

**Empowering Reality, Rationality,  
Creativity, Empathy**

Scientists and Engineers: Facts, Truth, Democracy?  
Statistical Mechanics, Demons, and Democracy

Joe Andrade  
University of Utah Dept. of Bioengineering

IBE  
April 1, 2017

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**Who am I?  
Why should you listen to me?**

Born 1941; 75 years old  
Univ of Utah Faculty 1969-2012  
Professor of Bioengineering, Materials Science,  
Pharmaceutics; Distinguished Prof.  
Dean of Engineering: 1983-87  
Chair of Bioengineering  
Science without Walls; The Leonardo; The CALL  
Emeritus Prof. 2012-present  
Ran for Congress, Dist. 2 Utah, 2012; Lost; The RUN  
Amateur Novelist: *State Change: A Chemical Fantasy*  
( [www.statechange.us](http://www.statechange.us) )  
Novel #2: *Deliver Us From Evil* - Pending

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**The 2017 IBE Annual Conference theme -**

**Convergence -**

transdisciplinary integration of life sciences, physical sciences  
and engineering for developing deeper understanding of  
complex living systems (creating the science of new biology) and  
for engineering novel solutions to address the grand challenges  
of our times - to promote a framework of enabling science with  
network of partners from all fields of life sciences, physical  
sciences, engineering, etc.

But need also to consider Humanities, Social and Behavioral  
Sciences - and especially Politics and Government

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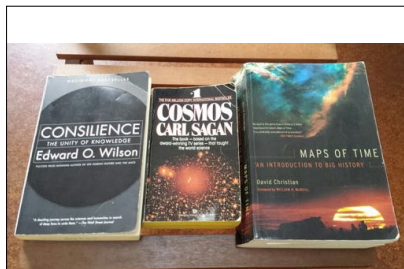
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The Scientific and Engineering Community has been largely uninterested and uninvolved in the education and awareness of the general public

The lack of effective science and technology education in the K-12 years over many decades has resulted in:

- an electorate which is largely scientifically, technologically, and numerically/mathematically illiterate....
- an electorate which can not deal objectively with a wide range of issues, and
- decreasing numbers of students electing to study the sciences.

[www.theleonardo.org](http://www.theleonardo.org) [slvsef.org](http://slvsef.org)



### Chemistry demonstrations are a real gas

Albuquerque Precipitation creates "great bubbles" with the help of Andrew Brown, a senior chemistry major at the University of Utah, right, during the American Chemical Society Student Chapter's "Aging Chemistry Festival" at the Long University Building on the University of Utah Lake City on Saturday. The bubbles were made out of dry ice, water, and soap and were used during the event, children and their families got to see demonstrations that illustrate the role of chemistry in cooking. Most of the demonstrations required making ice.



### Working 'with' Legislature , I learned: It's not about 'Science' - it's Ideology - Belief



Mike Noel, Kanab, State Legislator,  
BA Biology, UC Berkeley  
Denialist, Believer

<http://www.youtube.com/watch?v=16ofvM8aw>

*"The issue is NOT Science...the issue is BELIEF. If you choose to Believe in something very strongly and you choose to adopt a position very strongly - no amount of science will change your Belief. It takes a private revelation...to really change....We must understand that rationality is quite rare..."*

*"We must identify those totally irrational legislators...and get rid of them."* Joe Andrade UU Conf 2-2010

For a sustainable future

**JOE ANDRADE**  
Congress



[www.2andrade.org](http://www.2andrade.org)





*the* **Run**  
 My One-Year Experiment  
 in Democracy by Joe Andrade

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### Awareness and Exposure

*“Most of the population is semantically sheltered and isolated - ‘protected’ from issues, concepts, and problems. I tried to break through the very right, conservative echo chamber in which most Utahns reside. As people hear these words spoken and written - by people and candidates which otherwise seem to be reasonable, informed, educated, and interested - the words will begin to seem less of a threat.”*

The RUN by J Andrade 2012

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### Engagement Needed

*“One of the reasons our nation is in the mess it’s in - where ideology rules and critical thinking is almost non-existent - is because the most educated in our society have chosen to be among the least involved. This is especially true in academia. Academic and professional apathy often prevails.”*

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### Assumptions, Fear, and Revelation... impending dystopia...\*

*“...most people know major changes are coming - they know their historical expectations are in flux. They are afraid of such change. They are afraid of the climate change they hear about and work to deny. They are afraid of impending drought. They are afraid of carbon fees or taxes. They are afraid of higher energy costs. They are afraid.”*

\* Second Coming, Armageddon, Rapture, ... from parents to youth...young adults...

My discussions with high school kids:




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**Rodrigo Rodriguez, chapter in *Politics of Panem*:**

Collin's message is clear:

quoting Katniss: "...look at the state they left us in, with the wars and the broken planet. Clearly, they didn't care about what would happen to the people who came after them."

Collins seems to believe that the work of building a more equitable world is a project that ultimately falls to the young.

...the goal of the dystopian genre to 'place a mirror before readers, challenging them to examine the world they inhabit and the obstacles it places on the path to social justice'.

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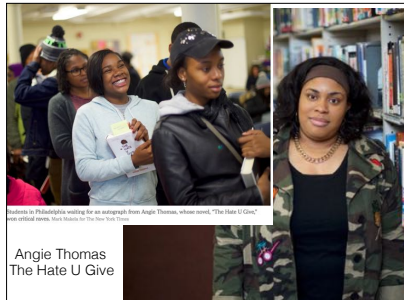
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Students in Philadelphia waiting for an autograph from Angie Thomas, who co-wrote, "The Hate U Give."

Angie Thomas  
The Hate U Give

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**Why Write Fiction?**

Reality is so diverse, so complicated, so interesting - why waste time on fiction? on fantasy?

That was my position for most of my career. But with age and time (gerontological 'wisdom?') I realized fiction, especially novels, can reach many more people than factual media do: newspapers, papers, documentaries, texts.

I read and reread some novels that had major socio-political impacts. I learned you can say and 'do' in fiction things which might get you arrested and jailed if said as fact (this was several years before the President of the United States endorsed 'alternative facts').

And I realized that if you self-publish you don't need to be constrained by editors, lawyers, agents, or publishers.

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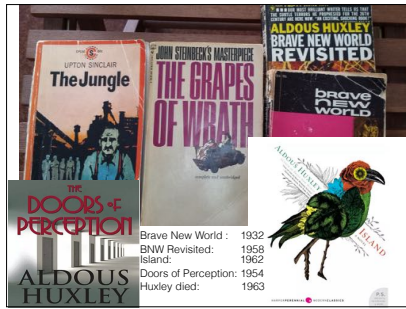
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So after many years of reading and study about mental constraints, rigidity, ideology, politics, plutocracy, voter and citizen apathy and misinformation, gerrymandering, and outright non-ethical, immoral, and even illegal behavior and actions, I devised a **novel hypothesis** and an **'experiment'** to hopefully address our impending political catastrophe and resultant dystopia.

The first implementation of that hypothesis is **State Change** - ([www.statechange.us](http://www.statechange.us))

a 450 page amateur novel in which a set of rigid, obstructionist political ideologues are illegally "treated" to facilitate their transformation to more rational and reasonable citizens, officials, politicians.

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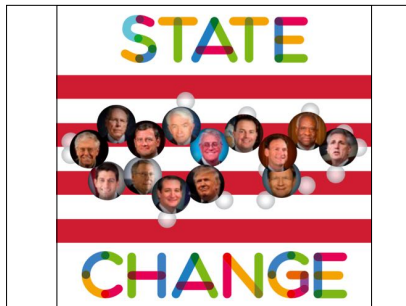
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The most effective, most pragmatic, most realistic solution is to directly change the mindsets of existent afflicted rulers and elected leaders.

Given the urgency of the problems which must be solved, those entrenched mindsets can only be rapidly changed by direct chemical means - by chemically-facilitated revelations and epiphanies.

That is the subject of this book.

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"Perhaps, but remember engineers and physicians – especially surgeons – often tend to be conservative – they like things simple."

"[Charles Koch] extrapolated his engineering rules and laws directly into the public sector. He assumes that the simplistic 'rules' and assumptions applied by his father, by Ayn Rand, by Hayek are as reliable in the social arena as Newton's Laws and the rules of chemistry are in the physical science arena."

**Charles and David Koch, Paul Ryan, Ted Cruz, and Robert Mercer are simplists: smart guys who prefer seductive simplicity to the complexity of social and political (and environmental) reality.**

It probably was not Einstein, but it's been said:  
*Things should be as simple as possible, but not simpler.*  
 also, Aldous Huxley:  
*Facts do not cease to exist because they are ignored.*

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**Engineers of Jihad: The Curious Connection between Violent Extremism and Education**

by Diego Gambetta

★ ★ ★ ★ ☆ 1 Review

[See All Formats & Editions >](#)

[Read Sample](#)

[f](#) [t](#) [g+](#) [@](#)

The violent actions of a few extremists can alter the course of history, yet there persists a yawning gap between the potential impact of these individuals and what we understand about them. In *Engineers of Jihad* Diego Gambetta and Steffen Hertog uncover two unsuspected facts, which they imaginatively leverage to narrow that gap: they find that a...

[See more details below](#)

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"Engineers like bombs and circuitry?" Jay asked.

"Yes, in part, but engineers really like ..."

"Rules ... simple, reasonable rules," Bill interrupted. "Just like adolescents."

"Yes – the world is confusing and complex – and certain mentalities strive for simplicity, for rules, for order."

"And some of those people choose engineering."

"Yes – and that's why a disproportionate number of active, 'successful', jihadists are engineers."

"And some of them become libertarians, Ayn Rand wannabees – and plutocrats."

"The book cites some psychology literature about the search for simplism – defined as exaggerated simplicity and oversimplification."

"Sounds like libertarianism, tea party patriots, and some engineers I know," Bill said.

"And jihadists."

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English has one word, TRUTH,  
with Two Definitions:

1. In accordance with fact or reality - the real world;
2. A firmly held opinion or conviction - as in the spiritual world.

TRUTH is What Is or What / Believe

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Russian has two different words for TRUTH:

**истина, пожалуйста**  
Real, Unshakeable, Factual Truth

**Правда, пожалуйста**  
Surface, Subjective, Superficial Truth

[https://www.nytimes.com/2016/12/15/opinion/to-understand-trump-learn-russian.html?\\_r=0](https://www.nytimes.com/2016/12/15/opinion/to-understand-trump-learn-russian.html?_r=0) :

"You can fiddle with the pravda all you want, but you can't change the istina."

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**Charles Blow: NYT 1-26-2017: <https://nyti.ms/2kvMkzt>**  
on liars, lying, fake news, truth, science

"Donald Trump is a proven liar. He lies often and effortlessly. He lies about the profound and the trivial. He lies to avoid guilt and invite glory. He lies when his pride is injured and when his pomposity is challenged.

Indeed, one of the greatest threats Trump poses is that he corrupts and corrodes the absoluteness of truth, facts and science.

It is no coincidence that the rise of Trump is concurrent with the rise of "fake news." It is no coincidence that his rise comes during an age of severely damaged faith in institutions."

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# WHAT'S "FAKE NEWS"? 60 MINUTES PRODUCERS INVESTIGATE

Stewart's Conf. Panel:  
News and Democracy

What surprised 60 Minutes producers who reported on "stories that are provably false" – and why arguing about it "is like going down the rabbit hole"

<http://www.cbsnews.com/news/whats-fake-news-60-minutes-producers-investigate/>

MAR 26

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SHARES FACEBOOK TWITTER

What does the phrase "fake news" mean? It depends who you ask. The term has become so loaded that when a team of 60 Minutes producers began to investigate fake news, the producers first had to agree on a definition.

"We weren't interested in doing a story about the 'fake news' that is invoked by politicians against the media for stories that they don't like or for comments that they don't like," explains producer Michael Radutzky in the 60 Minutes Overtime video above. "We're using the term 'fake news' to describe stories that are provably false, have enormous traction in the culture, and are consumed by millions of people."

FRI, DEC 23, 2016 12:00 PM MST

## Dystopian Donald: Will Trump make "1984" look like a nursery tale?

Can you doubt that we're in a dystopian age, even if we're still four weeks from Trump entering the Oval Office?

TOM ENGLISHARD, TOMSPATRIOT.COM

SEE COMMENTS

TOPICS: DONALD TRUMP, DYSTOPIA, ELECTION, IMAGINATION, TOMSPATRIOT.COM, POLITICS NEWS, DISTORTION MEDIA, SOCIAL MEDIA NEWS



## The Trump era's top-selling dystopian novels

By Brian Wheeler

BBC News, Washington DC

29 January 2017 Magazine



Donald Trump has sparked a sales bonanza for publishers of dystopian fiction - as well as his own books on business success. Here are the titles currently enjoying a boost on the back of his arrival in the White House.

The New York Times | <https://ny6.ms2/2kd55nq>


SCIENCE

## In Age of Trump, Scientists Show Signs of a Political Pulse

By AMY HARMON and HENRY FOUNTAIN FEB. 6, 2017

Michael Eisen, an evolutionary biologist, is among the elite of American scientists, with a tenured position at the University of California, Berkeley, and generous funding from the Howard Hughes Medical Institute for his research on fruit flies.


But late last month, dismayed over the Trump administration's apparent disdain for evidence on climate change and other issues, Dr. Eisen registered the Twitter handle @SenatorPHD and declared his intention to run in the 2018 election for a seat in the United States Senate from California. His campaign slogan: "Liberty, Equality, Reality."




**THE GLOBAL ENERGY CHALLENGE:**  
A GLOBAL CHALLENGE FOR THE UNIVERSITY

**DR. DANIEL G. NOCERA**  
Fletcher Research Professor of Energy, Harvard University

MARCH 20 | 6 PM | ASB 202  
with a reception





Dr. Daniel G. Nocera  
Fletcher Research Professor of Energy, Harvard University

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**The Global Energy Challenge: A Moral Imperative for the University**

Climate change is an existential threat to society as we continue to meet energy demand with carbon-based fuels. A growing population, increasing global living standards, expanding access to education, and improving health outcomes are all inescapably linked to a need for greatly increasing access to affordable, reliable energy. Meeting this need with the expanded use of fossil fuels is inconsistent with a low-risk climate pathway, yet those fuels often remain the most affordable and widely available. Despite continued declines in the costs for zero-carbon energy technologies, [fossil fuels](#)...

**Event Details**

**Thursday, March 30**

**6:00 P.M.**

ASB 202  
201 S. 402 E.  
S.G. UT 84112  
Free to the public

[Book Now on a table](#)

**Budget cuts to National Institutes of Health**

**BY JONIA L. ANDERSON**

The world is on the verge of a new battle over biomedical research and basic research. Congressional and executive branch actions are expected to cut funding for the NIH by 10 percent for many NIH divisions. The cuts are expected to be implemented in the coming fiscal year.

**KEY POINTS**

- The NIH budget is expected to be cut by 10 percent for many NIH divisions.
- The cuts are expected to be implemented in the coming fiscal year.
- The NIH budget is expected to be cut by 10 percent for many NIH divisions.

*Deputy News*

**WORLD VIEW**

**How Woody Guthrie can help us fight for science**

Oklahoma

**WHERE THERE IS CLIMATE WILL, THERE IS ALSO CLIMATE RESISTANCE.**

**RESISTANCE.**

**RESISTANCE.**

**RESISTANCE.**

**Major Science/IBE Societies: Twitter handles and membership**

Amer. Chem. Soc.	@AmerChemSociety	160,000
AAAS	@AAAS	120,000
Union Concerned Scientists	@UCSUSA	100,000
NSTA	@NSTA	50,000
Amer Physical Soc.	@APSPhysics	50,000
IBE	???	200
BMES	@BMEsociety	7,000
Soc. for Biomaterials	@SFBiomaterials	1,000
IEEE	@IEEEorg	400,000

### Internet in a Minute!

Over 2 Million Google searches  
over 300,000 Tweets  
about 3 Million YouTube views  
over 20 Million WhatsApp messages

If you Facebook, Tweet, post, blog, comment, like, follow -  
then  
"You are a publisher!" says Adam Sharp.  
"You are part of 'the media'"

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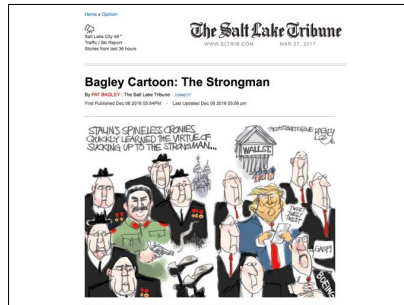
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### Twitter Followers

@NeilTyson	7 Million (M)
@ProfBrianCox	2.5 M
@RichardDawkins	2 M
@LKraus1	300K
@MichaelEMann	50K
@danlevitvion	20K
@PaulREhrlich	10K
@JoeAndrade2012	<100!

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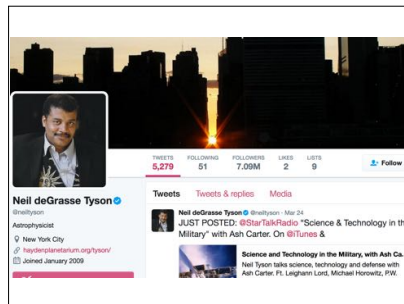
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**SCIENTIFIC COMMUNITY**

**From a tweet, a March for Science is born**  
Plans for 22 April demonstrations spread to more than 100 cities around the world

**By Linda Wood**

It was a tweet that brought them together. "We'll both be fair like a well-oiled scientist." Another. "Working a public health educator and science writer in New York City, needed last last month. As a result of worries about our hopes that President Donald Trump's administration might have on scientists.

The march will be not just for scientists, but for "anyone who believes in empirical methods, the experiment method, the scientific method." The organizers wanted one on the March for Science with pages. The demonstrators are excited to be a celebration of science, they say, as well as "to support and defend the scientific community."

But although the march has generated the endorsement of many prominent and general scientific society AAAS has not yet decided whether to endorse or participate in the march.

The debate over the march window is just part of the excitement that has inspired its organizer organizers, who have yet to meet in person. "We just need to meet face-to-face." Apollon says. It's just weeks, he says, for organizers have created a web page, written a mission statement, and or-

**WORKING LIFE**  
By Gabrielle Kuzdos

**Step out of the lab and engage**

Last month I found myself sitting on a leather couch, my black dress smoothed over my knees, in a hushed wood-paneled room in Washington, D.C. The silence was broken by a group of lobbyists for the aerospace industry bantering about labor costs. I panicked for a moment. "Why am I here waiting in the anteroom of this senator's office?" I asked myself. I had a mission—advocating for science funding—but I felt out of my element. Normally, I would be sitting in jeans and a T-shirt peering down a microscope at sections of muscle tissue. But I reminded myself that scientists have an important role to play in public policy.

My path to active policy engagement began when a graduate student and I enrolled into studying a common but relatively unexplained birth defect, Congenital diaphragmatic hernia (CDH), in which the diaphragm muscle does not develop properly, ultimately kills 50% of afflicted infants. After the excitement of publishing our research, I realized that I knew little about how this birth defect actually affects people's lives. So I reached out to Churchill, a community of CDH patients and parents, which enthusiastically embraced my

many people I employ and the effects of a flattened NIH budget on the high personnel and productivity, and I realized that few non-scientists understood the practical realities of conducting scientific research.

Did my visits to Congress make any difference? I know that Sen. Representative Stewart now knows that a developmental biology lab is like a small business, but I'm not sure how much further the latest estimate, A

fect actually affects people's lives. So I reached out to Chereba, a community of CDM patients and parents, which enthusiastically embraced my lab and me. In 2015, when I heard the group was lobbying Congress for increased research funding, I decided to join the effort. I was curious whether our concerns would resonate with our elected officials.

We visited more than a dozen members of Congress. The highlight was a discussion with then-Senator Jeff Sessions (R-AL), whose grandson is a CDM survivor. Fifteen CDM patients and parents crowded around a table in his conference room and took turns narrating their health care struggles. The senator (who is now the attorney general) then studied me out as the only scientist in the room and asked about the latest discoveries in CDM research. We chatted for a few minutes about the complicated genetics underlying CDM, and I saw how his personal connection with CDM sparked a sincere interest in the underlying science.

Then, last month, emboldened by this first visit and motivated by recent political events, I decided to speak with my senators and representative when I was in Washington, D.C. for a science meeting. My guest (incomparable) visit was with representative Chris Stewart (R-UT), again, a key to the success of this conversation was finding common interests. What resonated with him was hearing about the economics of running a lab that relies on funding from the National Institutes of Health (NIH). He was clearly interested in how



**"A key to the success of this conversation was finding common interests."**

representative Stewart now knows that a developmental biology lab is like a small business, but I'm not sure how much further the impact extends. A better question may be, "Will I visit Congress again?" I can answer that with an unqualified "yes!" It is critical that we scientists engage, communicate our science, and make it accessible to the larger community. Most members of the public have never met a scientist and may not know how science works, but we can each do our small part to change that. As I get here writing this piece, I chide myself for not spending this time on the tedious work that is getting up—experiments, manuscripts, grants, and lectures. But I've decided that replacing just one coffee hour a month with an outreach activity is a reasonable goal.

My advice is to find some way to tell your own science story that will resonate with your listeners. You could take a few hours during your next trip to Washington, D.C. to visit your senators and representatives. Attend town meetings and speak up. Volunteer in classrooms at your local schools. Participate in the March for Science. Step out of the lab, step in from the field, and engage. »


Gabrielle Kardon is an associate professor and a National Science Foundation—government (NSF-GEM) Ambassador (awards.org) at the University of Utah in Salt Lake City. Send your career story to [SciCareers@frontline.org](mailto:SciCareers@frontline.org).

334 17 MARCH 2017 • VOL. 363 | SCIENCE 633A sciencemag.org 34

“... replacing just one coffee hour a month with an outreach activity is a reasonable goal.”

Gabrielle Kardon

In the case of Tweeting, direct your Tweet to one or 2 who need the input, the education. It may only be a 'nano' effect, but they add up. Be a Maxwell's Demon via social media. Increase the Pressure!

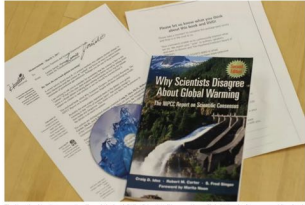


**Koch-Funded Group Tries to Persuade 200,000 Science Teachers That Climate Change Is Debatable**

The Heartland Institute is trying to nurture the next generation of climate change deniers.

The conservative and libertarian think tank has sent out 25,000 copies of the organization's book, *Why Scientists Disagree About Global Warming*, and an accompanying 10-minute DVD to 25,000 science teachers this month, according to a Frontline report. The book argues that climate change is not settled science.

MARCH 24, 2017 / by KATIE WOBETZ, Staff Journalist Fellow, FRONTLINE/Columbia Journalism School Fellowship



The Heartland Institute says it will send the book "Why Scientists Disagree About Global Warming" to every public school science teacher in the nation. (Source: News 10CHS.com)

Twenty-five thousand science teachers opened their mailboxes this month and found a package from the Heartland Institute, a libertarian think tank that rejects the scientific consensus on climate change.








Senator Mike Lee [mike\\_lee@lee.senate.gov](mailto:mike_lee@lee.senate.gov)  
To: [joseph.andrade@utah.edu](mailto:joseph.andrade@utah.edu)  
Reply-To: [mike\\_lee@lee.senate.gov](mailto:mike_lee@lee.senate.gov)  
The Laudable Pursuit: Fighting to Fix Your Health Care

Today at 3:23 PM



March 20, 2017

*"To establish the foundation of man-to-man artificial weights from all shoulders, to alter the path of laudable pursuit for all, in effort of an unshaken stand and a fair chance, in the face of all." -Abraham Lincoln*

**Chairman's Note: Fighting to Fix Your Health Care**

When I was first elected to the Senate in 2010, I ran on a promise to repeal Obamacare.

For more than six years, I've made finding a way to make health care more affordable for Utahns my top priority as a United States senator.

Regrettably, the American Health Care Act, which the House of Representatives rejected last week, would have failed to reduce health care premiums for Utahns.

But is why I urged my House colleagues to vote against it.

But that is also why I am more committed than ever to finding legislation that can pass both the House and Senate and reduce health care costs.

The heart of the problem is the Washington-created, one-size fits all regulations that treats Utah's unique population the same as that of Florida or Massachusetts.

Each of our 50 states has different populations with different health care needs. There is no reason why should all be forced to buy the same "essential health benefits" package when we shop for health insurance. What is essential to one family or individual may not be essential to another. That is a decision for our state's states, communities, and families to make, not bureaucrats and politicians in Washington.

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KNOW what you are talking about:



And insist others know what they are talking about

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[www.statechange.us](http://www.statechange.us)  
[joe.andrade@utah.edu](mailto:joe.andrade@utah.edu)  
[@JoeAndrade2012](https://twitter.com/JoeAndrade2012)

Thanks  
Discussion?

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*"Perhaps the sentiments contained [herein] ... are not yet sufficiently fashionable to procure them general favor, a long habit of not thinking a thing wrong, gives it a superficial appearance of being right, and raises at first a formidable outcry in defence of custom. But the tumult soon subsides. Time makes more converts than reason."*

Thomas Paine

*"Too much sanity may be madness – and the maddest of all – to see life as it is, and not as it ought to be."*

Don Quixote via Cervantes



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*If we appear to seek the unattainable, it has been said, then let it be known that we do so to avoid the unimaginable.*

—Tom Hayden, Port Huron Statement

*Too much sanity may be madness – and the maddest of all – to see life as it is, and not as it ought to be.*

—Don Quixote by Cervantes

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The New York Times | <https://ny6.ms/2rJHfwl>

MUSIC

## A Chelsea Manning-WikiLeaks Opera, Seen in a New Light

By ZACHARY WOOLFE FEB. 21, 2017

When you make art about current events, there's a catch: Events change.

"The Source," Ted Hearn's slippery, stunning opera about Chelsea Manning and WikiLeaks, had its premiere at the Brooklyn Academy of Music in 2014. The year before, Ms. Manning had been sentenced to 35 years in prison for leaking secret material on the Iraq war and other American military and diplomatic activities. Many on the left viewed WikiLeaks with wary sympathy for publishing her revelations.

Since then, of course, WikiLeaks has become a liberal pariah for publishing hacked emails belonging to Hillary Clinton's political advisers. And Ms. Manning, who transitioned from male to female in prison, will be freed in May since her sentence was commuted by President Obama.

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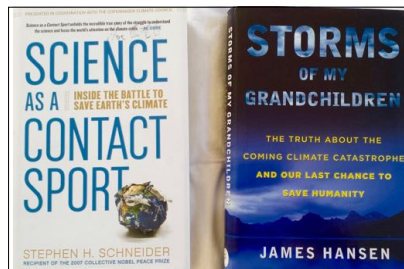
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both published 2009

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Daniel G. Nocera  
<http://nocera.harvard.edu/DanielGNocera>

Nocera is a frequent guest on TV (CNN, ABC Nightline, PBS, ABC Nature's Edge, Jim Lehrer News Hour, This New House, NOVA, CBS, CNBC, Discovery Channel, The Science Channel, Brink and Plum in the U.S. and Explora and RAI in Europe), radio (NPR, Bloomberg News, CBS, CBC, BBC, All Things Considered, Here and Now, Climate Connections, Voice of America, Radio New Zealand) and is regularly featured in print (New York Times, National Geographic, Forbes, Discover, Wall Street Journal, Time Magazine, The Statesman, The New Republic, U.S. News and World Report, ON, Outside Magazine, Wired, Technology Review, National Review). His 2006 PBS show was nominated for an Emmy Award.

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He worked with Robert Krulwich of ABC News to develop the pilot that was used to launch the PBS NOVA show, ScienceNow, which is now a regularly scheduled science program on PBS. He also worked with Mr. Krulwich and the web designer OddTodd to develop a five part series on The Lifestyle of Carbon. He opened the Mountain Film Festival 2007 in Telluride CO, the Aspen Forum in Aspen CO in 2008 and 2009, and the World Science Festival in NYC in 2008. He sits on several advisory boards and is currently working with several artists in the U.S and abroad, actors and producers in Los Angeles and major business leaders in the U.S. to help them develop a position that contributes positively to the energy and sustainability challenge confronting this planet. In 2008, he founded Sun Catalytix, a company committed to bringing personalized energy to the non-legacy world.

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### The 'new' District 2 - brilliant gerrymandering

- Most of Salt Lake City, Bountiful
- Universities, College
  - UU, SUU, Dixie, Snow, Westminster
- Most of Western Utah
  - Tooele, Delta, Milford
- 2/3 of Southern Utah
  - St. George, Cedar City, Kanab, Richfield
- National Parks and Monuments
  - Zion, Bryce, Capitol Reef,
  - Canyonlands (1/2), GSENM, ...
- Major Military (not Hill AFB)
- South half of Great Salt Lake



To T-shirts and signs! ...→

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