcher @ max planck institute, history of political economy, supplement to vol. 35, muse, http://muse.jhu.edu/journals/history\_of\_political\_economy/v035/35.5muller-wille.html)JFS

Beyond guiding research projects, Linnaeus's economic contentions also found expression in his engagement for educational and administrative reform. Thus he urged at several occasions that "oeconomia"—which he understood not as a science of human economic action and behavior, but as a science of natural products and their "use" for humans—should be included as a compulsory part of university teaching and that respective chairs of oeconomia should be created at Swedish universities (see Rausing, this volume). Another project of reform in which Linnaeus was involved was the foundation of the Royal Swedish Academy of Science at Stockholm in 1739, which by public lectures and demonstrations, as well as the edition of a scientific journal and a popular almanac, both in the vernacular, aimed to "serve the growth and development of useful sciences, economy, trade, and manufactures" (Liedman 1989; Eriksson 1989). In short, Linnaeus viewed oeconomia—the "new science" as he liked to call it—not only as a source of information for state elites, but also as a pedagogic instrument that could provide a broad, disciplined basis of local assistants—parsons, physicians, and engineers—to an administrative state machinery furthering national prosperity by systematic resource allocation and exploitation (cf. Liedman 1989, 28–31; Tribe 1988, 19–34). With this conception of science as an instrument for rational development, one should expect a close conformity between Linnaean oeconomia and natural science. And indeed, in Linnaeus's eyes, oeconomia was about hardly anything more than natural history plus information on the uses made of its diverse objects in technology. Conversely, Linnaean natural history was thoroughly designed to serve its function as a practical and simple tool to explore natural resources. Thus binomial nomenclature, the main innovation for which Linnaeus is remembered today, was developed within the context of one of his "patriotic" projects: as a tool for shorthand designation to be used by a group of students who followed cows, pigs, and sheep to observe which plants they fed upon (Stearn 1959). In a sense Linnaeus's version of oeconomia reduced economics to technology and science to a technicality serving technological goals (Koerner 1999, 101–4). Despite these conformities, however, some economic propositions surfacing in Linnaeus's botanical publications are not readily reconciled with the economic persuasions he expressed in his "patriotic" writings. Most conspicuously, as Koerner noted herself, Linnaeus's conception of an "economy of nature"—on which, after all, human economics depended in his view—was based on "notions of equilibria" as "checks and balances and feedback loops," while he "modeled . . . the economy of the nation on mechanistic notions of force" (102). The theoretical framework of Linnaeus's natural science, expressed in economic metaphors of balance and exchange, thus seems to have conflicted with the economic contentions on which he built his oeconomia. The key to developing an understanding of these conflicts lies in Linnaeus's classification of sciences, which did not result in a dichotomy of natural science versus oeconomia, as one might expect, but in a tripartition. In a programmatic contribution to the first volume of the journal of the Royal Swedish Academy of Science, Linnaeus distinguished "physics" from "natural science" (encompassing botany, zoology, and lithology), and each of them from "oeconomia." The latter was defined as "the science teaching us the application of the elements [i.e., "earth, water, air, and fire"] to natural bodies in serving our needs," while "physics" simply emerged as the science "rendering the properties of elements" and "natural science" as the science "teaching us the knowledge of natural bodies," both together providing the foundation for oeconomia (Linnaeus 1740, 411–12).2 Linnaeus explained the common ground for this tripartition in the following paragraph: "All that ~~man~~ can use for ~~his~~ needs, must be at hands on this globe; that is either elements or natural bodies. Elements can neither feed nor clothe man, for that ~~he~~ must use natural bodies primarily; however, these in themselves are often raw, unless they have been prepared by the elements for the purpose that ~~man~~ enjoys from them" (412). What can be discerned in this explanation is an abstract distinction that in itself is economical: Human production always involves the application of certain agents (elements) to certain materials (natural bodies), the latter preexisting the production process itself, as they always have to be procured from elsewhere. "Physics" is thus separated from "natural science" along a dividing line that approaches the modern distinction between "forces of production" and "commodities," or, to put it more generally, between a sphere of production and a sphere of exchange. However, in its abstract generality this distinction was (and still is) anything but trivial. To see this, one only has to think of the premodern opposition of oeconomia and chrematistics—Linnaeus's own economic ideal of (national) autarky being a reflection thereof—which identified the dividing line between (re)production and exchange with the concrete border of the individual "household" (cf. Tribe 1988, 23–25). And indeed, it is hard to see why water and earth should be conceived exclusively as agents (and not as materials also, as Aristotle originally had it), and minerals, plants, and animals exclusively as materials (and not as agents also).

Science Bad – Link – Econ Adv

Their economy adv demonstrates the perversity of science – What is “good” is what is profitable

**Reznik 8** (David, *Episteme*, vol 5, p. 220-238, lido)

In addition to restrictions on autonomy imposed by specific laws or regulations, there are restrictions on autonomy resulting from contractual obligations. Scientists, scientific groups, organizations, or disciplines may voluntarily restrict their conduct via contracts or other agreements. When individuals enter contracts, they decide to limit their freedom in order to obtain the benefits promised in the contracts (Calamari and Perillo 1998). For example, if X agrees to mow Y’s lawn on Saturday morning for $25, X has made a decision to limit his own freedom. If X wants to earn the $25, he must perform his part of the contract. Scientists also voluntarily restrict their own freedom by entering contracts with universities, private companies, or granting agencies. In these contracts, scientists promise to do specific things, such as teach, consult, lecture, or conduct research, in order to receive specific benefits, such as salary, honoraria, funding for research, etc. The parties in these contracts (e.g. the scientists, the university, and the company) are free to negotiate the terms and conditions. For example, if a company decides to conduct a clinical trial on the efficacy of drug X, it may offer a contract to clinical researchers interested in conducting the trial. The researchers (and their universities) are free to accept or reject this offer, or negotiate terms and conditions. Contracts with research sponsors play an important role in problem selection in science. Most scientists require large sums of money to conduct their research. To obtain funding, scientists often must decide to work on a problem that a sponsor is willing to pay to have studied. A scientist may become interested in a particular research problem, but the scientist usually cannot work on that problem unless he can find someone to pay for it. Research almost always follows the money.

Science Bad – Link – Environment Advs

What is true about nature is the product of the discourse that describes it—acid rain, loss of biodiversity, and global warming are all products of scientific observation

Kidner 0 (David, faculty of humanites @ Nottingham Trent U, Environmental Ethics Vol. 22.4 Winter Pg. 340-341 JF)

Claims that nature is entirely “socially constructed” have become widespread in recent years. Thus, Vivien Burr suggests that “what we regard as truth is a product not of objective observation of the world, but of . . . social . . . processes and interactions.”1 Similarly, Peter Mason argues that “reality” itself is a product of the activity of our imagination.”2 Language is often seen as playing a leading role in this construction: thus, William Chaloupka and R. McGreggor Cawley suggest that “nature, like everything else we talk about, is first and foremost an artifact of language.”3 In these terms, language is seen not as representing nature more or less adequately, but rather as constituting it, so that “any attempt to invoke the name of nature . . . must now be either naive or ironic.”4 Similarly, constructionists “question the assumption that science is about nature as it exists outside us.” Rather, “scientific paradigms are sociohistorical constructs—not given by the character of nature, but created out of social experience, cultural values, and political-economic structures.”5 Nature, according to this view, has no inherent structures or patterns of its own—a notion often criticized by constructionists as “essentialism”6—but is structured discursively. The “dubious” logic of nature, as Chaloupka and Cawleyargue, must therefore be replaced by “rhetoric.”7 Such claims suggest that nature is an entity very different from that which many environmental theorists, writers, and activists have up until now believed. Rather than being viewed as a multifaceted, diverse order whose patterns and possibilities extend well beyond our ability to understand them, nature becomes an offshoot of a social reality which also constructs individuality. And since the social world varies according to time and place, then it follows that each of these social worlds will construct a somewhat different version of nature, and there is, therefore, no single “nature,” but rather a diversity of “natures” constituted by our various fantasies and languages. In William Cronon’s words, it “hardly needs saying that nothing in physical nature can help us adjudicate among these different visions [of nature], for in all cases nature merely serves as the mirror onto which societies project the ideal reflections they wish to see.”8 Constructionism therefore implies a relativistic stance within which one attitude toward or interpretation of the natural world is no better or worse than any other. According to views such as these, then, nature is not the ground out of which human life grows, but “the site for a repertoire of definitional and contestatory activities.”10 In other words, nature is part of a discursive world, and any “problems” which might exist within this world are produced and solved by debate rather than by embodied action. In this spirit, John Hannigan argues that environmental problems originate in the discursive realm we call “science.” Criticizing the view that science can, at least to some extent, “reflect the physical reality of the natural world,” he claims that scientific knowledge “is highly dependent on a process of claims making.”11 It is rare indeed to find an environmental problem which does not have its origins in a body of scientific research. Acid rain, loss of biodiversity, global warming, ozone depletion, desertification and dioxin poisoning are all examples of problems which first began with a set of scientific observations.12 Cronon echoes this sentiment, claiming that “some of the most dramatic environmental problems we appear to be facing . . . exist mainly as simulated representations in complex computer models of natural systems.”13 Environmental problems, according to this viewpoint, are not disruptions of the ecological fabric of the world which can be more or less imperfectly detected, assessed and described through the scientific and conceptual tools available to us. They are, rather, constructed by these tools, and cannot be said to exist independently of the ways we measure and discuss them.

Science Bad – Link – Environment Advs

Study of environmental destruction is rooted in socially constructed objectivity

Demeritt 94 (David, U of British Columbia, Journal of Historical Geography 20.1 P. 26-27 JF)

History of science poses a second challenge to the critical project of environmental history. Ironically enough, environmental historians are themselves responsible for much of their own discomforting skepticism about ecology’s claims to represent nature accurately. They were quick to deploy the work of Thomas Kuhn and others who argued that scientific knowledge is socially constructed. They cheered as their critique discredited the objectivity claims of foresters, nuclear engineers, and other scientists opposed by the environmental movement. Now, however, environmental historians and their allies rest uneasily as they realize that ecology, their scientific darling child, is no different from any other science; its knowledge is also socially constructed and cannot claim to be a mirror of nature. More disorienting still is the realization that even their own critiques of science and our society can no longer claim a privileged vantage point from which to represent the world as it really is out there. Donald Worster’s Nature Economy, a history of ecological ideas, was in the forefront of the historicist critique of science. His systematic assault on scientific objectivity claims proceeded in two ways. First, Worster distinguished between science and ideology by documenting the influence of outside, “non-scientific” ideas on particular scientists. A.G. Tansley’s attack on Clementian climax ecology was not motivated by an objective re-evaluation of the data, but by a fervent wish “to put down the threat to the legitimacy of human empire posed by the natural climax theory”. Second, Worster measured the inaccuracy of scientific knowledge by charting the shifting fortunes of the reductionist and holistic metaphors in ecology against the implicitly unchanging ontological status of nature. Since nature does not change while the predominant scientific representations of it do, scientific knowledge must be “valid relatively, suited to or at least rooted in their times”. this tack smuggles an epistemological realism about its own claims to know an unchanging nature into its rendering of socially constructed science. These attacks on scientific objectivity erode the epistemological foundation that many environmental historians seek to build beneath their wider critique of modern society and its relations with the biogeochemical environment. If scientists cannot claim to represent nature truly, then environmental historians cannot realy upon ecology to provide the truth about nature. Ecology may be a preferable science to nuclear engineering, but it cannot claim to occupy a privileged vantage point from which to represent nature more accurately than other sciences. This realization is particularly troubling because environmental historians have relied so heavily upon the authority of favored scientists like Rachael Carson to unveil the truth about human devastation of the environment.

Science Bad – **Link – Warming Adv**

Science about warming is politicized and malleable—skepticism is needed

Corfee-Morlot, Maslin and Burgess 7 (Jan and Mark, University College of London, Jacquelin, U of East Anglia, Philosophical Transactions Vol. 365.1860 November 15 P. 2760 JF)

Given the complexity of these global issues, science plays a central role in political debate about climate change; science is also a main source of the expertise offered through the environmental social movement (Bramwell 1989; Yearley 1994; Gough k Shackley 2001; Weart 2003). Yearley (1994, p. 162) reminds us that 'many objects of environmental concern are only knowable through science. Without a scientific worldview we would know nothing of the ozone layer and would certainly be unable to measure its diminution; the same is true of the greenhouse effect.' Yet the science of global change can be used to promote quite different ends by friends and foes of environmental action alike (Yearley 1994; Herrick 2004). Although scientific knowledge is essential to global environmental problem identification and to solution design, there is malleability in the way it is interpreted and used. This was demonstrated by Carson in Silent Spring where she criticized the politics of science and exposed scientific controversy about the effects of chemicals to public scrutiny (Br?lle 2000, p. 183). This points to the importance of argument and interpretation in the use of science by both the environmental social movement and more broadly policymakers and other representatives of civil society to bring about change (Yearley 1994; Herrick 2004). In the public sphere, the media is another important pathway for relaying scientific knowledge to the lay public and for promoting political debate and understanding about global warming.

Science Bad – Link – Tech

Technology and science are synonymous and both extensions of capitalism

Nelson 3 (Richard, Philosophical transactions, vol 361, jstore, aug 15 2003, da: 6-27-2011, lido)

There is a widespread belief that, modern fields of technology are, in effect, applied science, in the sense that practice is directly drawn from scientific understanding, and that advancing technology is essentially a task of applyiug scientific knowledge to achieve better products and processes. This task requires scientific expertise, but in most cases is relatively routine one\*) the target is specified. Indeed, in his Capitalism, socialism and democracy, Schumpeter (1912) argued that by the mid twentieth century that was largely the case, and (he kind of competition among firms that bad, over the previous century, made capitalism such a powerful engine of progress was no longer necessary. With strong science, technological advance could be planned. Schumpeter's views were in accord with those of many prominent scientists of his day (and of those today). Yet careful studies of how technological advance actually proceeds in this modern era clearly show that the process remains unplannable in any detail, and competitive exploration of multiple paths remains an essential part of it (see, for example, Rosenberg 1996; Nelson & Winter 19S2). Virtually all empirically oriented scholarly accounts of how technology progresses have highlighted that the process Is evolutionary in the following senses (see, for example, Basalla 1986; Const Ant 1980; Dosi 1988; Mokyr 1990; Nelson k Winter 1982; Petroski 1992: Vincenti 1990; Zinian 2000). First, at any time there generally are a wide variety of efforts going on to improve prevailing technology, or to supersede it with something radically better. These efforts are generally in competition with each other, and with prevailing practice. The wiuners and losers in this competition are determined to a considerable extent through an ex-post-selection processes. Second, today's efforts to advance a technology to a considerable extent are informed by and follow from the successes amide failures of earlier efforts. While there are occasiomd major leaps that radically transform best practice, for the most part technological advance is cumulative. And scholars of technological advance also have generally stressed that the advanced technologies of a given era are almost always the result of the work of many inventors and developers. Technological advance is a collective, cultural, evolutionary process. The proposition that technological advance is an evolutionary process in the above sense in no way denies, or plays down, the often extremely powerful body of understanding and technique used to guide the efforts of those who seek to advance it, at least in modern times. A strong body of scientific understanding of a technology serves to enlarge and extend the area within which an inventor or problem solver can see relatively clearly and thus make informed judgments regarding what particular paths arc promising as solutions, and which ones are likely to be dead ends. Also, the sciences and engineering disciplines provide powerful ways of experimenting and testing new departures, so that a person or organization who commands these can explore the merit of designs without going to full-scale operational versions. Thus, strong science enables the process of designing and inventing to be more productive and powerful than it would be wen1 the science base weaker. However, it does not change the fact that the process of advancing the technology remains evolutionary. Strong science provides tools for problem solving, but usually itself does not solve practical problems. If anything, strong science increases the advantages to society of having many competent actors striving to improve the art. The connections between the 'body of practice' aspect of a technology atid the 'body of understanding' pari need to be understood in this context. Virtually all modern technologies are supported by a strong body of science or science-like understanding that illuminates how the artefacts and techniques employed work, provides insight into the factors that constrain performance and provides clues as to promising pathways toward improvement. But at the same time, much of practice in most fields remains only partly uuderstoml. and much of engineering design practice involves solutions to problems that professional engineers have learned 'work" without any particularly sophisticated understanding of why.

Science Bad – Link – Tech

Advancements in science and technology are of a colonialist mindset

Sherman 2000 (Daniel, French Historical Studies, vol 23, Muse, Fall 2000, da: 6-27-2011, lido)

For Michael Osborne, the preeminent ‘‘science of French colonialism’’ was acclimatization, sometimes known as economic zoology, and he sees its brief rise to prominence as an important part of the history of French colonization of Algeria. His thorough and often engaging study, however, may leave readers with a somewhat different impression. In the admittedly murky world of nineteenth-century pseudosciences, acclimatization stood out for its lack of pretension to pure scientific status; rather, it ‘‘signified both a method and a process whereby humans exploited the forces of nature, under the guidance of the principles of science, to assist exotic plants and animals to adapt to new circumstances’’ (71). Osborne’s study focuses on the Société zoologique d’acclimatation, founded in 1854; although scientists from the Muséum d’Histoire Naturelle played a prominent role in this group, it was never primarily a learned society. Rather, the Société brought together a typical cross section of the Second Empire elite, who shared such interests as thoroughbred racing, the breeding of exotic animals, and improving agricultural efficiency. Itsmost substantial and enduring investment, the Jardin d’acclimatation in the Bois de Boulogne,melded education and entertainment in a profit-making venture that not only exhibited but sold animals, dead as well as alive. Later, in the 1880s, the Jardin became one of the pioneering French spaces for live ethnographic exhibitions. The extent to which living organisms adapted to changing environments, a contentious issue in nineteenth-century science, obviously had significant implications for both advocates and opponents of settler colonialism, and Osborne provides a useful summary of the theoretical debates. But the Société zoologique remained overwhelmingly practical rather than theoretical in its orientation, and though it did have extensive contacts with scientific associations in Algeria, its members seem to have been just as interested in schemes such as the introduction of yaks in the Alpine regions or of llama and alpaca fleece in Lorraine. Moreover, acclimatization had only limited practical utility to colonization, especially as more rapid means of transportation made it cheaper simply to import exotic fruits, and the Société promoted an ideology of self-sufficient small farming that diverged sharply from the typical means colonial agriculture used to mobilize capital.23

**The expansion and innovation of technology is inherently masculine**

Smith 2 (Erin, American Quarterly, Vol 54, p. 359-367, dw: June 2002, da: 6-27-2011, lido)

Perhaps the most compelling part of Spigel’s thinking about the postwar media is her rejection of technological determinism. In place of grand theorizing about globalization or time-space compression, Spigel offers historically-specific ways of talking about the media, private life, and public space grounded in empirical research. The previously unpublished essay in part one, “Portable TV: Studies in Domestic Space Travel” is a response to Jean Baudrillard’s work and scholarship inspired by it.3 These abstract theories about technological change argue that television and satellite technologies have obliterated the distinctions between public and private space and have fundamentally reshaped human subjectivity as a consequence. Spigel explores the ways miniaturization and remote control technology (read: mobility) have changed our ways of being in the world historically—through investigating what purchases of portable televisions in the 1960s represented to viewers/consumers. While 1950s televisions and television advertising emphasized family viewing, family fun, and remaking the home into a private theater, 1960s ads for portable TVs likened owning or watching a television to liberation from the family circle and domestic space (especially for women) and to active participation in outdoor, action/adventure sports (especially for men). The names of television sets, the kinds of programming available, and the ways of advertising portable TVs all emphasized liberation, action, and adventure— but these remained concepts implicitly structured by class, race, gender, and sexuality. Mobility enabled by technology did not collapse the profoundly ideological boundaries between public and private but required that they be remade or reinvented to accommodate new situations. Spigel’s historical account is a much more complicated and nuanced discussion of technologies as socially situated, as part of larger meaning systems differently available and differently appropriated by historical actors.

**Science Bad – Link – Tech**

**Innovations in modern technology are unpredictable and chaotic**

Hong 98 (Sungook, Perspectives on Science, vol 6, da: 6-28-2011, lido)

Modern technology changes our society in unexpected ways. Many modern technologies have wider social ramifications and external costs than can be effectively predicted and controlled by their inventors. For example, nobody imagined at the time of the invention of oil containers that they would create serious marine pollution. Nobody imagined in the 1930s that the TV would have such a great influence on our everyday lives. No one saw that automobile exhaust might lead to global warming. The foresight and healing power of the individual, the local government, and the market to repair disturbances that modern technology generates is limited (Heilbroner 1965; Mesthene 1970). Yet, it is meaningless to say that, due to this, the container, the TV set, or the car has its own life. It makes more sense to say that this is a characteristic of the period in which "the forces of technical change have been unleashed, but the agencies for the control or guidance of technology are still rudimentary" (Heilbroner 1967, p. 345). Many technologies came to be used quite differently from the way in which they were originally designed. Induction coils designed in the 1840s to generate high-tension current for physical and medical purposes became transformers in the 1880s to transmit high AC voltage in power engineering. The quasi-optical apparatus constructed by Heinrich Hertz in 1887 to generate Maxwell's electromagnetic waves became the basic component of wireless telegraphy in the 1890s. The Triode designed and used for amplification of received wireless signals in the 1900s became an oscillator to generate homogeneous electromagnetic waves in the 1910s. It seems that the inventors of such technologies did not fully envisage their hidden potential. Different uses were later disclosed, or negotiated, by people other than the original inventors, usually in a quite different context and, in many cases, very haphazardly. But this is not the characteristic of technology alone; as we can easily see, "it is true of all aspects of our society" (Pitt 1990). A technology may appear to be autonomous, if we take two snapshots of it at two separate moments in which it was differently employed (e.g., the Triode in 1906 as an amplifier and the same Triode in 1916 as an oscillator) and highlight their differences. We can, however, obtain a quite opposite image of technology, if we think of technology as a "process" (Pitt 1990) and focus on the practices of engineers, scientists, businessmen, and users, who contribute, in effect, to the development of a technology in different ways. Obviously, many improvements in technology are somewhat predictable and can even be planned. If we use the language of innovation theory, incremental innovations can largely be predicted and steered by engineers. For example, once basic ideas, devices, and techniques [End Page 263] for integrated circuit (IC) technology were settled, integrating more and more semiconductors into a chip was predicted and achieved by overcoming technical and economic barriers. Generally speaking, once a technological paradigm is established, normal technical practices such as increasing efficiency, augmenting power, perfecting its peripheral components, and solving some crucial problems caused by imbalances among its components--problems called "bottle-necks" or "reverse salients"--are predictable and can be anticipated (Hughes 1983; Constant 1973; Dosi 1982). The distinction between radical and incremental innovations is important here, since an objection could be raised against the preceding paragraph on the grounds that radical innovations are not predictable while routine ones are (Kline and Rosenberg 1986; Freeman 1994, pp. 474-78). Radical innovations are characterized by the unexpectedness or exceptionality of the technical, social, and economic consequences of a technology. Such consequences take place in a relatively short time, so that few people can fully appreciate them during that time. This kind of objection contains an element of truth, because it is not possible to fully plan or predict radical innovations. Scientific research has sometimes led to important radical innovations, but we do not yet fully understand the complex dynamics surrounding this issue. So, in this sense, one may characterize radical developments in technology as, to some degree, uncertain and unpredictable. Moreover, since it is hard to see in advance which routine development will be transformed into a radical innovation (remember that many radical innovations started from seemingly routine improvements of existing technologies), it can be said that many technological developments are virtually uncertain.

Science Bad – Link – Tech

Expanses of technology are inherently expansive of scientific determinism and cause wars – arms race proves

Roland 10 (Alex, Technology and Culture, vol 51, dw: April 2010, p. 444-461, da: 6-28-2011, lido)

Was the mushroom cloud an icon of technological determinism, of the power of weapons to set policy?14 The proportionality and symmetricality of the nuclear arsenals suggest that the superpowers did not choose their weapons. Rather, the weapons chose themselves. The policy that came to dominate the cold war—MAD, or mutual assured destruction—suggests that the weapons were not tailored to strategy, but rather the strategy was shaped to suit the weapons. If the arms race was not deterministic, why did Soviet and American nuclear arsenals and manned spaceflight programs appear so similar? If the apparent determinism of the arms race was real, what was deterministic, the technology or the duel? Are all arms races deterministic? Are all duels deterministic? Does the determinism shape both the nature of the weapons and the nature of the contest? Is it only wars and weapons that are deterministic or are all competitions between material forces—say in markets or athletics or space programs—similarly driven by technology? Twice before in human history, titanic arms races have seemed to determine not only the nature of the arsenals in play but also the political economies of the states involved. Some time in the eighteenth century BCE, the horse-drawn war chariot appeared on the battlefields of the Levant and swept all before it.15 States that wanted to contend for power had to invest in the vast and expensive infrastructure necessary to support fleets of chariots sometimes numbering in the thousands. The competition even bred an international chariot aristocracy, mercenaries who rented their skills and their equipment to the highest bidder.16 William H. McNeill has called the chariot the “superweapon” of its day, “the supreme arbiter of the battlefield in all Eurasia.”17 More recently he has called it the “master weapon” of the second millennium BCE, a linguistic turn that invests agency in the technology itself.18 And then, around 1200 BCE, the dominance of the war chariot evaporated in the West, even more quickly than it had materialized.19 Historians have advanced multiple explanations for the eclipse of the war chariot, but all agree that this queen of battle was quickly relegated tomundane transport and ceremonial duties. Within a matter of decades, it was *hors de combat*. The Anglo-German naval race precedingWorldWar I provides another instance in which the weapons systems in play seemed to dictate the course of events.Germany chose the scale of the race by challenging Britain’s command of the sea and forcing the Royal Navy both to abandon its Two-Power strategy—to maintain a fleet larger than the next two powers combined— and to recall ships from its worldwide commitments to beef up the Home Fleet in the North Sea. Britain drove the symmetry by introducing the allbiggun battleship with the launching of HMS *Dreadnought* in 1905. Pre*Dreadnought* battleships receded into obsolescence as Britain, Germany, and other would-be naval powers accelerated building programs to produce the new style of capital ship.20 Like the cold-war nuclear arms race, the naval standoff between Britain and Germany proved to be a war of deterrence, in this case between what American naval theorist Alfred Thayer Mahan called “fleets in being.” The British Home Fleet and the German High Seas Fleet met only once in WorldWar I, at the inconclusive Battle of Jutland in 1915.21 Thereafter the German fleet stayed home but tied down British naval resources with the threat of sallying forth once more. The vast and symmetrical naval arsenals of the two powers cooled their guns for the duration of the war. The more telling naval contest between Britain and Germany was to revolve around a comparatively small number of German submarines and an asymmetrical campaign by the allied powers to meet this unexpected threat. Meanwhile, says William H. McNeill, Great Britain invented the militaryindustrial complex. To get the British people to pay for the ruinously expensive battle fleets called forth by the competition with Germany and the qualitative escalation of the *Dreadnought* revolution, the Royal Navy allied itself with the arms industry and sympathetic members of the government to shape public policy. Germany, a more authoritarian state, almost a command economy, had less trouble channeling national treasure into the arms buildup, but it still had to simultaneously fund an army large enough to fight enemies on two fronts and sustain an economy capable of supporting such a military establishment. What made the arms races between Britain and Germany before World War I and between the United States and the Soviet Union in the cold war symmetrical and proportional? In choosing weapons, why did the two sides arm themselves with the same instruments in the same quantities? Perhaps the dynamics of great-power war in the twentieth century bred this kind of parallelism. Perhaps modern war promotes contests of industrial production. Perhaps such arms races reveal nothing more than a lack of imagination, a kind of copycat impulse that drives one state to match the arsenal of a potential competitor. Or maybe arms races are inherently deterministic. Perhaps potential combatants gravitate to a norm of “weapons symmetry,” and the very symmetricality dictates the proportionality.22 Having chosen the same weapons as the enemy, one is naturally drawn to match or exceed the enemy’s numbers. Perhaps certain weapons development, such as allbiggun battleships or nuclear weapons—or even chariots—leave a potential adversary with no choice but tomatch the technology or get out of the game. On the other hand, it may be, as Thomas Misa has argued, that this is a historiographical illusion; perhaps events look more deterministic at a distance than they do close up.23 Other arms races have been clearly asymmetrical and disproportional. For political, economic, and even cultural reasons, enemies have sometimes chosen to fight with dissimilar arsenals. Ground warfare in the twentieth century seemed to be driven first by one paradigm and then another. Machine war in the first half of the century gave way to asymmetric warfare in the second half. Indeed, “asymmetrical war” became a catchphrase of later-twentieth-century American military thought.24 Total war in the twentieth century, for example, demanded complete mobilization of the state and its industrial capacity. The wealthy, industrialized states fielded mechanized armies—planes, tanks, mobile artillery, logistics—capable of crushing any military force not comparably equipped.25 Like the chariot of old, this paradigm appeared to sweep all before it. Countries had to develop like arsenals or submit.

Science Bad – Link – Specific Tech Link

Advocating certain sciences or tech destroys objectivity

Armstrong 89 (J. Scott, PhD from MIT, BA in Applied Science from Lehigh U, Prof of Marketing @ U of Pennsylvania, *Management Science*, Vol. 25, No. 5, May, pp. 423-428, jam)

Although advocacy improves efficiency by directing the scientist's efforts towards the testing of a single hypothesis, it also contributes to a loss of objectivity for the individual scientist [13]. The researcher often selects a simple, but unreasonable null hypothesis that offers no challenge to his favored hypothesis. For example, econometricians have published papers in which they defeat the null hypothesis that "the purchase of automobiles is unrelated to the income of potential buyers." The most promising suggestion for retaining efficiency while avoiding the bias of the single dominant hypothesis is to select a second reasonable hypothesis. This could take the form of the null hypothesis except that it is selected for its reasonability instead of its simplicity (in the automobile example, a reasonable null hypothesis is that income elasticity is + 1.0).

Science Bad – Link – State

Scientific justifications for law cause serial policy failure

Rizzuto 9 (Nick, journalist and radio producer, Dec 21, [townhall.com/columnists/nickrizzuto/2009/12/21/time\_for\_a\_separation\_of\_science\_and\_state] AD: 6-27-11, jam)

While many people take for granted the fact that it is dangerous to use articles of faith as the basis for public policy, we often fail to realize that science too represents an extremely dodgy justification for law. With a population that is often willing to unquestioningly defer to the “experts” on matters they feel are above their pay grade, the governed run the risk of empowering legislators to pass law that is just as much a product of faith as anything that can be found in your local church or synagogue. Policies based on “scientific fact” have a history of being more than just problematic, as with the veneer of absolute truth behind them they have oftentimes been downright irrational. This historic record should act as a guide to our current political occupation with anthropogenic global warming. Arguably, scientific fact changes more rapidly than religious dogma. What was undeniable truth one day might be discovered to be quackery the next. The most glaring example of this in the 20th century is the science of eugenics. The science of eugenics insisted that the human gene pool was being polluted by various undesirable races and threatened to lead to the degeneration of the human species into a collection of feeble minded individuals. So popular was this science that it spawned no less than three Global conferences with attendees included scientific and political heavyweights of the time. When eugenics took the form of government policy, it did so in a frightening way. Take for example the case of the Racial Integrity Act (RIA). In the name of fighting off the inevitability of human degeneracy that would occur if people were left to breed uncontrolled, the state of Virginia passed the RIA in 1924. This law allowed the state powers that today would cause us to recoil in horror. These powers included forced sterilizations, and the banning of intermarriage between minorities and whites. When brought before the Supreme Court, the law was upheld. Justice Oliver Wendell Holmes Jr. wrote in the ruling: It is better for all the world, if instead of waiting to execute degenerate offspring for crime, or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind. The principle that sustains compulsory vaccination is broad enough to cover cutting the Fallopian tubes. In other words, of course the law is constitutional, it’s based in science. Justice Holmes famously concluded the opinion by declaring that, “Three generations of imbeciles are enough.”

The mixture of science and the state is always political – reject it to avoid repeating mass murder

Amit 8 (Sudha, political pundit, Jul 21, [www.reasonforliberty.com/anarcho-capitalism/separation-of-science-and-state.html] AD: 6-27-11, jam)

Science has now become just another form of belief system – There was a time when whatever Royal Academy of Science in London proclaimed, it was considered to be a scientific truth. But with the advent of more and more scientific fronts, and decentralization of scientific research to various countries, there seems to be no clear leader in the field of scientific research, and this has resulted in creation of numerous hotly debated groups of scientists. Those who believe in Big Bang theory, those who don’t, those who believe in Global Warming, those who don’t, those who believe humans are causing global warming those who believe its a natural phenomenon. Science is more about your faith in it than it is about the objective truth – Today scientific community is merely an agenda provider for the Atheious(as opposed to religious) people. There is a massive debate on Stem Cell research on whether government should fund it or not, the controversy is not whether government should use public money for these things or not, rather whether Stem Cell research kills human life or not. The Global Warming debate is the most famous of them all, there is no substantial evidence to show whether it is being caused by the man made pollution or its merely a natural act. Even if its known with 80% certainty that Global warming is caused by human action, the price to verify this theorem is really high. But here is the deal, if you are leftist, anti-corporationist, occidental apologist, the issue of Global warming is so much a truth to you as the Sun light. If you are a right wing conservative, then Global warming is a complete myth. Science is merely a propaganda tool for politicians – Politicians like Al Gore use Science for their propaganda purposes, a political tool to rally the left-wing environmentalist, and to be significant again in the politics. In quasi-socialist countries like India, where the govt planners completely fail to provide utilities to people use the environmental propaganda to reduce the consumption. People in Socialist and quasi-socialist countries care more about Environment than people in Quasi-Capitalist and Capitalist countries. Socialist countries manage to completely separate church and state, but because of their failure of clear separation of science and state, they end up mass murdering their own citizens. The best example in this regard is “Great Chinese Famine(1958-1961)” where the scientific methods of farming(the idea of planting seeds very closely as they will share the nutrition on the socialist model) , and the Great Leap Forward where the govt planners tried to scientifically induce a super fast Industrial revolution, and ended up in the death of millions of poor Chinese.

Science Bad – Link – State

The state frames the debate on questions of science which inevitably destroys objectivity

Borders 9 (Max, Robert Novak Fellow at Phillips Foundation, Dec 4, [washingtonexaminer.com/blogs/examiner-opinion-zone/separation-science-and-state] AD: 6-27-11, jam)

In America, religion flourishes. It gets no subsidies from the government except for various tax exemptions. There is religious diversity and religious dynamism. In Europe, governments have subsidized Roman Catholicism and Protestantism over the years. In these countries, religion either languishes or tends to be monolithic. But don’t take my word for it. Read the work of Laurence Iannaccone, a top expert on the economics of religion. The more the government gets mixed up in religion, science – or anything for that matter – the more bias, corner-cutting and groupthink is likely to result. Climate science is starting to look like a really good example of this effect. Indeed, if you are one that thinks the $23 million Exxon-Mobil has thrown at climate change skepticism has lead to “bias,” consider the $79 billion since 1989 in government largess that has gone to “consensus” climate science. Wait. You don’t think government-funded scientists face perverse incentives? Think again. One of the principle players in the Climategate scandal has, himself, received over $3 million for his contributions to the IPCC’s body of research. When you consider that climate skepticism has gotten 1/1000th of that from Big Oil, accusations that the oil industry has corrupted the debate start to look a little silly. “But the government’s charge is only to find the truth!” they’ll cry. “They don’t have a stake in the outcome.” (Now look in the mirror and say that three times with a straight face.) For politicians, $79 billion is an investment in the trillions in ROI they can expect from cap-and-trade revenues—not to mention all the green energy special interests groups that will jockey to fill their campaign coffers. I know, I know. Many bureaucrats are honest folks. But the idea that government scientists and their funders are immune to incentives because they get our tax dollars is, well, laughable. Of course, none of this is to argue that scientific truth doesn’t stand on its own. Arguments should be judged on their merits and on accurate observable data, not whether they were funded by oil money or Barack Obama’s federal credit card. So here’s a radical idea: how about the separation of Science and State modeled after the 1st Amendment? I can hear the outcries: “Heavens! What will be the fate of science if government funding dries up? It will disappear! We won’t get pure research!” Again, there are plenty of analogs in American religion. But more importantly, no one ever stops to ask what kinds of science never emerges because central bureaucrats decide to pick and choose what’s important and what’s not--using our scarce resources to pick those winners and losers. With a decentralized system of science funded via private patronage and university-based philanthropy, we may not get capital-T Truth to rise up and glow above the people like a beacon. But we will get more diversity and less politicization. Then we’ll be more likely to get a natural coalescence of the scientific community around a view – one subject to the forces of refutation, rather than politics and activism.

State science threatens human liberty

Amit 8 (Sudha, political pundit, Jul 21, [www.reasonforliberty.com/anarcho-capitalism/separation-of-science-and-state.html] AD: 6-27-11, jam)

There are many political systems who proclaim that the government’s only job is to uphold the objective truths. Sadly the problem with that is, it disastrously arms the government with tools of oppression. We may have been brainwashed into believing that Science is always more logical and reasonable than religion(Note: Merely by using the term, “brainwashed” I am not saying there is anything wrong in believing in Science, or dictating your life with Science), but we must make sure Science and State are clearly separate. Yes we may not get man on the Moon, we may not get the Internet, but if the cost of doing these things is human Liberty and Freedom, then we are running in net Loss. Voluntary human action through Free Market will eventually get us these things with most benefit to maximum number of people.

Science Bad – Link – State

History proves that, when the government uses scientific findings or initiate studies, autonomy is lost and the science becomes useless – Lysenko incident

**Reznik 8** (David, *Episteme*, vol 5, p. 220-238, lido)

There is historical evidence that government interference in scientific decisionmaking can stunt or retard the growth of science (Sheehan 1993). The example I will discuss in this article is the negative effect of government control of science in the former Soviet Union, where biology suffered the effects of Marxist ideology from the 1930s to the 1960s. Following the Russian revolution of 1917, David B. Resnik the All Union Communist Party (a.k.a. the Bolsheviks) demanded that all social institutions, included science, conform to Marxist political theory. Members of the Party opposed scientific ideas they regarded as the product of Bourgeoisie thought, such as free market economics and Mendelian genetics. They also favored scientific ideas that supported the idea of re-engineering human society along Marxist lines. In the 1920s, Trofim D. Lysenko (1898–1976) developed a theory of inheritance that found favor among powerful members of the Party. Lysenko developed a process, known as vernalization, that involved soaking and chilling seeds from summer crops for winter planning. Lysenko claimed that vernalization could improve agricultural productivity, when, in fact, it could not. Scientists and politicians accepted Lysenko’s ideas, even though he had little evidence to support his ideas, he did not keep good research records, and he manipulated the data by not reporting negative results (Sheehan 1993). In 1930, the Ukrainian Commissioner of Agriculture created a vernalization department at a genetics institute in Odessa (Sheehan 1993). Lysenko proposed a theory to explain vernalization phenomena: one can alter the development of a plant by changing its environment because plants have different needs at different stages of development. Lysenko and I. I. Prezent, a member of the Communist Party, proposed a new environmental theory of heredity that stood in sharp contrast to Mendel’s theory of inheritance. The theory found favor with other members of the Communist Party, because it implied that human behavior can be changed through environmental manipulation, making it possible to overcome greed, selfishness, and possessiveness to create a communist state. Proponents of Mendelian genetics objected to the environmental theory as unscientific and unsound, but their criticisms could not overcome the theory’s political appeal (Sheehan 1993). Lysenko soon won the support of Joseph Stalin (1878–1953), the General Secretary of the Communist Party. In 1938, Lysenko was appointed President of the Lenin Academy for Agricultural Sciences, and in 1940 he became Director of the Department of Genetics at the Soviet Academy of Science (Hossfeld and Olsson 2002). By 1948, Lysenkoism became the official view of the Communist Party, and the Soviet government began to repress Mendelian genetics. Soviet scientists who attacked Lysenkoism or endorsed Mendelianism were denounced, declared mentally ill, imprisoned, exiled, or even murdered. Soviet scientists were not allowed to teach Mendelian ideas or conduct research in Mendelian genetics until the 1960s, when the period of official repression ended (Joravsky 1986). The suppression of ideas that contradicted Marxist ideology had a devastating effect on Soviet genetics, but many other disciplines also suffered, including zoology, botany, evolutionary biology, agronomy, and economics (Sheehan 1993). Before the 1940s, some of the world’s leading geneticists, such as Theodosius Dobzhansky (1900–75), lived in the Soviet Union, but by the 1960s, genetics and many other scientific disciplines in the Soviet Union were decades behind Western science (Joravsky 1986). Lysenkoism is an extreme example of what can happen when the government restricts the autonomy of individuals, groups, and organizations; yet it still offers us some important lessons that apply to situations where science is not as politicized. The Soviet Union’s repression of views that contradicted Lysenkoism undermined the progress of science in several different ways. First, the Soviet government’s actions interfered with objectivity of science. Theories of inheritance were accepted or rejected based on political reasons, not epistemological ones. Scientists were forced to ignore the evidence against Lysenkoism and the evidence in favor of Mendelianism. Second, the actions of the government interfered with communication among scientists and the sharing of ideas. Honest, open communication is vital to scientific inquiry, criticism, and debate (Burke 1995); yet the Soviet government stifled the exchange of information concerning some topics. Scientists were rightfully afraid to criticize Lysenkoism in public or to discuss or teach Mendelian theory. Third, the repression of Mendelian genetics nearly extinguished creativity in many areas of science. Creativity flourishes only when scientists are free to explore new ideas, theories, and methods and to challenge existing ones (Kantorovich 1993). The Soviet government violated the freedom of many citizens, and scientists were no exception. The government dictated the areas of science and the scientific ideas that would and would not be studied. It established a rigid research program geared toward promoting Marxist ideology. The government interfered with the freedom of scientists, scientific groups, and scientific institutions. Fourth, the Soviet government’s restrictions had a widespread impact. Many different research disciplines were directly or indirectly affected by the government’s repressive policies. The plague of Lysenkoism spread throughout the research community and affected many different scientists, scientific groups, and scientific institutions. Even people working in fields of research far removed from human genetics were apprehensive about potential intimidation, harassment, or repression (Joravsky 1986). The moral of Lysenkoism is that governments should be very wary of interfering with scientific decisions. Scientists (and scientific groups and organizations) should be granted autonomy within their domains of practice and expertise. The progress of science depends on its independence from government control and authority.

Science Bad – Link – State

**Government and private uses of science end up killing freedom**

**Reznik 8** (David, *Episteme*, vol 5, p. 220-238, lido)

In addition to restrictions on autonomy imposed by specific laws or regulations, there are restrictions on autonomy resulting from contractual obligations. Scientists, scientific groups, organizations, or disciplines may voluntarily restrict their conduct via contracts or other agreements. When individuals enter contracts, they decide to limit their freedom in order to obtain the benefits promised in the contracts (Calamari and Perillo 1998). For example, if X agrees to mow Y’s lawn on Saturday morning for $25, X has made a decision to limit his own freedom. If X wants to earn the $25, he must perform his part of the contract. Scientists also voluntarily restrict their own freedom by entering contracts with universities, private companies, or granting agencies. In these contracts, scientists promise to do specific things, such as teach, consult, lecture, or conduct research, in order to receive specific benefits, such as salary, honoraria, funding for research, etc. The parties in these contracts (e.g. the scientists, the university, and the company) are free to negotiate the terms and conditions. For example, if a company decides to conduct a clinical trial on the efficacy of drug X, it may offer a contract to clinical researchers interested in conducting the trial. The researchers (and their universities) are free to accept or reject this offer, or negotiate terms and conditions. Contracts with research sponsors play an important role in problem selection in science. Most scientists require large sums of money to conduct their research. To obtain funding, scientists often must decide to work on a problem that a sponsor is willing to pay to have studied. A scientist may become interested in a particular research problem, but the scientist usually cannot work on that problem unless he can find someone to pay for it. Research almost always follows the money. Research sponsors usually follow the advice of scientific experts in deciding whether to sponsor a particular study or pursue a particular domain. Government agencies, for example, **use scientists to help set funding priorities and to serve on peer review panels that evaluate funding proposals.** The public can also participate in government science funding decisions by serving on review panels, helping to set priorities within agencies, or lobbying legislators, who have some oversight authority over these agencies. **The public has a right and a duty to help decide how government agencies allocate research funds (**Dresser 2001, Resnik 2007). Research sponsors can influence many scientific decisions other than problem selection, such as research design, record keeping, data analysis, data sharing, and publication. While government agencies require scientists to share data and publish results, private companies usually place restrictions on data sharing and publication. In some instances, private companies have prevented researchers from publishing results that were unfavorable to their products (Resnik 2007). **Research grants with government agencies usually include a wide variety of restrictions, such as prohibitions on discrimination or harassment, laboratory safety standards, protection of animal and research subjects, and rules pertaining to dealing with allegations of research misconduct** (Shamoo and Resnik 2003). **Scientists**, scientific groups, and organizations **also voluntarily restrict their autonomy through an implicit contract with society in addition to explicit contracts with employers or funding agencies** (Shrader-Frechette 1994, Resnik 1998). Society provides scientists, scientific groups, organizations, and disciplines with education, training, money, equipment, administrative support, and other resources. In return, scientists (and groups or organizations) have an obligation to benefit society by conducting research, teaching, giving expert advice, and engaging in other valuable activities. This obligation to benefit society, also known as social responsibility, constitutes an ethical, not a legal restriction on scientific autonomy, since scientists are not legally obligated to do good for society. For example, Rachel Carson’s Silent Spring (1962) helped to launch the environmentalist movement in the United States by warning people about the dangers of DDT and other chemicals. Carson published the book out of a sense of social responsibility. Other scientists have followed their sense of social responsibility to try to stop nuclear proliferation, to develop vaccines for infectious diseases, to report fraud and corruption, and so on (Shamoo and Resnik 2003).

Reject state use of science as harmful dogmatism

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

Thus science is much closer to myth than a scientific philosophy is prepared to admit. It is one of the many forms of thought that have been developed by man, and not necessarily the best. It is conspicuous, noisy, and impudent, but it is inherently superior only for those who have already decided in favour of a certain ideology, or who have accepted it without having ever examined its advantages and its limits. And as the accepting and rejecting of ideologies should be left to the individual it follows that the separation of state and church must be supplemented by the separation of state and science, that most recent, most aggressive, and most dogmatic religious institution. Such a separation may be our only chance to achieve a humanity we are capable of, but have never fully realised.

\*\*\*Epistemology\*\*\*

Science Bad – Fraud

Scientific data falsification is widespread

MTI Review 1 (MTI Review, organization specializing in the identification, retrieval and analysis of

medical and scientific information, July, [www.medtoxinfo.com/news16.html] AD: 6-24-11, jam)

Examples of Scientific Misconduct. The following two examples taken from the Office of Research Integrity records illustrate how easily fraudulent or falsified data can (and all-too-often do) slip into the literature canon and stay there: A 1993 investigation found that a scientist fabricated and falsified data in research which had been funded by a grant from The National Eye Institute and The National Institutes of Health. Primary data were missing for almost half of the figures and tables in a series of published papers and manuscripts prepared by the scientist in question. Many instances of data fabrication and falsification were found, including: (1) presentation of data for cell counts that never were performed; (2) indication of multiple data points when, in fact, only a single data point was obtained; (3) elimination of the highest or lowest values in sets of experimental readings; (4) alteration or transposition of data to achieve a desired experimental result; and (5) misrepresentation of the time intervals at which data were collected. By the time this was discovered and the investigation completed, the scientist had published the falsified results in four different journals. The journals were notified to retract the articles, but not until several years after publication. In 1995, an investigation uncovered that a biochemist engaged in scientific misconduct in biomedical research by intentionally falsifying and fabricating data and claims about the purported effects of electric and magnetic fields (EMF) on cells. This scientist published his fabricated results in 1992 in two scientific journals. The published research findings, which were supported by a grant from the National Cancer Institute and The National Institutes of Health, reported data indicating that EMF exert a biological effect by altering the entry of calcium across a cell’s surface membrane. These claims were potentially very important when published because they purported to link EMF and calcium signaling, a fundamental cell process governing many important cellular functions. EMF, which are ubiquitous forms of radiation that arise from diverse sources such as power lines, home wiring, and household appliances, have been a public concern for potential health effects in humans. The journals were notified that the articles should be retracted. [However, by then, much time had elapsed leaving many unsuspecting scientists attempting to build upon the falsified data for future studies.] One would naturally surmise that since the parties were found guilty the falsified results would have been retracted and removed from the scientific literature by now. However, this is not the case as both authors still have articles indexed in numerous databases on the Internet and in PubMed, the huge database holdings of the National Library of Medicine which so many scientists rely on in performing their research. In fact, as of this writing, the scientist in the second example is featured as the author of 29 articles in PubMed--most of which reference back to the fabricated results of his earlier work. Consequently, lingering unsound science is not just a problem for the legal community; it is becoming a constant concern for everyone as unethical conduct permeates the sciences. It takes its toll on the majority of researchers that conduct their work in a responsible manner causing them to waste time, effort, and limited financial resources on unsound studies and ultimately results in an erosion of public confidence in all scientific findings. It also costs the federal government and American taxpayers, the single largest provider of research funds for scientific research, millions if not billions of dollars a year, and most frighteningly of all, it jeopardizes the very health and well being of everyone. Scientific misconduct is fraught with serious consequences indeed.

Fraud in science is inevitable

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medical and scientific information, July, [www.medtoxinfo.com/news16.html] AD: 6-24-11, jam)

As the pace of science continues to hurtle at breakneck speed it is becoming ever more difficult to isolate the perpetrators of fraud. In the old world of scientific research, science most often moved incrementally, reviewing and validating as it moved slowly forward to solid findings and only then would be published in a public forum. Scientific practice today, on the other hand, frequently places such an importance on publishing that the science itself is often eclipsed. As tenuous as the situation with scientific misconduct has become, the problem has been exponentially magnified by the instantaneous capabilities of publishing totally unreviewed findings on the Internet. This frenetic desire for publication along with the often cutthroat competition that exists for research funding, coupled with the overall erosion of scientific ethics, has opened a plethora of Pandora boxes. The "gate" that the Daubert and Kumho decisions directed judges to "keep" also threatens to open beyond a court’s watchful eye. For regardless of how vigilant an individual judge might be in exercising restraint over a question of scientific reliability and relevance, being unaware of scientific misconduct that is relevant to a particular case can only serve to make "gatekeeping" itself an inexact science. Only by adhering to careful attention to detail and obtaining qualified expert assistance that researches not only the science but the scientists who are responsible for it can you ensure that your case has the sound science that will both pass court mandated strictures and possess unassailable standards of scientific ethics.

Science Bad – Fraud

Scientists aren’t disinterested skeptics – fraud is common

Fanelli 9 (Daniele, Marie Curie Research Fellow @ Institute for the Study of Science, [www.plosone.org/article/info:doi/10.1371/journal.pone.0005738] AD: 6-24-11, jam)

The image of scientists as objective seekers of truth is periodically jeopardized by the discovery of a major scientific fraud. Recent scandals like Hwang Woo-Suk's fake stem-cell lines [1] or Jan Hendrik Schön's duplicated graphs [2] showed how easy it can be for a scientist to publish fabricated data in the most prestigious journals, and how this can cause a waste of financial and human resources and might pose a risk to human health. How frequent are scientific frauds? The question is obviously crucial, yet the answer is a matter of great debate [3], [4]. 1A popular view propagated by the media [5] and by many scientists (e.g. [6]) sees fraudsters as just a “few bad apples” [7]. This pristine image of science is based on the theory that the scientific community is guided by norms including disinterestedness and organized scepticism, which are incompatible with misconduct [8], [9]. Increasing evidence, however, suggests that known frauds are just the “tip of the iceberg”, and that many cases are never discovered. The debate, therefore, has moved on to defining the forms, causes and frequency of scientific misconduct [4].

Studies show scientists are prone to misconduct

Fanelli 9 (Daniele, Marie Curie Research Fellow @ Institute for the Study of Science, [www.plosone.org/article/info:doi/10.1371/journal.pone.0005738] AD: 6-24-11, jam)

In conclusion, several surveys asking scientists about misconduct have been conducted to date, and the differences in their results are largely due to differences in methods. Only by controlling for these latter can the effects of country, discipline, and other demographic characteristics be studied in detail. Therefore, there appears to be little scope for conducting more small descriptive surveys, unless they adopted standard methodologies. On the other hand, there is ample scope for surveys aimed at identifying sociological factors associated with scientific misconduct. Overall, admission rates are consistent with the highest estimates of misconduct obtained using other sources of data, in particular FDA data audits [11], [18]. However, it is likely that, if on average 2% of scientists admit to have falsified research at least once and up to 34% admit other questionable research practices, the actual frequencies of misconduct could be higher than this.

Science Bad – Bias

Objectivity assumes science happens in a vacuum – social, economic, and political bias inevitably seeps in

Sheldrake 95 (Rupert, Ph.D. in biochemistry from U of Cambridge, Research Fellow of the Royal Society, [www.rense.com/general93/crit.htm] AD: 6-25-11, jam)

Many non-scientists are awed by the power and seeming certainty of scientific knowledge. So are most students of science. Textbooks are full of apparently hard facts and quantitative data. Science seems supremely objective. Moreover, a belief in the objectivity of science is a matter of faith for many modern people. It is fundamental to the worldview of materialists, rationalists, secular humanists, and all others who uphold the superiority of science over religion, traditional wisdom, and the arts. This image of science is rarely discussed explicitly by scientists themselves. It tends to be absorbed implicitly and taken for granted. Few scientists show much interest in the philosophy, history, or sociology of science, and there is little room for these subjects in the crowded curriculum of science courses. Most simply assume that by means of "the scientific method," theories can be tested objectively by experiment in a way that is uncontaminated by the scientists' own hopes, ideas, and beliefs. Scientists like to think of themselves as engaged in a bold and fearless search for truth. Such a view now excites much cynicism. But I think it is important to recognize the nobility of this ideal. Insofar as the scientific endeavor is illuminated by this heroic spirit, there is much to commend it. Nevertheless, in reality most scientists are now the servants of military and commercial interests. Almost all are pursuing careers within institutions and professional organizations. The fear of career setbacks, rejection of papers by learned journals, loss of funding, and the ultimate sanction of dismissal are powerful disincentives to venture too far from current orthodoxy, at least in public. Many do not feel secure enough to voice their real opinions until they have retired, or won a Nobel Prize, or both. Popular doubts about the objectivity of scientists are widely shared, for more sophisticated reasons, by philosophers, historians, and sociologists of science. Scientists are part of larger social, economic, and political systems; they constitute professional groups with their own initiation procedures, peer pressures, power structures, and systems of rewards. They generally work in the context of established paradigms or models of reality. And even within the limits set by the prevailing scientific belief system, they do not seek after pure facts for their own sake: they make guesses or hypotheses about the way things are, and then test them by experiment. Usually these experiments are motivated by a desire to support a favorite hypothesis, or to refute a rival one. What people do research on, and even what they find, is influenced by their conscious and unconscious expectations. In addition, feminist critics detect a strong and often unconscious male bias in the theory and practice of science. Many practicing scientists, like doctors, psychologists, anthropologists, sociologists, historians, and academics in general, are well aware that detached objectivity is more an ideal than a reflection of actual practice. In private, most are prepared to acknowledge that some of their colleagues, if not they themselves, are influenced in their researches by personal ambition, preconceptions, prejudices, and other sources of bias. The tendency to find what is being looked for is deep-seated. It has a basis in the very nature of attention. The ability to focus the senses in accordance with intentions is a fundamental aspect of animal nature. Finding what is looked for is an essential feature of everyday human life. Most people are well aware that other people's attitudes affect the way they interact with the world around them. We are not surprised by such biases in politicians, nor by the differences in the way people see things within different cultures. We are not surprised to find many everyday examples of self-deception in members of our families and among friends and colleagues. But the "scientific method" is generally supposed to rise above cultural and personal biases, dealing only in the currency of objective facts and universal principles. Biases in science are easiest to recognize when they reflect political prejudices, because people of opposing political views have a strong motive to dispute the claims of their opponents. For example, conservatives like to find a biological basis for the superiority of dominant classes and races, explaining their differences as largely innate. By contrast, liberals and socialists prefer to see environmental influences as predominant, explaining existing inequalities in terms of social and economic systems. In the nineteenth century, this "nature-nurture" debate focused on measurements of brain size; in the twentieth, on measurements of IQ. Eminent scientists who were convinced of the innate superiority of men over women and of whites over other races, were able to find what they wanted to find. Paul Broca, for example, the anatomist after whom the speech area of the brain is named, concluded that: "In general, the brain is larger in mature adults than in the elderly, in men than in women, in eminent men than in men of mediocre talent, in superior races than in inferior races."3 He had to overcome many factual obstacles to maintain this belief. For example, five eminent professors at Gottingen gave their consent to have their brains weighed after they died; when these cerebral weights turned out to be embarrassingly close to average, Broca concluded that the professors hadn't been so eminent after all! Critics of a more egalitarian political persuasion have been able to show that generalizations based on different brain sizes or IQ scores rested on the systematic distortion and selection of data. Sometimes the data themselves "were actually fraudulent, as in the case of some of the publications of Sir Cyril Burt, a leading defender of the view that intelligence is largely innate. In his book The Mismeasure of Man, Stephen Jay Gould traces the sorry history of these purportedly objective studies of human intelligence, showing how persistently prejudice has been clothed in scientific garb. "If -- as I believe I have shown -- quantitative data are as subject to cultural constraint as any other aspect of science, then they have no special claim on final truth."4

Science Bad – Bias

Scientific objectivity is a joke even to scientists – societal pressures and theoretical prejudice contribute to data falsification even among the likes of Newton

Sheldrake 95 (Rupert, Ph.D. in biochemistry from U of Cambridge, Research Fellow of the Royal Society, [www.rense.com/general93/crit.htm] AD: 6-25-11, jam)

The illusion of objectivity is most powerful when its victims believe themselves to be free of it. Along with a laudable sense of honor, a tendency to self-righteousness has been present in experimental science right from the outset. With Galileo, the desire to make his ideas prevail apparently led him to report experiments that could not have been performed exactly as described. Thus an ambiguous attitude toward data was present from the very beginning of Western experimental science. On the one hand, experimental data was upheld as the ultimate arbiter of truth, on the other hand, fact was subordinated to theory when necessary and even, if it didn't fit, distorted. A similar vice afflicted other giants in the history of science, not least Sir Isaac Newton. He overwhelmed his critics with an exactness of results that left no room for dispute. His biographer Richard Westfall has documented how he adjusted his calculations on the velocity of sound and the precession of the equinoxes, and altered the correlation of a variable in his theory of gravitation to give a seeming accuracy of better than 1 part in 1,000. Not the least part of the Prindpias persuasiveness was its deliberate pretense to a degree of precision quite beyond its legitimate claim. If the Prindpia established the quantitative pattern of modern science, it equally suggested a less sublime truth -- that no one can manipulate the fudge factor so effectively as the master mathematician himself. Probably the commonest kind of deception -- and of self-deception -- depends on the selective use of data. For example, from 1910 to 1913, the American physicist Robert Millikan was engaged in a dispute with an Austrian rival, Felix Ehrenfeld, about the charge on the electron. Both Millikan's and Ehrenfeld's early data were rather variable. They depended on introducing oil drops into an electric field and measuring the strength of the field needed to keep them suspended. Ehrenfeld claimed that the data showed the existence of subelectrons with fractions of a unit electron charge. Millikan maintained there was a single charge. To rebut his rival, in 1913 he published a paper full of new, precise results supporting his own view, emphasizing in italics that "this is not a selected group of drops but represents all of the drops experimented upon during sixty consecutive days." A historian of science has recently examined Millikan's laboratory notebooks, which reveal a very different picture. The raw data were individually annotated with comments such as "very low, something wrong" and "beauty, publish this." The 58 observations published in his article were selected from 140. Ehrenfeld meanwhile went on publishing all his observations, which continued to show a far greater variability than Millikan's selected data. Ehrenfeld was disregarded while Millikan won the Nobel Prize. Millikan was no doubt convinced that he was right, and did not want his theoretical convictions to be disturbed by messy data. Probably the same was true of Gregor Mendel, the results of whose famous pea-breeding experiments were, according to modern statistical analysis, too good to be true. The tendency to publish only the "best" results and to tidy up data is certainly not confined to famous figures in the history of science. In most if not all areas of science, good results are likely to advance the career of the person who produces them. And in a highly competitive and hierarchical professional environment, various forms of improving the results are widely practiced, if only by omitting unfavorable data. This practice is indeed normal. Apart from anything else, journals are disinclined to publish the results of problematical or negative experiments. Little professional credit results from unclear data or seemingly meaningless results. I know of no formal study on the percentage of research data that are actually published. In the fields I know best from personal experience -- biochemistry, developmental biology, plant physiology, and agriculture -- I estimate that only about 5-20 percent of the empirical data are selected for publication. I have asked colleagues in other fields of inquiry, such as experimental psychology, chemistry, radioastronomy, and medicine, and come up with similar results. When the great majority of the data are discarded in private processes of selection -- often 90 percent or more -- there is obviously plenty of scope for personal bias and theoretical prejudice to operate both consciously and unconsciously. The selective publication of data creates a context in which deception and self-deception become a matter of degree. Moreover, scientists usually regard their research notebooks and data files as private, and tend to resist any attempts by critics and rivals to go through them. True, it is usually assumed that a researcher will, within reason, make his or her data available to any colleague who might express a desire to see them. But in my own experience, this ideal is far from the reality. On the several occasions I have asked researchers if I may see their raw data, I have been refused. Maybe this says more about me than about prevailing scientific norms. But one of the very few systematic studies of this cherished principle of openness gives little ground for confidence. The procedure was simple. The person conducting it, a psychologist at Iowa State University, wrote to thirty-seven authors of papers published in psychology journals requesting the raw data on which the papers were based. Five did not reply. Twenty-one claimed that their data had unfortunately been misplaced or inadvertently destroyed. Two offered access only on very restrictive conditions. Only nine sent their raw data; and when their studies were analyzed, more than half had gross errors in the statistics alone.

Science Bad – Bias Impact

Questions of bias aren’t irrelevant – they are symptomatic of larger power dynamics and it’s especially telling in science

Alcoff 8 (Linda, PhD in Philosophy from Brown U, Jan 14, [www.alcoff.com/content/foucphi.html] AD: 6-26-11, jam)

Given his account of how new knowledge emerged in very specific institutional arrangements with very specific actors as well as discursive formations, these how, what, and who questions are not epistemically tangential or “merely” political. Unless we hold that our current knowledge is absolute, final, and non-contingent (where contingent means that it might have evolved otherwise with no necessary sacrifice of truth or reference), unless we hold, in short, positivist accounts of contemporary knowledges, we must allow that such questions may be relevant for any adequate story of epistemic justification. Foucault makes the case for this argument most clearly in his two later works, Discipline and Punish and History of Sexuality. The debate over whether and how political considerations affect science is similar to the old debate about how irrationality is involved. The solution for those who want to protect science from what they worry is a slippery slope of disauthorization is to erect partitions. So irrationality, admitted certainly to playing a role in the development of hypotheses, as well as successful but logically baseless leaps of inference or abduction, intuitions, and so forth, was safely sequestered to the context of discovery, securely away from the context of justification. Similarly, politics is thought by many to affect scientific applications or technologies, choice of research topics, certainly funding sources and who gains entry to the profession, but not, ultimately, theory-choice. Foucault’s originality is to deconstruct the problem of showing precisely where power enters science by conceptualizing science as a field of power relation, where power is, in other words, always already there. He defines power as “the multiplicity of force relations immanent in the sphere in which they operate and which constitutes their own organization...”(Foucault 1978, 92) Because power is without sovereignty or centrality, because it is not analogous to the law in the sense of exerting specific controls over a range of actions and expressions, but is rather contextually based, productive, and relational, we can begin to think of the power operative in science as occurring from the ground up, rather than entering illicitly through the back door. His is not a sense of power as having a uniform or coherent strategy that seeks to manifest itself the same in every instance, but more as a system of possibilities for relations that interact, reenforce, and strengthen other operations. “Relations of power,” he says, “are not in a position of exteriority with respect to other types of relationships (economic processes, knowledge relationships, sexual relations), but are immanent in the latter.”(Foucault 1978, 94) But most importantly, power’s condition of possibility is the “moving substrate of force relations” which thus engender only “local and unstable” states of power.(Foucault 1978, 93)

Science Bad – Not Objective

Objective rationality doesn’t exist

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, "Against Method", p. 245-246, jam)

Moreover, the observations of Arp, M. Geller and others have thrown considerable doubt on the homogeneity assumption which plays a central role in it. Extended to 1,000 megaparsec, Geller's research may blow up the entire subject. We have a rabid materialism in some parts (molecular biology, for example), a modest to radical subjectivism in others (some versions of quantum measurement, anthropic principle). There are many fascinating results, specula- tions, attempts at interpretation and it is certainly worth knowing them. But pasting them together into a single coherent 'scientific' world-view, a procedure which has the blessings even of the Popel7 - this is going too far. After all, who can say that the world which so strenuously resists unification really is as educators and meta- physicians want it to be - tidy, uniform, the same everywhere? Besides, as was shown in Chapters 3ff, a paste job eliminates precisely those conflicts that kept science going in the past and will continue inspiring its practitioners if preserved. At this point some defenders of uniformity rise to a higher level. Science may be complex, they say, but it is still 'rational'. Now the word 'rational' can either be used as a collecting bag for a variety of procedures - this would be its nominalist interpretation - or it describes a general feature found in every single scientific action. I accept the first definition, but I reject the second. In the second case rationality is either defined in a narrow way that excludes, say, the arts; then it also excludes large sections of the sciences. Or it is defined in a way that lets all of science survive; then it also applies to love-making, comedy and dogfights. There is no way of delimiting 'science' by something stronger and more coherent than a list.

Science is subjective - the principle of falsification dictates that contradictory theories can coexist

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

No scientist will admit that voting plays a role in his subject. Facts, logic, and methodology alone decide - this is what the fairy-tale tells us. But how do facts decide? What is their function in the advancement of knowledge? We cannot derive our theories from them. We cannot give a negative criterion by saying, for example, that good theories are theories which can be refuted, but which are not yet contradicted by any fact. A principle of falsification that removes theories because they do not fit the facts would have to remove the whole of science (or it would have to admit that large parts of science are irrefutable). The hint that a good theory explains more than its rivals is not very realistic either. True: new theories often predict new things - but almost always at the expense of things already known. Turning to logic we realise that even the simplest demands are not satisfied in scientific practice, and could not be satisfied, because of the complexity of the material. The ideas which scientists use to present the known and to advance into the unknown are only rarely in agreement with the strict injunctions of logic or pure mathematics and the attempt to make them conform would rob science of the elasticity without which progress cannot be achieved. We see: facts alone are not strong enough for making us accept, or reject, scientific theories, the range they leave to thought is too wide; logic and methodology eliminate too much, they are too narrow. In between these two extremes lies the ever-changing domain of human ideas and wishes. And a more detailed analysis of successful moves in the game of science ('successful' from the point of view of the scientists themselves) shows indeed that there is a wide range of freedom that demands a multiplicity of ideas and permits the application of democratic procedures (ballot-discussion-vote) but that is actually closed by power politics and propaganda. This is where the fairy-tale of a special method assumes its decisive function. It conceals the freedom of decision which creative scientists and the general public have even inside the most rigid and the most advanced parts of science by a recitation of 'objective' criteria and it thus protects the big-shots (Nobel Prize winners; heads of laboratories, of organisations such as the AMA, of special schools; 'educators'; etc.) from the masses (laymen; experts in non-scientific fields; experts in other fields of science): only those citizens count who were subjected to the pressures of scientific institutions (they have undergone a long process of education), who succumbed to these pressures (they have passed their examinations), and who are now firmly convinced of the truth of the fairy-tale. This is how scientists have deceived themselves and everyone else about their business, but without any real disadvantage: they have more money, more authority, more sex appeal than they deserve, and the most stupid procedures and the most laughable results in their domain are surrounded with an aura of excellence. It is time to cut them down in size, and to give them a more modest position in society.

Science Bad – Not Objective

Our blind faith in science has replaced the medieval faith in god

Sheldrake 95 (Rupert, Ph.D. in biochemistry from U of Cambridge, Research Fellow of the Royal Society, [www.rense.com/general93/crit.htm] AD: 6-25-11, jam)

The cases of fraud uncovered in the great unpoliced hinterlands of science are rarely brought to light by the official mechanisms of peer review, refereeing of papers, and the potential for independent replication. And even if attempts to replicate an experiment fail, this is usually ascribed to a failure to reproduce the conditions of the experiment precisely enough. There is a big psychological and cultural barrier against accusing colleagues of fraud -- unless one has strong personal reasons to suspect their integrity. Most known cases of fraud come to light as a result of whistle-blowing by immediate colleagues or rivals, often as a result of some personal grievance. When this happens, the typical response of laboratory chiefs and other responsible authorities is to try to hush the matter up. But if the charges of fraud do not blow over, if allegations are made persistently enough, and if the evidence becomes overwhelming, then an official inquiry is held. Someone is found guilty and dismissed in disgrace. Most professional scientists deny that these incidents shed doubt on institutional science as a whole; rather, they are seen as isolated aberrations by individuals who have become temporarily unhinged under pressure, or who are rare but inevitable psychopaths. Science is purified by their expulsion. They are scapegoats in the biblical sense. On the Day of Atonement the high priest confessed the sins of the people while laying his hands on a goat. The guilt-laden scapegoat was then expelled from the community into the wilderness, bearing away their iniquities. Scientists generally feel the need to preserve an idealized self-image, not just for personal and professional reasons, but also because this image is projected on to them by others. There are many people who put their faith in science rather than religion, and need to believe in its superior, objective authority. And to the extent that science replaces religion as the source of truth and values, then scientists become a kind of priesthood. As with priests in general, there is then a public expectation that they will live up to the ideals they preach: in the case of scientists, objectivity, rationality, and the quest for truth. "Some scientists, in their public appearances, can be noticed playing up to this role, which seems to invest them as cardinals of reason propounding salvation to an irrational public." There is also a strong disincentive for them to admit that there is anything fundamentally wrong with the beliefs and institutions that legitimize their own position. While it is relatively easy to admit that individuals may err, and to purify the community by expelling them, it is much harder to question the beliefs and idealizations on which the whole system depends. Philosophers of science tend to idealize the experimental method, and so do scientists themselves. In their insightful study of fraud and deceit in science, William Broad and Nicholas Wade were led to inquire what actually happens in laboratories, as opposed to what is supposed to happen. They found that the reality was far more pragmatic and empirical, involving much trial and error:

Science is not objective—the claim to objectivity and the motivations behind research are ideologies that affect us all

**Proctor 91** (Robert, Prof of History of Science @ Stanford, “Value-free science? purity and power in modern knowledge” Pg. 230 JF)

It is possible to argue that all science is “interested” (Practiced in the service of interests), yet one should not underestimate the capacity of scholars to lose themselves in rather uninteresting trivia and detail. The “uselessness” of science, in other words, is not just a myth but can also be a reality, especially under social circumstances where irrelevance is encouraged. It is important to distinguish two senses of neutrality in this regard: neutrality as an apology or myth, used to disguise interests served by science (in the form of false consciousness or outright deception); and neutrality as a style of scientific practice—a way of doing science. the value of this distinction lies in recognizing that ideologies are not just illusions but have concrete effects and serve particular functions. Neutrality (for example) serves to preserve the autonomy of science, insulating science from critique. It serves well as a mask, disguising whatever interests may lie behind the origins and maintenance of research priorities. The ideal of value-neutrality may have consequences for the kinds of sciences actually pursued: a science that does not question the ends it serves (or potential source of bias) may miss certain fruitful areas of research that do not serve those interests. In other words, science practiced under the banner of neutrality does not escape unscathed. A price is paid, not just by science but by society as a whole. This is because theory can shape the world as it is shaped by it. And in a world where the quality of life depends at least in part on the quality of our science, this is a serious consideration.

Science Bad – Not Objective

Objectivity impossible – there is always prejudice

Hekman 83 (Susan, Professor of Political Science @ U Texas, The Western Political Quarterly, Vol. 36, No. 1, Mar., p. 98-115, JSTOR, http://www.jstor.org/stable/447847, JMB, accessed 6-26-11)

In the process of correcting these two errors in Dilthey's methodology Gadamer develops the two theories that, it is being argued, are of methodological .significance for the social sciences. The first theme is developed in the context of an examination of the nature of historical understanding. The essence of Gadamer's argument is the assertion that Dilthey did not understand his own principle that all understanding is historical. He failed to see that all understanding, without exception, necessarily involves preconceptions that are a product of the historical setting. Gadamer defines these preconceptions as "prejudice." His argument with regard to prejudice is radical in its simplicity: All understanding necessarily involves prejudice and thus neither observer nor observed, text or interpreter can be said to be free from prejudice. Prejudice is not as the Enlightenment thinkers argued, something that must be eliminated on the way to truth nor is it, as Dilthey thought, something that the historical observer can sidestep in the process of interpretation. Rather, it is a positive possibility of the most primordial kind of knowing (I97.r>: 236). The basic principle of Gadamer's hermeneutics, then, is his provocative statement that the attempt to remove all prejudice is itself a prejudice (1975: 244). Both the Enlightenment and nineteenth-century hermeneutics failed to grasp the phenomenon of understanding because they failed to understand the necessity of prejudice. This correction of Dilthey establishes two important points: first, it establishes that in the process of interpretation, interpreter as well as text are bound by prejudice, and second, it reveals that the Enlightenment's definition of truth as the elimination of prejudice is erroneous. These points form the basis of Gadamcr's theory of the phenomenon of understanding. Understanding, he asserts, is the interplay of the movement of the irradiation and the movement of the interpreter. It is a dialectical process he compares to the dialectic of question and answer. And, most importantly, both elements of the dialectic, the interpreter as well as the text, are historically conditioned.

Interpretation of texts is not objective – it depends on the interpreter

Hekman 83 (Susan, Professor of Political Science @ U Texas, The Western Political Quarterly, Vol. 36, No. 1, Mar., p. 98-115, JSTOR, http://www.jstor.org/stable/447847, JMB, accessed 6-26-11)

Two important consequences follow from this position. First, in the process of interpretation the interpreter is always inside language. When a text is interpreted the interpreter does not step outside language to an Archimedean point of objectivity, but rather, moves in the horizon defined by the language employed. Second, and more importantly for the present argument, Gadamer's theory establishes that the phenomenon of understanding that occurs in language does not entail recourse to the consciousness of the individual subject. In other words, when we understand a text what occurs is not the grasping of the author's subjective intentions, but rather, the interplay of the (linguistic) traditions of interpreter and interpreted. Gadamer states this point very explicitly: When we understand a text we do not put ourselves in the place of the other, and it is not a matter of penetrating the spiritual activities of the author. . . . The meaning of hermeneutical inquiry is to disclose the miracle of understanding lexis or utterance and nor the mysterious communication of Souls. Understanding is a participation in the common aim. (1979: 147.) This statement is the essence of what has been referred to above as Gadamer's rejection of the subject in his theory of interpretation. What Gadamer is asserting is that the subjective intentions of the author of a text are not the "real" objects of the interpreter's analysis. Rather, for Gadamer the meaning of the text is independent of the author's intentions. It forms a horizon of meaning constituted by the historical setting of the text. Gadamer's position on subjective intentionality is, moreover, a controversial one. The methodological significance of Gadamer's stance on this issue can be illustrated by referring to the controversy his position has aroused among literary critics. Eric Hirsch, in an ongoing debate with Gadamer, has attacked his position on subjective (or what he calls "authorial") intention. Briefly Hirsch's objection to Gadamer's position that the author's intention does not fix the meaning of a text is that it obviates the possibility of the objective interpretation of texts. Against Gadamer Hirsch claims that the meaning of a text is fixed and "objective" because it is determined by the author's intention. From the perspective afforded by the foregoing discussion, however, it is easy to identify Hirsch's position as falling prey to the same errors as that of Dilthey. Hirsch, like Dilthey, fails to see that the determination of what he calls the "meaning" of a text is a dialectical process which must take into account the historicity of the interpreter as well as that of the text. Hirsch assumes, instead, that interpretation means "getting inside the author's mind" from a position of historical objectivity. Gadamer's analysis of historical understanding, however, showed this position to be fundamentally in error.

Science Bad – Not Objective

Thought and reality are entirely disconnected – no basis for objectivity, the “knowledge” of science is all defined by the discourse within science – it’s historically created

 Hekman 83 (Susan, Professor of Political Science @ U Texas, The Western Political Quarterly, Vol. 36, No. 1, Mar., p. 98-115, JSTOR, http://www.jstor.org/stable/447847, JMB, accessed 6-26-11)

Althusser's theory of the production of scientific concepts, like that of his deconstruction of the concept of "man" is rooted in his understanding of Marx's theoretical approach. His theory can be reduced to two theses which he derives from Marx's analysis in Capital: first, the radical separation of the realms of thought and reality, and second, the analogy between the production of scientific concepts and the production of objects in the material world. The first thesis stems from the position that science has no object outside its own activity but, rather, produces its own norms and the criterion of its own existence. Althusser opposes this theory to what be labels the "empiricist" conception of knowledge, a position roughly equivalent to what was referred to above under the heading of positivism. On Althusser's definition the empiricist sees knowledge as the extraction of the essence from ihe real, concrete object. This extraction, which retains the reality of the object sought, is accomplished through the use of the scientist's "abstract" concepts. In opposition to this conception of knowledge Althusser proposes a radical separation of the realms of thought and reality that entails a rejection of the empiricist notion that knowledge is a part of the real world. Marx's analysis in Capital, Allhusser claims is informed by this position. For Marx the production process of real, material objects takes place entirely in the real world, while the production of thought objects takes place entirely in the realm of thought (1970: 41). The goal of Marx's analysis, then, is not to understand the relationship between the real and the thought, but, rather, to analyze the process of production of thought objects (1970: 54). As Althusser understands it, then, what is accomplished in the acquisition of scientific knowledge is not, as in the empiricist account, the appropriation of the real world by the world of thought. This is the case because "the sphere of the real is separate in all its aspects from the sphere of thought" (1970: H7).s The goal of Althusser's theory, rather, is to present an analysis of how the scientist produces and manipulates concepts within the realm of thought. His point of departure is the assertion that, in the separate worlds of the real and the theoretical, an analogous form of production occurs. Like production in the material world, the production of scientific concepts begins with raw materials. But these raw materials are not, as the empiricists claim, "objective" or "given" facts about the real world. They are, rather, the body of concepts operative in the scientific community at a particular time. This body of concepts will necessarily differ from one historical period to another and with the developmental level of a particular science. But they are at any given point a product of the norms and values of scientific discourse and the particular problematic motivating that discourse." This understanding of the process of the production of scientific concepts provides Althusser with answers to a number of questions central to the definition of knowledge in the social sciences. One of these questions is the definition of what constitutes a scientific concept. Scientific concepts, on Althusser's account, have no connection with the real world. They are formulated with only one end in view: the production of knowledge. Another question concerns the means of guaranteeing the scientificity of the knowledge produced by the scientific community. Althusser's answer to this is very straightforward: the guarantee of scientificity is given by the operating norms and rules wholly internal to scientific discourse (1970: 67). Two important results follow from this position. First. Althusser clearly rejects the empiricist notion that the scicntificity of results is guaranteed through reference to the "facts." Since there are no "facts" in the sense of real world data in Althusser's theory, there can be no "checking" of the facts to guarantee the accuracy of the results. In short, the whole question of the "objectivity" of scientific facts is dissolved. The second result is equally significant. Since Althusser claims that the criterion of scientificity is given by the norms of scientific discourse and that these norms change with the development of the particular science, it follows that those things that are recognized as "knowledges" arc historically conditioned. Since the norms of the scientific community are historically produced, there is no general criterion of 'scientificity, but only the particular criteria developed by particular sciences! 1970: (>2-7).T Ii can be concluded, then, that despite the differences between the two theories, Althusser, like Gadamer, rejects the Enlighienment conception of scientific methodology not by claiming, as the humanists do, that it is inapplicable to the social sciences, but, rather, by attacking its central epistemological tenets. He rejects the possibility or even desirability of "objective knowledge" provided by this model not by claiming that the 'mill sciences are inherently subjective but by denying any connection between the real and theoretical worlds. He also establishes the unavoidable historicity of knowledge by defining the production of scientific discourse in historical terms. In sum, he grounds his conception of knowledge entirely within the confines of scientific discourse and grounds that discourse firmly in history.

Science Bad – Not Objective – Political

Science is always wrapped up in politics—climate studies prove

Taylor 97 (Peter, VP and CFO for the UC System, “How do we know we have global environmental problems? Undifferentiated science-politics and its potential reconstruction” Changing Life: Genomes-Ecologies-Bodies-Commodities)

(1) In science certain courses of action are facilitated over others, not just in the use or misuse of scientific results, but in how science is formulated in the first place--the problems chosen, categories used, relationships investigated, and confirming evidence required. Politics--in the broad sense of courses of social action pursued or promoted--is not merely stimulated by scientific findings; politics is woven into the very fabric of science. In the case of environmental problems, we know they are global in part because scientists and political actors jointly construct them in global terms. (2) In global environmental discourse, two allied views of politics--the moral and the technocratic--have been privileged. Both views of social action emphasize people's common interests in remedial environmental efforts, while at the same time steering attention away from the difficult politics that result from differentiated social groups and nations having different interests in causing and alleviating environmental problems.[[1]](#endnote-1) We know we have global environmental problems, in part because the "we" referred to acts as if it were unitary and not a component of some highly differentiated population.[[2]](#endnote-2) (3) Global environmentalism, whether as a framework for science or for political mobilization, is particularly vulnerable to deconstruction. Inattention to the national and localized political and economic dynamics of socio-environmental change will ensure that scientists, both natural and social, and the environmentalists who invoke their findings will be continually surprised by unpredicted outcomes, unintended conflicts and unlikely coalitions. When environmental scientists (or some other group) attempt to focus on global environmental problems, to stand above the formation of such coalitions and conduct of such conflicts and to discount their responsibility for the undesired outcomes of their policy proposals, they are more likely to reinforce the constraints on, rather than enhancing the possibilities of, engaged participants shaping interrelated, yet not common nor global, futures. In short, they know there are global environmental problems because they do not know most people do not have problems of a global nature. This dominance of physical climate research over institutional analysis points to a related issue, the hierarchy of physical over the life and social sciences. This hierarchy constitutes an environmental determinism: the physics and chemistry of climate change set the parameters for environmental and biological change; societies must then best adjust to the change in their environment. The hierarchy is evident in both the temporal sequence and conceptual relationships of GCMs and other areas of environmental change research. GCM research began over two decades ago. Building on the prominence given to GCMs in the late 1980s, a second tier of research arose which generates scenarios of agricultural, vegetation, and wildlife changes. This research models the interaction of projected temperature and precipitation changes with regional soils, watersheds, timing of snowmelts, wildfire susceptibility, coastal upwelling, and so on. Following shortly after, a third tier of research was added which has been devoted to assessing the economic or security consequences of these biotic changes or of the more direct consequences of climate change, such as a rise in sea-level. Modes of geopolitical response to the global climate change threat then began to be discussed by political scientists. Finally, social scientists and humanists began investigating popular understanding of global climate change, furnishing the bottom rung on the ladder from the hard and physical down to the soft and personal. Looking back, it is clear that even before I mentioned the striking surprises, propositions 1 and 2 foreshadowed this moral prodding. By arguing that certain politics (here, the moralistic and technocratic tendencies) and also the science that facilitates them are not dictated by the nature of reality, it follows that scientists and other social agents can choose whether or not to contribute to such science-politics. They are thus partly and jointly responsible for the consequences. Proposition 3 then built on that: In order to urge GEers to acknowledge that responsibility I wanted to stress that their science-politics does have significant consequences; policies based on undifferentiated analyses make unintended effects and undesirable surprises inevitable.

Science Bad – Not Objective – Political

Science is shaped and controlled by social influences and policy concerns

Corfee-Morlot, Maslin and Burgess 7 (Jan and Mark, University College of London, Jacquelin, U of East Anglia, Philosophical Transactions Vol. 365.1860 November 15 P. 2767 JF)

Looking across early scientific discoveries, it is clear that the science of global warming has leapt forward in fits and starts. A base of knowledge was built through careful empirical and theoretical analysis of very small components of larger questions that may not even be directly related to climate change (Weart 2003). Theory, built on new data and concepts, may be used to forge ahead in one direction, while awaiting confirmation or defamation from the next study. Errors in a previous study become the inspiration for one that follows. Meanwhile attention and efforts of the scientific community are not fixed on climate change questions alone, but may be diverted to new pressing issues that are raised by social developments (such as wartime efforts). In this dynamic and often unpredictable way, science is a process of trial and error, repetition and confirmation, slow and methodical in its efforts to build knowledge about the physical world. Although a global environmental problem is initially identified and advanced by science, it inevitably becomes intertwined with society, with politics and policy. Scientific research is also inevitably shaped by society, as demonstrated by the close relationship between wartime politics and public funding for scientific research in the 1940s and 1950s. These contextual issues demonstrate the give and take recursive relationship that exists between society, science and the policy-making process.

**Science advocacy, especially in context of the government, isn’t objective**

**Greenberg 1** (Daniel S., Washington science journalist and scholar at Brookings, *Science, money, and politics: political triumph and ethical erosion*, p.6-7, JMB)

Several themes run through this book. One is that **the politics of science is not laden with the dispassionate objectivity traditionally associated with** the conduct of **scientific research**. Like generals pleading for new weapons, or highway contractors pining to pour concrete many of the **politicians of science employ the hard sell and a stretched tale** or two **to make their way in the competition for money**, public and private. Another of this book's themes is the durability of self-serving politic al myths and fables of science, each usually containing trace of reality sufficient to suggest plausibility. Among the sophisticates of science we will encounter examples of the "magical thinking" characteristic of primitive societies: belief in nonexistent cause-and-effect relationships in politics, and reveries for a paradisiacal "golden age" in government support for science and the volume of money for research. The 1990s –the first post-Cold War decade—were particularly trying for the sector of the scientific enterprise dependent on government money. In their anxiety-filled understanding of politics, the leaders of science saw fear of the Soviet Union as the principal motivation for Washington's spending on research. Suddenly, the USSR was gone, and they were convinced that financial disaster loomed. It did not occur. Little actually changed in the financial fortunes of science, which continued on an upward path. Nonetheless, the alleged retreat of the U.S. government from the financing of science came to be accepted, among scientists and in the popular press, as an established matter of fact. In reality in the final decade of the last century a record volume of **government money surged into science—to the accompaniment of intensified lobbying by science, in its own special fashion for influencing politics. Did the campaign for money, with its warning of national peril in trimming science budgets, turn the tide? Undoubtedly, it had some effect, thus encouraging science to even more muscular efforts in Washington**. But the proclamations of budget-cutting intentions were of questionable- power against the great government-financed scientific enterprise that had risen on the American landscape over the preceding half century. The political and financial triumph of science confounded the anitdeficit crusade and the antigovernment Republican Revolution. By virtually every relevant measure, the United States leads the world in the financing, quality, and volume of research- it has held this lead since the end of World War II, and appears bound to maintain, and increase, its supremacy far into the new century.

Science Bad – Not Objective – A2: Scientific Method

No universally applicable scientific method – that means science is always self-serving

Sheldrake 95 (Rupert, Ph.D. in biochemistry from U of Cambridge, Research Fellow of the Royal Society, [www.rense.com/general93/crit.htm] AD: 6-25-11, jam)

The competitors in a given field try many different approaches but are always quick to switch to the recipe that works best. Science being a social process, each researcher is trying at the same time to advance and gain acceptance for his own recipes, his own interpretation of the field. ... Science is a complex process in which the observer can see almost anything he wants provided he narrows his vision sufficiently. . . . Scientists are individuals and they have different styles and different approaches to the truth. The identical style of all scientific writing, which seems to spring from a universal scientific method, is a false unanimity imposed by the current conventions of scientific reporting. If scientists were allowed to express themselves naturally in describing their experiments and theories, the myth of a single, universal scientific method would probably vanish instantly.

Science Bad – Not Objective – Societal Pressures

Structural problems constrain objectivity

Armstrong 89 (J. Scott, PhD from MIT, BA in Applied Science from Lehigh U, Prof of Marketing @ U of Pennsylvania, *Management Science*, Vol. 25, No. 5, May, pp. 423-428, jam)

Although the traditional ideal of the objective scientist has been challenged, little evidence exists to suggest that this ideal should be discarded in favor of advocacy. No evidence was found to support the statement that an objective approach to science can be achieved by having biased scientists present evidence on their favored hypotheses. Unfortunately, our ideals conflict with our reward systems. We reward scientists who act as advocates. They are the ones who receive grants, who get promoted, who find it easiest to publish their findings, and who become the center of attention. Scientists are often identified by the theory that they advocate ("Professor Jones, the well known founder of the riddle theory"). Perhaps there is an analogy between selling theories and selling other items-like insurance and used cars. Successful salesmen use advocacy with these products also. How can we make the practice of science conform more closely to the ideal of objectivity? Urging scientists to be more objective is of little value. However, we could promote the methods of multiple hypotheses.

Objectivity is naïve – scientific theories are always cultural manifestations

Fine 96 (Arthur, prof of philosophy @ U of Washington, Ph.D from U of Chicago, [https://faculty.washington.edu/afine/SCIENCE%20MADE%20UP.pdf] AD: 6-23-11, jam)

I should like to begin with a description of the constructivist ideol¬ogy and its background. However, despite its short tenure there are already several different constructivist schools, each with its more and less radical wings. It is, therefore, no easier to characterize constructivism than it is to characterize realism or antirealism. Still, as in these other -isms, I think there is a cluster of important doctrines that distinguish the constructivist party. Because their own rhetoric tends to the political, and they are clearly conducting a campaign for party members, I will refer to the cluster as a constructivist platform and to the doctrines that fall under it as the planks.9 Plank 1. Beliefs on a topic can (and do) vary. Prevailing beliefs are relative to particular prevailing social circumstances. Plank 2. For any belief (whether true or false, rational or irrational) the question of why it is held (or not) is appropriate, and the answer is to be an explanation framed in terms of locally operating causes, and not in terms of the character of the belief (e.g., whether true or false) or in terms of rationality conditions (e.g., "It would be irrational not to hold"). Plank j. Contingent sociological factors are (must be) relevant to explaining beliefs and judgments. In particular, beliefs are produced and judged to further local, collectively sustained goals and interests. The scientists' role in belief formation is active. They are agents doing things: making choices, forming alliances, pursuing local goals, advancing interests, and so on. All these are done in a rich field of social, cultural, institutional, and political forces; that is, they are all done together with other agents behaving similarly. I have framed these planks in the language of "beliefs" and "judgments." Typically, however, constructivists do not distinguish between belief formation and the "making" ("construction," "manufacture," "production") of facts, using one idiom more or less interchangeably with the other, even when the result is literal nonsense. If we were to follow their lead in formulating the platform, and speak of facts rather than beliefs, then the first plank would issue in a rather striking relativism, and the third plank would amount to a strong sort of constructivism. Surely the conflation of the languages of beliefs and facts by the constructiv-ists is not just ignorant usage, but a particularly forceful (and, to some, annoying) way of expressing a central doctrine—namely, that what makes a belief true (if I may use oldspeak) is not its "correspondence with an element of reality" (i.e., a "fact," realist-style) but its adoption and authentication by the relevant community of inquirers. This amounts to a loose consensus theory of truth and constitutes a special sort of semantic antirealism. If we adopt the customary semantic convention according to which facts are identified with what makes beliefs true, and if we also subscribe to such a consensus theory of truth, then facts turn out (literally) to be constituted by processes of belief formation. Moreover, whatever drives these processes then (literally) makes the facts. Of course, according to Plank 3, what drives belief formation is the activity of the scientist-actors. Hence, facts are made by scientists (literally!). Thus an antirealist, consensus theory of truth binds the three planks together to form a specifically constructivist platform (and one that is also relativist). Although the details of the consensus theory are not too important for constructivism, it is necessary for them that beliefs do get fixed, so that facts do get made. Hence the consensus is not, as with Peirce, in the sweet by-and-by. Constructivists require truth to be made by actual consensus, and not by some long-run idealization.10

Science Bad – Not Objective – Societal Pressures

Societal bias always influences science

Priddy 99 (Robert, taught philosophy and sociology at the University of Oslo, [robertpriddy.com/lim/5.html] AD: 6-27-11, jam)

Scientific fact is what, on the basis of observational evidence and rigorous analysis, is confirmed in agreement between trained and established scientists. What is so confirmed as having been validated by the hypothetical-deductive method can itself be a matter of dispute. Not all the natural sciences deal with questions that are accessible to controllable experiments, and the human sciences can hardly ever do so at all. In the end, therefore, whatever is accepted as a valid result is decided by expert consensus, that is, 'inter-subjectively'. This is something different to 'objective knowledge'. What is validated and accepted is thus not necessarily what is objectively true. It is less than a half-truth to hold that the universal scientific method is empiricism, requiring strict sensory observation combined with rational analysis. Science also requires general faith in the body of science, belief in the validity of commonly-established hypotheses and theories in the major disciplines. This is necessitated by the circumstance that relatively very few persons can themselves observe experiments of any advanced nature and only a small minority of scientific experts can in practice have direct access to the original data of the great majority of scientific studies. The majority must rely on secondary or indirect sources like publications, information technology and other media. The doctrine that science is neutral as regards values has been much misunderstood and misapplied. The ideal of not being influenced by strongly asserted values should apply to negative values and such values as would divert science from objective results, like sheer ideology or interests that want biassed or falsified results. In scientific work, emotions are rejected, neutralised or even repressed if they are such that would interfere with perception or cognitive judgement. This is a correct understanding of value-neutrality. What is not correct is the attempt to ban emotions, values and even the open admission and airing of conflicting interests from all relevance or consideration. This amounts to a refusal of scientific self-reflection on the mistaken premise that science is somehow isolated from the society of which it nevertheless is part and parcel. An example shows this: the complete unwillingness of medical science to stand up against the interests of the tobacco industry for many decades - not until the evidence for mortality from smoking was monumental and overwhelming - illustrates how easily science falls prey to external pressures. Many other such pressures from consumer oriented industries are operative and still effective today.

Science Bad – Not Objective – Ideological

Science is not ideology free or ethically neutral – claims to be ideology-free are ideological

Harvey 74 (David, Clark University, Economic Geography, Vol. 50, No. 3, July, http://www.jstor.org/stable/142863, JMB, 6-26-11)

Scientists frequently appear to claim that scientific conclusions are immune from ideological assault. Scientific method, it is often argued, guarantees the objectivity and ethical neutrality of "factual" statements as well as the conclusions drawn therefrom. This view is common in the so-called natural sciences; it is also widespread in disciplines such as economics and sociology. The peculiarity of this view is that the claim to be ethically neutral and ideology free is itself an ideological claim. The principles of scientific method (whatever they may be) are normative and not factual statements. The principles cannot, therefore, be justified and validated by appeal to science's own methods. The principles have to be validated by appeal to something external to science itself. Presumably this "something" lies in the realms of metaphysics, religion, morality, ethics, convention, or human practice. Whatever its source, it lies in realms that even scientists agree are freely penetrated by ideological considerations. I am not arguing that facts and conclusions reached by means of a particular scientific method are false, irrelevant, immoral, unjustifiable, purely subjective, or non-replica-ble. But I am arguing that the use of a particular scientific method is of necessity founded in ideology, and that any claim to be ideology free is of necessity an ideological claim. The results of any enquiry based on a particular version of scientific method cannot consequently claim to be immune from ideological assault, nor can they automatically be regarded as inherently different from or superior to results arrived at by other methods. The ideological foundation of the ethical neutrality assumption can be demonstrated by a careful examination of the paradigmatic basis of enquiry throughout the history of science (both natural and social) [7; 16; 27], as well as by examining the history of the ethical neutrality assumption itself [27; 40]. The ideological foundation can also be revealed by a consideration of those theories of meaning in which it is accepted that there cannot be an ethically neutral language because meaning in language cannot be divorced from the human practices through which specific meanings are learned and communicated [9; 42]. It is not, however, the purpose of this paper to document the problems and defects of the ethical neutrality assumption, critical though these are. I shall, rather, start from the position that scientific enquiry cannot proceed in an ethically neutral manner, and seek to show how the inability to sustain a position of ethical neutrality inevitably implies some sort of an ideological position in any attempt to examine something as complex as a population-resources system.

Science Bad – Not Objective – Temporary

Science is a product of the times—today’s knowledge will eventually be outdated

Stevenson 99 (Ian, U of Virginia School of Medicine, Journal of Scientific Exploration, Vol. 13, No. 2, pp. 264-265 JF)

Unfortunately, even the most experienced scientists may be found lacking in objectivity (Arp, 1987; Hetherington, 19884; Marshall, 1990). Moreover, they too often believe that current knowledge will endure forever. What we now teach, they tell us, will not be changed in any substantial way. In recent years two scientists have published confident assertions of the immutability of current knowledge (Cromer, 1993; Wilson, l998). Such certitude has been given the name of a disease called “kelvinitis.” The name derives from Lord Kelvin’s statement, at the end of the l9th century, that “all the discoveries in physics had been made and... it remained only to adjust the last decimal point in a few measurements” (Asimov, 1964, p. 306)5. Another term for the same condition is “presentism,” whose advocates assure us that present, reliable knowledge has finally replaced long periods of bleak ignorance (Micale & Porter, 1994). “They live under perpetual illusion of fundamental understanding” (Bauer, 1992, p. 75). They are terribly wrong. The history of science offers us many examples of the supersession of one theory and the rise to dominance of a successor. Personal decisions and motives different from the search for truth frequently influence the succession of currently favored theories. To take only one example, the history of the ascent of genetics to its current hegemony in biology cogently demonstrates the influence of social and political forces in the evolution of one branch of scientific research. T. H. Morgan (1866–1945) began his professional career as an embryologist. Later, he became interested in the inheritance of traits. Considering that Darwin’s The Origin of Specieswas published in l859 and that Mendel’s discoveries concerning inheritance were brought to the attention of a wider scientific readership in l900, Morgan was slow to convert to the idea of evolution and to embrace genetics as a legitimate field of scientific research (Bowler, 1988; Shine & Wrobel, 1976). When he did convert in 1910, however, he, with his students and colleagues, established a scientific society and a journal of genetics; they trained graduate students who took teaching positions and propagated other students until their view of what is important in biology came to dominate the field and still does. Early in his enthusiasm for genetics Morgan separated it from embryology, and in the ensuing development of biology, embryology, and the problems of morphology became neglected, almost overlooked (Sapp, 1987; Bowler, l988). The few biologists who tried to draw more attention to morphology and its problems (Russell, l916/1982; Thompson, l917) were respected but largely ignored. The history of science shows that today’s facts may become tomorrow’s falsehoods. At different times the following were regarded as facts: the earth stands still and the stars move; the sun goes around the earth; the earth is flat; stones cannot fall out of the sky because there are none there; atoms are indivisible; atoms may break up, but this can never be exploited as a source of energy; space is filled with ether; machines heavier than air can never fly; continents cannot split and the parts move away from each other. Let me now list some of the current “facts” accepted by most of today’s scientists: natural selection fully explains evolution; the mind is only the behavior of a physical object called the brain; a human mind cannot communicate with another mind without the mediation of the currently known sensory organs; personality derives entirely from genetic inheritance and postnatal environmental experiences. Research now under way, some of it by members of the Society for Scientific Exploration, is already producing observations that challenge the status of these assertions as “facts.” I predict that at least some of them will cease to be regarded as “facts” by the middle of the next century.

Science Bad – Objectivity – Impact – VTL

Science’s purported objectivity is historically contingent – stepping outside of that orthodoxy lets us lead meaningful lives

Alford 85 (C. Fred, Assistant prof of government @ U of Maryland, College Park, Polity, Vol. 18, No.2, Winter, pp. 204-223, jam)

Feyerabend argues that his epistemological anarchism is intended as "medicine" for epistemology and the philosophy of science (AM, p. 17). The disease is an excess of law and order methodology, which tells scientists and others what they must do to have valid knowledge. Feyerabend implies that if circumstances were to change-if anarchism were carried to excess, for example-he might come to the defense of epistemological law and order (AM, pp. 21-22). His political theory, "democratic rela- tivism," is similarly reactive. It depends upon "a firmly entrenched pro- tective machinery."15 The institutions and legal forms necessary to pro- tect individuals and traditions already exist in the Western democracies. The question is not how to construct such machinery, "but how to loosen it up and detach it from the traditions now using it exclusively for their own purposes" ("Democracy and Science," p. 17). Feyerabend's approval of the use of state power to constrain the influence of scientific medicine in China, and so give traditional medicine a chance, demon- strates that he sees a role for state intervention in the interest of free com- petition among institutions representing different world views.'6 Though Feyerabend's institutional target is modern science, his funda- mental concern is with what he calls "abstract traditions," meaning any rules, procedures, norms, values, or beliefs, that claim general validity, such as the Judeo-Christian ethic, the rules of logic, or the methods of critical rationalism. Feyerabend argues that both abstract and historical traditions are always situated in a historical context, and make sense only when applied to problems and issues belonging to that context. However, abstract traditions "try to replace the quasi-intuitive and only partly standardized procedures of [historical traditions] with abstract concepts and abstract relations between them and they make maximal use of these relations in their arguments" ("Historical Background," p. 8; also EFM, pp. 39-67, 159-166; SFS, pp. 16-31). While this may seem to be an advance, in so far as these standardized relationships can be presented as objective and tradition independent, in fact such a replacement is frequently regressive. For abstract traditions generally employ concepts "which are too poor to reflect the peculiarities of any particular tradition" ("Historical Background," p. 7). The rise of abstract traditions is thus accompanied by a loss of content and richness. Content and rich- ness are matters of detail. Abstract traditions sacrifice the richness of actual historical traditions for a specious generality; specious because it is achieved at the cost of content, and because it can never actually transcend its historical context, but only abstract from it. Feyerabend's dis- tinction between abstract and historical traditions, and his preference for the latter, is the real link between his epistemology and social theory. I shall return to this issue in part IV below. Feyerabend argues that abstract traditions are in some ways the worst tyrants of all (SFS, p. 207). They imprison men's minds and spirits and yet, unlike actual physical tyrants, they cannot be readily identified or opposed. Abstract traditions tend to become internalized tyrants. Man ceases to be a slave and obtains dignity, says Feyerabend, "only when he becomes capable of stepping outside the most fundamental categories, including those which allegedly make him human" (AM p. 191). He can- not do so in the absence of an alternative. The value of a plurality of traditions is that each provides another place to stand. In such a world: Reason, at last, joins all those other abstract monsters such as Obligation, Duty, Morality, Truth and their more concrete prede- cessors, the Gods, which were once used to intimidate man and restrict his free and happy development: it withers away. (AM, p. 180)

Objective science removes the humanity from science turning us into joyless machines for observation

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, "Against Method", p. 153-154, jam)

Now at this point, one may raise two questions. 1. Is it desirable to live in accordance with the rules of a critical rationalism? 2. Is it possible to have both a science as we know it and these rules? As far as I am concerned, the first question is far more important than the second. True, science and related institutions play an important part in our culture, and they occupy the centre of interest for many philosophers (most philosophers are opportunists). Thus the ideas of the Popperian school were obtained by generalizing solutions for methodological and epistemological problems. Critical rationalism arose from the attempt to understand the Einsteinian revolution, and it was then extended to politics and even to the conduct of one's private life. Such a procedure may satisfy a school philosopher, who looks at life through the spectacles of his own technical problems and recognizes hatred, love, happiness, only to the extent to which they occur in these problems. But if we consider human interests and, above all, the question of human freedom (freedom from hunger, despair, from the tyranny of constipated systems of thought and not the academic 'freedom of the will'), then we are proceeding in the worst possible fashion. For is it not possible that science as we know it today, or a 'search for the truth' in the style of traditional philosophy, will create a monster? Is it not possible that an objective approach that frowns upon personal connections between the entities examined will harm people, turn them into miserable, unfriendly, self- righteous mechanisms without charm and humour? 'Is it not possible,' asks Kierkegaard, 'that my activity as an objective [or a critico-rational1 observer of nature will weaken my strength as .a human being?' I suspect the answer to many of these questions is affirmative and I believe that a reform of the sciences that makes them more anarchic and more subjective (in Kierkegaard's sense) is urgently needed.

\*\*\*Impacts\*\*\*

Science Bad – Impact – Solvency

Social sciences fail – dominant power dynamics destroy objectivity and empirical methods assume artificial norms

Alcoff 8 (Linda, PhD in Philosophy from Brown U, prof of philosophy @ CUNY, Jan 14, [www.alcoff.com/content/foucphi.html] AD: 6-26-11, jam)

The new disciplinary economy of power stimulated the human sciences, toward pursuing knowledge about Man through statistical analyses, surveys, polls, and controlled experiments. Norms were developed for every possible activity, from the normative amount of time it takes to learn arithmetic, to recover from an operation, to fall asleep, to be convinced to buy a brand of detergent. Persons became individuated through a meticulous measurement of their differences from a norm that imposed homogeneity. It makes perfect sense, then, to describe this as Foucault did: as a new regime for the circulation of power and of knowledge, involving a division and proliferation of forms of expertise, new types of epistemic relations, new institutionally constituted objects of knowledge, and new instrumentalities to direct operational determinations. The representation of science as prone to ideological manipulation might picture this state of affairs as follows: that power relations confer authority on knowledges that are in the interests of the dominant. But everyone came to be more or less subject to these norms of behavior, and the new subject positions of authority produced by this new domain were not imaginable before: the “trainer,” the psychologist, the efficiency expert, the pollster. Power cannot be separated from justification processes when they occur within and are administered by authority figures operating with norms of model behavior. Nor can it be separated from truths which relate facts about new experiences, practices, techniques, and indeed objects that did not preexist the current power/knowledge era, such as the criminal personality, the delinquent adolescent, the socially maladjusted, or the pervert.

Scientific knowledge can’t be separated from the context in which it was produced

Alcoff 8 (Linda, PhD in Philosophy from Brown U, prof of philosophy @ CUNY, Jan 14, [www.alcoff.com/content/foucphi.html] AD: 6-26-11, jam)

Beyond the particular depictions he gives of the rise of certain sciences, and of their interrelationships and institutional genesis, Foucault’s original contributions to the study of science have mainly to do with how he conceptualized its co-constitutive relationship to power. As in the Hegelian tradition, for Foucault the conceptual and methodological approaches used in producing knowledge are historically contingent; thus “one cannot speak of anything at any time...”(Foucault 1972, 45). This affects not just how objects are interpreted, but how phenomena are grouped into objects, as well as in some cases how phenomena, such as stable sexual identities or criminal personalities, come into existence. The conditions by which objects of study emerge are, then, as he says, “many and imposing.”(Foucault 1972, 45) Unlike the foundationalists but like the coherentists, for Foucault perception has no causal primacy of ontological pre-existence, but neither does an imagined abstracted process of conceptualization. Foucault does not separate perception from conceptualization: produced simultaneously are the object, the mode of perception, and the concept, after which come competing explanatory theories (see e.g. Foucault 1975, 125).

Science Bad – Impact – Extinction

The moral blindness of science would permit extinction

Arendt 61 (Hannah, American political philosopher, “The Conquest of Space and the Stature of Man” The New Atlantis Fall 2007 Pg. 51 JF)

The magnitude of the space enterprise seems to me beyond dispute, and all objections raised against it on the purely utilitarian level—that it is too expensive, that the money were better spent on education and the improvement of the citizens, on the fight against poverty and disease, or whatever other worthy purposes may come to mind—sound to me slightly absurd, out of tune with the things that are at stake and whose consequences today appear still quite unpredictable. There is, moreover, another reason why I think these arguments are beside the point. They are singularly inapplicable because the enterprise itself could come about only through an amazing development of man’s scientific capabilities. The very integrity of science demands that not only utilitarian considerations but the reflection upon the stature of man as well be left in abeyance. Has not each of the advances of science, since the time of Copernicus, almost automatically resulted in a decrease in his stature? And is the often repeated argument that it was man who achieved his own debasement in his search for truth, thus proving anew his superiority and even increasing his stature, more than a sophism? Perhaps it will turn out that way. At any event, man, insofar as he is a scientist, does not care about his own stature in the universe or about his position on the evolutionary ladder of animal life; this “carelessness” is his pride and his glory. The simple fact that physicists split the atom without any hesitations the very moment they knew how to do it, although they realized full well the enormous destructive potentialities of their operation, demonstrates that the scientist qua scientist does not even care about the survival of the human race on earth or, for that matter, about the survival of the planet itself. All associations for “Atoms for Peace,” all warnings not to use the new power unwisely, and even the pangs of conscience many scientists felt when the first bombs fell on Hiroshima and Nagasaki cannot obscure this simple, elementary fact. For in all these efforts the scientists acted not as scientists but as citizens, and if their voices have more authority than the voices of laymen, they do so only because the scientists are in possession of more precise information. Valid and plausible arguments against the “conquest of space” could be raised only if they were to show that the whole enterprise might be self-defeating in its own terms.

Science Bad – **Impact** – **Environment**

**Science leads to the manipulation of nature such that its original essence is destroyed along with humanity’s connection to it**

Kidner 0 (David, faculty of humanites @ Nottingham Trent U, Environmental Ethics Vol. 22.4 Winter Pg. 345-346 JF)

Science, then, may be a partial understanding which we often fatefully misconstrue as being a complete description of nature, but it is nevertheless firmly anchored in realities which are beyond the influence of language. To an increasing extent, however, even these realities are being modified by industrialism, not only through the breeding of certain species and the elimination of others, but also, and increasingly directly, through genetic manipulation. If nature, then, was not originally constructed by technology and language, it is in many ways in the process of being reconstructed by these means; and the metaphor of “construction” assumes the absence or obliteration of natural structure, so that the world is simply made up of (verbal or physical) “raw materials.” This demolition of the nature that frames and transcends human awareness, and its replacement by a “nature” which is defined and constructed by industrial and discursive activity from the fragments of the original nature, implies a corresponding redefinition of the person to fit a rational, commercial world—a redefinition which, in Arthur Kleinman’s words, has “deepened discursive layers of experience . . . while paradoxically making it more difficult to grasp and communicate poetic, moral, and spiritual layers of the felt flow of living.”32 This transformation, suggests Kleinman, “can be of a kind to cancel, nullify, or evacuate the defining human element in individuals—their moral, aesthetic, and religious experience.”33 Social constructionism, then, can be seen as rooted within a broader reconstructive project which reconfigures both humanity and the nonhuman world according to an industrialist blueprint. The physical and ideological replacement of nature, understood as the larger order out of which we grow, by a reduced order based on industrialist rationality finds its academic counterpart in the doctrine that nature is a mere part-actor in the wider drama of human life and language.

Scientific “progress” is responsible for environmental destruction

Levins 96 (Richard, John Rock Prof of Population Sciences at the Harvard School of Public Health, Sep, [pubs.socialistreviewindex.org.uk/isj72/levins.htm] AD: 6-27-11, jam)

But science also has had dramatic failures. The promises of understanding and progress have not been kept, and the application of science to human affairs has often done great harm. Public health institutions were caught by surprise by the resurgence of old diseases and the appearance of new ones. Modern planning has not given us more habitable cities. Industrial design for greater efficiency has not made work more humane but, instead, led to increased bodily stress, anxiety, overwork and unemployment. Pesticides increase pests, create new pest problems and contribute to the load of poison in our habitat. Antibiotics create new pathogens resistant to our drugs. Modern high-tech agronomy watches our soils disappearing. The green revolution did not eliminate hunger but increased the polarisation between rich and poor and the dependence of developing countries on imports. Scientific theories have even been put forth to justify inequality, racism, aggression and competitiveness. I am sure that all of you could add to the list of major problems that science has not only not solved but has even made worse through the impact of technologies that intervene strongly into complex processes with simple-minded expectations. It is no wonder that we see an anti-science backlash involving not only cuts in expenditures for research and the education of scientists, but also the turning of young people away from the scientific vocations, a counterposing of scientific knowledge to humane or spiritual feelings and morality, and attacks on scientific rationality itself.

**Science Bad – Impact – Environment – Impact Calc**

**Unchecked environmental destruction leads to extinction**

**Cairns 0** (John, Prof Emeritus of Environmental Bio @ Virginia State U, Politics and the Life Sciences, Vol. 19.1 March Pg. 29 JF)

And, there is even worse news. Dunning (1997) found that, of several undergraduate classes (622 responses), only 23% realized the population of the United States was between 250 and 300 million. Many of the students had no idea of how large a billion is—an important number since Earth's population is measured in billions. As United States Senator Everett M. Dirksen once said, "**a billion here and a billion there soon adds up** to real money." The same statement applies quite well to population numbers. **Smail (** 1997) **addresses a topic that few** demographers, ecologists, scientists, or politicians **dare to mention—whether Earth's carrying capacity for humans has already been exceeded. It does not pay to be a contrarian in an era in which economic growth**, accompanied by increased numbers of human artifacts, **is mentioned with pride** by both small and large political units. So**, the great global experiment** (e.g., Schneider, 1997) **with the planet's ecological life-support system continues, for which the outcome is fairly certain** if the carrying capacity concept has any validity. **The** classic **Kaibab Plateau** (north of the Grand Canyon in the United States) **study illustrates the penalties of exceeding the carrying capacity** (a recent summary is in Straub, 1999). The plateau was originally estimated to be capable of supporting 40,000 deer, with growth limited by natural predators (wolves, cougars, and coyotes). Bounties encouraged hunters to kill the predators, and the deer population increased to 50,000. The life-support system was damaged, and the carrying capacity plunged to 10,000, mainly due to starvation. Estimating the optimal carrying capacity for deer is relatively straightforward. Society will tolerate manipulation of deer populations even though such manipulation is unacceptable for the human species**. Estimation of "optimal human" carrying capacity is far more difficult, given the present range of socioeconomic systems** (e.g., Parsons, 1998**). Many analysts are convinced that cessation of destruction and degradation of natural systems requires limitation and even rollback of human population size. If present trends continue, livable limits will someday be encountered, but perhaps not without irreversible damage to the biosphere and impoverishment of the quality of life**—at worst, **diminishing prospects for survival of the human species. It is essential to examine this unpalatable possibility** because doing so may increase the duration of human life on the planet.

**Science Bad – Impact – Environment – Impact Calc**

Tolerating the destruction of the environment saps us of our humanity—it makes nuclear war and human extinction inevitable

**Bookchin**, **87** (Murray, co-founder of the Institute of Social Ecology, "An Appeal For Social and Psychological Sanity," The Modern Crisis p. 106-108)

**Industrially and technologically, we are moving at an ever-accelerating pace toward a yawning chasm with our eyes completely blindfolded**. From the 1950s onward, **we have placed ecological burdens upon our planet that have no precedent in human history. Our impact on our environment has been nothing less than appalling**. The problems raised by acid rain alone are striking examples of [end page 106] innumerable problems that appear everywhere on our planet. The concrete-like clay layers, impervious to almost any kind of plant growth, replacing dynamic soils that once supported lush rain forests remain stark witness to a massive erosion of soil in all regions north and south of our equatorial belt. The equator—a cradle not only of our weather like the ice caps but a highly complex network of animal and plant life—is being denuded to a point where vast areas of the region look like a barren moonscape. We no longer "cut" our forests—that celebrated "renewable resource" for fuel, timber, and paper. We sweep them up like dust with a rapidity and "efficiency" that renders any claims to restorative action mere media-hype. **Our entire planet is** thus **becoming simplified, not only polluted**. Its soil is turning into sand. Its stately forests are rapidly being replaced by tangled weeds and scrub, that is, where vegetation in any complex form can be sustained at all. Its **wildlife ebbs and flows on the edge of extinction, dependent largely on whether** one or two nations—or **governmental administrations**—**agree that certain** sea and land mammals, bird **species**, or, for that matter, magnificent trees **are "worth" rescuing as lucrative items on corporate balance sheets**. **With each such loss, humanity**, too, **loses a portion of its own character structure: its sensitivity toward life as such, including human life, and its rich wealth of sensibility. If we can learn to ignore the destiny of whales and condors**—indeed, turn their fate into chic cliches—**we can learn to ignore the destiny of Cambodians in Asia, Salvadorans in Central America,** **and**, finally, **the human beings who people our communities. If we reach this degree of degradation, we will then become so spiritually denuded that we will be capable of ignoring the terrors of thermonuclear war. Like the biotic ecosystems we have simplified with our lumbering and slaughtering technologies, we will have simplified the psychic ecosystems that give each of us our personal uniqueness. We will have rendered our internal mileau as homogenized and lifeless as our external milieu—and a biocidal war will merely externalize the deep sleep that will have already claimed our spiritual and moral integrity. The process of simplification**, even more significantly than pollution, **threatens to destroy the restorative powers of nature and humanity**—their common ability to efface the forces of destruction and reclaim the planet for life and fecundity. **A humanity disempowered of its capacity to change a misbegotten "civilization," ultimately divested of its power to resist, reflects a natural world disempowered of its capacity to reproduce a green and living world**.

Science Bad – **Impact** – **Weapons**

The use of science by the state is the root of horribly destructive weapons that have no peaceful use or moral control mechanism

**Proctor 91** (Robert, Prof of History of Science @ Stanford, “Value-free science?: purity and power in modern knowledge” Pg. 1-3 JF)

The inhumanity humans show toward one another is probably no greater now than in other times in history; the crimes of the Nazis against the Jews, or the Turks against the Armenians, or Americans against the Vietnamese are not the first of such crimes in history. What is new in our times is that we have greater means to effect such crimes—and these we owe largely to the growth of science and technology. Today’s powers are, of course, the product of centuries of technological progress. Francis Bacon celebrated the compass, gunpowder, and printing for having revolutionized navigation, warfare, and access to knowledge. But consider also that, in the century prior to Bacon, the compass allowed the Spanish to send their armies into the Americas; gunpowder allowed them to subdue the natives; and printing allowed records of these acts to survive (while at the same time Spanish priests burned the Mayan libraries). In recent years, more sophisticated, modern technologies promise to raise the stakes of destruction. The first hydrogen bomb, exploded on Bikini atoll in 1952, released more destructive power than had been loosed in all the previous wars in history. And by the 1980’s, the time required to complete a “nuclear exchange” between New York and Moscow had dwindled to something on the order of half an hour, less if one considers nuclear submarines lying outside national waters. Fears are translated into a barbaric will to survive: as “survival groups” take target practice to endure the holocaust, doctors explore the horrors of “catastrophe medicine” and governments stockpile opium to soothe the last minutes of the mutilated. “Preparedness” has taken on an almost comic air, as bureaucrats ponder the price of post-holocaust postage and morticians practice the art of embalming radioactive bodies. More terrifying of all, perhaps, is that there are those who have lost their fear. It is not so long since Colin Gray and Keith Payne assured us (in harmony with former vice-president George Bush) that “victory is possible” in a war in which 20 million Americans are killed. Language has been developed to soften the brutality. Departments of war have become departments of defense, recalling Orwell’s forecast of “Ministries of Peace.” War has been given the language of peace, and even art. We speak of “theater weapons,” “arenas of defense,” and “windows of vulnerability.” In classic doublespeak, the U.S. Department of Defense described its mission in Vietnam as waging “peacefare” and as “bringing peace to the countryside.” The horrors of war have been disguised with the sanitary terms of medicine, business, or even sex and birth—there is talk of “surgical strikes” and “penetration aids,” of nuclear bombs as “assets” or “ babies” or keepers of the peace.” Language, of course, is only part of the problem. Since the late 1970s we have seen the rapid militarization of science in the United States, as the proportion of government funds for military research and development rose from 50 percent under President Carter to more than 70 percent under Reagan and bush. There remains today a large and shadowy secret scientific community, with secret scientific journals and secret scientific conferences. Those who have studied this phenomenon estimate that as many as a quarter or a third of all American scientists and engineers have some form of military security clearance. This figure itself, of course, is not open to public scrutiny. Still we often hear that however foul its application, science itself is pure. Science may be political in its application, but not in its origin or structure. And certainly it is true that science and technology alone are hardly a threat to world peace. Politics and moralities stand behind our sciences and give them life; science can be used for good or for evil. This is one sense of the “neutrality” of science—that science (or technology) “in itself” is neither good nor bad; that science may be used, or it may be abused. This is hardly a new idea. Plato goes to some lengths to show that those most capable of healing are also those most capable of harming, that those most competent to tell the truth are those most able to tell a lie. Yet this supposed neutrality describes only the simplest technologies, the most abstract principles. The seven simple machines, perhaps, or the rules of arithmetic, may be neutral in this sense. But an abstract truth often conceals a concrete lie. “Guns don’t kill people, people kill people.” Yet is it surprising that a society that surrounds itself with guns will use them? “A newly sharpened sword,” reads the African proverb, “marches by itself to the next village.” Tools, we realize, have alternative uses; the knife bought for cooking might be used for killing. Yet knives or levers are not what modern science-based technology is all about. A nuclear power plant, cruise missile, or linear accelerator can hardly be used for ends other than which they are designed. Science-based technologies are increasingly end-specific: the means constrain the ends; it is no longer so easy to separate the origins of a tool from its intended use. What does it mean to “abuse” a cruise missile or a neutron bomb?

Science Bad – Impact – Genocide

Scientific rationality justified the holocaust

Feyerabend 87 (Paul, prof of philosophy @ UC Berkeley, [onlyagame.typepad.com/only\_a\_game/2006/06/farewell\_to\_rea.html] AD: 6-26-11, jam)

I say that Auschwitz is an extreme manifestation of an attitude that still thrives in our midst. It shows itself in the treatment of minorities in industrial democracies; in education… which most of the time consists in turning wonderful young people into colourless and self-righteous copies of their teachers… it shows itself in the killing of nature and of ‘primitive’ cultures with never a thought spent on those thus deprived of meaning for their lives; in the colossal conceit of our intellectuals, their belief that they know precisely what humanity needs and their relentless efforts to recreate people in their own, sorry image… in the lack of feeling of many so-called searchers for truth who systematically torture animals, study their discomfort and receive prizes for their cruelty. As far as I am concerned there exists no difference whatsoever between the henchmen of Auschwitz and these ‘benefactors of mankind’ – life is misused for special purposes in both cases. The problem is the growing disregard for spiritual values and their replacement by a crude but ‘scientific’ materialism, occasionally even called humanism: man (i.e. humans as trained by their experts) can solve all problems – they do not need any trust in and any assistance from other agencies. How can I take a person seriously who bemoans distant crimes but praises the criminals in his own neighbourhood? And how can I decide a case from afar seeing that reality is richer than even the most wonderful imagination.

Science Bad – Impact – Genocide – Terminal

Genocide is the ultimate impact and is categorically different from all other calculations. Failure to act on-face and without delay is one hundred percent complicity, even if our strategy has no definitive endpoint

**Vetlesen 2k** (Arne Johan, Department of Philosophy, U of Oslo, July, *Journal of Peace Research*, “Genocide: A Case for the Responsibility of the Bystander,” p. 520-522)

Most often, in cases of genocide, for every person directly victimized and killed there will be hundreds, thousands, perhaps even millions, who are neither directly targeted as victims nor directly participating as perpetrators. The moral issues raised by genocide, taken as the illegal act par excellance, are not confined to the nexus of agent and victim. Those directly involved in a given instance of genocide will always form a minority, so to speak. The majority to the event will be formed by the contemporary bystanders. Such bystanders are individuals; in their private and professional lives, they will belong to a vast score of groups and collectives, some informal and closely knit, others formal and detached as far as personal and emotional involvement are concerned. In the loose sense intended here, every contemporary citizen cognizant of a specific ongoing instance of genocide, regardless of where in the world, counts as a bystander. Bystanders in this loose sense are cognizant, through TV, radio, newspapers, and other publicly available sources of information, of ongoing genocide somewhere in the world, but they are not - by profession or formal appointment — involved in it. Theirs is a passive role, that of onlookers, although what starts out as a passive stance may, upon decision, convert into active engagement in the events at hand. I shall label this category passive bystanders. This group should be distinguished from bystanders by formal appointment: the latter bystanders have been professionally Engaged as a ‘third party’ to the interaction between the two parties directly involved in acts of genocide. The stance of this third party to an ongoing conflict, even one with genocidal implications, is in principle often seen as one of impartiality and neutrality, typically highlighted by a determined refusal to ‘take sides.’ This manner of principled non-involvement is frequently viewed as highly meritorious (Vetlesen, 1998). A case in point would be UN personnel deployed to monitor a ceasefire between warring parties, or (as was their task in Bosnia) to see to it that the civilians within a UN declared ‘safe area’ are effectively guaranteed ‘peace and security’, as set down in the mandate to establish such areas. By virtue of their assigned physical presence on the scene and the specific tasks given to them, such (groups of) bystanders may be referred to as bystanders by assignment. What does it mean to be a contemporary bystander? To begin with, let us consider this question not from the expected view- point — that of the bystander - but from the two viewpoints provided by the parties directly involved in the event. To put it as simply as possible: From the viewpoint of an agent of genocide, bystanders are persons possessing a potential (one needing to be estimated in every concrete case) to halt his ongoing actions. The perpetrator will fear the bystander to the extent that he [or she] has reason to believe that the bystander will intervene to halt the action already under way, and thereby frustrate the perpetrators goal of eliminating the targeted group, that said, we immediately need to differentiate among the different categories of bystanders introduced above. It is obvious that the more knowledgeable and other wise resourceful the bystander, the more the perpetrator will have reason to fear that the potential for such resistance will translate into action, meaning a more or less direct intervention by military or other means. Deemed efficient to reach the objectives of halting the incipient genocide. Of course, one should distinguish between bystanders who remain inactive and those who become actively engaged. Nonetheless, the point to be stressed is that, in principle, even the most initially passive and remote bystander possesses a potential to cease being a mere onlooker to the events unfolding. Outrage at what comes to pass may prompt the judgement that ‘this simply must be stopped’ and translate into action promoting that aim. But is not halting genocide first and foremost a task, indeed a duty, for the victims themselves? The answer is simple: The sheer fact that genocide is happening shows that the targeted group has not proved itself able to prevent it. This being so, responsibility for halting what is now unfolding cannot rest with the victims alone, it must also be seen to rest with the party not itself affected but which is knowledgeable about -which is more or less literally witnessing — the genocide that is taking place. So whereas for the agent, bystanders represent the potential of resistance, for the victims they may represent the only source of hope left. In ethical terms, this is borne out in the notion of responsibility of Immanuel Levinas (1991), according to which responsibility grows bigger the weaker its addressee. Of course, agents of genocide may be caught more or less in delicto flagrante. But in the age of television - with CNN being able to film and even interview doers as well as victims on the spot, and broadcast live to the entire television-watching world (such as was the case in the concentration camp Omarska in Bosnia in August 1992) (see Gutman, 1993) — physical co-presence to the event at hand is almost rendered superfluous. One need not have been there in order to have known what happened, The same holds for the impact of the day-to-day reporting From the ground by newspaper journalists of indisputable reputation. In order to be knowledgeable about ongoing genocide, it suffices to watch the television news or read the front pages of a daily newspaper. But, to be more precise, what exactly does it mean to act? What is to count as an action? We need to look briefly at the philosophical literature on the notion of action — as well as the notion of agent responsibility following from it - in order to gel a better grasp of the moral issues involved in being a bystander to genocide, whether passive or active. ‘I never forget', says Paul Ricoeur in Oneself as Another, 'to speak of humans as acting and suffering, The moral problem', he continues, ‘is grafted onto the recognition of this essential dissymmetry between the one who acts and the one who undergoes, culminating in the violence of the powerful agent.' To be the 'sufferer' of a given action in Ricoeur's sense need not be negative; either 'the sufferer appears as the beneficiary of esteem or as the victim of disesteem, depending on whether the agent proves to be someone who distributes rewards or punishments'. Since there is to every action an agent and a sufferer (in the sense given), action is interaction, its structure is interpersonal (Ricoeur. 1992:145). But this is not the whole picture. Actions are also omitted, endured, neglected, and the like; and Ricoeur takes these phenomena to remind us that ‘on the level of interaction, just as on that of subjective understanding, not acting is still acting: neglecting, forgetting to do something, is also letting things be done by someone else, sometimes to the point of criminality. (Ricoeur, 1992:157) Ricoeur's systematic objective is to extend the theory of action from acting to suffering beings; again and again he emphasizes that 'every action has its agents and its patients' (1992; 157). Ricoeur's proposed extension certainly sounds plausible. Regrettably, his proposal stops halfway. The vital insight articulated, albeit not developed, in the passages quoted is <CONTINUED>

Science Bad – Impact – Genocide – Terminal

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that not acting is still acting. Brought to bear on the case of genocide as a reported, on going affair, the inaction making a difference is the inaction of the bystander to unfolding genocide. The failure to act when confronted with such action, as is involved in accomplishing genocide, is a failure which carries a message to both the agent and the sufferer: the action may proceed. Knowing, yet still not acting, means-granting acceptance to the action. Such inaction entails letting things be done by someone else - clearly, in the case of acknowledged genocide, 'to the point of criminality', to invoke one of the quotes from Ricoeur. In short, inaction here means complicity; accordingly, it raises the question of responsibility, guilt, and shame on the part of the inactive bystander, by which I mean the bystander who decides to remain inactive. In the view I am advancing, the theory of action is satisfactorily extended only when it is recognized that the structure of action is triadic, not dyadic. It takes two to act, we are tempted to say — no more and no less. But is an action really the exclusive possession — a private affair — between the two parties immediately affected as agent and sufferer? For one thing, the repercussions of a particular piece of action are bound to reach far beyond the immediate dyadic setting. As Hannah Arendt (1958) famously observed, to act is to initiate, to make a new beginning in the world, to set in motion - and open-endedly so. Only the start of a specific action allows precise localization in space and time, besides our attributing it to a particular agent, as her property and no one else’s. But, as for the repercussions, they evade being traced in any definite manner, to any final and definitive endpoint.

**Genocide should be rejected categorically – it precedes other political considerations**

**Harff & Gur 81** (Barbara, Prof of Political Science Emerita @ U.S. Naval Academy in Annapolis, MD, “Humanitarian Intervention As A Remedy For Genocide,”, p. 40)

One of the most enduring and abhorrent problems of the world is genocide, which is neither particular to a specific race, class, or nation, nor is it rooted in any one, ethnocentric view of the world. **Prohibition of genocide** **and affirmation of its opposite, the value of life, are an eternal ethical verity, one whose practical implications** **necessarily outweigh possible theoretical objections and as such should lift it above prevailing ideologies or** **politics. Genocide concerns and potentially effects all people.** People make up a legal system, according to Kelsen. Politics is the expression of conflict among competing groups. Those in power give the political system its character, i.e. the state. The state, according to Kelsen, is nothing but the combined will of all its people. This abstract concept of the state may at first glance appear meaningless, because in reality not all people have an equal voice in the formation of the characteristics of the state. **But I am not concerned with the characteristics of** **the state but rather the essence of the state – the people. Without a people there would be no state or legal** **system. With genocide eventually there will be no people. Genocide is ultimately a threat to the existence of all.** True, sometimes only certain groups are targeted, as in Nazi Germany. Sometimes a large part of the total population is eradicated, as in contemporary Cambodia. Sometimes people are eliminated regardless of national origin – the Christians in Roman times. Sometimes whole nations vanish – the Amerindian societies after the Spanish conquest. And sometimes religious groups are persecuted – the Mohammedans by the Crusaders. The culprit changes: sometimes it is a specific state, or those in power in a state; occasionally it is the winners vs. the vanquished in international conflicts; and in its crudest form the stronger against the weaker. **Since virtually** **every social group is a potential victim, genocide is a universal concern.**

Science Bad – **Impact** – **Value to Life – General**

Science’s attempt to explain existence causes a loss of the essence that makes human life valuable—we need a holistic perspective

Vajda 78 (Mihaly, Marxist philosopher, “Lukacs and Husserl’s Critique of Science” Telos 38 Winter Pg. 115)

Thus, both critiques of science have no other goal than to rediscover truth. Both maintain that the meaning of our history can be grasped only from a holistic perspective. A mankind that seeks to adapt to its own world as something alien surrenders its human essence and fails to realize its teleology. In Lukács’ opinion, this teleology consists, ultimately, in achieving a mankind which does not let its norms be dictated by objective truth, i.e., which is capable of absolute self-responsibility by virtue of absolute theoretical insights. It is a question of objective knowledge. Lukács says: "the proletariat is ... the first subject in history that is (objectively) capable of an adequate social consciousness."3 4" It was necessary for the proletariat to be born for social reality to become fully conscious."3 5 Both Lukács and Husserl posit the necessity of total reorientation, the nature of which consists in grasping the totality. This knowledge of the totality is self-knowledge. Such a radical reorientation means the abolition of the duality of philosophy and science. Lukács:"only by overcoming the— theoretical—duality of philosophy and special discipline, of methodology and factual knowledge can the way be found by which to annul the duality of thought and existence."3 6 Husserl: “A definite ideal of a universal philosophy and its method forms the beginning; this is, so to speak, the primal establishment of the philosophical modern age and all its lines of development. But instead of being able to work itself out in fact, this ideal suffers an inner dissolution." "Along with this falls the faith in 'absolute' reason, through which the world has its meaning, the faith in the meaning of history, of humanity, the faith in man's freedom, that is, his capacity to secure rational meaning for his individual and common human existence.“3

The way science forces us to exorcise our consciousness is wrong—we need subjectivity

Midgley 96 (Mary, senior lecturer @ Newcastle U, Science Studies Vol. 9.2 Pg. 55 JF)

So how can we make that new arrangement without lapsing into anarchy? To do this, we shall surely need to get rid of the great gap which Descartes placed between mind and body, between subjects and objects. The ways in which we think about these two vast topics ought not to be kept incommunicado in separate watertight compartments. They need to speak to each other. And this speaking ought not to be kept incommunicado in separate watertight compartments. They need to speak to each other. And this speaking ought not to be hard, since our everyday life is a seamless web which weaves the subjective and objective points of view together as a matter of course. We could not have the kind of experience that we have everyday without constantly relating our momentary, inner perceptions to the facts, that we know through common-sense and history to the ones supplied by the natural sciences. But when we take up the scientistic viewpoint all this co-operation begins to look not just difficult but impossible. For physicalist prophets such as the Churchlands, (Churchland & Churchland, 1995: 65-78) all the ways of thinking by which we usually deal with ourselves and other people as subjects –as conscious, sentient agents—are dismissed as amateur vapourings, mere folk-psychology because they fall outside the strict definition of science. These prophets still dream of finding a single truly scientific language which will one day replace this stuff by terms which will say everything that we need to say about people, as well as about objects, but will say it in the ways that are scientific and objective. In their view, any trace of subjectivity is simply a weakness which must in the end be eliminated from serious thought. Thus the inner and outer aspects of life, which are inseparable sides of the whole person, are violently abstracted, reified and treated as if they were alternative realities fighting for supremacy. That is the set-up which we have to get rid of. Mind and body are not two separate, rival kinds of stuff or force. They are two points of view –inside and outside, subjective and objective, the patient’s point of view on his toothache and that of the dentist who studies it. Consciousness is not a suspect natural entity—a dubious extra to be sliced off with Occam’s Razor. Consciousness is a normal function of our species, an emergent capacity acquired by all social creatures during the regular course of evolution. And it could not have been so acquired if it did not play a central part in shaping their behaviour.

Science Bad – **Impact** – **Calculation**

Science reduces the world to calculation—pushing out qualitative appreciations

Vajda 78 (Mihaly, Marxist philosopher, “Lukacs and Husserl’s Critique of Science” Telos 38 Winter Pg. 106)

The next common point of criticism is the critique of total quantification. The sciences have reduced our qualitative world, the world we live in — the Lebenswelt in Husserlian terminology — to mere quantitative relations. The loss of a sense of quality is tied to the loss of meaning for the particular time. For modern science time has lost its quality: it has become just another dimension on the same level as space. There are numerous other points in common between the Husserlian and Lukácsian critiques of science. In fact, it would be difficult to distinguish the two standpoints since the critique of science in the two works is identical. Not only do they criticize the sciences for not accomplishing the real tasks of human knowledge and for their methodology, but both blame a bad attitude, a bad rationalism, for the failure. This crisis of the sciences is also a crisis of man (in Husserl the crisis of European man, the surrender of true teleology; in Lukács the crisis of capitalism — but the two views amount to the same thing: the total reification of man), and has its roots in naturalistic objectivism. "The 'crisis' could then become distinguishable as the apparent failure of rationalism. The reason for the failure of a rational culture, however, ... lies not in the essence of rationalism itself but solely in its being rendered superficial, in its entanglement in 'naturalism' and 'objectivism'." 6 And for Lukács, "the salient characteristic of the whole epoch is the equation which appears naive and dogmatic in the most 'critical' philosophers, of formal, mathematical, rational knowledge both with knowledge in general and also with 'our' knowledge." 7 The corollary of this one-sided, formal, objectivistic and naturalistic rationalism is necessarily an irrationalism : the irrationality of the whole. The rationally knowable partial systems, "the principle of rationalisation based on what is and can be calculated,"8 and the world of first and "second" nature obtains within the irrationality of the whole world — a world where man walks as a stranger, homeless and exposed to irrational forces.

**The environment is socially constructed and defines human being—science’s view of the world is meaningless**

Greider and Garkovich 94 (Thomas and Lorraine, U of Kentucky, Rural Sociology Vol. 59.1 Spring JF)

Our understanding of nature and of human relationships with the environment are really cultural expressions used to define who we were, who we are, and who we hope to be at this place and in this space. Landscapes are the reflection of these cultural identities, which are about us, rather than the natural environment. When attempting to identify and understand the potential human consequences of changes in the natural environment, it is imperative that these consequences are understood from the many cultural definitions that create landscapes. Is it the landscape created by the real estate developer, the farmer, or the hunter? Actually, any physical place has the potential to embody multiple landscapes, each of which is grounded in the cultural definitions of those who encounter that place. Every river is more than just one river, Every rock is more than just one rock. Cultural groups transform the natural environment into landscapes through the use of different symbols that bestow different meanings on the same physical objects or conditions. These symbols and meanings are sociocultural phenonmena; they are social constructions (Berger and Luckmann 1967), and they result from ongoing negotiations in a cultural context. Of course, humans reside in a natural “…world that is there…” to use Mead’s phrase (1938:30); but this world is meaningless. Meanings are not inherent in the nature of things. Instead, the symbols and meanings that comprise landscapes reflect what people in cultural groups define to be proper and improper relationships among themselves and between themselves and the physical environment. Through sociocultural phenomena, the physical environment is transformed into landscapes that are the reflections of how we define ourselves. Thus, when events or technological innovations challenge the meanings of these landscapes, it is our conceptions of ourselves that change through a process of negotiating new symbols and meanings. These self-definitions, the process of negotiation over landscapes, and subsequent social actions ought to be the foci of social science inquiry, because there are no natural meanings inherent in the world that is there. Some contemporary examples from around the world illustrate how landscapes are reflection of sociocultural symbols and meanings that define what it means to be human in a particular culture.

Science Bad – **Impact** – **Calculation**

**Science’s focus on concept formation forces thought to mimic machinery and fabricate experience in place of aesthetic perspective**

Dahlin 98 (Bo, Karlstad U, “The primacy of Cognition—or perception?” **Annual** European Educational Research Association Conference, Ljubljana, September JF)

Thus, according to Horkheimer and Adorno, Kant’s philosophy of knowledge is modelled on industrial production. The conceptual schematas we carry in our mind(s) correspond to the machinery in the factories, and the impressions we receive from our senses are like the raw material transported to these factories, where it is turned into marketable goods. Just as a factory brings in raw material to work on in order to produce consumable goods, so our understanding or ”mental apparatus” takes in the ”raw stuff” of sense impressions, which is worked upon by our ”mental schematas” in order to produce - in the first instance - ”experience”. Experience may then be further worked upon, by the schematas of higher order concepts, to produce ”knowledge”. Be all this as it may, I still believe that Horkheimer and Adorno very accurately identified a basic metaphor for the way many people in Western societies tend to picture the relation between intelligence or understanding (Verstand) on the one hand, and sensation or sense experience (Sinnlichkeit) on the other. That is, one tends to see it as an external relation. What we receive through our senses is looked upon as ”data”, which are ”treated” in various ways by our conceptual system(s). This treatment is subconsciously modelled on the image of how raw materials are treated in our factories, to produce commodities. The result of these processes is knowledge or representations (Vorstellungen) of the ”outer world”. Indeed, knowledge is becoming more and more like a commodity in our capitalist economy, being ”packed” and ”sold” like any other marketable goods (cf. Bernstein 1992). The intelluctualistic fallacy, or what Horkheimer and Adorno called ”Intellektualität der Wahrnehmeung”, is based upon this external relation between the senses and the understanding. Its consequence is a tendency to neglect the significance of more aesthetic modes of experience, as illustrated in the previous section. Such an ”anaesthetic” attitude is basic to cognitivistic approaches. A recent and extreme example of this stance is the connectionistic theory of Paul M Churchland (see for instance Churchland, 1992). Churchland even recommends that we employ ”the plasticity of perception” in order to replace …the present old-fashioned framework in which, for example, we 'observe the western sky redden' with a more scientifically up-to-date framework in which we 'observe the wavelength distribution of incoming solar radiation shift towards the arge wavelengths'. (Bogen & Woodward 1992, p 610) From such and similar reasoning, Bogen and Woodward (ibid.) come to the conclusion that the distinction between what can be perceived by our senses and what cannot be so perceived ”corresponds to nothing of fundamental epistemological interest” (p 610).(5) Thus, sense experience as an epistemological factor is more or less abolished. The mechanistic stance of such a perspective is revealed by the strong trust in electronic data registrations, and the equally strong distrust of human sense experience: …many advances in reliability come, not by improving perception at all (and still less by loading it with better theory), but rather by replacing perception entirely with mechanical detection and recording devices, or by redesigning the detection process so that perception plays a less central roll. (ibid., p 608) The message seems to be, that the more we reduce the role of sense-perception in scientific research, the more reliable will be our knowledge. A more telling example of what Boisvert calls the ”Asomatic Attitude” and the ”Galilean purification” could hardly be found. What will happen, if such ideas are turned into starting points for educational theories of learning? I do not believe that such and similar conceptions are generally accepted, neither among teachers nor among educational thinkers. However, they are logical consequences of an exclusive and one-sided focus on concepts and concept formation.

Science Bad – Impact – Calculation – ZPHC

The technologisation of the political justifies the devaluation of human life culminating in the zero-point of the holocaust

Dillon 1999 [Michael, “Another Justice,” *Political Theory* 27:2]

Philosophy's task, for Levinas, is to avoid conflating ethics and politics. The opposition of politics and ethics opens his first major work, Totality and Infinity, and underscores its entire reading. This raises the difficult question of whether or not the political can be rethought against Levinas with Levinas. Nor is this simply a matter of asking whether or not politics can be ethical. It embraces the question of whether or not there can be such a thing as an ethic of the political. Herein, then, lies an important challenge to political thought. It arises as much for the ontopolitical interpretation as it does for the under- standing of the source and character of political life that flows from the return of the ontological. For Levinas the ethical comes first and ethics is first phi- losophy. But that leaves the political unregenerated, as Levinas's own defer- ral to a Hobbesian politics, as well as his very limited political interventions, indicate.32 In this essay I understand the challenge instead to be the necessity of thinking the co-presence of the ethical and the political. Precisely not the subsumption of the ethical by the political as Levinas charges, then, but the belonging together of the two which poses, in addition, the question of the civil composure required of a political life. Otherness is born(e) within the self as an integral part of itself and in such a way that it always remains an inherent stranger to itself.33 It derives from the lack, absence, or ineradicable incompleteness which comes from having no security of tenure within or over that of which the self is a particular hermeneutical manifestation; namely, being itself. The point about the human, betrayed by this absence, is precisely that it is not sovereignly self-possessed and complete, enjoying undisputed tenure in and of itself. Modes of justice therefore reliant upon such a subject lack the very foundations in the self that they most violently insist upon seeing inscribed there. This does not, however, mean that the dissolution of the subject also entails the dissolution of Justice. Quite the reverse. The subject was never a firm foundation for justice, much less a hospitable vehicle for the reception of the call of another Justice. It was never in possession of that self-possession which was supposed to secure the certainty of itself, of a self-possession that would enable it ulti- mately to adjudicate everything. The very indexicality required of sovereign subjectivity gave rise rather to a commensurability much more amenable to the expendability required of the political and material economies of mass societies than it did to the singular, invaluable, and uncanny uniqueness of the self. The value of the subject became the standard unit of currency for the political arithmetic of States and the political economies of capitalism.34 They trade in it still to devastating global effect. The technologisation of the political has become manifest and global. Economies of evaluation necessarily require calculability.35 Thus no valuation without mensuration and no mensuration without indexation. Once rendered calculable, however, units of account are necessarily submissible not only to valuation but also, of course, to devaluation. Devaluation, logically, can extend to the point of counting as nothing. Hence, no mensuration without demensuration either. There is nothing abstract about this: the declension of economies of value leads to the zero point of holocaust. However liberating and emancipating systems of value-rights-may claim to be, for example, they run the risk of counting out the invaluable. Counted out, the invaluable may then lose its purchase on life. Herewith, then, the necessity of championing the invaluable itself. For we must never forget that, "we are dealing always with whatever exceeds measure."36 But how does that necessity present itself? Another Justice answers: as the surplus of the duty to answer to the claim of Justice over rights. That duty, as with the advent of another Justice, is integral to the lack constitutive of the human way of being. The event of this lack is not a negative experience. Rather, it is an encoun- ter with a reserve charged with possibility. As possibility, it is that which enables life to be lived in excess without the overdose of actuality.37 What this also means is that the human is not decided. It is precisely undecidable. Undecidability means being in a position of having to decide without having already been fully determined and without being capable of bringing an end to the requirement for decision. In the realm of undecidability, decision is precisely not the mechanical application of a rule or norm. Nor is it surrender to the necessity of contin- gency and circumstance. Neither is it something taken blindly, without reflection and the mobilisation of what can be known. On the contrary, know- ing is necessary and, indeed, integral to 'decision'. But it does not exhaust 'decision', and cannot do so if there is to be said to be such a thing as a 'dec- ision'. We do not need deconstruction, of course, to tell us this. The manage- ment science of decision has long since known something like it through the early reflections of, for example, Herbert Simon and Geoffrey Vickers.38 But only deconstruction gives us it to think, and only deconstructively sensible philosophy thinks it through. To think decision through is to think it as het- erogeneous to the field of knowing and possible knowing within which it is always located.39 And only deconstruction thinks it through to the intimate relation between 'decision' and the assumption of responsibility, which effect egress into a future that has not yet been-could not as yet have been-known: The instant of decision, if there is to be a decision, must be heterogeneous to this accumu- lation of knowledge. Otherwise there is no responsibility. In this sense only must the per- son taking the decision not know everything.40 Ultimately one cannot know everything because one is advancing into a future which simply cannot be anticipated, and into which one cannot see.

**Science Bad – Impact – Calculation – VTL**

Science has nothing to do with human existence--the most important questions of meaning and emotion are obscured by pure calculation

Vajda 78 (Mihaly, Marxist philosopher, “Lukacs and Husserl’s Critique of Science” Telos 38 Winter Pg. 105-106)

The following will attempt to outline briefly where the two critiques converge. Neither critique attacks science's claim to be scientific. What phenomenology and Marxism criticize in the exact sciences is their claim to exclusiveness, which does not and cannot meet scientific requirements. Today's sciences fail to justify their existence : they have nothing to do with the meaning of human existence. Husserl formulates the question very sharply from the beginning: "Merely fact-minded sciences make merely fact-minded people.... In our vital need — so we are told — this science has nothing to say to us. It excludes in principle precisely the questions which man, given over in our unhappy times to the most portentious upheavals, finds the most burning : questions of the meaning or meaninglessness of the whole of this human existence.. .. Scientific, objective truth is exclusively a matter of establishing what the world, the physical as well as the spiritual world, is in fact. But can the world, and human existence in it, truthfully have a meaning if the sciences recognize as true only what is objectively established in this fashion, and if history has nothing more to teach us than that all the shapes of the spiritual world, all the conditions of life, ideals, norms upon which man relies, form and dissolve themselves like fleeting waves, that it always was and ever will be so, that again and again reason must turn into nonsense, and well-being into misery?" Lukács emphasized this just as strongly: a science that merely discovers "facts" and seeks to determine the laws and structures of our world from these facts cannot guide our activities and actions. "A situation in which the 'facts' speak out unmistakably for or against a definite course of action has never existed, and neither can or will exist. The more conscientiously the facts are explored — in their isolation, i.e., in their unmediate relations — the less compellingly will they point in any one direction. It is self-evident that a merely subjective decision will be shattered by the pressure of uncomprehended facts acting automatically 'according to laws'." 3 This failure of science to carry out the task of human knowledge, i.e., to give meaning to our existence, stems, according to both Husserl and Lukács, from the fact that science is unable to assume the standpoint of the totality. Science has been reduced to technique (techné), an art of manipulation that rules out meaningful and really human action in favor of limited calculation, since it does not approach human reality as a totality, but only as the sum of "particular facts" governed by "objective" laws. The loss of the totality means at the same time the abolition of historicity. "The unscientific nature of this seemingly so scientific method consists," says Lukács, "in its failure to see and take account of the historical character of the facts on which it is based." 4

**Science Bad – Impact – Calculation – VTL**

Science’s use of microlevel study crushes meaning by privileging objective, scientific study over our senses and perceptions—this produces an ontological reversal of our experience of life

Dahlin 4 (Bo, Dep. of Edu Science @ Karlstad U, Scandinavian Journal of Educational Research 14 April)

In phenomenology however one starts only from what is ”positively given” in experience. In immediate experience colours and smells are as ”given” as for instance size or mass (perhaps even more so). Therefore, there is no experiential ground for the distinction between primary and secondary properties.[2] However, the distinction has played an important role in the development of natural science, and probably also for the popular understanding of the nature of science. According to Husserl’s (1970) analysis, Galilean science’s mathematisation of nature started with a ”geometrisation”, upon which followed an ”algebraisation” (cf. Harvey, 1989, pp. 58-59). Thereby we have moved two steps away from that foundation of meaning (Sinnesfundament), which is given to us in immediate sense-experience. Such mathematical transformations proved however (as we know) to be very successful. As a consequence, researchers became more and more interested in and occupied with them. Husserl calls this the ”technisation” (Technisierung) of science. The progressive technisation involves in its turn a gradual ”sedimentation of meaning”: the grounds of the original transformations in concrete, lived experience are forgotten and there arises more and more sediments of ”self-evidences”: …this problem of forgetfulness is exacerbated by the fact that with each new generation’s inheritance of the new techniques – an inheritance that presupposes the process of transformation without explicitly recognizing them – another increment in the Selbstverständlichkeit of natural scientific achievement occurs as well. (Husserl, 1970, p. 59) The sedimentation of meaning makes the ”higher objects” of science, such as mathematical formulas, take on a life of their own.[3] They become cut off from the fluctuating experiences of everyday life and start to float above it. At the same time they are supposed to explain these experiences. By being taken as explanations they are also ascribed an ontological status of truth and objectivity. Husserl meant that the consequence was …[a] surreptitious substitution of the mathematically substructed world of idealities for the only real world, the one that is actually given through perception, that is ever experienced and experienceable – our everyday lifeworld. (Husserl, 1970, pp. 48-49) The abstract mathematical models become more real than the concrete, lived experience in which they have their ultimate ground, and from which they have been abstracted. Harvey (1989) calls this ”the ontological reversal”. Since scientific theories and models are often incorporated or re-assimilated into the ordinary lifeworld, this ”reversal” becomes more and more a part of the ”natural attitude”, i.e. of peoples’ general everyday view of life. Husserl had no principal objections against the geometrisation and algebraisation of nature, as such. His critique was concerned with their unreflected consequences in terms of the ontological reversal, i.e. that mathematical formulas and models are supposed to describe a more true and objective reality than that which is available to us in our immediate experience. Thereby science divests itself of the possibility of verifying its theories. All verification must take place in the world of the senses, but it is precisely this world that has been denied as an illusion. As Democritos said: ”Poor understanding! From the senses you got your evidence and now you use that evidence to deny those very senses.” Of course, not all scientific concepts or models have this abstract, mathematical character. The concept of gravitational force, for instance, is immediately perceptible in the experience of our bodies. But many of the central concepts of science are not perceptible in this way. The theory of light as electromagnetic waves of different frequencies is one example. These concepts or models refer to a world “behind” perceived phenomena, i.e. a world that is “invisible” both to our eyes and to our other senses. The ontological reversal may be summed up in the following logical argument: Scientific theories and models refer to an invisible world that lies ”behind” phenomena. Scientific theories and models build upon systematic tests and experiments. They are therefore more true or trustworthy than conceptions based upon everyday experience. Hence, the world ”behind” phenomena, as described by science, is more true and real than the phenomena themselves, which we experience in our everyday life. The ontological reversal is connected to the reductionist tendency of natural science. The ”macroproperties” of phenomena – those properties that are observable by our unaided senses – are reduced to phenomena at the microlevel: molecules, elementary particles, and genes. It is worthwhile noting that even a hard-nosed positivist like Hempel argued against this kind of ontological reduction (Hempel, 1966, chpt 8). According to Hempel, phenomena at the macrolevel are as real as those on the microlevel; one cannot ontologically reduce the one to the other.

Science Bad – Impact – Democracy

Science undemocratic – politicization inevitable, funding controls research, not accountable

Nader 96 (Laura, Prof of Anthropology at UC Berkeley, *Naked science: anthropological inquiry into boundaries, power and knowledge*, p. 9-10, google books, JMB)

Recent ethnographic writing uses participant observation among scientists to render clearer histories of science in process. Histories that result from examining how scientists create knowledge and how that knowledge is received and used dismantle stereotypic images of science and society. Similar observations are sometimes shared by members of the scientific community, who themselves are able to separate image from practice. Physicists who observe themselves with some candor may refer to ideas and behaviors that are irrational, workplaces that are undemocratic, dissent that is not tolerated, and cultural practices that are in conflict (Nader 1980). While others idealize physicists' behavior as more rational, less subjective, and more advanced than the lay public, physicists interested in moving beyond the meaning of idealized versions of science explore how science and scientists have been affected by military and corporate interests, the primary sources of funding, and the users of the discoveries of physics. Introspection by physical and biological scientists provides anthropologists with useful commentary for understanding the way cultures of science arc formed and institutionalized. In the underlying politics of science, disciplines develop and are shaped by tension and power struggles, the dynamics of which are rarely chronicled. Though most scientists and engineers would (at least publicly) deny that they are engaged in or touched by political maneuvering, their behavior is affected by those who control funding and who often determine research questions! It is foolish not to recognize that the behavior of biotechnologists and physicists is affected by funding patterns, as in other fields as well. Nuclear weapons politics is linked to national and international hierarchies of power, just as biotech is to commerce. How does this play out in the way science is done? Such "naked" observations are rarely if ever discussed in biochemistry or physics classes. Denial of a contextualized science, or the assertion that science is autonomous, strikes at the scientific endeavor, defined as a process of free inquiry. Yet the politicization of science is unavoidable, not only because politicians, corporations, and governments try to use what scientists know, but because virtually all science has social and political implications. When the notion of an elegant, pure science defines as external the context in which science is practiced, a wider dialogue is considered irrelevant. Purity in this case is the pursuit and the myth. The threat inherent in a contextualized science is that it incorporates science publics. When laity has a window stripped of obfuscation, science practice becomes of participatory interest to wider publics. Over the past three centuries there has been the most extraordinary expansion of Western science.2 We have also witnessed an increase in human and environmental problems in which the use and abuse of Western science has made major contributions. In the light of what we know about non-Western, nonliterate peoples, Western science in Western and non-Western places is increasingly revealed as a self-conscious expansive science, self-consciously detached from its practical effect, detached from other scientific traditions and detached from the lay public, a situation that hardly bodes well for a renaissance in science on its comparative merits rather than "because the show has been rigged in its favour" (Feycrabcnd 1978:42).

Science Bad – Impact – Democracy

Scientific decisions are made by one, not many, killing democratic thinking

Cambell 9 (Nancy, prof of science, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-24-2011, lido)

Ultimately, however, reconstructivists appeal to the political-economic restructuring of the R&D infrastructure as a route toward gaining democratic control over technoscience. But reconstructivists appeal to political economy without having done the kind of thinking about it that feminists have. In the last section of this paper, I indicate where feminists supply a different kind of political-economic framing that would advance the reconstructivist cause. Feminist activists and scholars have much to contribute to the analysis of phenomena on which reconstructivists work: trade liberalization, nanotechnology, stem cell research, climate change, agricultural biotechnology, oil and coal dependency, water rights, hunger, global health equity, environmental justice, and myriad other substantive arenas. Reconstructivists attempt to “counteract the skewing of technoscientific negotiations” toward those whose disproportionately greater access to financial resources and expertise grant them control over research agendas and an infrastructure within which to pursue questions relevant to the social groups from which they come. Skewed so that profits from technoscientific investment accrue largely to participants in the corporate sectors of the economy while shifting costs to overburdened populations who have little or no voice in decisionmaking processes, these negotiations and maldistributions nevertheless negatively affect upper- and middle-class people as well.28 Links between those who bear the costs and those who reap the benefits of R&D are broken by its corporate structure, state failure to provide any but the most technocratic regulatory oversight, institutional capture of governance by corporate interests, and many other asymmetries of information and influence that add up to socially irresponsible R&D. While the reconstructivists know all this, they don’t always spell it out with enough detail and nuance as they would if they had started from a grounding in feminist standpoint epistemology. Additionally, the feminist point is that ending the abstraction of technoscience from the social lives of the less affluent requires something about which reconstructivists never speak: ending the denial about who actually absorbs the costs of social reproduction. Feminist economists, in particular Nancy Folbre, point out that “the invisible heart” subsidizes the capitalist relations that organize how technoscience is done, who does it, and who does not do it. Inequality is structured into who does science; what science is supported by government, academia, and industry; for whom scientific knowledge is produced and technological innovation enacted. Yet reconstructivists sometimes miss the extent to which gender inequality operates as an unseen “infrastructural” element inscribed into what technoscience is done and undone. To make a related point, technoscience has deeply material downstream effects on both the costs and the benefits of social reproduction. These, too, are unseen and under-analyzed.

Science is undemocratic – that locks in dogmatism

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

Finally, the manner in which we accept or reject scientific ideas is radically different from democratic decision procedures. We accept scientific laws and scientific facts, we teach them in our schools, we make them the basis of important political decisions, but without ever having subjected them to a vote. Scientists do not subject them to a vote - or at least this is what they say - and laymen certainly do not subject them to a vote. Concrete proposals are occasionally discussed, and a vote is suggested. But the procedure is not extended to general theories and scientific facts. Modern society is 'Copernican' not because Copernicanism has been put on a ballot, subjected to a democratic debate and then voted in with a simple majority; it is 'Copernican' because the scientists are Copernicans and because one accepts their cosmology as uncritically as one once accepted the cosmology of bishops and cardinals. Even bold and revolutionary thinkers bow to the judgement of science. Kropotkin wants to break up all existing institutions - but he does not touch science. Ibsen goes very far in unmasking the conditions of contemporary humanity - but he still retains science as a measure of the truth. Evans-Pritchard, Lévi-Strauss and others have recognised that 'Western Thought', far from being a lonely peak of human development, is troubled by problems not found in other ideologies - but they exclude science from their relativisation of all forms of thought. Even for them science is a neutral structure containing positive knowledge that is independent of culture, ideology, prejudice.

Science Bad – Impact – Democracy – Extinction

Democracy solves extinction and all your impacts

Carnegie Commission 95 (http://wwics.si.edu/subsites/ccpdc/pubs/di/1.htm, dw: Oct 1995, da: 6-28-2011, lido)

Nuclear, chemical, and biological weapons continue to proliferate. The very source of life on Earth, the global ecosystem, appears increasingly endangered. Most of these new and unconventional threats to security are associated with or aggravated by the weakness or absence of democracy, with its provisions for legality, accountability, popular sovereignty, and openness. The experience of this century offers important lessons. Countries that govern themselves in a truly democratic fashion do not go to war with one another. They do not aggress against their neighbors to aggrandize themselves or glorify their leaders. Democratic governments do not ethnically "cleanse" their own populations, and they are much less likely to face ethnic insurgency. Democracies do not sponsor terrorism against one another. They do not build weapons of mass destruction to use on or to threaten one another. Democratic countries form more reliable, open, and enduring trading partnerships. In the long run they offer better and more stable climates for investment. They are more environmentally responsible because they must answer to their own citizens, who organize to protest the destruction of their environments. They are better bets to honor international treaties since they value legal obligations and because their openness makes it much more difficult to breach agreements in secret. Precisely because, within their own borders, they respect competition, civil liberties, property rights, and the rule of law, democracies are the only reliable foundation on which a new world order of international security and prosperity can be built.

Science Bad – Impact – Elitism

Science only serves the powerful – it’s ideological

Blackwell et al 3 (Judith C., Prof of Sociology at Brock U, *Culture of Prejudice: Arguments in Critical Social Science*, p. 20, google books, JMB)

Ideology is a bedrock of the culture of prejudice and, like prejudice, has a great many possible definitions and connotations. When we use the term "ideology" in this book, we mean thought that serves class or group interests, and especially the interests of those of dominant positions within society—a system of beliefs that exists in a somewhat uneasy and even contradictory relationship to science. In the words of one critic,5 ideology is "the cuckoo in the nest of science"—limiting the scientific enterprise to questions that interest the powerful, while dismissing those of concern to the dominated. The one-sidedness of dominant ideologies puts a severe constraint on science—one that can be removed only by according serious attention to perspectives that aim to promote the interests of working-class people and victims of "special oppression," such as women, racialized minorities, and non-human animals. Accordingly, while the arguments in this book are not free of what some people might consider to be "ideology," we believe that by examining society from the standpoint of the dominated, the exploited, the excluded, and the oppressed, they serve the cause of both human emancipation and social science.

Science is premised in elitism – Publication standards

Cambell 9 (Nancy, prof of science, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-24-2011, lido)

While we may disagree with the sentiment that any women get their fair share of study or decry the nonspecific language of “poorer women,” the impulse to direct inquiry toward those excluded or marginalized aligns with feminist goals. Social inequality shapes not only what science is done and how it is done, according to reconstructivists, but what science remains undone. David J. Hess defines this problem in the following terms: Because political and economic elites possess the resources to water and weed the garden of knowledge, the knowledge tends to grow (to be “selected”) in directions that are consistent with the goals of political and economic elites. When social movement leaders and industry reformers who wish to change our societies look to “Science” for answers to their research questions, they often find an empty space—a special issue of a journal that was never edited, a conference that never took place, an epidemiological study that was never funded—whereas their better funded adversaries have an arsenal of knowledge to draw on. . . . [T]he science that should get done does not get done because there are structures in place that keep it from getting done.13 Similarly, feminists have called for new ways of knowing and new institutional practices amenable to the project of “undone science.” By subjecting the reconstructivist project to friendly feminist scrutiny, I seek to further its reach and amend its charter to the extent possible.

Science is unnaturalized and puts the weakest members of society at a disadvantage

Clough 4 (Sharyn, Hypatia, vol 19, Winter 2004, p. 102-118, muse, da: 6-24-2011, lido)

The attraction of naturalizing epistemology is two-fold. First, as an epistemic project, naturalism attempts to provide science and science studies with normative criteria for judging knowledge claims generally, no matter where they fall on the fact/value continuum—that is, it provides a mechanism for examining the limits of our knowledge. As a normative project, feminist science and science studies turns on the existence of such limits. Feminists have shown that scientific investigations are often biased in ways that disadvantage the weakest members of our society. And they have argued that the bias must be corrected. Philosophical appeals to epistemology attempt to analyze and in some cases reconfigure the normative criteria by which scientific claims are judged. A second attraction is that Quine’s focus on naturalism in epistemology more fully recognizes the ways in which our criteria for judging knowledge claims are themselves products of empirical investigation. An important implication here is that if the criteria employed by scientists and knowers more generally are the products of empirical processes, then both the criteria and the knowledge claims we use the criteria to adjudicate are contingent and fallible. Feminists have provided crucial insights into the social nature of the contingencies and the extent of the resulting fallibility. As Naomi Scheman writes, “To naturalize epistemology is to acknowledge that we need to study how actual people actually know (and) one thing we ought to know about actual people is that they inhabit a world of systematic inequality . . .” (1993, 166). Quine’s prescription for naturalism opens up this field of study.2 I agree that it is important to reveal the naturalized processes at work in the justificatory formulations of knowers generally, and of scientists in particular. Similarly, I agree that feminist studies of science needs a framework that provides normative force. In what follows, however, I sketch a series of arguments to suggest that Quinean epistemology while naturalized, does not necessarily improve our levels of normativity.

Science Bad – Impact – Elitism

**The elitist nature of science makes scientific findings invalid**

Cambell 9 (Nancy, prof of science, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-24-2011, lido)

Workers in technoscientific enterprises—scientists, designers, and engineers— are practically trained to disclaim critical subject positions and disavow politics.29 Instead they are taught to embrace various forms of “neutrality” even as myriad instances of inequality and nonneutrality unfold in their most proximate social worlds. Engineers and by extension scientists are educated to disclaim collective social responsibility for the overall trajectory of the R&D enterprise in which they play their particular parts. They are entrained into the very denial that would have to be overcome were they to become useful to the project of producing knowledge and technologies usable by more of the people more of the time. Programs to overcome that “translational” hurdle by instilling a sense of social responsibility or systematically teaching students skills in critical social analysis are few and far between.30 What would feminists teach designers and engineers about the various ways in which the world isn’t flat—in a climate dominated not by reconstructivists but by the very corporate-ruled processes they critique? Are not reconstructivists allies in bringing about wiser and fairer governance of technoscience?

Science Bad – Impact – Elitism – VTL

Scientific expertism hurts value to life

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 112-113, jam)

An expert is a man, or a woman, who has decided to achieve excellence, supreme excellence in a narrow field at the expense of a balanced development. He has decided to subject himself to standards which restrict him in many ways - his style of writing and the patterns of his speech included - and he is prepared to conduct most of his working life in accordance with these standards. He is not averse to occasionally venturing into different fields, to listen to fashionable music, to adopt fashionable ways of dressing (though the business suit still seems to be his favourite 'I.miform, in this country and abroad), or to seduce his students. However, these activities are aberrations of his private life, they have no relation whatever to what he is doing as an expert. A love for Mozart, or for Hair will not, and must not, make his physics more melodious, or give it a better rhythm. Nor will an affair make his chemistry more colourful. This separation of domains has very unfortunate consequences. Not only are special subjects voided of ingredients which make a human life beautiful and worth living, but these ingredients are impoverished, too; emotions become crude and thoughtless, just as thoughts become cold and inhumane. Indeed the 'private parts' of one's existence suffer much more than does one's official capacity. Every aspect of professionalism has its watchdogs; the slightest change, or threat of a change is examined, broadcast, warnings are issued, and the whole tremendous machinery moves at once in order to restore the status quo. Who takes care of the quality of our emotions? Who watches those parts of our language which are supposed to bring people together more closely - where one gives comfort, understanding, and perhaps a little personal criticism? There are no such agencies. The result is that professionalism takes over even here.

Science Bad – Impact – Elitism – VTL

Scientific expertism ignores the beauty in life reducing us to nothing more than efficient computers

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 117-119, jam)

That being an expert is a predicament and not a matter of pride was realized, long ago, by Aristotle. A free man, according to Aristotle, is a man who has a sense of balance. He has a sense of perspective. He is well informed, in politics, in the sciences, in the arts. He gives some weight to all these things, he lets all of them influence his being to some extent. Men think - but they are also capable of emotions. They have <an> interest in politics - but they also wonder about the stars. They want power - but they also want on occasions to submit to a higher authority. None of these interests, none of these subjects can demand exclusive attention, and each of them must be pursued with restraint. This restraint cannot be achieved abstractly, by devoting oneself to one subject and thinking that there may be a limit to it. Such thinking will soon lose its effectiveness and will become an empty formula unless it is supported by the concrete experience of what goes on outside the limit. It is this concrete experience which prevents a man from becoming narrow-minded and partial in the sense of being part of a man only; it is this concrete experience which prevents him from becoming a slave. In other words: you can be a free man, you can achieve and yet retain the dignity, the appearance, the speech ofa free man only if you are a dilettante. 'Any occupation, art, science', writes Aristotle, 'which makes the body, or soul, or mind ... less fit for the practice or exercise of virtue, is vulgar; therefore we call those arts vulgar which tend to deform the body, and likewise all paid employments, for they absorb and degrade the mind. There are some liberal arts quite proper for a free man to acquire,' Aristotle continues, 'but only to a certain degree, and if he attends to them too closely, in order to attain perfection in them, the same evil effect will follow' - he will become a slave in mind, and soon in actual position as well. Just remember to what extent the academic profession makes slaves of its members, especially of the untenured ones, and also remember how greedy and intolerant those slaves become once they get a whiffoffreedom, or what they think is freedom, viz., tenure. 'The organisation of science', writes Robert Merton on precisely this point, operates as a system of institutionalized vigilance, involving competitive co- operation. It affords both commitment and reward for finding where others have erred or have stopped before tracking down the implications of their results or have passed over in their work what is there to be seen by the fresh eye of another. In such a system, scientists are at the ready to pick apart and appraise each new claim to knowledge. This unending exchange of critical judgement [which can become quite nasty - vide The Double Helix, or the reaction to Velikovsky], of praise and punishment, is developed in science to a degree that makes the monitoring of children's behaviour by their parents seem little more than child's play. There are, ofcourse, wandering minstrels who try to bewitch the onlookers by praising the beauties of science, the joys of discovery, the essentially human character of the search for knowledge and truth - or whatever other titles they choose for their arias. I am afraid they are singing about a time that has long gone by, and their songs are not melodious enough to let us forget the present squalor. To sum up: experts today are excellent, useful, irreplaceable, but mostly nasty, competitive, ungenerous slaves, slaves both in mentality, speech, and in social position. Now, what I have said so far is only one side of the matter and, although quite depressing, it is the most innocuous one. It is quite depressing to see with what fervou r thousands of young people throw themselves into special subjects where they are trained and trained and trained by receiving now punishment, now a pat on the head until they are hardly distinguishable from the computers whom they want to approach in efficiency - except that being human they have to add self-righteousness, lack of perspective, Puritanism, and atrocious professional jokes to what they are pleased to call the various steps of their reasoning. Now, the peculiar situation in which we find ourselves today is that these inarticulate and slavish minds have convinced almost everyone that they have the knowledge and the insight not only to run their own playpens, but large parts of society as well, that they should be allowed to educate children, and that they should be given the power of doing so without any outside control and without supervision by interested laymen. One of the most basic elements of the scientific ideology (and of expert ideology in general) is that only a scientist can understand what a scientist is up to and that only a scientist can decide how a scientist should be employed. For example, only a scientist can know how his subject should be taught and only he knows how important it is when compared with other subjects. It is this demand of the experts which I want to examine in the rest of my paper. Should we allow a bunch of narrow-minded and conceited slaves to tell free men how to run their society? What arguments do they have to demand such meekness from us? What arguments do they have to demand not only that their own particular business should be exempt from inspection by non-experts (though, of course, it should be financed by them), but also that their religion should become a state religion and that the education of the young should be left in their hands entirely? What arguments do they have to support their impudent demand that evolution should replace Genesis as a view of man and why are there theologians who try to redefine their subject so that no clash with science can ever arise? Has it been proved that scientific theories are more correct than anything that follows from a literary interpretation ofthe Bible? What are the proofs? Let us see!

Science Bad – Impact – Ethics

A pure focus on science diverges from the ethical analysis vital to decision making

Allchin 99 (Douglas, Dep. of Biology UT El Paso, Pg. Science and Education 8 P. 7-8 JF)

The most dramatic social influence of scientific values, however, may be the image of science itself as a model for all problem-solving. Science (or technology) is sometimes viewed, first, as the panacea for all social problems and, second, as the exclusive or primary means for objectivity, even where other values are involved. Not all problems are amenable to scientific approaches, however, and a narrowly scientific or ‘technocratic’ view can forestall solving problems in the appropriate realm. Garrett Hardin (1968) noted, for example that ‘the population problem has no technical solution’. That is, population pressure is fundamentally an ethical challenge about the freedom to bear children in the context of limited global resources. Neither better agricultural efficiency nor reproductive control technology can avert a ‘tragedy of the commons’. Instead, we must reach some consensus about the ethics of an individual’s use of common resources. Neither better agricultural efficiency nor reproductive control technology can avert a ‘tragedy of the commons’. Instead, we must reach some consensus about the ethics of an individual’s use of common resources and how we may enforce such collective judgments about reproductive rights or privileges. We often need to integrate scientific values with other ethical and social values. Science can help identify unforeseen consequences or causal relationships where ethical values or principles are relevant. In addition, individuals need reliable knowledge for making informed decisions. One archetypal hybrid project is risk assessment. Scientists can articulate where, how, and to what degree a risk exists, for example. But other values are required to assess whether the risk is ‘acceptable’ or not. Communicating the nature of the risk to non-experts who participate in making decisions can thus become a significant element of science. Where one expects scientists or panels of technical experts to solve the problem of the acceptability of risk, science is accorded value beyond its proper scope – and others abdicate their responsibility in addressing the sometimes more difficult questions of value. Likewise, those who do not address the facts of the matter fail in their responsibility to make an informed decision. Facts and social values function in concert. As noted above, the values of science may also be applied inappropriately as a model for decision-making. While quantification is often an asset for science, for example, it does not address all the ethically relevant dimensions of technological risk. Cases of risk assessment, in particular, require addressing questions about the distribution of risk among different persons and about the autonomy of accepting risk. Efforts to reduce the problem to a single numerical scale (and then to minimize risk) can obscure the central issues. What matters socially and ethically is the meaning more than the magnitude of the risk (e.g. Sagoff 1992). A ‘scientific’ approach to solving global warming, for example, might easily focus on cost-effective means of reducing greenhouse gas emissions, diverting attention away from the history of the problem and the ethical need for accountability and remedial justice on the part of industrialized nations. Cases of uncertainty pose special problems for applying scientific values. Scientists generally refrain from advocating claims that cannot yet be substantiated. Ethically, however, one often wishes to hedge against the possibility of a worst case scenario (catastrophic floods, nuclear melt-downs, ozone depletion, etc.) – even if the actual expected consequences are not yet proven. In cases of uncertainty, scientific values about certified knowledge (‘assume nothing unproven’) and ethical values about communal action (‘assume the worst’) can diverge (see Schrader-Frechette 1991. One task in teaching is clearly to articulate the limited domain of scientific values and how they integrate with other values.

Science Bad – Impact – Freedom

We should prioritize human freedom over science

Alford 85 (C. Fred, Assistant prof of government @ U of Maryland, College Park, Polity, Vol. 18, No.2, Winter, pp. 204-223, jam)

Feyerabend argues that critical rationalism obtains its social philosophy-piecemeal social engineering-by "generalizing solutions for methodological and epistemological problems. Critical rationalism arose from the attempt to solve Hume's problem and to understand the Ein- steinian revolution, and it was then extended to politics and even to the conduct of one's private life" (AM, p. 175). Feyerabend goes on to say that if the good for man, and particularly his happiness, is given first priority, rather than giving first priority to the solution of an epistemo- logical problem, then it is a profound mistake to proceed as does critical rationalism. It sacrifices human freedom to methodological rules which are ultimately hostile to freedom (AM, p. 175). Feyerabend may be cor- rect. However, it should not be overlooked that he too employs epis- temological arguments in support of his political theory. These argu- ments are simply different from Popper's. Feyerabend does not argue from epistemological relativism to "democratic relativism" because the former is somehow more fundamental than the latter. Indeed, he claims quite the opposite: considerations concerning human freedom and happiness come first (AM, p. 179). Rather he appears to think that it is an effective argument-especially against rationalists-to point out how democratic relativism can be "derived" from epistemological rela- tivism. In this belief he is mistaken, as I will be concerned to show below. Another epistemological relativist, Nelson Goodman, states that "a broad mind is no substitute for hard work."'2 Feyerabend is not merely a "broad mind." He has done some of the hard work as well. However, it is important to be clear about what this "hard work" consists of. Feyera- bend's substantive argument is that a pluralistic way of life is conducive to self-development, that the place accorded science in modern society is far more restrictive of pluralism and self-development than is generally realized, and that this can be slowly changed if enough people wish to do so. Taking his political theory seriously means approaching it much like any other political theory: as an argument about the good society, and its relationship to the good for man. That Feyerabend seeks to downplay the "traditional" structure of his argument (meaning that his argument makes substantive empirical and moral claims about the good life, and seeks to back them up with reasons), and in effect argues for his political theory from epistemological relativism, should not cause us to overlook the fact that he is indeed concerned with the good life. One might ask why we should abstract what is of value in Feyerabend's political theory from the rhetoric that surrounds it when others have made essentially the same argument more clearly. Part of the answer has already been given. Feyerabend's analysis tells us what we might do about the problem of ra- tionalization in a way that some "deeper" analyses do not. Another part of the answer is that there is an inner elegance and coherence to Feyera- bend's argument which is pleasurable to consider.

Moral side constraint to resist any invasion of freedom

Petro 74 (Sylvester, Professor of Law at Wake Forest University, University of Toledo Law Review, p.480)

However, one may still insist, echoing Ernest Hemingway – “I believe in only one thing: liberty.” And it is always well to bear in mind David Hume’s observation: “It is seldom that liberty of any kind is lost all at once.” Thus, it is unacceptable to say that the invasion of one aspect of freedom is of no importance because there have been invasions of so many other aspects. That road leads to chaos, tyranny, despotism, and the end of all human aspiration. Ask Solzhenitsyn. Ask Milovan Djilas. In sum, if one believes in freedom as a supreme value, and the proper ordering principle for any society aiming to maximize spiritual and material welfare, then every invasion of freedom must be emphatically identified and resisted with undying spirit.

Science Bad – Impact – Imperialism

Use of science by the government is inherently imperialist

Gilmartin 94 (David, Journal of Asian studies, vol 4, p 1128, da: 6-27-2011, JSTore, Nov 1994, lido)

Most critical to the "science of empire," however, was the fact that it defined not simply a structure of domination, but also a distinctly colonial political system linking the colonial state and indigenous elites together in a common political order. The key to this order—and the "science of empire"—»-lay in the scientific appropriation of what might be called "local knowledge." Indigenous "local knowledge" (and the local power relations and forms of knowing that it embodied) of necessity occupied a critical place in the scientific structuring of colonial administration. Though "objedification" lay at the heart of colonial social science, the complete objectification of the ruled was impossible within the discourse of "scientific empire." The object of study in India was not simply a "society" of individuals controlled, in the words of Foucault, through "small techniques of notation, of registration, of constituting files, or arranging facts in columns and tables" (Foucault 1977:190), but an alien world of "communities" and "cultures." To know these, local information and local subjects were critical. Many historians have thus stressed the important interactive role played by indigenous informants, particularly colonial elites, in defining the scientific discourse that shaped the basic "colonial sociology" underlying British colonial power (e.g., Amin 1989, Freitag 1991). Power was hardly equal in this system, but the "science of empire" linked the state and Indian elites together in a common political structure. "Imperial science," with its command over environmentally transformative technologies such as irrigation, operated in India within this political framework. "Imperial science" suggested a colonized world that became, in many respects, a great laboratory in which the natural world was not only catalogued, studied, and observed, but also technologically manipulated in the name of commercial transformations on a great scale. But "imperial science"—however important in justifying colonial rule for Europeans—did not itself define a common political discourse in which the colonizer and the colonized were linked. The knowledge that produced these transformations was a universal, yet bounded field of expertise in which "local knowledge" (though potentially useful to the scientist) had no formal place. Critically, "imperial science" (and technology) was thus not, as a distinctive discourse, grounded in a context-specific political field in which the rulers and the ruled shared.

Science Bad – Impact – Imperialism – Terminal

Imperialism causes extinction

Santos 3 (Boaventura de Sousa, Prof of Sociology at the School of Econ, U of Coimbra, Apr, [bad.eserver.org/issues/2003/63/santos.html] AD: 6-28-11, jam)

According to Franz Hinkelammert, the West has repeatedly been under the illusion that it should try to save humanity by destroying part of it. This is a salvific and sacrificial destruction, committed in the name of the need to radically materialize all the possibilities opened up by a given social and political reality over which it is supposed to have total power. This is how it was in colonialism, with the genocide of indigenous peoples, and the African slaves. This is how it was in the period of imperialist struggles, which caused millions of deaths in two world wars and many other colonial wars. This is how it was under Stalinism, with the Gulag, and under Nazism, with the Holocaust. And now today, this is how it is in neoliberalism, with the collective sacrifice of the periphery and even the semiperiphery of the world system. With the war against Iraq, it is fitting to ask whether what is in progress is a new genocidal and sacrificial illusion, and what its scope might be. It is above all appropriate to ask if the new illusion will not herald the radicalization and the ultimate perversion of the Western illusion: destroying all of humanity in the illusion of saving it. Sacrificial genocide arises from a totalitarian illusion manifested in the belief that there are no alternatives to the present-day reality, and that the problems and difficulties confronting it arise from failing to take its logic of development to ultimate consequences. If there is unemployment, hunger and death in the Third World, this is not the result of market failures; instead, it is the outcome of market laws not having been fully applied. If there is terrorism, this is not due to the violence of the conditions that generate it; it is due, rather, to the fact that total violence has not been employed to physically eradicate all terrorists and potential terrorists. This political logic is based on the supposition of total power and knowledge, and on the radical rejection of alternatives; it is ultra-conservative in that it aims to reproduce infinitely the status quo. Inherent to it is the notion of the end of history. During the last hundred years, the West has experienced three versions of this logic, and, therefore, seen three versions of the end of history: Stalinism, with its logic of insuperable efficiency of the plan; Nazism, with its logic of racial superiority; and neoliberalism, with its logic of insuperable efficiency of the market. The first two periods involved the destruction of democracy. The last one trivializes democracy, disarming it in the face of social actors sufficiently powerful to be able to privatize the state and international institutions in their favor. I have described this situation as a combination of political democracy and social fascism. One current manifestation of this combination resides in the fact that intensely strong public opinion, worldwide, against the war is found to be incapable of halting the war machine set in motion by supposedly democratic rulers. At all these moments, a death drive, a catastrophic heroism, predominates, the idea of a looming collective suicide, only preventable by the massive destruction of the other. Paradoxically, the broader the definition of the other and the efficacy of its destruction, the more likely collective suicide becomes. In its sacrificial genocide version, neoliberalism is a mixture of market radicalization, neoconservatism and Christian fundamentalism. Its death drive takes a number of forms, from the idea of "discardable populations", referring to citizens of the Third World not capable of being exploited as workers and consumers, to the concept of "collateral damage", to refer to the deaths, as a result of war, of thousands of innocent civilians. The last, catastrophic heroism, is quite clear on two facts: according to reliable calculations by the Non-Governmental Organization MEDACT, in London, between 48 and 260 thousand civilians will die during the war and in the three months after (this is without there being civil war or a nuclear attack); the war will cost 100 billion dollars, enough to pay the health costs of the world's poorest countries for four years. Is it possible to fight this death drive? We must bear in mind that, historically, sacrificial destruction has always been linked to the economic pillage of natural resources and the labor force, to the imperial design of radically changing the terms of economic, social, political and cultural exchanges in the face of falling efficiency rates postulated by the maximalist logic of the totalitarian illusion in operation. It is as though hegemonic powers, both when they are on the rise and when they are in decline, repeatedly go through times of primitive accumulation, legitimizing the most shameful violence in the name of futures where, by definition, there is no room for what must be destroyed. In today's version, the period of primitive accumulation consists of combining neoliberal economic globalization with the globalization of war. The machine of democracy and liberty turns into a machine of horror and destruction.

Science Bad – Impact – Sexism

In science, the more masculine, the more true – every decision as to what constitutes truth is based off of who has the most power

Cambell 9 (Nancy, prof of science, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-24-2011, lido)

Striking resonances and parallels between post-positivist, feminist, and reconstructivist agendas include the following. “Facts” are constructed and are thus not determinative of the forms that social interactions and negotiations take. Negotiating the conceptual practices of power or ruling relations inevitably involves conflicting and partial perspectives. Coping with disagreement is a necessary part of social and political life (including those parts of it that shape decisions about what kinds of technoscientific innovation to pursue). Science is not about closure but about interpretive flexibility in the face of the ongoing production of uncertainty. Thus coping with uncertainty will inevitably challenge those for whom science raises more questions than it answers. Reconstructivists argue that “reconstructivism starts from the premise that ‘better’ design of sociotechnical life ought to be built directly into scholarly inquiry. Notions of better and worse inevitably involve a partisan component. . . . ”22 Similarly, Haraway’s work on “situated knowledges” acknowledges the inevitably partial and partisan processes by which knowledge claims are produced and negotiated.23 Weaving together the strands of similarity between feminist and reconstructivist science and technology studies reveals a tapestry against which the knowledge production projects of each stand out more clearly. Embracing partisanship and struggle as they do, reconstructivists have 8 frontiers/2009/vol. 30, no. 1 taken to heart various critiques of objectivity, among which feminists figure prominently. Quoting Harding’s Science and Social Inequality (2006), Woodhouse and Sarewitz get the point that privilege is both a material advantage and an epistemological disadvantage: that “those advantaged by the status quo tend to operate in a state of denial about the maldistribution of costs and benefits of technoscience.”24 Taking “science-policy influentials” to task for failing to mention inequality except in toothless and conventional ways, Woodhouse and Sarewitz call for greater recognition of social conflict in the tussle over who gets what, when, and how that is science and technology policy and politics. They share with feminists the intention to “move equity considerations higher on science-policy agendas.” They share the suspicion that the social organization of technoscience exacerbates social inequality and consistently rewards the already affluent, while hurting the persistently poor. They call for refocusing R&D on “poor people’s problems” yet do not call upon feminist scholarship to explain precisely how welfare states and labor markets are structured to reproduce gendered and racialized poverty.25 How can it be that well intentioned and well informed scholars seeking to refocus technoscientific R&D on the needs of the poor, broaden participation in research priority-setting, and reorient technoscientific innovation toward the creation of public goods miss the feminist point that addressing inequity requires attending to how gender and power relations structure the world? How can those who set out to “level the playing field among diverse social interests so that all are represented fairly” miss the point that forms of “fairness” inattentive to power differentials lead to unfair processes and outcomes?26 The reconstructivist agenda is too important to be dismissed by feminists as not “getting it,” and thus it seems important to understand how reconstructivists propose to reshape inquiry by encouraging scholars to adopt projects that incorporate “normative, activist, or reconstructive intentions” into their research.27 Reconstructivists suggest a more collective agenda-setting process to channel scholarly work into areas where inadequate attention has been directed to a collective need. They urge scholars not to shy from “thoughtful partisanship” despite recognizing their own fallibility and partiality, and encourage them to participate more actively in “positive efforts to shape technoscientific activities in progressive directions.” They call for revision of the academic reward system so as to recognize academic participation in public engagement and community building.

Science has an intersectional bias – Poor women are underrepresented

Cambell 9 (Nancy, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-23-2011, lido)

 Upper-middle-class professional women of the sort who might be disadvantaged by gendering of recruitment and advancement in science and engineering probably are getting about their fair share of study these days, but poorer women . . . surely are not. And the deeper insights of feminist theory rarely get applied concretely to science and technology policy outside the reproductive and medical fields.12 While we may disagree with the sentiment that any women get their fair share of study or decry the nonspecific language of “poorer women,” the impulse to direct inquiry toward those excluded or marginalized aligns with feminist goals. Social inequality shapes not only what science is done and how it is done, according to reconstructivists, but what science remains undone. David J. Hess defines this problem in the following terms: Because political and economic elites possess the resources to water and weed the garden of knowledge, the knowledge tends to grow (to be “selected”) in directions that are consistent with the goals of political and economic elites. When social movement leaders and industry reformers who wish to change our societies look to “Science” for answers to their research questions, they often find an empty space—a special issue of a journal that was never edited, a conference that never took place, an epidemiological study that was never funded—whereas their better funded adversaries have an arsenal of knowledge to draw on. . . .

Science Bad – Impact – Sexism

Scientific power is sexist – inequality of pay

Cambell 9 (Nancy, prof of science, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-24-2011, lido)

Reconstructivist STS shares with women’s and gender studies the recognition that technoscientific knowledges are enacted within complex power relations that shape them in nondeterministic yet firmly social ways. By contrast to reconstructivists, however, feminist economists have attended to how the gendered division of labor ultimately subsidizes an otherwise unsustainable economic order. A clearly gendered illustration is the reconstructivist attention to the overvalorized pay of elites. Although reconstructivists write of disproportionate payments to elites, they do not see how unjust social reproduction schemes subsidize that pay because of the dependency on the undervalorized pay of labor. Feminist political economists show how the “invisible heart,” as Nancy Folbre calls it, silently subsidizes the “invisible hands” that absorb the costs of care. Gendered identities assumed by heart and hand “conform to the hierarchical principles of the game. Processes of socialization are thus central, not marginal, to reproducing the economic order.”50 Social reproduction theory offers a compelling account of how inequalities are produced and reproduced through the division of labor underpinning social structures and standpoints evolved from location within them. Processes of social reproduction encompass both household-level, day-to-day biosocial reproduction of the labor force, and the high degrees of social differentiation and skill necessary for a technoscientific labor force in a hypercapitalist knowledge economy dependent on information. Defined by V. Spike Peterson as the private sphere economy in which “human life is generated, daily life maintained, and socialization reproduced,” social reproduction includes “both the symbolic/material processes required to reproduce human beings over time—daily and intergenerationally— and the social relations of power within which these processes are embedded.”51 Social reproduction also depends upon what we might call with Dorothy Roberts a “reproductive caste system” that accords social valuation or devaluation to women’s biological reproduction depending on race, ethnicity, sexuality, and social class52 and that operates across geographic scales.53 Critically examining how social reproduction patterns shape the questions that become research priorities, the ways we go about asking and answering them, and the outcomes for which we settle continues not to be part of even reconstructivist agendas. Similarly, social reproduction patterns shape who is involved in R&D enterprises by modulating access to credit, human capital, and technological infrastructures necessary for communication in “knowledge-rich” regimes.54 If the goal is reconstructing how technoscientific R&D is done—and changing what is undone—attention must be paid to how social reproduction operates at the infrastructural level. Whereas infrastructure is typically addressed as an abstraction, functioning at an extra-local remove from everyday life, feminist work has led me to see it as the grounds upon which everyday life unfolds—problematically, indeed.

Science Bad – Impact – Sexism – Extinction

Sexism and patriarchy justify environmental destruction and cause extinction

Warren & Cady 94 (Karen, Associate Prof of Philosophy at Macalester College in St. Paul, Minnesota, and Duane, Department of Philosophy @ Hamline U, *Hypatia*, Vol. 9, Iss. 2, pp . 4)

Operationalized, the evidence of patriarchy as a dysfunctional system is found in the behaviors to which it gives rise, (c), and the unmanageability (d), which results. For example, in the United States, current estimates are that one out of every three or four women will be raped by someone she knows; globally, rape, sexual harassment, spouse-beating, and sado-masochistic pornography are examples of behaviors practiced, sanctioned, or tolerated within patriarchy. In the realm of environmentally destructive behaviors, strip-mining, factory farming, and pollution of the air, water, and soil are instances of behaviors maintained and sanctioned within patriarchy. They, too, rest on the faulty belief that is okay to “rape the earth,” that it is “man’s God-given right” to have dominion (that is, domination) over the earth, that nature has only instrumental value, that environmental destruction is the acceptable price we pay for “progress.” And the presumption of warism, that war is a natural, righteous, and ordinary way to impose dominion on a people or nation, goes hand in hand with patriarchy and leads to dysfunctional behaviors of nations and ultimately to international unmanageability. Much of the current “unmanageability” of contemporary life in patriarchal societies, is then viewed as a consequence of a patriarchal preoccupation with activities, events, and experiences that reflect historically male-gender-identified beliefs, values, attitudes, and assumptions. Included among these real-life consequences are precisely those concerns with nuclear proliferation, war, environmental destruction, and violence towards women, which many feminist see as the logical outgrowth of patriarchal thinking. In fact, it is often only though observing these dysfunctional behaviors—the symptoms of dysfunctionality—that one can truly see that and how patriarchy serves to maintain and perpetuate them. When patriarchy is understood as a dysfunctional system, this “unmanageability” can be seen for what it is—as a predictable and thus logical consequence of patriarchy. The theme that global environmental crisis, war, and violence generally are predictable and logical consequences of sexism and patriarchal culture is pervasive in ecofeminist literature. Ecofeminist Charlene Spretnak, for instance, argues that “a militarism and warfare are continual features of a patriarchal society because they reflect and instill patriarchal values and fulfill needs of such a system. Acknowledging the context of patriarchal conceptualizations that feed militarism is the first step toward reducing their impact and preserving the earth”. Stated in terms of the foregoing model of patriarchy as a dysfunctional social system, the claim by Spretnak and other feminists take on a clearer meaning: Patriarchal conceptual frameworks legitimate impaired thinking (about women, national and regional conflict, the environment) which is manifested in behaviors which, if continued, will make life on earth difficult, if not impossible. It is a stark message, but it is plausible. Its plausibility lies in understanding the conceptual roots of various women-nature-peace connections in regional, national and global contexts.

\*\*\*AT: AT’s\*\*\*

Science Bad – AT: Perm

Science is a regime of truth – it indoctrinates and suppresses free thought

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

There is another reason why such a re-examination is urgently required. The rise of modern science coincides with the suppression of non-Western tribes by Western invaders. The tribes are not only physically suppressed, they also lose their intellectual independence and are forced to adopt the bloodthirsty religion of brotherly love - Christianity. The most intelligent members get an extra bonus: they are introduced into the mysteries of Western Rationalism and its peak - Western Science. Occasionally this leads to an almost unbearable tension with tradition (Haiti). In most cases the tradition disappears without the trace of an argument, one sim ply becomes a slave both in body and in mind. Today this development is gradually reversed - with great reluctance, to be sure, but it is reversed. Freedom is regained, old traditions are rediscovered, both among the minorities in Western countries and among large populations in non-Western continents. But science still reigns supreme. It reigns supreme because its practitioners are unable to understand, and unwilling to condone, different ideologies, because they have the power to enforce their wishes, and because they use this power ' just as their ancestors used their power to force Christianity on the peoples they encountered during their conquests. Thus, while an American can now choose the religion he likes, he is still not permitted to demand that his children learn magic rather than science at school. There is a separation between state and church, there is no separation between state and science. And yet science has no greater authority than any other form of life. Its aims are certainly not more important than are the aims that guide the lives in a religious community or in a tribe that is united by a myth. At any rate, they have no business restricting the lives, the thoughts, the education of the members of a free society where everyone should have a chance to make up his own mind and to live in accordance with the social beliefs he finds most acceptable. The separation between state and church must therefore be complemented by the separation between state and science. We need not fear that such a separation will lead to a breakdown of technology. There will always be people who prefer being scientists to being the masters of their fate and who gladly submit to the meanest kind of (intellectual and institutional) slavery provided they are paid well and provided also there are some people around who examine their work and sing their praise. Greece developed and progressed because it could rely on the services of unwilling slaves. We shall develop and progress with the help of the numerous willing slaves in universities and laboratories who provide us with pills, gas, electricity, atom bombs, frozen dinners and, occasionally, with a few interesting fairy-tales. We shall treat these slaves well, we shall even listen to them, for they have occasionally some interesting stories to tell, but we shall not permit them to impose their ideology on our children in the guise of 'progressive' theories of education. We shall not permit them to teach the fancies of science as if they were the only factual statements in existence. This separation of science and state may be our only chance to overcome the hectic barbarism of our scientific-technical age and to achieve a humanity we are capable of, but have never fully realised. Let us, therefore, in conclusion review the arguments that can be adduced for such a procedure. The image of 20th-century science in the minds of scientists and laymen is determined by technological miracles such as colour television, the moon shots, the infra-red oven, as well as by a somewhat vague but still quite influential rumour, or fairy-tale, concerning the manner in which these miracles are produced. According to the fairy-tale the success of science is the result of a subtle, but carefully balanced combination of inventiveness and control. Scientists have ideas. And they have special methods for improving ideas. The theories of science have passed the test of method. They give a better account of the world than ideas which have not passed the test. The fairy-tale explains why modern society treats science in a special way and why it grants it privileges not enjoyed by other institutions. Ideally, the modern state is ideologically neutral. Religion, myth, prejudices do have an influence, but only in a roundabout way, through the medium of politically influential parties. Ideological principles may enter the governmental structure, but only via a majority vote, and after a lengthy discussion of possible consequences. In our schools the main religions are taught as historical phenomena. They are taught as parts of the truth only if the parents insist on a more direct mode of instruction. It is up to them to decide about the religious education of their children. The financial support of ideologies does not exceed the financial support granted to parties and to private groups. State and ideology, state and church, state and myth, are carefully separated. State and science, however, work closely to-ether. Immense sums are spent on the improvement of scientific ideas. Bastard subjects such as the philosophy of science which have not a single discovery to their credit profit from the boom of the sciences. Even human relations are dealt with in a scientific manner, as is shown by education programmes, proposals for prison reform, army training, and so on. Almost all scientific subjects are compulsory subjects in our schools. While the parents of a six-year-old child can decide to have him instructed in the rudiments of Protestantism, or in the rudiments of the Jewish faith, or to omit religious instruction altogether, they do not have a similar freedom in the case of the sciences. Physics, astronomy, history must be learned. They cannot be replaced by magic, astrology, or by a study of legends. Nor is one content with a merely historical presentation of physical (astronomical, historical, etc.) facts and principles. One does not say: some people believe that the earth moves round the sun while others regard the earth as a hollow sphere that contains the sun, the planets, the fixed stars. One says: the earth moves round the sun - everything else is sheer idiocy.

Science Bad – AT: Perm

Science is highly ideological and inhibits freedom of thought

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 181-183, jam)

I want to defend society and its inhabitants from all ideologies, science included. All ideologies must be seen in perspective. One must not take them too seriously. One must read them like fairytales which have lots of interesting things to say but which also contain wicked lies, or like ethical prescriptions which may be useful rules of thumb but which are deadly when followed to the letter. Now - is this not a strange and ridiculous attitude? Science, surely, was always in the forefront of the fight against authoritarianism and super- stition. It is to science that we owe our increased intellectual freedom vis-a- vis religious beliefs; it is to science that we owe the liberation of mankind from ancient and rigid forms of thought. Today these forms of thought are nothing but bad dreams - and this we learned from science. Science and enlightenment are one and the same thing - even the most radical critics of society believe this. Kropotkin wants to overthrow all traditional institu- tions and forms of belief, with the exception of science. Ibsen criticizes the most intimate ramifications of nineteenth-century bourgeois ideology, but he leaves science untouched. Levi-Strauss has made us realize that Western Thought is not the lonely peak of human achievement it was once believed to be, but he excludes science from his relativization of ideologies. Marx and Engels were convinced that science would aid the workers in their quest for mental and social liberation. Are all these people deceived? Are they all mistaken about the role of science? Are they all the victims of a chimaera? To these questions my answer is a firm Yes and No. Now, let me explain my answer. My explanation consists of two parts, one more general, one more specific. The general explanation is simple. Any ideology that breaks the hold a comprehensive system of thought has on the minds of men contributes to the liberation of man. Any ideology that makes man question inherited beliefs is an aid to enlightenment. A truth that reigns without checks and balances is a tyrant who must be overthrown and any falsehood that can aid us in the overthrow of this tyrant is to be welcomed. It follows that seventeenth- and eighteenth-century science indeed was an instrument of liberation and enlightenment. It does not follow that science is bound to remain such an instrument. There is nothing inherent in science or in any other ideology that makes it essentially liberating. Ideologies can deteriorate and become stupid religions. Look at Marxism. And that the science of today is very different from the science of 1650 is evident at the most superficial glance. For example, consider the role science now plays in education. Scientific 'facts' are taught at a very early age and in the very same manner in which religious 'facts' were taught only a century ago. There is no attempt to waken the critical abilities of the pupil so that he may be able to see things in perspective. At the universities the situation is even worse, for indoctrination is here carried out in a much more systematic manner. Criticism is not entirely absent. Society, for example, and its institutions, are criticized most severely and often most unfairly and this already at the elementary school level. But science is excepted from the criticism. In society at large the judgement of the scientist is received with the same reverence as the judgement of bishops and cardinals was accepted not too long ago. The move towards 'demythologization', for example, is largely motivated by the wish to avoid any clash between Christianity and scientific ideas. If such a clash occurs, then science is certainly right and Christianity wrong. Pursue this investigation further and you will see that science has now become as oppressive as the ideologies it once had to fight. Do not be misled by the fact that today hardly anyone gets killed for joining a scientific heresy. This has nothing to do with science. It has something to do with the general quality of our civilization. Heretics in science are still made to suffer from the most severe sanctions this relatively tolerant civilization has to offer. But - is this description not utterly unfair? Have I not presented the matter in a very distorted light by using tendentious and distorting terminology? Must we not describe the situation in a very different way? I have said that science has become rigid, that it has ceased to be an instrument of change and liberation without adding that it has found the truth, or a large part thereof. Considering this additional fact we realize, so the objection goes, that the rigidity of science is not due to human wilfulness. It lies in the nature of things. For once we have discovered the truth - what else can we do but follow it? This trite reply is anything but original. It is used whenever an ideology wants to reinforce the faith of its followers. 'Truth' is such a nicely neutral word. Nobody would deny that it is commendable to speak the truth and wicked to tell lies. Nobody would deny that - and yet nobody knows what such an attitude amounts to. So it is easy to twist matters and to change allegiance to truth in one's everyday affairs into allegiance to the Truth of an ideology which is nothing but the dogmatic defence of that ideology. And it is of course not true that we have to follow the truth. Human life is guided by many ideas. Truth is one of them. Freedom and mental independence are others. If Truth, as conceived by some ideologists, conflicts with freedom then we have a choice. We may abandon freedom. But we may also abandon Truth. (Alternatively, we may adopt a more sophisticated idea of truth that no longer contradicts freedom; that was Hegel's solution.) My criticism of modern science is that it inhibits freedom of thought. If the reason is that it has found the truth and now follows it then I would say that there are better things than first finding, and then following such a monster.

Science Bad – AT: Perm

Perm fails – humanism and positivism have major substantative differences

Lemke et al 84 (James Lemke, Coker College; David Shevach, U North Carolina @ Wilmington; Richard H. Wells, U South Alabama, Sociological Inquiry, Jan 1, “The Humanism-Positivism Debate in Sociology: A Comment on Tibbett’s Reconsideration” ebsco, JMB)

Tibbet’s characterization of the humanism-positivism debate as a pseudocontroversy is based on inadequacies in both his method of philosophical analysis as well as the derived conclusions. The combination of these analytic flaws and his restrictive role for philosophers means that Tibbetts is unable to acknowledge the obvious social and political significance of disputes about meaning. As a consequence, he is left with the unsupportable position that the humanism-positivism debate is not grounded in fundamentally different assumptions, methods, concepts, goals, implications, etc. In conclusion, the humanism-positivism controversy is a real debate with vital consequences for social science and social policy. Anyone who attempts to "explain it away" must at some point anticipate and justify what would happen if we had only one "linguistic grid" such as positivism. For us such implications are clear and unacceptable.

Scientific principles become all-powerful – The link reifies the system overwhelming the alt

Kellner 90 (Douglas, professor of education @ UCLA, Sociological Perspectives, Vol. 33, No. 1, Spring, JSTOR, http://www.jstor.org/stable/1388975, JMB, accessed 6-27-11)

Critical theorists privileged Marxist categories in their supradisciplinary discourse, arguing that Marx's concepts of commodity, money, value, exchange, and fetishism characterize not only the capitalist economy but also social relations under capitalism where human relations and all forms of life are governed by commodity and exchange relations and values. Building on Lukacs's theory of reification (1971), they argued that capitalist society produced a rigid, reified structure wherein human beings were transformed into things. On this theory, through the process of reification, the unnatural conditions of the capitalist economy and labor process, the com modification of all goods, services, and objects, and the new modes of thought promoted by the mass media and positivist science appear to be "natural" and to form a system impervious to human control or intervention. Horkheimer's essay- "Traditional and Critical Theory" (1972) provides the most systematic and comprehensive presentation of the Institute's conception of social theory, while spelling out the presuppositions of the project and its relation to traditional theory. Traditional theory from Descartes through positivism is characterized by what is now called "foundationalism," i.e., the attempt to ground theory in theoretical postulates which form the foundation upon which the traditional theorist builds theoretical constructions. Traditional theory tends to be deductive, privileging natural science and mathematics; its goal, Horkheimer claims, is unity and harmony, with mathematics as its model (1972:190)- Horkheimer suggests that traditional theory is thus a projection of the bourgeois ideal of the harmonious capitalist market unified by calculable laws of supply and demand. Critical theory frequently shows the relationships between ideas and theoretical positions and their social environment, and thus attempts to con-textualize or historicize ideas in terms of their roots within social processes. Following this line of inquiry, Horkheimer suggests that traditional theory is itself part of the social practices that constitute capitalism and bourgeois society. Its tendencies toward mechanistic materialism reproduced the mechanistic thought and practices of the industrial revolution according to which the world was conceptualized as a machine during an era in which machines came to dominate human beings. The dominant bourgeois trends of abstract and quantitative thought which informed traditional theory reproduced the tendencies toward abstraction and a mode of quantification that was based on exchange in the capitalist market where value was expressed in abstract, quantitative terms. Just as a bourgeois society governed by exchange value abstracted from values, goals, sentiments, and qualities, so too did traditional theory. And, finally, the fragmentation and division of the sciences reproduced the bourgeois division of labor under capitalism whereby specialization and fragmentation become dominant features of society's structure. Social theories, for critical theory, are thus forms of social practice which reproduce dominant forms of social activity.4 Traditional theory is, Horkheimer claims, unaware of the ways in which it is bound together with social processes and thus fails to see its lack of autonomy and social determination. As it became increasingly involved in social processes of production and reproduction, it became increasingly conformist, uncritically submitting to the dominant instrumental, quantitative, and capitalist values. Unaware of its social determination, "theory was absolutized . . . and became a reified, ideological category" (1972:194). Consequently, "The scholar and his science are incorporated into the apparatus of society; his achievements are a factor in the conservation and continuous renewal of the existing state of affairs, no matter what fine names he gives to what he does" (1972:96).

Science Bad – AT: Perm

Humanist and scientific worldviews are fundamentally divergent

Forman 91 (Paul, historian of science and a curator of the Division of Medicine and Science at the National Museum of American History, Isis, Vol. 82, No. 1 March, JSTOR, http://www.jstor.org/stable/233515, JMB, accessed 6-27-11)

The humanists Bellow and Bloom go a remarkably long way with the physicists Kramers and Dresden in their pursuit of transcendence. However, their routes must eventually diverge. For the scientists transcendence is pursued by holding humanity to be "only an ephemeral embellishment enlivening for a moment the great landscape of the cosmos." For the humanist, on the contrary, that cosmos "is merely the stage upon which man, the actor, makes his appearance,"45

Scientific dogmatism means the perm fails

Kellner 90 (Douglas, professor of education @ UCLA, Sociological Perspectives, Vol. 33, No. 1, Spring, JSTOR, http://www.jstor.org/stable/1388975, JMB, accessed 6-27-11)

For the Institute, philosophy without empirical scientific research is empty, just as science without philosophy is blind. In the mid-1930s, Horkheimer's unification of science and philosophy seemed to involve a dialectical inter-penetration and mediation of science and philosophy, without making one superordinate to the other.3 Consequently, Horkheimer rejects both metaphysical and positivist concepts of science which profess " 'the dogma of the invariability of natural laws'" (Horkheimer 1972:36). Dominant positivist conceptions of science, according to Horkheimer, are "unhistorical," and "science" for critical theory will not be privileged above philosophy and social theory. Yet Horkheimer maintains that "materialism has in common with positivism that it acknowledges as real only what is given in sense experience, and it has done so since its beginnings" (Horkheimer 1972:42). Sense experience, however, is mediated through concepts, and both sense perception and cognition are subject to social conditions and historical change. Thus, notions of absolute intuition, whether through the senses or cognition, are to be rejected. Horkheimer and his colleagues therefore subscribe to a nontranscendental materialist theory of knowledge which acknowledges, with Kant and the idealists, tha forms of cognition and theories determine our experience of the external world, but which acknowledges as well that objective material conditions in turn condition forms of thought and knowledge. The results of postmetaphysical, materialist social theory are thus always provisional, contextual, and subject to revision.

Scientific reductionism and determinism mean the perm fails

Dawson 85 (Lorne L., Wilfrid Laurier University, “Free-Will Talk and Sociology” Sociological Inquiry, Fall, Vol. 55, Iss. 4, p. 348-362, ebsco, JMB)

Positivists, Tibbetts notes, recognize that humanity has a mental life which can be grasped introspectively. But as to the matter of whether such cognitive states are causally efficacious or mere epiphenomena of cerebral processes," he declares, they have "rightly avoided metaphysical questions concerning the freedom-determinism issue" (1982:193). Instead, following Carnap, they postulate the "unified language thesis" (Tibbetts preferred rendering of the unity of science doctrine). The unity of language thesis, in its physicalist guise, claims "that the language descriptive of social behaviour can, in principle, be systematically replaced by a language the descriptive predicates of which denote purely physical/observable properties" (1982:192). This brand of semantic reductionism, Tibbetts acknowledges, has been abandoned as unfeasible. But the virtue he sees in the linguistic twin given to the unity of science tenet leads him to rather surprisingly conclude that the conflict within sociology over positivism's reductionistic orientation concerns but "a preference for one 'linguistic grid' over another." "I fail to see," he states, "where a humanistic sociology would be threatened by a mere semantic preference." On this point I am personally sympathetic with the position that "free-will talk" versus "causal-deterministic talk” reduces to an essentially arbitrary preference for one preferred mode of speech over another. (1982:193) These comments miss the point of the humanists' protest against the application of causal-deterministic language to human affairs. At the same time they do an injustice to the intent of the positivist turn to language. As so ably demonstrated by ordinary language philosophers like Wittgenstein (1958) and Austin (1962) and anthropologists like Whorf (1956) and Uvi-Strauss (1966), languages, by shaping human perceptions, have the power to shape (though not determine) human "reality." The choice of a language is hardly "arbitrary." It is charged with explicit and implicit epistemological and practical consequences. The unified language thesis was not advanced as a mere preference but as a normative prescription for science, and it is hard to see what merit there is in reducing it to an ability to arbitrarily identify one and the same social action as both caused and free. It is neither necessary to decree that all actions have causes (i.e., determinism) nor that all human actions are ultimately free (i.e., libertarianism). It is necessary, however, to be able to say (recognizing the implicitly evaluative character of ail judgments) with some degree of regularity when an action is in the last analysis one or the other.

Science Bad – AT: “You Kill Science”

Other ways of knowing are just as good as science

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 186-187, jam)

According to part (2), science deserves a special position because it has produced results. This is an argument only if it can be taken for granted that nothing else has ever produced results. Now it may be admitted that almost everyone who discusses the matter makes such an assumption. It may also be admitted that it is not easy to show that the assumption is false. Forms of life different from science have either disappeared or have degenerated to an extent that makes a fair comparison impossible. Still, the situation is not as hopeless as it was only a decade ago. We have become acquainted with methods of medical diagnosis and therapy which are effective (and perhaps even more effective than the corresponding parts ofWestern medicine) and which are yet based on an ideology that is radically different from the ideology of Western science. We have learned that there are phenomena such as telepathy and telekinesis which are obliterated by a scientific approach and which could be used to do research in an entirely novel way (earlier thinkers such as Agrippa ofNettesheim,]ohn Dee, and even Bacon were aware of these phenomena). And then - is it not the case that the Church saved souls while science often does the very opposite? Of course, nobody now believes in the ontology that underlies this judgement. Why? Because of ideological pressures identical with those which today make us listen to science to the exclusion of everything else. It is also true that phenomena such as telekinesis and acupuncture may eventually be absorbed into the body of science and may therefore be called 'scientific'. But note that this happens only after a long period of resistance during which a science not yet containing the phenomena wants to get the upper hand over forms of life that contain them. And this leads to a further objection against part (2) of the specific argument. The fact that science has results counts in its favour only if these results were achieved by science alone, and without any outside help. A look at history shows that science hardly ever gets its results in this way. When Copernicus introduced a new view oft he universe, he did not consult scientific predecessors, he consulted a crazy Pythagorean such as Philolaos. He adopted his ideas and he maintained them in the face of all sound rules of scientific method. Mechanics and optics owe a lot to artisans, medicine to midwives and witches. And in our own day we have seen how the interference of the state can advance science: when the Chinese communists refused to be intimi- dated by the judgement of experts and ordered traditional medicine back into universities and hospitals there was an outcry all over the world that science would now be ruined in China. The very opposite occurred: Chinese science advanced and Western science learned from it. Wherever we look we see that great scientific advances are due to outside interference which is made to prevail in the face of the most basic and most 'rational' methodological rules. The lesson is plain: there does not exist a single argument that could be used to Support the exceptional role which science today plays in society. Science has done many things, but so have other ideologies. Science often proceeds systematically, but so do other ideologies Just consult the records of the many doctrinal debates that took place in the Church) and, besides, there are no overriding rules which are adhered to under any circumstances; there is no 'scientific methodology' that can be used to separate science from the rest. Science is Just one of the many ideologies that propel sociery and it should be treated as such (this statement applies even to the most progressive and most dialectical sections of science). What consequences can we draw from this result?

Science Bad – AT: “You Kill Science”

Criticism of science generates better science which can deal with metaphysics

Collingridge 85 (David, Technology Policy Unit, Aston U, Social Studies of Science, Vol. 15, No. 4, Nov., JSTOR, http://www.jstor.org/stable/285405, JMB, accessed 6-27-11)

Science in its present form, adopting what Maxwell calls standard empiricism", is at the very heart of intellectual inquiry dominated by the philosophy of knowledge. Its domination leads to a whole range of intractable problems for the official view of science. In reality, science seeks not truth, but explanatory truth -which raises the question of what is it to be explanatory? The question may he raised, but it cannot receive an answer, or even an intelligent discussion, within the bounds of science as officially conceived. For very much the same reason, standard empiricism cannot overcome the problem of induction, cannot explain predictive success of theories, nor give a satisfactory account of scientific progress Reform is therefore called for and is provided by Maxwell in the form of what he calls 'aim-oriented rationality'. As before, Maxwell seems able to get great service from very simple ideas. Aim-oriented rationality is merely the recognition that whatever aims are sought by an activity, they may be revised in the light of criticism The target is problematic. According to standard empiricism, the aim of science is truth, but this runs into all kinds of problems. The aim may therefore be improved, not just truth, but explanatory truth Such aim-oriented science seeks explanations and not only makes room for, but actively encourages, explicit statements of what it is to explain Science of this reformed variety contains metaphysical conjectures about the existence of various kinds of regularity in the universe which are open to criticism and improvement as the non-metaphysical, empirical parts of science change The existence of metaphysical claims woven into the fabric of science enables the problems lacing standard empiricism to be overcome, we can now understand what it is for science to grow, and how conjectures can be successful and explanatory. Einstein is shown to have brilliantly exploited this kind of aim-oriented way of doing physics in his development of relativity, recognizing the clash between the metaphysical ideas of Newtonianism (that velocities arc relative I and the metaphysical claims incorporated into Maxwell's electromagnetic theory (that influences are transmitted with finite velocity) Einstein's successful resolution of this clash has generated problems for contemporary scientists who often follow his aim-oriented methods, but officially adhere to the stale doctrines of standard empiricism, which denies a place for any discussion within science of metaphysical ideas so essential to their theories. In particular, physicists remain blind to the inadequacies of contemporary quantum theory.

Alt allows for a new wave of thinking of the roots of science

Harding 94 (Sandra, Configurations, da: 6-27-2011, dw: 1994, lido)

Second, to this kind of new "science education" about the history of scientific traditions we can add a new education in the sciences both for schoolrooms and for public discussion in journals, newspapers, television, and other resources through which a citizenry [End Page 327] educates itself. Obviously, one important assistance in this project will be to achieve more culturally diverse science communities, including especially their directors and funders; in terms of what happens in the laboratory as well as later, "science communities" are far more extensive than only those who work in laboratories. However, other equally important transformations are necessary here. "Science criticism" that draws on the postcolonial analyses needs to be introduced into all science education programs--both inside and outside classroom contexts, in media accounts and in museum exhibits. Existing science programs are supposed to instill in students a commitment to the most rigorous criticism of traditional assumptions, but the postcolonial accounts show that Eurocentric assumptions have blocked a crucial range of such criticisms. Scientists and humanists have usually spoken as if intellectual life should be divided up between their two kinds of projects, as if the sciences and humanities are parallel projects. 56 But they are not: the sciences are parallel to the arts, and the humanities to the social studies of science, which are not considered part of science at all. Persons well educated in the humanities are expected to have a good training in literary, art, drama and other forms of humanist criticism--in the "history, theory, and sociology" about these arts--but we do not expect them to be accomplished poets, sculptors, or playwrights. And this humanist critical education is not considered to be a lesser field than the performance of the arts. It is not an introductory project of explaining "arts for nonmajors," it is an equal and different project with its own principles and goals--one in which poets, sculptors, and playwrights can gain greater resources through exposure to the achievements and limitations of past efforts in their fields. It is a kind of parallel program for the sciences that I suggest is needed.

Science Bad – AT: Self-Correcting

Science is not self-correcting

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

Such a study reveals that, while some scientists may proceed as described, the great majority follow a different path. Scepticism is at a minimum; it is directed against the view of the opposition and against minor ramifications of one's own basic ideas, never against the basic ideas themselves. Attacking the basic ideas evokes taboo reactions which are no weaker than are the taboo reactions in so-called "primitive societies." Basic beliefs are protected by this reaction as well as by secondary elaborations, as we have seen, and whatever fails to fit into the established category system or is said to be incompatible with this system is either viewed as something quite horrifying or, more frequently, it is simply declared to be non-existent. Nor is science prepared to make 'a theoretical pluralism the foundation of research. Newton reigned for more than 150 years, Einstein briefly introduced a more liberal point of view only to be succeeded by the Copenhagen Interpretation. The similarities between science and myth are indeed astonishing.

Science is ideological and indoctrinating

Watson 3 (Brett, Graduate Diploma in Philosophy, Macquarie University, Jun 16, [www.nutters.org/docs/feyerabend] AD: 6-26-11, jam)

Our second straw-man thinks that Feyerabend is misguided because science is progressive, and better than the alternatives. Science is not perfect — far from it, in fact — but it is vastly superior to its alternatives (again, as evinced by scientific progress). Even if there are alternative theories, we should not waste time with them in education precisely because they are already known to be inferior. Education is a finite resource, and there are an infinite number of bad theories. The only thing that ought to replace the best current theory is a better one, not a worse one. The position held by this straw-man is similar to that of the first, but more patronising. It contains the same set of value judgments, by which some particular formulation of "science" is judged as superior to its alternatives, plus the additional judgment that only the best theory ought to be presented in education even if we acknowledge that "best" is not "perfect"; that positions which have been judged as inferior should not be allowed to waste precious time. Despite the moderate phrases in which our second straw man expresses his case, this objection is less reasonable than the first: not only would he impose on us his values with regards to progress, but also with regards to education. Feyerabend takes a directly opposing view with regards to the exclusion of contrary ideas because he thinks it results in better education. In a few words, one could object to our second straw-man on the grounds that he is advocating indoctrination, which is surely something he would object to if a religion (or other disagreeable party) imposed it.

Science Bad – AT: Progress

Unscientific ideas were key to “scientific progress”

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

This advice, which only few of our well-conditioned contemporaries are prepared to accept, seems to clash with certain simple and widely-known facts. Is it not a fact that a learned physician is better equipped to diagnose and to cure an illness than a layman or the medicine-man of a primitive society? Is it not a fact that epidemics and dangerous individual diseases have disappeared only with the beginning of modern medicine? Must we not admit that technology has made tremendous advances since the rise of modern science? And are not the moon-shots a most impressive and undeniable proof of its excellence? These are some of the questions which are thrown at the impudent wretch who dares to criticise the special position of the sciences. The questions reach their polemical aim only if one assumes that the results of science which no one will deny have arisen without any help from non-scientific elements, and that they cannot be improved by an admixture of such elements either. 'Unscientific' procedures such as the herbal lore of witches and cunning men, the astronomy of mystics, the treatment of the ill in primitive societies are totally without merit. Science alone gives us a useful astronomy, an effective medicine, a trustworthy technology. One must also ' assume that science owes its success to the correct method and not merely to a lucky accident. It was not a fortunate cosmological guess that led to progress, but the correct and cosmologically neutral handling of data. These are the assumptions we must make to give the questions the polemical force they are supposed to have. Not a single one of them stands up to closer examination. Modern astronomy started with the attempt of Copernicus to adapt the old ideas of Philolaos to the needs of astronomical predictions. Philolaos was not a precise scientist, he was a muddle-headed Pythagorean, as we have seen, and the consequences of his doctrine were called 'incredibly ridiculous' by a professional astronomer such as Ptolemy. Even Galileo, who had the much improved Copernican version of Philolaos before him, says: 'There is no limit to my astonishment when I reflect that Aristarchus and Copernicus were able to make reason to conquer sense that, in defiance of the latter, the former became mistress of their belief' (Dialogue, 328). 'Sense' here refers to the experiences which Aristotle and others had used to show that the earth must be at rest. The 'reason' which Copernicus opposes to their arguments is the very mystical reason of Philolaos combined with an equally mystical faith ('mystical' from the point of view of today's rationalists) in the fundamental character of circular motion. I have shown that modern astronomy and modern dynamics could not have advanced without this unscientific use of antediluvian ideas. While astronomy profited from Pythagoreanism and from the Platonic love for circles, medicine profited from herbalism, from the psychology, the metaphysics, the physiology of witches, midwives, cunning men, wandering druggists. It is well known that 16th- and 17th-century medicine while theoretically hypertrophic was quite helpless in the face of disease (and stayed that way for a long time after the 'scientific revolution'). Innovators such as Paracelsus fell back on the earlier ideas and improved medicine. Everywhere science is enriched by unscientific methods and unscientific results, while procedures which have often been regarded as essential parts of science are quietly suspended or circumvented. The process is not restricted to the early history of modern science. It is not merely a consequence of the primitive state of the sciences of the 16th and 17th centuries. Even today science can and does profit from an admixture of unscientific ingredients. An example which was discussed above, in Chapter 4, is the revival of traditional medicine in Communist China. When the Communists in the fifties forced hospitals and medical schools to teach the ideas and the methods contained in the Yellow Emperor's Textbook of Internal Medicine and to use them in the treatment of patients, many Western experts (among them Eccles, one of the 'Popperian Knights') were aghast and predicted the downfall of Chinese medicine. What happened was the exact opposite. Acupuncture, moxibustion, pulse diagnosis have led to new insights, new methods of treatment, new problems both for the Western and for the Chinese physician. And those who do not like to see the state meddling in scientific matters should remember the sizeable chauvinism of science: for most scientists the slogan 'freedom for science' means the freedom to indoctrinate not only those who have joined them, but the rest of society as well. Of course - not every mixture of scientific and non-scientific elements is successful (example: Lysenko). But science is not always successful either. If mixtures are to be avoided because they occasionally misfire, then pure science (if there is such a thing) must be avoided as well. (It is not the interference of the state that is objectionable in the Lysenko case, but the totalitarian interference that kills the opponent instead of letting him go his

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Science Bad – AT: Progress

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own way.) Combining this observation with the insight that science has no special method, we arrive at the result that the separation of science and non-science is not only artificial but also detrimental to the advancement of knowledge. If we want to understand nature, if we want to master our physical surroundings, then we must use all ideas, all methods, and not 'just a small selection of them. The assertion, however, that there is no knowledge outside science - extra scientiam nulla salus - is nothing but another and most convenient fairy-tale. Primitive tribes have more detailed classifications of animals and plants than contemporary scientific zoology and botany, they know remedies whose effectiveness astounds physicians (while the pharmaceutical industry already smells here a new source of income), they have means of influencing their fellow men which science for a long time regarded as non-existent (Voodoo), they solve difficult problems in ways which are still not quite understood (building of the pyramids; Polynesian travels), there existed a highly developed and internationally known astronomy in the old Stone Age, this astronomy was factually adequate as well as emotionally satisfying, it solved both physical and social problems (one cannot say the same about modern astronomy) and it was tested in very simple and ingenious ways (stone observatories in England and in the South Pacific; astronomical schools in Polynesia - for a more detailed treatment and references concerning all these assertions c.f. my Einführung in die Naturphilosophie). There was the domestication of animals, the invention of rotating agriculture, new types of plants were bred and kept pure by careful avoidance of cross fertilisation, we have chemical inventions, we have a most amazing art that can compare with the best achievements of the present. True, there were no collective excursions to the moon, but single individuals, disregarding great dangers to their soul and their sanity, rose from sphere to sphere to sphere until they finally faced God himself in all His splendour while others changed into animals and back into humans again. At all times man approached his surroundings w' h wide open senses and a fertile intelligence, at all times he made incredible discoveries, at all times we can learn from his ideas.

Laypersons can be just as qualified as scientists

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 187-188, jam)

The most important consequence is that there must be aformal separation between state and science just as there is now a formal separation between state and church. Science may influence society but only to the extent to which any political or other pressure group is permitted to influence society. SClentIsts may be consulted on important projects but the final judgement must be left to the democratically elected consulting bodies. These bodies will consist mainly of laymen. Will the laymen be able to come to a correct judgement? Most certainly, for the competence, the complications and the successes of science are vastly exaggerated. One of the most exhilarating experiences is to see how a lawyer, who is a layman, can find holes in the testimony, the technical testimony of the most advanced expert and thus prepare the jury for its verdict. Science is not a closed book that is understood only after years of training. It is an intellectual discipline that can be examined and criticized by anyone who is interested and that looks difficult and profound only because of a systematic campaign of obfusca- tion carried out by many scientists (though, I am happy to say, not by all). Organs of the state should never hesitate to reject the judgement of scientists when they have reason for doing so. Such rejection will educate the general public, will make it more confident and it may even lead to improvement. Considering the sizeable chauvinism of the scientific estab- lishment we can say: the more Lysenko affairs the better (it is not the interftrence of the state that is objectionable in the case of Lysenko, but the totalitarian interference which kills the opponent rather than just neglecting hIs adVIce). Three cheers <for> the fundamentalists in California who succeeded in having a dogmatic formulation of the theory of evolution removed from the text books and an account of Genesis included (but I know that they would become as chauvinistic and totalitarian as scientists are today when given the chance to run society all by themselves. Ideologies are marvellous when used in the company of other ideologies. They become boring and doctrinaire as soon as their merits lead to the removal of their opponents). The most important change, however, will have to occur in the field of education.

Science Bad – AT: Progress

Science doesn’t progress – the trend is toward the constant refutation of theories

Watson 3 (Brett, Graduate Diploma in Philosophy, Macquarie University, Jun 16, [www.nutters.org/docs/feyerabend] AD: 6-26-11, jam)

Firstly, opinions ought not to be stifled on the grounds that we consider them false, for we ought not to presume ourselves to be infallible judges. Even in science, where the real world is supposed to act as an arbiter of opinion (or theory), this is obviously true. Some would consider the history of science to be a progression towards "greater truths", but the idea is problematic when spelled out in any detail. We certainly get the impression of general progress, particularly with regards to technology, and one might reasonably suppose this to reflect progress towards a more accurate understanding of reality itself; but on the other hand, the strongest trend in science has been the inevitable discovery of flaws in incumbent theories which lead to their substantial revision or replacement. The incumbent theory may currently have the weight of evidence, but this does not make it true and its alternatives false. Mill's argument seems, thus far, entirely applicable to science.

Establishing science as the only way of knowing reverse progress

Watson 3 (Brett, Graduate Diploma in Philosophy, Macquarie University, Jun 16, [www.nutters.org/docs/feyerabend] AD: 6-26-11, jam)

Although Feyerabend does not cite any particular source when he mentions the application of Darwinism to "the battle of ideas", I think the relevance of the issue is fairly obvious. If the competitive forces of evolution can give us the very brains by which we are able to conduct this discussion, then competitive forces between opposing views must surely work to the advantage of those views in terms of weeding out weak arguments, fallacies, anomalies, and so on. Mill's suggestion that we should manufacture dissent is the intellectual equivalent of a fighter seeking a competent sparring partner. We typically acknowledge "competition" as an agent of improvement in biology, economics, and sports; why not, then, in the field of science? A defender of science might object, at this point, that we do have such competition in the field of science. There are, for example, competing theories with regards to the mechanism of evolution; and scientific revolutions could not occur at all unless there were at least two competing theories at the time. These points are true, but the diversity exists despite the prevailing culture, not because of it. Diversity is not encouraged; the existence of competing theories is viewed as a problem, since at least one of them must be false. Feyerabend addresses this when he compares Mill's approach to that of Karl Popper. Finally, Popper's standards eliminate competitors once and for all: theories that are either not falsifiable or falsifiable and falsified have no place in science. Popper's criteria are clear, unambiguous, precisely formulated; Mill's criteria are not. This would be an advantage if science itself were clear, unambiguous, and precisely formulated. Fortunately, it is not. — Paul Feyerabend, How to Defend Society Against Science

Arguments for scientific progress conflate results with method

Watson 3 (Brett, Graduate Diploma in Philosophy, Macquarie University, Jun 16, [www.nutters.org/docs/feyerabend] AD: 6-26-11, jam)

Our first straw-man believes we should ignore Feyerabend because science works. If the progress of science weren't self-evident enough, then the accompanying march of technology must surely be proof. When did any religion offer us such technological progress? Surely, therefore, one cannot construct a meaningful case against science as knowledge; the only kind of argument in which one can reasonably engage is that of why science does work. This straw-man is largely playing definitional games; equating "science" with "progress". Under this definition, something is "science" to the extent that it effects "progress", for values of that term principally relating to technology. But note that this formulates science in terms of its results rather than its methods, and Feyerabend's main thrust is against method, not against results. Thus, this argument would appear to be a non sequitur; it fails to address Feyerabend's actual point. Even if we were to grant the very generous assumption that the results in question can be best obtained by a particular "scientific method", the selection of results is value-laden. On what rational grounds could we say that the person who prefers "spiritual progress" over "technological progress" is wrong? To this, our straw-man may retort that technological progress is objectively measurable, whereas anything that might be called "spiritual progress" (whatever it is) is subjective at best, and purely imaginary at worst. This is, of course, absolutely true, so long as we accept the metrics used in making the judgment. But the preference for one system of metrics over another is also a value judgment, and therein lies a strong indicator that science could be something against which society ought to be defended. No doubt our straw-man considers it bad for religions to impose their value-judgments on society as a whole; why should it be different for science?

Science Bad – AT: Progress

Alt increases scientific progress – the academy would be flooded by free thinkers instead of conformists

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 189-190, jam)

Such further mastery was aimed at, and was partly achieved, by the Presocratics. The Presocratics not only tried to understand the world. They also tried to understand, and thus to become the masters of, the means if understanding the world. Instead of being content with a single myth they developed many and so diminished the power which a well-told story has over the minds of men. The sophists introduced still further methods for reducing the debilitating effect of interesting, coherent, 'empirically ade-quate' etc. etc. tales. The achievements of these thinkers were not appreciated and they certainly are not understood today. When teaching a myth, we want to increase the chance that it will be understood (i.e, no puzzlement about any feature of the myth), believed, and accepted. This does not do any harm when the myth is counterbalanced by other myths: even the most dedicated (i.e. totalitarian) instructor in a certain version of Christianity cannot prevent his pupils from getting in touch with Buddhists, Jews and other disreputable people. It is very different in the case of science, or of rationalism where the field is almost completely dominated by the believers. In this case it is of paramount importance to strengthen the minds of the young and 'strengthening the minds of the young' means strengthening them against any easy acceptance of comprehensive views. What we need here is an education that makes people contrary, counter- suggestive without making them incapable of devoting themselves to the elaboration ofany single view. How can this aim be achieved? It can be achieved by protecting the tremendous imagination which children possess and by developing to the full the spirit of contradiction that exists in them. On the whole children are much more intelligent than their teachers. They succumb, and give up their intelligence because they are bullied, or because their teachers get the better of them by emotional means. Children can learn, understand and keep separate two to three different languages ('children' and by this I mean three to five-year-olds, not eight-year-olds who were experimented upon quite recently and did not come out too well; why? because they were already loused up by incompe- tent teaching at an earlier age). Of course, the languages must be introduced in a more interesting way than is usually done. There are marvellous writers in all languages who have told marvellous stories - let us begin our language teaching with them and not with 'der Hund hat einen Schwanz' and similar inanities. Using stories we may of course also introduce 'scientific' accounts, say, ofthe origin ofthe world and thus make the children acquainted with science as well. But science must not be given any special position except for pointing out that there are lots of people who believe in it. Later on the stories which have been told will be supplemented with 'reasons' where by reasons I mean further accounts of the kind found in the tradition to which the story belongs. And, of course, there will also be contrary reasons. Both reasons and contrary reasons will be told by the experts in the fields and so the young generation becomes acquainted with all kinds of sermons and all types of wayfarers. It becomes acquainted with them, it becomes acquainted with their stories and every individual can make up his mind which way to go. By now everyone knows that you can earn a lot of money and respect and perhaps even a Nobel Prize by becoming a scientist, so, many will become scientists. They will become scientists without having been taking in by the ideology of science, they will be scientists because they have made a free choice. But has not much time been wasted on unscientific subjects and will this not detract from their competence once they have become scientists? Not at all! The progress of science, of good science, depends on novel ideas and on intellectual freedom: science has very often been advanced by outsiders (remember that Bohr and Einstein regarded themselves as outsiders). Will not many people make the wrong choice and end up in a dead end? Well, that depends on what you mean by a 'dead end'. Most scientists today are devoid of ideas, full of fear, intent on producing some paltry result so that they can add to the flood of inane papers that now constitutes 'scientific progress' in many areas. And, besides, what is more important? To lead a life which one has chosen with open eyes, or to spend one's time in the nervous attempt of avoiding what some not so intelligent people call 'dead ends'? Will not the number of scientists decrease so that in the end there is nobody to run our precious laboratories? I do not think so. Given a choice many people may choose science, for a science that is run by free agents looks much more attractive than the science of today which is run by slaves, slaves of institutions and slaves of 'reason'. And if there is a temporary shortage of scientists the situation may always be remedied by various kinds of incentives.

Science Bad – AT: Empiricism

Empiricism is dogmatic – only a questioning of all established fact can solve

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 78-81, jam)

Today empiricism is the professed philosophy of a good many intellectual enterprises. It is the core of the sciences, or so at least we are taugllt, for it is responsible both for the existence and for the growth of scientific knowledge. It has been adopted by influential schools in aesthetics, ethics and theology. And within philosophy proper the empirical point of view has been elaborated in great detail and with even greater precision. This predilection for empiricism is due to the assumption that only a thoroughly observational procedure can exclude fanciful speculation and empty metaphysics as well as to the hope that an empiristic attitude is most liable to prevent stagnation and to further the progress of knowledge. It is the purpose of the present paper to show that empiricism in the form in which it is practised today cannot fulfil this hope. Putting it very briefly, it seems to me that the contemporary doctrine of empiricism has encountered difficulties, and has created contradictions which are very similar to the difficulties and contradictions inherent in some versions of the doctrine of democracy. The latter are a well-known phenomenon. That is, it is well known that essentially totalitarian measures are often advertised as being a necessary consequence of democratic principles. Even worse - it not so rarely happens that the totalitarian character of the defended measures is not explicitly stated but covered up by calling them 'democratic', the word 'democratic' now being used in a new, and somewhat misleading, manner. This method of (conscious or unconscious) verbal camouflage works so well that it has deceived some of the staunchest supporters of true democracy. What is not so well known is that modern empiricism is in precisely the same predicament. That is, some of the methods of modern empiricism which are introduced in the spirit of anti-dogmatism and progress are bound to lead to the establishment of a dogmatic metaphysics and to the construction of defence mechanisms which make this metaphysics safe from refutation by experimental inquiry. It is true that in the process of establishing such a metaphysics the words 'empirical' or 'experience' will frequently occur; but their sense will be as distorted as was the sense of 'democratic' when used by some concealed defenders of a new tyranny.1 This, then, is my charge: far from eliminating dogma and metaphysics and thereby encouraging progress, modern empiricism has found a new way of making dogma and metaphysics respectable, viz., the way of calling them 'well-confirmed theories', and of developing a method of confirmation in which experimental inquiry plays a large though well controlled role. In this respect, modern empiricism is very different indeed from the empiricism of ~ Galileo, Faraday and Einstein, though it will ofcourse try to represent these scientists as following its own paradigm of research, thereby further confusing the issue.2 From what has been said above it follows that the fight for tolerance in scientific matters and the fight for scientific progress must still be carried on. What has changed is the denomination of the enemies. They were priests, or 'school-philosophers', a few decades ago. Today they call themselves 'philosophers ofscience', or 'logical empiricists'. 3 There are also a good many scientists who work in the same direction. I maintain that all these groups work against scientific progress. But whereas the former did so openly and could be easily discerned, the latter proceed under the flag of progressivism and empiricism and thereby deceive a good many of their followers. Hence, although their presence is noticeable enough they may almost be compared to a fifth column, the aim ofwhich must be exposed in order that its detrimental effect be fully appreciated. It is the purpose of this paper to contribute to such an exposure. I shall also try to give a positive methodology for the empirical sciences which no longer encourages dogmatic petrification in the name of experi- ence. Put in a nutshell, the answer which this method gives to the question in the title is: you can be a good empiricist only if you are prepared to work with many alternative theories rather than with a single point of view and 'experience'. This plurality of theories must not be regarded as a pre- liminary stage of knowledge which will at some time in the future be replaced by the One True Theory. Theoretical pluralism is assumed to be an essentialfiature of all knowledge that claims to be objective. Nor can one rest content with a plurality which is merely abstract and which is created by denying now this and now that component of the dominant point of view. Alternatives must rather be developed in such detail that problems already 'solved' by the accepted theory can again be treated in a new and perhaps also more detailed manner. Such development will o f ~ c o u r s e take time, and it will not be possible, for example, at once to construct alternatives to the present quantum theory which are comparable to its richness and sophistication. Still, it would be very unwise to bring the process to a standstill in the very beginning by the remark that some suggested new ideas are undeveloped, general, metaphysical. It takes time to build a good theory (a triviality that seems to have been forgotten by some defenders of the Copenhagen point of view of the quantum theory); and it also takes time to develop an alternative to a good theory. The function of such concrete alternatives is, however, this: they provide means of criticizing the accepted theory in a manner which goes beyond the criticism provided by a comparison of that theory 'with the facts': however closely a theory seems to reflect the facts, however universal its use, and however necessary its existence seems to be to those speaking the corresponding idiom, its factual adequacy can be asserted only after it has been confronted with alternatives whose invention and detailed development must therefore precede any final assertion of practical success and factual adequacy. This, then, is the methodological justification of a plurality of theories: such a plurality allows for a much sharper criticism of accepted ideas than does the comparison with a domain of 'facts' which

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Science Bad – AT: Empiricism

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are supposed to sit there independently of theoretical considerations. The function of unusual metaphysical ideas which are built up in a nondogmatic fashion and which are then developed in sufficient detail to give an (alternative) account even of the most common experimental and observational situations is defined accordingly: they play a decisive role in the criticism and in the development ofwhat is generally believed and 'highly confirmed'; and they have therefore to be present at any stage of the development of our knowledge.4A science that is free from metaphysics is on the best way to becoming a dogmatic metaphysical system. So far the summary of the method I shall explain, and defend, in the present paper. It is clear that this method still retains an essential element of empiricism: the decision between alternative theories is based upon crucial experiments. At the same time it must restrict the range of such experiments. Crucial experiments work well with theories of a low degree of generality whose ~ p r i n c i p l e s do not touch the principles on which the ontology of the chosen observation language is based. They work well if such theories are compared with respect to a much more general background theory which provides a stable meaning for the observation sentences. However, this background theory, like any other theory, is itself in need of criticism. Criticism must use alternatives. Alternatives will be the more efficient the more radically they differ from the point of view to be investigated. It is bound to happen, then, that the alternatives do not share a single statement with the theories they criticize. Clearly, a crucial experiment is now impossible. It is impossible, not because the experimental device is too complex, or because the calculations leading to the experimental prediction are too difficult; it is impossible because there is no statement capable of expressing what emerges from the observation. This consequence, which severely restricts the domain of empirical discussion, cannot be circum- vented by any of the methods which are currently in use and which all try to work with relatively stable observation languages. It indicates that the attempt to make empiricism a universal basis of all our factual knowledge cannot be carried out. The discussion of this situation is beyond the scope of the present paper.

Science Bad – AT: Empiricism

Empirical logic is self-referential and destroys independent thinking – only the constant questioning of dogma breaks this cycle

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 95-97, jam)

At the same time it is evident, on the basis of the considerations in the last section, that this appearance of success cannot in the least be regarded as a sign of truth and correspondence with nature. Quite the contrary, the suspicion arises that the absence of major difficulties is a result of the decrease of empirical content brought about by the elimination of alternatives, and of facts that can be discovered with the help of these alternatives only. In other words, the suspicion arises that this alleged success is due to the fact that in the process of application to new domains the theory has been turned into a metaphysical system. Such a system will of course be very 'successful' not, however, because it agrees so well with the facts, but because no facts have been specified that would constitute a test and because some such facts have even been removed. Its 'success' is entirely man made. It was decided to stick to some ideas and the result was, quite naturally, the survival of these ideas. If now the initial decision is forgotten, or made only implicitly, then the survival will seem to constitute independent support, it will reinforce the decision, or turn it into an explicit one, and in this way close the circle. This is how empirical 'evidence' may be created by a procedure which quotes as its justification the very same evidence it has produced in the first place. At this point an 'empirical' theory of the kind described (and let us always remember that the basic principles of the present quantum theory and especially the idea of complementarity are uncomfortably close to forming such a theory) becomes almost indistinguishable from a myth. In order to realize this, we need only consider that on account of its all- pervasive character a myth such as the myth of witchcraft and of demonic possession will possess a high degree of confirmation on the basis of observation. Such a myth has been taught for a long time; its content is enforced by fear, prejudice and ignorance as well as by a jealous and cruel priesthood. It penetrates the most common idiom, infects all modes of thinking and many decisions which mean a great deal in human life. It provides models for the explanation of any conceivable event, conceivable, that is, for those who have accepted it.30 This being the case, its key terms will be fixed in an unambiguous manner and the idea (which may have led to such a procedure in the first place) that they are copies of unchanging entities and that change of meaning, if it should happen, is due to human mistake - this idea will now be very plausible. Such plausibility reinforces all the manoeuvres which are used for the preservation of the myth (elimination of opponents included). The conceptual apparatus of the theory and the emotions connected with its application having penetrated all means of communication, all actions, and indeed the whole life of the community, such methods as transcendental deduction, analysis of usage, phenomenological analysis which are means for further solidifying the myth will be extremely successful (which shows, by the way, that all these methods which have been the trademark of various philosophical schools old and new, have one thing in common: they tend to preserve the status quo of the intellectual life).31Observational results, too, will speak in favour of the theory as they are formulated in its terms. It will seem that at last the truth has been arrived at. At the same time it is evident that all contact with the world has been lost and that the stability achieved, the semblance of absolute truth, is nothing but the result if an absolute conformism.32For how can we possibly test, or improve upon, the truth of a theory if it is built in such a manner that any conceivable event can be described, and explained, in terms of its principles? The only way of investigating such all-embracing principles is to compare them with a different set of equally all-embracing principles - but this way has been excluded from the very beginning. The myth is therefore of no objective relevance, it continues to exist solely as the result of the effort of the community of believers and of their leaders, be these now priests or Nobel prize winners. Its 'success' is entirely man made. This, I think, is the most decisive argument against any method that encourages uniformity, be it now empirical or not. Any such method is in the last resort a method of deception. It enforces an unenlightened conformism, and speaks of truth; it leads to a deterioration of intellectual capabilities, of the power of imagination, and speaks of deep insight; it destroys the most precious gift of the young, their tremendous power of imagination, and speaks of education. To sum up: unanimity of opinion may be fitting for a church, for the frightened victims of some (ancient, or modern) myth, or for the weak and willing followers of some tyrant; variety of opinion is a feature necessary for objective knowledge; and a method that encourages variety is also the only method that is compatible with a humanitarian outlook. To the extent to which the consistency condition (and, as will e m e r g e ~ the condition of meaning invariance) delimits variety, it contains a theological element (which lies, of course, in the worship of 'facts' so characteristic for nearly all empiricism).

Science Bad – AT: Empiricism

Empiricism fails – multiple conclusions can be drawn from any one experiment

Newall 5 (Paul, contributer to the Galilean Library, frequently cited in Wikipedia articles, Sep 22, [www.galilean-library.org/site/index.php/page/index.html/\_/essays/philosophyofscience/anything-goes-feyerabend-and-method-r76] AD: 6-26-11, jam)

Feyerabend preferred to use another – more famous – example from the history of science: Galileo's work on geostaticism. His reductio consisted in three stages, designed to critique na�ve empiricism, Popper's falsificationism and Lakatos' Methodology of Scientific Research Programmes in turn – each being an instance of a rationalist approach to science (in the case of the latter two, the most common even today). For the first of these, he considered the famous Tower Argument, a circumstance relied upon by Aristotelians to discount the possibility of a moving Earth. Its proponents pointed to the fact that a stone dropped from a tower lands at its base. If the Earth was moving, as some supposed, the tower would move with it and hence the stone would drop some distance away. (A variant of the same argument stated that an arrow fired vertically into the air should fall far from the firer, since he or she would have moved along with the earth while the arrow was in flight.) This was an idea everyone could understand and hence served as a powerful refutation of the notion that the Earth moves. It matters not at this stage whether Galileo was an empiricist or not: in order to undertake a reductio, we assume that he was and see what follows. What Galileo did was to accept the observations made by those who had tested this theory (that the stone falls at the base) and then appeal to a principle of relativity (often called Galilean relativity). He asked his readers to imagine two friends throwing a ball to each other while inside a cabin on a ship alongside and then the same situation while the ship was underway, considering whether more (or less) force would be required to throw the ball when the ship was moving. This was also a test that most people could understand and it helped him to explain that there was no difference because any motion of the ship would also be shared by the passengers. That is, whichever direction the ship moved in, the cabin would, too - along with everything inside it. As a result of this discussion, Galileo was able to demonstrate that the very same "fact" used by the Tower Argument itself - the stone falling at the base - also supported the idea that the Earth was rotating, since any evidence that the geostaticist could appeal to would likewise support the alternative (this is actually an example of underdetermination by data and the theory-ladenness of observational terms). The naive empiricist has no means of deciding between these two rival theories and hence any choice made by Galileo would violate this form of empiricism. If our methodology insists that only those decisions made on the basis of evidence can be called rational then Galileo and the Aristotelians alike were irrational to prefer geokineticism or geostaticism respectively. We are thus forced either to give up on calling Galileo's behaviour rational or else admit that naive empiricism is inadequate.

The scientific method supports conservatism – Malthus proves

Harvey 74 (David, Clark University, Economic Geography, Vol. 50, No. 3, July, http://www.jstor.org/stable/142863, JMB, 6-26-11)

By the use of the logical empiricist method Malthus arrives at certain conclusions supportive of those advanced by the advocates of "the existing order of things," rejects the utopianism of Godwin and Condorcet, and rebuffs the hopes for political change. The diminution in polemics and the greater reliance on empiricism in the subsequent editions of the Essay may in part be regarded as a consequence of Malthus' basic discovery that scientific method of a certain sort could accomplish, with much greater credibility and power than straight polemics, a definite social purpose. The resort to empiricism was facilitated in turn by the growing body of information concerning the growth and condition of the world's population—a prime source, for example, was the work of the geographer Alexander von Humboldt [10].

Science Bad – AT: Scientific Method

Saying the scientific method solves begs the question of method in the first place – there are no universal methodologies, only contingent historical solutions

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 177-178, jam)

What can we expect given this methodological situation? What are the rules that we must follow in order to arrive at useful results in science as well as in practice (like for example in politics)? Which steps lead to success and which are to be avoided? After the considerations just adduced, the answer is clear. Although rules which are valid in all possible circumstances can be set up and even possibly violently enforced, it will always be at the expense of the possibility of fundamental progress (where 'progress' is to be understood as the defender of a certain rule understands it, thus differently for different social and professional groups). If one does not want to cut oneself off from the means to such progress, only one option remains: one admits that there simply are no generally valid rules, that no general methodology which is independent of history, psychology, physics, belief in God, guides our steps uncompromisingly (this is also the basic thought of all dialectical philosophies). Even the most seemingly trivial demands have their limits and must be given up in certain circumstances. Is it not evident, for instance, that a researcher or a research group can cope better with a problem the more they know about the relevant circumstances? The more knowledge, the more prospects for success. Everyone seems to hold this as a self-evident principle. But it is definitely not self-evident. Too much detail confuses our thoughts and takes away our ability to find simple solutions to complex problems. Is it not evident that a clear and precise solution must be preferred to an unclear and ambiguous one? Absolutely not. The 'clear' solution disguises the superficiality and ambiguity which accompany every step of thinking and which make it possible in the first place. One accepts such a result as flawless and turns to other things. Clear solutions are like modern canals, they guide research in a certain direction and shut out alternatives. One does not see further than the walls ofone's own canal allow. Third, has it not been determined that we are only allowed to use consistent theories, i.e., is it not imperative to free one's theory from contradictions before one looks at its other features more closely? Abso- lutely not. In the history of the sciences, an inconsistent theory T" often follows an inconsistent theory T' before one is all too clear about its logical properties, and this succession would be delayed ad infinitum by the search for a consistent and logically flawless form. In addition, striving for logical perfection separates the 'superstructure' of science from predictive, experi- mental practice, and forces the scientist to 're-establish the connection in a highly untidy way (see the example in section 6). The devil disappears from the textbooks, but in return he only feels better in practice.102And so on. Every methodological rule which one would want to enforce on practice or science has (because of psychological, historical, sociological, etc. laws) undesired consequences. If one acknowledges these consequences, then one is often forced to restrict the rule, or to dispose of it totally. So how does one proceed in a concrete case? How does one solve a theoretical problem? How does one initiate a political change? One proceeds as a normal person who wants to solve a certain problem, such as a political problem, proceeds. First one informs oneself. Not too much, but also not too little. (What 'much' and 'little' are depends on the situation, as well as on the peculiarities of one's own thinking processes.) Then, one decides whether one can solve the problem alone, or whether one needs the help of others. If the latter is the case, then the choice of whom is made according to character, intelligence, emotional stability, sex, and the like. The choice is different if one wants to make a free coalition, or a tightly organized assault party. At this point, it may be useful to study the debate between Marx and Bakunin, or between Lenin and his more 'liberal' opponents in the party, provided that one has enough time, and that the circumstances (the brains of the little group included) demand such a procedure. Then comes the question of action: should one publish or drop bombs? Should one try to persuade (again there are alternatives here: mass meetings, or house calls) or should one intimidate? Decisions on all these questions must be made in the concrete historical situation in which they were posed, and cannot be anticipated, not even in the most vague and general way. Even the existence of professions with strict ethical and theoretical standards (medicine, physics) does not necessarily lead in a certain direction, since why should one follow physics or medicine, or any other sect, just because it is there? But alluding to past 'success' (atomi\ bomb, etc.), cannot pacify us, because the relationship between theory and technology and invention is anything but clear (again see section 6).

Science Bad – AT: Scientific Method

Science assumes universal methodological rules – that’s not the case

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

The idea that science can, and should, be run according to fixed and universal rules, is both unrealistic and pernicious. It is unrealistic, for it takes too simple a view of the talents of man and of the circumstances which encourage, or cause, their development. And it is pernicious, for the attempt to enforce the rules is bound to increase our professional qualifications at the expense of our humanity. In addition, the idea is detrimental to science, for it neglects the complex physical and historical conditions which influence scientific change. It makes our science less adaptable and more dogmatic: every methodological rule is associated with cosmological assumptions, so that using the rule we take it for granted that the assumptions are correct. Naive falsificationism takes it for granted that the laws of nature are manifest and not hidden beneath disturbances of considerable magnitude. Empiricism takes it for granted that sense experience is a better mirror of the world than pure thought. Praise of argument takes it for granted that the artifices of Reason give better results than the unchecked play of our emotions. Such assumptions may be perfectly plausible and even true. Still, one should occasionally put them to a test. Putting them to a test means that we stop using the methodology associated with them, start doing science in a different way and see what happens. Case studies such as those reported in the preceding chapters show that such tests occur all the time, and that they speak against the universal validity of any rule. All methodologies have their limitations and the only 'rule' that survives is 'anything goes'.

Science cannot offer universal explanations – it’s as useful as myth

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

The change of perspective brought about by these discoveries leads once more to the long-forgotten problem of the excellence of science. It leads to it for the first time in modern history, for modern science overpowered its opponents, it did not convince them. Science took over by force, not by argument (this is especially true of the former colonies where science and the religion of brotherly love were introduced as a matter of course, and without consulting, or arguing with, the inhabitants). Today we realise that rationalism, being bound to science, cannot give us any assistance in the issue between science and myth and we also know, from inquiries of an entirely different kind, that myths are vastly better than rationalists have dared to admit.' Thus we are now forced to raise the question of the excellence of science. An examination then reveals that science and myth overlap in many ways, that the differences we think we perceive are often local phenomena which may turn into similarities elsewhere and that fundamental discrepancies are results of different aims rather than of different methods trying to reach one and the same 'rational' end (such as, for example, 'progress', or increase of content, or 'growth'). To show the surprising similarities of myth and science, I shall briefly discuss an interesting paper by Robin Horton, entitled 'African Traditional Thought and Western Science'.' Horton examines African mythology and discovers the following features: the quest for theory is a quest for unity underlying apparent complexity. The theory places things in a causal context that is wider than the causal context provided by common sense: both science and myth cap common sense with a theoretical superstructure. There are theories of different degrees of abstraction and they are used in accordance with the different requirements of explanation that arise. Theory construction consists in breaking up objects of common sense and in reuniting the elements in a different way. Theoretical models start from analogy but they gradually move away from the pattern on which the analogy was based. And so on.

Science Bad – AT: Scientific Method

There is no coherent scientific method – it’s impossible to infer working theories from facts

Feyerabend 99 (Paul, prof of philosophy @ UC Berkeley, “Knowledge, Science and Relativism: Philosophical Papers, Volume 3,” book, p. 183-186, jam)

There exists a more specific argument to defend the exceptional position science has in society today. Put in a nutshell the argument says (1) that science has finally found the correct method for achieving results and (2) that there are many results to prove the excellence of the method. The argument is mistaken - but most attempts to show this lead into a dead end. Methodology has by now become so crowded with empty sophistication that it is extremely difficult to perceive the simple errors at the basis. It is like fighting the hydra - cut off one ugly head, and eight formalizations take its place. In this situation the only answer is superficiality: when sophistication loses content then the only way of keeping in touch with reality is to be crude and superficial. This is what I intend to be. There is a method, says part (l) of the argument. What is it? How does it work? One answer which is no longer as popular as it used to be is that science works by collecting facts and inferring theories from them. The answer is unsatisfactory as theories never follow from facts in the strict logical sense. To say that they may yet be supported by facts assumes a notion of support that (a) does not show this defect and is (b) sufficiently sophisticated to permit us to say to what extent, say, the theory of relativity is supported by the facts. No such notion exists today nor is it likely that it will ever be found (one of the problems is that we need a notion of support in which grey ravens can be said to support 'All ravens are black'). This was realized by conventionalists and transcendental idealists who pointed out that theories shape and order facts and can therefore be retained come what may. They can be retained because the human mind either consciously or unconsciously carried out its ordering function. The trouble with these views is that they assume for the mind what they want to explain for the world, viz. that it works in a regular fashion. There is only one view which overcomes all these difficulties. It was invented twice in the nineteenth century, by Mill, in his immortal essay On Liberty, and by some Darwinists who extended Darwinism to the battle of ideas. This view takes the bull by the horns: theories cannot be justified and their excellence cannot be shown without reference to other theories. We may explain the success of a theory by reference to a more comprehensive theory (we may explain the success of Newton's theory by using the general theory of relativity); and we may explain our preference for it by comparing it with other theories. Such a comparison does not establish the intrinsic excellence of the theory we have chosen. As a matter of fact, the theory we have chosen may be pretty lousy. It may contain contradictions, it may conflict with well-known facts, it may be cumbersome, unclear, ad hoc in decisive places and so on. But it may still be better than any other theory that is available at the time. It may in fact be the best lousy theory there is. Nor are the standards of judgement chosen in an absolute manner. Our sophistication increases with every choice we make, and so do our standards. Standards compete just as theories compete and we choose the standards most appropriate to the historical situation in which the choice occurs. The rejected alternatives (theories; standards; 'facts') are not eliminated. They serve as correctives (after all, we may have made the wrong choice) and they also explain the content of the preferred views (we understand relativity better when we understand the structure of its competitors; we know the full meaning of freedom only if we have an idea of life in a totalitarian state, of its advantages - and there are many advantages - as well as of its disadvantages). Knowledge so conceived is an ocean of alternatives channelled and subdivided by an ocean of standards. It forces our mind to make imaginative choices and thus makes it grow. It makes our mind capable of choosing, imagining, criticizing. Today this view is often connected with the name of Karl Popper. But there are some very decisive differences between Popper and Mill. To start with, Popper developed his view to solve a special problem of epistemology - he wanted to solve 'Hume's problem'. Mill, on the other hand, is interested in conditions favourable to human growth. His epistemology is the result of a certain theory of man, and not the other way around. Also, Popper, being influenced by the Vienna Circle, improves on the logical form of a theory before discussing it while Mill uses every theory in the form in which it occurs in science. Thirdly, Popper's standards of com- parison are rigid and fixed while Mill's standards are permitted to change with the historical situation. Finally, Popper's standards eliminate competi- tors once and for all: theories that are either not falsifiable, or falsifiable and falsified have no place in science. Popper's criteria are clear, unambig- uous, precisely formulated; Mill's criteria are not. This would be an advantage if science itself were clear, unambiguous, and precisely formu- lated. Fortunately, it is not. To start with, no new and revolutionary scientific theory is ever formulated in a manner that permits us to say under what circumstances we must regard it as endangered: many revolutionary theories are unfalsifi- able. Falsifiable versions do exist, but they are hardly ever in agreement with accepted basic statements: every moderately interesting theory is falsified.

Science Bad – AT: Peer Review

No clear standards make peer review useless – anything could get through

Smith 6 (Richard, medical degree from U of Edinburgh, management degree from Stanford, former editor of the British Medical Journal, R Soc Med. April; 99(4): 178–182, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1420798/, JMB, accessed 6-24-11)

My point is that peer review is impossible to define in operational terms (an operational definition is one whereby if 50 of us looked at the same process we could all agree most of the time whether or not it was peer review). Peer review is thus like poetry, love, or justice. But it is something to do with a grant application or a paper being scrutinized by a third party—who is neither the author nor the person making a judgement on whether a grant should be given or a paper published. But who is a peer? Somebody doing exactly the same kind of research (in which case he or she is probably a direct competitor)? Somebody in the same discipline? Somebody who is an expert on methodology? And what is review? Somebody saying `The paper looks all right to me', which is sadly what peer review sometimes seems to be. Or somebody pouring all over the paper, asking for raw data, repeating analyses, checking all the references, and making detailed suggestions for improvement? Such a review is vanishingly rare. What is clear is that the forms of peer review are protean. Probably the systems of every journal and every grant giving body are different in at least some detail; and some systems are very different. There may even be some journals using the following classic system. The editor looks at the title of the paper and sends it to two friends whom the editor thinks know something about the subject. If both advise publication the editor sends it to the printers. If both advise against publication the editor rejects the paper. If the reviewers disagree the editor sends it to a third reviewer and does whatever he or she advises. This pastiche—which is not far from systems I have seen used—is little better than tossing a coin, because the level of agreement between reviewers on whether a paper should be published is little better than you'd expect by chance.1 That is why Robbie Fox, the great 20th century editor of the Lancet, who was no admirer of peer review, wondered whether anybody would notice if he were to swap the piles marked `publish' and `reject'. He also joked that the Lancet had a system of throwing a pile of papers down the stairs and publishing those that reached the bottom. When I was editor of the BMJ I was challenged by two of the cleverest researchers in Britain to publish an issue of the journal comprised only of papers that had failed peer review and see if anybody noticed. I wrote back `How do you know I haven't already done it?'

Peer review fails – no better than chance and can’t detect fraud

Smith 6 (Richard, medical degree from U of Edinburgh, management degree from Stanford, former editor of the British Medical Journal, R Soc Med. April; 99(4): 178–182, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1420798/, JMB, accessed 6-24-11)

But does peer review `work' at all? A systematic review of all the available evidence on peer review concluded that `the practice of peer review is based on faith in its effects, rather than on facts'.2 But the answer to the question on whether peer review works depends on the question `What is peer review for?'. One answer is that it is a method to select the best grant applications for funding and the best papers to publish in a journal. It is hard to test this aim because there is no agreed definition of what constitutes a good paper or a good research proposal. Plus what is peer review to be tested against? Chance? Or a much simpler process? Stephen Lock when editor of the BMJ conducted a study in which he alone decided which of a consecutive series of papers submitted to the journal he would publish. He then let the papers go through the usual process. There was little difference between the papers he chose and those selected after the full process of peer review.1 This small study suggests that perhaps you do not need an elaborate process. Maybe a lone editor, thoroughly familiar with what the journal wants and knowledgeable about research methods, would be enough. But it would be a bold journal that stepped aside from the sacred path of peer review. Another answer to the question of what is peer review for is that it is to improve the quality of papers published or research proposals that are funded. The systematic review found little evidence to support this, but again such studies are hampered by the lack of an agreed definition of a good study or a good research proposal. Peer review might also be useful for detecting errors or fraud. At the BMJ we did several studies where we inserted major errors into papers that we then sent to many reviewers.3,4 Nobody ever spotted all of the errors. Some reviewers did not spot any, and most reviewers spotted only about a quarter. Peer review sometimes picks up fraud by chance, but generally it is not a reliable method for detecting fraud because it works on trust. A major question, which I will return to, is whether peer review and journals should cease to work on trust.

Science Bad – AT: Peer Review

Peer review can’t solve fraud

Relman 90 (Arnold S., MD and Editor-in-Chief of the New England Journal of Medicine, West J Med Nov; 153:520-522, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1002603/pdf/westjmed00111-0058.pdf, JMB, accessed 6-24-11)

The peer review process cannot be relied on to detect and rule out fraud. The reason is very simple. Discourse among scientists must be based on a kind of trust. When scientists say, in effect, "This is what we did, and this is what we observed," we have to believe them. The peer review process challenges the soundness of the design, the appropriateness of the methods, the quality of the evidence, the interpretation and analysis, and the conclusions. But if we cannot assume that the authors honestly described what they did and what they observed, then any further discourse is impossible. We cannot monitor the experiments being done; we cannot have a policeman in the laboratory, nor can we ask our colleagues to submit sworn affidavits that they have not lied to us. There must be an assumption of trust, and if scientists have lied about their work, we probably would not know it unless we were there to see what they did. If the fraudulent results are plausible, internally consistent, and not too startling, they usually are not detected by peer review. The fabrication has to be clumsy, careless, or incredible to be recognized or suspected during the review of a manuscript

Science Bad – AT: Falsifiability

Theories don’t need to be falsifiable

Newall 5 (Paul, contributer to the Galilean Library, frequently cited in Wikipedia articles, Sep 22, [www.galilean-library.org/site/index.php/page/index.html/\_/essays/philosophyofscience/anything-goes-feyerabend-and-method-r76] AD: 6-26-11, jam)

Before we look at Feyerabend's argument, it is useful to take a simple example of a reductio at work. If we subscribe to the tenets of dogmatic falsificationism (or else advocate basing our acceptance and rejection of scientific theories on so-called decisive experiments) and suppose Einstein's Special Theory of Relativity to have been a step in the right direction with regard to gaining knowledge of our universe, we find that we run into a problem. Falsificationists do not dispute the historical account of 1905, in which the first response to Einstein's paper noted that his theory had already been refuted by Kaufman's experimental results, published in the Annalen der Physik in that year. The dogmatic falsificationist is thus forced to admit that Einstein should have dismissed his theory as falsified – which, of course, he did not. We are led to the unfortunate position of either arguing that Einstein was irrational (or mistaken, if we wish to be more charitable) in his refusal to give up the special theory (and moreover that we, as good falsificationists, would have rejected it, along with any consequences) – a demand we would probably call absurd – or else accepting that dogmatic falsificationism fails.

Science Bad – A2: Innovation Good

Science restricts innovation and is biased towards status quo knowledge

Stevenson 99 (Ian, U of Virginia School of Medicine, Journal of Scientific Exploration, Vol. 13, No. 2, pp. 266-267 JF)

I believe it is more difficult now than formerly to introduce new ideas and concepts and have them accepted by scientists. I attribute this to the larger number of practicing scientists compared with former times. This larger number of scientists increases the likelihood that one or more of them will make important discoveries. Unfortunately, it also has the disadvantage of presenting a larger mass of scientists resistant to change. “A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it” (Planck, l950, pp. 33–34). To this we may add that death is often not a sufficient facilitator of the acceptance of new ideas. How did science arrive at this condition? It sometimes seems that little has changed since Francis Bacon, who, surveying the world of learning in his time, remarked that “the last thing anyone would be likely to entertain is an unfamiliar thought” (1607/1964, p. 79). Scientists who think for themselves have few defenses against the thought-collective. In principle, peer review of research grant applications and articles submitted to scientific journals should boost their chances of escaping the vigilance of thwarting conservatives. That it does not do so is not news. In 1793 the Royal Society rejected Jenner’s paper on vaccination (Magner, 1992); he published it privately five years later (Jenner, 1798). In the next century anonymous reviewers for the Annalen der Physik refused to publish Helmholtz’s paper on the conservation of energy (Graneau & Graneau, 1993). Readers who wish experimental evidence of the imperfections of peer review can find it in Mahoney’s (1977) study of the influence of personal bias on referee’s judgments of the quality (and hence suitability for publication) of manuscripts submitted to a journal. Horrobin (1990) has gone so far as to stigmatize peer review as a suppressor of innovation.

Science Bad – AT: Sokal Affair

Sokal trivializes critique and can’t provide benefit from his writing

Babich 1 (Babette, Prof of Philosophy @ Fordham U, Philosophy of Science, Van Gogh’s Eyes, and God: Hermeneutic Essays in Honor of Patrick A. HeelanP. 73 JF)

And yet if Sokal’s ST text begins with such tentative disclaimers, his LF text takes an altogether different tone. Here, maliciously indignant, he announces the success of his ST hoax, claiming his right to serve as judge, jury, and executioner of whole disciplines other than his own. Yet nothing could be more obvious than that Sokal fails to understand his own sentences – he seems to regard his disclaimers as the equivalent of protocol statements in co-authored science texts, fatuously pro forma and adjunct to the report of the text as such – nor does he seem to comprehend the point of reflective critique. In essence, Sokal has no sense of the complex nature and range of the kind of things one can do with words. For texts proposed as speculative and critical, drawing the implications assessed in the author’s view as “philosophical and political” are offered for the similar judgment of the reader’s assessment of the same. Such non-assertoric texts do not report fact but invite further reflection; as readings of possibility, they are submitted to question. Such texts are under no compulsion to follow the logic of a physicist, particularly one who does not mean what he says. That is, although Sokal’s text is presented under the aegis of a physicist’s authority (this applies to both ST and LF texts), his ST text does not argue on the basis of authority because it does not argue. Speculative, interpretive texts exceed authorized limits as exactly alternate readings. While meaningful discourse need not (although it may well) observe ordinary patterns of logic, it is a capital if also a paradoxical and inevitably obscure point that philosophical speculation does not always do so. And it is salutary to add that reflection on the fundamental value of logical constructions cannot do so. It is for this reason from Nietzsche to Davidson (never mind Duhem and Quine and scholars of mathematical and formal systems can add other names beyond Gödel and Turing) that a critique of logic and truth cannot be conducted on the ground of logic or truth. It is for this reason that Nietzsche wrote in “tissues” (in aphorisms and patterned discussions, ranging contradictory points in productive tension): “the problem of science,” as Nietzsche put it, “cannot be recognized in the context of science.” This together with Nietzsche’s 20 penchant for inconsistency and explicit self-contradiction, is usually taken to mean all manner of things – not one of them good with respect to Nietzsche’s scientific qualifications – but, in the current context, Nietzsche’s claim is reasonable enough. All it entails is that the problem of science is ineluctably philosophical not scientific. We need to hear from philosophers on the problem of science – not from physicists. And when I say this I am very aware that this claim flies in the face of an old conviction of the very young discipline that is the philosophy of science (a discipline, notably, that did not exist as such in Nietzsche’s day). This is the conviction that to philosophize on science one ought to be a scientist oneself (this is an ideal prerequisite as, however much they may aspire to be regarded on the same level, philosophers of science typically are not scientists). Yet I have argued elsewhere that Nietzsche’s point is not without substance and that to the extent that the scientist Ernst Mach philosophised about Knowledge and Error, as indeed he did, to that same extent, he too, like Ludwik Fleck, was a philosopher. Patrick Heelan’s fine lattice of languages and discourse communities illustrates something of the way one wears such different hats, not simultaneously, and not merely cumulatively – that is: what is phenomenological about it, to borrow Bob Crease’s language, is the aletheic dimension – to use the only word, regrettably Heideggerian, we can have for the intuitively real (phenomenological) but counter-intuitive aspect of any revelation of truth as a occluding focus or emphasis that is always and also concealing or distraction.

The Sokal affair just generates scientific extremism

Nicolescu 6 (Basarab, Universit´e Pierre et Marie Curie, “The Latest on the Sokal Affair: Beyond Three Extremisms” http://arxiv.org/pdf/physics/0601108v1 JF)

Paradoxically, however, the Sokal Aﬀair served to reveal the extent of another form of extremism namely scientist extremism, the mirror-image of religious extremism. Indeed, Sokal’s position was supported by some notable heavyweights including the Nobel Prizewinner Steven Weinberg, who wrote a long article in the New York Review of Books[3]. For Weinberg ”The gulf of misunderstanding between scientists and other intellectuals seems to be at least as wide as when C. P. Snow worried about it three decades ago”. But what is the cause of this “gulf of misunderstanding”? According to Weinberg, one of the essential conditions for the birth of modern science was the severance of the world of physics from the world of culture. Consequently, from that moment on, any interaction between science and culture can only be seen as detrimental. And with this, in one fell swoop, he dismissed as irrelevant the philosophical considerations of the founding fathers of quantum mechanics. To some, Weinberg’s arguments caused some to smart as if from the whiﬀ of the scientism of another century: the appeal to common sense in support the claim about the reality of physical laws, the discovery through physics of the world as it is, the one-to-one correspondence between the laws of physics and objective reality, the hegemony on an intellectual level of the natural science (because we have a clear idea of what it means for a theory to be true or false). However, Weinberg is certainly neither a positivist nor a mechanist. He is without doubt one of the most distinguished physicists of the 20th century and a man of broad culture, and due attention should be paid to his arguments.

Science Bad – AT: Medicine

Medical science fails – 90% is wrong

Scott 11 (Bill, BlogCritics.com, cites medical experts, via Christian Science, June 21, http://christianscience.com/press-room/2011/06/who-knew-that-standing-firm-on-scientific-evidence-could-be-so-controversial/, JMB, accessed 6-26-11)

The March 22 editorial in The Wall Street Journal noted, “The most compelling reason to be worried about comparative effectiveness research is simple. Randomized trials are designed to find average results over large groups of people, but doctors do not treat averages. They care for individuals, and what works for the typical patient may not work for you…” (Randomized controlled trials compare how one group responds to a treatment against how an identical group fares without the treatment.) A June 17 article in The Seattle Times further emphasizes the point: “the committee puts too much emphasis on randomized studies, when they may not be that good—or even exist—and don’t reflect what doctors see in their practices.” More surprising is the recent work, profiled in The Atlantic, of Dr. John Ioannidis, professor of medicine and director of the Stanford Prevention Research Center at the Stanford University School of Medicine. His exhaustive research continues to conclude that trusting the scientific validity of medical studies is often misplaced. Randomized trials are considered the gold standard, yet in different fields of medicine, Ioannidis found 25 percent to be wrong and 80 percent of non-randomized studies were also incorrect. He goes so far in the article as to note, “as much as 90% of the published medical information that doctors rely on is flawed.” Dr. Ioannidis is one of the world’s foremost experts on the credibility of medical research. Clifford Saron, a neuroscientist at the University of California at Davis, is quoted in this month’s Atlantic as saying: “We have to be careful about allowing presumed objective scientific methods to trump all aspects of human experience.”

Medicine is part of a regime of knowledge construction limited by the regime of truth in science

Cambell 9 (Nancy, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-23-2011, lido)

To focus attention on social inequality, feminists tend to emphasize that social construction is real in its material effects: “In developing a theory of the gendered character of technology, we are inevitably in danger of either adopting an essentialist position that sees technology as inherently patriarchal, or losing sight of the structure of gender relations through an emphasis on the historical variability of the categories of ‘women’ and ‘technology.’”5 Within STS, science and medicine comprise a “domain in which a host of political problems can get worked out—the nature of social justice, the limits and possibilities of citizenship, and the meanings of equality and difference at the biological as well as social levels.”6 Academic constructions of bodily difference and group difference, as well as those that activists put into play, are debated with nearly the same intensity in STS as by feminists. Science and technology, far from being politically neutral, are shown to be part of the conceptual practices of power that sustain the ruling relations.7

\*\*\*Alternative\*\*\*

Science Bad – Alt Solves

Rejecting scientific dogmatism is key in an academic setting to allow for new democratic ways of knowing

Feyerabend 75 (Paul, prof of philosophy @ UC Berkeley, [www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm] AD: 6-25-11, jam)

The way towards this aim is clear. A science that insists on possessing the only correct method and the only acceptable results is ideology and must be separated from the state, and especially from the process of education. One may teach it, but only to those who have decided to make this particular superstition their own. On the other hand, a science that has dropped such totalitarian pretensions is no longer independent and self-contained, and it can be taught in many different combinations (myth and modern cosmology might be one such combination). Of course, every business has the right to demand that its practitioners be prepared in a special way, and it may even demand acceptance of a certain ideology (I for one am against the thinning out of subjects so that they become more and more similar to each other; whoever does not like present-day Catholicism should leave it and become a Protestant, or an Atheist, instead of ruining it by such inane changes as mass in the vernacular). That is true of physics, just as it is true of religion, or of prostitution. But such special ideologies, such special skills have no room in the process of general education that prepares a citizen for his role in society. A mature citizen is not a man who has been instructed in a special ideology, such as Puritanism, or critical rationalism, and who now carries this ideology with him like a mental tumour, a mature citizen is a person who has learned how to make up his mind and who has then decided in favour of what he thinks suits him best. He is a person who has a certain mental toughness (he does not fall for the first ideological street singer he happens to meet) and who is therefore able consciously to choose the business that seems to be most attractive to him rather than being swallowed by it. To prepare himself for his choice he will study the major ideologies as historical phenomena, he will study science as a historical phenomenon and not as the one and only sensible way of approaching a problem. He will study it together with other fairy-tales such as the myths of 'primitive' societies so that he has the information needed for arriving at a free decision. An essential part of a general education of this kind is acquaintance with the most outstanding propagandists in all fields, so that the pupil can build up his resistance against all propaganda, including the propaganda called 'argument'. It is only after such a hardening procedure that he will be called upon to make up his mind on the issue rationalism-irrationalism, science-myth, science-religion, and so on. His decision in favour of science - assuming he chooses science - will then be much more 'rational' than any decision in favour of science is today. At any rate - science and the schools will be just as carefully separated as religion and the schools are separated today. Scientists will of course participate in governmental decisions, for everyone participates in such decisions. But they will not be given overriding authority. It is the vote of everyone concerned that decides fundamental issues such as the teaching methods used, or the truth of basic beliefs such as the theory of evolution, or the quantum theory, and not the authority of big-shots hiding behind a non-existing methodology. There is no need to fear that such a way of arranging society will lead to undesirable results. Science itself uses the method of ballot, discussion, vote, thou-h without a clear grasp of its mechanism, and in a heavily biased way. But the rationality of our beliefs will certainly be considerably increased.

Science Bad – Alt Solves

The alternative is to democratize science by contesting expert knowledge in public discourse

McCormick 7 (Sabrina, Robert Wood Johnson Health & Society Scholar at the University of Pennsylvania, Social Studies of Science Vol. 37.4 August Pg. 610-612 JF)

In order to make science a more democratic forum for development, debate and policy-making, democratizing science movements contest science, critiquing it as biased and politically driven. In many cases, movement activists form alliances with sympathetic experts who then conduct new studies to influence political and scientific discourse. In other cases, they use scientific processes, methods, language, and objects to inform public protest, education, and discourse. Through such contestation and democratization of expert knowledge, normative constraints on what is considered legitimate in science and technology have shifted to make science more accountable to affected populations. In order to theorize and empirically explore how democratizing science movements function in multiple contexts, this paper examines two social movements: the anti-dam movement (ADM) in Brazil and the environmental breast cancer movement (EBCM) in the USA. By examining movement initiation, framing, and tactics, I draw attention to the processes of contesting existing research, generating new research to counter it, and re-framing the debate through technical language. A reciprocal process occurs between science and social movements in which each shapes the other. In the cases at hand, the movements utilize science to gain additional legitimacy and success. In these ways, democratizing science movements inform multiple theories of social movement framing, resource mobilization, and political opportunity. Working with scientists and experts has also served an important role in movement initiation, development and processes of framing. Due to the extensive scientization of society, democratizing science movements can address a broad range of topics. For example, they have focused on uncertainties about the health impacts of nanotechnology, the inadequacies of urban planning schemes, and reduction of point-source pollution. These movements can also have a broad range of goals: social justice, normative change, improved democratic practice, altering public perception, and many others. Democratizing science activism manifests itself in a number of ways: contesting expert knowledge, re-framing science, making political claims, mobilizing scientific resources, and democratizing knowledge production. One of the primary methods of democratizing science movements is to democratize knowledge production through lay/expert collaborations - partnerships between researchers and activists for critiquing existing science or constructing new knowledge. These goals do not mean that local knowledge or lay perspectives are sufficient to create effective research outcomes or policy-making. Instead, they can actually adopt and adapt science to fit their strategies. persists. These two cases demonstrate the central role of science across contexts and subjects of contestation. From a distance, the EBCM and the ADM look entirely different, but they both have a similar focus on contesting, controlling and re-framing expert knowledge. The ADM in Brazil is the only movement of its kind at a national level. It protests the undemocratic government practices that deny corporate accountability and result in the displacement of poor, rural people, with little compensation. The movement has changed the conception of dams from sustainable energy sources to national and international ecological problems (Khagram, 2004). Contesting official codifications of dams to include their social and environmental impacts has been critical to this process. The EBCM is a subset of the larger breast cancer movement that focuses specifically on potential environmental causes of the illness (McCormick et al., 2003). Unlike the broader breast cancer movement that focuses on raising funds to find a cure, the EBCM directs attention to the need to better regulate polluters in order to prevent breast cancer. EBCM activists partner with experts in order to develop this innovative framing of the illness and develop new evidence that supports their argument. Although in different countries, contesting different topics, and composed of very different populations, both the ADM and EBCM find it necessary to contest expert knowledge and construct new research to advance movement goals. The differences between these movements highlight the importance and applicability of this movement framework. Despite the entrenched economic interests against which they struggle, both the ADM and the EBCM use lay knowledge to develop new expert, political, and public discourses about breast cancer and dams. Participants in these movements also assert their rights as citizens of democratic countries to improve participation in policy-making. These movements are only two of the many in which science has been central for contestation and mobilization.

Science Bad – Alt Solves

**We should take local stances of taking down science – only using the personal experience allows us to rethink and decentralize science**

Barton 98 (Angela, “Feminist Science Education,” p. 111-116, Google Books, da: 6-27-2011, lido)

Within the past 5 years, there has been a growing attack on the feminist notion that the personal is political (Giroux, 1992; Mercer, 1990; Ruther­ford, 1990). Giroux (1992) summarizes much of this debate when he writes that "one has to now genuflect before the discourse of "authentic experience" in order to be taken seriously . . . the politics of experience is questionable on any number of grounds" (p. 312). He argues that to accept the authority of experience uncritically is to forget that identity is complex, contradictory, and multilayered. He suggests, further, that using the personal as political results in a form of "confessional poli­tics." Using personal experience to rethink science has been central to my efforts to construct a feminist liberatory science education and to my attempts to "research" my efforts toward those teaching goals. Al­though this route has caused me to share parts of my life with the reader and with my students, I do not see that as "confession." It is not an admission of doing something essentially wrong—an action, thought, or conversation that has denied social justice or social transformation for the "greater good." The personal as political—although a reminder and a source for the deconstruction of our own actions—is neither a pleading for forgiveness nor an admittance of a life of sin. Rather, it is a political declaration that our lives are holistic—that everything we do informs other things and cannot be ignored. It is a way to make clear the power, limits, and partiality that inscribe my own sense of identity in science and in education, my relationships with these institutions and the peo­ple acting within, and my own visions for change. Central to making this work is the process of viewing our experiences with a critical eye. What is the point of rethinking science from our experiences without being critical of them? Science has done this all along; it is objectivist and positivistic. The science community has successfully attempted to depoliticize cultural differences by inserting itself in a power-neutral discourse. The very act of recognizing that our experiences are embed­ded with social values and locations makes our efforts to rethink science inherently political and radical. For me, positionality in feminist libera­tory education is about critically rereading lived experiences and interro­gating science and our experiences through connections to our lives. The stories about the gas laws and the medical cyclotron illustrate how the science grew out of the students' lived experiences. They illustrate that because the students' experiences involved many things besides science, the science the students learned was not confined to traditional scientific concepts and principles, or even processes. In fact, I would argue, a significant piece of using lived experiences to create science is the decentering of science. Science was represented as something that was integrated in messy ways with other things. "Doing science" was part of, but not more important than, everything else that went along with the things the students did, such as family and work activities. One way to think about decentering science is to think about the "fuzzy" borders encountered and also created by the students that separate "science" from other things. Using this argument, it is easier to see how the role of science class was not simply to help the students "do science" but rather to do that which grows out of their questions and experiences. It was not to fit their experiences into science; it was to fit their questioning and critique into their experiences. This distinction is important because it blurs the borders of science in two ways.

\*\*\*Aff Answers\*\*\*

\*Impact Turns\*

Science Good – Impact – General

Even if science has produced bad things, the good of science outweighs

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 19-20, JMB)

I know that science and technology are not just cornucopias pouring gifts out into the world. Scientists not only conceived nuclear weapons; they also took political leaders by the lapels, arguing that their nation - whichever it happened to be - had to have one first. Then they manufactured over 60,000 of them. During the Cold War, scientists in the United States, the Soviet Union, China and other nations were willing to expose their own fellow citizens to radiation - in most cases without their knowledge - to prepare for nuclear war. Physicians in Tuskegee, Alabama, misled a group of veterans into thinking they were receiving medical treatment for their syphilis,when they were the untreated controls. The atrocious cruelties of Nazi doctors are well-known. Our technology has produced thalidomide, CFCs, Agent Orange, nerve gas, pollution of air and water, species extinctions, and industries so powerful they can ruin the climate of the planet. Roughly half the scientists on Earth work at least part-time for the military.While a few scientists are still perceived as outsiders, courageously criticizing the ills of society and providing early warnings of potential technological catastrophes, many are seen as compliant opportunists, or as the willing source of corporate profits and weapons of mass destruction - never mind the long-term consequences. The technological perils that science serves up, its implicit challenge to received wisdom, and its perceived difficulty, are all reasons for some people to mistrust and avoid it. There's a reason people are nervous about science and technology. And so the image of the mad scientist haunts our world - down to the white-coated loonies of Saturday morning children's TV and the plethora of Faustian bargains in popular culture, from the eponymous Dr Faustus himself to Dr Frankenstein, Dr Strangelove, and Jurassic Park. But we can't simply conclude that science puts too much power into the hands of morally feeble technologists or corrupt, powercrazed politicians and so decide to get rid of it. Advances in medicine and agriculture have saved vastly more lives than have been lost in all the wars in history.\* Advances in transportation, communication and entertainment have transformed and unified the world. In opinion poll after opinion poll science is rated among the most admired and trusted occupations, despite the misgivings. Thesword of science is double-edged. Its awesome power forces on all of us, including politicians, a new responsibility - more attention to the long-term consequences of technology, a global and transgenerational perspective, an incentive to avoid easy appeals to nationalism and chauvinism.Mistakes are becoming too expensive.

Science knowledge key to avoid destruction

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 33, JMB)

We’ve arranged a global civilization in which most crucial elements profoundly depend upon science and technology. We have also arranged things so that almost no one understands science and technology. This is a prescription for disaster. We might get away with it for a while, but sooner or later this combustible mixture of ignorance and power is going to blow up in our faces.

Science knowledge key to a clear world-view

Wilson 95 (Edward O., prof at Harvard and curator in entomology at the Museum of Comparative Zoology, speech to the convention of the National Association of Scholars, Academic Question, Vol. 8, 6-1, http://hiram-caton.com/documents/Evolution/Science%20and%20ideology.pdf, JMB, accessed 6-26-11)

It follows that the process of discovery, the inner fire of the scientific enterprise, cannot be communicated effectively to the citizen who doesn't already know a substantial amount of science. Only when he possesses some of the content of science can he grasp its living culture. Then he can understand how scientific knowledge is validated and how best to make judgments on his own accord. Graphs and "margins of error" make sense to him. He can explain them to others. Controls, multiple competing hypotheses, and disconfirmation become habits of thought. Accounts of science in newsmagazines are read with an engrained reserve, and scientists are viewed less as savants than as the artists and lucky conjurers they are in fact. Moral-tinged controversies are weighed with close attention to testable reality in the physical world. Of course these abilities are very limited today, and that is why anti-science ideologues and other charlatans get away with so much.

Science Good – Impact – General

Scientific knowledge key to understand the world – it’s objective and key to major problem-solving. Plus, their authors do drugs

Wilson 95 (Edward O., prof at Harvard and curator in entomology at the Museum of Comparative Zoology, speech to the convention of the National Association of Scholars, Academic Question, Vol. 8, 6-1, http://hiram-caton.com/documents/Evolution/Science%20and%20ideology.pdf, JMB, accessed 6-26-11)

Is this triumphalism? Not, I think, in the sense of a mental force impinging on history, art, and ritual. But, blended with technology, science as a way of knowing has already transformed human existence. Being richly self-rewarding and universally distributed, it feeds upon itself and grows exponentially. Scientific knowledge doubles every ten to fifteen years, as measured by articles, new journals, and the number of professional scientists. Understanding based on the new information now reaches into virtually every sphere of human activity and every moral dilemma. One need think only momentarily on nuclear armament, the Green Revolution, genetic engineering, cloning, artificial intelligence, visits to the planets, and human activity as an atmospherealtering force--all changes that have originated or accelerated during the past fifty years--to see where science is taking us. The future, if we are to have one, is increasingly to be in the hands of the scientifically literate, those who at least know what it is all about. There can be no multicultural solution to the genetics of cystic fibrosis; the ozone hole cannot be deconstructed; there is nothing whatsoever relativistic or culturally contextual about the dopamine transporter molecules whose blockage by cocaine gives a rush of euphoria, the kind that leads the constructivist to doubt the objectivity of science.

**Criticizing science is suicidal—it abandons the factual approach necessary to analyze real-life events and policy that shapes them**

**Sokal 0** (Alan, Prof of Physics @ NYU, Economic & Political Weekly 4/8 P. 1300- JF)

It is beyond my competence to comment on the specifically Indian socio-political issues raised in Chadha's most recent article [Chadha 1998:2966-2967]. But I would like to point out a key ambiguity in her use of the word 'science'. Among the causes of "a generation's disenchantment with science", Chadha enumerates the following: "technocratic bias which led to the bulldozing of slums and family planning programmes... the Bhopal gas disaster... the proposal of constructing the Narmada dam". Please note that all of these are public-policy issues concerning the application of scientific knowledge (i e, technology) in specific social situations. Even if we grant that Chadha's view on each of them is correct - and I am perfectly happy to do so- why on earth should that lead anyone to be 'disenchanted' with science as a methodology aimed at acquiring accurate knowledge of the natural and social world? In particular, what support does it provide for 'epistemic relativism'? The answer, quite simply, is none. On the contrary, activists who wish to challenge public policy need a scientific worldview: when opponents of a project argue, for example, that it will have (or will most likely have) deleterious social effects (e g, increasing the inequality in the distribution of wealth), they are making claims about the natural and social world - claims that need be taken seriously only to the extent that there is evidence that the assertions are objectively true. Epistemic relativism, I submit, is suicidal for progressive political movements.

Science Good – Impact – General

Science key to the preservation of the world – science has changed

Sperry 91 (Roger W., Prof of Psychobiology at Caltech, Zygon, 26 no. 2 Je, p. 237-258, “Search for beliefs to live by consistent with science” ebsco, JMB)

With a scientist's faith in empirically verified truth and a long commitment to research in the brain, behavioral, and life sciences, I spent most of my working years accepting the scientific accounts of the nature and origins of life and the universe. If science said that human life is lacking in any ultimate purpose, value, or higher meaning—that we and our world are driven merely by mindless, indifferent physical forces—I was prepared to face this. Like many scientists, I preferred to seek out and confront the truth, however harsh, than to live by false premises and illusory values. The more I learn about the workings of the brain and how it processes information, the stronger becomes my allegiance to the type of truth that receives consistent empirical validation in the outside real world. Nevertheless, without abandoning or compromising scientific principles, I have come around almost full circle today to reject the type of truth science traditionally has stood for, along with its dominant central tenet that everything in our universe, including the human psyche, can be accounted for in terms entirely physical—that science has absolutely no need for recourse to conscious mental or spiritual forces. As a brain scientist, I have come to believe in the reality and power of conscious mental/cognitive entities of the mind or spirit and the indispensability of their causal control for both brain function and its evolution—and that science has been wrong all along in its categorical denial of this. In particular, I take the subjective value-belief system of the brain to be a powerful intrinsic force that, above any other, shapes human culture and the course of affairs in the civilized world. This turnabout in my system of belief began with some changed ideas about consciousness and the fundamental relation of mind to the physical brain. It soon became apparent that if these revised mind-brain concepts were to hold up, they would transform our scientific views of both human and nonhuman nature and of the kinds of forces that control them, with wide-ranging humanistic as well as scientific consequences. Among the many ideologic and value-belief consequences, I could foresee the foundations for a naturalistic "global ethic" for all nations and cultures, based in the neutral universality and credibility of science: an ethic promoting values that would tend to preserve and enhance, instead of destroy, our world. The bottom-line message that emerged said we should be looking to science to save the world, not through more or better technology (which would only stave off and thereby magnify our impending downfall) but, instead, by providing reformed value-belief guidelines to live and govern by. As these and other ramifications began to unfold, I found myself drawn more and more away from the world of the laboratory and split-brain research and toward these more compelling and timely issues. Our experiments to determine whether different mental states are more left or right hemisphere, though still intriguing and productive (Trevarthcn 1990), began to seem less crucial in the light of our worsening global predicament and imperiled future, especially when compared with the new issues being raised by the idea that mental states have an interactive causal role. By the 1970s, this causal view of mind had become the center of a paradigm battle in behavioral science, with a possibility of further spread into all science. Meantime, as more implications continued to unravel, and with the left-right research already well under way, I decided it would be better to shift my top priority in order to concentrate on the issues of consciousness and mental causation. Many people fail to see how a "save the world" strategy derives from a concept of consciousness in relation to brain physiology. The answer, put very simply, goes as follows: The fate of the biosphere will depend on human value priorities, which will depend upon assumptions about human life and its meaning—which the new theory modifies in critical ways. The new view of consciousness radically revises the kinds of beliefs upheld in science about ourselves and the world, with conceptual impacts that reach deeply into religion, science, philosophy, and social priorities in general. Consciousness pervades nearly all aspects of the human enterprise. Everything ever known or felt, seen, heard, believed, imagined, or experienced in any form has to be processed through this universal medium, the conscious mind. Conveyor of all our values, our sense of purpose and meaning, of right and wrong, of beauty, joy, and so on, consciousness is central to all that matters most in life. Any basic revision in its conception, therefore, or in its role, or how it relates to the physical brain or to outside reality is bound to produce sweeping reverberations. An implied answer, for example, to just the one question, "Is consciousness mortal or immortal?" would have repercussions in all dimensions or levels of the social structure. The shift from a noncausal to a causal view of consciousness, asserting that subjective awareness counts and makes a real difference in the physical world, has enormous and far-reaching implications. It abolishes the traditional science-values dichotomy and leads to a new resolution of the old free will-determinism paradox (Deci 1980; Grenander 1983). The very nature and causal influence of belief itself is changed. Subjective belief, in our new theory, is no longer a mere impotent epiphenomenon of brain activity. It becomes a powerful impelling force in its own right. From the standpoint of the brain's functional organization and cognitive processing, one can hardly overrate the commanding, central-control influence of the human belief system as a shaper of both individual and social behavior. What we believe determines what we value, what we choose, how we act, and what we decide in social policy-making. It is no surprise that our current global crises, viewed historically, can be ascribed in no small part to the kinds of religious beliefs that have long prevailed (White 1967). I think human destiny and the fate of our whole biosphere hang critically on the kinds of beliefs and values the next few generations (let us hope, to come) elect to live and be governed by.

Science Good – Impact – Extinction

Science is key to prevent extinction – their relativism justifies a conservative take-over and threatens all of human progress

Berube 11 (Michael, Ph.D. from the U of Virginia, Director of the Institute for the Arts and Humanities at Pennsylvania State U, Winter, [www.democracyjournal.org/19/6789.php?page=5] AD: 6-27-11, jam)

But what of Sokal’s chief post-hoax claim that the academic left’s critiques of science were potentially damaging to the left? That one, alas, has held up very well, for it turns out that the critique of scientific “objectivity” and the insistence on the inevitable “partiality” of knowledge can serve the purposes of climate-change deniers and young-Earth creationists quite nicely. That’s not because there was something fundamentally rotten at the core of philosophical anti-foundationalism (whose leading American exponent, Richard Rorty, remained a progressive Democrat all his life), but it might very well have had something to do with the cloistered nature of the academic left. It was as if we had tacitly assumed, all along, that we were speaking only to one another, so that whenever we championed Jean-François Lyotard’s defense of the “hetereogeneity of language games” and spat on Jürgen Habermas’s ideal of a conversation oriented toward “consensus,” we assumed a strong consensus among us that anyone on the side of heterogeneity was on the side of the angels. But now the climate-change deniers and the young-Earth creationists are coming after the natural scientists, just as I predicted–and they’re using some of the very arguments developed by an academic left that thought it was speaking only to people of like mind. Some standard left arguments, combined with the left-populist distrust of “experts” and “professionals” and assorted high-and-mighty muckety-mucks who think they’re the boss of us, were fashioned by the right into a powerful device for delegitimating scientific research. For example, when Andrew Ross asked in Strange Weather, “How can metaphysical life theories and explanations taken seriously by millions be ignored or excluded by a small group of powerful people called ‘scientists’?,” everyone was supposed to understand that he was referring to alternative medicine, and that his critique of “scientists” was meant to bring power to the people. The countercultural account of “metaphysical life theories” that gives people a sense of dignity in the face of scientific authority sounds good–until one substitutes “astrology” or “homeopathy” or “creationism” (all of which are certainly taken seriously by millions) in its place. The right’s attacks on climate science, mobilizing a public distrust of scientific expertise, eventually led science-studies theorist Bruno Latour to write in Critical Inquiry: Entire Ph.D. programs are still running to make sure that good American kids are learning the hard way that facts are made up, that there is no such thing as natural, unmediated, unbiased access to truth…while dangerous extremists are using the very same argument of social construction to destroy hard-won evidence that could save our lives. Was I wrong to participate in the invention of this field known as science studies? Is it enough to say that we did not really mean what we meant? Why does it burn my tongue to say that global warming is a fact whether you like it or not? Why can’t I simply say that the argument is closed for good?

Their K is the pinnacle of anti-intellectualism – science is key to confronting every societal problem like global warming

Berube 11 (Michael, Ph.D. from the U of Virginia, Director of the Institute for the Arts and Humanities at Pennsylvania State U, Winter, [www.democracyjournal.org/19/6789.php?page=5] AD: 6-27-11, jam)

Why, indeed? Why not say, definitively, that anthropogenic climate change is real, that vaccines do not cause autism, that the Earth revolves around the Sun, and that Adam and Eve did not ride dinosaurs to church? At the close of his “Afterword” to “Transgressing the Boundaries,” Sokal wrote: No wonder most Americans can’t distinguish between science and pseudoscience: their science teachers have never given them any rational grounds for doing so. (Ask an average undergraduate: Is matter composed of atoms? Yes. Why do you think so? The reader can fill in the response.) Is it then any surprise that 36 percent of Americans believe in telepathy, and that 47 percent believe in the creation account of Genesis? It can’t be denied that some science-studies scholars have deliberately tried to blur the distinction between science and pseudoscience. As I noted in Rhetorical Occasions and on my personal blog, British philosopher of science Steve Fuller traveled to Dover, Pennsylvania, in 2005 to testify on behalf of the local school board’s fundamentalist conviction that Intelligent Design is a legitimate science. “The main problem intelligent design theory suffers from at the moment,” Fuller argued, “is a paucity of developers.” Somehow, Fuller managed to miss the point–that there is no way to develop a research program in ID. What is one to do, examine fossils for evidence of God’s fingerprints? So these days, when I talk to my scientist friends, I offer them a deal. I say: I’ll admit that you were right about the potential for science studies to go horribly wrong and give fuel to deeply ignorant and/or reactionary people. And in return, you’ll admit that I was right about the culture wars, and right that the natural sciences would not be held harmless from the right-wing noise machine. And if you’ll go further, and acknowledge that some circumspect, well-informed critiques of actually existing science have merit (such as the criticism that the postwar medicalization of pregnancy and childbirth had some ill effects), I’ll go further too, and acknowledge that many humanists’ critiques of science and reason are neither circumspect nor well-informed. Then perhaps we can get down to the business of how to develop safe, sustainable energy and other social practices that will keep the planet habitable.

Science Good – Impact – AT: Enviro

Reps of nature are not socially constructed because language is only another part of the natural world—science is our ability to examine the world that we exist in

Crist 4 (Eileen, Virginia Tech, Environmental Ethics Vol 26 Spring Pg. 6-7, 9 JF)

While at face value the idea that knowledge is socio-historically situated seems trivially true, probing into the assumptions and repercussions of the “social construction of nature” reveals it to be intellectually narrow and politically unpalatable. Despite a predilection for uncovering the sociocultural roots of representations, constructivists about “nature” and “wilderness” do not deconstruct their own rhetoric and underlying assumptions to consider what fuels the credibility social constructivism musters as a “knowledge/power configuration.” I argue that recent applications of social constructivism to environmentally related issues reflect the recalcitrance of anthropocentrism and buttress the drive to humanize the Earth. As an intellectual looking glass of these trends, constructivism functions as ideology—and it is, as conservation biologist Michael Soule has pointed out, as dangerous to the goals of conservation, preservation, and restoration of natural systems as bulldozers and chainsaws. Another way to make this anti-constructivist point is that the representational structures people work with are derived from the world within which the human species evolved. The composition of language coevolvd as, and with, the emanations and exigencies of the natural world—it is neither an alien installation or a quantum leap beyond nature accomplished by the human brain. It is not as if we have been beamed onto this planet from another dimension and must struggle to represent a nebulous world in “our” terminologies. Rather, such comprehensive ideas and universal preoccupations with truth, goodness, and beauty are integral with the natural universe within which they originated and within which their applications lean. The difference between the typecast alternatives “assigning meaning” and “receiving meaning” is heuristically important in yet another way. Anyone can assign meaning to nature, arbitrarily or to serve whatever purposes or motives. Not everyone is in position to receive meaning from the natural world with equal alacrity or acument. People receive meaning with divergent depth and accuracy according to whether they are equipped with pertinent knowledge, relevant training, prior experience, tuned awareness, passionate interest and attention, breadth of understanding, care, or sufficient self-cultivation.

Science being constructed is something we can overcome—it still allows us to make decisions for good and encounter our world

Demeritt 94 (David, U of British Columbia, Journal of Historical Geography 20.1 P. 31-33 JF)

Just as historic facts are constructed by historians, facts about nature are constructed by natural scientists. With Cronon’s second requirement that environmental history must make ecological sense, he does not enter a privileged realm of truth about nature. Rather he simply requires himself to conform the facts as set down by a second discursive community, ecological science. Ecological discourse has its own particular discursive rules and disciplinary structures that help produce (and police) facts about nature. And at the moment, environmental historians find the politics of truth about nature changing rapidly in ecological discourse. Though facts, history, and nature may have no more concrete claim on us than that they work for us, we can use them all the same. Their constructed nature does not make them any less of a guide to our world as it is and as we want it to be. As long as we agree to live by them, constructed or not, facts history and nature can help explain the world we make for ourselves to ourselves. This process of construct always involves the negotiation of relationships between many different actors, not all of them human. But, a recognition of the discursive construction of knowledge does not preclude making moral choices about the world as we happen to understand it, despite what some environmental historians may fear. Such anti-foundationalism simply undermines exclusive claims to legitimate knowledge about the world, claims that both environmentalists and their political opponents have used entirely too much. In this conversation, we should look to science not as a mirror to nature but as a useful tool for engaging our world critically. Ecology, like every other science, is a discourse with its own particular rules and disciplinary structures that produce representations of nature. These representations involve the exercise of power, and we should treat them as such. This situation does not rule out appropriations of ecological science or other fields of knowledge where they prove useful and convincing. Science can still provide an important way to make our relationships with the world visible to us. These knowledge’s are necessarily perspectival, situated ones, but this fact makes the atmospheric carbon dioxide measurements at Mauna Loa no less important in helping us reevaluate anthropogenic carbon releases.

Science Good – Impact – Genocide

Science stops genocide

Erickson 93 (George, Bachelor of Science and a Doctor of Dental Surgery degree from the U of Minnesota, Humanism Today, vol. 8, p. 63-65, http://www.humanismtoday.org/vol8/erickson.pdf, JMB, accessed 6-25-11)

Jacob Bronowski, Humanist and scientist, will always be remembered by those who saw this gentle man in the stunning British Broadcasting Corporation's series, "The Ascent of Man." Near the end of the series he addressed the criticism that many so wrongly make of science: that it is dehumanizing and responsible for our ills. In that scene, Bronowski slowly walked into an Auschwitz pond until its waters lapped over the tops of his polished shoes. He bent over, reached into the pond and brought up a fistful of verdant, sodden grass. Then, looking up into the cameras, he began: It is said that science will dehumanize people and turn them into numbers. That is false, tragically false. Look for yourself. This is the concentration camp and crematorium at Auschwitz. This is where people were turned into numbers. Into this pond were flushed the ashes of some four million people. And that was not done by gas. It was done by arrogance. It was done by dogma. It was done by ignorance. When people believe that they have absolute knowledge, with no test in reality, this is how they behave.

**Claims that science leads to genocide are political and unfounded**

Willower and Uline 1 (Donald, Penn State U, and Cynthia, Ohio State U, Journal of Education Administration Vol. 39.5 Pg. 463-464 JF)

Burrell and Morgan, however, have a far narrower subject matter. And it is a blatantly partisan one. Burrell, who sees himself as something of a postmodernist-poststructuralist, for instance, charges that ``Modernism is about the death camps . . . even though its apologists seek to distance the likes of Auschwitz from the achievements of modern society based as it is supposedly on critical inquiry. . .'' 􏰣Burrell, 1996, p. 656). Burrell's far fetched charges are based on a political agenda, not on evidence. His feckless views provide a glimpse into the consequences of the doctrine of incommensurability, were it to become widely accepted, namely the substitution of an academic version of a Tower of Babel for critical discourse that appeals to logic and evidence. Our exploration of incommensurability suggests the limitations of that concept which are related to the assessment of ideas, not to their generation. Science is open to all views and concepts. Creation has an anything goes element. Clearly, new ideas are the life blood of inquiry, but equally important is their appraisal. The spirit of genuine scholarship is to craft an idea, and then to subject that creation to as critical an assessment as possible. Small wonder that incommensurability is a favorite of political ideologues and others who do not want their ideas to be examined critically.

Science Good – Impact – Value to Life

Science key to understanding and meaning in the world – their ev doesn’t assume changes in scientific practice

Sperry 94 (Roger W., Prof of Psychobiology at Caltech, Journal of Humanistic Psychology, 283, p. 1-25, adapted from “Holding Course Amid Shifting Paradigms” http://people.uncw.edu/puente/sperry/sperrypapers/80s-90s/283-1994.pdf, JMB, accessed 6-27-11)

Science, over some three hundred years, has proven itself against all rivals to be our most successful and effective means for explaining, understanding and for working in and with the world we live in. More than any other approach, philosophic, religious, mystic, occult, that of secular humanism, or of just plain common sense, science has succeeded in being able to "clear the mystery and show the way" in the realm of the natural world. This same science, however, has insisted that we and the entire universe are driven throughout merely by strictly physical, mindless forces of the most elemental kind. Indifferent, purposeless and fatalistic, these forces govern a cosmos which, by scientific theory, has to be devoid of any higher meaning, values, freedom of choice, or any moral difference. Materialist science has long depicted a stark overall life-view of utter "cosmic meanlnglessness" (Jones, 1965; Provlne, 1988). This ultimate nihilism, taken along with today's mounting apprehensions about the kind of world to which an "age of science" is leading, plus growing questions about the most basic starting assumptions of science (Herman, I960), appear collectively to indeed warrant now some intensive reexamination, not only of the metaphysical assumptions of science, but also Its plain 'physical\* assumptions. Such reexamination in my own case has served only to freshen and further strengthen a conviction that science today, fortified with its changed concepts of consciousness and causation, is now stronger than ever, that science still offers the best available approach to true understanding of the nature and meaning of existence. In the kind of value-belief system upheld by modern science I continue to see 'the best hope for tomorrow's world" and "the key to long-term, high-quality survival". It cannot be overemphasized that I do not refer here to traditional materialist science of the past two centuries, but rather to the new science spawned by the cognitive (consciousness) revolution of the 1970s with its revised principles of emergent, macro, and subjective causation, and embracing reciprocal 'top—down' as well as "below-up' determinism. I presume here also that those new principles have by now gained sufficient ground in other disciplines that they deserve recognition as today's majority mainstream view. In other words, what started as a revolution within a single discipline is presumed to have become a revolution for all science.

Science can access value – no fundamental conflict

Sperry 91 (Roger W., Prof of Psychobiology at Caltech, Zygon, 26 no. 2 Je, p. 237-258, “Search for beliefs to live by consistent with science” ebsco, JMB)

This intermediate outlook, moreover, though based in the worldview and truths of science, no longer clashes with common experience nor with traditional views in the humanities, nor is it incompatible with liberal nondualislic religious belief and values. Subjectivity and the qualitative aspects of reality arc no longer shut out. A sense of higher meaning is provided in the cosmic scheme of things, with rich value and moral directives. In these and other ways, the consciousness revolution has turned around the traditional science-values dichotomy and is thus, in effect, also a values revolution. Further, the scientific about-face on consciousness is one of the few scientific revolutions that also qualifies as a combined ideological revolution, in the sense described by Karl Popper (Popper 1975). The overall outcome is that, for the first time, our most advanced scientific theories need no longer be kept separate from religious values in "mutually exclusive realms" of human thought (Byers 1987; Pugh 1977; Rottschaefer 1987, 1988; Sperry 1988). The most precious and sacred things in life are no longer reduced to subatomic physics or set apart in another, dualistic existence. Transcendent guidelines for judging moral right and wrong are established in terms consistent with mainstream science. Humanity's creator becomes the vast interwoven fabric of all evolving nature. The creative forces and creation itself are inextricably interfused. What is done to one is done to the other, making it immoral, even sacrilegious, to degrade earthly existence or to treat it as only a way station.

Science Good – Impact – Value to Life

Science is a good way to view the world – beautiful and powerful

Wilson 95 (Edward O., prof at Harvard and curator in entomology at the Museum of Comparative Zoology, speech to the convention of the National Association of Scholars, Academic Question, Vol. 8, 6-1, http://hiram-caton.com/documents/Evolution/Science%20and%20ideology.pdf, JMB, accessed 6-26-11)

I hope they nonetheless might agree with me that the nobility of science as a human endeavor was well encapsulated by the physicist Subrahmanyan Chandrasekhar when he used the Icarus metaphor in praise of Sir Arthur Eddington. He said, "Let us see how high we can fly before the sun melts the wax in our wings." And on the appropriateness of the rosette of the National Academy of Sciences, the other NAS, that is splendidly symbolic in this sense: the gold of science is placed solidly in the center, surrounded by the purple of natural philosophy. Members are elected primarily or solely on the basis of objective discoveries they have made, expressible in clear declarative sentences, and not by any ideological test. By science in common parlance is meant natural science, which gathers knowledge of the world as an organized, systematic enterprise and attempts to condense it into testable laws and principles by a wide- ranging and shifting set of methods. The diagnostic features of science that distinguish it from pseudoscience are, first, repeatability: the same phenomenon is sought again, preferably by independent investigation, and the interpretation given it confirmed or discarded by means of novel analysis and experimentation. And second, economy: scientists attempt to abstract the information into the form that is simplest, most easily recalled, and most esthetically pleasing--the combination called elegance--while yielding the largest amount of information with the least amount of effort. Third, mensuration: if something can be properly measured, using universally accepted scales, generalizations about it will be rendered less ambiguous. And fourth and finally, heuristic: the best science stimulates further discovery, often in unpredictable new directions, whose content confirms or modifies the parent formulation. Science is thus not just a profession. Nor is it a delectation of mavens. Nor is it a philosophy. It is a combination of mental operations that has increasingly become the habit of educated peoples. It's a culture of illuminations hit upon by a fortunate turn of history, of uncountable small and large steps, of adjustments to reality during the past four centuries that yielded the most powerful way of knowing about the world ever devised.

Science isn’t anti-spiritual – the wonders of science ARE spiritual

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 37, JMB)

In its encounter with Nature, science invariably elicits a sense of reverence and awe. The very act of understanding is a celebration of joining, merging, even if on a very modest scale, with the magnificence of the Cosmos. And the cumulative worldwide build-up of knowledge over time converts science into something only a little short of a trans-national, transgenerational meta-mind. `Spirit' comes from the Latin word `to breathe'. What we breathe is air, which is certainly matter, however thin. Despite usage to the contrary, there is no necessary implication in the word `spiritual' that we are talking of anything other than matter (including the matter of which the brain is made), or anything outside the realm of science. On occasion, I will feel free to use the word. Science is not only compatible with spirituality; it is a profound source of spirituality. When we recognize our place in an immensity of light years and in the passage of ages, when we grasp the intricacy, beauty and subtlety of life, then that soaring feeling, that sense of elation and humility combined, is surely spiritual. So are our emotions inthe presence of great art or music or literature, or of acts of exemplary selfless courage such as those of Mohandas Gandhi or Martin Luther King Jr. The notion that science and spirituality are somehow mutually exclusive does a disservice to both.

Science Good – Impact – Value to Life

Science increases our ability to pursue our interests and define our value to life

Smith 5 (Steven, University of San Diego, “Legal Scholarship as Resistance to ‘Science’” Pg. 8 JF)

Other scholarship more enthusiastically embraces the scientific, interest-oriented, efficiency vision. It sometimes seems to me, exaggerating slightly, that law school colloquia and especially job talks consist of wave after wave of technically-adept speakers offering some version of game theory or rational choice analysis to support some sciency-looking “model” of how some cubbyhole of life works. Sometimes these models issue directly in policy recommendations for making that area of life run more efficiently– for improving the content or timing of disclosures in real estate transactions, or for construing statutes so as to reduce the inefficiencies of the legislative process. Sometimes the models have no immediate payoff; they seem more designed to contribute to some emerging, scientific understanding of life that, when complete, will presumably allow us to maximize the efficiency with which we pursue and satisfy our interests. Now I have no deep principled objection to these presentations. Sometimes they are interesting, and illuminating. More generally, I have no objection to using science to improve our understanding of the world. I freely admit that I have “interests”– too many of them, probably– and so do my friends and family; and I want to see those interests satisfied as fully as possible. If the proliferation of models will help achieve that goal (about which I admit to some skepticism), then more power to the modelers.

Science isn’t anti-Humanism – only positivism is

Varela 9 (Charles, Scholar in Anthropology, *Science for humanism: the recovery of human agency*. P. 42, google books)

Although it certainly is the case that the traditional Science/Humanism debate has taken the thematic form of Science against Humanism, the historical reason for that fact must now be fully identified. Between the second half of the eighteenth century and the early part of the nineteenth century, science is being conflated with the positivist view of science (Manicas 1987: 7 36: Keat 1971: 3-17). This conflation then becomes institutionalized into the very fabric of the tradition of the Science and Humanism encounter (see its persistence in an eminent serious critic of traditional Science and Humanism, Lemert 1997: 131-46, especially 131-36). Thus, the traditional debate concerning the problem of freedom and determinism has not in fact been between Science and Humanism, but between Positivism and Humanism: and that is why we can now say that the theme of antagonism and defiance is an expression of Positivism against Humanism in the history of the social sciences. In light of this clarification, I can now say that Sahlins' reply. "It's History," to the question as to the contemporary relevance of the "Science and Humanism" debate is right, in one sense; but that is because it is wrong in another. In view of the fact that it is wrong to presume that Humanism has been in a debate with science as it is, that is a realist practice, it thus can be said, and rightfully, that the debate that has been going on, which has been the debate with Positivism, is now "History." However, as I think is clear at this point, that difference makes all the difference. Particularly with respect to the problem of structure and agency, and the competing solutions of the rescuing of freedom from the natural world, the Old Humanist strategy, and the recovery of freedom from the natural world and from culture, the New Humanist strategy.

Science Good – Impact – AT: Calculation Bad

Reductionist science is true because the evidence shows it

**Sagan 97** (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 265-266, JMB)

We hear - for example from the theologian Langdon Gilkey in his Nature, Reality and the Sacred - that the notion of the laws of Nature being everywhere the same is simply a preconception imposed on the Universe by fallible scientists and their social milieu. He longs for other kinds of `knowledge', as valid in their contexts as science is in its. But the order of the Universe is not an assumption; it's an observed fact.We detect the light from distant quasars only because the laws of electromagnetism are the same ten billion light years away as here. The spectra of those quasars are recognizable only because the same chemical elements are present there as here, and because the same laws of quantum mechanics apply. The motionof galaxies around one another follows familiar Newtonian gravity. Gravitational lenses and binary pulsar spin-downs reveal general relativityin the depths of space.We could have lived in a Universe with different laws in every province, but we do not. This fact cannot but elicit feelings of reverence and awe. We might have lived in a Universe in which nothing could be understood by a few simple laws, in which Nature was complex beyond our abilities to understand, in which laws that apply on Earth are invalid on Mars, or in a distant quasar. But the evidence - not the preconceptions, the evidence - proves otherwise. Luckily for us, we live in a Universe in which much can be ,reduced' to a small number of comparatively simple laws of Nature. Otherwise we might have lacked the intellectual capacity and grasp to comprehend the world.

Science no longer reductionist – moved to wholism in the 60s

Sperry 94 (Roger W., Prof of Psychobiology at Caltech, Journal of Humanistic Psychology, 283, p. 1-25, adapted from “Holding Course Amid Shifting Paradigms” http://people.uncw.edu/puente/sperry/sperrypapers/80s-90s/283-1994.pdf, JMB, accessed 6-27-11)

This strong upswell of reductive physicalist thinking, described by philosopher Thomas Nagel (1971) as a "wave of reductionist euphoria", was again, however, to give way to an opposing wave of holism, emergence and "irreducibility" (e.g., Bertalanffy, 1968; Koestler and Smythies, 1969; Laszlo, 1972; Pattee, 1973; Polanyi, 1968; Popper, 1972). This latter wholist movement has continued since to burgeon into an extreme new high that still today is gaining further ground both within and outside science, extending even into cosmology (Harris, 1991), and a -postmodern" theology (Griffin, 1988). This latest mainstream swing from extreme reductionism to an all-time high in wholistic thinking, rather abrupt in terms of historical precedents, poses a key question: "What happened that served to break the 1960's wave of reductionist", and turned it around into a general new all-time high for wholism, a development so marked that today it prompts proposals for a new "science of wholeness" (Herman, 1993)? What turned the "reductionist euphoria" of the 1960s into the current boom in holistic "new sciences"? Also in this same period what prompted the rise of similar antireductionist thinking in a "New Philosophy of Science" (Manicas £ Secord, 1983)? The logical answer, I believe, is found in those same conceptual developments that enabled the revolutionary turnabout with respect to consciousness. The five year period starting from about the mid 1960s thus becomes, in this analysis, a crucial turning point in the history of both the reductionist debate and also that on the mind-body problem. It also will be seen that this same period represents a turning point as well for the fact-value or science-values dichotomy (Edel, 1980), and similarly for the ancient freewill-determinism paradox (Deci, 1980). Further, it is these collective changes that are inferred to have set the stage for the subsequent outburst in the 1970's and '80s proclaiming new paradigms, worldviews, epistemologies, and so on.

Science Good – Impact – AT: Calculation Bad

Science isn’t confined to the lab – reproducibility and knowledge about objects stays the same inside or outside

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

There is in fact a parsimonious explanation that can reconcile local human labor that goes into an experiment with an experiment's ability to tell us something about the entities in the world outside the lab. First, the very fact that an experimental result is reproducible shows that it is not produced by the work done in any particular local setting." The human labour that goes into an experiment only actualizes the potential and structures already existing in nature. As Bhaskar elaborates, the very significance of experiments lies in the fact that they tell us about mechanisms, structures and systems of relations that persist in the object of study even outside the lab when it is not being experimented upon. A strict localism on the lines of Bachelard assumes that our transitive knowledge /practice is the same as the intransitive dimension and exhausts it. Bhaskar correctly points out, experiments 'do not produce its intransitive objects of investigation but only the conditions for their identification.'

Science is only reductionist in instances where the reductionism is true – Newtonian physics proves

**Sagan 97** (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 262-263, JMB)

A related complaint is that science is too simple-minded, too `reductionist'; it naively imagines that in the final accounting there will be only a few laws of Nature - perhaps even rather simple ones - that explain everything, that the exquisite subtlety of the world, all the snow crystals, spiderweb latticework, spiral galaxies, and flashes of human insight can ultimately be `reduced' to such laws. Reductionism seems to pay insufficient respect to the complexity of the Universe. It appears to some as a curious hybrid of arrogance and intellectual laziness. To Isaac Newton - who in the minds of critics of science personifies `single vision' - it looked like a clockwork Universe. Literally. The regular, predictable orbital motions of the planets around the Sun, or the Moon around the Earth, were described to high precision by essentially the same differential equation that predicts the swing of a pendulum or the oscillation of a spring. We have a tendency today to think we occupy some exalted vantage point, and to pity the poor Newtonians for having so limited aworld view. But within certain reasonable limitations, the same harmonic equations that describe clockwork really do describe the motions of astronomical objects throughout the Universe. This is a profound, not a trivial parallelism. Of course, there are no gears in the solar system, and the component parts of the gravitational clockwork do not touch. Planets generally have more complicated motions than pendulums and springs. Also, the clockwork model breaks down in certain circumstances: over very long periods of time, the gravitational tugs of distant worlds - tugs that might seem wholly insignificant over a few orbits - can build up, and some little world can go unexpectedly careening out of its accustomed course. However, something like chaoticmotion is also known in pendulum clocks; if we displace thebob too far from the perpendicular, a wild and ugly motion ensues. But the solar system keeps better time than any mechanical clock, and the whole idea of keeping time comes from the observed motion of the Sun and stars. The astonishing fact is that similar mathematics applies so well to planets and to clocks. It needn't have been this way. We didn't impose it on the Universe. That's the way the Universe is. If this is reductionism, so be it.

Science Good – Impact – AT: Calculation Bad

Atomism inevitable and good – science studies interactions between parts, not just the parts

Heath 92 (Timothy B., U Pittsburg, Journal of the Academy of Marketing Science, Vol. 20, No. 2, p. 107-118, http://business.nmsu.edu/~mhyman/M670\_Articles/Heath\_JAMS\_1992.pdf, JMB, accessed 6-26-11)

In attacking the introspectionistic methods of the 19th-century structuralists, gestalt psychologists made the following observation: The whole is more than the sum of its parts. Humanists invoke this fact to justify a focus on the gestalt and to differentiate themselves from naturalist researchers who purportedly study elements. However, elementarists such as naturalists agree that the whole is more than the sum of its parts. It is the interaction of the parts, whether additive or not that determines the whole. Instead of being less interested in the gestalt, naturalism tries to understand the gestalt by examining the interactions among elements. There are, however, three gestalt-related issues on which humanism and naturalism might differ (1) the independence of pans and wholes. (2) The futility of analyzing parts, and (3) the fragmentability of gestalts. As discussed next, these differences are superficial, especially when considering the relativity of the term gestalt. Pan-Whole Independence Water's freezing point is quite different from that of its oxygen and hydrogen elements. Such emergent properties of the whole may lead some to view the whole as greater than the interaction of its parts and to reject the study of elements. Emergent properties are, however, quite consistent with elementarism. Water's freezing point is explained by the sharing of electrons across molecules as atomic movement slows due to falling temperatures. Further, claiming that the whole is more than the interactions of its parts is difficult to defend since the existence of the whole is isomorphic with the existence of its parts; Eliminating the parts eliminates the whole. Arguing for properties beyond the interactions among parts introduces supernatural concepts such as the soul that are beyond the current discussion. Futility of Analysing Parts One gestaltist argument is that the parts are simply too numerous to be addressed meaningfully in the social sciences. This is commonly cited as a barrier to reductionism. It is, however, not entirely convincing. For example, it would be easy to dismiss interactions among neurotransmitters in the central nervous system as irrelevant to theory and research in consumer behavior. However, such neurophysiology may explain behavioral predispositions underlying compulsive consumption (e.g.. O'Guinn and Faber 1989). Given the success of elementarist physical science in the face of what probably seemed futile at one time, there is little justification for expelling elementarism from the social sciences on grounds of futility. Fragmentability, Relativity, and Philosophy Humanists sometimes advocate studying the gestalt because fragmentation may be impossible without altering the phenomena under study (Rist 1977). But in practice, humanists themselves fragment topics of study since there is actually only one grand gestalt whose scope is prohibitive. This grand gestalt includes interstellar gravitational forces, gluons, world politics, marital squabbles, and so on. Humanists differ from naturalist researchers not because they refuse to fragment, but rather because they fragment less. The implication it that whether a particular study is elementaristic or holistic depends on an individual's perspective. In the eyes of a macroeconomist. humanist consumer researchers may appear elementarist since they do not address the impact of rising interest rates, unemployment, and the money supply. On the other hand, neurophysiologists may see naturalist consumer research as holistic. Compared to the difference in levels of analysis between cultural anthropology and panicle physics, the difference between humanist and naturalist inquiry within consumer research is slight. The purported humanism/naturalism chasm within consumer research is but a small crack on the face of the larger research terrain. The relativity of the term gestalt highlights an important but often overlooked proviso for those trying to compare humanist and naturalist research. Inferring a researcher's philosophy from his/her method is dubious. If a researcher engages in observational studies, it might be tempting to infer that she is a humanist conducting holistic research. However, she may be a naturalist examining what she considers to be a small component of a much larger gestalt. Instead of reflecting an underlying and stable philosophy, the choice of method and level of analysis may be driven by substantive interest. The difference between philosophy and substantive interest parallels the difference between personality trait and situational factor. Regardless of the researcher's philosophy (trait), substantive interest in cultural rituals (situation) will probably require field research and less fragmentation than the study of memory.

Science Good – Impact – Democracy

Science key to democracy – conflict resolution

Ziman 96 (John, emeritus prof of Physics @ U Bristol, Nature, Vol 382, Aug 29, p. 751-754 http://libweb.surrey.ac.uk/library/skills/Science%20and%20Society/SS\_1\_Reading2.pdf, JMB)

Objectivity is what makes science so valuable in society. It is the public guarantee of reliable disinterested knowledge. Science plays a unique role in settling factual disputes. This is not because it is particularly rational or because it necessarily embodies the truth: it is because it has a well-deserved reputation for impartiality on material issues. The complex fabric of democratic society is held together by trust in this objectivity, exercised openly by scientific experts. Without science as an independent arbiter, many social conflicts could be resolved only by reference to political authority or by a direct appeal to force''.

Science key to democracy and exposing fakes

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 46-47, JMB)

The values of science and the values of democracy are concordant, in many cases indistinguishable. Science and democracy began - in their civilized incarnations - in the same time and place, Greece in the seventh and sixth centuries BC. Science confers power on anyone who takes the trouble to learn it (although too many have been systematically prevented from doing so). Science thrives on, indeed requires, the free exchange of ideas; its values are antithetical to secrecy. Science holds to no special vantage points or privileged positions. Both science and democracy encourage unconventional opinions and vigorous debate. Both demand adequate reason, coherent argument, rigorous standards of evidence and honesty. Science is a way to call the bluff of those who only pretend to knowledge. It is a bulwark against mysticism, against superstition, against religion misapplied to where it has no business being. If we're true to its values, it can tell us when we're being lied to. It provides a mid-course correction to our mistakes. The more widespread its language, rules and methods, the better chance we have of preserving what Thomas Jefferson and his colleagues had in mind. But democracy can also be subverted more thoroughly through the products of science than any preindustrial demagogue ever dreamed. Finding the occasional straw of truth awash in a great ocean of confusion and bamboozle requires vigilance, dedication and courage. But if we don't practise these tough habits of thought, we cannot hope to solve the truly serious problems that face us and we risk becoming a nation of suckers, a world of suckers, up for grabs by the next charlatan who saunters along.

Science Good – Impact – Democracy

Criticisms of science and demands to politicize science break down the impartiality of science – destroys democracy

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

Deeper democracy and pluralism in more and more aspects of society is an ideal I share. But I believe that the demand to democratize science, when carried into the realm of justification itself, may end up making science less objective, rather than more. However flawed our contemporary scientific institutions are, they nevertheless allow room for scientists to come together (or at least aspire toward coming together) as a community not based on their sex, race or class, but united in a broadly defined goal - finding truths about the natural world. These institutions are based upon an ethic (however imperfectly adhered to) that demands submission of all claims, regardless of the source, to the toughest empirical tests and critique. Constructivists by and large are suspicious of any such profession of unity of ideas and goals and tend to see them as ideological justification of scientists' bid for power. They would like scientists to be explicit about their 'true' interests (determined by personal identities, interests and histories) and give up 'pretensions' of universalism. This lies at the heart of the demand for discursive democracy, wherein scientists should be free to explicitly invoke their identity-based ideologies and assumptions at all steps of scientific reasoning. Such a demand, I am convinced, will destroy the community of knowers united in an ideal of search for truth and replace it with a Hobbesian war of all ideologies against all others. I believe that the deeper democracy of society that the radical critics of science seek may require that the process of evidential justification in science not be seen as inherently political, and not be democratized if democratization means rooting out 'bad' bias (by whose standards?) and inculcating 'good' bias (by whose standards?). If democratization of science requires 'admitting political considerations as relevant constraints on reasoning . .. and content' as Longino recommends,'" or that science be seen as 'politics by other means,' as Sandra Harding advisesu5 or that science incorporates anarchist values of 'individual liberty, community life and healthy environments' as Sal Restivo urges,'36 then I am afraid such 'democratization' will end up undercutting the grounds for genuine and deeper democracy in our social relations, because the latter requires reliable knowledge of the structures of the world that exist independently of all partial perspectives.

Science Good – Impact – AT: Elitism

Science not technicist – it promotes democracy and accountability

Brown, Professor of Sociology at U Maryland, 98 (Richard Harvey, “Modern Science and Its Critics: Toward a Post-Positivist Legitimization of Science” New Literary History 29.3 (1998) 521-550, Muse, JMB)

A view of science as discourse also provides a partial response to Habermas and others who have criticized science as an ideological force that generates personal alienation and public technicism within society. 60 Less noted, however, is that science also provides a discourse for conflict resolution that is, in principle, available to everyone, a discourse, indeed, that is more embracing than those of many of its critics. For example, as Ezrahi claims, "as a way of justifying public action in a liberal democracy, science exerts a force of its own on the formulation of public actions, by subjecting this formulation to the exacting criteria of scientific validity. Science is a relatively benign ideology, one that facilitates the realization of collective goals and fosters accountability of public officials. It safeguards the public interest by allowing public actions to be alienated from the particular personalities, interests, and shortcomings of the actors. Its efficiency is therefore political rather than technical or technocratic." 61 Such a response challenges critics of science to imagine alternative discourses that would not only give voice to the Other, but would at the same time retain the lingua franca that enables cultural particularism without abandoning civic pluralism and citizenship. Habermas provides only ideal norms for such a discourse, not an outline of its practice. For such an outline, the field theory of science offers a significant model.

Science Good – Impact – AT: Ethics

All human institutions are morally ambiguous (not just science)

**Sagan 97** (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 279-280, JMB)

What realm of human endeavour is not morally ambiguous? Even folk institutions that purport to give us advice on behaviour and ethics seem fraught with contradictions. Consider aphorisms - haste makes waste; yes, but a stitch in time saves nine. Better safe than sorry; but nothing ventured, nothing gained. Where there's smoke, there's fire; but you can't tell a book by its cover. A penny saved is a penny earned; but you can't take it with you. He who hesitates is lost; but fools rush in where angels fear to tread. Two heads are better than one; but too many cooks spoil the broth. There was a time when people planned or justified their actions on the basis of such contradictory platitudes.What is the moral responsibility of the aphorist? Or the Sun-sign astrologer, the Tarot card reader, the tabloid prophet? Or consider the mainstream religions. We are enjoined in Micah to do justly and love mercy; in Exodus we are forbidden to commit murder; in Leviticus we are commanded to love our neighbour as ourselves; and in the Gospels we are urged to love our enemies. Yet think of the rivers of blood spilled by fervent followers of the books in which these well-meaning exhortations are embedded. In Joshua and in the second half of Numbers is celebrated the mass murder of men, women, children, down to the domestic animals in cityafter city across the whole land of Canaan. Jericho is obliterated in a kherem, a `holy war'. The only justification offered for this slaughter is the mass murderers' claim that, in exchange for circumcising their sons and adopting a particular set of rituals, their ancestors were long before promised that this land was their land. Not a hint of self-reproach, not a muttering of patriarchal or divine disquiet at these campaigns of extermination can bedug out of holy scripture. Instead, Joshua `destroyed all that breathed, as the Lord God of Israel commanded' (Joshua, x, 40). And these events are not incidental, but central to the main narrative thrust of the Old Testament. Similar stories of mass murder (and in the case of the Amalekites, genocide) can be found in the books of Saul, Esther, and elsewhere in the Bible, with hardly a pang of moral doubt. It was all, of course, troubling to liberal theologians of a later age. It is properly said that the Devil can `quote Scripture to his purpose'.The Bible is full of so many stories of contradictory moral purpose that every generation can find scriptural justification for nearly any action it proposes, from incest, slavery and mass murder to the most refined love, courage and self-sacrifice. And this moral multiple personality disorder is hardly restricted to Judaism and Christianity. You can find it deep within Islam, the Hindu tradition, indeed nearly all the world's religions. Perhaps then it is not so much scientists as people who are morally ambiguous.

Science Good – Impact – AT: Imperialism

Science is from many groups not just the west

Harding 94 (Sandra, Configurations, da: 6-27-2011, dw: 1994, lido)

The least controversial response is to acknowledge that modern sciences have borrowed from other cultures. Most people are aware of at least a couple of such examples. However, the borrowings have been far more extensive and important than the conventional histories reveal. Modern sciences have been enriched by contributions not only from the so-called complex cultures of China, India, and other east Asian and Islamic societies, but also from the so-called simpler ones of Africa, the pre-Columbian Americas, and others that interacted with the expansion of European cultures. To list just a few examples: Egyptian mystical philosophies and premodern European alchemical traditions were far more useful to the development of sciences in Europe than is suggested by the conventional view that these are only irrational and marginally valuable elements of immature Western sciences. 8 The Greek legacy of scientific and mathematical thought was not only fortuitously [End Page 305] preserved but also developed in Islamic culture, to be claimed by the sciences of the European Renaissance. 9 Furthermore, the identification of Greek culture as European is questionable on several counts. For one thing, the idea of Europe and the social relations that such an idea made possible only came into existence centuries later: some would date the emergence of "Europe" to Charlemagne's achievements; others, to fifteenth-century events. Another point here is that through the spread of Islam, diverse cultures of Africa and Asia can also claim Greek culture as their legacy. 10 Some knowledge traditions that were appropriated and fully integrated into modern sciences are not acknowledged at all. Thus the principles of pre-Columbian agriculture, which provided potatoes for almost every European ecological niche and thereby had a powerful effect on the nutrition and subsequent history of Europe, were subsumed into European science. 11 Mathematical achievements from India and Arabic cultures provide other examples. The magnetic needle, the rudder, gunpowder, and many other technologies useful to Europeans and the advance of their sciences (were these not part of scientific instrumentation?) were borrowed from China. Knowledge of local geographies, geologies, animals, plants, classification schemes, medicines, pharmacologies, agriculture, navigational techniques, and local cultures that formed significant parts of European sciences' picture of nature were provided in part by the knowledge traditions of non-Europeans. ("We took on board a native of the region, and dropped him off six weeks further up the coast," reputedly report voyagers' accounts.) Summarizing the consequences for modern sciences of British imperialism in India, one recent account points out that in effect "India was added as a laboratory to the edifice of modern science." 12 We could [End Page 306] say the same for all of the lands to which the "voyages of discovery" and later colonization projects took the Europeans. 13 Thus modern science already is multicultural, at least in the sense that elements of the knowledge traditions of many different non-European cultures have been incorporated into it. There is nothing unusual about such scientific borrowing: it is evident in the ordinary, everyday borrowing that occurs when scientists revive models, metaphors, procedures, technologies, or other ideas from older European scientific traditions, or when they borrow such elements from the culture outside their laboratories and field stations, or from other contemporary sciences. 14 After all, a major point of professional conferences and international exchange programs, not to mention "keeping up with the literature," is to permit everyone to borrow everyone else's achievements. As we shall shortly see, without such possibilities, sciences wither and lose their creativity. What is at issue here is only the Eurocentric failure to acknowledge the origins and importance to "real science" of these borrowings from non-European cultures, thereby trivializing the achievements of other scientific traditions. To give up this piece of Eurocentrism does not challenge the obvious accomplishments of modern sciences. Every thinking person should be able to accept the claim that modern science is multicultural in this sense. Of course, it is one thing to accept a claim that conflicts with one's own, and quite another to use it to transform one's own thinking. To do the latter would require historians of science and the rest of us to locate our accounts on a global civilizational map, rather than only on the Eurocentric map of Europe that we all learned. There are implications here also for philosophies and social studies of science. For example, the standard contrast of the objectivity, rationality, and progressiveness of modern scientific thought vs. the only-locally-valid, irrational, and backward or primitive thought of other cultures begins to seem less explanatorily useful and, indeed, less accurate after the postcolonial accounts. Whether overtly stated or only discreetly assumed, such contrasts damage our ability not only to appreciate the strengths of other scientific traditions, [End Page 307] but also to grasp what are the real strengths and limitations of modern sciences. These accounts of multicultural origins do not directly challenge the conventional belief that modern sciences uniquely deserve to be designated sciences, however, or that they are universally valid because their cognitive/technical core transcends culture. Other arguments in the postcolonial accounts do.

Science Good – Impact – AT: Freedom

Science key to challenge authority – developing countries prove – relativism stops movements against oppression

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

As a one-time biologist and a feminist from a non-western country, I find the neo-traditionalism condoned, tolerated and, indeed, often celebrated by feminist and postcolonial science critics extremely troubling. It may be appropriate at this point to disclose my personal investment in a defence of scientific rationality. I learned to do science as a young woman in India, received a doctorate in molecular biology and later worked as a science writer in close collaboration with science for people movements in India. I found in science the intellectual resources for rationally questioning - and rejecting - many of the Hindu assumptions regarding caste and gender hierarchies. Indeed, it would be no exaggeration to say that training in modem science marked the beginning of humanism and feminism for me. I cannot consent to the radical deconstructionist theories of science for the simple reason that they completely misdescribe the science I did in the lab, and the science I did on the streets as an activist and a writer in New Delhi, circa mid '70s to the mid '80s. Most progressive intellectuals in the West at the close of the twentieth century have come to see scientific rationality as the 'mantle of those in power, those with authority." But coming from where I come from, I can see the missing half of the dialectic: scientific rationality also contains the resources to challenge those in power, those with authority. The sociological theories of science which see natural science as purely local and context-specific practice contradict the very rationale that made it possible for me to learn modem science while growing up in a small and rather provincial city in Punjab. The entire idea of adopting modem scientific education in non-western countries is premised on a belief in the universality or trans-contextuality of scientific knowledge.13 Social constructivist theories embrace a deep and radical relativism which undercuts all epistemological grounds for transcultural appropriation of the methods, theories and worldview of modem science. These theories reduce the obvious spread of modern science beyond the Western world to an epiphenomenon of the West's imperialism - a sign of the West's cultural hegemony which must be resisted in the name of national liberation, cultural survival and the recovery of the civilizational projects interrupted by colonialism. Framing science as Western cultural imposition on non- Western others undercuts the very rationale of progressive people's science movements in Third World whose primary commitments are not to the nation, but to universal human values of justice and equity; not to cultural survival, but to cultural change that promotes these values; not to a resumption of inherited civilizational projects, but to new futures. These movements are committed, in other words, to an internal critique of local knowledges in the light of the best available and the most humanly accountable values, regardless of the place of origin By treating the best confirmed scientific theories simply as local constructs of the West, no different in their basic logic than the local cultural constructs of the rest (i-e., pre-scientific folk knowledges), constructivists undercut epistemological grounds for the critique of the latter from the vantage point of the former.

Science Good – Impact – AT: Freedom

Enlightenment science is critical to freedom

Blackwell et al. 3 (Judith C., Prof of Sociology at Brock U, *Culture of Prejudice: Arguments in Critical Social Science*, p. 13-14, google books, JMB)

The great majority of people in the Western world have every reason to be grateful that they are alive today rather than in some long-past historical era. An obvious reason is that average living standards in the West are much higher than they were in feudal Europe, ancient Rome, or Victorian England. However, an equally important and perhaps even more compelling reason is that those alive today are the beneficiaries of titanic social struggles that succeeded both in expanding the scope of human freedom and thereby also succeeded, in some measure, in dismantling some aspects of what we call the "culture of prejudice." The culture of prejudice is the antithesis of human freedom and the mortal enemy of human self-realization. It is a system of ideas and values that is rooted in the impulse of some segments of humanity to improve their condition at the expense of other humans, non-human life forms, and the health of the planet. As such, the culture of prejudice is a mainstay of social oppression and exploitation—a fount of selfish and ill-founded judgments and attitudes that are disseminated by the socially privileged and often uncritically accepted by those who are its victims. Its chief function is to discourage the kind of critical, rational thought that might inspire collective action to achieve social justice, human equality, and genuine social progress. In the Western world, the culture of prejudice of five hundred years ago maintained that there was but one legitimate religious authority, the Roman Catholic Church. Four hundred years ago, the idea of the "divine right of kings" was still widespread and democratic ideas were regarded as treasonous. Three hundred years ago, the few parliamentary democracies in existence still limited the right to vote to men with substantial claims to property ownership. Two hundred years ago, chattel slavery'was still a thriving institution in much of the world, including the Western hemisphere. One hundred years ago, in virtually every country in the world, women were still deprived of the right to vote and of many other citizenship rights enjoyed by their fathers, brothers, and husbands. Over the course of the past century, epic struggles have been waged against colonialism, national oppression, sexual oppression, racial oppression, and class exploitation, and the ideas that justified these iniquities are now widely understood to be unacceptable and retrograde. Some progress, it would seem, has been made in replacing "backward" ideas with "enlightened" (or what some choose to call "politically correct") ones.

Objective scientific truth key to justice for marginalized groups

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

Such a collapse has disastrous consequences for the concept of truth. All varieties of constructivism urge science to divorce truth from the world as it exists, and marry it to what we may believe about the world." Such a scenario where truth and reality are made internal to the social context will leave both science and society impoverished, and the worst victims will be precisely those who the constructivists want to stand up for: the dominated groups, people on the margins, especially those in the Third World, who need the findings of modern science to question some of the inegalitarian ideas of their own cultures. Truth, understood more traditionally as a degree of fit between what is said and what is requires the most strenuous defence by all those interested in justice.

Science Good – Impact – AT: Sexism

The alt will fail because they do not question the workings of power through a feminist critical viewpoint – the roots of power will still remain unless undone.

Cambell 9 (Nancy, Fronteirs: A journal of womens studies, vol 30, 2009, p. 1-29, Muse, da: 6-23-2011, lido)

Recently, an explicitly normative and even prescriptive “reconstructivist” agenda has emerged within Science and Technology Studies. Proponents argued for rapprochement between the academic and activist wings of the field in a reconstructivist manifesto appearing in the flagship journal Social Studies of Science under the title “Science Studies and Activism: Possibilities and Problems for Reconstructivist Agendas.”8 Urging scholars to take up positions of thoughtful partisanship based on a normative—even activist— stance on the inclusion of relevant communities in the making of technoscience, the authors acknowledged that everyone involved in or implicated by technoscientific enterprises faces certain perennial problems. These include uncertainty, disagreement, and ongoing social conflict, all of which inevitably permeate the social construction of technology. Instead of turning to a strategy of false neutrality, the reconstructivists believe that the inherent partisanship of technological decision making and scientific prioritizing should be much more openly acknowledged than it currently is. Explicitly siding with what they call the “have-nots” in opposition to “government, business, and technoscientific elites,”9 reconstructivist Edward J. Woodhouse laid out conceptual guidelines for a multipartisan science that share a deep resonance with what feminist standpoint theorists have been arguing for—but reconstructivists lack the language developed in feminist epistemology. Based in a political science tradition that emphasizes inequality because it negatively affects the “intelligence of democracy,”10 reconstructivists adopted the modest goal of simply expanding the discursive space for “creative constructionists” within their own field. They did not rule out strategic alliances but simply sought to expand the discursive space for their project within interdisciplinary STS. They did not peer deeply into the constitution of “have-nots” or “elites,” although when pressed they might well reply that the maldistribution of the costs and benefits of technoscience occurs along various axes of difference including, but not limited to, race, class, and gender in much the same way that feminists might. However, multiple categories of difference remain un- or underspoken in reconstructivist thought. Thus, despite the basic convergence between feminist and reconstructivist thought, feminists are likely to have difficulty hearing the reconstructivists because of their tendency to speak in general rather than specific terms. The reconstructivist tendency to speak in terms of generality rather than specificity arises from the attempt to make a case that applies to everyone anywhere. This universalizing tendency can be glimpsed in the list of the tenets of reconstructivism shown in Figure 1, which reflects a major current of reconstructivist thought on incentivizing the production of more relevant social science and more usable knowledge.11

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Privileging female or non-western viewpoints legitimates oppressive stereotypes

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

I am especially concerned with the exhaustion of ideology-critique in contemporary feminist and postcolonial writings on science and society. These critics have turned their backs on the earlier science-for-the-people initiatives that used the findings of modern science to critique the false and inadequate knowledge that legitimizes the existing social hierarchies. They have instead turned their critical tools on modem science itself in an attempt to expose science's own unacknowledged social values and ideologies. Having found Western, patriarchal and capitalist assumptions going 'all the way down' into the very logic of modern science, the only alternative these critics can consistently support is that of a multicultural collage of 'ethnosciences' or 'situated knowledges' justified by the worldviews and interests of women (for feminists), the non-West (for post-colonials) or non-Western women (for post-colonial and multicultural feminists). But given that neither 'women,' the 'non-West' nor 'non- Western women' make up uniform categories, situated knowledges end up privileging the most hackneyed stereotypes of feminine ways of knowing and the 'wisdom' of non-western traditions over scientific methods of inquiry. What gets lost in this discursive affirmative action is a critical appraisal of these parochial, localized perspectives, many of which are deeply implicated in legitimizing age-old oppressions."

Science Good – Impact – AT: Sexism

Objectivity possible - humans can act in disinterested ways

Klein 93 (E.R, assistant prof of philosophy @ U of North Florida, Jacksonville, Fall, [www.reasonpapers.com/pdf/18/rp\_18\_5.pdf] AD: 6-27-11, jam)

Some feminist critics of science and scientific methodology do address the concept of objectivity in its more sophisticated form-via the notion of a disinterested or unbiased stance-while still claiming that the classical concept is sexist. Two different kinds of criticisms are offered. The first focuses on the hermeneutical rendering of the texts of science as androcentric; the second focuses on the claim that "humans can- not be impartial or objective recorders of the world."Ig Both are problematic. 1. The hermeneutical fallacy. The first kind of criticism focuses on the fact that objectivity has been genderized male, while subjectivity has been genderized female. Such genderization is obvious (to many feminists) from a number of avenues: feminist historical interpretation, literary criticism, and psychoanal- ysis, just to name a few. It is stated that there are ways to " 'read science as a text' [which] reveal the social meanings-the hidden symbolic and cul- tural agendas-of purportedly [disinterested120 claims and practices."2\* This "reading" of text has demonstrated (to feminists) that science is "inextricably connected with specific masculine . . . needs and desires.'= This kind of hermeneutical evidence is illegitimate because it presupposes precisely what is being challenged, namely, that the concept of 'disinterested stance' is itself male-biased. To simply adopt an androcenuic interpretation without offering some justification for such an adoption is to beg the question. 2 No such thing as objectivity. The hermeneutical "reason" is not the only justification feminist critics supply for rejecting the classical notion of objectivity. Their other, stronger claim is that we can never act in a dis- interested way. Why not? Is this a fact of human psychology or the logical/epistemo- logical outcome of the fact that there is no disinterested stance to be had? a The psychological point. If feminist critics mean the former, then their claim-that "human beings can never act in a disinterested way"-is in the same kind of trouble that surrounds the psychological egoist's claim that "human beings can never act except in their own best interest." As an empirical thesis, the egoist's claim is either false (e.g., Mother Theresa) or unfalsifiable. The argument against the claim that "human beings can never act in a disinterested way" follows suit- as an empirical thesis, it is either false (e.g., when we rationally decide, not merely arbitrarily choose, which of our students earned an "A") o r unfalsifiable.

Objectivity is inevitable – the alternative retreats from science reinscribing male domination

Klein 93 (E.R, assistant prof of philosophy @ U of North Florida, Jacksonville, Fall, [www.reasonpapers.com/pdf/18/rp\_18\_5.pdf] AD: 6-27-11, jam)

If feminists are relativists, then there are some serious pragmatic problems with which they will have t o contend. With respect to theory choice in science, a feminist (relativistic) scientific method leaves one with the ability to choose evidence o r theory in the one way that classical science condemns-taking seriously criteria other than our reasoned decisions based on evidence. To relativize the warrant- ability of a theory with respect t o personal o r political motivations is to do precisely what we ought not. For feminists to adopt such a negative response t o objectivity misses the spirit of their original intent-to make the sciences less sexist. Their political point is that science has misused its power and has hurt women in the process. However, the ability to say that science has been wrong requires that one forgo relativism and develop an account of science which can take feminist criticism seriously.37 At the very least, this requires one t o be able t o point t o objective evidence-not evidence for feminists or evidence for men, but evidence simpliciter. To make sense of the fact that someone misuses evidence, or brings political and personal desires into play when deciding on the worth of a theory, requires, at some level, a commitment to objectivity. Furthermore, it is important for feminists to realize that insofar as they have been able t o track sexism-make sense of where it is coming from and why--and defend the position that specific men o r specific research projects are sexist, feminists have appealed t o the very same objective criteria which they deny exist o r claim exist only for men. If feminists accept relativism, they must realize that decision making, by their own lights, will be left to either providence o r politics. If they leave decision making to the former, their chances for emancipation are a t best fifty-fifty. If they leave i t to the latter, the odds against a r e even greater. For men hold all the cards. The only hope for this account with respect to theory choice in science is to presuppose a feminist political agenda and then develop those (and only those) scientific theories which are consistent with feminist goals. This may offer political and personal gains, but only a t the cost of trivializing the very position which allowed feminists t o initiate the serious criticism that science is sexist. By presupposing feminist goals, science will remain sexist; it will sease t o be androcentric only because i t will have become gyno centric. Feminists must make peace with the concept of objectivity. This does not mean the acceptance of any specific account of objectivity, only a com- mitment to its underlying spirit-to d o one's best to act in an unbiased way.

Science Good – Impact – Medicine

Science good – medicine proves

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 16-19, JMB)

Hippocrates of Cos is the father of medicine. He is still remembered 2,500 years later for the Hippocratic Oath (a modified form of which is still here and there taken by medical students upon their graduation). But he is chiefly celebrated because of his efforts to bring medicine out of the pall of superstition and into the light of science. In a typical passage Hippocrates wrote: `Men think epilepsy divine, merely because they do not understand it. But if they called everything divine which they do not understand, why, there would be no end of divine things.' Instead of acknowledging that in many areas we are ignorant, we have tended to say things like the Universe is permeated with the ineffable. AGod of the Gaps is assigned responsibility for what we do not yet understand. As knowledge of medicine improved since the fourth century BC, there was more and more that we understood and less and less that had to be attributed to divine intervention - either in the causes or in the treatment of disease. Deaths in childbirth and infant mortality have decreased, lifetimes have lengthened, and medicine has improved the quality of life for billions of us all over the planet. In the diagnosis of disease, Hippocrates introduced elements of the scientific method. He urged careful and meticulous observation: `Leave nothing to chance. Overlook nothing. Combine contradictory observations. Allow yourself enough time.' Before the invention of the thermometer, he charted the temperature curves of many diseases. He recommended that physicians be able to tell, from present symptoms alone, the probable past and future course of each illness. He stressed honesty. He was willing to admit the limitations of the physician's knowledge. He betrayed no embarrassment in confiding to posterity that more than half his patients were killed by the diseases he was treating. His options of course were limited; the drugs available to him were chiefly laxatives, emetics and narcotics. Surgery was performed, and cauterization. Considerable further advances were made in classical times through to the fall of Rome. While medicine in the Islamic world flourished, what followed in Europe was truly a dark age. Much knowledge of anatomy and surgery was lost. Reliance on prayer and miraculous healing abounded. Secular physicians became extinct. Chants, potions, horoscopes and amulets were widely used. Dissections of cadavers were restricted or outlawed, so those who practised medicine were prevented from acquiring first-hand knowledge of the human body. Medical research came to a standstill. It was very like what the historian Edward Gibbon described for the entire Eastern Empire, whose capital was Constantinople: In the revolution of ten centuries, not a single discovery was made to exalt the dignity or promote the happiness of mankind. Not a single idea had been added to the speculative systems of antiquity, and a succession of patient disciples became in their turn the dogmatic teachers of the next servile generation. Even at its best, pre-modern medical practice did not save many. Queen Anne was the last Stuart monarch of Great Britain. In the last seventeen years of the seventeenth century, she was pregnant eighteen times. Onlyfive children were born alive. Only one of them survived infancy. He diedbefore reaching adulthood, and before her coronation in 1702. There seems to be no evidence of some genetic disorder. She had the best medical care money could buy. Diseases that once tragically carried off countless infants and children have been progressively mitigated and cured by science - through the discovery of the microbial world, via the insight that physicians and midwives should wash their hands and sterilize their instruments, through nutrition, public health and sanitation measures, antibiotics, drugs, vaccines, the uncovering of the molecular structure of DNA, molecular biology, and now gene therapy. In the developed world at least, parents today have an enormously better chance of seeing their children live to adulthood than did the heir to the throne of one of the most powerful nations on Earth in the late seventeenth century. Smallpox has been wiped out worldwide. The area of our planet infested with malariacarrying mosquitoes has dramatically shrunk. The number of years a child diagnosed with leukaemia can expect to live has been increasing progressively, year by year. Science permits the Earth to feed about a hundred times more humans, and under conditions much less grim, than it could a few thousand years ago. We can pray over the cholera victim, or we can give her 500 milligrams of tetracycline every twelve hours. (There is still a religion, Christian Science, that denies the germ theory of disease; if prayer fails, the faithful would rather see their children die than give them antibiotics.) We can try nearly futile psychoanalytic talk therapy on the schizophrenic patient, or we can give him 300 to 500 milligrams a day of chlozapine. The scientific treatments are hundreds or thousands of times more effective than the alternatives. (And even when the alternatives seem to work, we don't actually know that they played any role: spontaneous remissions, even of cholera and schizophrenia, can occur without prayer and without psychoanalysis.) Abandoning science means abandoning much more thanair conditioning, CD players, hair dryers and fast cars. In hunter-gatherer, pre-agricultural times, the human life expectancy was about 20 to 30 years. That's also what it was in Western Europe in Late Roman and in Medieval times. It didn't rise to 40 years until around the year 1870. It reached 50 in 1915, 60 in 1930, 70 in 1955, and is today approaching 80 (a little more for women, a little less for men). The rest of the world is retracing the European increment in longevity. What is the cause of this stunning, unprecedented, humanitarian transition? The germ theory of disease, public health measures, medicines and medical technology. Longevity is perhaps the best single measure of the physical quality of life. (If you're dead, there's little you can do to be happy.) This is a precious offering from science to humanity - nothing less than the gift of life.

Science Good – Impact – Growth

Science key to growth

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 46, JMB)

Despite plentiful opportunities for misuse, science can be the golden road out of poverty and backwardness for emerging nations. It makes national economies and the global civilization run. Many nations understand this. It is why so many graduate students in science and engineering at American graduate schools - still the best in the world - are from other countries. The corollary, one that the United States sometimes fails to grasp, is that abandoning science is the road back into poverty and backwardness.

**Extinction**

Bearden 2k (Lieutenant Colonel in the U.S. Army, www.cheniere.org/techpapers/Unnecessary%20Energy%20Crisis.doc) ET

Bluntly, we foresee these factors - and others { } not covered - converging to a catastrophic collapse of the world economy in about eight years. As the collapse of the Western economies nears, one may expect catastrophic stress on the 160 developing nations as the developed nations are forced to dramatically curtail orders. International Strategic Threat Aspects History bears out that desperate nations take desperate actions. Prior to the final economic collapse, the stress on nations will have increased the intensity and number of their conflicts, to the point where the arsenals of weapons of mass destruction (WMD) now possessed by some 25 nations, are almost certain to be released. As an example, suppose a starving North Korea launches nuclear weapons upon Japan and South Korea, including U.S. forces there, in a spasmodic suicidal response. Or suppose a desperate China - whose long range nuclear missiles can reach the United States - attacks Taiwan. In addition to immediate responses, the mutual treaties involved in such scenarios will quickly draw other nations into the conflict, escalating it significantly. Strategic nuclear studies have shown for decades that, under such extreme stress conditions, once a few nukes are launched, adversaries and potential adversaries are then compelled to launch on perception of preparations by one's adversary. The real legacy of the MAD concept is his side of the MAD coin that is almost never discussed. Without effective defense, the only chance a nation has to survive at all, is to launch immediate full-bore pre-emptive strikes and try to take out its perceived foes as rapidly and massively as possible. As the studies showed, rapid escalation to full WMD exchange occurs, with a great percent of the WMD arsenals being unleashed . The resulting great Armageddon will destroy civilization as we know it, and perhaps most of the biosphere, at least for many decades.

Science Good – Impact – Overpopulation

Science good – overpopulation proves

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 19, JMB)

If the world is to escape the direst consequences of global population growth and 10 or 12 billion people on the planet in the late twenty-first century, we must invent safe but more efficient means of growing food - with accompanying seed stocks, irrigation, fertilizers, pesticides, transportation and refrigeration systems. It will also take widely available and acceptable contraception, significant steps toward political equality of women, and improvements in the standards of living of the poorest people. How can all this be accomplished without science and technology?

Extinction

Daily Mail 10 (6-19, http://www.dailymail.co.uk/sciencetech/article-1287643/Human-race-extinct-100-years-population-explosion.html)

As the scientist who helped eradicate smallpox he certainly know a thing or two about extinction. And now Professor Frank Fenner, emeritus professor of microbiology at the Australian National University, has predicted that the human race will be extinct within the next 100 years. He has claimed that the human race will be unable to survive a population explosion and 'unbridled consumption.’ Fenner told The Australian newspaper that 'homo sapiens will become extinct, perhaps within 100 years.'

Science Good – Self-Correcting

Science is self-correcting – continual skepticism allows improvement

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 35-36, JMB)

One of the reasons for its success is that science has built-in, errorcorrecting machinery at its very heart. Some may consider this an overbroad characterization, but to me every time we exercise self-criticism, every time we test our ideas against the outside world, we are doing science. When we are self-indulgent and uncritical, when we confuse hopes and facts, we slide into pseudoscience and superstition. Every time a scientific paper presents a bit of data, it's accompanied by an error bar - a quiet but insistent reminder that no knowledge is complete or perfect. It's a calibration of how much we trust what we think we know. If the error bars are small, the accuracy of our empirical knowledge is high; if the error bars are large, then so is the uncertainty in our knowledge. Except in pure mathematics nothing is known for certain (although much is certainly false). Moreover, scientists are usually careful to characterize the veridical status of their attempts to understand the world - ranging from conjectures and hypotheses, which are highly tentative, all the way up to laws of Nature which are repeatedly and systematically confirmed through many interrogations of how the world works. But even laws of Nature are not absolutely certain. There may be new circumstances never before examined - inside black holes, say, or within the electron, or close to the speed of light - where even our vaunted laws of Nature break down and, however valid they may be in ordinary circumstances, need correction. Humans may crave absolute certainty; theymay aspire to it; they may pretend, as partisans of certain religions do, to have attained it. But the history of science - by far the most successful claim to knowledge accessible to humans - teaches that the most we can hope for is successive improvement in our understanding, learning from our mistakes, an asymptotic approach to the Universe, but with the proviso that absolute certainty will always elude us.

Science Good – Self-Correcting

Science self-correcting and valuable

Gleiser 11 (Marcelo, Professor of Natural Philosophy Dartmouth College, npr, Feb 9, http://www.npr.org/blogs/13.7/2011/02/09/133591874/speaking-in-defense-of-science, JMB, accessed 6-25-11)

The danger of taking science too far, as in stating to the world that science has all the answers and can understand it all, is to lose its credibility when findings are doubted, or when "established" theories are supplanted by new ones. Much better is to explain how science goes about creating knowledge through a process of trial and error and constant verification by independent experimental groups. Our scientific knowledge of nature grows through a self-correcting accretion process. New theories emerge through the cracks in old ones. There is drama and beauty in this endeavor, as we struggle to make sense of the world around us. To deny what we've learned is to deny one of the greatest accomplishments of humanity. Our children deserve better than that. To not know is fine. To not want to know is disastrous.

Science self-correcting – new evidence re-shapes philosophical assumptions – research on DNA proves

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

For the science studies scholars and most feminist science critics, the domain of the background assumptions is a network of all social and cultural forces that shape the common sense of an era: there is no line between what is internal to science and what is an external influence. These scholars work with what Ernan McMullin has dubbed 'presumption of unrestricted sociality By and large, those who operate with PUS tend to treat background assumptions themselves as givens which don't change in the light of the new knowledge. Reading social values as constraints on scientific reasoning fails to see the other half of the dialectic: the initial common sense and cultural assumptions that lead scientists to seek some kind of evidence themselves get revised in the light of the evidence. Those theorists who collapse the social context of discovery into all the later stages of research tend to see science as a seamless fabric which is stamped forever by the conditions of its origin. They fail to see that all aspects of scientific inquiry are potentially capable of redesign in the light of knowledge derived from the earlier phase.l13 Recent developments in many disciplines of science-as-we-know-it (that is, without any radical make-over of either the institutions of science or the larger society) provide ample evidence of a constant revision of background conventions, metaphors and philosophical assumptions about our world and life in it. As new empirical findings have revealed new phenomena and structures at successive levels in matter, living organisms and mind-brain relationships, there are signs of a new synthesis between what has been conventionally called reductionism and holism. Understanding of details of mechanisms at one level have led to theories that seek to understand relations between different levels and see how qualitatively new properties emerge through these interactions. Take the case most often cited as the exemplar of reductionist, controlling and patriarchal thinking - the idea of DNA as the 'master molecule,' or the 'central dogma' of transfer of information from DNA to proteins. Almost from the time that DNA structure was discovered, the attempt to understand how it was replicated and translated into proteins involved an understanding of a concert of enzymes and structures involving the entire cell - a far cry from the image of central control and dominance read into the metaphor of 'master molecule' by the critics. Likewise, there was nothing dogmatic about the central dogma of molecular biology: each step of it was subjected to rigorous empirical tests.114This is not to say that science-as-we-know-it is free from social interests and influences: the rush to commercialize processes and products of molecular biology has encouraged a race to decode, manipulate and sell genetic information, often at the cost of a deeper understanding of the physiology of the whole organism. But these interests hardly warrant giving the internal logic of molecular biology a gendered gloss.

Science Good – Self-Correcting

Even if science starts from socially effected choices, the content discovered allows self-correction and challenge to negative cultural norms – key to beat reactionaries

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

But - and this is crucial - I am equally strongly aware of how fundamentally contra-conventional the content of science can be. Scientific practice is culture- and context-bound, but the content of science is not always so. The prevailing paradigm leads a scientific community to selectively pick out a certain (and not any other) natural object/phenomenon from the entirety of the natural order. It is also true that scientists approach this object/phenomenon with time- and context-dependent questions, theory-laden methods and rules of evidence. But the results of scientific inquiry quite often confound the conventions from which we begin. As any self-reflective working scientist can attest, often the methodological conventions, the theoretical postulates and the larger goals of the inquiry are re-evaluated in the light of what we learn about nature starting from our local conventions, goals, and values. Science is simply not so circular and question-begging an affair as social constructivist theories make it out to be, where social conventions determine what we can see and accept as true. Scientific knowledge depends upon social institutions and cultural conventions for its existence but not for its truth. The truth of a belief, as we shall see, is not a matter of internal relations or coherence within a framework of beliefs, but a matter of the relationship of the belief to something else prior to and independent of the framework. And we can arrive at successively approximate descriptions of this relationship through a constant revision and modification of our conceptual categories and theories in the light of newly discovered features of the world. Indeed, it is precisely because the findings of science are a constant threat to the spontaneous consciousness of everyday life sanctified by the authority of culture, that doing and teaching science had a subversive quality in my social milieu. It is the contra-conventional character of science that made it an ally of those of us engaged in an internal critique of some of the inegalitarian elements of our culture. The findings of modern 'Western' science enabled us to show - with empirical evidence that was publicly testable - that no matter what the consensus of the local community is, no matter what the powers-that-be claim, some social values and some facts of nature that these values are informed by, are wrong and must be rejected as false.15 Our project of denaturalizing socially-created, religiously-sanctified inequities (especially of gender and caste) was not different in spirit than that of feminist and other progressive critics of science in the West. But where they see science as an agent of naturalization of social differences, we sought in modem science evidence that the facts of nature were not what they were assumed to be by our community, and that a different social order, in tune with a different understanding of the natural order, was possible. Some would - as indeed, many postmodern/postcolonial critics of modem science, both in India and the West already do - doubtless think of our attempt to challenge the traditional order from the vantage point of 'Western' science as an act of treason against our natal civilization, and consider us 'internal colonizers' bringing the diverse local narratives under the sway of a eurocentric metanarrative. But as long as we could argue that the content of modem science was not 'Western' or Eurocentric in any substantive way, and that it gave us a picture of the natural world that was as true for us in India as it was for the bearer of any culture anywhere on the planet earth, we could defend ourselves against the charges of imperialism. But now, the social constructivist theories that claim that the particular content of scientific knowledge cannot transcend the context of its production have pulled the rug from under our feet. Those of us who believed in science for social revolution are left with no principled defence against the shrill accusations of our cultural nationalists and our fundamentalists, the sophisticated among whom silence us by citing the authority of (the much misunderstood) Kuhn and (only too well understood) Foucault, Rorty and Latour.

Science Good – Self-Correcting

Science good – they don’t assume changes – it’s fixing the problems of science – means the perm solves and makes ethics better

Sperry 94 (Roger W., Prof of Psychobiology at Caltech, Journal of Humanistic Psychology, 283, p. 1-25, adapted from “Holding Course Amid Shifting Paradigms” http://people.uncw.edu/puente/sperry/sperrypapers/80s-90s/283-1994.pdf, JMB, accessed 6-27-11)

Previous inadequacies in the traditional approach of science are still being corrected and remedied at many different levels within the behavioral sciences, for example, the new treatment of mental states has promptly been applied to the animal Bind, bringing a more cognitive or mentalist approach in comparative psychology and ethology (Griffin, 1981), not to mention strengthened "animal rights" concerns. The way was cleared as well for a return movement to so-called "folk" or "commonsense" psychology (impossible under behaviorism), and for today's ascendance of a largely new "cognitive science" encompassing computer science, artificial intelligence (AI) and information theory in conjunction with cognitive psychology and cognitive neuroscience. Many participants in this latter field with backgrounds in physics have sensed the makings of an emerging "new science" that stands in striking contrast to their conventional reductive physicalism. A sound theoretic basis Is now recognized for the cognitive, humanistic, and therapy-centered schools of psychology, proponents of which all through the decades of behaviorism had been obliged to accept second-class rating because they were "not scientific". The new outlook has helped also to strengthen other approaches dependent on introspection such as research on personality, values, motivation, and the like. The bidirectional model for causal explanation has found ready application well beyond psychology in the biological, human, and social sciences, in systems theory, evolutionary theory, and other more remote disciplines including cosmology, philosophy and even theology. Systems theory, for example, since the mid 1960s has become a different entity. Infused now with emergent interaction, down-level causal determinism, and irreducibility of the emergent whole (In principle as well as in practice), all implanted by the same conceptual developments that were necessary to shift conscious experience from its old noncausal into its new causally interactive role. In respect to past inadequacies, the new impacts of greatest interest are those that most directly affect the overall scientific worldview. These include such changes, for example, as help bridge the former 'two cultures' gulf between science and the humanities, especially changes in the treatment of human values and the age-old freewill-determinism paradox. These logically reverse today the long-standing antithesis between science and ethics (Bixenstine, 1976), and enable, for the first time, the logical derivation of science-based or science-consistent moral guidelines (Byers, 1907). Human values are no longer treated as being merely parallel or epiphenomenal to brain function. Subjective values become causally Interactive and thus qualify as legitimate causal constructs, ineliminable for scientific explanation. All the other rich emergent macro phenomena and other higher qualities we customarily value, including the mental, vital and social forces, also are given their due in the new outlook, as well as physics and chemistry. Since the mid-1970s it has become increasingly evident that we are in an entirely new era with respect to values (Edel, 1980) and that the consciousness revolution might equally well be called a "values" revolution Another legendary inadequacy of the standard physicalist was its direct contradiction of the subjective impression of free will, posing the age-old freewill-determinism paradox (Rogers, 1964). Today's mentalist doctrine resolves this old dilemma in a way that preserves both determinism and free-will, but in a modified form (Decl. 1980i Sparry, 1965, 1960). Free-will is maintained, but not, however, with complete freedom from all causation. This would make one's volitional decisions and actions meaningless, based merely on random caprice, unaccountable and with no predictive reliability. This is not what we subjectively experience, nor what we want. What we experience is the ability to carry out, as a rule, what we personally, voluntarily choose, wish, intend or decide to do. This kind of subjective volitional power to determine what we say and do is exactly what the new mentalist theory provides, and thus, moral responsibility is preserved. In conclusion, science today is very different from the science we knew 30 years ago. The change, has little or no effect on the everyday practice, methodology of science, nor on its unequaled potential in the realm of analytic and technologic innovation. The kind of worldview science upholds, however, and scientific descriptions of the conscious self are vastly transformed. The new cosmology of science, no longer incompatible with human values, purpose, or moral responsibility, can now be used for rational debate of social value policies, ethical standards, and guideline principles for world law and justice. Context-dependent principles replace moral absolutes. A premium on evolving quality, not quantity, replaces the "go forth and multiply" growth morality that was adequate 2,000 years ago but in today's kind of world is lethal, even evil. Social priorities emerge that are more realistic and sustainable for today's type of world. The "highest good", no longer derived from mystical, otherworldly, or unproven realms, nor reduced to subatomic physics, works out to be an ever-evolving quality of life and all existence including axiomatically the "rights of the unborn" millions of coming generations. Without going through all the intervening logic, reviewed elsewhere (Sperry, 1972, 1991a), the result, in effect is a new moral compass based in the credibility and neutral universality of science.

\*AT’s\*

Science Good – Alt Fails – Science Inev

Positivism inevitable – key to determine positive or negative benefits

Schrag 92 (Francis, prof, Department of Educational Policy Studies and Department of Philosophy, U of Wisconsin, Madison, Educational Researcher, Vol. 21, No. 5, Jun. - Jul. p. 5-8, “In Defense of Positivist Research Paradigms,” JSTOR, JMB)

Despite the attacks leveled against it then, the positivist paradigm is hard to avoid. Let me generalize from the above examples: Insofar as any research program aspires to enhance educational practice, it must ultimately issue in some policy, way of thinking, conceptual framework, design, strategy, or practice for intervention in the lives of children. At that point, it is incumbent to ask whether the intervention is an improvement on current practice. If the argument is to be persuasive, it must show the superiority of the innovation. To demonstrate that superiority, it will have to provide evidence that compared with current practice the innovation yields more educational value. Where can such evidence come from? It can come from philosophical considerations that support or undermine the innovation regardless of its consequences. Or it can come from data derived from experiments that utilize the educational trial. I see no other alternative.

Alternatives fail – science in the system is inevitable

Barton 98 (Angela, “Feminist Science Education,” p. 111-116, Google Books, da: 6-27-2011, lido)

As Linda talked about her experiences with cooking spaghetti, she began to construct new relationships with and in science. She had thought of her knowledge in the kitchen as "commonsense cooking," but by talking through those ideas and her experiences with a small group of students who shared similar experiences, she began to use her understanding of herself and her spring semester. The students were constructing their own knowledge about the laws, and about what is important when they study them. Their knowledge was generated, at times, in opposition to the hierarchical scientific tradition, which labeled their everyday experiences as unimportant and trivial. The students labeled their experiences with gases as important and as more complex than science could describe. The students (and I) were openly struggling against the power of the dominant culture (in science) claims to truth, to descriptions for the world. I pushed my students to be critical of the texts they were reading, because those texts denied their reality. As Chinosole, one of the professors in Maher's and Tetreault's study of feminist classroom, suggests: We create the knowledge, and just because our creations are not in places where knowledge is held, which is in the textbooks, that doesn't mean we didn't do it. . . .

Generalization inevitable

Schneider 4 (David J., prof of psychology at Rice,The psychology of stereotyping, p. 8, google books, JMB)

Among other things, this dialogue reveals how difficult it is to have a clear .sense of what stereotypes are. As OP consistently reminds us, it is not so clear how stereotypes differ from ordinary generalizations, and it is also not clear that they can or even should he avoided. To give up our capacity to form stereotypes, we would probably have to give up our capacity to generalize, and that is a trade none of us should he willing to make. The ability to generalize is a central, primitive, hard-wired cognitive activity (Schneider. 1\*V.I2).'

Science Good – Alt Fails – Social Constructivism Bad

Social constructivism is a dead-end political philosophy – it “thins out” the world

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

I will contend that anti-realism and relativism are two sides of one basic philosophical fallacy which, following Roy Bhaskar, I call the 'epistemic fallacy or , following Philip Kitcher, IRA or 'Inaccessibility of Reality Argument. The epistemic fallacy consists of assuming that our socially derived conventions have ontological consequences, or that how we know determines (or at least, crucially shapes, or delimits) what exists. The widespread tendency to derive conclusions about reality from our representations of it follows from the basic philosophical assumption that underlies all social constructivist and postmodern thought, namely, that all the reality we can ever really get at is the reality that is internal to our system of representation. Our representations thus constitute reality for us and what falls outside of our representations is relegated to the Kantian noumena, things-in-themselves, which cannot be known. Moreover, because IRA is supposed to apply equally to social reality as well as natural reality, constructivists believe that there is no philosophical difference between natural and social sciences, and that both are equally interpretive. One logical conclusion of this equivalence is that, as John Searle correctly surmises, for constructivists, natural reality (for example, a mountain) is socially constructed in a way that, say, money is socially constructed." In both cases, it is our representations that confer the particular status to a physical entity: our representations make the object real for us. There are various versions of the epistemic fallacy and IRA, but all lead to the same result: thinning out and disempowering reality in relation to socially-situated knowers. Very many features of the world once seen as a result of the world's own determination are seen as projections upon a much thinner world by the powers of the subject. This thinning out and contraction of the world is recommended by constructivists as liberatory, for they seem to believe that it gives human subjects more power to change what they take to be reality, by changing their conceptual schemes and discursive practices. The political dead-ends that such prioritization of discourse has led the academic left into are by now well understood.

Truth about reality is not relative or constructed

**Sokal 0** (Alan, Prof of Physics @ NYU, Economic & Political Weekly 4/8 P. 1299 JF)

First of all, what could be meant by "truth is a social construct"? If I assert it is true that several million native Americans died of disease and starvation during the century following the European invasion, I mean that, as a matter of historical fact, several million native Americans really did die of disease and starvation during the century following the European invasion. If I assert it is true that the planets and comets move (to a high degree of approximation, though not exactly) as predicted by Newtonian mechanics, I mean that they really do move in this way. My assertions are true or false according as they do or do not correspond to historical or physical reality. In particular, their truth or falsity is independent of the beliefs or other characteristics of any individual or social group. Truth - at least for factual assertions about the world - is not 'relative', nor is it 'constructed' by anyone. Of course, perhaps Chadha means only to say that our beliefs about what is true are the result, in part, of a social process. But then why does not she just say so, rather than confusing truths with beliefs?4

Science Good – Alt Fails – K=Totalizing

Criticism of science causes critics to ignores their own underlying philosophy—totalizing binaries and the implicit connection between epistemology and politics

Guillory 2 (John, Prof of English @ NYU, Critical Inquiry Vol. 28.2 Winter 2002 p. 475-476)

The philosophical positions implicit in a given discipline's knowledge-claims are complicated by the status of philosophy itself. Though it is one discipline among many, it has strong historical claims to the position of primus inter pares. Consequently, the resort of the disciplines to epistemological defense is always subject to a kind of oversight by philosophy itself. As an instance of such oversight, one can do no better than a late essay of Althusser's, in which he cross-examines the philosophizing of scientists under the arch but appropriate rubric of "the spontaneous philosophy of the scientists."" Spontaneous philosophy as Althusser defines it is inseparable from scientific practice and stands in relation to it as a kind of ideology, though not an ideology that translates simply into positions on a political spectrum. This ideology has two complexly related components: an internal, which is the scientist's account of scientific practice, and an external, consisting of the specifically political and social commitments of scientists. Althusser is careful not to reduce the internal component to an effect of the external ideology. If there is a "spontaneous philosophy of the scientists," I suggest that the Sokal affair brought to light an analogous "spontaneous philosophy of the critics." Let us acknowledge, if this is still a question for anyone, that science as a practice is never wholly autonomous, that it does not transcend political or social context. But that was not the issue in the Sokal affair. The issue was rather the necessary political implications of realist epistemology, as this is supposed to underlie the practice of science (just as, conversely, antirealist epistemology is assumed in the critique of science). The spontaneous philosophy of the critics consisted not simply in antirealism per se but just as much in the assumption that epistemological positions have a necessary relation to political positions. Sokal hoped to discredit postmodernist discourse by claiming in his Lingua Franca article that realism, so far from entailing an inherently reactionary politics, was the more authentically left position." This strategic repositioning of realism was more challenging than Paul Gross and Norman Levitt's avowedly antileftist polemic, but it also oddly mirrored the axiom long prevalent in the literary academy of a necessary correlation between epistemology and politics. The hoax had the salutary effect of making the "spontaneous" entailments of this axiom very clear, namely, that an antirealist epistemology (alternatively expressed as antifoundationalism or relativism) is a requisite for any progressive politics and, conversely, that realism, foundationalism, or universalism underlie-at the level of the episteme, as it were-all that is regressive in our society. Because these philosophical positions (and their opposites among the scientists) were typically overstated and underargued, they could easily be reduced to caricature, which was quickly disowned on both sides. The scientific realists were only too happy to concede the cultural context of science, just as the cultural antirealists were delighted to concede the reality of the physical world. But if the controversy could have been resolved by displacing speech acts to the register of common sense, it would never have been propelled into the arena of public scandal. Spontaneous philosophy is something more than common sense, if also less than adequate philosophy. It is a discourse that is generated casually, in the context of practice, or urgently, in the context of a legitimation crisis.'3

The negative treats science as an evil monolithic entity—this view is too narrow

Midgley 96 (Mary, senior lecturer @ Newcastle U, Science Studies Vol. 9.2 Pg. 52-53 JF)

The reason why I am raising this point about ‘modernism’ is that it has important consequences for our attitude to science. It means that we really should stop treating ‘science’ as a single monolithic entity, a solid kingdom embattled against rival kingdoms. On the one hand, we should admit freely how much the various sciences differ. Ecology and anthropology are not at all like physics and they don’t have to be. And on the other hand, we should stop treating this solid entity called ‘science’ as an expanding empire that will eventually take over the rest of the intellectual world. These two mistakes have been closely connected, as is clear from the way in which the Unity of Science movement in the United States has devoted itself to asserting Omnicompetence. Both errors, in fact, spring from a single root in our over-narrow, over-monopolistic concept of rationality –a concept which we still draw, essentially, from seventeenth-century philosophers and particularly from Descartes.

Science Good – Alt Fails – Fundamentalist Fill-in

Without science, religious fundamentalism fills in, causing disastrous policies

Center for Inquiry 6 (Endorsed by over 50 prominent scientists and scholars, Nov 14, http://www.centerforinquiry.net/advocacy/declaration\_in\_defense\_of\_science\_and\_secularism/, JMB, accessed 6-25-11)

We are deeply concerned about the ability of the United States to confront the many challenges it faces, both at home and abroad. Our concern has been compounded by the failure exhibited by far too many Americans, including influential decision-makers, to understand the nature of scientific inquiry and the integrity of empirical research. This disdain for science is aggravated by the excessive influence of religious doctrine on our public policies. We are concerned with the resurgence of fundamentalist religions across the nation, and their alliance with political-ideological movements to block science. We are troubled by the persistence of paranormal and occult beliefs, and by the denial of the findings of scientific research. This retreat into mysticism is reinforced by the emergence in universities of “post-modernism,” which undermines the objectivity of science. These disturbing trends can be illustrated by the push for intelligent design (a new name for creationism) and the insistence that it be taught along with evolution. Some 37 states have considered legislation to mandate this. This is both troubling and puzzling since the hypotheses and theories of evolution are central to modern science. The recent federal court decision in the Dover, Pa., case has set back, but not defeated, these efforts. Moreover, the resilience of anti-evolution movements is supported not only by religious dogmatism but also by the abysmal public ignorance of basic scientific principles. Consider these facts: A recent poll by the Pew Research Center revealed that 64% of Americans are open to the idea of teaching intelligent design or creationism in public schools. Some 42% totally reject evolution or believe that present forms of life existed since the beginning of time. 38% would teach only creationism instead of evolutionary theory. Only 26% agree with the predominant scientific view that life evolved by processes of natural selection without the need for divine intervention. The percentage of individuals who accept the theory of evolution is lower in the United States than in any other developed country, with the exception of Turkey. Recent polls have illustrated other instances of scientific illiteracy: 20% of Americans think that the Sun revolves about the Earth Only 10% know what radiation is Less than one-third can identify DNA as a key to heredity In the U.S., twelfth grade students scored lower than the average of students in 21 other countries in science and math. We think that these dismal facts portend a clear and present danger to the role of science in the U.S. In our view it is not enough to teach specific technical subjects—important as that is—but to convey to the public a general understanding of how science works. This requires both some comprehension of the methods of scientific inquiry and an understanding of the scientific outlook. The cultivation of critical thinking is essential not only for science but also for an educated citizenry—especially if democracy is to flourish Unfortunately, not only do too many well-meaning people base their conceptions of the universe on ancient books—such as the Bible and the Koran—rather than scientific inquiry, but politicians of all parties encourage and abet this scientific ignorance. It is vital that the public be exposed to the scientific perspective, and this presupposes the separation of church and state and public policies that are based on secular principles, not religious doctrine. Yet government legislators and executives permit religion, instead of empirical, scientifically supported evidence, to shape public policy. Consider: Embryonic stem cell research, which promises to deliver revolutionary therapies, has been needlessly impeded by the misguided claim that the embryo and/or the first division of cells in a petri dish (blastocyst) is the equivalent of a human person. This is rooted in a moral-theological doctrine that has no basis in science. The nation spends hundreds of millions of dollars on faith-based programs of unproven efficacy, including ill-advised abstinence-only programs in such areas as drug abuse prevention and sex education, which are more successful at promoting misinformation than abstinence. Abstinence policies are advocated abroad and promotion of condom use rejected, heedless of the danger of AIDS and of the need for wise policies aimed to restrain rapid population growth. Scientific evidence of global warming is dismissed and the destruction of other species on the planet is ignored, driven by the misguided view that the Earth has been given to the human species as its dominion. We cannot hope to convince those in other countries of the dangers of religious fundamentalism when religious fundamentalists influence our policies at home; we cannot hope to convince others that it is wrong to compel women to veil themselves when we deliberately draw a veil over scientific knowledge; we cannot hope to convince others of the follies of sectarianism when we give preferential treatment to religious institutions and practices. A mindset fixed in the Middle Ages cannot possibly hope to meet the challenges of our times. Science transcends borders and provides the most reliable basis for finding solutions to our problems. We maintain that secular, not religious, principles must govern our public policy. This is not an anti-religious viewpoint; it is a scientific viewpoint. To find common ground, we must reason together, and we can do so only if we are willing to put personal religious beliefs aside when we craft public policy

Science Good – Alt Fails – Fundamentalist Fill-in

Science key to stopping ideological takeover which causes destruction

Barbiero 99 (Daniel, Manager, Archives and Records, National Academy of the Sciences, Summer, Issues In Science and Technology, Books, September 11, http://www.issues.org/15.4/br\_barbiero.htm, JMB, accessed 6-25-11)

In the end, does it matter that a handful of academic humanists pretend to a scientific competence they do not have? To the extent that the positions they espouse remain influential, yes. As Sokol and Bricmont point out, the abandonment of clear rigorous thinking and expression can have only negative consequences not only for humanities departments but for the culture at large. But beyond this, the acceptance of radical relativism and the rejection of the goal of objectivity can lead to worse abuses in which ideological standards replace standards of sound reasoning as the criteria against which assertions will be judged valid. As philosopher Paul Boghossian remarks in a thoughtful consideration of the Sokol hoax, that way leads to completely socially determined science and to such destructive madness as Lysenkoism in the Soviet Union and "Aryan science" in Germany. Against this dangerous prospect, Sokol and Bricmont offer an uncompromising defense of science and reason.

Science Good – Alt Fails – Pseudoscience Turn

Science key to combat pseudoscience – Russia proves

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 26, JMB)

Russia is an instructive case. Under the Tsars, religious superstition was encouraged, but scientific and sceptical thinking - except by a few tame scientists - was ruthlessly expunged. Under Communism, both religion and pseudoscience were systematically suppressed - except for the superstition of the state ideological religion. It was advertised as scientific, but fell as far short of this ideal as the most unself-critical mystery cult. Critical thinking - except by scientists in hermetically sealed compartments of knowledge -was recognized as dangerous, was not taught in the schools, and was punished where expressed. As a result, post-Communism, many Russians view science with suspicion. When the lid was lifted, as was also true of virulent ethnic hatreds, what had all along been bubbling subsurface was exposed to view. The region is now awash in UFOs, poltergeists, faith healers, quack medicines, magic waters and old-time superstition. A stunning decline in life expectancy, increasing infant mortality, rampant epidemic disease, subminimal medical standards and ignorance of preventive medicine all work to raise the threshold at which scepticism is triggered in an increasingly desperate population. As I write, the electorally most popular member of the Duma, a leading supporter of the ultranationalist Vladimir Zhirinovsky, is one Anatoly Kashpirovsky - a faith healer who remotely cures diseases ranging from hernias to AIDS by glaring at you out of your television set. His face starts stopped clocks.

**The central criticisms of science can support nonsense because they are founded in generic liberal philosophy that doesn’t need to be well founded**

Economic and Political Weekly 98 (Vol. 33.16. Apr. 18-24 P. 912 “Science and the Progressive Agenda”)

Having established his political and intellectual sympathy with the critics, Sokal promises to 'carry their deep analyses one step further,' by showing that recent developments in quantum gravity substantiate not only postmodern denials of 'objectivity reality' and 'absolute truth' but also lead to a kind of physics that is truly 'liberatory' in the "broadest sense: the transgressing of boundaries, the breaking down of barriers, the radical democratisation of all aspects of social, economic, political and cultural life". The irony - and humour - of the alleged progressive political implications of quantum gravity become apparent when one keeps in mind that quantum gravity is a still speculative theory of space and time on scales of a millionth of a billionth of a billionth of a billionth of a centimetre. As Bruce Robbins, one of the editors of Social Text, later admitted, part of the reason why he and his colleagues agreed to publish Sokal's essay, even though they did not understand the complexities of quantum physics, was because its arguments and conclusions 'dovetailed with postmodern philosophy'. Sokal could not have himself made his case more eloquently: It wasn't the plausibility, validity or even intelligibility of the ideas, but their political valence that decided their acceptability. As long as any idea can be made to appear to advance 'emancipation', 'radical democracy' and of course, 'anti-imperialism' (regardless of what these terms may actually imply), it could be admitted as genuine and radical scholarship. Thus, one of the questions Sokal set out to answer - has acceptability of ideas come to depend upon their political valence - was answered in the affirmative, at least for a small (but highly influential) segment of the radical critics of science. As Sokal has pointed out on many occasions, even though he wrote this parody, he was not the real author at all: the real authors were the leading theorists of postmodernism, feminism and science studies themselves. Indeed, Sokal deconstructed quantum gravity by stringing together extensive and duly attributed quotations from these theorists, used pretty much in the same context as they were by the theorists themselves. This raises important questions about these theories. If, when used as intended (that is, not taken out of context) they can be made to support a purely nonsensical thesis, one cannot but wonder how sound they are in the cases where they are used to support ideas and analyses that are actually meant to tell us something.

Science Good – AT: Feyerabend

Just because science isn’t perfect doesn’t mean that it can’t generate valid empirical conclusions

Sokal and Bricmont 98 (Alan D., prof of mathematics at University College London and prof of physics at New York U, and Jean, Belgian theoretical physicist, philosopher of science and a prof at the Université catholique de Louvain, "Fashionable nonsense: postmodern intellectuals' abuse of science," book, p. 78-82, jam)

We fundamentally agree with what Feyerabend says about the scientific method, considered in the abstract The idea that science can, and should, be run according to fixed and universal rules, is both unrealistic and pernicious. (Feyerabend 1975, p. 295) He criticizes at length the "fixed and universal rules" through which earlier philosophers thought that they could express the essence of the scientific method. As we have said, it is extremely difficult, if not impossible, to codify the scientific method, though this does not prevent the development of certain rules, with a more-or-less general degree of validity, on the basis of previous experience. If Feyerabend had limited himself to showing, through historical examples, the limitations of any general and universal codification of the scientific method, we could only agree with him.100 Unfortunately, he goes much farther All methodologies have their limitations and the only 'rule\* that survives is 'anything goes'. (Feyerabend 1975, p. 296) This is an erroneous inference that is typical of relativist reasoning. Starting from a correct observation—"all methodologies have their limitations"—Feyerabend jumps to a totally false conclusion: "anything goes". There are several ways to swim, and all of them have their limitations, but it is not true that all bodily movements are equally good (if one prefers not to sink). There is no unique method of criminal investigation, but this does not mean that all methods are equally reliable (think about trial by fire). The same is true of scientific methods. In the second edition of his book, Feyerabend tries to defend himself against a literal reading of "anything goes". He writes: A naive anarchist says (a) that both absolute rules and context-dependent rules have their limits and infers (b) that all rules and standards are worthless and should be given up. Most reviewers regard me as a naive anarchist in this sense... [But) while I agree with (a) I do not agree with (b). I argue that all rules have their limits and that there is no comprehensive 'rationality', I do not argue that we should proceed without rules and standards. (Feyerabend 1993, p. 231) The problem is that Feyerabend gives little indication of the content of these "rules and standards"; and unless they are constrained by some notion of rationality, one arrives easily at the most extreme form of relativism. When Feyerabend addresses concrete issues, he frequently mixes reasonable observations with rather bizarre suggestions: (The first step in our criticism of customary concepts and customary reactions is to step outside the circle and either to invent a new conceptual system, for example a new theory, that clashes with the most carefully established observational results and confounds the most plausible theoretical principles, or to import such a system from outside science, from religion, from mythology, from the ideas of incompetents, or the ramblings of madmen. (Feyerabend 1993, pp. 52-53)101 One could defend these assertions by invoking the classical dis-tinction between the context of discovery and the context of justification. Indeed, in the idiosyncratic process of inventing scientific theories, all methods are in principle admissible— deduction, induction, analogy, intuition and even hallucina¬tion102—and the only real criterion is pragmatic. On the other hand, the justification of theories must be rational, even if this rationality cannot be definitively codified. One might be tempted to think that Feyerabend's admittedly extreme exam¬ples concern solely the context of discovery, and that there is thus no real contradiction between his viewpoint and ours. But the problem is that Feyerabend explicitly denies the validity of the distinction between discovery and justification.103 Of course, the sharpness of this distinction was greatly exaggerated in traditional epistemology. We always come back to the same problem: it is naive to believe that there exist general, context-independent rules that allow us to verify or falsify a theory; otherwise put, the context of justification and the con¬text of discovery evolve historically in parallel.1W Nevertheless, at each moment of history, such a distinction exists. If it didn't, the justification of theories would be unconstrained by any con¬siderations of rationality. Let us think again about criminal in¬vestigations: the culprit can be discovered thanks to all sorts of fortuitous events, but the evidence put forward to prove his guilt does not enjoy such a freedom (even if the standards of evidence also evolve historically).1\*

Science Good – AT: Feyerabend

Science can police itself for objectivity

Sokal and Bricmont 98 (Alan D., prof of mathematics at University College London and prof of physics at New York U, and Jean, Belgian theoretical physicist, philosopher of science and a prof at the Université catholique de Louvain, "Fashionable nonsense: postmodern intellectuals' abuse of science," book, p. 82, jam)

Once Feyerabend has made the leap to "anything goes", it Is not surprising that he constantly compares science with mythology or religion, as, for example, in the following passage: Newton reigned for more than 150 years, Einstein briefly introduced a more liberal point of view only to be succeeded by the Copenhagen Interpretation. The similarities between sci¬ence and myth are indeed astonishing. (Feyerabend 1975, p. 298) Here Feyerabend is suggesting that the so-called Copenhagen interpretation of quantum mechanics, due principally to Niels Bohr and Wemer Heisenberg, was accepted by physicists in a rather dogmatic way, which is not entirely false. (It is less clear which point of view of Einstein he is alluding to.) But what Feyerabend does not give are examples of myths that change because experiments contradict them, or that suggest experiments aimed at discriminating between earlier and later versions of the myth. It is only for this reason—which is crucial—that the "similarities between science and myth" are superficial.

The scientific method is inevitable – any other method is useless

Sokal and Bricmont 98 (Alan D., prof of mathematics at University College London and prof of physics at New York U, and Jean, Belgian theoretical physicist, philosopher of science and a prof at the Université catholique de Louvain, "Fashionable nonsense: postmodern intellectuals' abuse of science," book, p. 83-84, jam)

This analogy occurs again when Feyerabend suggests separating Science and the State: While the parents of a six-year-old child can decide to have him instructed in the rudiments of Protestantism, or in the rudiments of the Jewish faith, or to omit religious in¬struction altogether, they do not have a similar freedom in the case of the sciences. Physics, astronomy, history must be learned. They cannot be replaced by magic, astrology, or by a study of legends. Nor is one content with a merely historical presentation of physical (astronomical, historical, etc.) facts and princi¬ples. One does not say: some people believe that the earth moves round the sun while others regard the earth as a hollow sphere that contains the sun, the planets, the fixed stars. One says: the earth moves round the sun—everything else is sheer idiocy. (Feyerabend 1975, p. 301) In this passage Feyerabend reintroduces, in a particularly brutal form, the classical distinction between "facts" and "theories"—a basic tenet of the Vienna Circle epistemology he rejects. At the same time he appears to use implicitly in the social sciences a naively realist epistemology that he rejects for the natural sciences. How, after all, does one find out exactly what "some people believe", if not by using methods analogous to those of the sciences (observations, polls, etc.)? If, in a survey of Americans' astronomical beliefs, the sample were limited to physics professors, there would probably be no one who "regards the earth as a hollow sphere"; but Feyerabend could respond, quite rightly, that the poll was poorly designed and the sampling biased (would he dare say that it is unscientific?). The same goes for an anthropologist who stays in New York and invents in his office the myths of other peoples. But which crite-ria acceptable to Feyerabend would be violated? Doesn't anything go? Feyerabend's methodological relativism, if taken- literally, is so radical that it becomes self-refuting. Without a minimum of (rational) method, even a "merely historical pre¬sentation of facts" becomes impossible.

Science Good – AT: Feyerabend

Indicting science in general isn’t enough – they have to indict our specific scenarios

Sokal and Bricmont 98 (Alan D., prof of mathematics at University College London and prof of physics at New York U, and Jean, Belgian theoretical physicist, philosopher of science and a prof at the Université catholique de Louvain, "Fashionable nonsense: postmodern intellectuals' abuse of science," book, p. 84, jam)

What is striking in Feyerabend's writings is, paradoxically, their abstractness and generality. His arguments show, at best, that science does not progress by following a well-defined method, and with that we basically agree. But Feyerabend never explains in what sense atomic theory or evolution theory might be false, despite all that we know today. And if he does not say that, it is probably because he does not believe it, and shares (at least in part) with most of his colleagues the scientific view of the world, namely that species evolved, that matter is made of atoms, etc. And if he shares those ideas, it is probably because he has good reasons to do so. Why not think about those rea¬sons and try to make them explicit, rather than just repeating over and over again that they are not justifiable by some uni¬versal rules of method? Working case by case, he could show that there are indeed solid empirical arguments supporting those theories. Of course, this may or may not be the kind of question that interests Feyerabend. He often gives the impression that his op¬position to science is not of a cognitive nature but follows rather from a choice of lifestyle, as when he says: "love becomes im¬possible for people who insist on 'objectivity', i.e. who live en¬tirely in accordance with the spirit of science."105 The trouble is that he fails to make a clear distinction between factual judg¬ments and value judgments. He could, for example, maintain that evolution theory is infinitely more plausible than any cre¬ationist myth, but that parents nevertheless have a right to de¬mand that schools teach false theories to their children. We would disagree, but the debate would no longer be purely on the cognitive level, and would involve political and ethical consid¬erations.

Science Good – AT: Feyerabend

Feyerabend’s analysis of expertise is founded on evidence from trials – inappropriate and wrong

Selinger 3 (Evan M., associate prof of Philosophy at Rochester, Critical Review, Summer, Vol. 15, Iss. 3/4, p. 359, “Feyerabend’s Democratic Critique of Expertise” proquest, JMB)

The bulk of Feyerabend's case against experts consists of similarly unfounded arguments for the potential expertise of laypeople. Consider these three passages: Conceited and intimidating scholars, covered with honorary degrees, university chairs, presidents of scientific societies are tripped up by a lawyer who has the talent to look through the most impressive piece of jargon and to expose the uncertainty, indefiniteness, the monumental ignorance behind the most dazzling display of omniscience: science is not beyond the reach of the natural shrewdness of the human race. (Feyerabend 1978, 98, emph. orginal.) That the errors of specialists can be discovered by ordinary people provided they are prepared to "do some hard work" is the basic assumption of trial by jury. The law demands that experts be cross-examined and that their testimony be subjected to the judgment of a jury. (Ibid., 97.) One of the most exhilarating experiences is to see how a lawyer, who is a layman, can find holes in the testimony the technical testimony, of the most advanced expert and thus prepare the jury for its verdict. (Feyerabcnd 1998, 61.) In short, laypeople have a general capacity for detecting and unmasking logical fallacies in experts' arguments The problem with the example of the lawyer developed in the first and third passages, however, is that it neglects the differences between laypeople and lawyers. A lawyer traditionally becomes a skilled cross-examiner not simply because she is willing to "do some hard work," but because she possesses a formally taught ability (obtained through training in law school, mock-trial practice, and courtroom experience) to dissect and refute witnesses' testimony. In treating a lawyer's cross-examination of an expert witness during a trial as a proxy for the abilities of the average layperson to criticize a scientific expert, Feyerabend also overlooks the fact that the aim of a lawyer is not the establishment of scientific truth, but victory in an adversarial legal setting. The same lawyer who may be able to expose fallacies proffered during expert legal testimony, may, when engaging with experts outside of the courtroom (e.g., qua patient with a physician), be less talented in exposing fallacious arguments. A lawyer who attempted to cross-examine his doctor (if the doctor allowed it) might succeed only in embarrassing the "witness"-not necessarily in achieving a more accurate diagnosis. The example of the juror, taken together with the example of the lawyer, is supposed to justify the sweeping claim in Feyerabend's first passage about the accessibility of scientific truth to laypeople. But in reality, jurors do not directly engage with expert witnesses; they simply listen as some experts (scientists) are cross-examined by others (experts in the art of discrediting scientists rhetorically). And when jurors do take on an active role, they prove to be quite incapable of understanding the implications of scientific testimony, or even of performing simple tasks of memory and logic. In punitive-damages cases, for example, a recent study reporting on elaborate experimental data on jury deliberations found that only 5 percent of the jurors . . . remembered and understood the judge's instructions setting out the legal standard for their task, and this ignorance held even when the jurors were provided with memory aids, including various forms of written reminders. . . . Far from making punitive damages awards more rational, [jury] deliberation increased their severity and unpredictability. Moreover, despite painstaking instructions and warnings, civil jurors consistently fell prey to "hindsight bias," by which they saw any accident that did happen as an accident that was waiting to happen. So, for example, when participants in these studies were presented with a fact scenario concerning the operation of a railroad and were asked if they would approve of its continuing operation without further safety precautions, two-thirds of them said "yes." But when they were presented with precisely the same facts, and were then told that an accident had occurred, the same proportion had little trouble concluding that the railroad's decision to operate without taking further precautions had been reckless and therefore warranted the award of punitive damages. Jurors have an ironclad aversion to the use of a formal calculus to make decisions about safety procedures. Any time evidence came to light that a company had performed a cost-benefit analysis in deciding what safety precautions to take in a given circumstance, the level of punitive damages awarded spiked upwards. . . . Cost-benefit analyses are said to demonstrate how depraved corporations "put a price tag on human life.". . . However, neither businesses nor individuals can function without "putting a price tag on human life." Each time we get into a car, step onto an airplane, swim in the ocean, or head to the city, we put a price on human life; we take a risk after either calculating or assuming that it's worth it. To operate in the real world, businesses are forced to make similar calculations concerning the lives of others. If something happens to go wrong, however, the willingness of companies to calculate these risks explicitly is taken by juries as a sign of the moral degeneracy of corporate America. To add insult to injury in these matters . . . the higher the value that a company places on a human life in its cost-benefit calculations, the higher the damages [assessed against the company]. The culprit here is the "anchoring effect" by which the jurors, at sea in their task of attaching a dollar amount to the alleged transgression, grabbed pretty much any number at hand as the base point for their calculations. These numbers include the (legally irrelevant) amount asked for by the plaintiff's attorney (the more he asked for, the more he got), and the (legally irrelevant) level of compensatory damages, as well as the valuation of human life drawn from the company's internal cost-benefit analysis. (Kersch 2003, 124-25.) None of this experimentally derived information, of course, was available to Feyerabend, and conceivably jurors in real-world trials, for Dreyfusian reasons, may suddenly acquire better memories and reasoning faculties than jurors in laboratory experiments. But the experimental evidence is prima facie plausible, and Feyerabend provides no evidence at all to suggest that, on the contrary, jurors tend to be logical, let alone that they tend to be as knowledgeable as experts. What he does instead is treat a democratic political ideal-that of the competent juror-as if it were an empirical reality: "That the errors of specialists can be discovered by ordinary people provided they are prepared to 'do some hard work' is the basic assumption of trial by jury" (Feyeraband 1978, 97, emph. added). But we are given no reason to accept this assumption as having any basis in reality. His politics may also drive Feyerabend's dichotomization of the world into experts (elites) and laypeople (the people). In any event, it is clear that this dichotomy is what enables him to lump jurors and lawyers together as laypeople and to credit them with the attributes of experts; and it is upon this move that his case against expertise largely rests.

Science Good – AT: Feyerabend

Feyerabend’s analysis of expertise is founded on evidence from trials – inappropriate and wrong

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Science Good – AT: Feyerabend

Feyerabend’s analysis fails – outsiders can’t understand and critique science

Selinger 3 (Evan M., associate prof of Philosophy at Rochester, Critical Review, Summer, Vol. 15, Iss. 3/4, p. 359, “Feyerabend’s Democratic Critique of Expertise” proquest, JMB)

Feyerabend fails to recognize that there are many different ways one can be outside of scientific practice. For example, someone who is uninformed about physics might be completely ignorant of even its basic principles. A "well informed amateur" (Ihde 1998, 134-35) might be ignorant of many aspects of physics, but familiar with a particular problem area. A frontier researcher might know quite a bit about physics, yet have views on some aspect of it that differ greatly from those espoused by the dominant community of physicists. And an absolute outsider might oppose any claims that are justified by physics, on the basis of an alternative worldview. In the following illustrative passage, Feyerabend (1978, 88-89) blends these four different senses of being a scientific outsider together. Scientific mistakes that have been hidden by the experts' consensus view, he writes, can be discovered by laymen and dilettantes, and often have been discovered by them. Inventors built "impossible" machines and made "impossible" discoveries. Science was advanced by outsiders, or by scientists with an unusual background. Einstein, Bohr, Born were dilettantes and said so on a number of occasions. Schliemann who refuted the idea that myth and legend have no factual content started as a successful businessman, Alexander Marshack who refuted the idea that Stone Age Man was incapable of thought was a journalist. . . . Columbus had no university training and learned Latin late in his life. . . . The Chinese communists of the Fifties who forced traditional medicine back into the universities and thereby started most interesting lines of research the world over had only little knowledge of the intricacies of scientific medicine. How is this possible? How is it possible that the ignorant or ill-informed can occasionally do better than those who knew their subject inside out? Feyerabend tries to convince the reader that in some sense, Einstein, Bohr, Schliemann, Marshack, Columbus, and practitioners of traditional Chinese medicine are all "laymen," equally classifiable as "ignorant" and "ill informed," equally outsiders to expert culture. Yet all that he has really shown is that sometimes people who begin their lives engaged in one career are eventually able to make contributions to a field in which they were not initially expert. This passage (like similar ones that appear throughout Feyerabend's work) fails to establish that these initial outsiders remained outsiders to the fields to which they eventually made contributions. Classifying Einstein and Bohr as dilettantes, at least in part on the basis of their self-description as such, is naive; it is like believing that James Watson (1969) was really as clueless as he depicts himself as being while he was conducting research that led to the discovery of DNA. This self-depiction is not historically accurate; it is a persona that Watson projects in order to impress readers even more than they would be on scientific grounds alone.

Feyerabend’s philosophy inconsistent

Couvalis 99 (George, Prof of Philosophy at Flinders U, Metascience, July 1, Vol 8, Iss. 2, p 206, “Radical Fallibilism vs Conceptual Analysis: The Significance of Feyerabend’s Philosophy of Science” Ebsco, JMB)

Despite some problems. Preston's book very clearly shows the role certain underlying assumptions play in Feyerabend's view and convincingly argues that one cannot consistently and plausibly adhere to all of its various strands. Much of what Preston reveals is original and interesting. He is very good at pointing out inadequacies in Feyerabend's arguments. Professional philosophers and students can thus learn a great deal about Feyerabend from Presion's book even if his criticisms of Feyerabend's claims are often inadequate.

Science Good – AT: Inequality

Science is not inherently unequal

Mendieta 8 (Eduardo, Hypatia, vol 23, Fall 2008, p. 192-200, Muse, da: 6-23-2011, lido)

The second claim over which I want to linger is stated thus: “The very ontology of modern sciences generates these inequitable acts” (47; cf. 77). I think Harding means here to summarize postcolonial criticisms of Western scientific practices, while also endorsing their seemingly comprehensive and damning critique. If I am not mistaken, this is the only time in the entire book when Harding uses the word ontology. By ontology we generally understand, “its most fundamental structure,” or “essentially,” or “ineluctably and inescapably.” I suspect Harding does not mean that all of modern Western science is in its essence, ineluctably and inescapably, and in its most fundamental structure geared toward producing inequities and injustices. I suspect she does not mean this because in other parts of the book she talks about the “political unconscious” of Western science, which is composed of repressed, hidden, or 196 Hypatia background philosphemes, beliefs, and prejudices that unwittingly condition the practice or science. The unconscious distorts and redirects, influences and conditions, but remains separate, or at least only partial, from the rest of the psychic apparatus of science. I want to endorse Harding’s appropriation of Frederic Jameson’s phrase political unconscious to designate those concealed, sedimented, repressed, though effective and efficacious background assumptions, prejudices, and ideals that both enable and distort the practice of science in the West, and by the same token, other practices of science as well. If all science is only ethnoscience, then every practice of science is haunted by its own political unconscious. Postcolonial criticisms of science, Harding notes, have led us to the recognition that science is plural and heterogeneous. Additionally, these criticisms have revealed that the myth of science’s unity militates against its own “scientificity,” in the sense that this putative and fictitious unity leads us to see with only one eye, not both eyes, to use Harding wonderful expression. Indeed, postcolonial critiques of Western science contribute to our overall understanding of the world, and contribute what may turn out to be indispensable pieces of the puzzle in our quest to make sense of the world in order to lead to more humane lives. I see no reason to quibble with these conclusions. I would only add that this “disunity of science” is not just trans-scientific, that is to say, across different ethnosciences, but that it is also intrascientific, that is to say, that Western science itself has been plagued by internal differentiation and distinction. In order to illustrate this point, I refer to Peter Galison’s important 2001 essay, “Material Culture, Theoretical Culture, Delocalization.” Here, Galison offers what he calls an “intercalated periodization.” This type of periodization decouples the scientific narratives of conditions of theoretical formulation, from both the conditions of experimentality and instrumentality. Galison thinks that theory does not always match what can be made into an experiment due to the lack of proper material conditions, and conversely, a theoretical model may only be “thinkable” once we have obtained certain advances in the means of experimental testing and material wherewithal. For this reason, Galison argues that this “intercalated peridodization” helps overcome and solve many of the problems with positivist and antipositivist periodizations of science. For the latter two, the history of science is merely a narrative that concatenates theoretical perspectives or systems over a continuous and unified field of observation, or matches a theoretical perspective with its own discrete field of observation. For Galison, these views of science are untenable and simplistic. He proposes a model that attends to the material dislocations of the practice and production of science. In this model, what we have are conditions of experimentality that refer to the conditions of possibility of scientific argumentation that allow for “forms of laboratory argumentation” that ask: Should we allow probabilistic arguments? Can we admit of results with margins of errors, how big are these margins? Are witnesses necessary? In addition, under this model, we must distinguish the conditions of instrumentality that delimit the material performance of science: What kinds of machines are allowed? What kinds of observation and how they are made are allowed, and so on. (Here, I would also like to mention the work of Don Ihde, who has been doing some exciting work on observation, imaging devices, and theoretical construction. Indeed, scientific observation is never unmediated and undistorted.) Finally, we have to distinguish conditions of theoricity, that is to say, those conditions under which certain forms of theorizing may be possible, or as Galison asks, “What is it that a theory must exhibit for it to count as reasonable even before it faces experiments?”

Science Good – AT: Inequality

Science exposes key truths and stops advance of prejudice

Kitcher 1 (Philip, Professor of Philosophy at Columbia University,

*Science, truth, and democracy*, p. 3-4, JMB)

What is the role of the sciences in a democratic society? Some people, let us call them the "scientific faithful," say this: "The sciences represent the apogee of human achievement. Since the seventeenth century, they have disclosed important truths about the natural world, and those truths have replaced old prejudices and superstitions. They have enlightened us, creating conditions under which people can lead more satisfying lives, becoming more fully rational and more fully human. The proper role of the sciences today is to continue this process, by engaging in free inquiry and by resisting attempts to hobble investigations for the sake of any moral, political, or religious agenda." The faithful do not believe that scientific research is completely free of moral constraints. They would agree that investigators must be honest in the presentation of their findings, and they would concede that some methods of inquiry cannot be tolerated. Mindful of the appalling activities undertaken by the Nazi doctors and of the Tuskegee syphilis study (in which black men were left untreated "for the sake of science"), they recognize that the conduct of experiments cannot override human rights—or, perhaps, even the rights of some animals. However great the intellectual benefits of disentangling the roles of nature and nurture in human development, it would be morally monstrous to breed "pure lines" of children and rear them in carefully calibrated environments. So when it is claimed that inquiry must be free, what seems to be intended is that moral, political, and religious judgments should not enter into two important contexts of decision: the formulation of projects for scientific inquiry and the appraisal of evidence for conclusions. The questions investigators address should not be limited by the ideals and the fears that happen to be prevalent in human societies. Nor should we deceive ourselves by believing what we find comfortable when that belief would be undermined by available evidence. Sapere aude remains our proper motto.

Science good – the alternative is ignorance

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 21-22, JMB)

It's disheartening to discover government corruption and incompetence, for example; but it is better not to know about it? Whose interest does ignorance serve? If we humans bear, say, hereditary propensities toward the hatred of strangers, isn't self-knowledge the only antidote? If we long to believe that the stars rise and set for us, that we are the reason there is a Universe, does science do us a disservice in deflating our conceits? In The Genealogy of Morals, Friedrich Nietzsche, as so many before and after, decries the `unbroken progress in the selfbelittling of man' brought about by the scientific revolution. Nietzsche mourns the loss of `man'sbelief in his dignity, his uniqueness, his irreplaceability in the scheme ofexistence'. For me, it is far better to grasp the Universe as it really is than to persist in delusion, however satisfying and reassuring.Which attitude is better geared for our long-term survival? Which gives us more leverage on our future? And if our naive self-confidence is a little undermined in the process, is that altogether such a loss? Is there not cause to welcome it as a maturing and characterbuilding experience? To discover that the Universe is some 8 to 15 billion and not 6 to 12 thousand years old\* improves our appreciation of its sweep and grandeur; to entertain the notion that we are a particularly complex arrangement of atoms, and not some breath of divinity, at the very least enhances our respect for atoms; to discover, as now seems probable, that our planet is one of billions of other worlds in the Milky Way galaxy and that our galaxy is one of billions more, majestically expands the arena of what is possible; to find that our ancestors were also the ancestors of apes ties us to the rest of life and makes possible important - if occasionally rueful - reflections on human nature. Plainly there is no way back. Like it or not, we are stuck with science. We had better make the best of it. When we finally come to terms with it and fully recognize its beauty and its power, we will find, in spiritual aswell as in practical matters, that we have made a bargain strongly in our favour.

Science Good – AT: Tech Bad

Science solves the problems it creates – more science key

Time 71(Time Magazine, cites Lawrence Lessing, formerly on the editorial board of fortune magazine and an editor and contributor to Scientific American, March 8, http://www.time.com/time/magazine/article/0,9171,904799-1,00.html, JMB, accessed 6-23-11)

Spurred on by World War II, then the cold war, then Sputnik, U.S. science rose to an unprecedented level of prestige in the 1960s. Yet even as it is gaining its greatest triumphs—the moon, the green revolution, the ability to control and even change the processes of life—science and scientists have come under increasing attack. Some more reasonable critics argue that the antiscience barrage promises more good than harm for a field that has been enjoying too high a priority for too long. Science Writer Lawrence Lessing, a member of FORTUNE'S board of editors, does not agree. In the magazine's March issue, he argues that if the current "senseless war" on science and its kindred discipline, technology, continues much longer, the U.S. will be a considerably worse place in which to live. Seamless Web. Lessing acknowledges that the "apocalyptic mood has been stirred by some very palpable social miscarriages of science and technology"—notably the Indochina war and the environmental crisis. Still, he cannot accept "the proposition that America needs less growth, less knowledge, less skill, less progress." Scientists and engineers, he says, "are increasingly cast as the villains of this emotional drama. But it should be obvious that science by its nature and structure can offer society only options." Lessing points out that the traditional role of scientists is advisory, and as often as not their advice is ignored. "The height of the new folly," he says, "is the rising call upon scientists and technicians to foresee all the consequences of their actions and to make a moral commitment to suppress work on any discovery that might some day be dangerous, which is to demand that they be not only scientists but certified clairvoyants and saints." There is also danger in the notion that society can choose what it wants of science and destroy what it feels is valueless or threatening. "Science is indivisible," Lessing states, "a seamless web of accumulated knowledge, and to destroy a part would rip the whole fabric. Every discovery or invention of man has this dual aspect"—a potential for both benefit and harm. He warns that it does no good to try to retreat to an earlier century, and he quotes Konrad Lorenz, the famed naturalist and animal behaviorist, who has been warning hostile student audiences that if they tear down knowledge to start afresh, they will backslide 200,000 years. "Watch out!" Lorenz cautions the students. "If you make a clean sweep of things, you won't go back to the Stone Age, because you're already there, but to well before the Stone Age." Nonetheless, inflation, recession and other assorted ills have meant that in the past four years total federal expenditures on U.S. research and development in science and technology have declined in real dollars by more than 20%. "If the decline continues," Lessing predicts, "it will have a delayed, disastrous effect on the economy." Already, he reports, the U.S. lags be hind in a variety of fields. Japan and Europe are far ahead in establishing fast, new train networks and Mexico City has completed a subway system "that is both a great feat of engineering and a work of art." In high-energy physics, Italian scientists using a colliding-beam electron accelerator have come upon "what may be a new phenomenon in the creation of matter from energy, which seems to go beyond present physical theory." France, the Soviet Union and Switzerland are all at work testing the discovery on similar accelerators, but the U.S. has only one such machine, and it is not yet fully ready for operation. In plasma physics, after a significant 1968 Soviet breakthrough in the containment of thermo nuclear power, U.S. scientists ran confirming experiments that suggested that "this almost limitless, pollutionless source of energy may be nearer than was once expected. But the U.S. effort is having funded at a level, cut back again this year, that could put off this development as much as 25 to 50 years." In the life sciences, research funds are still lagging some 20%, or at least $250 million per year, behind research capacity. More than Primitive. Implicit in Lessing's analysis is the belief that man can use increasingly sophisticated science to solve his problems and, at the same time, ensure that science does not turn on its master and destroy him. He suggests that society has little choice other than to press on vigorously in scientific research; he rejects the notion that the only options are to abandon science and become primitive, or continue it and be destroyed. Lessing echoes the warning of Biochemist Philip Handler, president of the National Academy of Sciences: "If we forswear more science and technology, there can be no cleaning up cities, no progress in mass transportation, no salvage of our once beautiful landscape and no control of overpopulation. Those who scoff at technological solutions to these problems have no alternative solutions.

Science Good – AT: Tech Bad

Science and technology aren’t bad – people just use their products badly; fundamentalism and prejudice fill in instead

Erickson 93 (George, Bachelor of Science and a Doctor of Dental Surgery degree from the U of Minnesota, Humanism Today, vol. 8, p. 63-65, http://www.humanismtoday.org/vol8/erickson.pdf, JMB, accessed 6-25-11)

During the Friday evening of the seventh annual Humanist Weekend airing of modemist/postmodernist viewpoints, science and technology were criticized directly by some and indirectly by others. While science and technology are fair game, it is unfortunate that time was not available to rise in their defense. Love Canal and nuclear weapons were given as examples, as they frequently are. What many forget is that science is the search for knowledge, and technology is the sum of the ways that society provides itself with the objects of civilization. To portray science or technology as villains ignores our own role in determining how their fruits are used. To the contrary, science and technology have not failed; they have been phenomenally successful. The fault lies not with scientists, who are not insensitive to the fragrance and radiance of a rose, and to imply such is more than prejudicial. Again, to the contrary, many of the persons of science whom I have known are deeply attuned to the aesthetic nature of the world in general and of the subjects of their study in particular. To cast blame on science or technology is to join ranks with the hard-core religionists, the fundamentalists in particular, against whom science has fought a long and unrelenting battle, frequently at great cost. No, science is not at fault, nor technology. The fault is ours. It belongs to those of us who treasure opinion more than knowledge. It belongs to those who use technology to gamer profits regardless of the human and environmental costs. It belongs to churches that preach love and tolerate greed, and to the ignorant and indolent who read the sports and the funnies, but rely on astrology tables or the church to show them the way. The famous physicist, Leo Szilard, fought against use of the atom bomb, cabling and sending memoranda to President Roosevelt, urging an international demonstration so that the Japanese could witness its power and surrender. But others, not scientists, determined that the bomb would be used for effect-and not as a mere demonstration.

\*Perm\*

Science Good – Perm – Solves VTL

Combining science w cultural studies solves the value to life best

Guillory 2 (John, Prof of English @ NYU, Critical Inquiry Vol. 28.2 Winter 2002 p. 496)

In a certain respect, the procedure I have just described can be seen as nothing other than a descendant of the skeptical critique inaugurating modernity-that is, the critique of tradition. In this context, nature signifies what is given or unquestioned in the social domain, an order of things. The residue of this philological history is dispersed throughout ordinary language, for example in the adverbial form naturally, which typically invokes the givenness of the social order: "Naturally, I was offended by his remarks." This usage concentrates in one word the entire normative force of culture but without necessarily invoking the nature of natural science. A difficulty arises when this adverbial nature is simply conflated with the nature of natural science. While the latter concept is not identical to the socially given, it has become a given of modern culture; as such, this nature is just as deservedly the object of critique as its predecessor.59 There is no question that cultural norms (what is natural in the old sense) can be reinforced in modernity by grounding them in the nature disclosed by natural science. This is just the basis for the political critique of science. The utility of the semantic confusion for cultural studies extends well beyond this critique, however, because it provides an opportunity for reasserting the antagonism to science of the old cultural criticism. If it is science's nature that underlies the naturalization of all cultural practices, then it is easy to see that an alliance between cultural studies and science studies would be very desirable indeed.

Permutation solves – a middle view allows VTL and the benefits of science

Sperry 91 (Roger W., Prof of Psychobiology at Caltech, Zygon, 26 no. 2 Je, p. 237-258, “Search for beliefs to live by consistent with science” ebsco, JMB)

During the past twenty-five years I have become increasingly convinced that there is another, better alternative. I can see another kind of answer to this dilemma, a third choice, based in a different conception of ourselves and the natural world that emerged from my revised view of consciousness and how it relates to the workings of the physical brain. A different scientific mode of thinking is involved, specifically, a different conception of causal explanation. It brings a different, "compromise" view of the kinds of powers that govern the universe and created humankind. Incompatible objective-vs.-subjective frameworks of the past arc reconciled in a unifying, intermediate position that departs from previously accepted philosophical dichotomies. Standard philosophic terms must be given new meaning, or new terms must be invented (Ripley 1984). Features from both sides of the old dichotomy— the mental and the physical, fact and value, subjective and objective, freedom and determinism—are blended, without contradiction, within a single, consistent, worldview synthesis (Natsoulas 1987; Sperry 1988, 1990). In practice, the outcome means that I have no longer been obliged to vacillate between two mutually antithetical schemes for ultimate reality. Instead, I can rely only on this single third choice, which preserves and integrates what seem to me the most credible aspects from each of the earlier views. On one hand, it relinquishes dualistic supernatural beliefs, such as unembodied minds or spirits. On the other, it denies that the traditional (reductive physicalist) accounts of science have been giving the true story. After more than a quarter century, I find that this "third choice" continues to measure up to its initial impression as a valid reconciliation of earlier polar disparities in a consistent, long-sought unifying view of man in nature (Sperry 1965)—a credible and functional worldview of a kind I can live and work with. Since using this new reference frame, with its intrinsic, almost self-evident global ethic (outlined later), I have much less trouble perceiving moral solutions, for example, to issues between fundamentalists and secular humanists, prochoice versus prolife factions on abortion, environmentalist interests versus those of human subsistence, animal rights issues, and so on. Further, I no longer need to keep my religion and my science separate.

Science Good – Perm – Solves VTL

Scientific self-reflection allows it to incorporate their K

Blair and Grafton 92 (Ann, Harvard U and Anthony, Princeton U, Journal of the History of Ideas, Vol. 53, No.4, Dec. 1, p. 535-540, JSTOR, http://www.jstor.org/stable/2709934, JMB, accessed 6-26-11)

Humanism affected scientific practice, finally, through its methods, which Owen Hannaway urges us to consider more closely. The precise attention to textual detail required in humanist reading and editing could be brought to bear on astronomical data, as in the work of Kepler, belying any necessary opposition of humanism to quantification and numeracy. The commonplace book developed as a pedagogical tool in humanist schools can illustrate, as Ann Blair argues, the process of selection and recombination of bookish facts characteristic not only of the cycle of traditional natural philosophy to the mid-seventeenth century but also of many aspects of the Baconian method. The humanists' skills in elegant and accessible presentation helped to spread scientific material to a wider public of readers and patrons, thanks to the use of the dialogue form, carefully crafted narratives and vernacular translations.17 Finally, the humanist emphasis on arguing from evidence rather than from first principles may help account for the increased references to direct observation, especially novel when they are drawn from the practical arts which until the Renaissance were always considered divorced from the pursuit of scientia. We do not seek to deny the contributions of medieval scholasticism to the development of modern science nor the revolutionary character of the proposals of the "novatores" of the seventeenth century. Galileo's mathematical abstraction from real experience. Bacon's call for the systematic gathering and confrontation of facts, Descartes's construction of a philosophy from first principles, and the claims of all three to stand at the beginning of a new age all have genuinely novel elements—as well as a shared and older element of rhetoric. Instead, taking to heart Paul Kristeller's injunction not "to play up humanism against scholasticism, or scholasticism against humanism, or modern science against both of them,"19 we have tried to appreciate the specific ways in which humanist beliefs and methods shaped the practice of science in the Renaissance. In doing so we bring out the similarities linking figures whom the history of science has treated very differently: from Kepler the canonical "scientist," to Agricola the early "technologist/\* to Gassendi and Bodin, bookish authors of philosophy and natural philosophy, who are less easily canonized by the standards of modern science but who are equally representative of the historical context that these writers all share.20

Positivism and humanism are fundamentally compatible – positivism supports improvement of society and morals

Tibbetts 82 (Paul, prof @ U Dayton, Ph.D. on philosophy and sociology, Sociological Inquiry, June 1, p. 184-199, “The Positivism-Humanism Debate in Sociology: A Reconsideration” Ebsco, JMB)

In conclusion, I have suggested throughout this paper that (P) and a (HS) need not be thought of as defending mutually exclusive and antagonistic claims. On the contrary, it should now be clear that a number of writers who ascribe to a cluster of themes in (P. 1)-(P8) see themselves as continuing the traditions of the Enlightenment. This is particularly evident in their enlightenment-through-science emphasis, their concern with reliable social knowledge as the basis for public policies, and with the "broadening of our (moral) horizons," as Hempel phrased it. (P) has of course at times tipped dangerously close to scientism, a dogma which a (HS) is rightly hostile to (HS.5). Other than this particular claim, however, I have argued that none of the other theses explicated in (HS.l)-(HS.8) is inherently incompatible with the outlook labeled as 'positivistic.' I am not of course suggesting that (P) and a (HS) are perfectly compatible on all scores. On the contrary, there was a fascination by positivists with formal deductive theorizing, quantification, and formal model building which is entirely foreign to the spirit of a humanistic conception of science. In addition, the high degree of law-like explanation and experimental control evident in the more advanced physical sciences exercised considerable influence on practically all twentieth-century positivists. Such an influence has been entirely absent in humanism. Finally, though I have argued at length that the positivists were not at all indifferent to the matter of science and normative considerations, it must be admitted that humanists have consistently been far more vocal and vigorous in their vision of the limits, responsibility and function of science in a free society. Though these are certainly points of contrast worth noting, they should not blind us to the significant parallels and even convergences between these two complementary frameworks of analysis.

\*(P) = Positivist; (HS) = Humanistically conceived sociology; (P.1-P.8) =principles of positivism; (HS.1-HS.8)=principles of humanist sociology

Science Good – Perm – Solves VTL

No fundamental conflict between humanism and positivism – their evidence assumes a radical position – science can provide a helpful guide for morals

Tibbetts 82 (Paul, prof @ U Dayton, Ph.D. on philosophy and sociology, Sociological Inquiry, June 1, p. 184-199, “The Positivism-Humanism Debate in Sociology: A Reconsideration” Ebsco, JMB)

Let us now look more specifically at the claims noted above associated with a (HS), particularly those claims supposedly in collision with (P). For a (HS) a distinguishing and perhaps unique feature of human beings is the existence of a mental life wherein reflections, imaginings, and thoughts occur. (HS.8) However, it would be a serious mistake to uncritically assume that for (P) there is no mental life and that even if there were it could not be grasped intrespectively. Carnap (1938:57) himself wrote that the facts themselves to which the term 'Introspection' is meant 10 refer will scarcely be denied by anybody, e.g., the fact that a person sometimes knows that he is angry without applying any of those procedures which another person would have to apply, i.e.. without looking with the help of a physiological instrument at his nervous system or looking at the play of his facial muscle\*. So much for what one positivist had to say regarding human subjectivity and introspection. As to the matter of whether such cognitive states arc causally efficacious or are mere epiphenomena of cerebral processes (HS.I), Carnap and other positivists rightly avoided metaphysical questions concerning the freedom-determinism issue. On this point I am personally sympathetic with the position that 'free-will talk' versus 'casual-determinism talk\* reduces to an essentially arbitrary preference for one preferred mode of speech over the other. To say this is not to ignore the important ramifications for sociological theories and, on a more concrete level, for social policies that adoption of the one mode of speech may entail over the other there could be political and ideological considerations at work here in one semantic choice. In any case, the last thing the sophisticated positivist wants to do is to dogmatize about unresolvable metaphysical issues such a 'Is human behavior, in the final analysis, free or determined?' 'To wha extent, if any, are we autonomous agents?' 'Is human reason and rationality an illusion, a mere epiphenomenon?' Regarding (HS.6), or the claim that all scientific inquiry is value-laden and that a value-free, totally objective stance is an illusion, we find even critics of (P) having mixed feelings on this issue. Gouldner (1973:11-12), for example, recognizes that the value-free doctrine could and sometimes did aid men in transcending the morality of their 'tribe', to open themselves to the diverse moralities of unfamiliar groups, and to see themselves and others from the standpoint of a wider range of significant cultures. Andreski, another critic of (P) in sociology and of the fact-value distincton also has second thoughts concerning the possible utility of a (relatively) value-free objectivity in sociological inquiry and explanation. In a chapter entitled, "Evasion in the Guise of Objectivity," Andreski (1972:94) begins with the question, what could be more ethically neutral, wrrifin. non-hortatory, nonvaluative, call it what you will, than the question of how many people fall into which income bracket? Yet the statistics of income distribution ran be regarded as highly inflammable material in a system which claims to have abolished inequality of classes. However, Andreski (1972:98, 104) later adds that We can discern a trend towards a more exclusive concern to understand through dispassionate analysis rather than to apportion blame—-towards objectivity, if you like. But the ideal of objectivity is much more complex and elusive than the pedlars of methodological gimmicks would have us believe, and that it requires much more than an adherence to the technical rules of verification, or recourse to recondite unemotive terminology: namely, a moral commitment to justice—the will to be fair to people and institution), to avoid the temptations of wishful and venomous thinking, and the courage to resist threats and enticement. Such a position regarding objectivity and the fact-value issue is not at all foreign to the positivist tradition. Hempel (1965), for example, in a little referred-to article, argues, first of all, that by providing relevant factual information, science can place us in a position from which to make more informed and therefore intelligent decisions. Secondly, such information can involve a revision in our value priorities, "not by 'disconfirming' them, of course, but rather by motivating a change in our total appraisal of the issues in question" (Hempel, 1965:94). Thirdly, though social scientific studies can not validate any system of value, the results of such inquiries can "psychologically effect changes in our outlook on moral issues by broadening our horizons . . . and by thus providing some safeguard against moral dogmatism or parochialism" (Hempel, 1965:94). I fail to see how any representative of a (HS) could fault Hempel for this reasoned and moderate position regarding science, objectivity, and human values. It is certainly in the spirit of the remarks above by Gouldner and Andreski. As some readers might suspect, positivists and their critics are equally concerned with exposing and eliminating attempts to enlist scientific findings in support of one or another thinly disguised set of normative or ideological imperatives, particularly imperatives of a dogmatic and cognitively opaque character.

\*(P) = Positivist; (HS) = Humanistically conceived sociology

**Science Good – Perm – Solves Gender**

**Perm solves fem – reductionism isn’t key to science**

**Fehr 4** (Carla, assistant prof of phil and an affiliate of women's studies at Iowa, NWSA Journal 16.1 (2004) 136-156, MUSE, JMB)

Whereas a reductive mechanistic approach to science results either strongly in a methodological monopoly, or weakly in privileging low-level methods**, once mechanism and reductionism are teased apart, mechanistic science is open to a plurality of methods that can be used to investigate nature at a variety of levels of organization**. The interactionist model provides a highly mechanistic explanation of the development of sexual behavior that is consistent with both Salmon's and Machamer, Darden, and Craver's views of mechanism. It reveals how the development of sexual behavior works, both in terms of the constituents of the behavior within the organism and in terms of the processes both internal and external to the organism by which the behavior develops. This model is pluralistic; it does not ignore or rule out the causal influence of genes and hormones, but it also does not privilege these low-level causes over higher level causes, such as social influences**. Social influences as well as genetic influences exhibit causal regularities and productive processes. Very different methodologies are required to uncover the genetic influences and social influences on behavior.** The interactionist view requires methodological pluralism with respect to the elucidation of causal influence at these different levels of organization. It is an example of an approach to science that produces results that ameliorate many feminist concerns about the linear explanatory model and that, because of the explicit inclusion of higher level causes and social factors, can be used to counteract one of the most central and important feminist criticisms of the biological sciences, biological determinism. **A view of mechanism unhindered by a priori reductionist assumptions allows us to address** the three **feminist concerns** raised earlier. The problem of **biological determinism is caused by the assumption that biological causes are the only or primary determinants of gendered behavior**, and [End Page 152] that these causes are low-level and unidirectional. **Nonreductive, mechanistic approaches such as the interactionist model ameliorate this problem**. The inclusion of environmental and social factors, and the explicit emphasis on the interactions among these factors means that high-level phenomena are not solely determined by genetics or hormonal states. Change in those upper level phenomena may be induced not only by genetic change, but also by environmental or social change. **The interactionist model also offers insight concerning how nonreductive mechanism escapes the methodological/epistemological problem**. **Although a reductive perspective encourages researchers to focus on phenomena that exhibit low-level causal regularities, a mechanistic approach need not do so.** The interactionist model is an example of a mechanistic approach to the role of high-level causes in the explanation of complex phenomena. I have argued that methodological pluralism is an implication of mechanism without reductionism. Studies of low-level phenomena may very well be easier to conduct, but at least part of the reason for this is that methods that engage the world in terms of its tiniest bits are central to sciences such as physics and molecular biology. Within disciplines such as these, reductive methods have been honed and taught over long periods of time. **Focusing on mechanism without reductionism provides an avenue for revaluing sciences such as ecology and evolutionary biology,** which have long provided mechanistic accounts of complex ecological and biological phenomena. **Mechanism without reductionism allows for a plurality of investigational styles and methodologies**. Through whatever complicated interaction of causes, it may turn out to be the case that some women approach research differently from most men. One of the characteristics that may be more common in women's labs is a tendency to engage in a more contextualized and holistic approach to their work. This concept of mechanism takes away many claims that such work is unscientific. A plurality of methods, such as those inherent in the interactionist model, opens the door for researchers to choose an approach that best suits not only the object of study but also one that may best suit their political interests. **The opening up of methodology that results from teasing mechanism away from reductionism may give feminist researchers the opportunity to look at gendered issues from a perspective designed to ameliorate past injustices**, or to address previously overlooked areas of investigation. Finally, sciences that attract the most women tend to be seen as the "low status" or "softer" sciences. This approach gives us an intellectual framework to revaluing those sciences. Just because evolution is not reductionist does not mean that it is less scientific or even less mechanistic.

Science Good – Perm – AT: Crowds Out Alts

The perm does not preclude alternative conceptions from science

Heath 92 (Timothy B., U Pittsburg, Journal of the Academy of Marketing Science, Vol. 20, No. 2, p. 107-118, http://business.nmsu.edu/~mhyman/M670\_Articles/Heath\_JAMS\_1992.pdf, JMB, accessed 6-26-11)

It is often said that naturalist researchers assume a single reality while humanists assume multiple realities constructed by the perceiver. However, the difference is largely one of semantics as evident in the example of Schrodinger's cat (Zukav 1979). Assume that a cat is placed out of sight in a box, and that the box is connected to 3 device capable of releasing a deadly gas. Whether the gas is released or not depends on some random event occurring at midnight. The question is whether the cat is dead or alive after midnight. Doctrinaire naturalism might maintain that there is but one reality: Either the cat is dead or alive. We will not know which until we open the box. However, another interpretation is that the fate of the cat is not decided until the box is opened. Until then, there are two realities. In the case of Schrodinger's cat there is a correspondence between the humanists\* phrase multiple realities and the naturalists' phrase multiple interpretations or multiple possibilities. In research practice, naturalism commonly acknowledges the viability of multiple interpretations. For example, naturalist researchers develop and test different interpretations of their findings (e.g., Allen and Madden 1985), reinterpret the data of others (e.g., Russo 1974), use multiple judges to interpret qualitative data (e.g., Mac-Kenzie. Lutz, and Belch 1986), and interpret their findings in ways that are acceptable to their respective scientific communities (e.g., McCloskey 1983). Interpretation is an important pan of experimentation (see Franklin 1990; Hol-brook and O'Shaughnessy 1988). The only difference is that, unlike naturalist researchers, humanists do not believe there is a single reality awaiting discovery. But this difference is not substantive in research practice where the following two conditions hold: (1) liberal naturalists recognize the possibility of multiple and valid interpretations (realities), and (2) in their dependability criterion (which is discussed later), conservative humanists recognize that some realities (interpretations) are likely to be more valid than others. Thus, the conflict over the singleness of reality has no bearing on the conduct or interpretation of research.

The perm does not reify anything – Determinism does not dictate scientific outcomes

Heath 92 (Timothy B., U Pittsburg, Journal of the Academy of Marketing Science, Vol. 20, No. 2, p. 107-118, http://business.nmsu.edu/~mhyman/M670\_Articles/Heath\_JAMS\_1992.pdf, JMB, accessed 6-26-11)

Hudson and Ozannc (1988) argued that humanism is vol-untaristic and naturalism is deterministic. Whereas voluntarism views people as actively interacting with their environment, determinism maintains that individuals primarily react to external stimuli. However, conservative humanists and liberal naturalists evidence a combination of voluntarism and determinism. Conservative humanists recognize some measure of determinism when they acknowledge that human behavior is partially determined by an individual's history, culture, and current situation For rumple. Belk. Waltenderf, and Sherry (1989) found that some situations bred consumption sa-credness while others did not. On the other hand, liberal naturalists recognize the fact that human beings actively construct perceptions and their memories of those perceptions (cf. Hum 19\*9). People's perceptions are often influenced by what they expect to see (e.g., Grcenwald. Praikanu. Leippe, and Baumgardncr 1986). and reports of memories are easily biased by how a question is asked (e.g.. Loflus and Zanni 1975). Thus, conservative humanists and liberal naturalists incorporate aspects of both voluntarism and determinism.

\*Epistemology\*

Science True – Generally

Science is powerful because it is consistently the best system for making predictions

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 37-38, JMB)

Think of how many religions attempt to validate themselves with prophecy. Think of how many people rely on these prophecies, however vague, however unfulfilled, to support or prop up their beliefs. Yet has there ever been a religion with the prophetic accuracy and reliability of science? There isn't a religion on the planet that doesn't long for a comparable ability - precise, and repeatedly demonstrated before committed sceptics - to foretell future events. No other human institution comes close. Is this worshipping at the altar of science? Is this replacing one faith by another, equally arbitrary? In my view, not at all. The directly observed success of science is the reason I advocate its use. If something else worked better, I would advocate the something else. Does science insulate itself from philosophical criticism? Does it define itself as having a monopoly on the `truth'? Think again of that eclipse a thousand years in the future. Compare as many doctrines as you can think of, note what predictions they make of the future, which ones are vague, which ones are precise, and which doctrines - every one of them subject to human fallibility - have errorcorrecting mechanisms built in. Take account of the fact that not one of them is perfect. Then simply pick the one that in a fair comparison works best (as opposed to feels) best. If different doctrines are superior in quite separate and independent fields, we are of course free to choose several - but not if they contradict one another. Far from being idolatry, this is the means by which we can distinguish the false idols from the real thing. Again, the reason science works so well is partly that built-in errorcorrecting machinery. There are no forbidden questions in science, no matters too sensitive or delicate to be probed, no sacred truths. That openness to new ideas, combined with the most rigorous, sceptical scrutiny of all ideas, sifts the wheat from the chaff. Itmakes no difference how smart, august or beloved you are. You must prove your case in the face of determined, expert criticism. Diversity and debate are valued. Opinions are encouraged to contend - substantively and in depth.

Science is true – we can repeat experiments to verify it

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 247-248, JMB)

Something similar is true in science. We have biases; we breathe in the prevailing prejudices from our surroundings like everyone else. Scientists have on occasion given aid and comfort to a variety of noxious doctrines (including the supposed `superiority' of one ethnic group or gender over another from measurements of brain size or skull bumps or 10 tests). Scientists are often reluctant to offend the rich and powerful. Occasionally, a few of them cheat and steal. Some worked - many without a trace of moral regret - for the Nazis. Scientists also exhibit biases connected with human chauvinisms and with our intellectual limitations. As I've discussed earlier, scientists are also responsible for deadly technologies - sometimes inventing them on purpose, sometimes being insufficiently cautious about unintended side-effects. But it is also scientists who, in most such cases, have blown the whistle alerting us to the danger. Scientists make mistakes. Accordingly, it is the job of the scientist to recognize our weakness, to examine the widest range of opinions, to be ruthlessly self-critical. Science is a collective enterprise with the errorcorrection machinery often running smoothly. It has an overwhelming advantage over history, because in science we can do experiments. If you are unsure of the negotiations leading to the Treaty of Paris in 1814-15, replaying the events is an unavailable option. You can only dig into old records. You cannot even ask questions of the participants. Every one of them is dead. But for many questions in science, you can rerun the event as many times as you like, examine it in new ways, test a wide range of alternative hypotheses. When new tools are devised, you can perform the experiment again and see what emerges from your improved sensitivity. In those historical sciences where you cannot arrange a rerun, you can examine related cases and begin to recognize their common components. We can't make stars explode at our convenience, nor can we repeatedly evolve through many trials amammal from its ancestors. But we can simulate some of the physics of supernova explosions in the laboratory, and we can compare in staggering detail the genetic instructions of mammals and reptiles.

Science True – AT: Fraud

Science reformed – there’s no more fraud

MTI Review 1 (MTI Review, organization specializing in the identification, retrieval and analysis of

medical and scientific information, July, [www.medtoxinfo.com/news16.html] AD: 6-24-11, jam)

When did we arrive at such a position in the sciences? In the early 1980's both federal funding sources and the scientific community became acutely aware that actions of misconduct in the previous twenty years had caused a watershed change in scientific affairs. Both government officials and scientists realized that more oversight was needed as reports of plagiarism, fraud and falsified data intensified. Scientific societies strengthened their standards and Congress passed the Health Research Extension Act in 1985 which required that all institutions awarded federal research funds establish "an administrative process to review reports of scientific fraud and report to the Secretary any investigations of alleged scientific fraud which appears substantial." From this came the present Office of Research Integrity (ORI) whose mission is to oversee government funded research and ferret out instances of scientific misconduct and mete out suitable punishments. The last decade has been a particularly busy one for the ORI. Between 1992 and 2000 there were 223 investigations of possible scientific misconduct which uncovered 111 confirmed cases that mainly involved fabrication and falsification of data. To aid identification of fraudulent work the ORI publishes some of the names of those found guilty over the last five years and brief information detailing their fabrication and fraud on its website. A Freedom of Information Request (FOI) is required to obtain a complete list of names and details of the cases.

Science True – AT: Bias

Even if scientists are biased, the community solves

Siegel 85 (Harvey, Professor and Chair of the Department of Philosophy, University of Miami, Philosophy of Science, Vol. 52, No. 4, p. 531, JSTOR)

I have been writing as if science's utilization of SM is perfect; as if every scientist always bases her claims evidentially. This is, of course, not so. As scarcely needs mention, scientists are passionate, human creatures, not automatons who routinely grind out results according to some formula for establishing evidential support. But this fact is perfectly compatible with the view of SM offered here. For science is a communal affair; individual passions and commitments are controlled by community assessment. In cases of dispute, settlement comes on the heels of relevant new evidence- Sometimes such evidence is not available—in which case disputes remain open. Sometimes evidence is at hand but not taken as such; at other times it may denied or distorted. In these last cases SM is not fully in command, and we might well say that those who fail to honor the commitment to evidence forfeit their claim to the title "scientist.wl8 But these considerations do not harm the analysis. For an account of SM should not pretend that the scientific community's reliance on SM is unwavering. It is enough to note that the community strives, ideally, for such reliance.

\*SM=Scientific Method

Science True – AT: Objectivity

**Their kritik verges on silliness—disavowing objective fact is meaningless self-gratification that ignores the real problems of the world that we need science to solve**

Sokal 96 (Alan, Prof of Physics @ NYU, “A Physicist Experiments with cultural studies” Lingua Franca May/June JF)

The fundamental silliness of my article lies, however, not in its numerous solecisms but in the dubiousness of its central thesis and of the "reasoning" adduced to support it. Basically, I claim that quantum gravity--the still-speculative theory of space and time on scales of a millionth of a billionth of a billionth of a billionth of a centimeter--has profound political implications (which, of course, are "progressive"). In support of this improbable proposition, I proceed as follows: First, I quote some controversial philosophical pronouncements of Heisenberg and Bohr, and assert (without argument) that quantum physics is profoundly consonant with "postmodernist epistemology." Next, I assemble a pastiche--Derrida and general relativity, Lacan and topology, Irigaray and quantum gravity--held together by vague references to "nonlinearity," "flux," and "interconnectedness." Finally, I jump (again without argument) to the assertion that "postmodern science" has abolished the concept of objective reality. Nowhere in all of this is there anything resembling a logical sequence of thought; one finds only citations of authority, plays on words, strained analogies, and bald assertions. In its concluding passages, my article becomes especially egregious. Having abolished reality as a constraint on science, I go on to suggest (once again without argument) that science, in order to be "liberatory," must be subordinated to political strategies. I finish the article by observing that "a liberatory science cannot be complete without a profound revision of the canon of mathematics." We can see hints of an "emancipatory mathematics," I suggest, "in the multidimensional and nonlinear logic of fuzzy systems theory; but this approach is still heavily marked by its origins in the crisis of late-capitalist production relations." I add that "catastrophe theory, with its dialectical emphasis on smoothness/discontinuity and metamorphosis/unfolding, will indubitably play a major role in the future mathematics; but much theoretical work remains to be done before this approach can become a concrete tool of progressive political praxis." It's understandable that the editors of Social Text were unable to evaluate critically the technical aspects of my article (which is exactly why they should have consulted a scientist). What's more surprising is how readily they accepted my implication that the search for truth in science must be subordinated to a political agenda, and how oblivious they were to the article's overall illogic. Why did I do it? While my method was satirical, my motivation is utterly serious. What concerns me is the proliferation, not just of nonsense and sloppy thinking per se, but of a particular kind of nonsense and sloppy thinking: one that denies the existence of objective realities, or (when challenged) admits their existence but downplays their practical relevance. At its best, a journal like Social Text raises important issues that no scientist should ignore--questions, for example, about how corporate and government funding influence scientific work. Unfortunately, epistemic relativism does little to further the discussion of these matters. In short, my concern about the spread of subjectivist thinking is both intellectual and political. Intellectually, the problem with such doctrines is that they are false (when not simply meaningless). There is a real world; its properties are not merely social constructions; facts and evidence do matter. What sane person would contend otherwise? And yet, much contemporary academic theorizing consists precisely of attempts to blur these obvious truths. Social Text's acceptance of my article exemplifies the intellectual arrogance of Theory--postmodernist literary theory, that is--carried to its logical extreme. No wonder they didn't bother to consult a physicist. If all is discourse and "text," then knowledge of the real world is superfluous; even physics becomes just another branch of cultural studies. If, moreover, all is rhetoric and language games, then internal logical consistency is superfluous too: a patina of theoretical sophistication serves equally well. Incomprehensibility becomes a virtue; allusions, metaphors, and puns substitute for evidence and logic. My own article is, if anything, an extremely modest example of this well-established genre. Politically, I'm angered because most (though not all) of this silliness is emanating from the self-proclaimed Left. We're witnessing here a profound historical volte-face. For most of the past two centuries, the Left has been identified with science and against obscurantism; we have believed that rational thought and the fearless analysis of objective reality (both natural and social) are incisive tools for combating the mystifications promoted by the powerful--not to mention being desirable human ends in their own right. The recent turn of many "progressive" or "leftist" academic humanists and social scientists toward one or another form of epistemic relativism betrays this worthy heritage and undermines the already fragile prospects for progressive social critique. Theorizing about "the social construction of reality" won't help us find an effective treatment for AIDS or devise strategies for preventing global warming. Nor can we combat false ideas in history, sociology, economics, and politics if we reject the notions of truth and falsity. The results of my little experiment demonstrate, at the very least, that some fashionable sectors of the American academic Left have been getting intellectually lazy. The editors of Social Text liked my article because they liked its conclusion: that "the content and methodology of postmodern science provide powerful intellectual support for the progressive political project." They apparently felt no need to analyze the quality of the evidence, the cogency of the arguments, or even the relevance of the arguments to the purported conclusion. And why should self-indulgent nonsense--whatever its professed political orientation--be lauded as the height of scholarly achievement?

Science True – AT: Objectivity

The link is threat construction—science never claims perfect objectivity or universal truth

Willower and Uline 1 (Donald, Penn State U, and Cynthia, Ohio State U, Journal of Education Administration Vol. 39.5 Pg. 457-459 JF)

Related criticisms of science are that it seeks ultimate reality and final, universal truth and since neither has been demonstrated, science is flawed. Such criticisms are misleading because they are so blatantly incorrect. As an open, growing activity, one of the main characteristics and great strengths of science is its self-corrective nature. In science, there are no final or universal truths, only theories that can be assessed using a variety of logical and evidentiary criteria, and subject to modification or replacement at any time. Similarly, the notion of an ultimate reality waiting to be uncovered and revealed by science is long out-of-date, a vestige of nineteenth century scientism. Yet, both of these charges are sometimes laid upon science by critics, with postmodernists/poststructuralists 􏰣Derrida, 1973, 1976) but one example. Little more need be said about final, universal truth, except to stress that even the most established theoretical explanations are subject to self-rectifying inquiry which might provide even better established ones. Ultimate reality is an awkward term that conjures up images of scientists pulling away the curtain of ignorance to gaze upon the true world. The terms ultimate reality and universal truth in a sense feed on each other because presumably to see the former is to know the latter. The problem is that such a conception of scientific inquiry is a figment of the postmodern imagination in search of a straw man. What actually happens is that a theory is created and tested and if the evidence fails to reject the theory, it gains in credibility. Theories are genuine constructions, but their assessment depends on judgments of adequacy using criteria developed in scientific communities. Theories supported by logic and cumulative evidence over time achieve relatively high levels of credibility, but words like ultimate reality and final truth are foreign to inquiry, found mainly in the conceptions of science provided by the fantasies of its antagonists. When it comes to truth, we prefer Dewey's 􏰣1938) concept of warranted assertibility. It holds that propositions are warranted by logic, and by evidence gathered in the process of inquiry. This view is consistent with scientific practice and is antithetical to universal or final truths. It sees science and knowledge as open, changing, and growing, not as closed, static, and settled.

No link to positivism- their literature base is simplistic and misinterprets science

Willower and Uline 1 (Donald, Penn State U, and Cynthia, Ohio State U, Journal of Education Administration Vol. 39.5 Pg. 464 JF)

The foregoing discussions of criticisms leveled at science and its methods demonstrate the limitations of the criticisms. None seems to have inflicted fatal or even disabling damage. Most epistemological questions are many sided, and too much of the debate about them has been simplistic. Part of the problem is that in educational administration, and in a number of other disciplines as well, the critics of science have framed recent intellectual history. Generally they have produced bad history, guided by their particular political ideologies and objectives. Many authors in educational administration seem to have uncritically accepted the sloganistic treatments of science provided by critical theorists, postmodernists-poststructuralists, some committed to identity politics, and others. A prime example is the pejorative use of the term positivism, which is falsely equated with science. As Phillips 􏰣1992) pointed out, ``antipositivist vigilantes'' p. 95) still see it everywhere, despite its demise long ago. A recent example is found in the chapter by Chapman et al. 1999) in the second Handbook of Research on Educational Administration. While other sections of this chapter are quite cogent, the part devoted to philosophy paints positivism as ``orthodoxy'' in educational administration until the 1970s. Yet, an examination of the literature in educational administration during the time in question (Willower, 1996) showed little substantive attention to positivism or to sociological functionalism, another view alleged to have been dominant then. Oddly, the chapter 􏰣Chapman et al., 1999) also cites work that criticizes and rejects logical positivism, but is favorable to science. What is odd is that this work substantially predates the period when positivism was alleged to dominate educational administration, but the chapter's authors appear to believe that scholars in educational administration were influenced by the work of Schlick, Carnap, and other members of the Vienna Circle 􏰣1923-1936), but not by John Dewey's 􏰣1922, 1938) seminal views on inquiry. Positivism has not been a serious contender in philosophy for many decades. It was referred to only briefly and critically in Dewey's Logic 􏰣1938), his master work in philosophy. Writing in 1964 on knowledge, values, and practice in educational administration from a generally naturalistic-pragmatist perspective, the first author of this article did not even mention positivism, considering it dated in philosophy and unimportant in educational administration 􏰣Willower, 1964). This, at the very time of positivism's claimed domination.

Science True – AT: Objectivity

Even if objectivity is impossible, scientists can still strive for it to produce a close approximation of the real

Kukla 8 (Rebecca, Professor of Philosophy and Medicine at the University of South Florida, “Naturalizing Objectivity” Perspectives on Science, Volume 16, Number 3, Fall, Muse, JMB)

Now this might seem to justify the sweeping rejection of self-effacing objectivity for which I criticized Barad above. For if there is no such thing as a transcendental perspective outside all local bodies of epistemic practices, then in an important sense the understanding of objectivity as self-erasure is simply incoherent, rather than merely limited and historically situated. Standpoint theory is deeply right, on this naturalized picture: knowledge is always and ineliminably the knowledge of a performative, concrete self who is situated within a particular, historically and socially contextualized body of norms. As natural beings engaged in natural epistemic practices, selves cannot adopt a stance outside of the nature they seek to know, and knowing is a material, interactive activity, and hence [End Page 299] there is no possibility of attaining objectivity by erasing the traces of the knowing self and its standpoint. Doesn't this make the ideal of mechanical objectivity fundamentally and unqualifiedly wrong-headed, as Barad, unlike Daston and Galison, believes? I think this conclusion would be based on an unsubtle understanding of mechanical objectivity. Let us grant that it is incoherent to believe that the self can, in fact, completely erase all traces of itself from the material practice of knowing, or that it can inhabit some unmarked perspective that is ontologically severed from the world. It can still make perfect sense to strive, in practice, to minimize the traces of the self, and to produce knowledge that is maximally reproducible and minimally tied to the particular perspective of its producer. Indeed, in some domains and for some purposes, holding oneself to this regulative ideal is surely a useful and important component of accountability to the real. (In addition to the many examples Daston and Galison offer, we might think of the task of the court stenographer, for instance.) Daston and Galison are clear that mechanical objectivity can only serve as a regulative ideal, and that at its limit point it would become self-undermining: "[Mechanical] objectivity . . . is epistemology taken to the limit . . . The demands it makes on the knower outstrip even the most strenuous forms of self-cultivation, to the brink of self-destruction" (374). But this does not, in their view, mean that the ideal is not actually mobilizable in practice. Norms can serve as regulative ideals even when they are never fully realizable—consider Kant's command that we abstract from our pathological existence as material objects and act in accordance with the demands of pure rationality, for example, which he certainly never meant to be a fully achievable goal. Indeed, the mere impossibility of an absolutely self-effacing, aperspectival form of objective knowing seems to be no count at all against the utility of this ideal in practice. In the laboratory, we regularly go out of our way to control some variables in order to better disclose the real relations between others. When we do this, we are under no illusion that the controlled variables have thereby been metaphysically excised from the natural scene. Similarly, I think that Daston and Galison effectively show that some scientific practices involve minimizing or 'controlling for' the influence of the self—but this does not mean that these practices depend upon an ontological picture upon which the self can effectively cast itself out of the natural scene of inquiry. Thus even if Barad is right, as it appears to me she is, that quantum mechanics is a domain where this ideal is inappropriate and distorting, she has not earned the right to extend this conclusion to other kinds of objects and epistemic projects—any more than the impossibility of walking through a forest without leaving a trace renders pointless the effort of minimizing one's impact on the land.

Even if objectivity is wrong in the abstract, science is respected because there is a culture of attempting impartiality

Ziman 96 (John, emeritus prof of Physics @ U Bristol, Nature, Vol 382, Aug 29, p. 751-754 http://libweb.surrey.ac.uk/library/skills/Science%20and%20Society/SS\_1\_Reading2.pdf, JMB)

Scientific objectivity is not an abstract philosophical virtue. It is a cultural norm embodied in a web of social practices. Academic scientists incorporate the norm of 'disinterestedness' into their system of personal values as a result of their own experience in research situations where these practices are systematically observed. They never forget the moment when they were reproved by their professor for failing to present fairly the arguments of their opponents or for conveniently 'forgetting' an awkward fact that invalidates their exciting discovery. From then on, they know in their hearts that this is how real scientists ought to behave. It is hard to see how this norm will be sustained when there are few situations yielding the relevant experience. Objectivity is what makes science so valuable in society. It is the public guarantee of reliable disinterested knowledge. Science plays a unique role in settling factual disputes. This is not because it is particularly rational or because it necessarily embodies the truth: it is because it has a well-deserved reputation for impartiality on material issues. The complex fabric of democratic society is held together by trust in this objectivity, exercised openly by scientific experts. Without science as an independent arbiter, many social conflicts could be resolved only by reference to political authority or by a direct appeal to force''.

Science True – AT: Objectivity

Science has objective truths – provable beyond reasonable doubt

Nagel 98 (Thomas, prof at NYU, The New Republic, Oct 12, pp. 32-38, http://www.physics.nyu.edu/faculty/sokal/nagel.html, JMB, 6-25-11)

As Sokal and Bricmont point out, the denial of objective truth on the ground that all systems of belief are determined by social forces is self-refuting if we take it seriously, since it appeals to a sociological or historical claim which would not establish the conclusion unless it were objectively correct. Moreover, it promotes one discipline, such as sociology or history, over the others whose objectivity it purports to debunk, such as physics and mathematics. Given that many propositions in the latter fields are much better established than the theories of social determination by which their objectivity is being challenged, this is like using a ouija board to decide whether your car needs new brake linings. Relativism is kept alive by a simple fallacy, repeated again and again: the idea that if something is a form of discourse, the only standard it can answer to is conformity to the practices of a linguistic community, and that any evaluation of its content or its justification must somehow be reduced to that. This is to ignore the differences between types of discourse, which can be understood only by studying them from inside. There are certainly domains, such as etiquette or spelling, where what is correct is completely determined by the practices of a particular community. Yet empirical knowledge, including science, is not like this. Where agreement exists, it is produced by evidence and reasoning, and not vice versa. The constantly evolving practices of those engaged in scientific research aim beyond themselves at a correct account of the world, and are not logically guaranteed to achieve it. Their recognition of their own fallibility shows that the resulting claims have objective content. Sokal and Bricmont argue that the methods of reasoning in the natural sciences are essentially the same as those used in ordinary inquiries like a criminal investigation. In that instance, we are presented with various pieces of evidence, we use lots of assumptions about physical causation, spatial and temporal order, basic human psychology, and the functioning of social institutions, and we try to see how well these fit together with alternative hypotheses about who committed the murder. The data and the background assumptions do not entail an answer, but they often make one answer more reasonable than others. Indeed, they may establish it, as we say, "beyond a reasonable doubt." That is what scientists strive for, and while reasonable indubitability is not the position of theories at the cutting edge of knowledge, many scientific results achieve it with time through massive and repeated confirmation, together with the disconfirmation of alternatives. Even when the principles of classical chemistry are explained at a deeper level by quantum theory, they remain indispensably in place as part of our understanding of the world.

Science True – AT: Objectivity – AT: Gov’t/Econ

Science isn’t beholden to sponsors – sponsors have to grant autonomy or findings aren’t perceived as valid

Brown, Professor of Sociology at U Maryland, 98 (Richard Harvey, “Modern Science and Its Critics: Toward a Post-Positivist Legitimization of Science” New Literary History 29.3 (1998) 521-550, Muse, JMB)

A rhetorical, sociological view of science also responds in part to the modernist and environmentalist criticism that science is driven by and beholden to an instrumental corporate state. This criticism certainly has validity, but it overlooks the fact that the very autonomy of science as an intellectual practice depends on funding by nonscientific sponsors. For example, "big science" requires big money which becomes available only if such science promises to be useful to those who possess the economic resources to fund it. Thus high energy physics is almost wholly dependent on government and industry. Yet paradoxically, the disciplines that depend most on external support also tend to be most autonomous. Autonomy brings intellectual power that generates findings that may be useful in multiple ways. This becomes a lever for gaining further financial support, which also supports the autonomy that is the source of intellectual innovation. If one punctuates this interaction as a one way causal process--either political or intellectual--one obviates the dialectical character of power/knowledge discourses through which science/society or inside/outside are mutually transformed. For example, as Latour shows, the application of Pasteur's germ theories to milk production or public sanitation required that farms and cities be reconceived and redesigned as enormous laboratories. 57 In this sense Pasteur's scientific findings changed the world by making its practices more scientific. In this and many similar cases, the strict segregation of "inside" and "outside" loses its analytic power. That science must be relatively autonomous to produce possibly useful knowledge also implies that such scientific ideas may be put to use in ways very different from those intended by their makers or sponsors. For example, the American social theorist, George Fitzhugh, developed ideas on the dynamics of capitalism that adumbrated those of Marx and Engels. However, he used them not to promote proletarian revolution in the North but to justify the more personalistic slavery of the South. Such ideological differences, if they are subordinated to the norms of scientific communities or disciplines, are not necessarily an impediment to the production of knowledge. Indeed, "an enormous amount of important science serves particular non-scientific ideological interests and may even have been the product of ideological conflict." 58 Thus science often plays an important role in political debates. Science is useful to politics partly because it is a source of legitimacy and authority, [End Page 542] insofar as scientists are authorized to state a social consensus about what are the facts, thereby shaping the terms of debates and even their outcomes. 59 Such directly political uses of science, however, are useful precisely because of the more general autonomy of science. In sum, the apparent conflict between the autonomy of scientific disciplines and their dependence on external funding is modulated by two phenomena. First, science has much power to change the world, sometimes even more power than external funders have to change scientific practice. Second, the utility of scientific disciplines to nonscientific sponsors depends on the very autonomy that may be threatened by outside funding and direction. This is because scientific knowledge is generated through a politics of truth that can only exist in an autonomous community of knowledge producers, one in which there is sole (or at least primary) accountability to one's scientific peers. Such knowledge production depends on external resources for its institutionalization as an autonomous practice, but if those external funders excessively direct the scientific enterprise they undermine its capacity to produce new knowledge, a capacity that motivated the original funding. This also explains the apparent paradox that the most "mature" disciplines, those with the most accumulated symbolic capital, also are the most autonomous and the best funded disciplines--for example, economics in the social sciences and physics in the natural sciences

Science True – AT: Objectivity – AT: Gov’t/Econ

Outside politics don’t shape science – it builds upon itself and self-corrects values

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

What I want to suggest is that a congruence between facts and values may not always be evidence of values constructing facts, but can also be read as facts leading to values: the two generally grow and change together, and I see no reason to see contextual values as given and prior to the actual work of science. Moreover, I would argue that the very fact that the selectionist model has had the kind of appeal among biologists interested in the development of brain and consciousness shows that the existing scientific institutions are capable of correcting their course and heading out in directions which hold promise for expansion of human abilities - a promise that feminists and other progressives can welcome, as Longino indicates. One aspect of the give-and-take between our assumptions and the real world in the process of scientific inquiry is that the domain of background assumptions changes and becomes less social as science matures, and correspondingly, scientists have less choice to pick background assumptions and models that are consonant with their politics. As Dudley Shapere has argued, for a mature science, background assumptions are mostly made up of a set of background scientific theories, or 'a body of successful and doubt-free beliefs which have been found relevant to the domain':l18 science becomes more internalized in its reasoning process as it grows, and once past its infancy, the external milieu is no longer internal to it. As Kuhn put it, 'compared with other professional and creative pursuits, the practitioners of mature science are effectively insulated from the cultural milieu in which they live their extra-professional lives.'"' Science aims at becoming more self-sufficient in the sense that 'the more science learns, the more it becomes able to learn' on the basis of its already existing stock of the best, most confirmed, least doubted beliefs. Therefore, what decides evidential relevance in mature science is not raw social values but scientifically tested reasons, and the two gradually get demarcated from each other through a process of 'conceptual bootstrapping,' which involves a constant revision of culturally derived assumptions in the light of empirical evidence generated by the hypotheses which are initially based on the cultural assumptions. The increasing demarcation between the scientifically relevant background assumptions and contextual factors need not be based on any a priori and universal criterion but is itself a product of historical development of a science. The relevance of this dynamic to the question of doing science as a feminist (or as a socialist, as a Third World scientist, or as a Hindu or Islamic scientist) is that as any science matures, background assumptions are not up for grabs. After a certain point, the question of the political valence of background assumptions becomes rather meaningless. Another way to visualize how background assumptions become a part of science - not as raw social conventions which can be changed voluntarily depending upon ones politics, but as a part of the corpus of tested and confirmed results - is to see the growth of science in any domain as a progressive filling out of a crossword puzzle. In this crossword puzzle, as Susan Haack argues, experimental evidence serves as the analogue of the clues, while background information serves as already completed entries. How reasonable a new entry in the puzzle is depends on how well it is supported by the clue and any other already-completed intersecting entries. Once a new entry is accepted, it becomes a part of the background against which other clues are read and new entries made.

Science True – AT: Peer Review Bad

Peer review generates strong science – bad papers are weeded out

Relman 90 (Arnold S., MD and Editor-in-Chief of the New England Journal of Medicine, West J Med Nov; 153:520-522, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1002603/pdf/westjmed00111-0058.pdf, JMB, accessed 6-24-11)

Second, peer review holds manuscripts to the highest current standards. Knowing that their manuscript must pass rigorous peer review, most authors will do the best they can. If there were no peer review and journals simply published whatever was sent, we would quickly be awash in a sea of mediocrity and background noise; reports of good science would be swallowed up by a vast amount of shoddy work. The existence of peer review tells authors that if they want to get their work published in the journals that are read most widely and are most trusted, they will have to submit good work. Even so, much shoddy work is submitted for publication, and another important role of peer review is to screen out the obviously flawed and invalid manuscripts. This it can do fairly reliably. Peer review improves the quality of manuscripts that are published by requiring revisions, more data, reanalysis, and so on. Peer review also improves the readability of what is published. Biomedical science is in danger of splintering apart because of the arcane, specialized language used in each new field. Scientific progress requires interactions; advances in science require not only digging deeply into one narrow field but making connections with work going on in other fields. That is facilitated by having interesting and important new developments written in clear, concise, relatively simple language that can be read and understood by many scientists and physicians. This kind of clarity is important not only for other investigators, but particularly so for physicians in practice if they are to be able to understand the latest developments in biomedical science and their application to human health.

Science True – AT: Relativism

Relativism is false – even if theoretical frameworks vary, facts don’t

Barbiero 99 (Daniel, Manager, Archives and Records, National Academy of the Sciences, Summer, Issues In Science and Technology, Books, September 11, http://www.issues.org/15.4/br\_barbiero.htm, JMB, accessed 6-25-11)

The argument from framework relativism, derived rightly or wrongly from Kuhn and frequently encountered among postmodern writings, holds that since our descriptions of the world are necessarily relative to the conceptual repertoires through which we have access to the world and to the conditions under which our descriptions are formulated, then our knowledge has no necessary validity for others outside of the contexts in which our descriptions are formulated. Consequently, we cannot look to objective factors to evaluate knowledge; on the contrary, the very notion of objectivity must be abandoned. But this is obviously untrue; the speed of light, for instance, is the same no matter which conceptual framework one holds to. It may be that a framework lacks a concept for the speed of light, but that says something only about the framework, not about the speed of light. It simply isn't the case that because a description can be made relative only to a given linguistic, social, or historical context, the facts described are valid relative only to that context. In the end, features of the world either will or will not bear out the descriptions we make of them. The assertion that science is a social practice driven by interests, purposes, and concerns has become a dogma among postmodern writers, particularly those engaged in social and cultural studies of science. If the claim is simply that science does not take place in a vacuum, that it is situated within particular cultures at particular points in their histories, then it is a reasonable if not banal one. The false step, which many postmodern critics of science seem more than willing to take, is to go from the generally accepted observation that science is not simply a matter of the mechanical application of general topic-neutral laws of derivation to bare facts, to the false conclusion that there therefore is no fact of the matter to scientific knowledge outside of social determination. Socially negotiable interests can influence the terms in which we will describe something, the choice of what it is we will describe, or what questions we will attempt to answer in generating the description. But ultimately we are still left with the crucial question: Is our description an adequate one, given what we want to know?

Science isn’t arbitrary – it’s based on the laws of nature

**Sagan 97** (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 261-262, JMB)

There is a strangely waxing academic opinion, with roots in the 1960s, that holds all views to be equally arbitrary and `true' or `false' to be a delusion. Perhaps it is an attempt to turn the tables on scientists who have long argued that literary criticism, religion, aesthetics, and much of philosophy and ethics are mere subjective opinion, because they cannot be demonstrated like a theorem in Euclidean geometry nor put to experimental test. There are people who want everything to be possible, to have their reality unconstrained. Our imagination and our needs require more, they feel, than the comparatively little that science teaches we may be reasonably sure of. Many New Age gurus - the actress Shirley MacLaine among them - go so far as to embrace solipsism, to assert that the only reality is their own thoughts. `I am God,' they actually say. `I really think we are creating our own reality,' MacLaine once told a sceptic. `I think I'm creating you right here.' If I dream of being reunited with a dead parent or child, who is to tellme that it didn't really happen? If I have a vision of myself floating in space looking down on the Earth, maybe I was really there; who are some scientists, who didn't even share the experience, to tell me that it's all in my head? If my religion teaches that it is the inalterable and inerrant word of God that the Universe is a few thousand years old, then scientists are being offensive and impious, aswell as mistaken, when they claim it's a few billion. Irritatingly, science claims to set limits on what we can do, even in principle. Who says we can't travel faster than light? They used to say that about sound, didn't they? Who's going to stop us, if we have really powerful instruments, from measuring the position and the momentum of an electron simultaneously?Why can't we, if we're very clever, build a perpetual motion machine `of the first kind' (one that generates more energy than is supplied to it), or a perpetual motion machine `of the second kind' (one that never runs down)? Who dares to set limits on human ingenuity? In fact, Nature does. In fact, a fairly comprehensive and very brief statement of the laws of Nature, of how the Universe works, is contained in just such a list of prohibited acts. Tellingly, pseudoscience and superstition tend to recognize no constraints in Nature. Instead, `all things are possible'. They promise a limitless production budget, however often their adherents have been disappointed and betrayed.

Science True – AT: Socially Constructed

Science isn’t affected by social norms – it’s verifiable

Sagan 97 (Carl, PhD in astrophysics from U of Chicago, *The Demon-Haunted World: Science as a Candle in the Dark*, p. 250-251, JMB)

Postmodernists have criticized Kepler's astronomy because it emerged out of his medieval, monotheistic religious views; Darwin's evolutionary biology for being motivated by a wish to perpetuate the privileged social class from which he came, or to justify his supposed prior atheism; and so on. Some of these claims are just. Some are not. But why does it matter what biases and emotional predispositions scientists bring to their studies, so long as they are scrupulously honest and other people with different proclivities check their results? Presumably no one would argue that the conservative view on the sum of fourteen and twenty-seven differs from the liberal view, or that the mathematical function that is its own derivative is the exponential in the northern hemisphere but some other function in the southern. Any regular periodic function can be represented to arbitrary accuracy by a Fourier series inMuslim as well as in Hindu mathematics. Non-commutative algebras (where A times B does not equal B times A) are as self-consistent and meaningful for speakers of Indo- European languages as for speakers of Finno-Ugric. Mathematics might be prized or ignored, but it is equally true everywhere - independent of ethnicity, culture, language, religion, ideology. Towards the opposite extreme, there are questions such as whether abstract expressionism can be `great' art, or rap `great' music; whether it's more important to curb inflation or unemployment; whether French culture is superior to German culture; or whether prohibitions against murder should apply to the nation state. Here the questions are oversimple, or the dichotomies false, or the answers dependent on unspoken assumptions.Here local biases might very well determine the answers. Where in this subjective continuum, from almost fully independent of cultural norms to almost wholly dependent on them, does science lie? Although issues of bias and cultural chauvinism certainly arise, and although its content is continually being refined, science is clearly much closer to mathematics than it is to fashion. The claim that its findings are in general arbitrary and biased is not merely tendentious, but specious.

Scientific truths are not relative; social norms just influence the progress of knowledge

Ziman 96 (John, emeritus prof of Physics @ U Bristol, Nature, Vol 382, Aug 29, p. 751-754 http://libweb.surrey.ac.uk/library/skills/Science%20and%20Society/SS\_1\_Reading2.pdf, JMB)

The scientific ethos The close link between social norms and philosophical principles is no accident. It is not even clear which set comes first. It could be argued that the philosophical principles are primary and that the norms sum up the social practices that have naturally developed as scientists have tried to apply these principles In their research. But a sociologist might say that the institutional selling of academic science generates certain practices, and that these practices determine the principles regulating the type of knowledge that is produced. The norms and principles are clearly complementary aspects of an ethos whose social and psychological parts are inseparable. It does not follow, however, that all truth is 'relative' or that scientific knowledge is constructed\* entirely to suit certain social 'interests'. All it means is that the progressive unveiling of nature is not a very systematic process. How far we have got in that process — that is, what counts as scientific knowledge at any given moment — is obviously influenced by the way in which research is organized. This comes out clearly when we consider how academic science is organized. Whatever the formal management structure, academic science is divided into disciplines That disciplines are usually loosely organized does not make them ineffective. An academic discipline is a global invisible college' whose members share a particular research tradition. This is where scientists acquire the theoretical frameworks, codes of practice and technical methods considered to be 'good science'.

Science True – AT: Socially Constructed

Science has inherent truth value even if it is socially constructed – public acceptance and predictive value proves

Brown, Professor of Sociology at U Maryland, 98 (Richard Harvey, “Modern Science and Its Critics: Toward a Post-Positivist Legitimization of Science” New Literary History 29.3 (1998) 521-550, Muse, JMB)

For this project the positivist philosophy of science has great power, but not as an explanation of how scientists achieve consensus about theories or findings. Instead, positivism describes major rhetorics by which political moves within the scientific field are legitimized and made disinterested. Again, the criterion of disinterest is also a criterion of interest--interest in advancing one's own research program and career by shaping validity consensus around some new finding, technique, or theory. Such a formulation clarifies some ambiguities within the critiques of science and also implies ways in which science might be re-legitimized or reformed. That is, even if significant social texts like science are deconstructed as fictions of one sort or another, we are still left with the task of explaining how they become "significant" to their authors and their publics. 53 This question is not addressed if we simply relativize and politicize the text by insisting that both facts and fictions are socially constructed. Indeed, we noted that some deconstructionists share the positivists' assumption that valid knowledge must be built on a wholly factual or logical foundation. Then, when the truth value of a discourse is dismissed as "constructed," there are no qualitative degrees of the varieties of truth or significance that remain. This tends to reduce knowledge to power, to place the deconstructor in complete control of the story, and to overlook the practical experience of meaning, truth, or significance of the original author and audience. To avoid these limitations, the task of a thorough-going rhetorical critique of science also must account for the sort of knowledge that science offers for the audiences that made it the text that it is. Thus postmoderns, for example, must explain how the text of science might be construed as "true." This hypothetical construal constitutes a joining with the experience of the audience and rhetor which is at the core of any meaningful hermeneutical analysis. Such joining is never complete, of course. It always involves some critical distance through which the critic brackets or suspends the text as the literal truth it might have [End Page 539] represented for its original author and audience, in order to then identify the social, conceptual preconditions for that assertion being taken as true. Thus, rhetorical critique of science will identify the background assumptions and rules of discourse for that community as well as the shared epistemic categories that provide an explanation in that community for that text's power to speak the truth to its public. In this formulation, epistemology is taken very seriously as norms of truth telling, not absolutely or universally, but as social rules for legitimating discourse within particular groups, discourse that in practice may have been conducted by very different, less explicit, and much more ambiguous rules. Once science is seen as discursive practice, the proper locus of its legitimization also becomes rhetorical, that is, aesthetic and political. This is increasingly recognized by scientists themselves, who often speak of the beauty of a particular scientific theory or experiment, and who also may view their work as a mythic narration of society and cosmos. This view is quite contrary to the positivist defenders of science who argue that it is not the job of the scientist qua scientist to deal with the nature of truth or the meaning of time and the universe. These are tasks, they argue, for metaphysicians and theologians, or for poets, the "unacknowledged legislators of mankind," as Shelley called them. Hence, according to this argument ,"it is only necessary to point out the inherent limitations of science so that people will look elsewhere for answers to these larger questions." 54 The difficulties with this view are the same as with those of positivist philosophy of science itself: the ideal of an inherently self-limiting science has little relationship to the operations of actual scientific fields. True, the myths and religions of humanity address the great existential questions, apprehensions of life and death, where we come from and what is our fate. But these concerns have not been erased by the disenchantment of science and the modern world. Instead, they are increasingly addressed by science, despite our skepticism toward it. In the modern era science became and remains the throne of God, the seat on high from which one views the world and proclaims the rules by which it is ordered. As Mary Hesse notes, "acceptable theories . . . tell a story about the world which captures some of its structure, and in that sense relate to its true state. So far a moderate realism for science can be maintained. But theories as 'world-stories' also have another function in our society, in which they can be likened to social myths. Use of the word 'myth' here is not intended to devalue their importance or significance within scientific knowledge, for two reasons. First, their predictive value ensures that they are not myths in the sense of arbitrary fantasies, and second, they have the essential function of reducing experience to a [End Page 540] descriptive language which, though it is theoretical, forms the medium of communication within scientific communities. They also serve to communicate with popular culture, by informing the laity about science, and, even more significantly, by providing the social myths previously provided by religion. Think of the enthusiasm engendered by myths of the beginning and end of the universe arising from modern cosmology, and publicized in best-selling books and popular media productions. These are the 'Genesis' and 'Judgment' myths of our culture. It is true that since they arise from a self-proclaimed 'neutral' science, they notably lack the overt moral content which typically characterizes almost every other social mythology, but this is not to say that their influence is in fact neutral. Indeed the very claim of neutrality can serve to mask value-judgments about the nature of science and its social consequences" (HT 447-48).

Science True – AT: Socially Constructed

Facts of nature found by science are objective; they transcend cultural norms – scientists would realize it if this weren’t the fact

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

Most working scientists would agree with Gross and Levitt, a biologistmathematician duo who have recently taken issues with constructivism, that 'science is, above all, a reality driven enterprise. ‘As the outpouring of working scientists' critique of constructivism that followed the recent hoax by the physicist Alan Sokal indicates, most agree with Sokal's statement that ' there is a real world; its properties are not merely social constructions; facts and evidence do matter.'28 Indeed, to tell a physicist that laws of nature are not explanations of natural phenomena but projections on nature of our social concepts is like 'telling a tiger stalking prey that all flesh is grass,' as Steven Weinberg put it.29 It is scandalous how feminist and sociological critics of science have never paused to wonder why most working scientists fail to recognize the science they do in the picture of science that emerges in constructivist accounts. I am not suggesting that all science critique must obtain a seal of approval from working scientists - there may well be aspects of their work (especially science's social history) that scientists may not be aware of, or may not immediately recognize. But at the same time, surely something is amiss in a critique that assumes the actors to be so deluded as to consistently confuse their own constructions for facts of nature. The realism that I'll defend aspires to capture the robust realism of most natural scientists. I will argue that scientists find out things about the world which are independent of human cognition; they advance true statements, use concepts that conform to natural divisions and develop schemata that capture objective dependencies. One of the most rigorously argued defences of such a realism has been recently provided by Philip Kitcher whose definition of science I will follow: science aims to 'produce structured accounts of causal structures of the world, by delineating the pre-existing natural kinds and uncovering the mechanisms that underlie causal dependencies.'" Such realism rejects 'deflationary realism,' a recent favourite in science studies circles, which grants the existence of entities described by science, but does not accept that successful scientific theories are progressively truer accounts of these entities.3z The great virtue of the realist philosophers whose work I will use is that their account of realism does not require an appeal to some ideal, a priori notion of rationality involving either a semantic relationship between our words and the world, or a god-like transcendence of the social context. The realization that we can only access the world through our cultural and social categories by no means vitiates knowing the world in a manner that can transcend our cultural and social categories.

Interpretation of tests isn’t driven by social interests

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

All irony aside, I find both of the above cited 'conclusions' (assumptions?) of EPOR - that science is, in the final instance, convention driven, and that the reality is a retrospective 'upshot' of scientific practices - extremely troubling. The views of these sociologists go completely against all that made laboratory work exciting and worth the effort. But there are good reasons to refuse Collins' conclusions. For one, because Collins completely ignores the perfectly rational reasons (wrong calculations, computer errors ) why the experiment in question had to be rejected.''' Furthermore, Collins' premise for experimenter's regress is plain wrong. Experimenters' regress does not exist. It does not exist for this reason: the reliability of an instrument (or a technique) can be established by connecting its performance to procedures that can be validated by a set of background assumptions and laws that are independent of the claim under test. Thus it is simply not the case that the test of the g-wave detector depends upon the existence of g-waves, or the existence of g-waves is 'coextensive with' the availability of a g-wave detector. We have a large number of independently justified beliefs - indeed, Einstein's theory of general relativity itself - that predict the presence of g-waves and allow us to hypothesize their nature, and how, in principle they can be detected. Likewise, there are other networks of physical theories that justify the design, functioning, sensitivity etc. of the detector. It is encouraging that the more recent work recognizes the independence of experiments from the theory under test.'02

Science True – AT: Social Location

Social position irrelevant to the interpretation of science – self-correction and barriers of reality

Nanda 97 (Meera, John Templeton Foundation Fellow in Religion and Science, doctorate in molecular biology, The Socialist Register, p. 302-352, “Restoring the Real: Rethinking Social Constructivist Theories of Science” JMB)

According to Haack, it is due to the strength and distinctiveness of the social and communal nature of science that warrant does not get determined by acceptance. Because science is the work of many persons, spanning different generations and different cultures (increasingly so in today's globalized science), scientific knowledge gets accepted through a process of checking and criticism. Here, one would happily agree with the constructivist critics that the more open and inclusive the social institutions of science, the better it would be for science, since inclusion of diverse view points will improve the quality and degree of mutual criticism. Thus the argument for equal opportunity for women and minorities with adequate interest and training, makes not just social but epistemic sense. The more open and inclusive communities of knowers are, the more likely they will be to pass on true(r) beliefs rather than falsehoods. What does not make sense is the claim that the gender, race or ideology of the knowers will (or should) make any difference to the assessment of the evidence and the conclusions derived therefrom. The idea that the social location of the knower makes a difference to scientific reasoning does not make sense because, just as someone solving a crossword puzzle is limited by the grid of already-completed entries and the clues, the scientific community is not at liberty to change any entry at will without destroying the integrity of the puzzle. In the final instance, this integrity is crucially dependent on the structures and mechanism of the world itself. Only those who would simultaneously deny the integrity and independence of reality would have no qualms in treating the social character of science as necessary and sufficient to explain the entire logic of science.

1. [↑](#endnote-ref-1)
2. [↑](#endnote-ref-2)