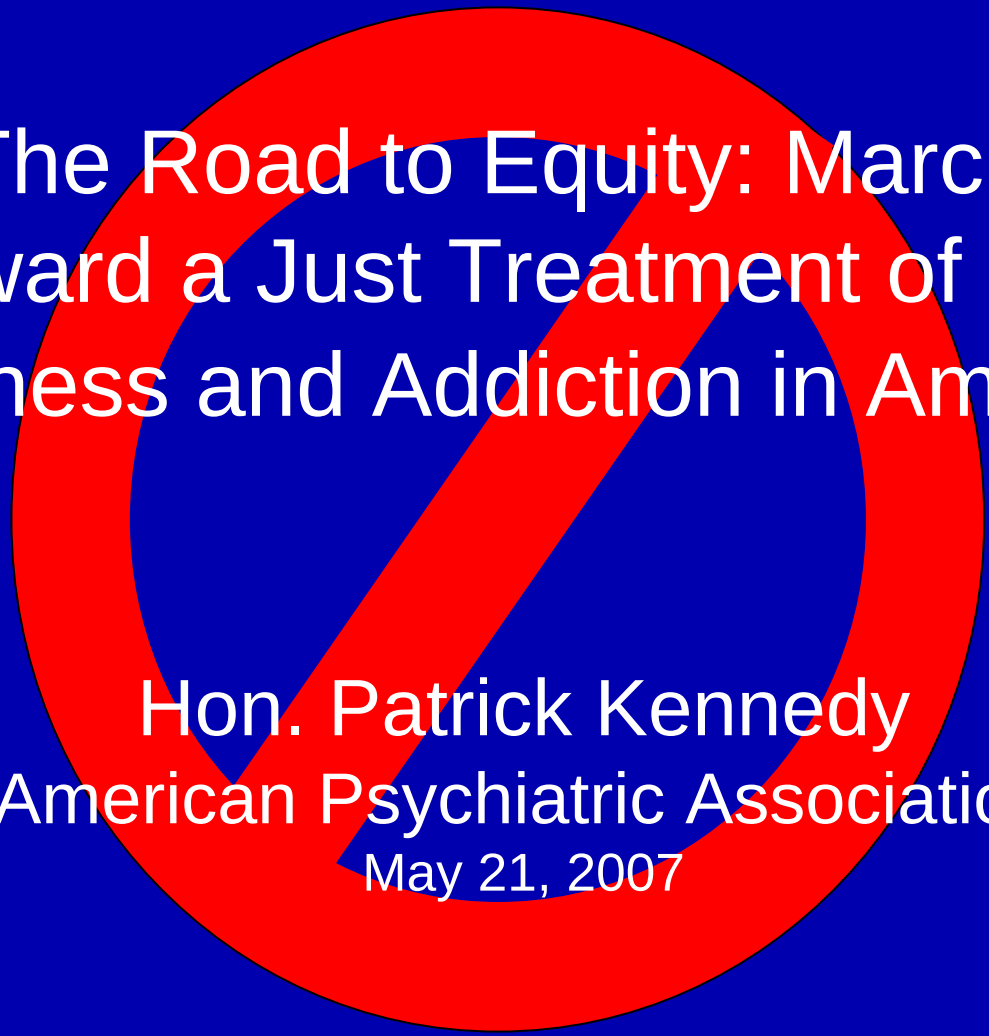
The Road to Equity: Marching Toward a Just Treatment of Mental Illness and Addiction in America



Hon. Patrick Kennedy
American Psychiatric Association
May 21, 2007

Science AAAS

Never Discuss Floods With Noah In the Audience

Stick to stuff you know something about!

I’ve become obsessed with the science-society relationship

- Overlays the science base for mental illness and addiction understanding, stigma and treatment
  - And reimbursement issues

The Evolving Climate for Neuroscience & Society

American Psychiatric Association
May 21, 2007

Science
AAAS

Why do we have science anyway?

- To provide natural explanations of the nature and workings of the natural world
  - Whether we like the answers or not!
- To improve the human condition

Baseline truism:

Science and technology are ever-more imbedded in every aspect of modern life!

Corollaries:

- For people to prosper in modern society, they need fundamental understanding and comfort with S&T
- For science to prosper, the science-society relationship must be positive and strong

We have a problem

- The science-society relationship is experiencing significant tension
  - Is beginning to erode
- Neuroscience is not immune

As Charles Dickens would say…..

- We're living in the best of times
- And the worst of times

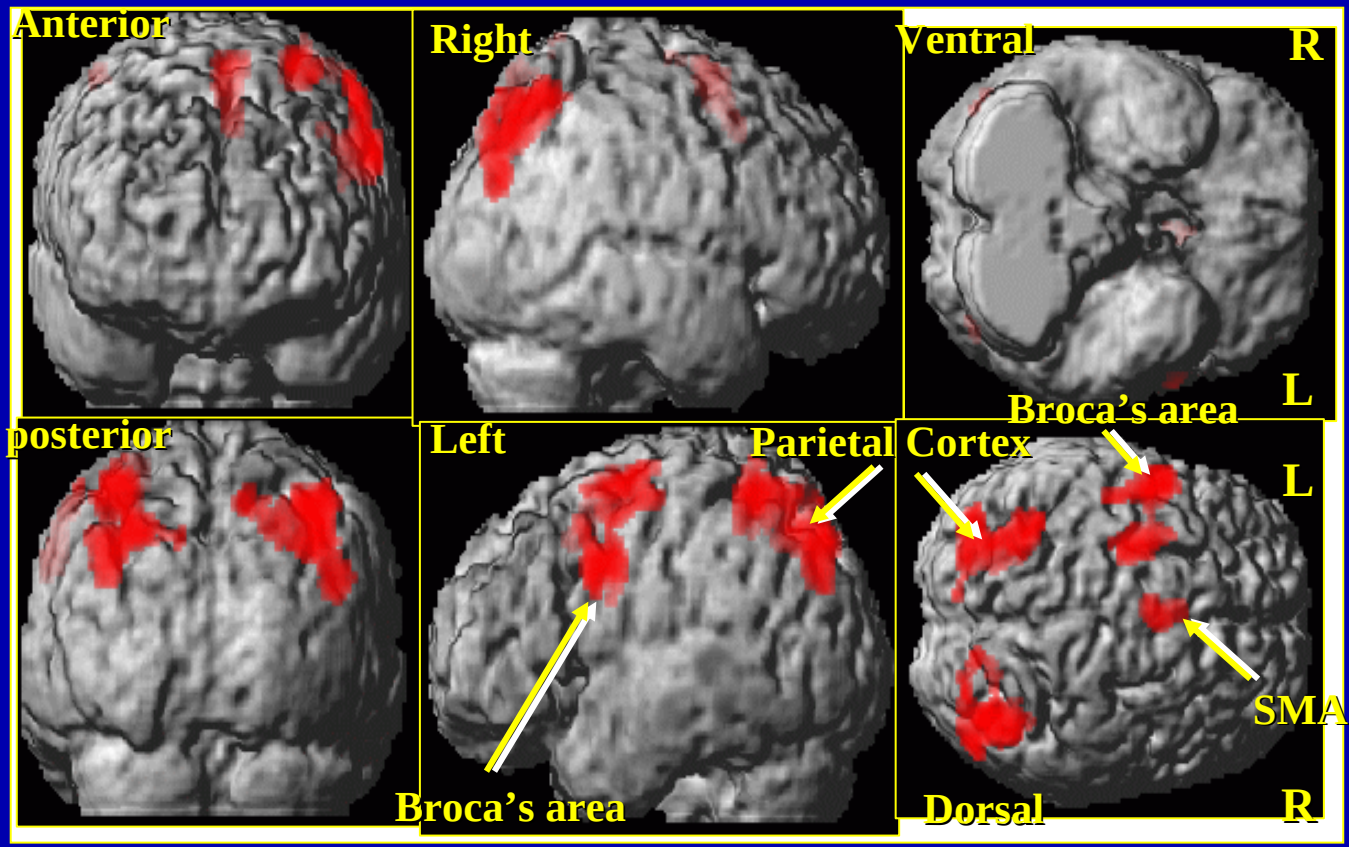
On the one hand

We're living in the best of scientific times

Advances in science are coming at a fantastic pace

- The rate of incremental advance is accelerating
- New technologies are enabling quantum jumps in understanding
  - With great practical significance

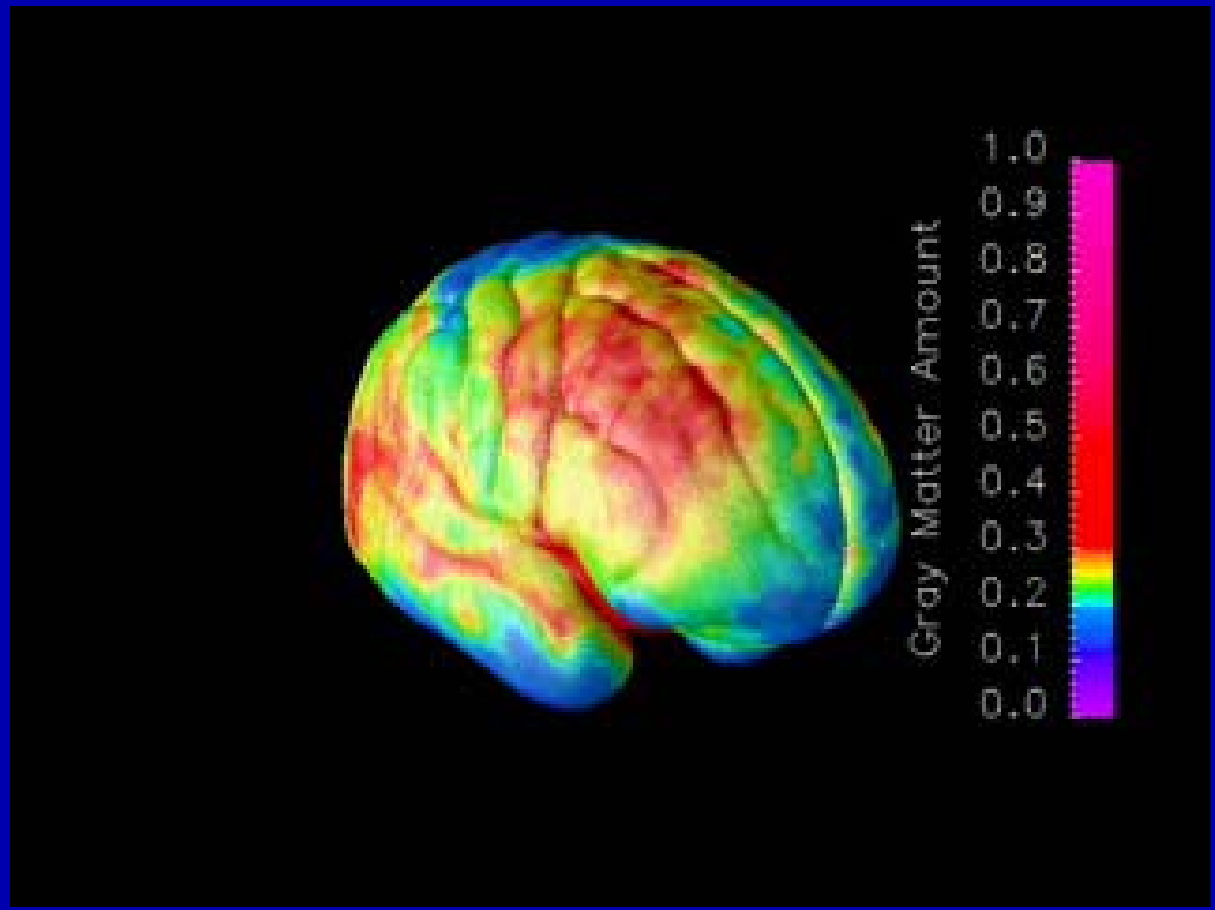
Functional MRI of a "normal" subject writing a talk



Generating words (left brain dominant)

Chang, et al.

Dynamic mapping of human cortical development during childhood through early adulthood



Gogtay, et al., PNAS, 2004, 101: 8174-8179

Science AAAS

Lesser brain activation in adolescents compared to adults in anticipation of monetary reward

Bjork, et al., J. Neurosci. 24:1793-1802 (2004)

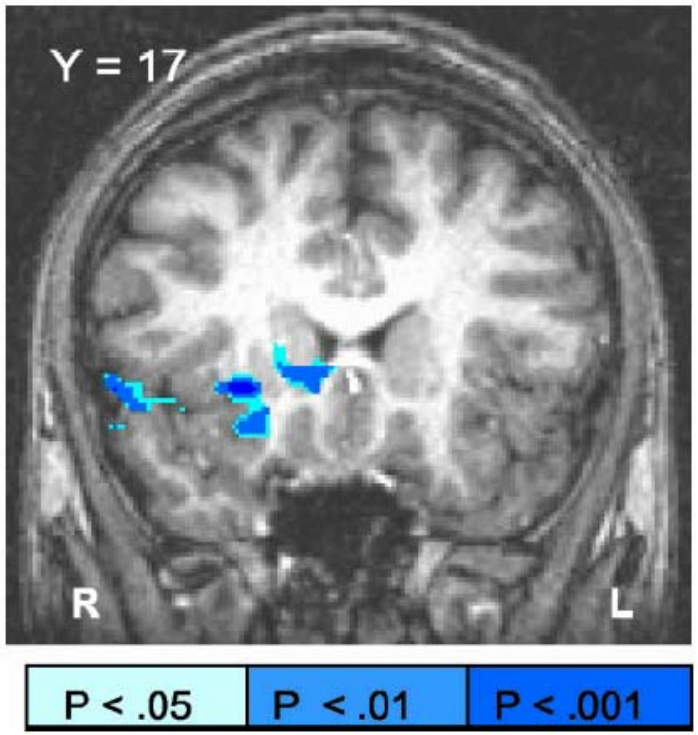


Figure 3. Age difference in gain anticipation activation. Voxel-wise *t* tests of age group differences in event-related regression coefficients were performed in regions of interest. Adolescents showed decreased gain anticipation activation compared with adults in the right ventral striatum. For illustrative purposes, maps were thresholded at $p < 0.05$ with exclusion of noncontiguous voxels and clusters $< 1000\ \mu l$. The group difference map depicts this activation deficit in adolescents, where voxel-wise group differences are graded on the basis of uncorrected *p* values, and the groups differ at a Bonferroni-corrected $p < 0.05$ in voxels centered at 9, 17, and −2.

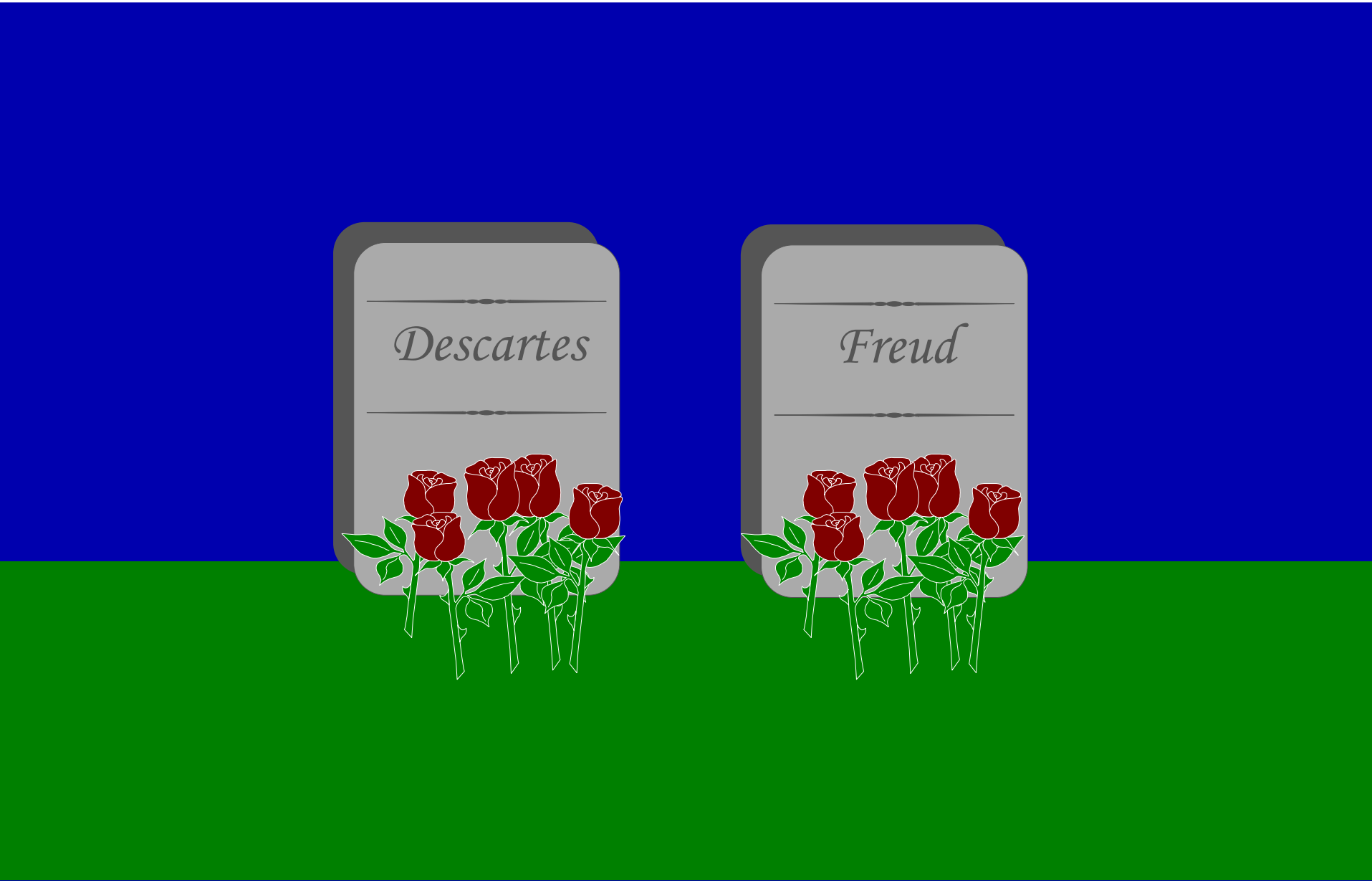
That's why 12 year-olds and 18 year-olds feel like different species

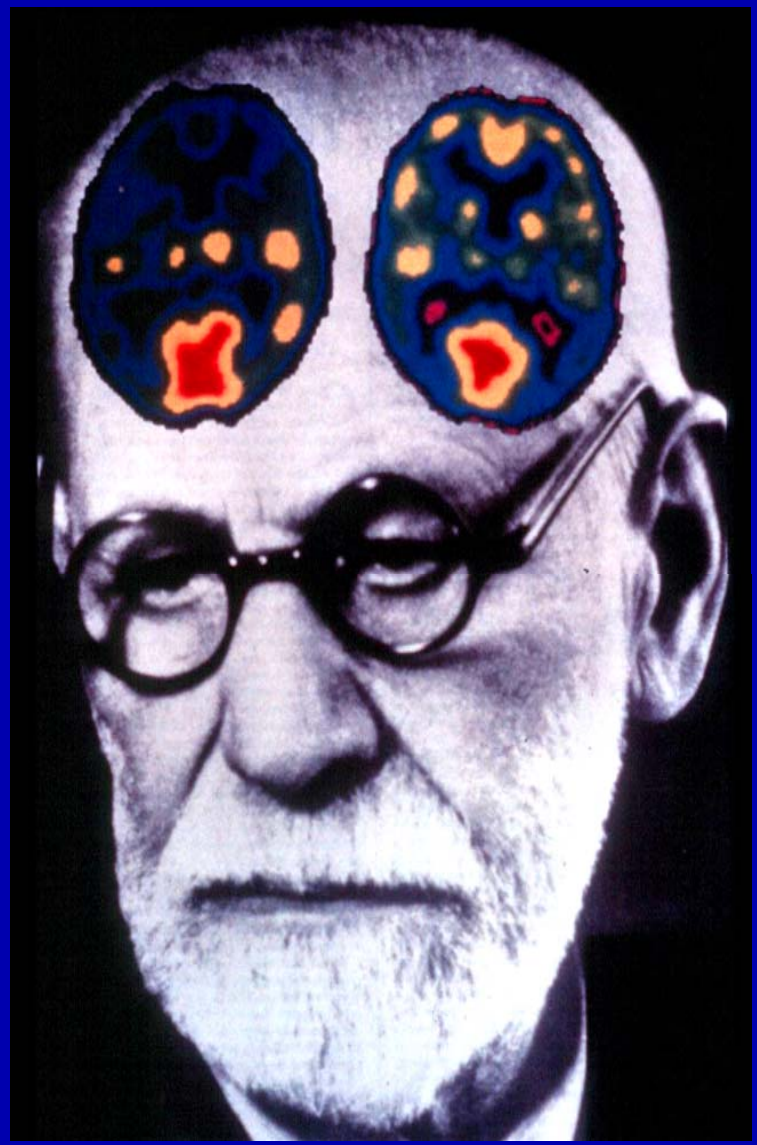
- Their brains are different

Mind and Body are Inseparable

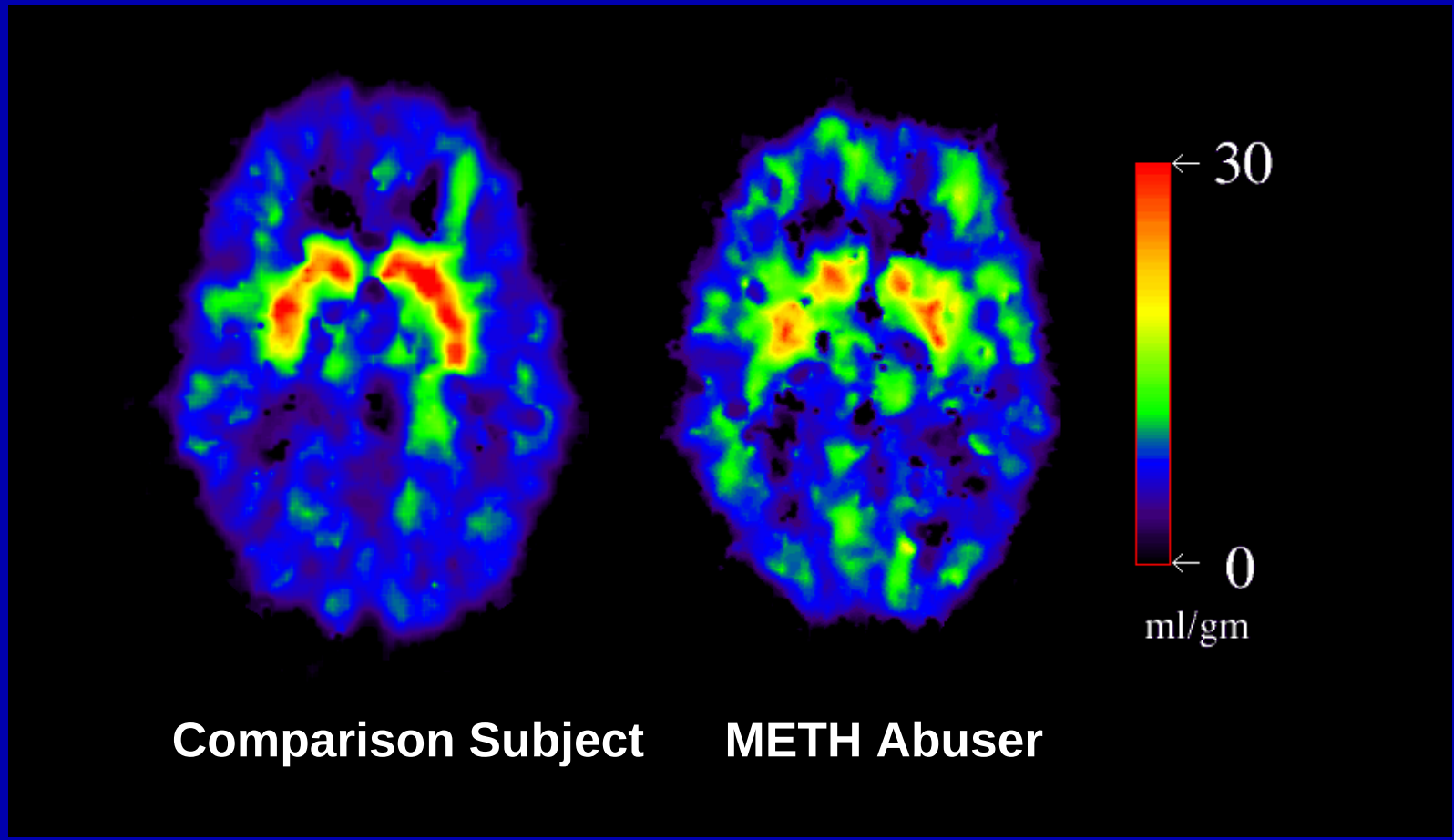
The Evolving Climate for Neuroscience and Society

American Psychiatric Association, May 21, 2007

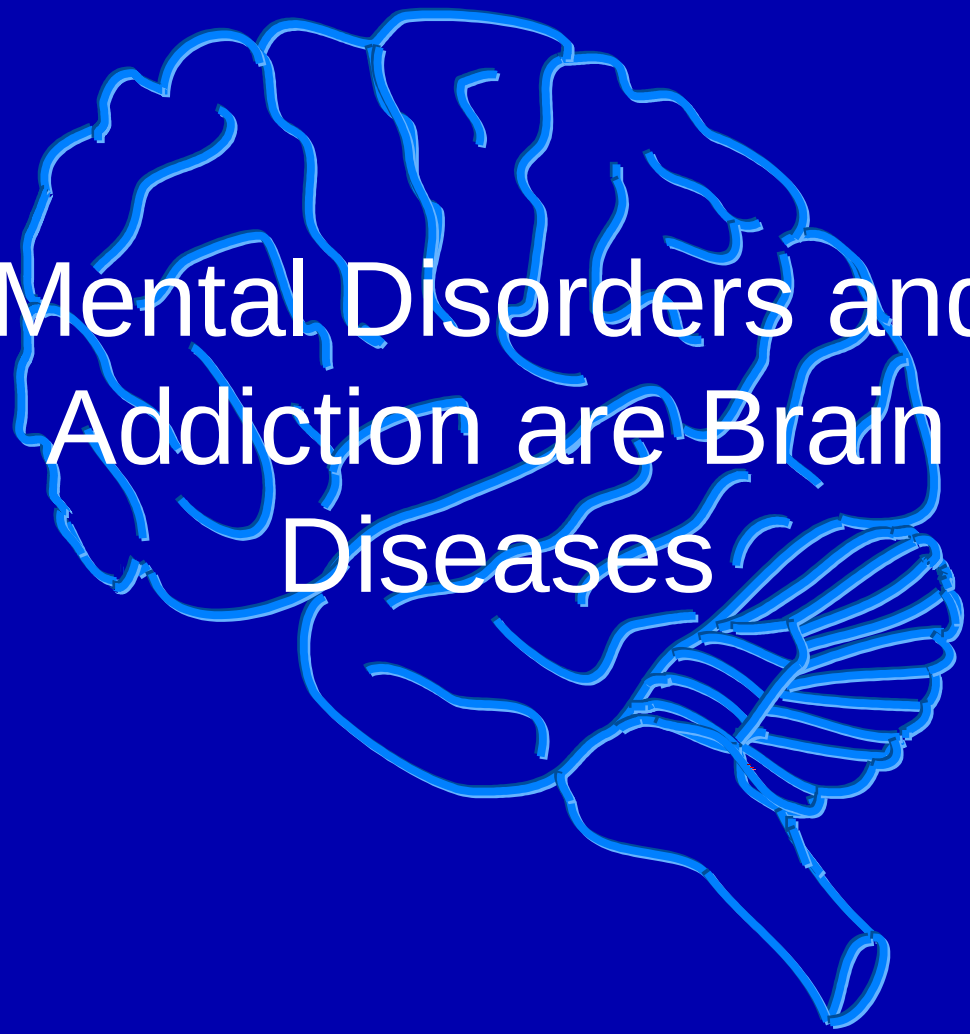




Dopamine Transporter Loss After Heavy Methamphetamine Use



Source: Volkow, N.D. et al., Am J. Psychiatry, 158(3), pp. 377-382, 2001.



Mental Disorders and Addiction are Brain Diseases

So, scientific progress is going great!!

- With all its implications for understanding, prevention and treatment
- For stigma
- For reimbursement

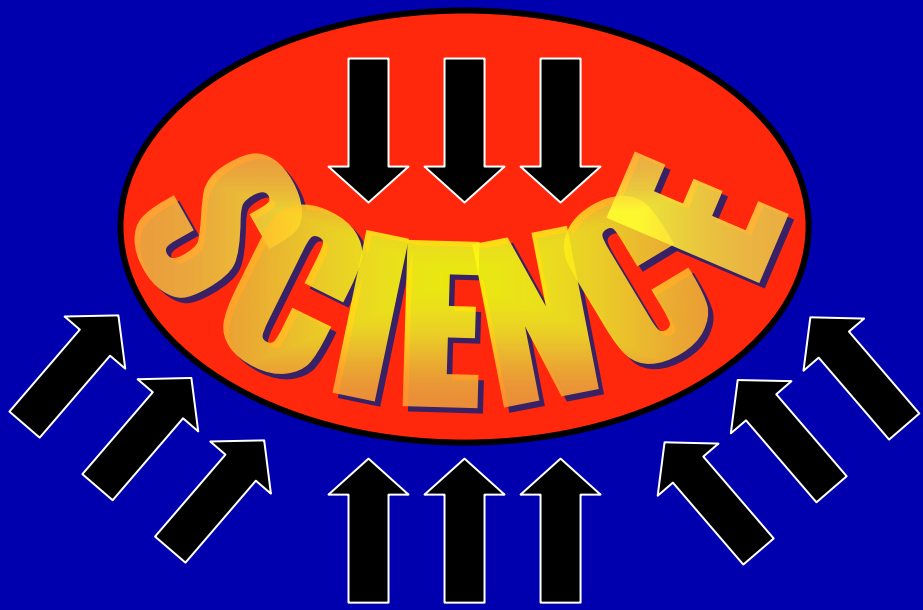
On the other hand….

Other issues *within* science are not going so well…and negatively affect the broader (societal) context for science

- Incidents of scientific misconduct
- Human subjects concerns
- Animal welfare issues
- Conflict of interest problems

These are factors *internal* to science

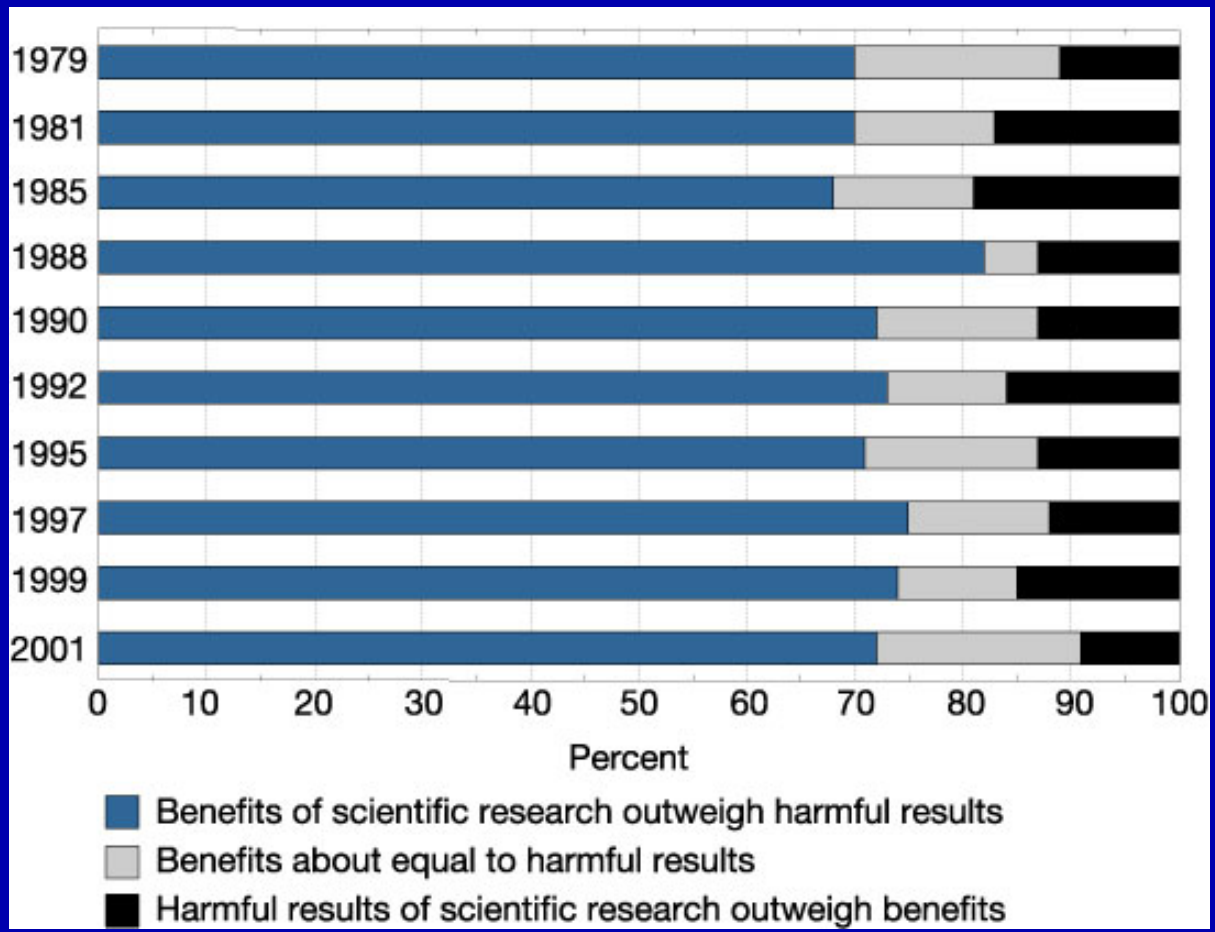
- There are problematic *external* factors as well



People generally still respect science and technology….

Science AAAS

US public's view of scientific research



National Science Board, *Science and Engineering Indicators* - 2002

They have little understanding of what is and is not science

- 60% of Americans believe in extrasensory perception
- 41% think astrology is somewhat scientific
- 47% still do not answer "*true*" to the statement: "Human beings developed from earlier species of animals"

Science and Engineering Indicators, 2004

Some Americans have reservations about science

	Agree %	Disagree %
Science makes our way of life change too fast	38	59
Scientific research has created as many problems for society as it has solutions	52	41
→ Scientific research these days doesn't pay enough attention to the moral values of society	56	37
→ We depend too much on science and not enough on faith	50	45

Science and Engineering Indicators, 2006

There's a lesson here!

People need to know more about science as an *enterprise*

- What makes something scientific?
- The limits of scientific investigation
  - Natural explanations of the natural world

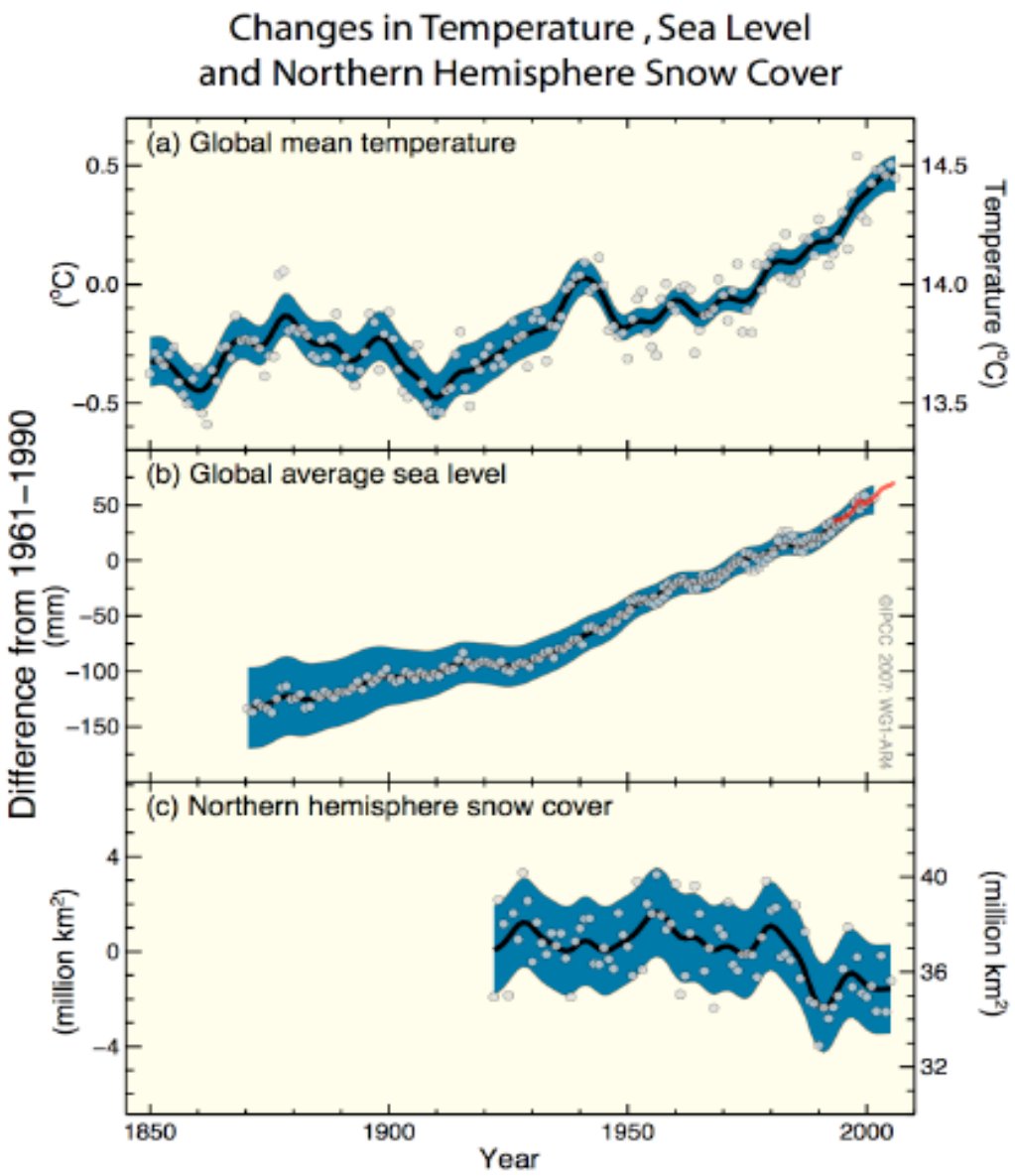
Much science-society tension results from conflicts between scientific findings and

- Political/economic expediency
- Core human values

One political (economic) example…

- Is there global warming?


GEOGRAPHIC
SOUTH POLE
ROALD AMUNDSEN
ROBERT F. SCOTT
JANUARY 17, 1912
"The Pole. Yes, but under very different circumstances from those expected."
9,301 FT.
Celebrating 125 Years of Science
Science



Source: IPCC, 2007

Changes in Greenhouse Gases from ice-Core and Modern Data

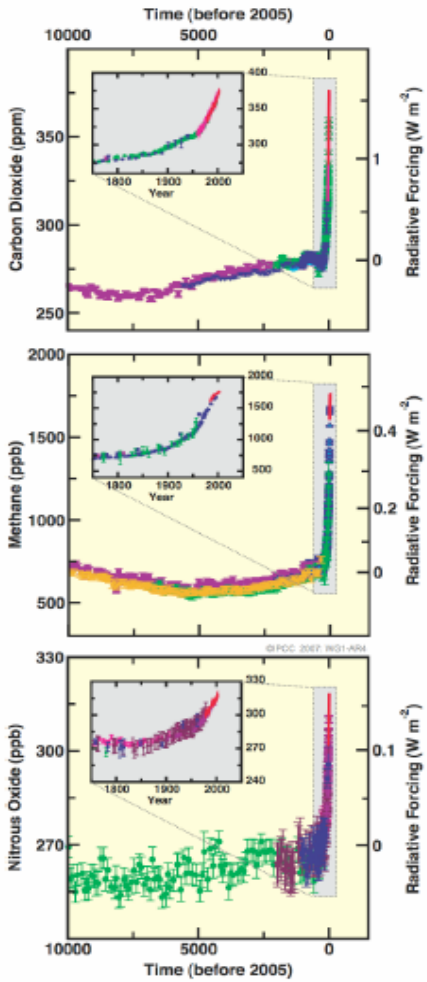


FIGURE SPM-1. Atmospheric concentrations of carbon dioxide, methane and nitrous oxide over the last 10,000 years (large panels) and since 1750 (inset panels). Measurements are shown from ice cores (symbols with different colours for different studies) and atmospheric samples (red lines). The corresponding radiative forcings are shown on the right hand axes of the large panels. {Figure 6.4}

Source: IPCC, 2007

Glacier National Park, Grinnel Glacier

Photo: Fred Kiser, Glacier National Park archives

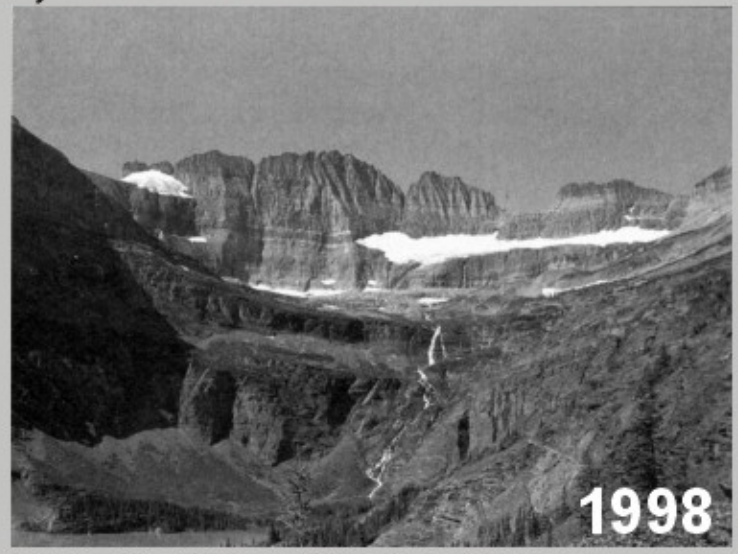


Photo: Karen Holzer, US Geological Survey

Glacier National Park, Boulder Glacier

Photo: George Grant, Glacier National Park archives

Photo: Jerry DeSanto, National Park Service

Source: *BioScience*, Vol. 53 No. 2, Feb 2003

Science-society tension results from conflicts between scientific findings and

- Political/economic expediency
- Core human values

Scientific issues abut against values:

- Embryonic stem cell research
- Studying “personal” topics
  - Sex
  - Genetics of behavior
- “Intelligent Design” versus evolution in science classrooms and science museums

Science AAAS

Many neuroscience issues abut against human values

- The nature of the mind
  - Mind-body-soul concepts
  - Free will vs. determinism
- The ability for anyone to look into your brain and watch your mind in action
  - Darkest secret thoughts
  - Lie detecting

More…..

Neuroscience issues that abut against human values (cont.)

- How to relate to brain disordered individuals
  - Personal responsibility for your brain diseased behavior

Society's views on this continue to have an enormous impact on parity issues

  - When and how to intervene in brain-mind function

The emergence of *neuroethics* as a field/enterprise

Two prominent values-related examples

- Embryonic stem cell research
- Evolution vs intelligent design

The embryonic stem cell issue

- Whether or not human embryos can be destroyed to produce (and grow) pluripotent stem cells for research directed at potential therapies

Objections are not based on skepticism about the potential for developing therapies

- Most people agree there is significant potential

Objections have more to do with how the issue intersects with one's religious/moral beliefs

Stem cells and religion

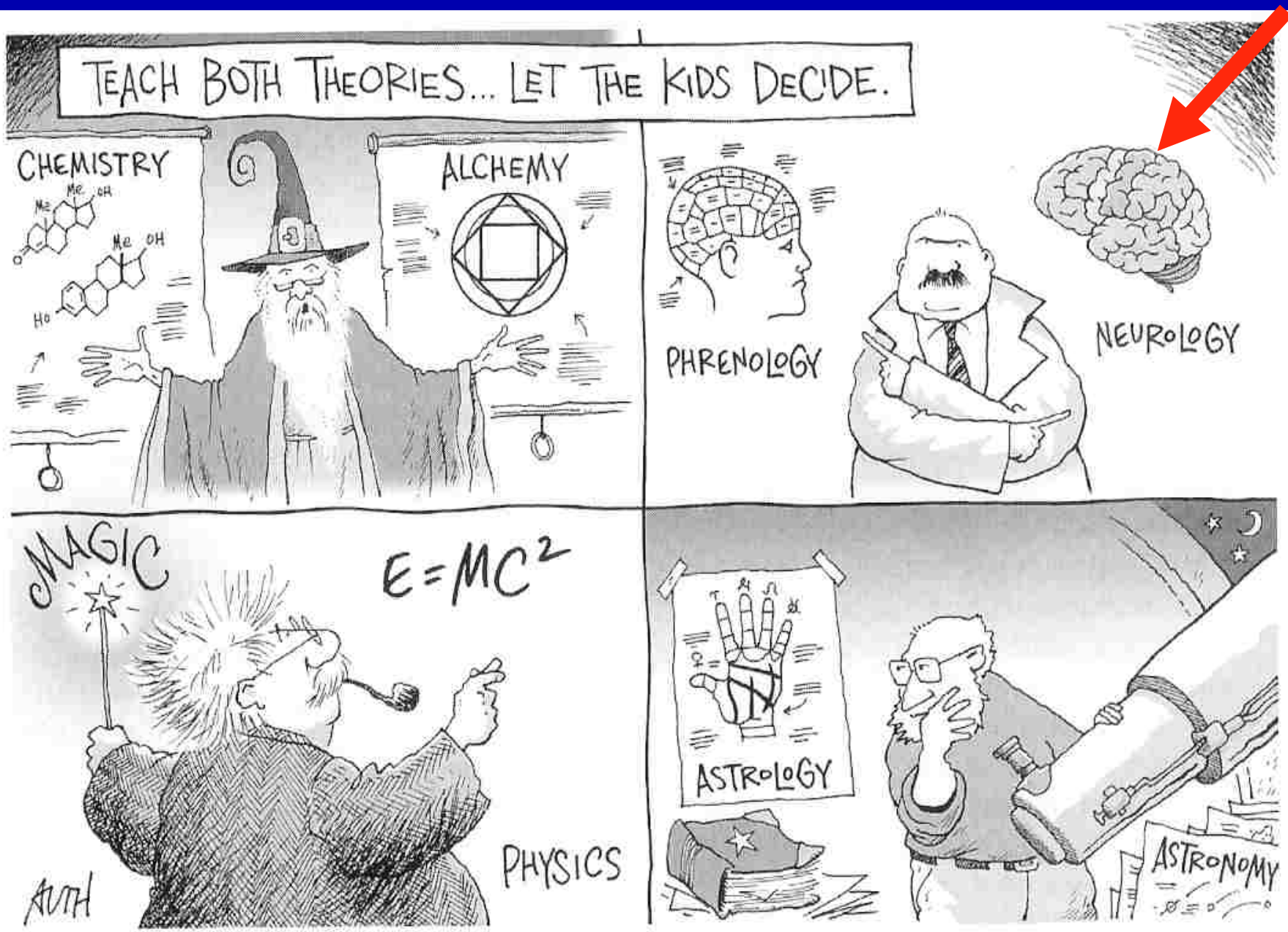
- Different religious groups have differing ethical perspectives on using embryonic stem cells for research purposes
  - When does life begin?
    - Fertilization
    - During gestation
    - Birth

Intelligent design

Intelligent design claims to believe, like evolution, in gradual change

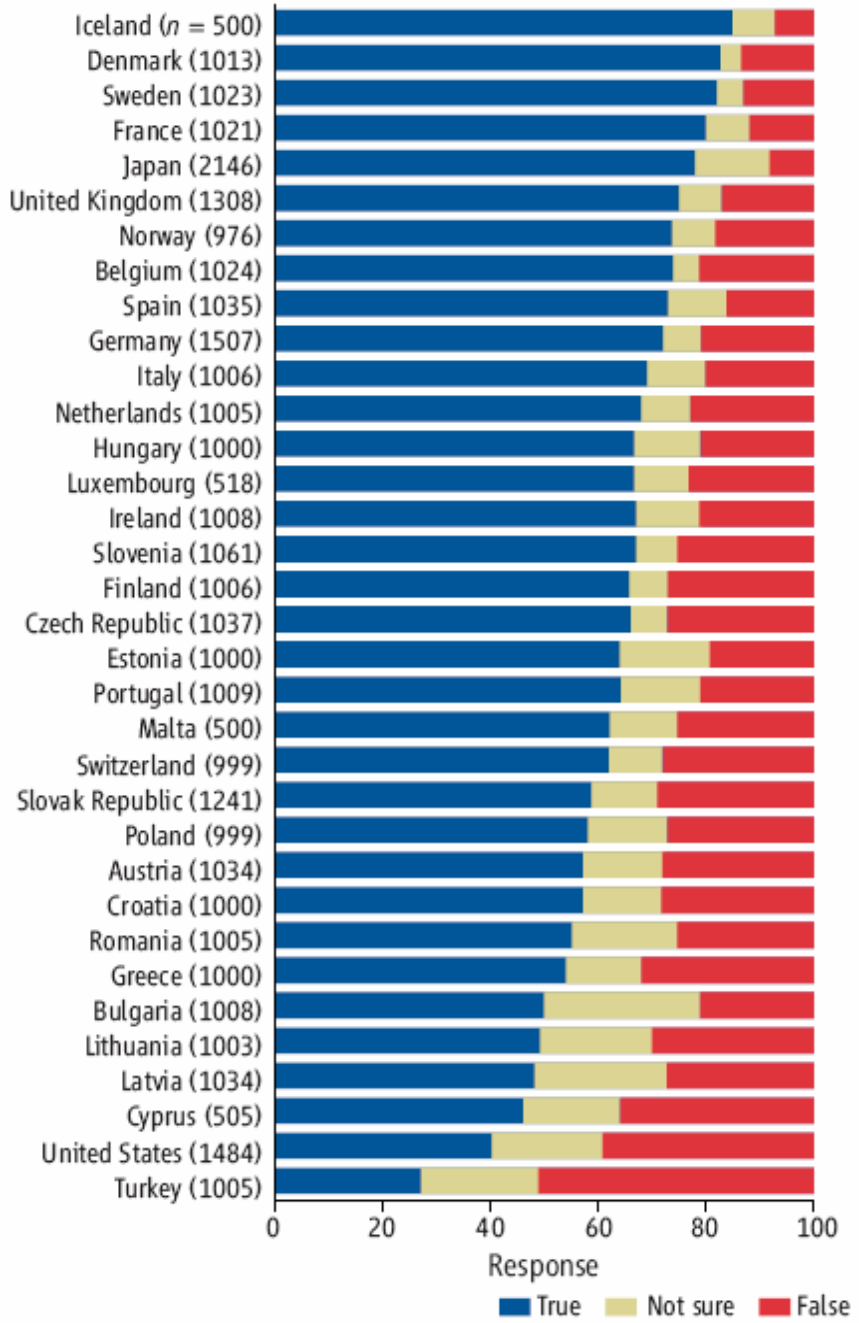
- But a supernatural being guided the process
- Claims to be a scientific alternative to evolution

Advocates want intelligent design taught in science classrooms as an alternative to evolution


TEACH BOTH THEORIES... LET THE KIDS DECIDE.
CHEMISTRY
ALCHEMY
PHRENOLOGY
NEUROLOGY
MAGIC
E=MC²
PHYSICS
AUTH
ASTROLOGY
ASTRONOMY
8.4.05 THE PHILADELPHIA INQUIRER. UNIVERSAL PRESS SYNDICATE.

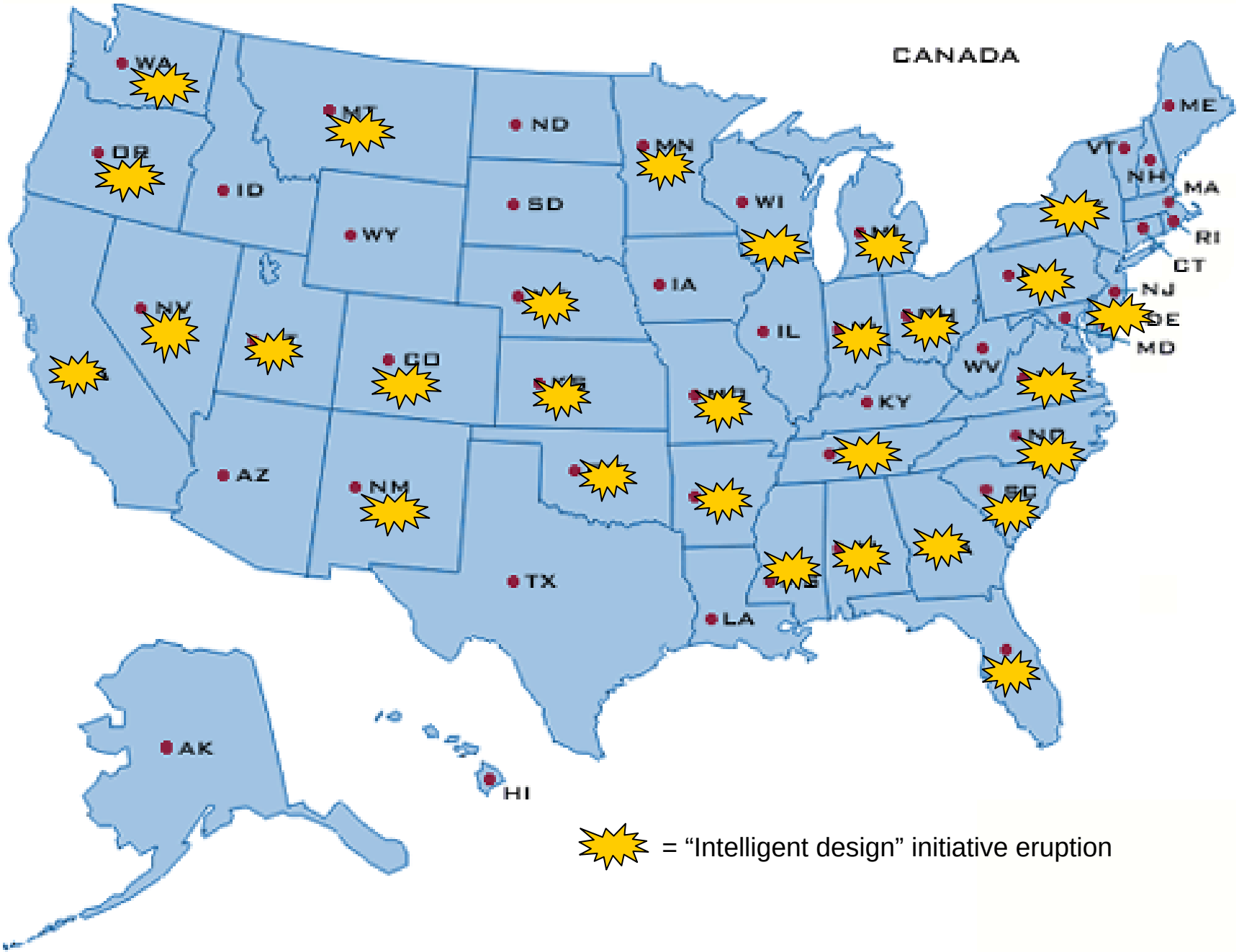
Scientists argue that ID is not science

- Science is restricted to the natural world
  - ID posits a supernatural “designer”
    - And supernatural is not science
- Keep non-science out of science classrooms



Public acceptance of evolution in 34 countries, 2005.

Source: Miller, et. al. Science 313, 765 (2006).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HI
= “Intelligent design” initiative eruption

Overlay of values is having serious consequences for the whole science-society relationship

- Society wants to influence science
  - Rather than just the reverse
- Creating a divide between science and the rest of society

What to do?

- How to improve the science-society relationship?

We can't just "educate" our way out of it

- The problem is not just lack of understanding
  - People do understand much of what we're saying or want to do
  - They don't like it
    - Conflict with their core values trumps their view of societal benefits
    - Only scientists must "stick to the science"

What can we do?

- Continue protesting/lamenting the situation
- Adopt a more assertive strategy
  - Engage with the public on the issues
    - Try to find common ground

One can't deal with

- Evangelical fundamentalists
- Evangelical atheists
- Militant agnostics

One can work with

- Undecideds
- Rational middle

We need to change not only the style and content but also the *intent* of the conversation:

Communicating <u>to</u> the public → Communicating <u>with</u> the public

We need to listen to the public about:

- Their concerns about science and technology and their concomitants
- Their priorities among research areas
- Questions they would like or need us to answer
  - Help frame the research agenda

Formal dialogues in the United States:

- NIH/NHGRI's "Ethical, Legal and Social Implications" (ELSI) Program
- AAAS's Dialogue on Science, Ethics and Religion
- Johns Hopkins Univ. Genetics and Public Policy Center

In genetics:

- What values and priorities should genetic research and its application seek to uphold?
- Where does the public draw the line on an acceptable level of risk?

Kathy Hudson, Research USA, June 30, 2003

Neuroscience needs to go out to the public in a similar way

- Stigma
- Personal responsibility for brain diseased behavior
- Criminal justice policies related to addicted individuals
- Reimbursement for mental disorders and addiction treatment

AAAS Public Engagement Programs

- Science center/museum collaborations
- *Science Update* – radio show
- Array of publications
- Dialogue on Science, Ethics and Religion (DoSER)
- Center for Public Engagement with Science and Technology

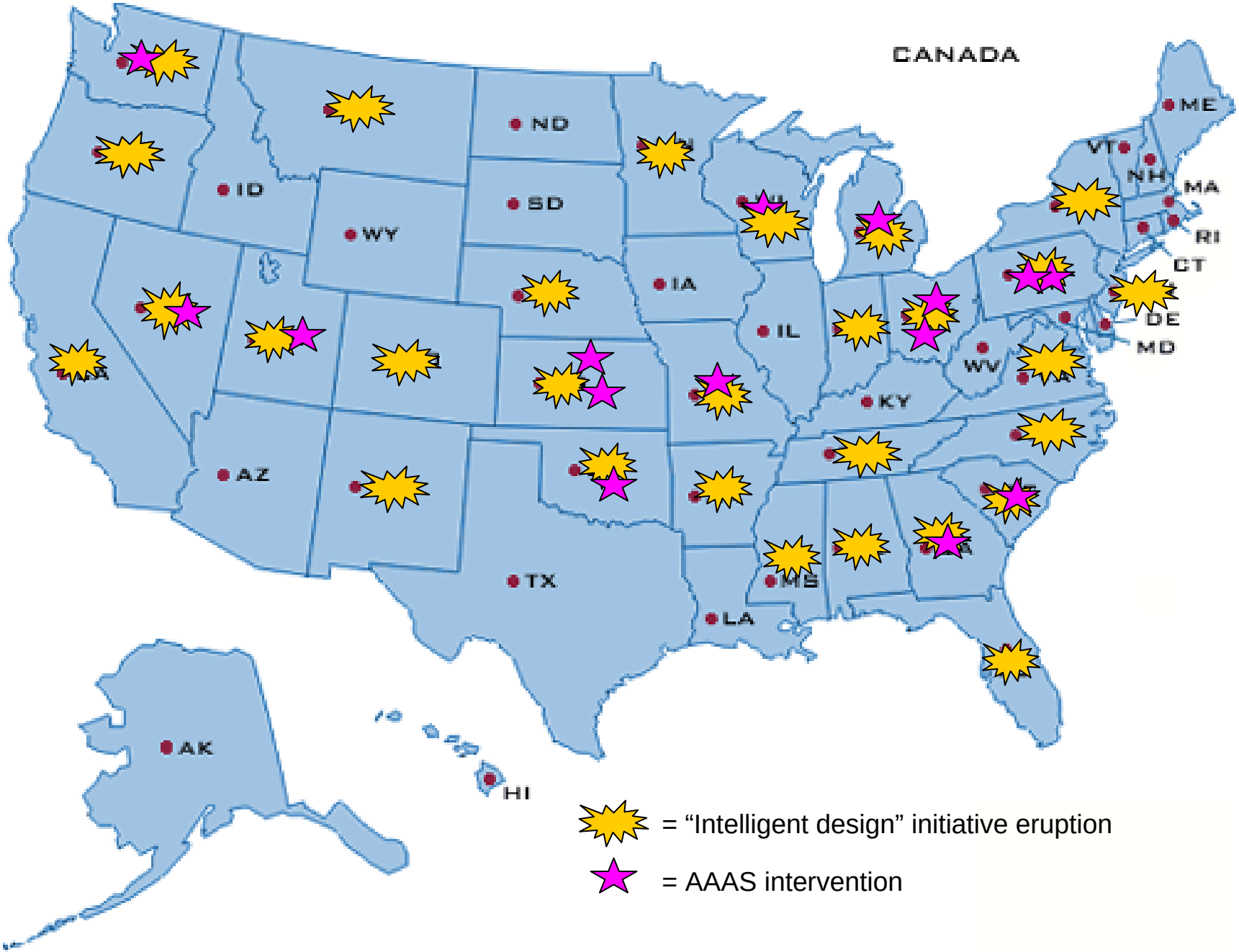
AAAS Center for Public Engagement with Science and Technology

- Town meetings
- Family science days
- Topical public workshops
- Meet the scientists events
- Broadcast opportunities
- Partnerships with science museum and centers
- Active outreach
  - Clubs
  - Residential communities
  - Religious institutions

AAAS "Glocal" strategy

Working with local opinion leaders and resources

- Local media and op-eds
- Clergy
- School officials
- Local government leaders/politicians
- Science museums and centers
- Community groups
- Town meetings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= “Intelligent design” initiative eruption
= AAAS intervention

The Dover trial local op-ed strategy

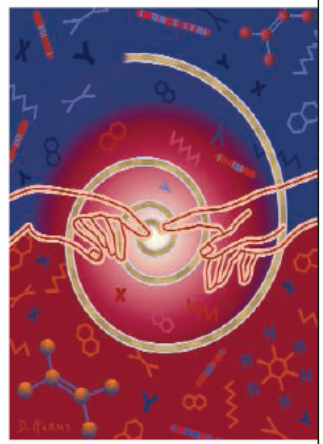
As we move through this difficult era for science and society

EDITORIAL

Twilight for the Enlightenment?

For much of their existence over the past two centuries, Europe and the United States have been societies of questioners: nations in which skepticism has been accepted and even welcomed, and where the culture has been characterized by confidence in science and in rational methods of thought. We owe this tradition in part to the birth of the Scottish Enlightenment of the early 18th century, when the practice of executing religious heretics ended, to be gradually replaced by a developing conviction that substituted faith in experiment for reliance on inherited dogma.

That new tradition, prominently represented by the Scottish philosopher David Hume, supplied important roots for the growth of modernity, and it has served U.S. society well, as it has Europe's. The results of serious, careful experimentation and analysis became a standard for the entry of a discovery or theory into the common culture of citizens and the policies of their governments. Thus, scientific determinations of the age of Earth and the theories of gravity, biological evolution, and the conservation of matter and energy became meaningful scientific anchors of our common understanding.



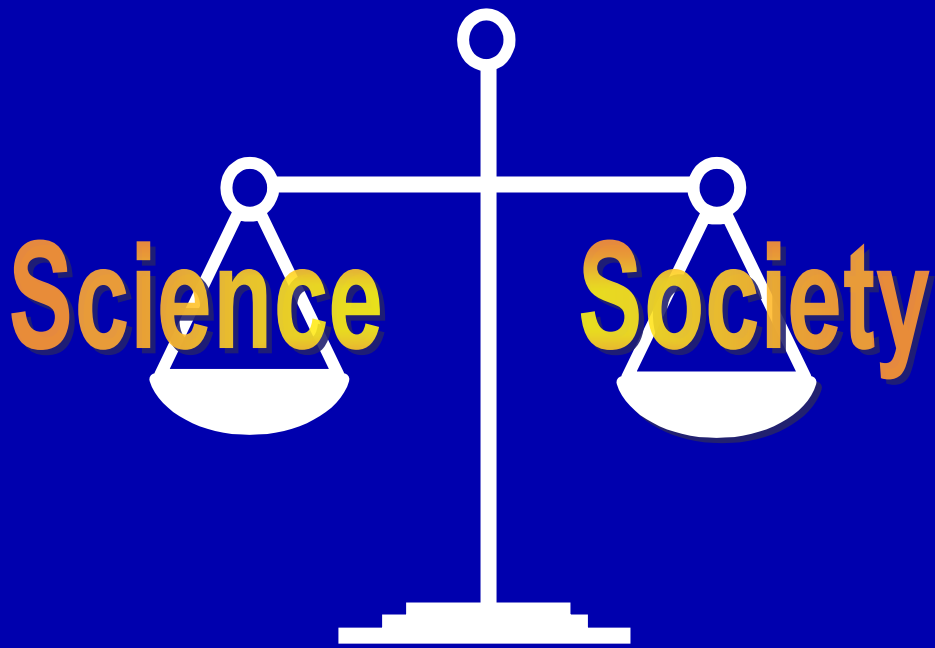
In the United States, that understanding is now undergoing some dissolution, as some school boards eliminate the teaching of evolution or require that religious versions of creation be represented as "scientific" alternatives. "Intelligent design," a recent replacement for straight-up creationism, essentially asserts that a sufficient quantity of complexity and beauty is by itself evidence of divine origin—a retrogression to the pre-Darwinian zoologist William Paley, who saw in the elegant construction of a beetle's antenna the work of a Creator.

In 1998, I helped the National Academies produce a book entitled *Teaching About Evolution and the Nature of Science*. At the press conference announcing its publication, I was asked if I knew that most U.S. citizens did not believe that humans descended from other forms. I said I did, but expressed a hope that things might change. Well, things changed in the wrong direction: Alternatives to the teaching of biological evolution are now being debated in no fewer than 40 states. Worse, evolution is not the only science under such challenge. In several school districts, geology materials are being rewritten because their dates for Earth's age are inconsistent with scripture (too old).

Meanwhile, President Bush's Emergency Plan for AIDS Relief policies recommend "evidence-based" risk-reduction strategies: abstinence for youth, fidelity for married couples, and condoms recommended only for infected or high-risk individuals, such as sex workers. Failure rates for condoms are commonly quoted, apparently to discourage their use by young people for risk prevention. Mysteriously, the policy

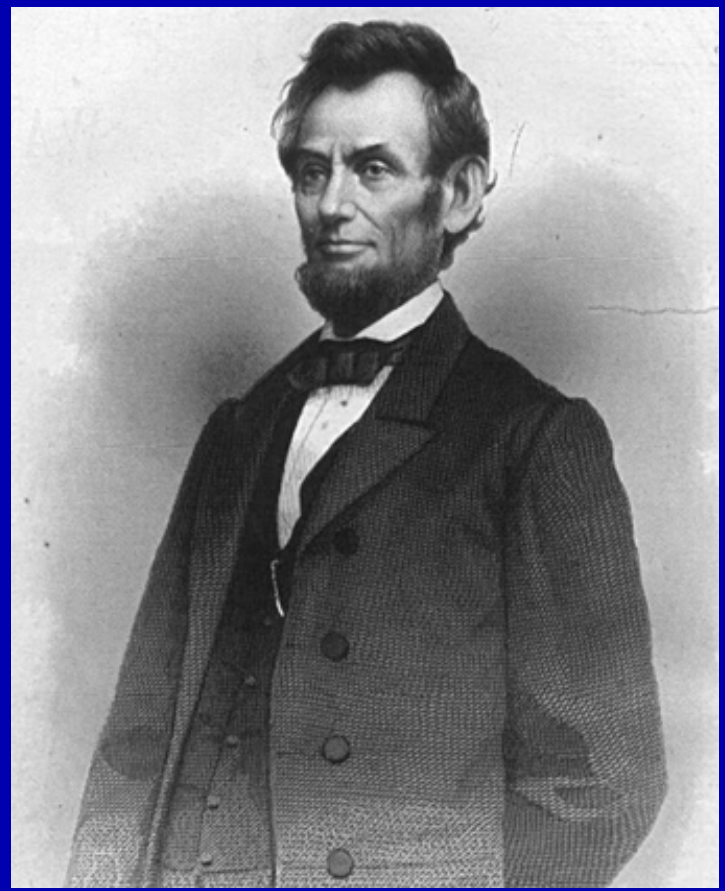
Donald Kennedy, *Science*, April 8, 2005

We Need to Restore Equilibrium to the Science-Society Relationship



Public sentiment is everything. With public sentiment, nothing can fail; without it, nothing can succeed.

Abraham Lincoln



Who's going to do it?

We *All* Need to be a Part of the Effort!