

EVOLUTION & ADAPTATION

(EEB214S) 2012

Jennifer Carpenter

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COURSE SCHEDULE:
EVOLUTION & ADAPTATION (EEB214S) 2012
Ecological & Evolutionary Biology, University of Toronto



Sept.	12	Lecture 1: Why is evolution under debate? <i>Video: Creation</i>
	19	Lecture 2: Darwin's Ideas <i>Video: Darwin's Dangerous Idea (Part 3) 60 min</i>
	26	Lecture 3: Evidence for evolution: Written in the rocks <i>Video: First Life</i>
Oct	3	Lecture 4: Evidence for evolution: Vestigial traits, atavisms and bad designs <i>Video: Planet dinosaur (Part 2) 60 min</i>
	10	Lecture 5: Evidence for evolution: Biogeography <i>Video: <u>Galápagos</u> (Part 2)</i>
	17	Lecture 6: Evidence for evolution: Artificial and Natural selection <i>Video: TBA</i>

Practical things:

- Office Hours: Thursday 10:00-1100. If you would like to speak to me in private email me beforehand.
- Course assessment - midterm multiple choice, final short answer exam and a popular science article (all dates will be available by the end of the week).
- Talking during lectures = ;(
- Reading for lectures



Lecture 1 ▾

Build Content ▾

Create Assessment ▾

Add Interactive Tool ▾

Assign Textbook ▾

Discover Content



Slides ▾

Attached Files: [Lecture1EEB214.pdf](#) (1.702 MB) [Lecture1EEB214_x6perpage.pdf](#) (1.474 MB)



Essential Reading ▾

Anne Holden's review of the history of the creationist movement on the Inkling site makes a really good read (in three parts):

[Thy will be done again and again: the evolution of creationism in America](#)
[Of monkeys and men: the trials of the century](#)
[Don't call it a comeback creationism evolves](#)



Extra Reading (for you boffins) ▾

Nothing this week.

Blogs

- Carl Zimmer writes about science regularly for the New York Times and magazines such as Discover, and he recently had a book out about biology tattoos, this is his blog, which covers quite a lot of evolutionary biology:
Loom: <http://blogs.discovermagazine.com/loom/>
- For a blog about videos of creatures (its fun):
Creaturecast: <http://creaturecast.org/>
- Evolutionary biologist Jerry Coyne blogs here (note, I sometimes find his writings a little polemic on creationism vs. Darwinism):
WhyEvolutionIsTrue: <http://whyevolutionistrue.wordpress.com/>
- Harvard's lizard lab has lots of good evolutionary stories about lizards:
Anoleannals: <http://www.anoleannals.org/>
- Ed Young is currently one of the most prolific science bloggers out there, check him out:
NotExactlyRocketScience: <http://blogs.discovermagazine.com/notrocketscience/>

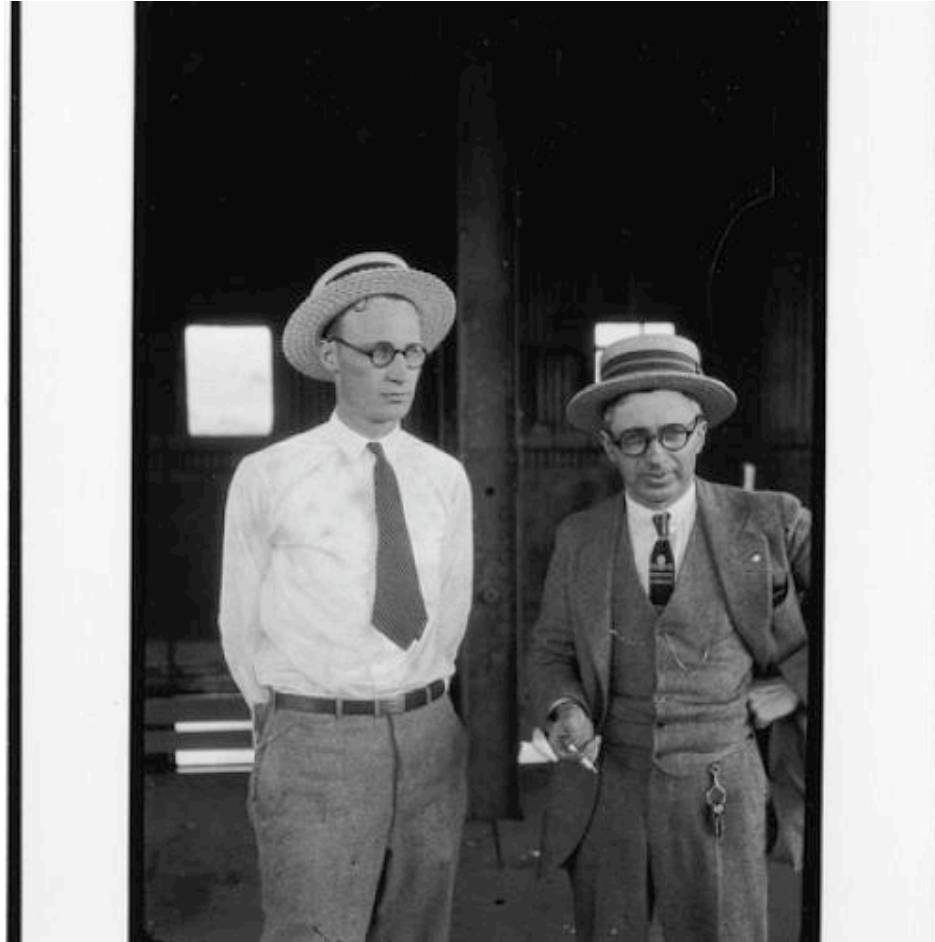
Why is evolution under debate?

Lecture 1

- Why should you take this course - the history of the evolution versus creationism debate
- If you aren't convinced that you should...one more try.



The Scopes Trial (1925)



John Thomas Scopes (l) and George Washington Rappleyea (r),
June 1925—the month before the Tennessee v. John T. Scopes Trial.

“The Trial of the Century”

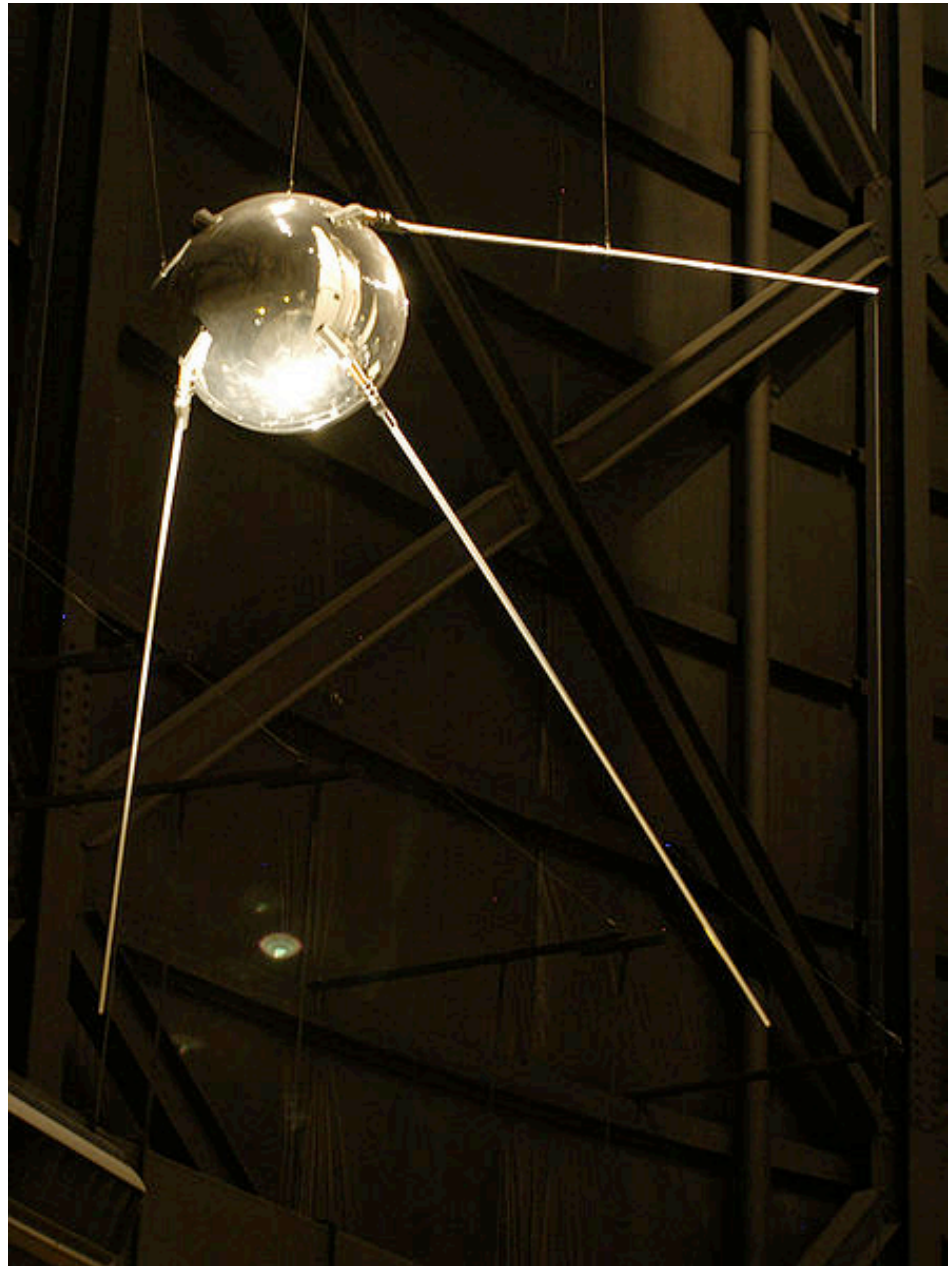
The Scopes Trial (1925)

- Clarence Darrow was permitted to call William Bryan to the stand as an ‘expert of religion’.
- Bryan couldn’t perform and was seen to be largely ignorant of many fundamental Christian concepts.
- But despite Darrow’s expert questioning, Scopes was ultimately found guilty, and fined.

Sputnik:

the first artificial
satellite to be put
into Earth's orbit (1957)

ignited the
Space Race



“...nearly every objecting school board ended up adopting the books...there was community pressures on school boards to be up to date, even if a little wicked, rather than be behind the times and fully virtuous.”

-- John Moore

Science and its Public: The Changing Relationship.

- The last of the anti-evolution state laws were finally dissolved in 1968, when the United States Supreme Court ruled that banning the teaching of evolution on religious grounds violated the First Amendment (**Epperson vs. Arkansas (1968)**)
- **MacLean vs. Arkansas (1982)** saw the Creation Science movement arguing for balanced treatment to "creation-science" and "evolution-science"; they lost.
- **Edwards vs. Aguillard (1987)** [wiggly room]... “if a valid scientific alternative to evolution did arise, then it could be taught alongside evolution”

intelligent design

intelligent design

argues that certain aspects of life are too complex to have evolved naturally, instead, there must be a form of intelligence, a “designer,” to provide guidance along the way.

Creationism
begets
‘Creation science’
begets
Intelligent design

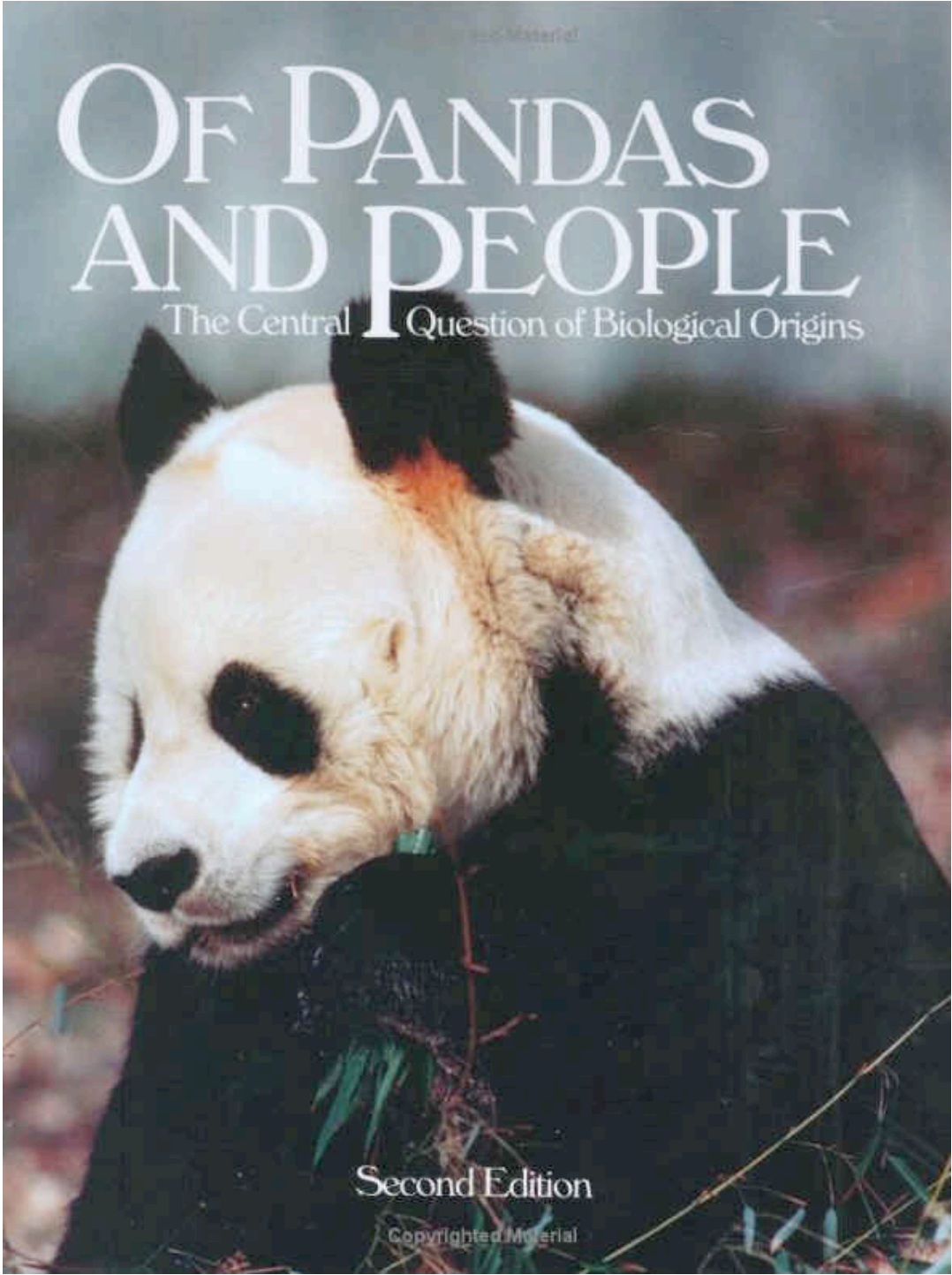
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OF PANDAS AND PEOPLE

The Central Question of Biological Origins

Second Edition

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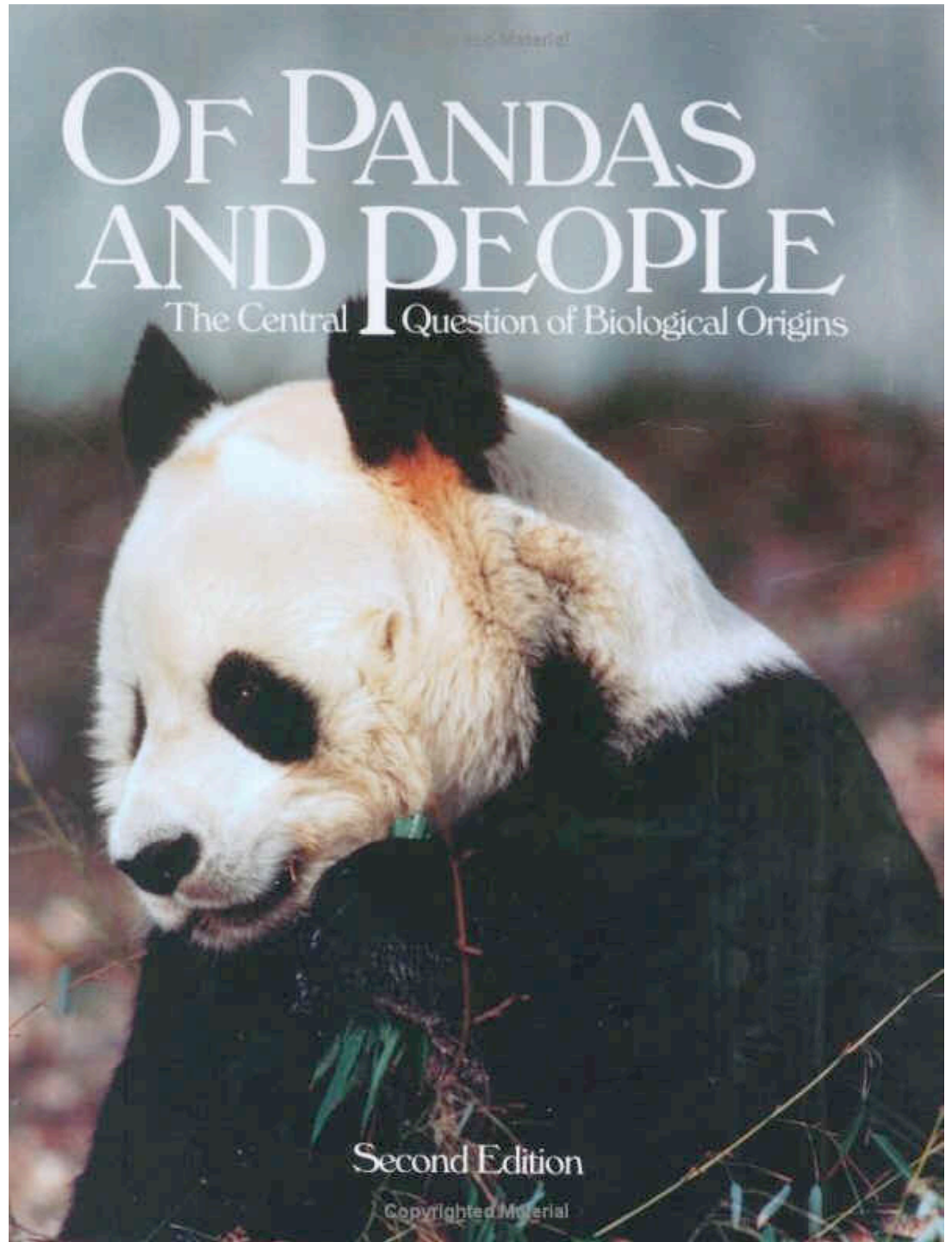
A close-up photograph of a giant panda's head and shoulders. The panda is white with black patches around its eyes and on its ears. It is holding a piece of bamboo in its mouth and appears to be eating it. The background is a soft-focus natural setting with some reddish-brown foliage.

Kitzmiller et al. vs. Dover Area School District et al.
(2005)

Dover High's proposed statement to be read to all ninth-grade classes:

“The Pennsylvania Academic Standards require students to learn about Darwin's theory of evolution, and eventually to take a standardized test of which evolution is a part. Because Darwin's Theory is a theory, it is still being tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations...Intelligent design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People*, is available for students to see if they would like to explore this view in an effort to gain an understanding of what intelligent design actually involves. As is true with any theory, students are encouraged to keep an open mind.”

“Scopes Trails
of
OUR Century”



a wolf in sheep's clothing.

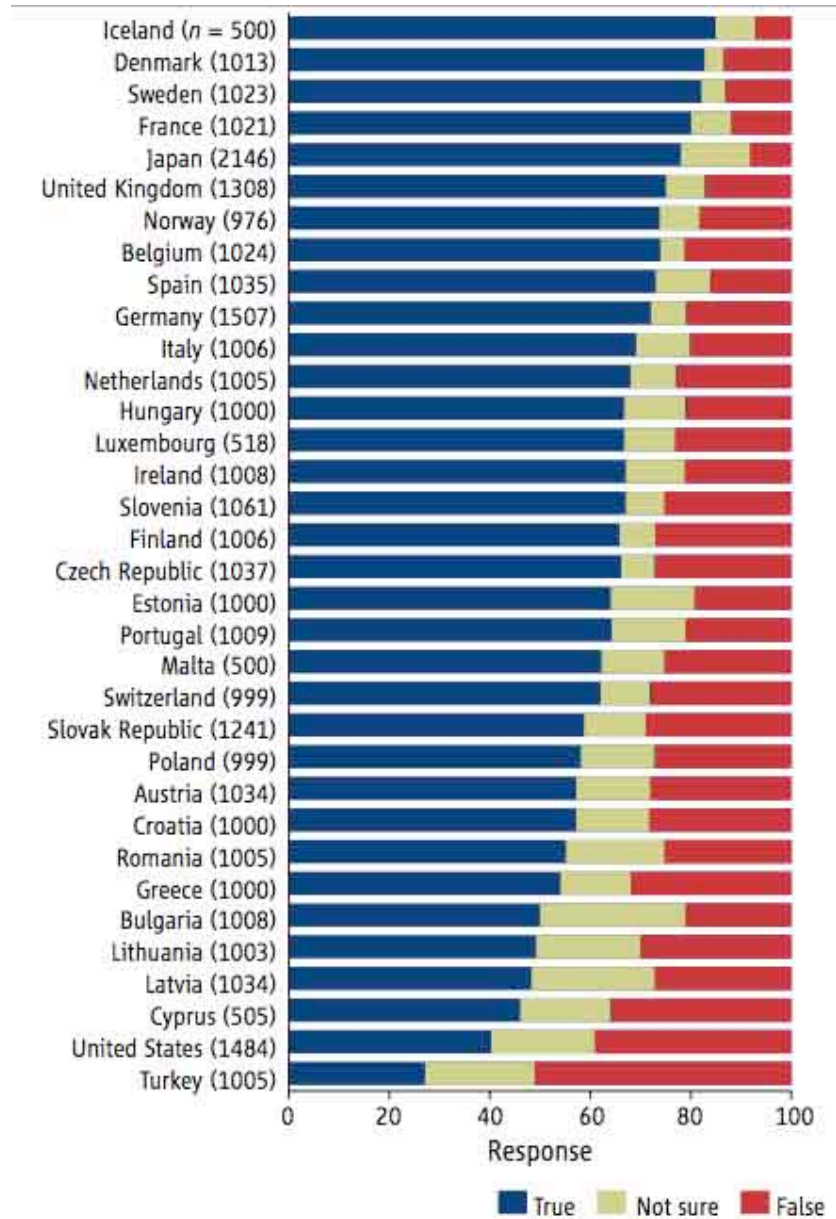
“...the [school board's] disclaimer singles out the theory of evolution for special treatment, misrepresents its status in the scientific community, causes students to doubt its validity with scientific justification, presents students with a religious alternative masquerading as a scientific theory, directs them to consult a creationist text [Of Pandas and People] as though it were a science resource, and instructs students to forego scientific inquiry in the public school classroom and instead to seek out religious instruction elsewhere”

-- Judge Jones, 2005 (NB George W. Bush appointee, a devoted churchgoer and a conservative Republican)



“Human beings, as we
know them, developed
from earlier species of
animals”

“Human beings, as we know them, developed from earlier species of animals”



“History shows that anti-evolutionism does not disappear after defeat in the courts: it merely evolves.” If we are to succeed in fighting this highly adaptable “species,” we must know its shifting shape as well as we do our own.

-- As Nicholas Matzke, National Center for Science Education (NCSE)

Why is this happening now?

theguardian

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[News](#) > [Science](#) > [Evolution](#)

The new anti-science assault on US schools

In a disturbing trend, anti-evolution campaigners are combining with climate change deniers to undermine public education



Katherine Stewart

guardian.co.uk, Sunday 12 February 2012 14.00 GMT



“There are six bills aimed at undermining the teaching of evolution before state legislatures this year: two each in New Hampshire and Missouri, one each in Indiana and Oklahoma. And it's only February.”

have I convinced you yet that evolution is a hot topic?





Why do men have nipples?

- Useful to men therefore favoured by natural selection
- Useful to women and because men and women share many genes men have them too

