

CONTROVERSY AND DENIAL!

(a toolkit)



Professor Stephen Sekula

Presented on Sep. 19, 2012

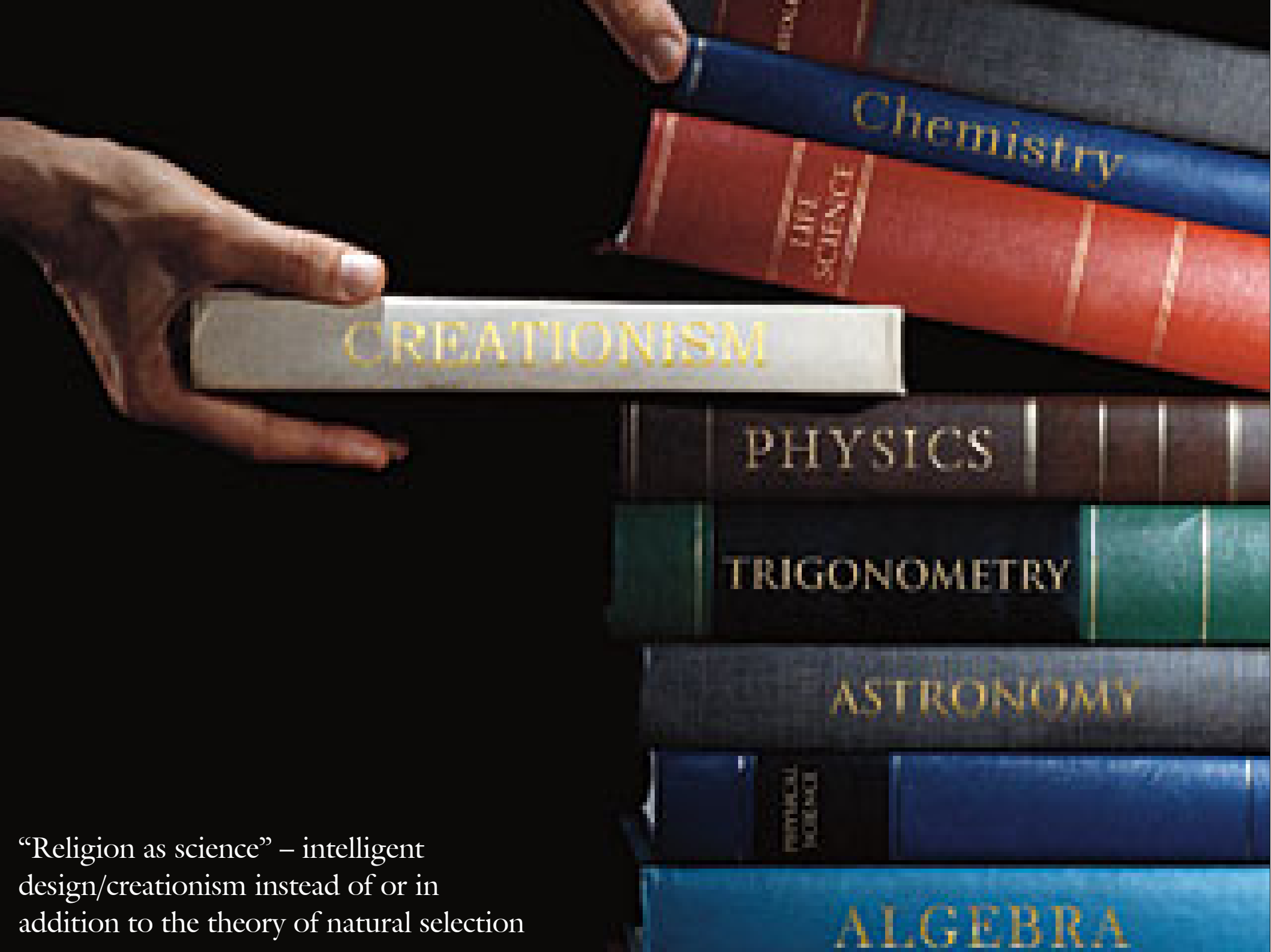
at the meeting of the Secular Humanists' Club

SMU



Childhood vaccination





CREATIONISM

Chemistry

PHYSICS

TRIGONOMETRY

ASTRONOMY

ALGEBRA

“Religion as science” – intelligent design/creationism instead of or in addition to the theory of natural selection



Ted Kaczynski
The Unabomber

**I still believe in
Global Warming.
Do you?**

www.heartland.org

Human-induced climate disruption
("global warming", "climate change")

Common Themes

- Declare a (scientific) controversy exists
 - avoid making policy or a decision as a result
- Deny the conclusions of a body of knowledge
 - cast doubt on the science
 - ignore evidence that supports the conclusion
 - argue using weak evidence or logical fallacies
 - etc.

QUESTION:

What is a “scientific controversy” and does that term apply to these issues (or others)?

The Scientific Method (in a nutshell)

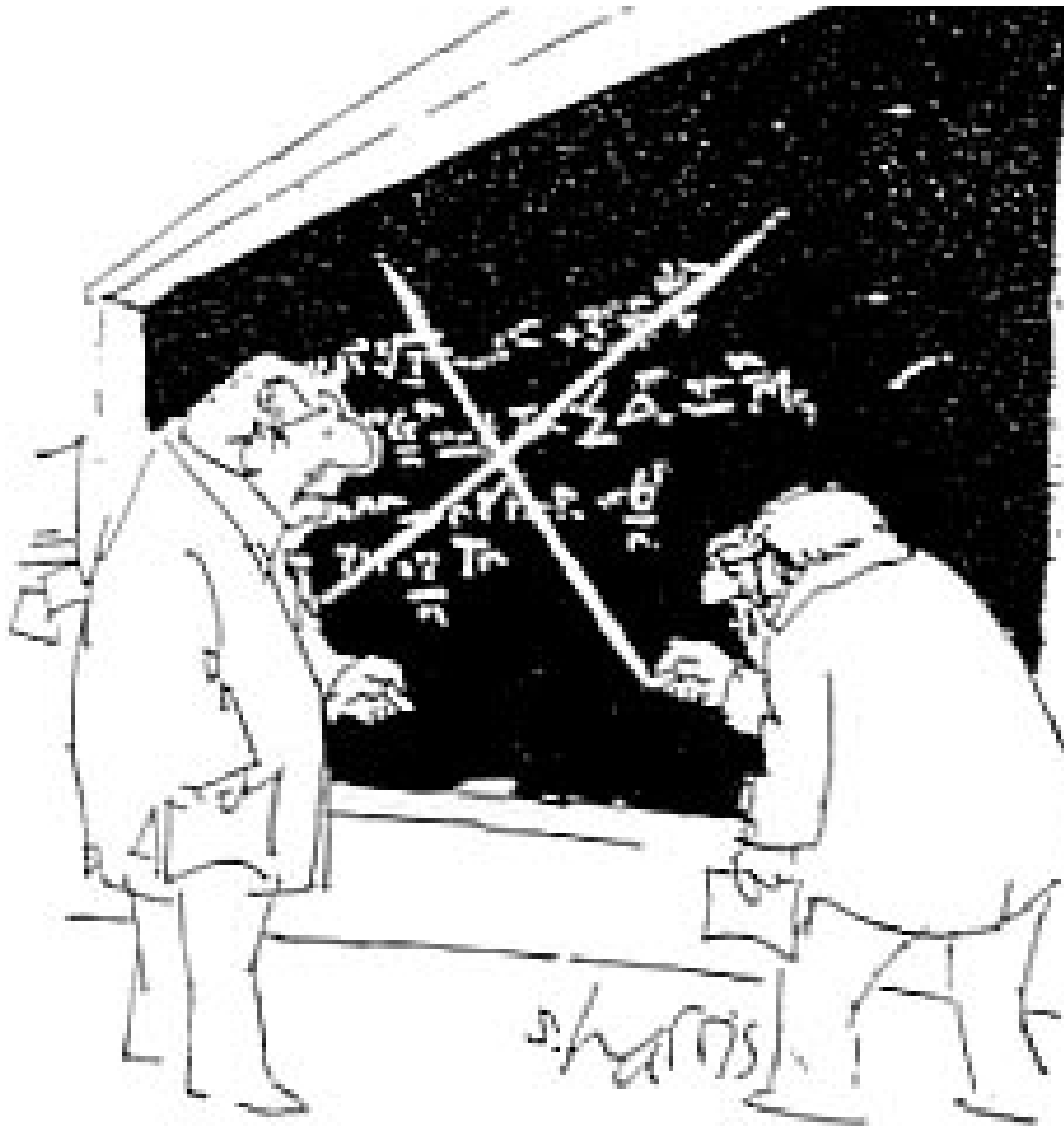
- Observe a phenomenon
- Construct a testable explanation (an “hypothesis”) of that phenomenon
- Propose a test of the hypothesis using an experimental approach
- Perform the experiment and evaluate the original hypothesis based on the outcome

The Progression of Knowledge

HYPOTHESIS MODEL THEORY* LAW FACT

“THEORY” here means “Scientific Theory.” The word “theory” in a scientific context means “a powerful explanation that incorporates facts, observations, laws, and other knowledge, predicts new knowledge, and has withstood the test of many experiments.” In popular discourse, this word is often mistakenly interchanged to mean “opinion,” as in “political theory” or “you have your theory and I have mine.” An opinion is an explanation that doesn't have to be testable (in fact, it can be untestable – a “construct”) and may not be based on any sound evidence.

The Practice of Science



"That's it? That's peer review?"

Stephen J. Sekula - SMU

Medical Doctor and
Epidemiologist Ben
Goldacre:

“... real science is about critically appraising the evidence for somebody else's position. That's what happens in academic journals. That's what happens at academic conferences. The Q&A session after a postdoc presents data is often a bloodbath, and nobody minds that. We actively welcome it. It's like a kind of consenting intellectual S&M activity.”

TED Talk

A “Skeptic” vs. a “Denier”
what is the difference?

What is a “Scientific Controversy?”

A Scientific Controversy must stem from a stage of the Scientific Method

- Observe a phenomenon
 - Problems in:
 - quality of observation and methodology
 - bias or deception in the methodology
 - size of data sample (poor statistical sample size, subject to random fluctuations)

A Scientific Controversy must stem from a stage of the Scientific Method

- Construct a testable explanation (an “hypothesis”) of that phenomenon
 - Problems in:
 - testability of the hypothesis (hypothesis is really a construct)
 - hypothesis is testable but makes no new predictions
 - equally valid hypotheses all explain the same observation with no disconfirming evidence for any of them (no “weight” to any single explanation)

A Scientific Controversy must stem from a stage of the Scientific Method

- Propose a test of the hypothesis using an experimental approach
 - Problems in:
 - cost of test (too expensive, too elaborate, etc.)
 - methodology of test, etc (same problems that applied to the observation)
- Perform the experiment and evaluate the original hypothesis based on the outcome
 - Problems here similar to possible problems in observation of phenomenon

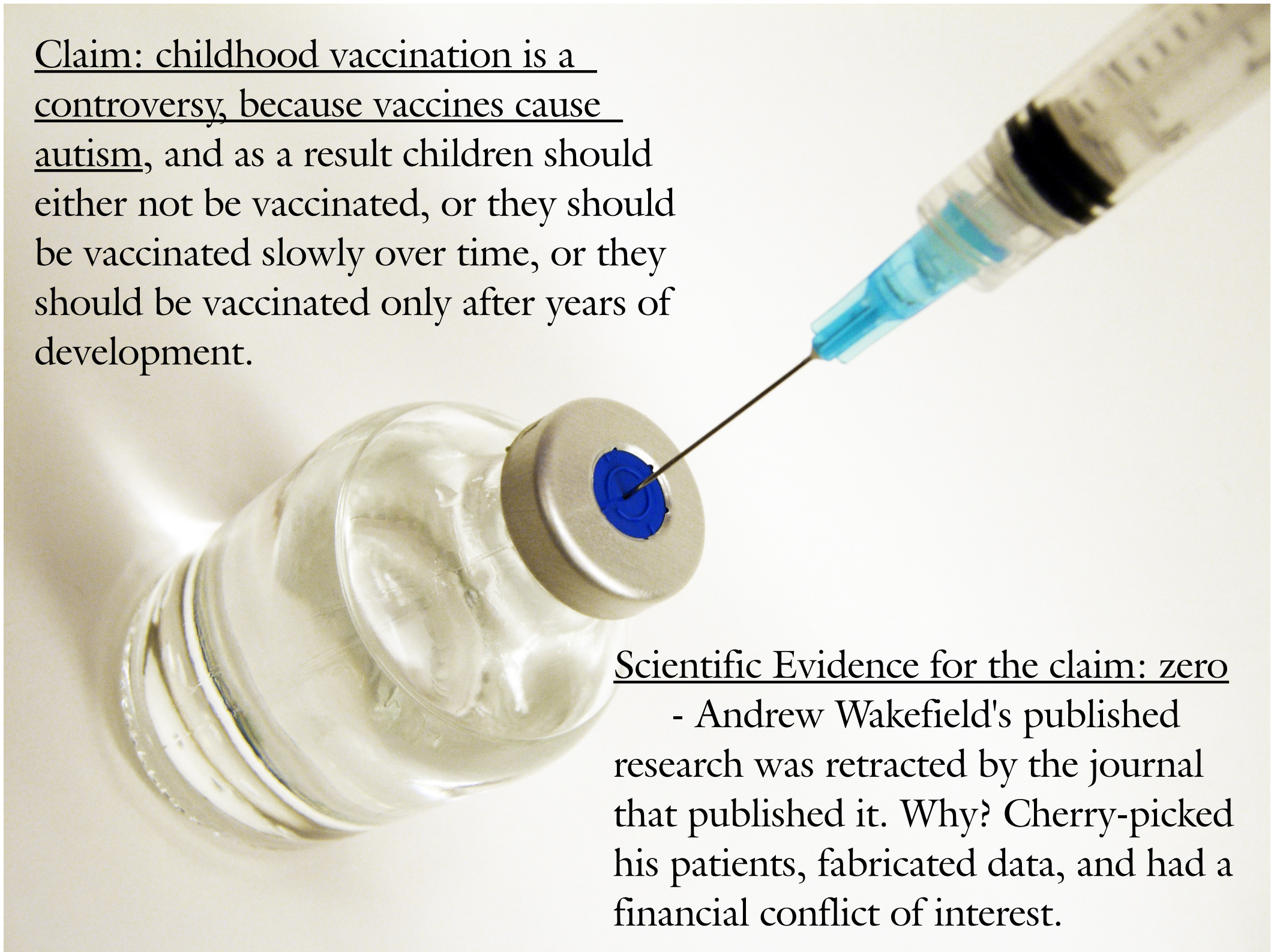
A Scientific Controversy must stem from a stage of the Scientific Method

- Peer review
 - Problems in:
 - who does the reviewing (e.g. some are authors of study)
 - personal biases influence review process (no editorial oversight from the journal)
 - poor quality journals are the only source of publications (e.g. no peer review done in the journal, or short time for review, or too few reviewers)

Controversies

- “Scientific Controversy”
 - stems from one or more problems within the framework of the scientific method
- Other Kinds
 - Social Controversy
 - Political Controversy
 - Values Controversy (e.g. religious controversy)

Claim: childhood vaccination is a controversy, because vaccines cause autism, and as a result children should either not be vaccinated, or they should be vaccinated slowly over time, or they should be vaccinated only after years of development.

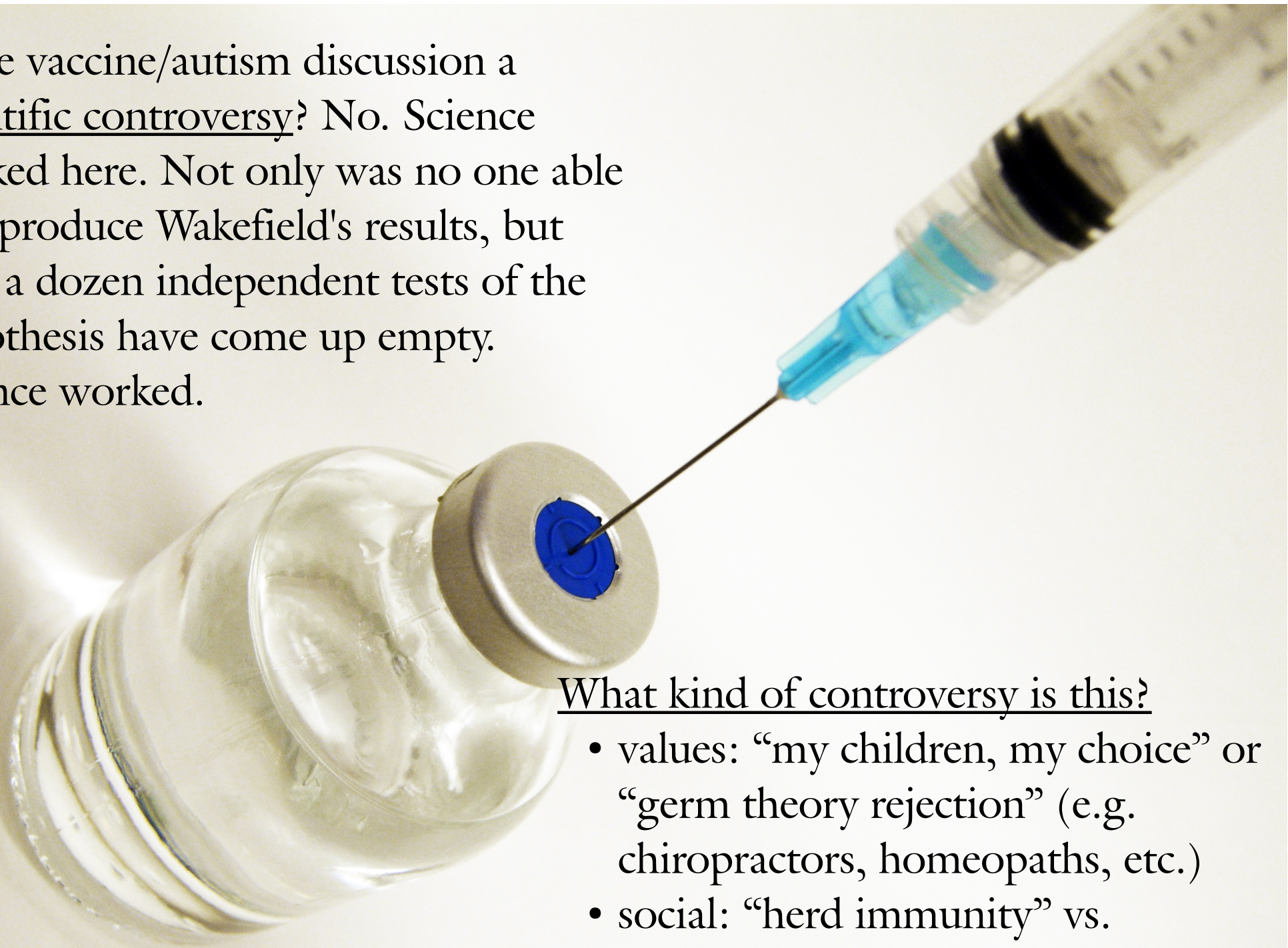


Scientific Evidence for the claim: zero
- Andrew Wakefield's published research was retracted by the journal that published it. Why? Cherry-picked his patients, fabricated data, and had a financial conflict of interest.


Is the vaccine/autism discussion a scientific controversy? No. Science worked here. Not only was no one able to reproduce Wakefield's results, but over a dozen independent tests of the hypothesis have come up empty. Science worked.

What kind of controversy is this?

- values: “my children, my choice” or “germ theory rejection” (e.g. chiropractors, homeopaths, etc.)
- social: “herd immunity” vs. “individual liberty”
- policy: require vaccination or not?



How I View the World



SUPERNATURAL
BELIEF
SYSTEM



SCIENCE

Everything is basically OK

**SUPERNATURAL
BELIEF
SYSTEM**

**pseudo-science
pseudo-religion
anti-science
anti-religion**

SCIENCE

**Fuzzy thinking, with
potentially dangerous
outcomes**

Denial: A Toolkit

A Denial Toolkit

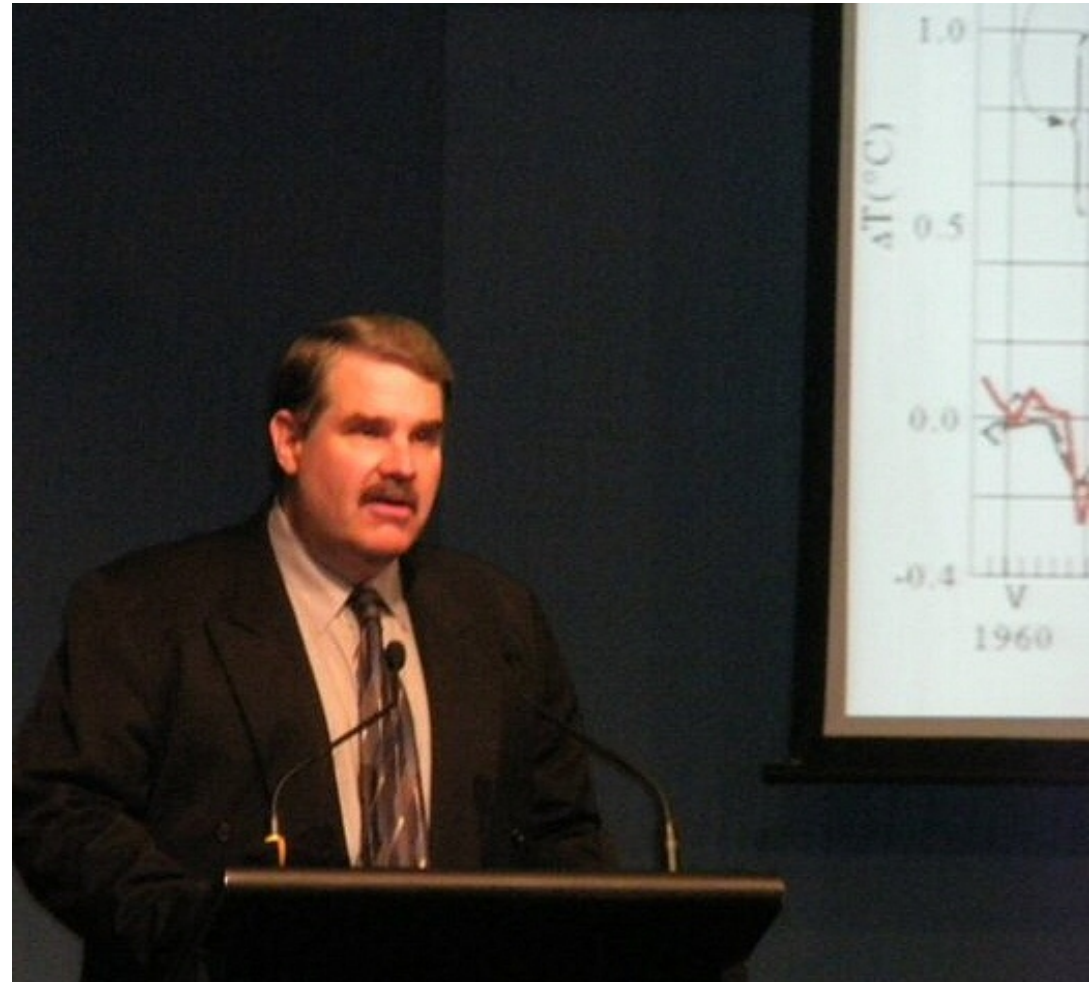
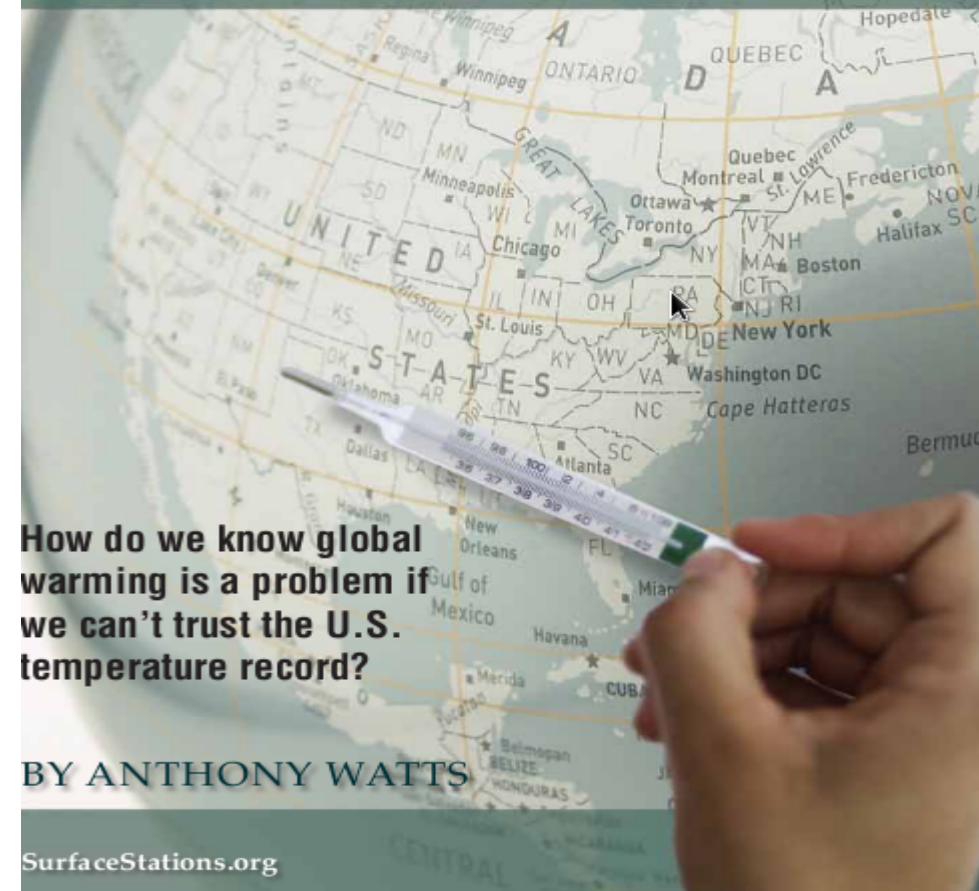
- Cast doubt on the scientific research
- Question the scientists' motives and integrity
- Cite only the disagreements among scientists, and amplify the arguments of a tiny group of dissenters
- Exaggerate the potential harm
- Appeal to personal freedom
- Argue that acceptance of the claim would violate or invalidate a core philosophical tenet



Example: human-induced
climate change

Cast Doubt on the Science

Is the U.S.
Surface Temperature
Record Reliable?



Anthony Watts, a meteorologist with no training in scientific research, routinely broadcasts science doubt about the existence of climate warming trends.

Question the Scientists' Motives and Integrity

“Why is there so much passion about global warming, and why has the issue become so vexing that the American Physical Society, from which Dr. Giaever resigned a few months ago, refused the seemingly reasonable request by many of its members to remove the word "incontrovertible" from its description of a scientific issue? There are several reasons, but a good place to start is the old question "cui bono?" Or the modern update, "Follow the money.”

Alarmism over climate is of great benefit to many, providing government funding for academic research and a reason for government bureaucracies to grow. Alarmism also offers an excuse for governments to raise taxes, taxpayer-funded subsidies for businesses that understand how to work the political system, and a lure for big donations to charitable foundations promising to save the planet. Lysenko and his team lived very well, and they fiercely defended their dogma and the privileges it brought them.”

-- From an Op-Ed piece in the Wall Street Journal, printed in January, 2012 and signed by 16 scientists. Stephen J. Sekula - SMU

“The WSJ OpEd makes a lot of hay from having 16 scientists sign it, but of those only 4 are actually climate scientists. And that bragging right is crushed to dust when you find out that the WSJ turned down an article about the reality of global warming that was signed by 255 actual climate scientists.”

-- Phil Plait, author of the “Bad Astronomy” blog hosted at Discover Magazine.

Cite only disagreements/amplify the small minority opinions

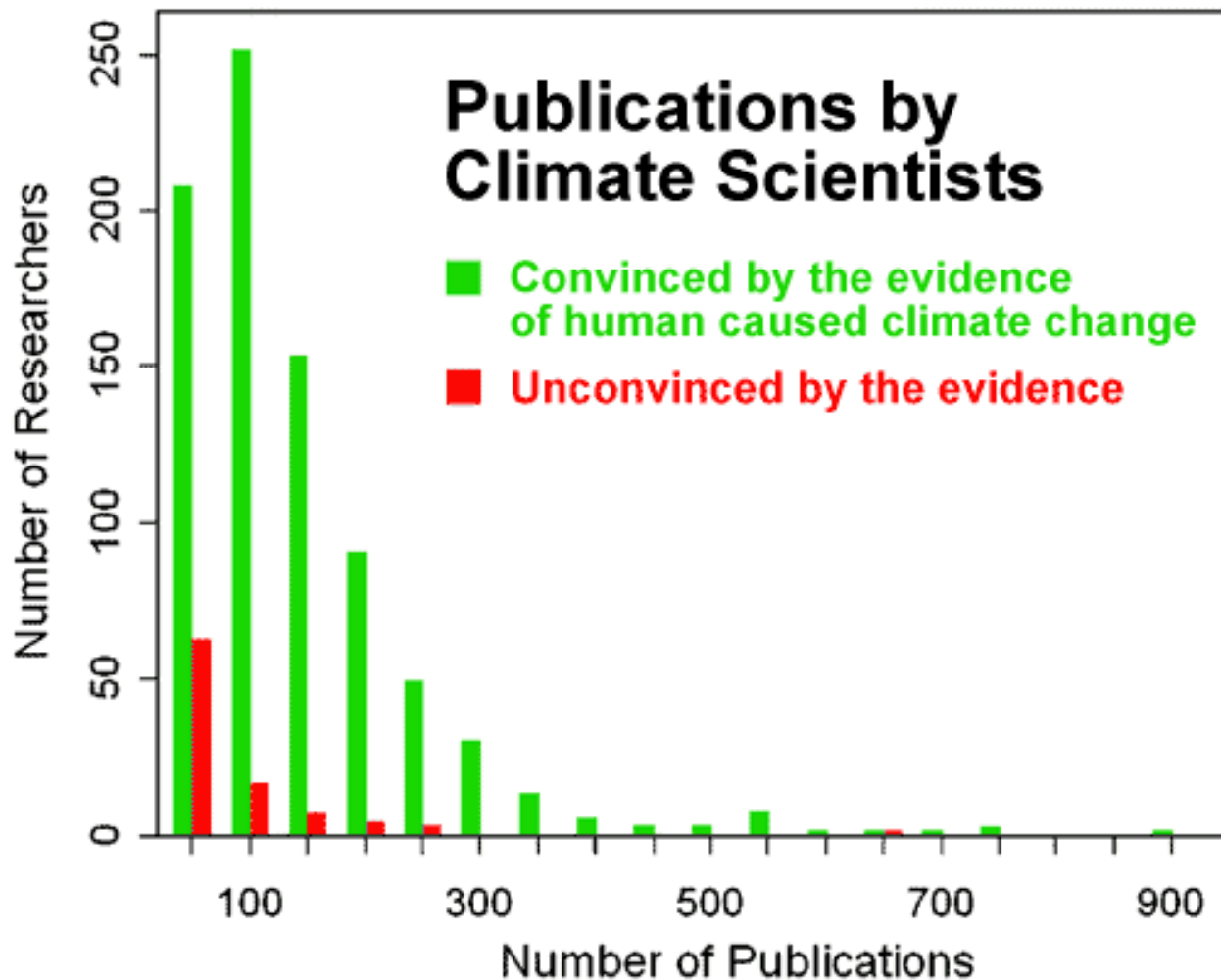


“Despite media claims to the contrary, the debate is not over. There is no consensus among scientists concerning global warming. While most appear to subscribe to the theory, thousands of others do not.”

-- From the “About” page of <http://noconsensus.org>

Exercise: analyze the above passage – see if you can spot the weak critical thinking, logical fallacies, weasel words, etc.

Cite only disagreements/amplify the small minority opinions



Survey of actively publishing climate scientists – 97-98% of them are convinced by the evidence that climate change is happening and caused by human activity. This is one of a few detailed studies of this issue that all find the same conclusions.

Publication: *“Expert credibility in climate change.”* Anderegg, William R. L., Prall, James W., Harold, Jacob, and Schneider, Stephen H. *Proceedings of the National Academy of Sciences*. 2010.

<http://www.pnas.org/content/early/2010/06/04/1003187107.abstract>

Project Steve



NCSE provides information and advice as the premier institution dedicated to keeping evolution and climate change in the science classroom and to keep out creationism and climate change denial. [LEARN MORE >>](#)

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QUICK LINKS

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Project Steve

October 17th, 2008



NCSE's "Project Steve" is a tongue-in-cheek parody of a long-standing creationist tradition of amassing lists of "scientists who doubt evolution" or "scientists who dissent from Darwinism."

Creationists draw up these lists to try to convince the public that evolution is somehow being rejected by scientists, that it is a "theory in crisis." Not everyone realizes that this claim is unfounded. NCSE has been asked numerous times to compile a list of thousands of scientists affirming the validity of the theory of evolution. Although we easily could have done so, we have resisted. We did not wish to mislead the public into thinking that scientific issues are decided by who has the longer list of scientists!

Project Steve pokes fun at this practice and, because "Steves" are only about 1% of scientists, it also makes the point that tens of thousands of scientists support evolution. And it honors the late Stephen Jay Gould, evolutionary biologist, NCSE supporter, and friend.

We'd like to think that after Project Steve, we'll have seen the last of bogus "scientists doubting evolution" lists, but it's probably too much to ask. We hope that when such lists are pronounced, reporters and other citizens will ask "How many

TOP LINKS

- [Talk Origins index of creationist claims](#)
- [Clergy Letter Project](#)

STEVE-O-METER

as of 9/18/12

1300

1200

1100

1000

900

800

700

600

500



Exaggerate the potential harm

“The U.S. Environmental Protection Agency (EPA) seems to be on a drunken binge to impose increasingly *economy-killing regulations* to reduce CO2 emissions. These new regulations are based on flimsy pseudoscience and what amounts to religious tenants of faith that humans are destroying mother earth. Nonetheless, the EPA claims that current air and water emissions endanger human health. The most ridiculous of these assertions is carbon dioxide (CO2) emissions.”

-- Michael S. Coffman, August 12, 2012
(emphasis is mine)

<http://www.newswithviews.com/Coffman/mike132.htm>



His Ph.D. is in forest science from the Univ. of Idaho at Moscow (<http://www.uidaho.edu/cnr/frfs>). He has no formal training in economics, physics, or chemistry.

Appeal to personal freedom

“Democrats have another energy problem, namely bipartisan opposition to a proposed average Fuel Economy Standard of 35 miles per gallon by 2020, a 40 percent increase over current rules. The auto industry calls this unrealistic. Its new radio ad campaign, which can be heard at the website DriveCongress.com, features a so-called SUV mom fretting about Congress forcing her to drive a smaller car.”

-- From “Special Report with Brit Hume,” June 19, 2007. Reported by Major Garrett, a Fox News Correspondent, during the segment.

<http://www.foxnews.com/story/0,2933,285113,00.html#ixzz26xJwae34>



Argue that acceptance would invalidate a philosophical tenet



Senator James Inhofe (R-OK) is a key opponent of the scientific evidence for human-induced climate disruption and an outspoken denier.

“Well actually the Genesis 8:22 that I use in there is that 'as long as the earth remains there will be springtime and harvest, cold and heat, winter and summer, day and night.' My point is, God's still up there. The arrogance of people to think that we, human beings, would be able to change what He is doing in the climate is to me outrageous.”

-- Senator James Inhofe, in an interview with Vic Eliason of Christian Youth America. March 7, 2012.

What to do, what to do?

- What can you do if you encounter denial?
 - Try to understand how the denial is conducted (apply the toolkit)
 - Determine if the person would ever be convinced of the claim (how much evidence would it take?)
 - Try to understand the real cause of the denial
 - is it a science issue, or a values, social, or political issue?
 - Understand that more data may not be the right path to making the argument

References

- “Science Writing in the Age of Denial”
<http://sciencedenial.wisc.edu/videos/>
- Sagan, Carl and Druyan, Ann. “The Demon-Haunted World: Science as a Candle in the Dark.” Ballantine Books (February 25, 1997)
- Global climate disruption
 - The website <http://www.skepticalscience.com> has a ton of the most common denial arguments and 10 tons of research to assess each argument
- Ben Goldacre's excellent TED Talk on “Battling Bad Science”
 - http://www.ted.com/talks/ben_goldacre_battling_bad_science.html
- Oreskes, Naomi. “Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming.” Bloomsbury Press; 1 edition (May 25, 2010)