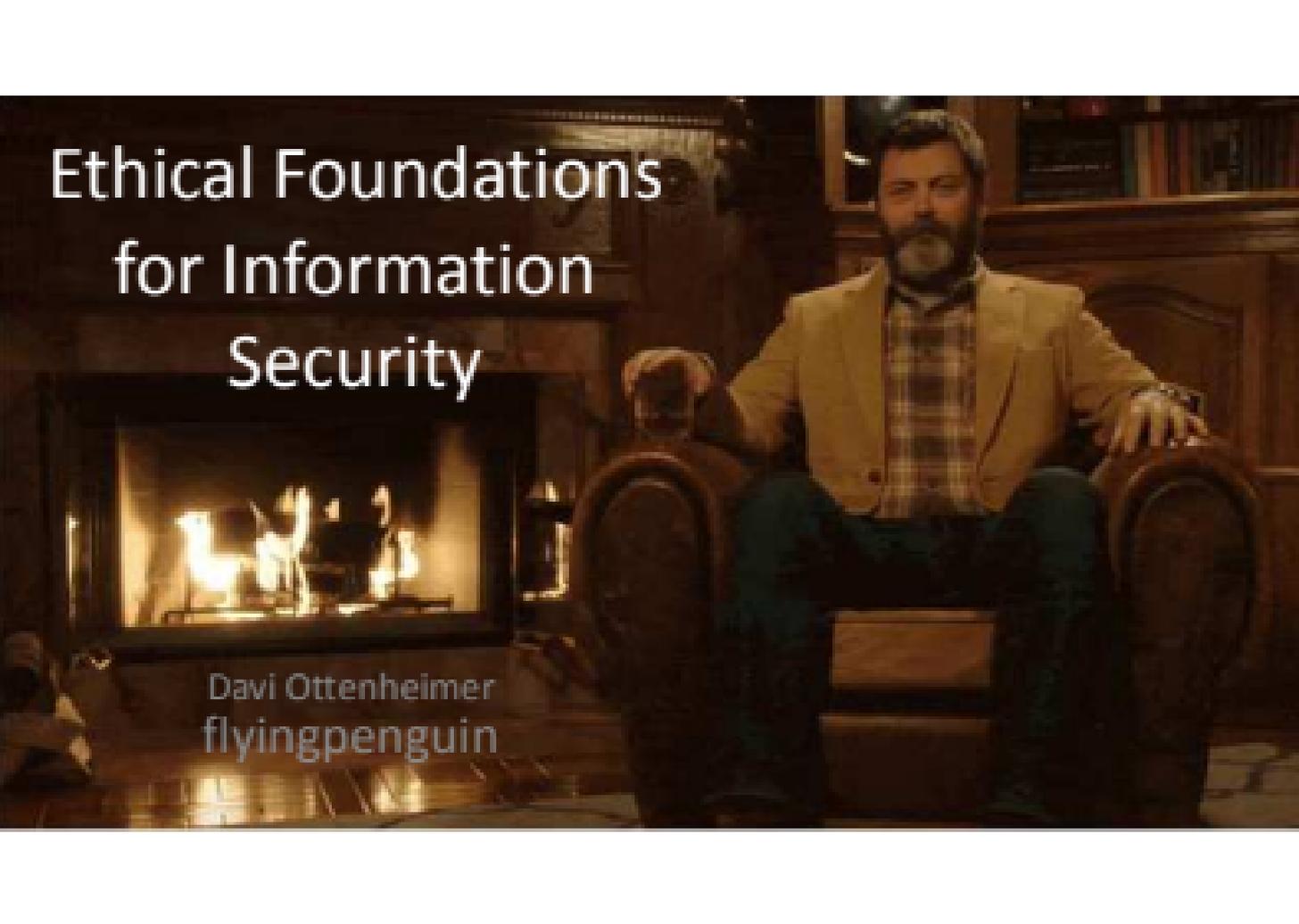


# Ethical Foundations for Information Security

A man with a beard, wearing a tan jacket and a plaid shirt, is sitting in a large, dark wooden armchair. He is in a room with a fireplace to his left, which has a fire burning inside. The room has wood-paneled walls and a bookshelf in the background. The lighting is warm and dim, creating a cozy atmosphere.

Davi Ottenheimer  
flyingpenguin



**"Good vs. evil,"**

stated as a kind of equation,  
makes for ***lame drama***,

because if the choice is so clear,  
***nothing is at stake.***



## Pop Quiz

You find root pwd, curve, key...

- Before could be tracked
- Now can erase tracks and hide

Do you do *bad things* because... you can?

## Who Refuses to Sign a Code-of-Ethics?

“In an open letter we approached nearly 100 *US-based cryptographers* and found that *just over half* were willing to sign on to the letter after many rounds of changes.

The people who did not want to sign on had a variety of reasons, but the most common was that they *didn't feel they were somehow experts* in this domain, or they thought that engaging in something ostensibly political they would somehow *weaken their standing* as academic cryptographers.”

<http://www.radionz.co.nz/national/programmes/ninetoonoon/audio/201780914/the-ethics-of-mass-surveillance>

## Who Refuses to Sign a Code-of-Ethics?

“A new *scientific truth does not triumph* by convincing its opponents and making them see the light, but rather because its *opponents eventually die*, and a new generation grows up that is familiar with it.”

-- Max Planck

Does Science Advance One Funeral at a Time?

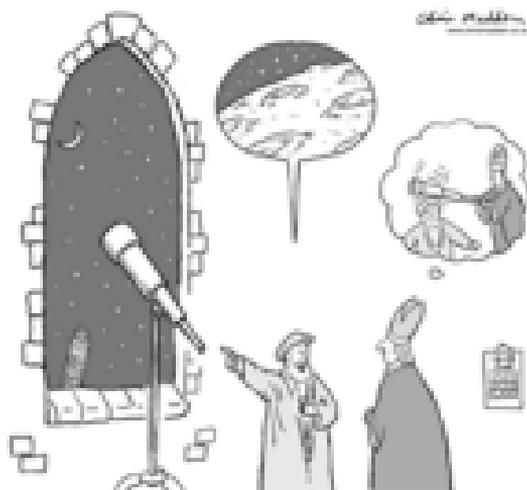
<http://www.econ.upf.edu/docs/papers/downloads/1498.pdf>

# Pop Quiz

A group claims new truth...

- Before just a hypothesis
- Now action taken without any scientific proof

Do you wait to respond because... you can?



# What is an Engineer in IT?

“...undermines a long tradition of designing and building infrastructure in the public interest.

...explicit responsibility to public safety and reliability...the title ‘engineer’ is cheapened by tech industry.”

<http://www.theatlantic.com/technology/archive/2015/11/programmers-should-not-call-themselves-engineers/414271/>

# 1996 Ariane 5 Launch Review



**“software should be  
assumed to be faulty”**

**“concern software exception is allowed, or even required,  
to cause processor halt on mission-critical equipment”**

# A Few Philosophers

- Socrates 400s BCE
- Hobbes 1600s
- Kant & Wollstonecraft 1700s
- Bentham early 1800s
- Mill mid 1800s
- Nietzsche late 1800s



*"You have logic, I have Roscoe."*

# Socrates 400s BCE

- If everyone treated equally regardless of color, creed, religion, sex...who decides morality?
- Morality from just one God? Many Gods?
- What if there is a Universal Condition?
  - Right, Fair or Just
  - Common Good
  - Virtue



Students Plato & Aristotle: Our social instinct is to succumb to authority

# Which is correct?

**Inherent  
right/wrong**

Authority follows  
and can be good.

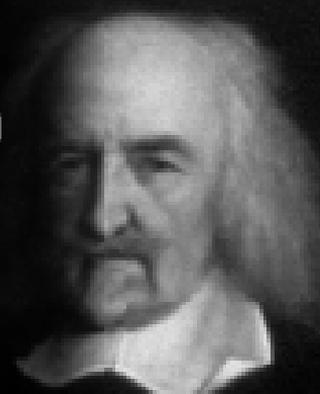
**Controlled  
right/wrong**

Authority can not  
be good or bad.

... the life of man  
solitary, poor, nasty,  
brutish, and short. ...

The condition of man  
... is a condition of war  
of everyone against  
everyone.

Thomas Hobbes



Aristotle  
ur dumb

# Thomas Hobbes 1600s

- Yes! Do as you like when root
- Life is nasty, short and brutish  
(although he was pampered and lived 1588 –1679: 91 years)
- Everyone maximizes self-benefit
- Only way to stop someone else benefiting is to oppose with your self-benefit (e.g. band together to support mutual interests)

Morality is not, strictly speaking, the doctrine which teaches us how we should make ourselves happy, but how we make ourselves worthy of happiness.

Immanuel Kant



# Immanuel Kant 1700s

- No! Do only good, absolutely (Deontology)
  - Right and wrong inherent
  - Categorical Imperative
- Humans always must be treated as an end, dignity respected, and not as a means
- Negative Rights: Privacy...
- Positive (welfare) Rights: Health, Education...

I do not wish  
[women] to have  
power over men;  
but over  
themselves.

Mary Wollstonecraft

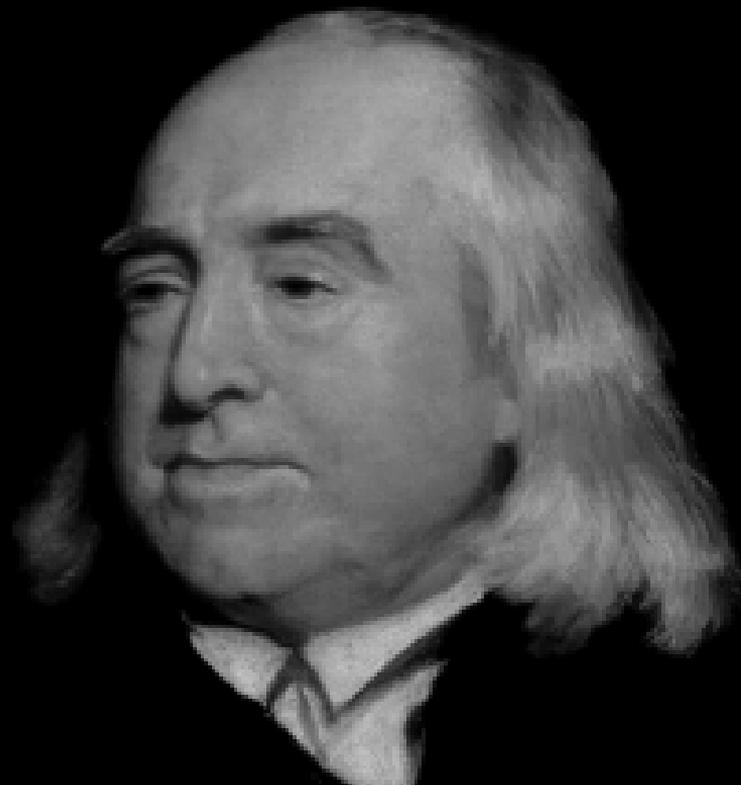


# Mary Wollstonecraft 1700s

- No! Do only *rational* good
- A Vindication of the Rights of Man (1790)
  - Unequal society founded on passivity of women
  - Rationality, unlike ancestral traditions, abolishes slavery
- A Vindication of the Rights of Woman (1792)
  - Human limitations are a result of deficient education
  - Middle-class “most natural state”
  - Equality of sexes

The question is not  
can they reason,  
nor can they talk,  
but can they suffer.

Jeremy Bentham



# Bentham early 1800s

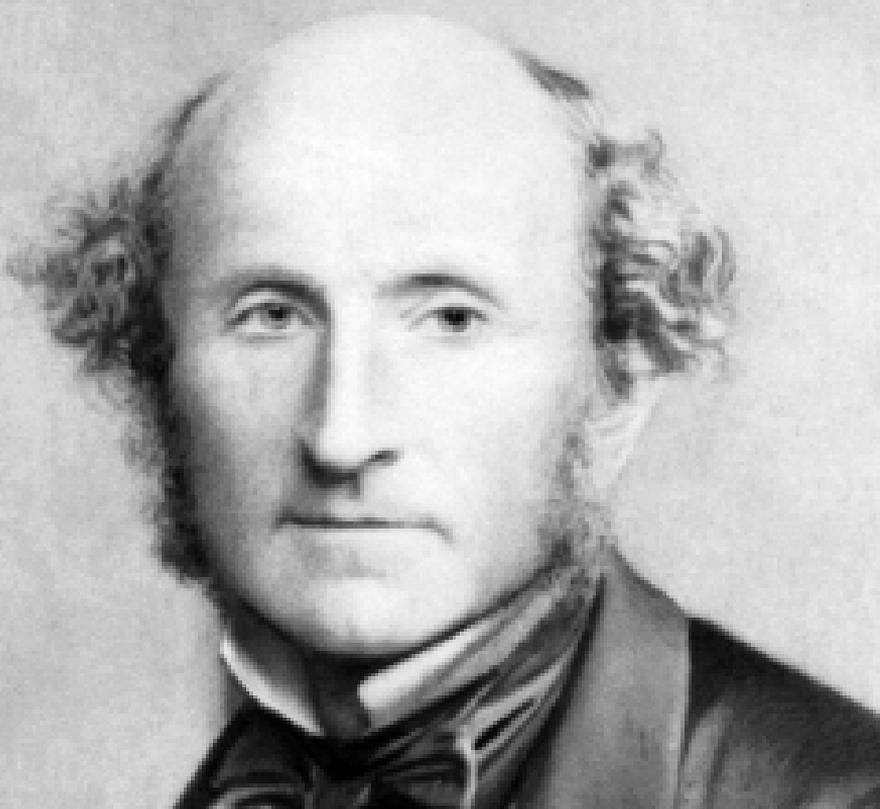
- Math! We can calculate consequences
- Consequentialism
  - Intensity
  - Duration
  - Propinquity (how direct)
  - Fecundity (how lasting)
  - Purity (side-effects)
  - Extent (number affected)



*"You want the usual stuff,  
or this thing?"*

The only freedom which deserves the name is that of pursuing our own good, in our own way, so long as we do not attempt to deprive others of theirs, or impede their efforts to obtain it.

John Stuart Mill

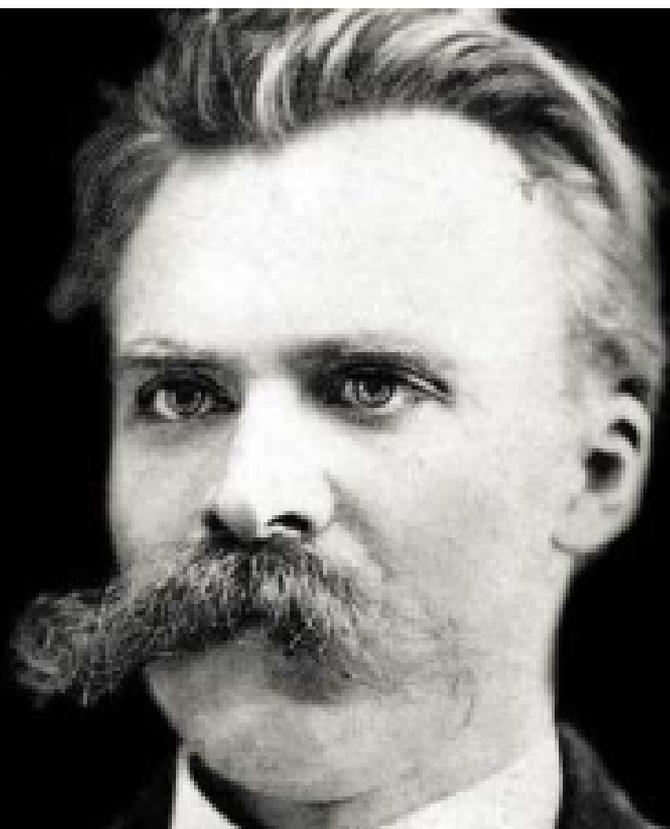


# John Stuart Mill mid 1800s

- Math! Consequences can be generalized despite being unpredictable
  - Good intentions turn out bad
  - Bad intentions turn out good
- Calculation simplified by utility (Utilitarianism)

Battle not with  
monsters, lest you  
become a monster,  
and if you gaze into  
the abyss, the abyss  
gazes also into you.

Friedrich Nietzsche

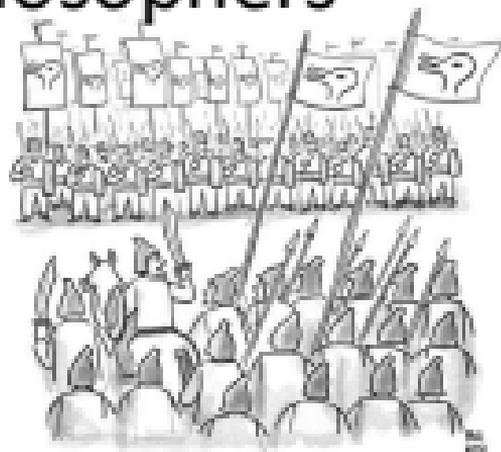


# Friedrich Nietzsche late 1800s

- Nature!
- Basic human instinct should not be denied by the human moralist
- Forced morality, wipes out nature of our being, poorly regulates right/wrong

# Recap of A Few Philosophers

- Socrates 400s BCE
- Hobbes 1600s
- Kant & Wollstonecraft 1700s
- Bentham early 1800s
- Mill mid 1800s
- Nietzsche late 1800s



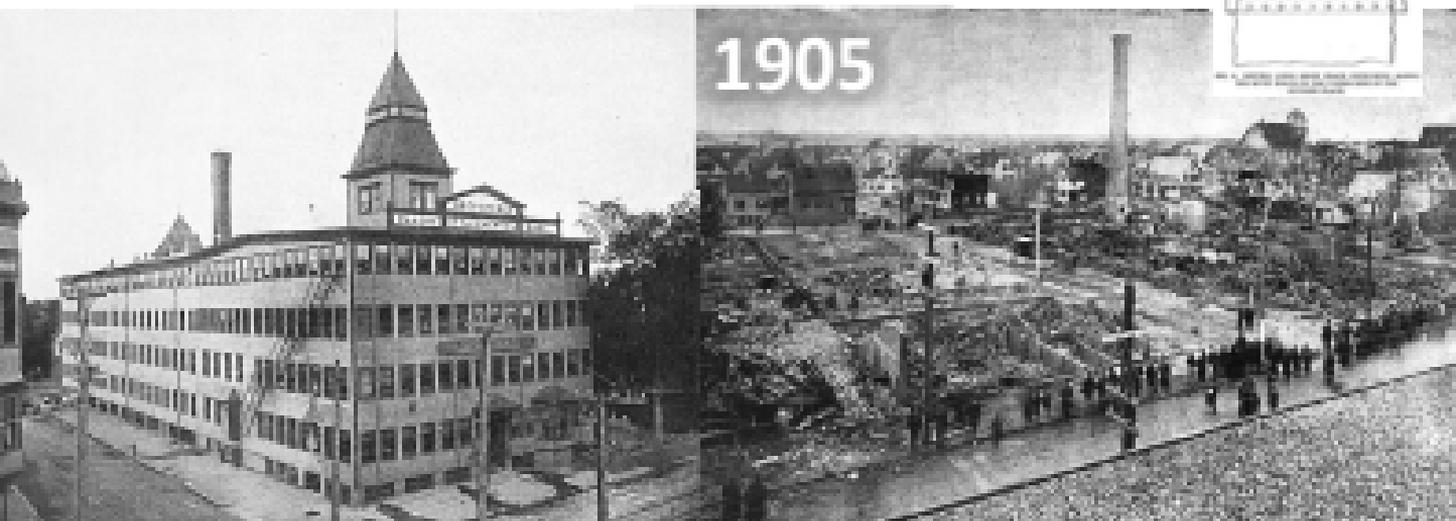
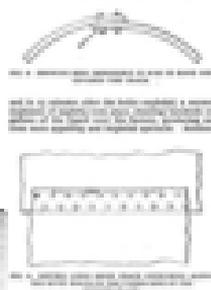
*"There can be no peace until they renounce their Rabbit God and accept our Duck God."*





**Over 2000 explosions 1880 - 1890**

# Tech Boom 15 Years Later: Grover Shoe Disaster



<https://books.google.com/books?id=dCQAAAAAMAAJ&pg=PA1-PA3#v=onepage&q&f=false>

# West Texas Fertilizer

Claimed Loss: \$100 million

FEMA Rebuild Grant: \$35 million

Estimated *Prevention* Cost: \$40,000

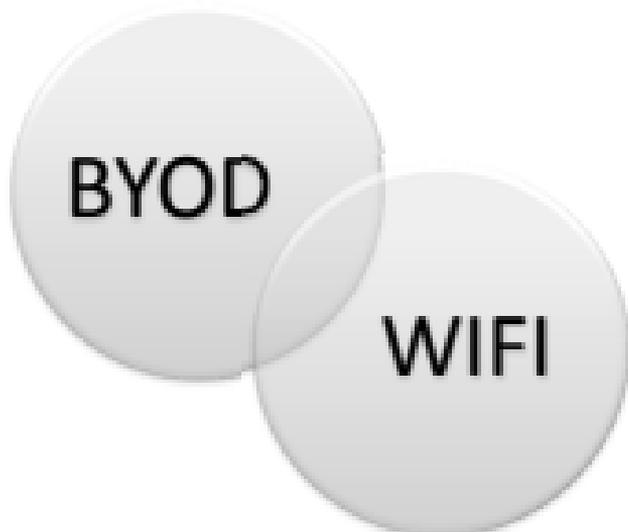


<http://www.claimsjournal.com/news/southcentral/2014/08/11/259079.htm>

# Quiz: Knowledge v Privacy

How best *engineer* for safety, when given...

- Reduced Control of Perimeters
- Reduced Control of End Points



I refused to invest in security until the worms of 2001 hit. I even ignored 2 years of internal warnings from SWI. Don't do what I did.



<https://twitter.com/daviottenheimer/status/581172997815279616>

© 2015 Twitter

# Quiz: Knowledge v Privacy

Intel Gaps, Executive Failures or Both?

– May 10<sup>th</sup> 1940,  
**Maginot Line**

**“Enigma was SSLv2 of the 1930s”**

– June 6<sup>th</sup> 1944, D-Day Landings



**I'm nothing, and yet, I'm all I  
can think about**



# Quiz: “Fairness” in ML

- Computer Code is Reduced Set of Human Code
- Encryption Makes Knowledge More Expensive
- From Where Comes Algorithm Accountability?
  - Induction Fallacies (Hume)
  - “Acceptability” of a Percentage Safe or Accurate
  - Training, Choices, Discrimination, Stereotyping

# Further Research Areas



Sources – Variety of raw data



Streams – Near real-time processing (in-mem)



Stores – Large-scale distribution



Analysis – ML, SQL, Statistics



Actions – Apply new value

# Further Research Areas

<b>5 PHASES OF BIG DATA RISK</b>	<b>SOURCES</b> 	<b>STREAMS</b> 	<b>STORES</b> 	<b>ANALYSIS</b> 	<b>ACTIONS</b> 
Net & System Security					
Data Protection					
Vulnerability					
Access Control					
Monitoring					
Policies					

LiDAR 360 scans for objects

Processor calculates behavior based on data

# WHO GETS THE SLOW TICKET?

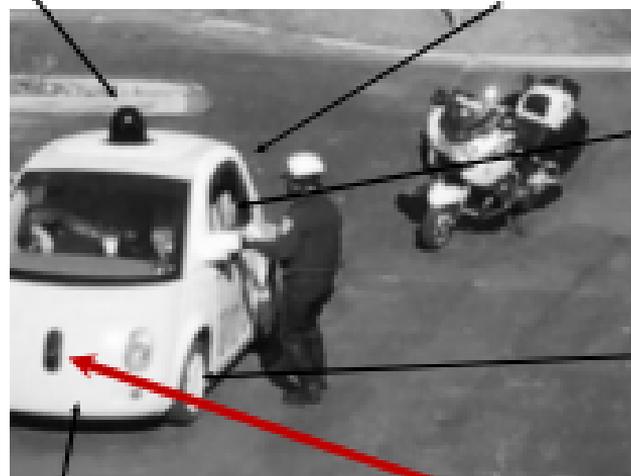
*Public sentiment?*

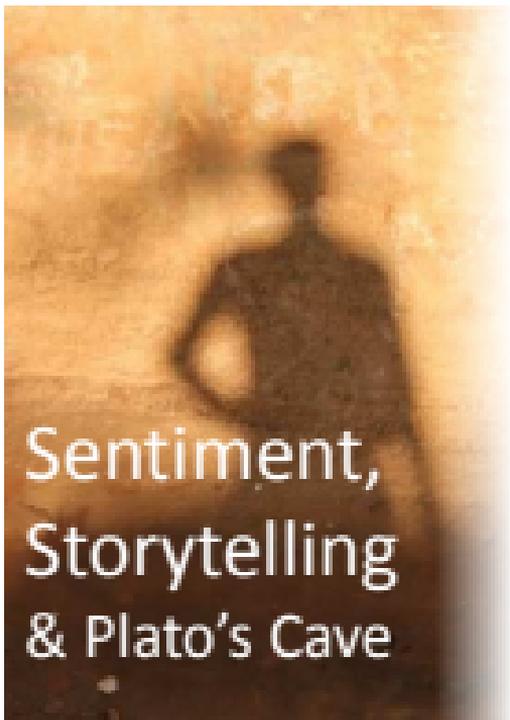
Passenger throws hands up in air like they just don't care

Hub rotation sensor calculates distances

Motion and balance sensors detect orientation

Radar measures speed relative to others

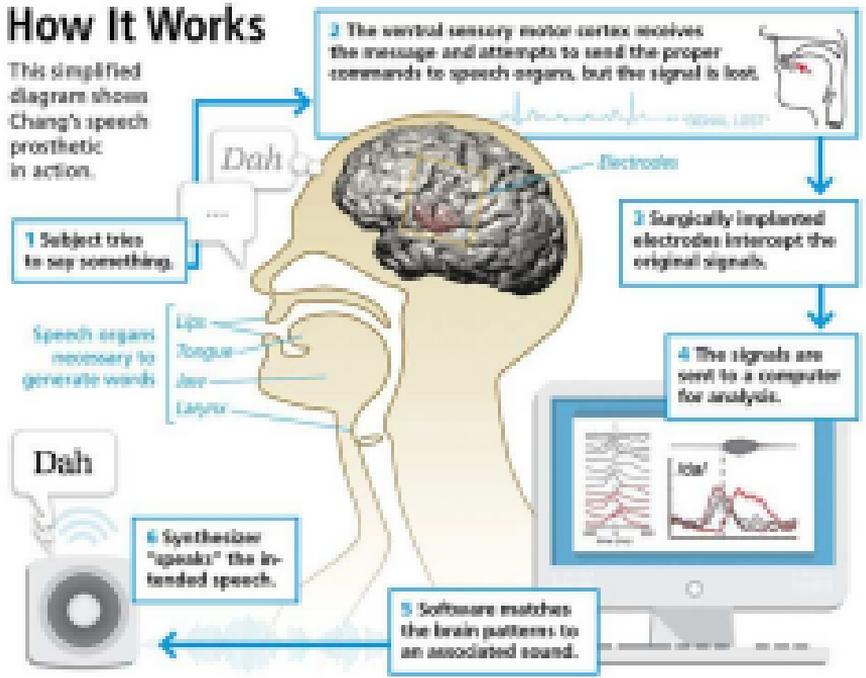




# Sentiment, Storytelling & Plato's Cave

## How It Works

This simplified diagram shows Chang's speech prosthetic in action.



<http://discovermagazine.com/2014/april/9-whats-on-your-mind>

“her brain will learn how to interpret  
the new optical signals it's receiving”



## Sentiment, Storytelling & Plato's Cave

<http://www.koaa.com/story/30720890/your-healthy-family-colorado-woman-undergoes-bionic-eye-surgery>

“That's the Holy Grail — the ability of sensors to continuously track you so *if it looks like there's been a change* in your health, you're notified before the event.”



## Sentiment, Storytelling & Plato's Cave

<http://www.cnbc.com/2015/12/12/price-of-wearable-craze-your-health-data-hacked.html>

# What Do You See?

2011-10-25 21:55:47

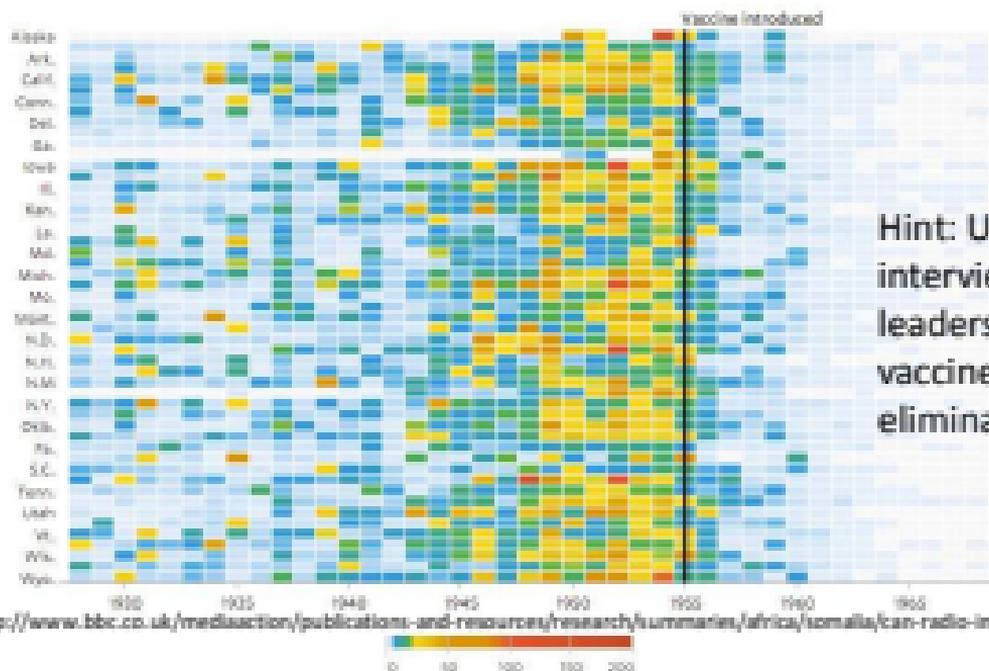
№0435041 E50.430975

215K m/H

Lepse Avenue, Kiev, Ukraine: <https://www.jwt.com/en/ukraine/work/pedestrianghost/>

# What Do You See?

Polio

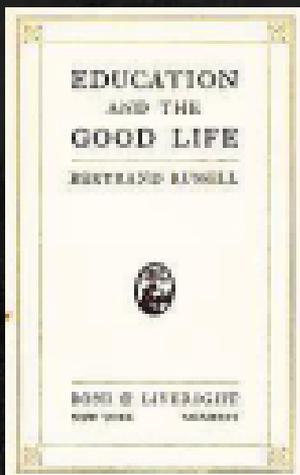
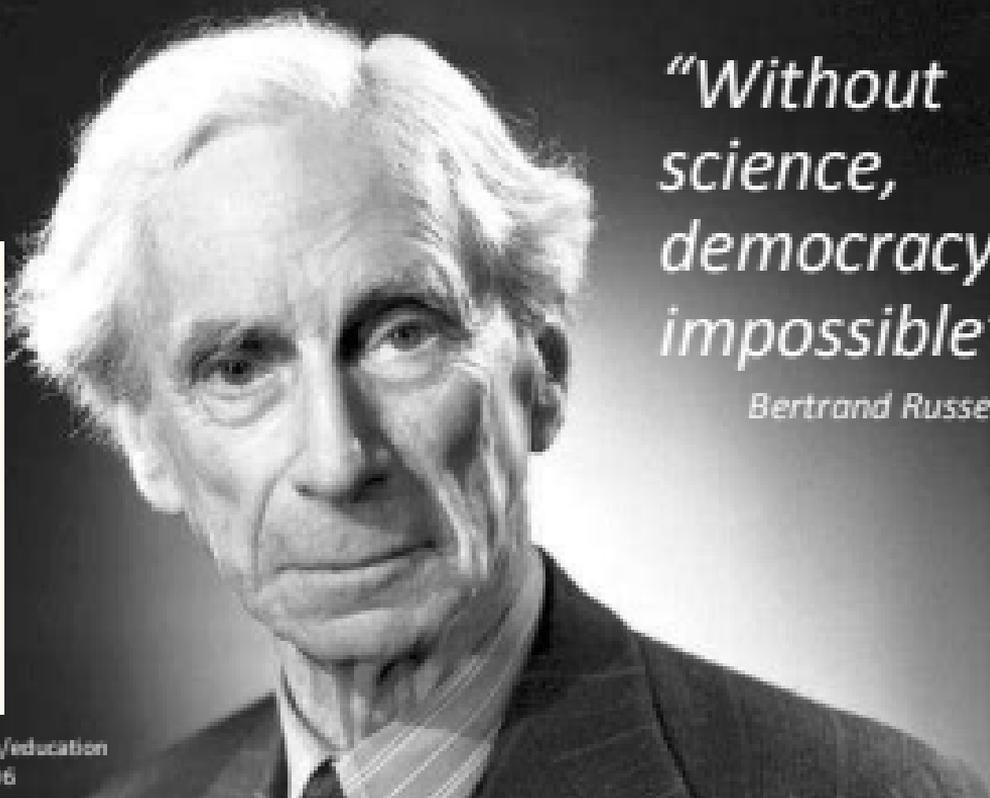


Hint: UNICEF radio interviews with Islamic leaders helped end vaccine resistance, eliminate Somalia's Polio

[http://www.bbc.co.uk/1/health/2015/05/150520\\_somalia\\_polio\\_vaccine\\_campaign.shtml](http://www.bbc.co.uk/1/health/2015/05/150520_somalia_polio_vaccine_campaign.shtml) <http://dovfriedman.com/>

*“Without  
science,  
democracy is  
impossible”*

*Bertrand Russell 1926*

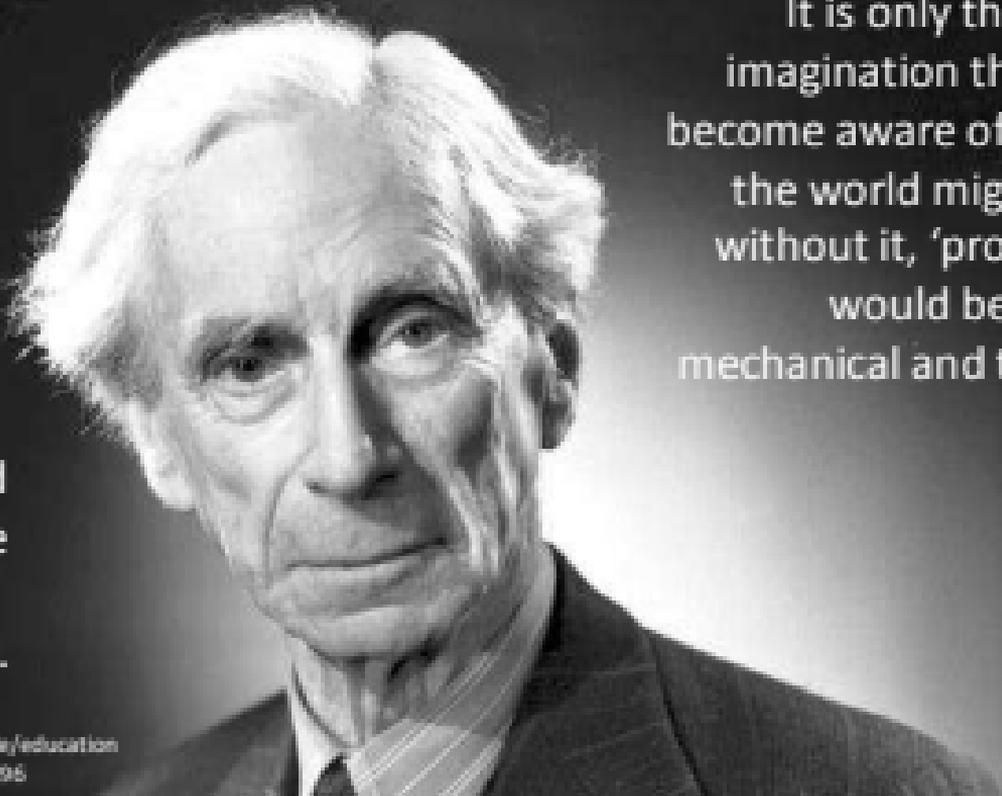


<http://www.worldcat.org/title/education-and-the-good-life/oclc/735296>

# 1

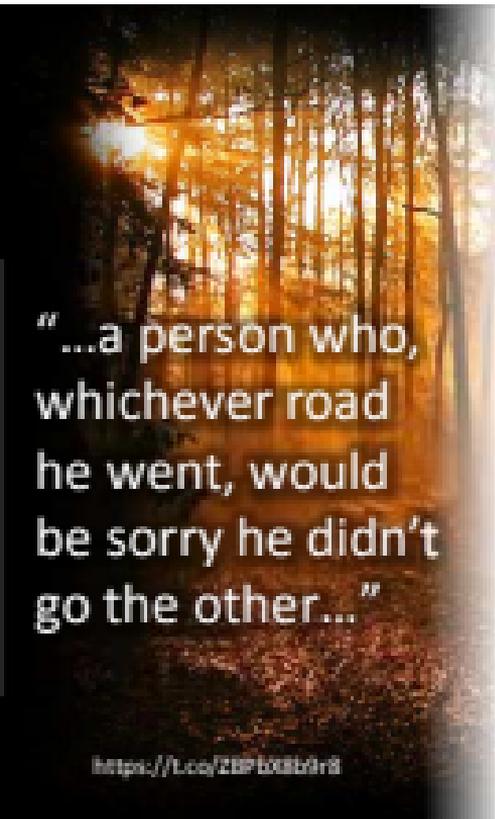
Without physics and physiology and psychology, we cannot build the new world.

<http://www.worldcat.org/title/education-and-the-good-life/oclc/735296>



It is only through imagination that we become aware of what the world might be; without it, 'progress' would become mechanical and trivial.

# 2



“...a person who,  
whichever road  
he went, would  
be sorry he didn't  
go the other...”

<https://t.co/ZDP603b9r8>

Robert Frost. Mountain Interval. 1920.

## 1. The Road Not Taken

TWO roads diverged in a yellow wood,  
And sorry I could not travel both  
And be one traveler, long I stood  
And looked down one as far as I could  
To where it bent in the undergrowth;

1

Then took the other, as just as fair,  
And having perhaps the better claim,  
Because it was grassy and wanted wear;  
Though as for that the passing there  
Had worn them really about the same,

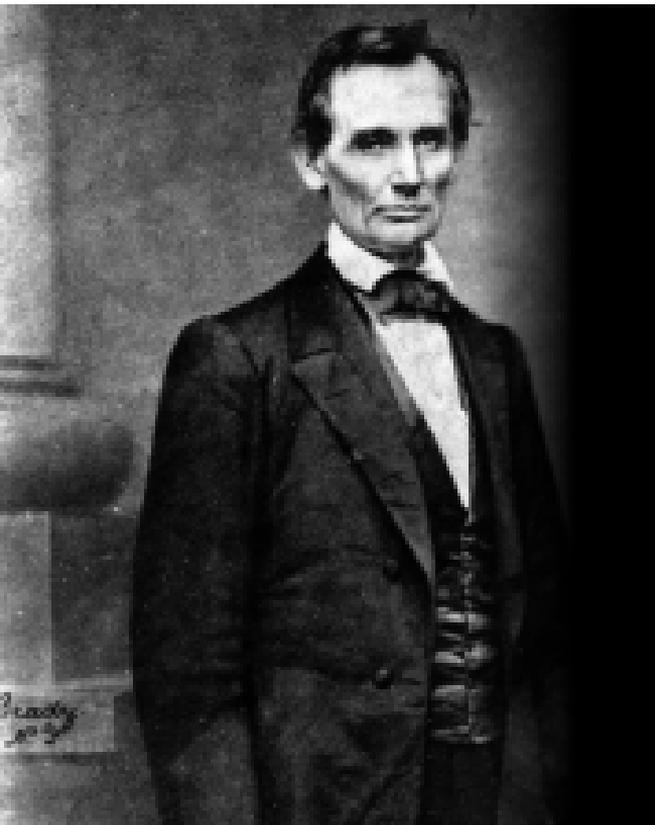
10

And both that morning equally lay  
In leaves no step had trodden black.  
Oh, I kept the first for another day!  
Yet knowing how easy both on me  
I doubted if I should ever come back.

15

I shall be telling this with a sigh  
Somewhere ages and ages hence:  
Two roads diverged in a wood, and I—  
I took the one less traveled by,  
And that has made all the difference.

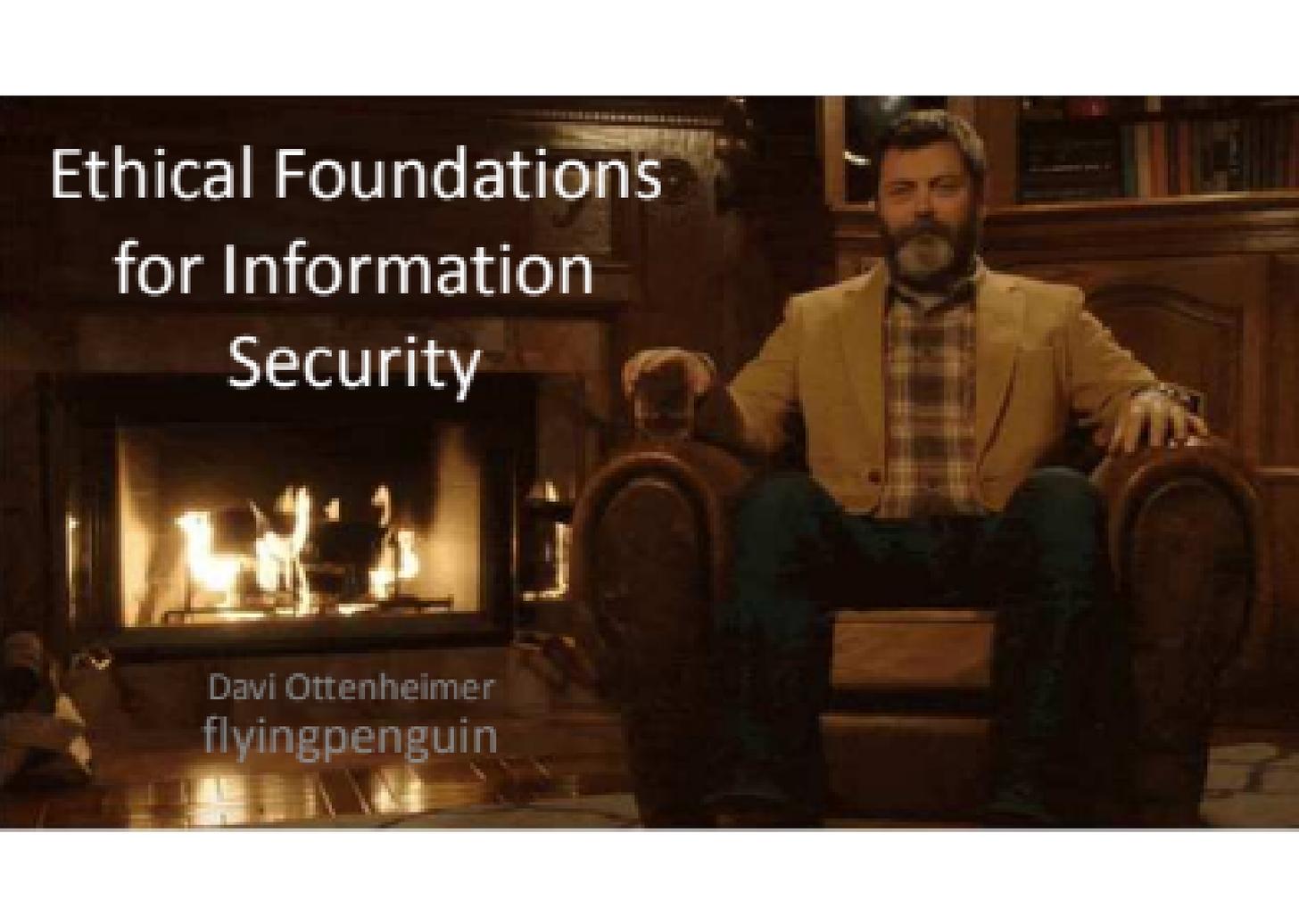
20



With public sentiment, nothing can fail; without it nothing can succeed. Consequently, he who moulds public sentiment goes deeper than he who enacts statutes or pronounces decisions. He makes statutes and decisions possible or impossible to be executed.

Abraham Lincoln 1858

<http://www.bardeby.com/251/pages/page152.html>

A man with a beard, wearing a tan jacket and a plaid shirt, is sitting in a large, dark wooden armchair. He is in a room with a fireplace to his left, which has a fire burning. The room has wood-paneled walls and a bookshelf in the background. The lighting is warm and dim.

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