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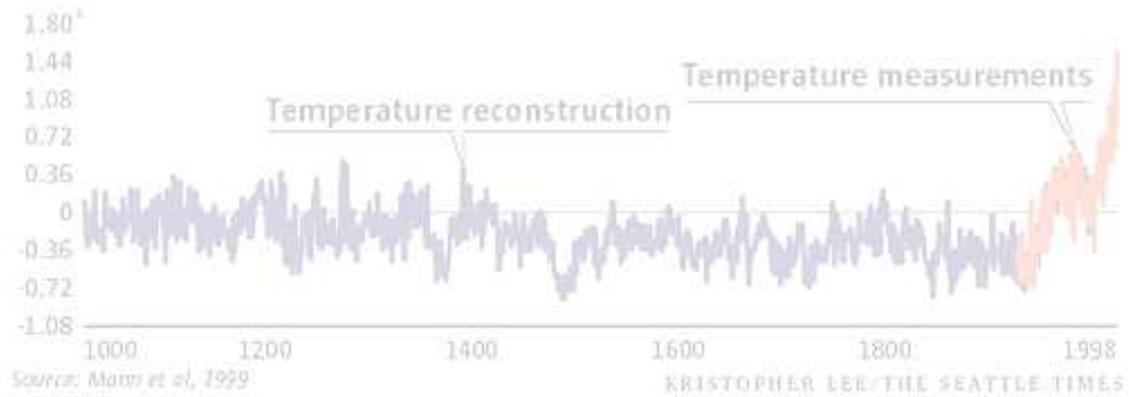
Money and the epistemologies of ignorance concerning climate change

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MONEY AND THE EPISTEMOLOGIES OF IGNORANCE CONCERNING CLIMATE CHANGE

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COVER ART: Bird Talk in the Plum Garden, Seiho Takeuchi

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ABSTRACT

The investigations and politically-motivated attacks taking place in climate change studies confirm that scientific knowledge comes about as social constructions shaped by non-scientific events and circumstances such as interests, power relationships and negotiations. As both Lynn Hankinson Nelson and Foucault wrote truth claims are the result of (convergence and alignment) rather than the cause of agreement within some epistemic communities.

1. INTRODUCTION

The dominant economic system is based on short-term thinking and the unsustainable use of natural resources. This system has become so normalized that it is difficult to change even in the face of potential catastrophic climate change (Krugman 2010b). Capitalism reduces biological diversity to quantitative values and does not mourn the loss of those species considered to have little economic value (Gilson 2011). Scientists can act as epistemic agents; selecting their evidence. Code calls this an ecological model of knowledge- every cognitive act takes place in a specific space, time and context in the knower's history reflecting that person's background and circumstances (quoted in Koggel 2008; Sarewitz 2004).

In a discussion of quacks Goodwin and Tangum (1998) defined science as a human performance or human enterprise. As part of this human enterprise the boundaries and contents of science are continually negotiated and re-negotiated rather than being only pre-existing entities needing to be discovered and revealed (Code,

1993). Truth claims are then the result rather than the cause of agreement within a scientific community (Nelson, 1993). Therefore scientists cannot claim that they are accountable only to their evidence since scientists act as epistemic agents and their evidence is selected and not found (Nelson 1993; Code 1993; Deichmann and Müller-Hill 1998).

Latour (1988) debunked the idea of ideology-free Science. However in 2003 two conservative think-tanks published a book arguing that only ideology-free science should guide politics. Congressman Henry Waxman released a report a month later stating that the Bush Administration manipulated the scientific process and distorted or suppressed scientific findings for the benefit of its financial backers. Given this context, the chief reason for the lack of action on climate change is the extreme concentration of income in countries like the US which is incompatible with real democracy. These fortunes have been built on climate-destroying industries like oil and coal (Krugman 2011f).

Two dozen multimillionaires and companies gave \$54 million in donations to Republican “super PACs” (NYT Editorial February 23, 2012). Oxbow Carbon LLC. gave \$750,000 to Romney. It’s a petroleum company founded by Bill Koch, the brother of David H. and Charles Koch. Bill Koch also personally contributed \$250,000 (Ericson et al. 2012). Rove’s American Crossroads got \$425,000 from Alliance Management Holdings, from one coal operation run by Joseph W. Craft III of Tulsa and \$100,000 from another, Alpha Natural Resources LLC., (CEO Kevin S. Crutchfield). Rick Perry’s Super Pac got \$250,000 from S. Javaid Anwar, President of Midland Energy, who was also paid \$66,362.50 for the use of a private jet. Kelcy L. Warren CEO of Energy Transfer Partners gave \$250,000. Stephen I. Chazen CEO of Occidental Petroleum Corp gave

\$100,000 as did Paul L. Foster, Chairman of Western Refining Company. Mr. Foster spent \$20,000 flying Gov. Perry to a trade meeting where Perry asked Mexican energy officials to consider more joint ventures with Texas oil companies (Ericson et al. 2012). Rick Santorum’s Super Pac got \$1.0 million from William J. Dore, President of Dore Energy.

The Koch brothers are conservative businessmen (worth \$35 billion) with oil refineries in Alaska, Texas and Minnesota, four thousand miles of pipeline and their own advocacy groups - Americans for Prosperity, the Heartland Institute, the Cato Institute, the Institute for Humane Studies, the American Enterprise Institute, the Independent Women’s Forum and George Mason University (Figure 1a&b). Koch Industries is one of the top ten US air polluters.

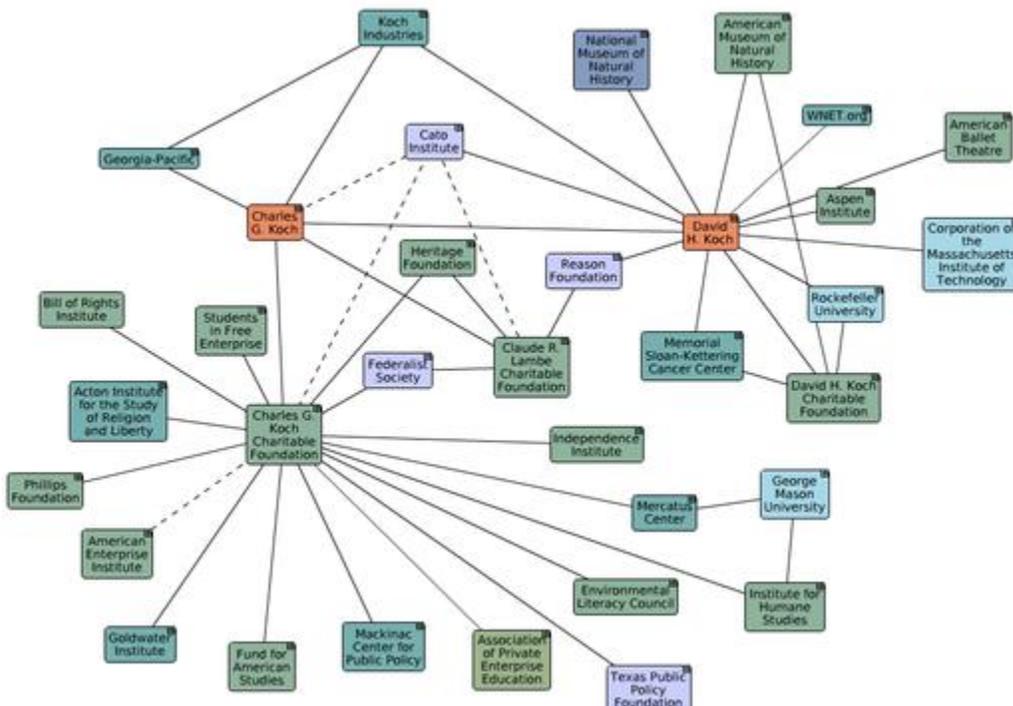


Figure 1a. The Koch brothers have their tentacles in everything

<http://www.sott.net/articles/show/228651-Professor-Koch-s-Psychopathy-101-Class>

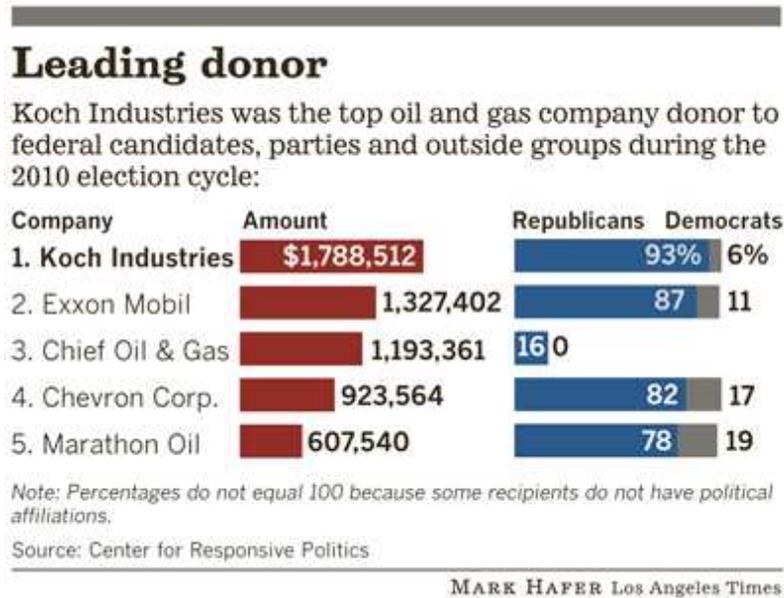
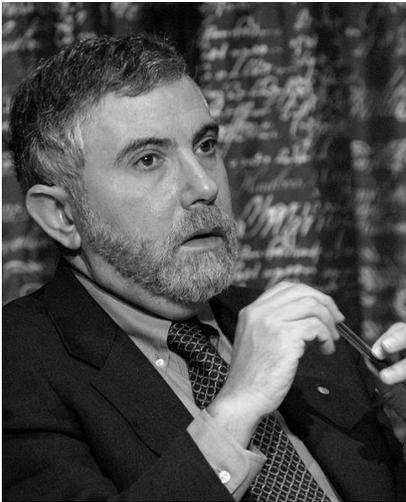


Figure 1b.

The Koch-funded Mercatus Center at George Mason University focuses on writing deregulation policies for politicians typically aimed at the Environmental Protection Agency (Mayer 2010). Charles Koch has strong ideas about [libertarian] social change and uses a vertically and horizontally integrated radical strategy that starts with idea creation and goes to policy development, including education, NGOs, lobbying, and litigation. For example the Independent Women’s Forum is used to oppose the presentation of global warming as a scientific fact in American public schools (Mayer 2010).

[Koch brothers] “a family of billionaires who support right-wing causes and pose as super-patriots, while actually using their political influence to cover for wrongdoing on multiple fronts — not just endangering workers and the environment, but even making deals with foreign regimes that are actively anti-United States and sponsor terrorists” (Krugman 2011e).

“Can anyone seriously deny that our political system is being warped by the influence of big money, and that the warping is getting worse as the wealth of a few grows ever larger?” (Krugman 2011f)...[it] may have as much to do with power relations as it does with market forces (Figure 2). “Both history and modern experience tell us that highly unequal societies also tend to be highly corrupt” (Krugman 2006).



Paul Krugman, Laureate of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2008 at a press conference at the Royal Swedish Academy of Sciences in Stockholm

“Today, energy is already the main driver of China's international behavior. Its energy needs have brought Beijing to turn a blind eye to human rights violations in Sudan, Myanmar and Uzbekistan,” testified oil analyst Gal Luft before the U.S. House Committee on Foreign Affairs last year. “China's energy deals led Beijing to block U.S. attempts to the UN Security Council to impose crippling sanctions against Tehran for its nuclear weapons” (Nikiforuk 2012).

Krugman (2011g) has also spoken publically about the soft corruption of the revolving door between government jobs and large private companies seeking to influence political decisions for their own benefit.

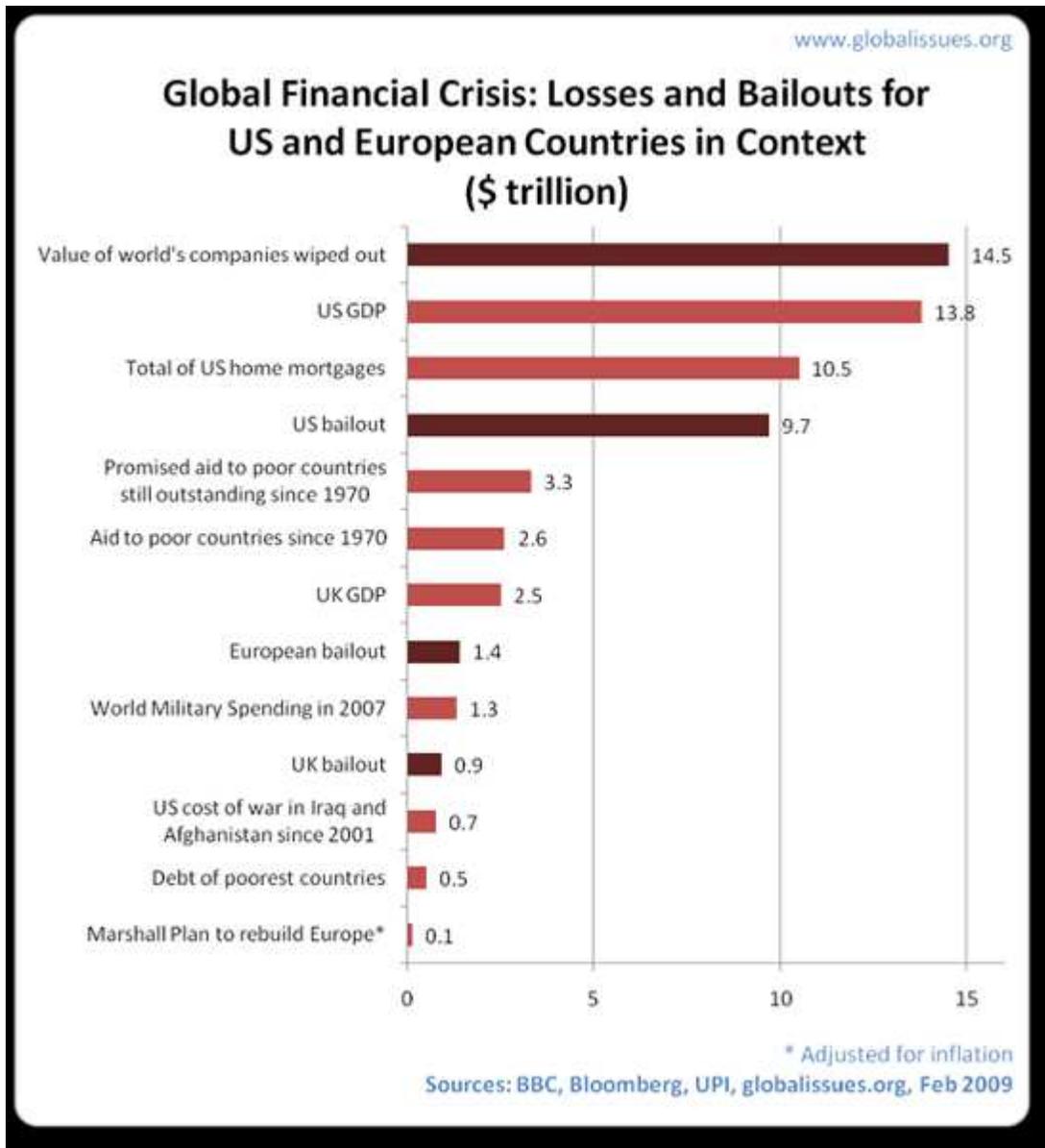


Figure 2. Political power of the finance industry including the shadow banks

W.W. writing a blog post from Iowa City responded to Professor Krugman's articles on inequality in *The Economist* and tried to shift the blame to female-headed households:

Suppose we were to tax income above the 95th percentile at 100%. Would that redistribute political influence sufficiently to qualify America as a non-oligarchy?

Why would it? Anyway, how exactly would lopping the tall poppies improve the relatively poor prospects of the large percentage of children raised in single-parent households? Unless you happen to think the political influence of a tiny ultra-rich elite is somehow keeping the general will from expressing its support for policy interventions known to successfully lower the barriers faced by single-parented kids, it won't (Anon 2011).

2. THE HOCKEY STICK GRAPH VS NEW PIPELINES

While referring to the epistemology of ignorance, this paper will focus on the 2006 debate over the hockey stick graph. Some of the financing that tried to debunk the hockey stick graph came from the American Petroleum Institute, the Canadian-based Fraser Institute and the Society of Petroleum Geologists (Monastersky 2006). Excerpts of blog posts, editorials and media transcripts from Princeton Professor Paul Krugman will be used. He is a fairly reliable observer of economic and political events and is a top public intellectual (US Foreign Policy magazine and Britain's Prospect Magazine). He uses his status to say what others can't or won't. The blogs and articles were read when originally published and downloaded for this paper. This paper will also rely on the account of the congressional inquiry on the hockey stick graph published by Richard Monastersky (2006). Monastersky's article was downloaded and used as teaching materials in 2006.

The fight over the hockey stick graph may be a precursor to the 2011/2012 environmental fights over the Alberta tar sands and the proposed Northern Gateway Pipeline Project which would bring tar sands oil from Alberta to Kitimat on the northwest coast of BC, before shipment to China (Figure 3). Northern Gateway would carry 1,172

kilometers through fairly pristine temperate rainforest (Hoggan 2012; Welsch 2012). Enbridge pipelines (from 1999 – 2008) had 610 recorded oil spills that leaked 132,000 barrels of hydrocarbons onto farms and natural areas (Nikiforuk 2010). The company has received 31 citations from the U.S. Pipeline and Hazardous Materials Safety Administration for poor operational management since 2002.

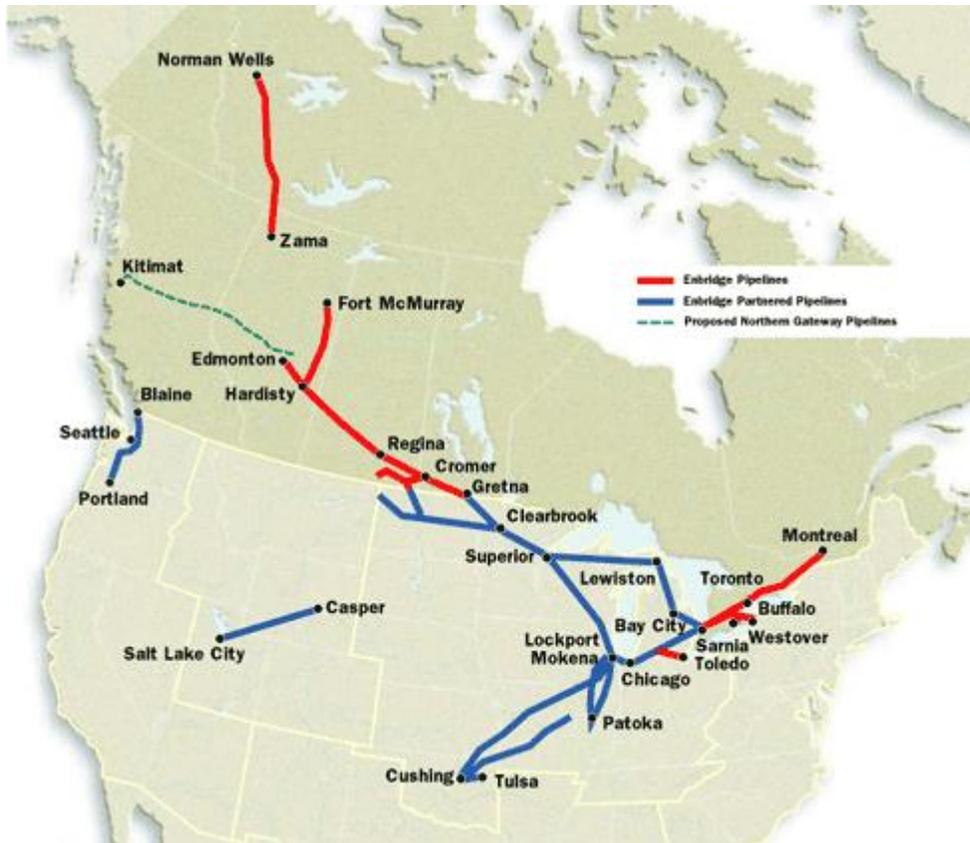


Figure 3: Enbridge Northern Gateway Pipelines (Source northerngateway.ca)

The financial backers of Northern Gateway are Alberta oil sands producers and China's energy companies. They are: China's state-owned Sinopec, Cenovus Energy Inc., MEG Energy Corp., Nexen Inc., Suncor Energy Marketing Inc. (a subsidiary of Suncor Energy Inc. (all of Alberta) and French owned Total E&P Canada. Other probable Chinese backers are National Petroleum Corp., and Sinochem Group (Worcester 2012).

A media push including a book launch was made to brand Canadian tar sands as ethical oil (www.ethicaloil.org) led by Canadian lawyer Ezra Levant and Prime Minister Stephen Harper's current Director of Planning Alykhan Velshi (Hoggan 2012). Sinopec, Enbridge's Chinese business partner for the Northern Gateway Project, has a history of human rights violations, environmental pollution and working with corrupt governments (e.g. Sudan, Angola, Myanmar and Iran). Two temporary Chinese workers were killed in a storage tank collapse in Alberta and there were issues with wages. Sinopec wants the Supreme Court of Canada to overturn the ruling forcing them to stand trial for ignoring Alberta's health and safety regulations (Nikiforuk 2012).

"No matter if it's rogue's oil or a friend's oil, we don't care," explained one Chinese energy advisor to the Washington Post in 2005. "Human rights? We don't care. We care about oil. Whether Iran would have nuclear weapons or not is not our business. America cares, but Iran is not our neighbor. Anyone who helps China with energy is a friend" (Nikiforuk 2012)

On Wednesday January 2012, Canadian Finance Minister Jim Flaherty asked for faster approval of projects like Enbridge Inc.'s (ENB) proposed Northern Gateway oil pipeline. This appeal came just before the first public regulatory hearings for the Northern Gateway pipeline in Kitimat. The pipeline is being contested by First Nations and by international environmental groups who have also opposed TransCanada Corp.'s (TRP) Keystone XL that would expand southbound oil shipment capacity from Canada to the U.S (Welsch 2012).

An open letter written by a whistleblower, a former ForestEthics communications staffer, claimed that the Harper government was trying to silence critics of the proposed

Enbridge pipeline..." <http://www.straight.com/article-590706/vancouver/andrew-franks-whistlebl...> See also - <http://greenparty.ca/blogs/103/2012-01-29/prime-minister-s-offices-silence-pipeline-critics-labels-environmental-gro>

His letter followed an open letter by Joe Oliver, Minister of Natural Resources claiming that "there are environmental and other radical groups that would seek to block this opportunity to diversify our trade": Excerpts from the Minister's letter are provided below:

http://business.financialpost.com/2012/01/09/joe-olivers-open-letter-the-regulatory-system-is-broken/?_lsa=16cca868

...We must expand our trade with the fast growing Asian economies. We know that increasing trade will help ensure the financial security of Canadians and their families. Unfortunately, there are environmental and other radical groups that would seek to block this opportunity to diversify our trade. Their goal is to stop any major project no matter what the cost to Canadian families in lost jobs and economic growth. No forestry. No mining. No oil. No gas. No more hydro-electric dams...These groups threaten to hijack our regulatory system to achieve their radical ideological agenda... to undermine Canada's national economic interest.

3. THE BIRTH OF THE HOCKEY STICK CHART

The hockey stick chart depicting anthropogenic climate change was developed by Michael E. Mann, an associate professor of meteorology at Pennsylvania State University, with two colleagues Jeffrey Park, Professor of Geology and Geophysics at Yale University and Raymond Bradley Distinguished Professor in the Department of Geosciences at the University of Massachusetts Amherst (Figure 4), and published in *Nature* (378, 266 – 270) (Monastersky 2006).

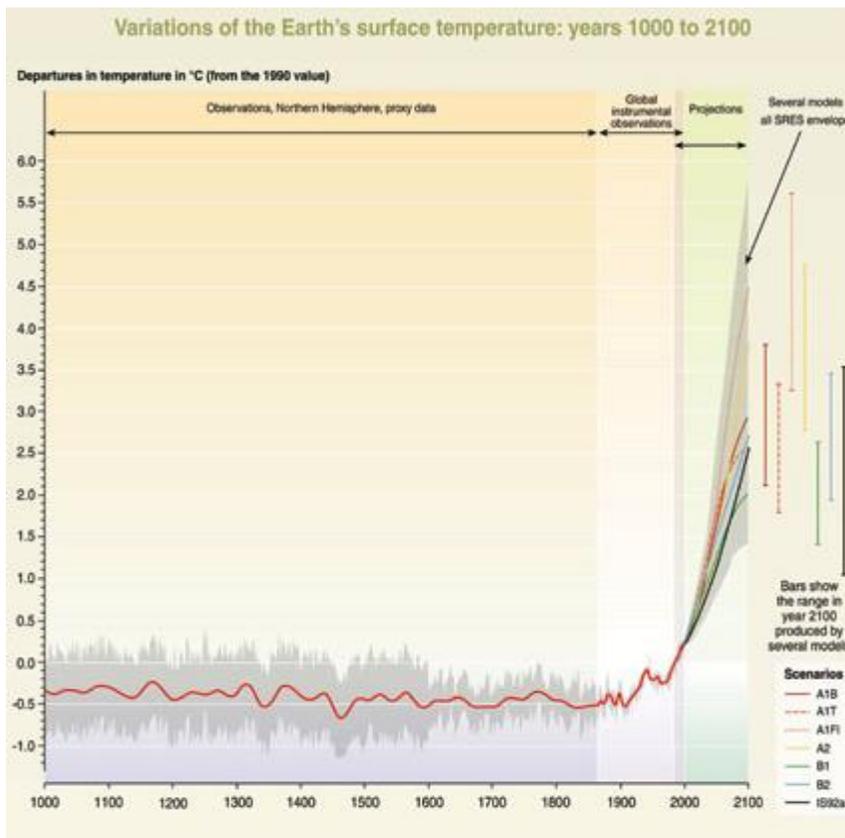
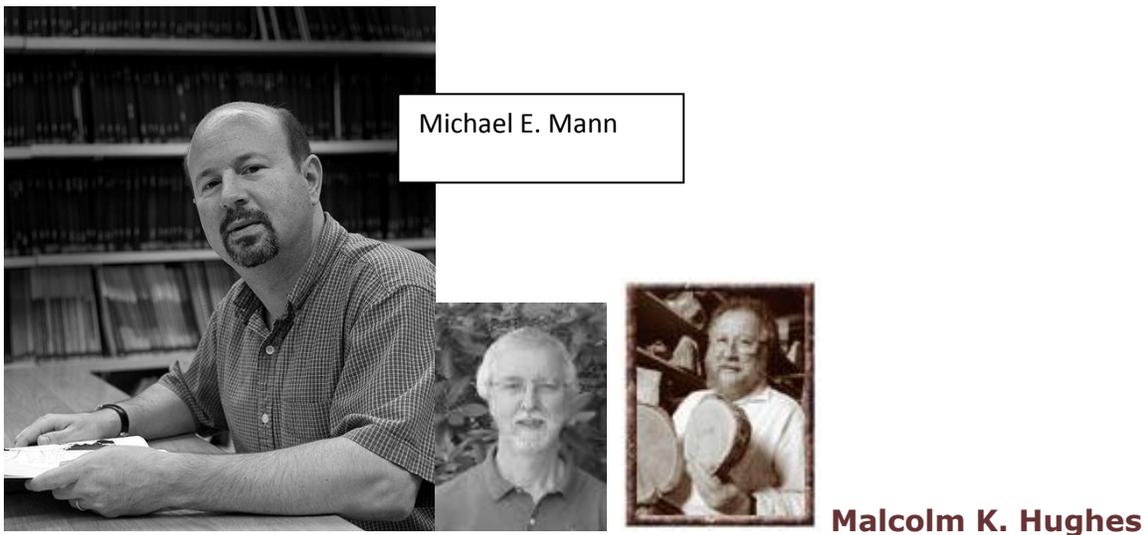


Figure 4. Taken from Mann's original paper in *Nature*

<http://www.nature.com/nature/journal/v441/n7097/full/4411032a.html>

Working with Malcolm K. Hughes, a professor of dendrochronology at the University of Arizona, Mr. Mann used records from disparate natural sources — tree rings, lake sediments, ice cores and layers, and coral layers — (called proxy records) to reconstruct what temperatures were like across the Northern Hemisphere for the past six centuries. This temperature chart resembles a hockey stick due to the steep rise in temperature that began with the Industrial Revolution.



The National Research Council of the National Academy of Sciences released a 141-page assessment of the chart (Anon 2005; Monastersky 2006). In 2001, the UN-Intergovernmental Panel on Climate Change (IPCC) convened researchers to report on climate change. Mr. Mann and other authors wrote the section on temperature changes, described the millennial reconstructions and the remaining uncertainties.

The leaders of the IPCC summarized the 994-page scientific report into a 20-page synopsis which included the hockey-stick graph (Figure 4). The graph also appeared on a poster during the televised report of the summary by Sir John T. Houghton.



www.lexi-tv.de

The first page of the "Summary for Policy Makers" stated that "new analyses of proxy data for the Northern Hemisphere indicate that the increase in temperature in the 20th century is likely (66- 98%) to have been the largest of any century during the past 1,000 years." In 2006, seven other climate studies of the past 2000 years also confirmed man-made generated climate change (Monastersky 2006).

4. THE BURIED EPISTEMOLOGY OF ENLIGHTENMENT THINKING

Part of the reason why there has been little consensus on how climate change should be addressed is due to the "human exemptionalism paradigm" born in Enlightenment thinking which allows scientists to claim that they can remake or replace nature with technology and thus transcend nature (Goldman and Schurman 2000; Merchant 1980; Mies and Shiva 1993; Salleh 1997). Goldman and Schurman (2000) wrote that tools such as environmental impact assessments and green cost-benefit analyses which form part of the scientific discourse around climate change reflect newly contrived universal norms and models which reflect the perspective of Western scientists. In contrast to the dualisms of Enlightenment thinking, environmental feminists have theorized social-natural relations in terms of ecological embeddedness, reflexive awareness and biological embodiment. Nature has to be

included alongside capital and labor as fundamental economic categories (O'Connor 2008).

5. GENDER AND CLIMATE CHANGE

Terry (2009) claims that the mainstream policy discourse of climate change is stereotypically masculine- consisting of computer models, neoclassical economic approaches like carbon trading and quick fix technologies. While not completely agreeing I would add nuclear energy to this list (Mummy will clean up the messy nuclear waste). The majority of the politicians and businessmen involved in the climate change dispute, and in the Super Pac donations mentioned above are men. Ross (2008) found that oil-dominated economies in the Middle East, Azerbaijan, Russia, Chile, Botswana and Nigeria had repressive gender policies because of the oil wealth, which boosted male dominated construction (golf courses) and services but suppressed alternative manufacturing which served as career entry points for women (like sewing). Lisa Blaydes and Drew Linzer (2007) found that lack of economic opportunity led women to embrace fundamentalist belief systems in order to make themselves more marriageable (marriage becoming their main economic support).

Few national leaders are female and only 15% of the scientists involved in the IPCC assessment report were female. Gender issues were described on half a page in the 2007 IPCC report (Quraishi 2009). Terry (2009) also discusses gendered vulnerability in which women are seen as victims of unpredictable weather, agricultural and health conditions but they are not seen as providers of solutions to climate change.

Krugman (2009b) addressed the masculinity concerns behind climate change resistance in a few blog posts:

“First, environmentalism is the ultimate “Mommy party” issue. Real men punish evildoers; they don’t adjust their lifestyles to protect the planet. An important part of the population just doesn’t want to believe in the kind of world in which we have to limit our appetites on the say-so of fancy experts. And so they angrily deny the whole thing.”.. “Conservatives seem deeply offended by anything that challenges the image of Americans as big men driving big cars” (Krugman 2009a).

He refers to the gender findings from the 2006 American Environmental Values survey and the 2008 American Climate Values Survey. The women surveyed were more likely to want to address climate change. Men were less concerned about global warming and thought that addressing it would result in negative personal and economic consequences. Traditional male-dominated industries – coal, petroleum, and other environmentally destructive status quo industries were seen as manly and macho.

6. EPISTEMOLOGIES OF IGNORANCE: DEFINITION

Dr. Carla Fehr of Iowa State University summarized the discussion of the epistemology of ignorance on an undated webpage. Charles Mills coined the term “epistemology of ignorance” in his 1997 book *The Racial Contract*. Mills argues that the Racial Contract is a meta-agreement and series of acts to not know, an agreement to “*misinterpret the world*” that is underlined by the assurance that this misinterpretation (of non-whites as inferior, subordinate and thus exploitable) will count as the true account of the world by

the beneficiaries/signatories of the contract, Whites.” Agency and structure are co-constituted and structures are reproduced through the practices of knowledgeable agents [or ignorant agents] while at the same time enabling these practices (Locher and Prugl 2005). The epistemology of ignorance is summarized below:

- 1) Ignoring or discrediting knowledge so that dominant groups don't have to face hard truths about the system (like domination and exploitation) similarly to what Kuhn (1970) described as the accumulation of anomalies in scientific paradigms until they become too numerous to ignore. The economy proceeds along non-neutral paths determined by short-term production goals, other paths (like solar energy and electric cars) are closed off.
- 2) This misinterpretation [active ignorance is a knowledge system or contract in action] coheres with a social system/paradigm in which powerful people maintain their privilege.
- 3) There is no motivation to pursue new or alternative knowledge [and] “ossified bodies of ignorance” continue (Bauer 2009; Code 2007). The powerful don't have to confront things that might unsettle them and make them feel vulnerable; so they become closed to other forms of meaning and value (Gilson 2011)

For example Richard Tol, Senior Research Officer at Ireland's Economic and Social Research Institute claimed: "(My damage estimate) does hide some things (rapid sea level rise) that some people will get very upset about"... "From an economic perspective small island states are so tiny and people are moving out of there anyway" (Wynn 2006). He is projecting vulnerability onto those others who have to move and claiming a mantle of invulnerability for himself (Gilson 2011).

Because the contract of acceptable ignorance claims to represent truth, if you disagree with it, you are discredited as a knower and have no credibility. Krugman refers to this many times in his blog and in his October 17, 2009 blog post on climate change –

“Contrary to what you may have heard, there’s very little that’s baffling about our problems — In fact, someone who learned economics from the original 1948 edition of Samuelson’s textbook would feel pretty much at home in today’s world. If economists seem totally at sea, it’s because they have carefully unlearned the old wisdom. If policy has failed, it’s because policy makers chose not to believe their own models” (Krugman 2010c).

October 17, 2009, Superfreakonomics on climate, part 1

“...the first five pages, by themselves, are enough to discredit the whole thing. Why? Because they grossly misrepresent other peoples’ research, in both climate science and economics. The chapter opens with the “global cooling” story — Um, no. Real Climate has the takedown. What you had in the 70s was a few scientists advancing the cooling hypothesis, and a few popular media stories hyping their suggestions...The book asks. Do the future benefits from cutting emissions outweigh the costs of doing so? ..The economist Martin Weitzman... concluded that the future holds a 5 percent chance of a terrible-case scenario .. Yikes. I read Weitzman’s paper, and have corresponded with him on the subject — and it’s making exactly the opposite point they’re implying it makes. Weitzman’s argument is that uncertainty about the extent of global warming makes the case for drastic action **stronger**, not weaker. .. The conventional economic advice of spending modestly on abatement now but gradually ramping up expenditures over time is an extreme lower bound on what is reasonable rather than a best estimate of what is reasonable”.

<http://krugman.blogs.nytimes.com/2009/10/17/superfreakonomics-on-climate-part-1/>

John Reilly, Senior Lecturer and Co-Director of the Joint Program on the Science and Policy of Global Change at MIT, also estimated high costs (trillions) for both rises in temperatures and to keep temperatures within a 2 degree Celsius increase (Wynn 2006).

Menzel (2010) also looks at the meta political level, writing that policy makers' cognitive frames continue be stuck in the frame of reference that has caused and continues to replicate crisis conditions that impact the poor more than the rich. Menzel (2010) gives a few real-time examples of this; World Bank adviser Jeffrey Sachs proclaimed that the structural adjustment programs and neoliberal agricultural reforms that had been imposed on many developing countries did not work, but then went on to join the Gates/Rockefeller funded alliance for a Green Revolution in Africa, ignoring the comprehensive critique of the Green Revolution by Vandana Shiva. Menzel (2010) then quotes Hoagland (2007, 105) who claims that socially advantaged subjects have a perceptual faculty of recognizing only what reinforces their own status.

7. AGNOTOLOGY

Proctor and Schiebinger (2008) defined agnotology as the study of how ignorance is produced and maintained as an active construct. They include the agents who manufacture doubt and "question the science" about problematic products such as tobacco, the agents behind climate change denial, media complicity and the ongoing reconstructions of sexism and racism. Mayer (2010) quoted the Republican political

consultant Frank Luntz who wrote in a 2002 memo that as long as “voters believe that there is no consensus about global warming within the scientific community” the status quo would prevail. Shermer (2010) makes a distinction between skepticism leading to replication in science and a climate denier who “has a position staked out in advance, and sorts through the data employing confirmation bias to find supporting evidence while ignoring the rest of the data”.

At the Congressional hearing [109th Congress under Chairman Joe Barton (R Texas) against climate change science (House of Representatives 2006)] Henry A. Waxman, Democrat Representative of California, outlined how ignorance was being produced: "This committee is doing what the deniers of global warming would have us do: ignore all the important questions and divert ourselves to a ridiculous effort to discredit a climate scientist and two studies he published eight years ago." They wanted to cast doubt on all climate-change research (Brumfiel 2006). "It's back to the tactics of the tobacco industry," he says, "manufacture doubt to delay action on an urgent problem."

(Krugman 2011a)" ...the joke actually ended up being on the Republicans, when one of the two actual scientists they invited to testify (Prof. Richard Muller of Berkeley) went off script. He is a physicist who has gotten into the climate skeptic game.. he has been leading the Berkeley Earth Surface Temperature project, an effort partially financed by none other than the Koch foundation (Figure 1a&b). ... Professor Muller reported that his group's preliminary results find a global warming trend "very similar to that reported by the prior groups" (See Figure 5).

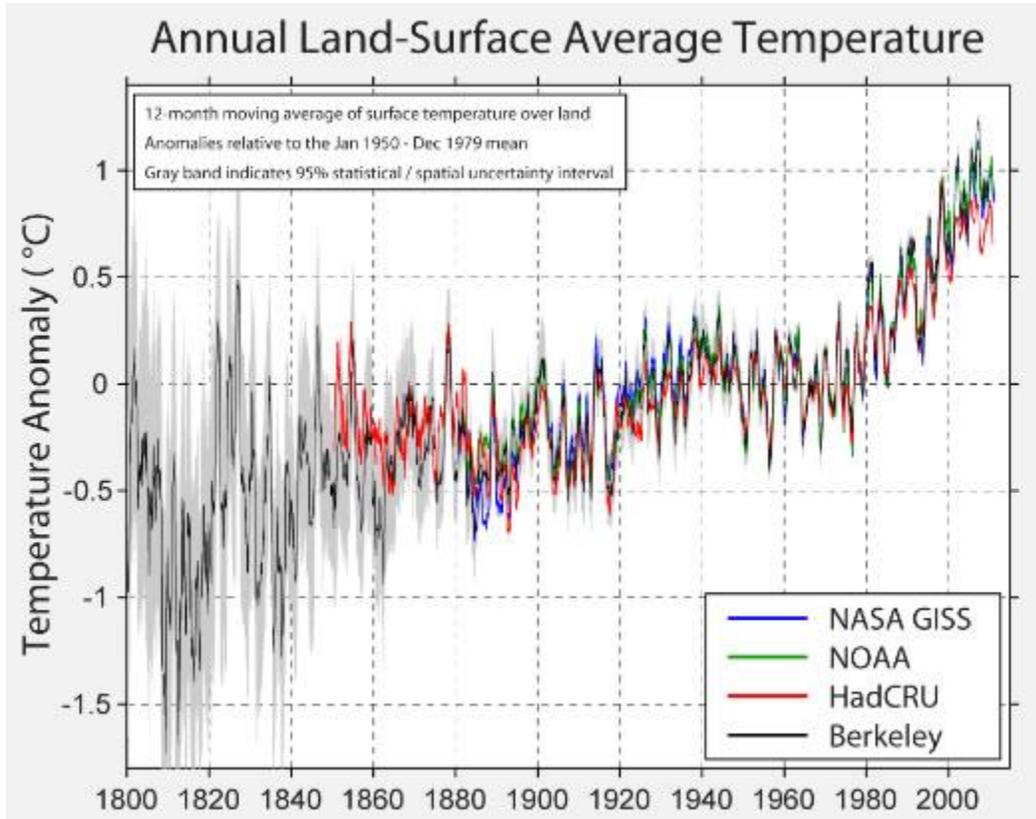


Figure 5. Muller' chart shows the annual land-surface average temperature using a 12 month moving average of surface temperatures over land. Anomalies are relative to the Jan 1950 - December 1979 mean. The grey band indicates 95% statistical and spatial uncertainty interval. <http://berkeleyearth.org/analysis/>

“...The deniers’ response was both predictable and revealing.. Just a few weeks ago Anthony Watts, who runs a prominent climate denialist Web site, praised the Berkeley project and piously declared himself “prepared to accept whatever result they produce, even if it proves my premise wrong”. Mr. Watts [now] dismissed the hearing as “post normal science political theater”. And one of the regular contributors on his site dismissed Professor Muller as “a man driven by a very serious agenda.” Of course, it’s actually the climate deniers who have the agenda..... But what we had, instead of high seriousness, was a farce: a

supposedly crucial hearing stacked with people who had no business being there and instant ostracism for a climate skeptic who was actually willing to change his mind in the face of evidence. As I said, no surprise: as Upton Sinclair pointed out long ago, it's difficult to get a man to understand something when his salary depends on his not understanding it" (Krugman 2011a).

Billionaire brothers take control of House committee (The Los Angeles Times)
(excerpted from a change in the wind blog)

The front page story [with the headline above] "reveals how the multi-billionaire Koch brothers, aka The Kochtopus came to control the House committee on regulation of fossil fuels, aka the House Energy and Commerce Committee. Wichita-based Koch Industries and its employees formed the largest single oil and gas donor to members of the panel, ahead of giants like Exxon Mobil, contributing \$279,500 to 22 of the committee's 31 Republicans, and \$32,000 to five Democrats. Nine of the 12 new Republicans on the panel signed a pledge distributed by a Koch-founded advocacy group — Americans for Prosperity — to oppose the Obama administration's proposal to regulate greenhouse gases. Of the six GOP freshman lawmakers on the panel, five benefited from the group's separate advertising and grass-roots activity during the 2010 campaign.

Claiming an electoral mandate, Republicans on the committee have launched an agenda of the sort long backed by the Koch brothers. A top early goal: restricting the reach of the Environmental Protection Agency, which oversees the Kochs' core energy businesses... It's quite astounding. For just \$20,000, they flipped Rep. Fred Upton, the new committee chair. .. The Republican from Michigan, who was once criticized by conservatives for his middle-of-the-road approach to

environmental issues, is now leading the effort to rein in the EPA”.

<http://www.achangeinthewind.com/2011/02/kochtopus-buys-house-committee-takes-power.html>



Fred Upton, Member of the U.S. House of Representatives from Michigan's 6th district; Incumbent.

Krugman (2010a) outlined why climate-change legislation was blocked in the Senate.

“...every one of these supposed scandals was eventually unmasked as a fraud concocted by opponents of climate action, then bought into by many in the news media. ...the bad science comes from a handful of essentially bought and paid for “skeptics” (Krugman 2011b)...conservatives who laud the limitless power and flexibility of markets turn around and insist that the economy would collapse if we were to put a price on carbon... we could phase in limits on greenhouse gas emissions with at most a small impact on the economy’s growth rate (Krugman, 2010a)... The economy as a whole wouldn’t be significantly hurt if we put a price on carbon, but certain industries — above all, the coal and oil industries — would. And those industries have mounted a huge disinformation campaign to protect their bottom lines” (Krugman 2010a). “Look at the scientists who question the consensus on climate change; look at the organizations pushing fake scandals; look at the think tanks claiming that any effort to limit emissions would cripple the economy. Again and again, you’ll find that they’re on the receiving end of a pipeline of funding that starts with big energy companies, like Exxon Mobil,

which has spent tens of millions of dollars promoting climate-change denial, or Koch Industries, which has been sponsoring anti-environmental organizations for two decades. Or look at the politicians who have been most vociferously opposed to climate action. Where do they get much of their campaign money? You already know the answer”.

Peter Doran spoke out about how his research was being used:

“Our results have been misused as “evidence” against global warming by Michael Crichton in his novel “State of Fear” and by Ann Coulter in her latest book, “Godless: The Church of Liberalism.” Search my name on the Web, and you will find pages of links to everything from climate discussion groups to Senate policy committee documents — all citing my 2002 study as reason to doubt that the earth is warming. One recent Web column even put words in my mouth. I have never said that “the unexpected colder climate in Antarctica may possibly be signaling a lessening of the current global warming cycle.” I have never thought such a thing either ...I would like to remove my name from the list of scientists who dispute global warming. I know my coauthors would as well” (Doran 2006).



www.uic.edu/.../images/peter_doran_ice_2.jpg

8. EPISTEMOLOGIES OF IGNORANCE: MEDIA

To discuss the epistemologies of ignorance perpetuated through the media I will continue to use Nobel laureate Paul Krugman as a high-ranking sample of one. Professor Krugman addressed the climate change debate in 2009, and the misinformation coming from Fox News in 2010. Professor Krugman has repeatedly pointed out the biases and strategies of Fox News. He became famous to progressive voices when he told FOX News host Bill O'Reilly on the August 7 2004 edition of CNBC's Tim Russert: "This is not your show, you can't cut my mic" (mediamatters.org/research/200408080001).

This Week, November 29, 2009: The Roundtable with Paul Krugman, George Stephanopoulos, George Will, Cokie Roberts, Matthew Dowd, and Dan Senor

GEORGE STEPHANOPOULOS (ABC NEWS): George, there's been a partisanizing of this issue and then you throw in one more complication we've had over the last week, this Climate Research Institute at the East Anglia University, someone hacked into their e-mail account and showed a bunch of e-mails between scientists which opponents of climate change legislation has said proves that they are rigging the science and trying to hide information that runs counter to their theories.

GEORGE WILL (ABC NEWS): Well what it - it raises the question of we're being asked to wager trillions of dollars and substantially curtailed freedom on climate models that are imperfect and unproven. And the consensus far from being as solid as they say it is, and the debate as over as they say it is, the e-mails indicate people are very nervous about suppressing criticism, gaming the peer

review process for scholarly works and all the rest. One of the e-mails said it is a travesty, his word - it is a travesty that we cannot explain the fact that global warming has stopped. Well, they shouldn't be embarrassed about that. It's a complicated business and that's why we shouldn't wager these trillions.

PAUL KRUGMAN (NEW YORK TIMES):They don't - there's not a single smoking gun in there. . .

GEORGE WILL (ABC NEWS): One of the e-mails, Paul, said he wished he could delete, get rid of the medieval warming period. That lasted 600 years.

PAUL KRUGMAN (NEW YORK TIMES): It's not if you read the - this has all been explained. What he meant is they want to put a start on it. We have an end to it. ... And what the deleting really meant .. we don't know when this thing started because we don't have very good data, you know, back then, there weren't any weather stations.

The Cato Institute gave more than twenty interviews about the climategate scandal in the first fortnight after the emails leaked (Mayer, 2010).

This Week, January 31, 2010: The Roundtable with Paul Krugman, Barbara Walters (ABC News), George Will, CEO of Fox News Roger Ailes, and Arianna Huffington
<http://www.pkarchive.org/economy/ThisWeek013110.html>

PAUL KRUGMAN (ABC NEWS): If I can just weigh in. You know, what bothers me is not the, not the nasty language... what bothers me is, is the fact that people are not getting informed....

ROGER AILES (CHAIRMAN AND CEO): Wait a minute. Wait a minute.

ROGER AILES (CHAIRMAN AND CEO): The American people are not stupid. If you say...

PAUL KRUGMAN (ABC NEWS): No, they're not stupid. They're ill informed.

9. EPISTEMOLOGIES OF IGNORANCE: ECONOMICS

Colander et al. (2009) wrote that economics has no theory to explain systemic crises because markets and economies are considered to be inherently stable and models are limited to the allocation of scarce resources. Traditional economics misses the coordination of actions and ignores network theory, network structure and coordination failures. Systemic risk is defined as lying outside the responsibility of market participants therefore participants' behavior and participants' emotional and hormonal reactions on the stability of the system are not factored in.

Chris Dillow is an economics writer at the Investors Chronicle who blogs at *Stumbling and Mumbling*. Professor Mark Thoma (Department of Economics, University of Oregon), linked to Dillow's June 08, 2012 blog called "*Economics*" & *Rationality* on his own blog *Economist's View*. In this blog post Dillow seconded by Thoma, expressed irritation with non-economics who contend that economists only stress rational behavior in their models. Dillow lists the diversity of economic research including that on cognitive biases, behavioral economics (Daniel Kahneman), risk aversion (Ken Arrow, James Tobin, Harry Markowitz) and culture (George Akerlof, Nathan Nunn, Daron Acemoglu). However Dillow says nothing about how widespread the use of these new theoretical approaches is versus the theoretical dominance of *homo economicus*.

An interdisciplinary group of social scientists built on Kahneman's ideas about risk perception to better understand apathy about climate change (Goldstein 2011). The Koch brothers and their friends in Congress are not demonstrating apathy about climate change. Nobel laureate George Akerlof suggested that the political problem of climate change could be partially resolved by raising awareness about climate change's importance (<http://ineteconomics.org/video/conference-kings/economics-climate-change-tax-bads-carbon-george-akerlof>). There are many groups trying to raise awareness, which is in fact quite high, while the climate change deniers work hard to undermine this awareness.

The Cultural Cognition Project conducted at the Yale Law School with a national sample of 1500 U.S. adults found little apathy or ignorance connected to climate change. They found that as members of the public became more science literate and numerate, the individuals belonging to opposing cultural groups (egalitarian versus individualistic) become even more divided on the risks attributed to impending climate change (<http://current.com/132qskc>; <http://www.law.yale.edu/news/15546.htm>; Citation: [The polarizing impact of science literacy and numeracy on perceived climate change risks](#), *Nature Climate Change*, DOI: 10.1038/NCLIMATE1547.).

"The aim of the study was to test two hypotheses," said Dan Kahan, Elizabeth K. Dollard Professor of Law and Professor of Psychology at Yale Law School and a member of the study team. "The first attributes political controversy over climate change to the public's limited ability to comprehend science, and the second, to opposing sets of cultural values. "In effect," Kahan said, "ordinary members of the public credit or dismiss scientific information on disputed issues based on whether the information strengthens or weakens their ties to others who share their values. At least among ordinary members of the public, individuals with

higher science comprehension are even better at fitting the evidence to their group commitments." (<http://current.com/132qskc>).



Geroge A. Akerlof, Nobel economics Laureate (2001), shared with Michael Spence and Joseph E. Stiglitz, at Berkeley.

This result fits George Akerlof's identity economics theory. Akerlof's work on identity economics can be linked to the epistemology of ignorance. He explains these identities as social codes that tell people how they should think of themselves and who they should interact with. This shapes their motivations and decisions (Akerlof 2010). So they ignore climate change if they think it will negatively affect their careers or their status.

Ken Arrow improved the mathematical basis for the *Stern Review Report on the Economics of Climate Change* by postulating that *additional consumption does not have a linear value* (Smith 2011). In other words the more stuff you have, the less valuable incremental stuff is. Arrow concluded that investing 1% of GDP per year in cutting greenhouse gases was a good investment. However this additional consumption theory does not work for the Koch brothers who are worth \$35 billion and want more power and money, or for the other high net worth individuals who are funding climate change denial, who also want more money and power (attaining goals at minimum cost to oneself as would be predicted by rational choice theory).

The Euro has been in continuous crisis since 2008 and the Tobin tax on financial transactions has not yet been implemented, although it is said to be coming "soon"

(<http://en.mercopress.com/2012/06/19/eu-announces-at-g20-tobin-tax-opposed-by-us-uk-and-sweden>); this would imply that the power of financiers is greater than that of the politicians that they control.

“Economics 101 tells us that an industry imposing large costs on third parties should be required to “internalize” those costs — that is, to pay for the damage it inflicts on the environment and on public infrastructure, treating that damage as a cost of production (Krugman 2011c). ..Yet what the [fracking] industry and its defenders demand is, of course, precisely that.. Because we need that energy!”

Notice the similarity to the argument by Joe Oliver, Canadian Minister of Natural

Resources:

Canada is on the edge of an historic choice: to diversify our energy markets away from our traditional trading partner in the United States or to continue with the status quo. Virtually all our energy exports go to the US. As a country, we must seek new markets for our products and services and the booming Asia-Pacific economies have shown great interest in our oil, gas, metals and minerals. For our government, the choice is clear: we need to diversify our markets in order to create jobs and economic growth for Canadians across this country. We must expand our trade with the fast growing Asian economies. We know that increasing trade will help ensure the financial security of Canadians and their families (http://business.financialpost.com/2012/01/09/joe-olivers-open-letter-the-regulatory-system-is-broken/?__lsa=225c7097).

“So it’s worth pointing out that special treatment for fracking makes a mockery of free-market principles. Pro-fracking politicians claim to be against subsidies, yet letting an industry impose costs without paying compensation is in effect a huge subsidy. They say they oppose having the government “pick winners,” yet they demand special treatment for this industry precisely because they claim it will be a winner” (Krugman 2011c).

“...Today’s American right ... believes that there are no market failures, that capitalism unregulated is always right. Faced with evidence that market prices are in fact wrong, they simply attack the science .. What this tells us is that we are not actually having a debate about economics. Our free-market advocates aren’t actually operating from a model of how the economy works; they’re operating from some combination of knee-jerk defense of the haves against the rest and mystical faith that self-interest always leads to the common good” (Krugman 2011d).

Gerard Wynn (2006) presented the views of selected economists on the issue of climate change in an article posted on the International Business Times webpage. The first line of his story asks if it costs more to prevent global warming than permitting it, or even enjoying the possible financial benefits of a hotter planet. Therefore he frames the issue from the beginning in a laissez-faire way. David Koch apparently used the same phrase in an interview (Mayer 2010). Ed Crane the Cato Institute’s founder and president told Mayer (2010) that “global-warming theories give the government more control of the economy” and political attempts to stop global warming are expensive, ineffective and unnecessary.

Robert Mendelsohn, Professor at the Yale School of Forestry and Environmental Studies, claimed that there was a net global warming bonus in the near-term (until 2050) from higher farming yields in northern countries which would offset the damage in African countries. He did not cost species extinctions and health effects, or give the true costs of island inundations, apparently considering them unimportant.



Nobel laureate and former World Bank chief economist Joseph Stiglitz said immediate action to curb climate-changing emissions was more cost-effective than later spending.

10. EPISTEMOLOGIES OF IGNORANCE: CONGRESS

Professor Roger Pielke is Professor in the Environmental Studies Program in Boulder, Colorado. He called the Congressional wars [109th Congress under Chairman Joe Barton (R Texas) (House of Representatives, 2006)] against climate change science the “perfect case study” [of Agnotology] “the whole purpose of the hearing, as far as I could tell, was to wage a political battle on the science of the hockey stick”.



Joe Barton, Chairman U.S. House of Representatives
The Committee on Energy and Commerce

When *The Wall Street Journal* wrote about the hockey stick graph in February 2005, Mr. Whitfield and Texas Rep. Joe Barton, chairman of the House energy committee, sent letters to Mr. Mann and his colleagues requesting detailed information on all of their studies in order to resolve questions surrounding the hockey stick and the independence of the IPCC process (Figure 6). The American Petroleum Institute provided funds for research that criticized the hockey stick, and James M. Inhofe, an Oklahoma Senator (R), criticized the graph from the Senate floor (Monastersky 2006).

The committee had previously held only one hearing on climate change science since 1995, and intimidation was suspected by many (Monastersky 2006). Sherwood L. Boehlert, a Republican from New York and chairman of the House Science Committee, wrote a letter to Mr. Barton "to express my strenuous objections to what I see as a misguided and illegitimate investigation".

Instead of requesting a study by the National Research Council, which Mr. Boehlert eventually did, Republican leaders of the House Committee on Energy and Commerce, Mr. Barton and Mr. Whitfield asked three academic statisticians led by Wegman to examine the hockey-stick curve (Wegman 2006). Edward Wegman of George Mason University, was a past Chairman of the National Academy of Sciences Committee on Theoretical and Applied Statistics.

Variations of the Earth's surface temperature for:

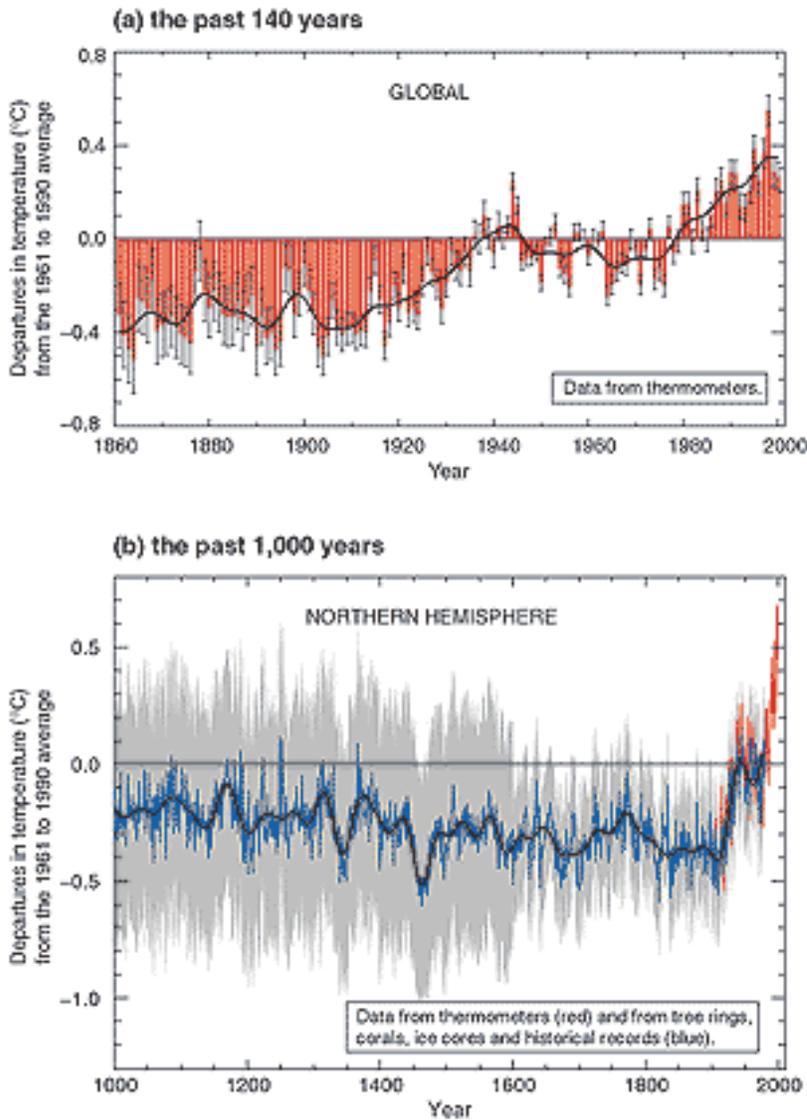


Figure 6. Variations of the Earth's surface temperature over the last 140 years and the last millennium. <http://www.ipcc.ch/ipccreports/tar/wg1/005.htm>

Willie Wei-Hock Soon, an astrophysicist at Harvard testified before Congress in 2003 that global warming was caused by solar variation. He said that he had “not knowingly been hired by, nor employed by, nor received grants from any organization that had taken advocacy positions with respect to the Kyoto organization or the UN Framework

Convention on Climate Change”. It was later revealed that he received over a million dollars from the coal and petroleum industries (Koch Foundation \$175,000 in 2005 and in 2010, Southern Co., (coal \$120,000 from 2008), Exxon Mobil (\$335,000 from 2005 – 2010), American Petroleum Institute (\$274,000 from 2001 - 2007)) and from the Mobil Foundation, and the Texaco Foundation (Vidal 2011).



Stephen McIntyre

Ross McKittrick www.uoguelph.ca/~rmckitri/ross.jpg

[Climate Audit](http://www.climateaudit.org/) <http://www.climateaudit.org/>

Stephen McIntyre a Canadian mining consultant started a blog (<http://www.climateaudit.org>) documenting his criticisms of the hockey stick graph. He was flown to Washington to present his work with Ross McKittrick to Congressional staff members, the Competitive Enterprise Institute, and others. Mr. Mann and his colleagues started their own blog (<http://www.realclimate.org>) to respond to critics.

The National Research Council panel led by Gerald North, a professor of atmospheric sciences at Texas A&M University at College Station, issued its report in late June.



Gerald North www.physorg.com/newman/gfx/news/seawater.jpg

It agreed with some of the statistical criticisms of the hockey stick made by Mr. McIntyre and others. It also found larger uncertainties than the original hockey-stick study had estimated. But the panel agreed with Dr. Mann "that the Northern Hemisphere was warmer during the last few decades of the 20th century than during any comparable period of the preceding millennium". The Congressional investigation "is kind of a delaying tactic to find little things like this to slow down government action on greenhouse-gas limitations" claimed Professor North (Monastersky 2006).

The report prepared for Mr. Barton's House energy committee criticized the work of Mr. Mann and was published in *The Wall Street Journal*, who published the hockey stick graph (without error bars) in its July 14 editorial (see below). Mr. Barton claimed that there were significant problems in the climate science field, which they claimed was too insular to produce reliable research and it therefore needed more Congressional scrutiny:

Hockey Stick Hokum July 14, 2006; Page A12

http://energycommerce.house.gov/108/News/07142006_1990.htm

It is routine these days to read in newspapers or hear -- almost anywhere the subject of climate change comes up -- that the 1990s were the "warmest decade

in a millennium" and that 1998 was the warmest year in the last 1,000.

...underlines yet again just how shaky this "consensus" view is... That

consensus, as shown in the first of the two IPCC-provided graphs nearby, held

that the Medieval warm period was considerably warmer than the present day.

Mr. Mann's 1999 paper eliminated the Medieval warm period from the history

books, with the result being the bottom graph you see here...

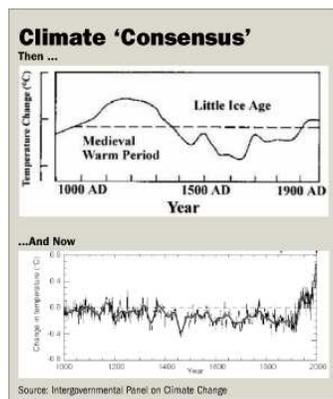


Figure 7. Graphs used by Mr. Barton's House energy committee

Questions were raised about Mr. Mann's paper almost as soon as it was

published. In 2003, two Canadians, Ross McKittrick and Steven McIntyre,

published an article in a peer-reviewed journal showing that Mr. Mann's

methodology could produce hockey sticks from even random, trendless data.

The report commissioned by the House Energy Committee, due to be released

today, backs up and reinforces that conclusion...

Mr. Wegman goes a step further in his report, attempting to answer why Mr.

Mann's mistakes were not exposed by his fellow climatologists. Instead, it fell to

two outsiders, Messrs. McIntyre and McKittrick, to uncover the errors.

Mr. Wegman brings to bear a technique called social-network analysis to

examine the community of climate researchers. His conclusion is that the coterie of most frequently published climatologists is so insular and close-knit that no effective independent review of the work of Mr. Mann is likely... Mr. Wegman writes, "there is a tightly knit group of individuals who passionately believe in their thesis." He continues: "However, our perception is that this group has a self-reinforcing feedback mechanism and, moreover, the work has been sufficiently politicized that they can hardly reassess their public positions without losing credibility."

In other words, climate research often more closely resembles a mutual-admiration society than a competitive and open-minded search for scientific knowledge. And Mr. Wegman's social-network graphs suggest that Mr. Mann himself -- and his hockey stick -- is at the center of that network (House Energy Committee, 2006)..

<http://www.gpo.gov/fdsys/search/pagedetails.action?browsePath=109%2FHOUS E%2FCommittee+on+Energy+and+Commerce&granuleId=CHRG-109hrg31362&packageId=CHRG-109hrg31362&fromBrowse=true>

The Washington Post of August 3 2006 responded with its own editorial –

“Over the past two weeks, a House Energy and Commerce subcommittee has held a pair of truly senseless hearings on global climate change (Anon, 2006). The purpose ...was to pick at a single study of global temperature patterns, the so-called "hockey stick" graph.. . Even the Bush administration [through James L. Connaughton] -- which is actively avoiding regulation of carbon emissions -- took pains to acknowledge the science of climate change... The major outstanding question .. is how sensitive the climate will be to what mass of additional carbon

over time -- and how bad the practical consequences of that sensitivity will be. ... So the prudent move is to take action now as a kind of insurance policy. Yes, reducing carbon emissions substantially is daunting ... so daunting that it induces a kind of denial in many people. But it is a particularly ugly kind of denial that leads a congressional committee to spend this kind of energy attacking scientists, instead of confronting the problems their data suggest”.

“So the House passed the Waxman-Markey climate-change bill.. . But 212 representatives voted no. .. they rejected the whole notion that we have to do something about greenhouse gases. And as I watched the deniers make their arguments, I couldn’t help thinking that I was watching a form of treason — treason against the planet.. What you saw, instead, were people who show no sign of being interested in the truth. They don’t like the political and policy implications of climate change, so they’ve decided not to believe in it — and they’ll grab any argument, no matter how disreputable, that feeds their denial. .”.
(Krugman 2009).

11. FACILITATING CHANGE

Feminist epistemology considers the ways in which gender influences what we take to be knowledge (Anderson 1995). Moderate constructivism allows for a study of science and technology that addresses issues of science policy, appropriate technology and science-and-technology created dependency (Baber 1992). Empirical questions posed by Anderson (1995) shaped the analysis above. These are: the influence of social factors on knowledge production; who gets to participate in theoretical inquiry; who listens to whom; the relative prestige of different styles and fields of knowledge; the

influence of socially constructed conceptions and norms of gender; and the gender-specific interests and experiences on the production of knowledge. The focus on men reflects the reality of the climate change discussion and also accepts that view that feminist research should not focus exclusively on women's lives but should also investigate male lives and male power (Layland 1990).

Many scientists assume that "if the[ir] science is good, it will serve the people" (Star 1991). However few individuals or governments take on the role of ensuring that science does serve the people. If we accept that scientific and technical truths and indigenous knowledge are partial we still have to determine what knowledge is helpful [for the planet] and which is not (Longino 1993; Nelson 1993).

Van Steenberg (1983) and Verijken (1992) discuss the role of science as a "pull model" in facilitating change. Transformed personal lives do not necessarily bring about systemic social change; but altering social structures can (Berleant-Schiller 1999). The Koch brothers have demonstrated how this method works [in negative ways]. Code (2006) also claims that researchers should be engaged in producing a viable habitat and ethos which would include addressing climate change while taking gender into account.

Science is increasingly seen as a social process of making narratives where meanings are contested and stabilized for a time through the productive relations of power (Morawski 1988). This means that the epistemological paradox of using political enterprises like feminism to achieve a more accurate, coherent and less masculinist science can be resolved through the reconsideration and alteration of existing social relations of power (Morawski 1988). These relationships of power are quite obvious in the climate change debate, especially at the legislative level. Even though researchers

self-reflexivity should involve a realistic appraisal of the limits of research as a locus for authentic political activity (Glucksman 1994); this does not mean that researchers should not strive for an outcome of greater awareness [of the epistemologies of ignorance] and hope that sharing this knowledge leads to positive social change (Mies 1983).

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