

Bio

Instructor at City College San Francisco
Founder: infosec Decoded, Inc.

Slides at samsclass.info



A screenshot of a Twitter profile card for Sam Bowne. The card features a circular profile picture of a man with glasses and a purple t-shirt. To the right of the picture, the name "Sam Bowne" is displayed in bold black text, with the handle "@sambowne" below it. At the bottom of the card, three statistics are listed: "Tweets" with a value of "75.1K", "Following" with a value of "1,733", and "Followers" with a value of "15.7K". The background of the card is a solid blue color.

Tweets	Following	Followers
75.1K	1,733	15.7K

Cyberwar



Official Blog

Insights from Googlers into our products, technology, and the Google culture

A new approach to China

January 12, 2010

Like many other well-known organizations, we face cyber attacks of varying degrees on a regular basis. In mid-December, we detected a highly sophisticated and targeted attack on our corporate infrastructure originating from China that resulted in the theft of intellectual property from Google. However, it soon became clear that what at first appeared to be solely a security incident—albeit a significant one—was something quite different.

First, this attack was not just on Google. As part of our investigation we have discovered that at least twenty other large companies from a wide range of businesses—including the Internet, finance, technology, media and chemical sectors—have been similarly targeted. We are currently in the process of notifying those companies, and we are also working with the relevant U.S. authorities.

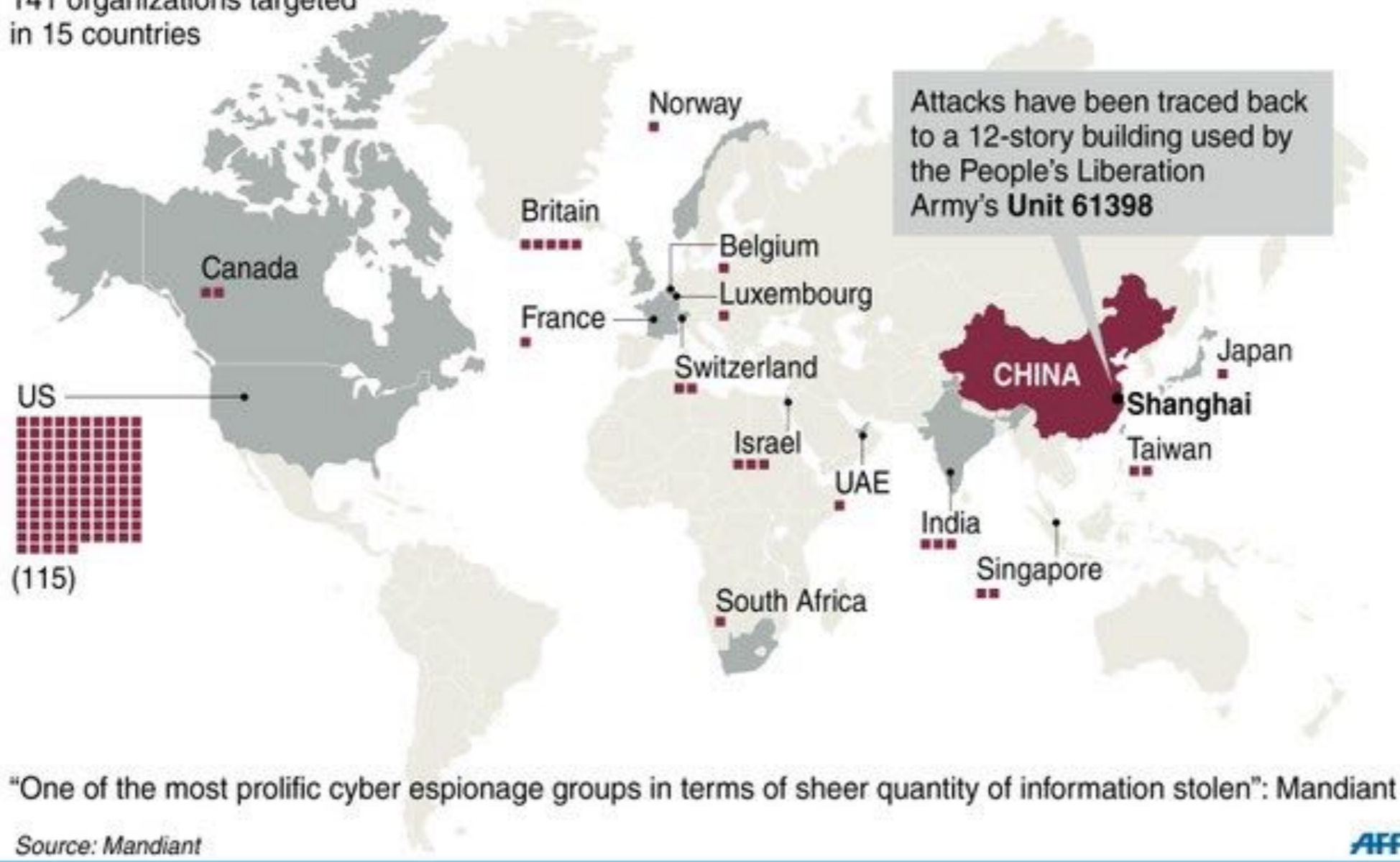
Second, we have evidence to suggest that a primary goal of the attackers was accessing the Gmail accounts of Chinese human rights activists. Based on our investigation to date we believe their attack did not achieve that objective. Only two

China cyberattack

US firm Mandiant has issued a 74-page report on a global cyber espionage campaign by what it says is a Chinese government-backed organization dubbed APT1 (Advanced Persistent Threat 1)

APT1 global attacks since 2006

141 organizations targeted
in 15 countries



- <https://www.rfa.org/english/news/china/hacking-02222013121848.html>

Kill Chain



APT groups [edit]

American advanced persistent threat groups [edit]

- [Equation Group](#)^[28]

Chinese advanced persistent threat groups [edit]

- [PLA Unit 61398](#) (also known as APT1)
- [PLA Unit 61486](#) (also known as APT2)
- [Buckeye](#) (also known as APT3)^[29]
- [Red Apollo](#) (also known as APT10)
- [PLA Unit 78020](#) (also known as APT 30)
- [Periscope Group](#) (also known as APT40)

Iranian advanced persistent threat groups [edit]

- [Elfin Team](#) (also known as APT33)
- [Helix Kitten](#) (also known as APT34)

North Korean advanced persistent threat groups [edit]

- [Reaper Group](#) (also known as APT37)
- [Lazarus Group](#) (also known as APT38)

Russian advanced persistent threat groups [edit]

- [Fancy Bear](#) (also known as APT28)
- [Cozy Bear](#) (also known as APT29)

The biggest cybersecurity threats to the US



CHINA

Once launched noisy attacks, but is now more subtle.

Notable attack:

Chinese military officers stole secrets on fighter jets, including the F-35, from Lockheed Martin.



RUSSIA

America's most sophisticated cyber adversary.

Notable attack:

The plot to interfere in the 2016 US presidential election by the Internet Research Agency.



IRAN

There has been significant uptick in cyber attacks in recent years.

Notable attack:

Iranian Behzad Mesri charged with hacking into HBO, leaking "Game of Thrones" scripts and demanding \$6 million in ransom.



NORTH KOREA

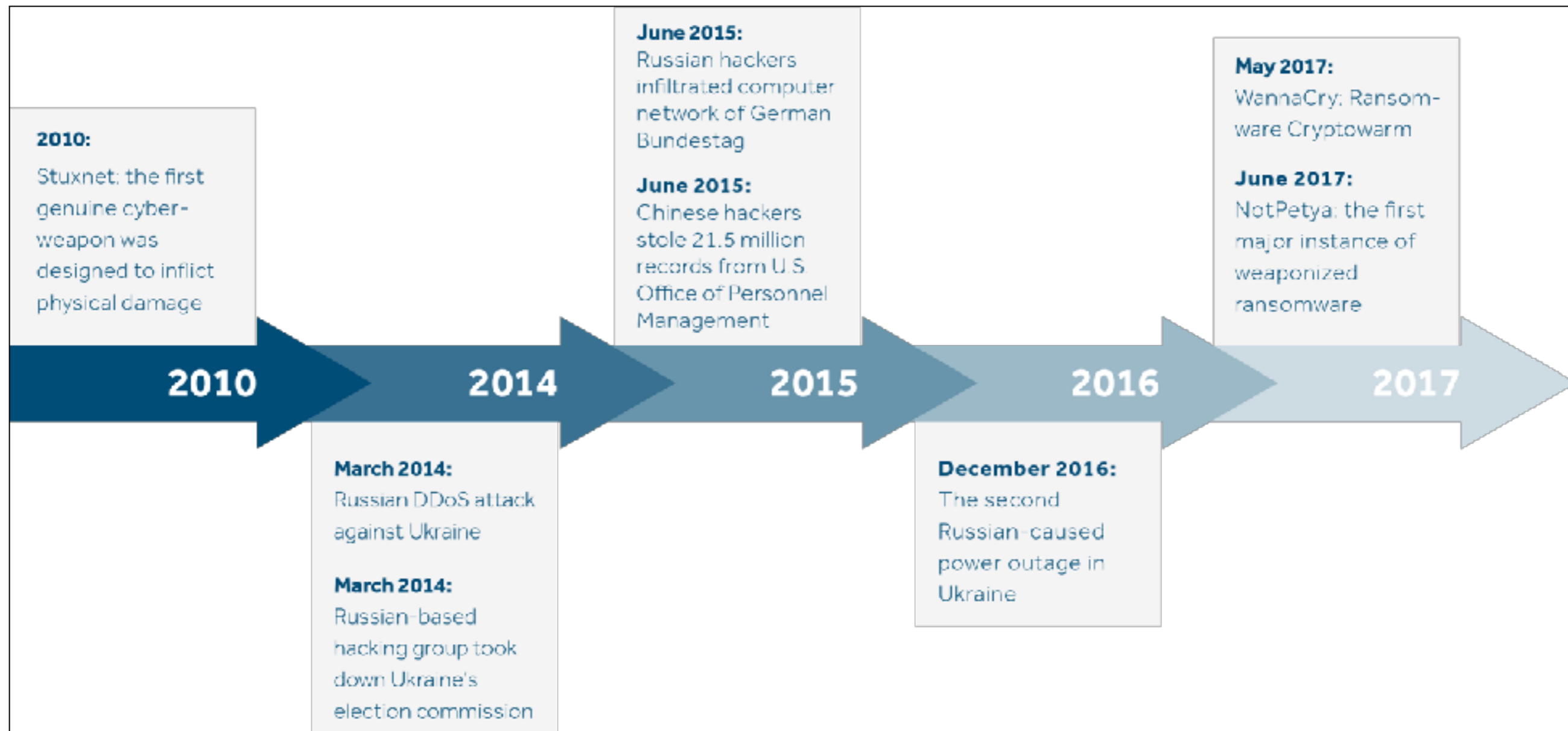
High on US watchlist despite better diplomatic relations.

Notable attack:

The US blamed North Korea for the WannaCry attack in 2017.

Insider Inc.

A Brief History of Cyberwarfare



- <https://graquantum.com/a-brief-history-of-cyberwarfare/>

Scorecard



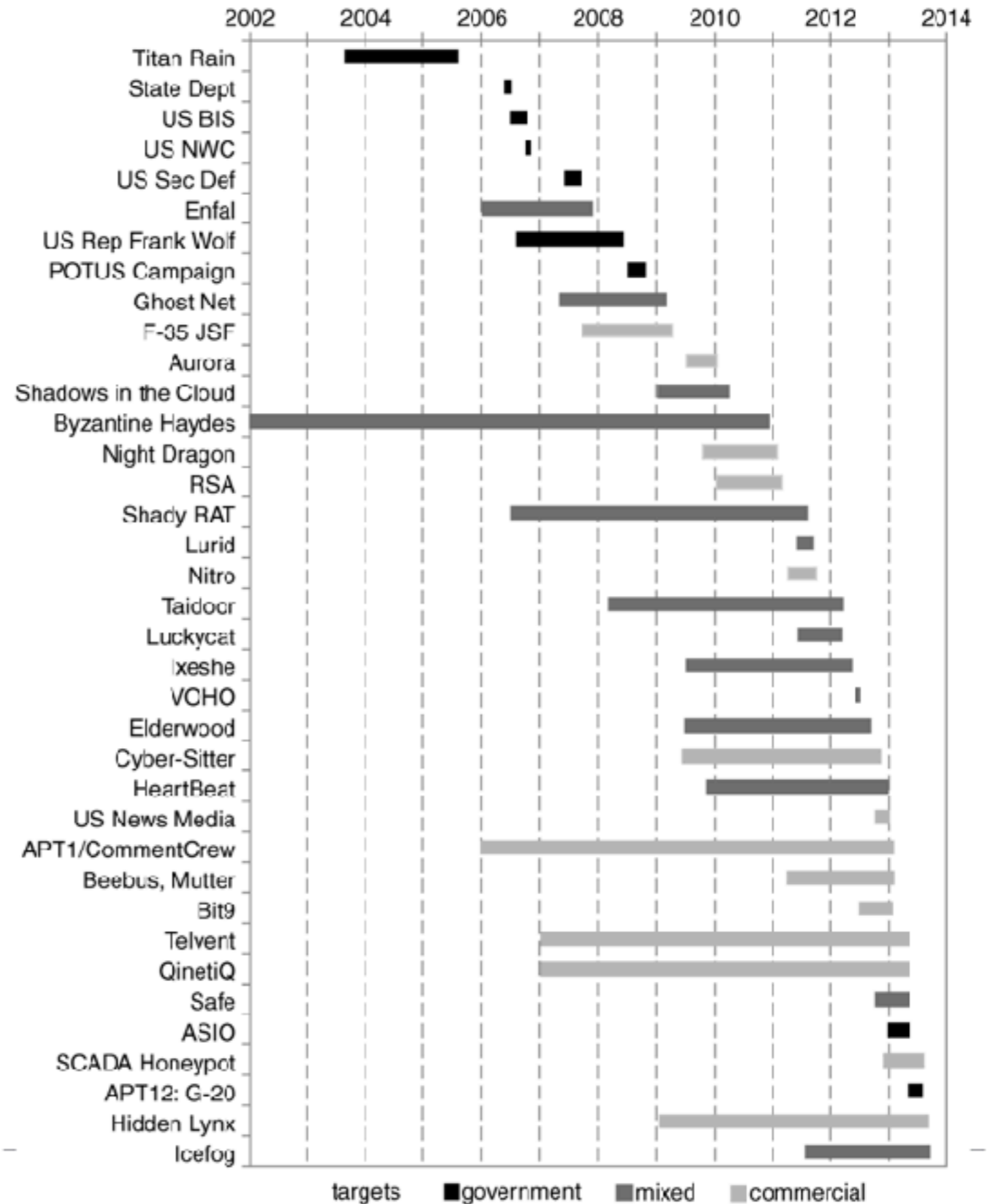
- <https://warontherocks.com/2017/07/cyber-attacks-whos-keeping-score/>

Russian Physical Cyberattacks

- In **April 2015**, an attack destroyed media broadcast equipment belonging to **France's** TV5Monde.
 - While the motive remains obscure, it may have simply been a test of capability.
- In **December 2015**, an attack against several regional electricity distribution firms knocked out power to at least 225,000 customers in **Ukraine**.
- In **December 2016**, an attack against a Ukrainian transmission firm took out power to a section of **Kiev**.
 - This appeared to be part of a larger campaign that also disrupted financial transactions and rail shipments.

Chinese Attacks

Figure 2. Public Reporting on Chinese Intrusions, Ordered by Reporting Date and Displaying Estimated Duration



THE CHINA RULES

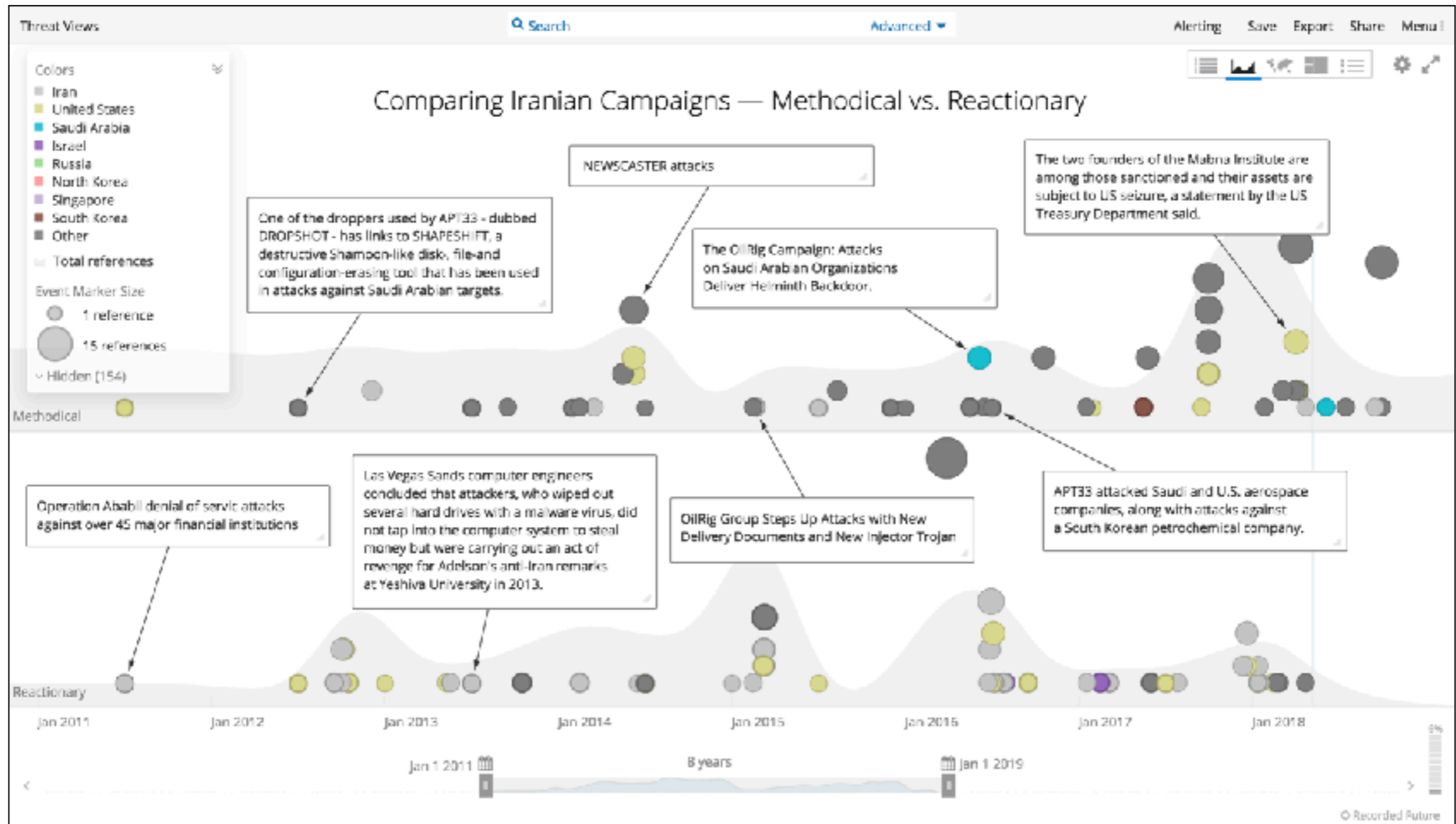
I mean, there are two kinds of big companies in the United States. There are those who've been hacked by the Chinese and those who don't know they've been hacked by the Chinese.

—James Comey, then FBI director, October 5, 2014

Russian Cyberattacks



Iranian Attacks



<https://www.recordedfuture.com>



<https://www.nytimes.com/2018/03/15/technology/saudi-arabia-hacks-cyberattacks.html>

TECHNOLOGY

The New York Times

***A Cyberattack in Saudi
Arabia Had a Deadly Goal.
Experts Fear Another Try.***



Hack of Saudi Petrochemical Plant Was Coordinated From Russian Institute



The cyberattack on a Saudi petrochemical plant was the first known attempt to manipulate an emergency-shutdown system, which is designed to avoid disaster and protect human lives. Christophe Viseux for The New York Times

International Cybersecurity Community



Summer 2018 Events

Fri, May 11 -
Sun, May 13, 2018

DEF CON China

Practical Malware Analysis

with Dylan Smith & Elizabeth Biddlecome

Sat. 14:00-18:00 room 8-9

Sun. 10:00-14:00 room 8-9



DEF CON China

Beijing, Fri, May 31 - Sun, June 2

Two workshops with Elizabeth Biddlecome:

Exploit Development for Beginners

Fri 10:30 - 14:30, room 3 &

Sun 10:30 - 14:30, room 1

Reverse Engineering Mobile Apps

Sat 14:30 - 18:30 Room 1

Purple Team 4: Threat Hunting with Splunk

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Cybersecurity training and services

Black Hat Trainings

Las Vegas, Sat, Aug 3 - Tue, Aug 6, 2019

Exploit Development for Beginners
with Elizabeth Biddlecome

Two sessions: one Aug-2-3, and one Aug 5-6

Daily schedule



Black Hat Asia

Tue, March 31 - Fri, April 3, 2020

Singapore

Approved Training:
Introduction to Exploit Development
with Elizabeth Biddlecome



7TH ANNUAL
CYBER SECURITY
SUMMIT 2019

Cyber Security Summit

Sept 23-25, 2019, Sri Lanka

Mon, Sept 23: Youth Summit on Cyber: My talk at 9 am

Obfuscation CTF

Vulnerable Android Apps

Reverse Engineering Mobile Apps from DEF CON China

Equity Pandit

Tue, Sept 24: Cyber Security Summit & Night hack (Cinnamon Grand)

Wed, Sept 25: Chief Guest at Diploma Graduation at 9.30am

Wed, Sept 25: CEO Forum (Cinnamon Grand) 6:30 pm

[Agenda \(pdf\)](#)

7th Annual
CYBER SECURITY
SUMMIT 2019

Organized By
CICRA **Daily FT**

7TH ANNUAL
CYBER SECURITY
SUMMIT 2019



THE SHADOW WAR

Inside Russia's and China's Secret
Operations to Defeat America

JIM SCIUTTO

CNN ANCHOR AND CHIEF NATIONAL SECURITY CORRESPONDENT

Russian Attacks



2006: Litvineko poisoned in London with Polonium-210

2007: Cyberattack on Estonia

2008: Invasion of Georgia

2016: Cyberattacks to influence US election

2018: Skripal poisoned with Novichok nerve agent in Salisbury, England



Hillary Clinton and Sergei Lavrov with the "reset" button Clinton presented to Lavrov in March, 2009

Dan Coats Lost His Job for Telling Trump the Truth

The president wants intelligence that will hurt his enemies, not challenge his opinions.

By FRED KAPLAN

JULY 29, 2019 • 1:47 PM



Opinions

Mitch McConnell is a Russian asset




Senate Majority Leader Mitch McConnell (R-Ky.) speaks to reporters on Capitol Hill in Washington on Tuesday. (Susan Walsh/AP)

US Attack Tools

STUXNET, THE WORLD'S FIRST DIGITAL WEAPON



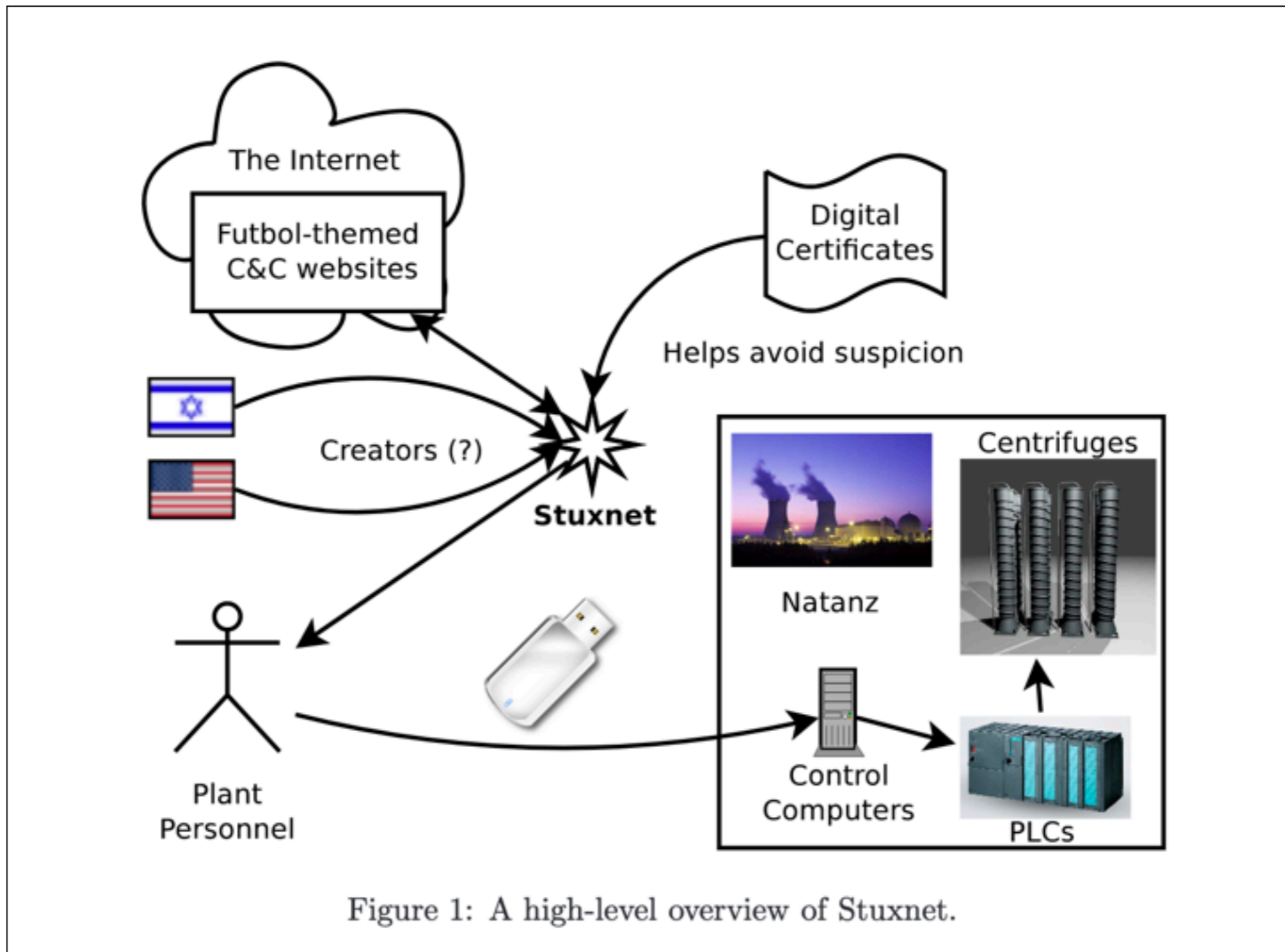
Iranian President Mahmoud Ahmadinejad during a tour of centrifuges at Natanz in 2008.  OFFICE OF THE PRESIDENCY OF THE ISLAMIC REPUBLIC OF IRAN



This recent undated satellite image provided by Space Imaging/Inta SpaceTurk shows the once-secret Natanz nuclear complex in Natanz, Iran, about 150 miles south of Tehran.

 AP PHOTO/SPACE IMAGING/INTA SPACETURK. HQ

<https://www.wired.com/2014/11/countdown-to-zero-day-stuxnet/>



<https://www2.cs.arizona.edu/~collberg/Teaching/466-566/2012/Resources/presentations/2012/topic9-final/report.pdf>

2.3 Command and Control servers

After Stuxnet establishes itself on a computer, it tries to contact one of two servers via HTTP:

- www.mypremierfutbol.com
- www.todaysfutbol.com

2.4.2 Kernel-Mode

Stuxnet installs two kernel-mode drivers. `Mrxcls.sys` is a driver signed by a Realtek certificate as shown in Figure 6. When Stuxnet wants to install it onto the system, it marks it as a boot startup so it starts in the early stages of Windows boot. This driver first reads a registry key which has been written in the installation step and contains the information for injecting Stuxnet images into certain processes.

The other driver, `Mrxnet.sys`, is actually the rootkit and is also digitally signed by a Realtek certificate. It creates a device object and attaches it to the system's device objects so that it can monitor all requests sent to these objects. The purpose of this job is to hide files which meet certain criteria from users.

boingboing / JOSEPH MENN / 12:52 PM TUE OCT 26, 2010

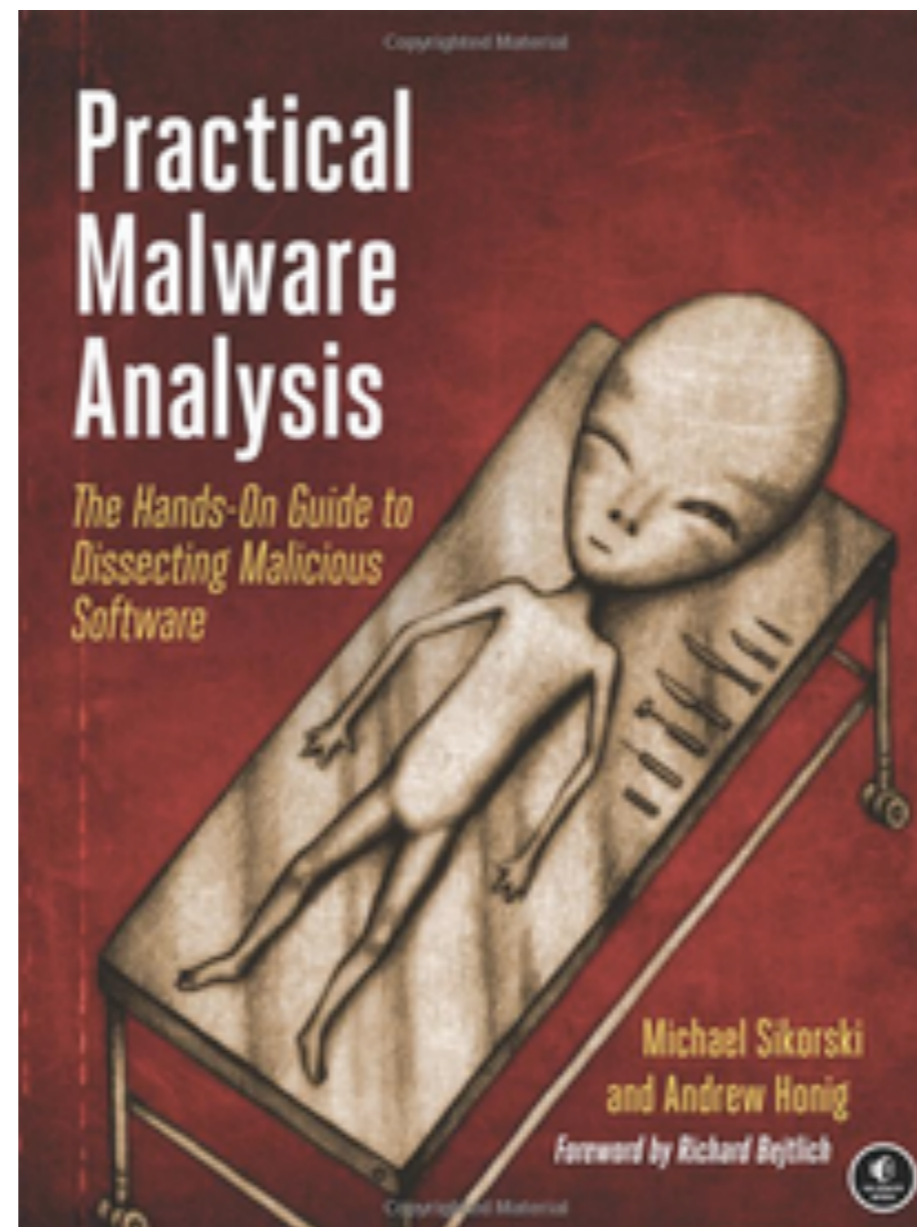
Good news, of a kind, from a dark world



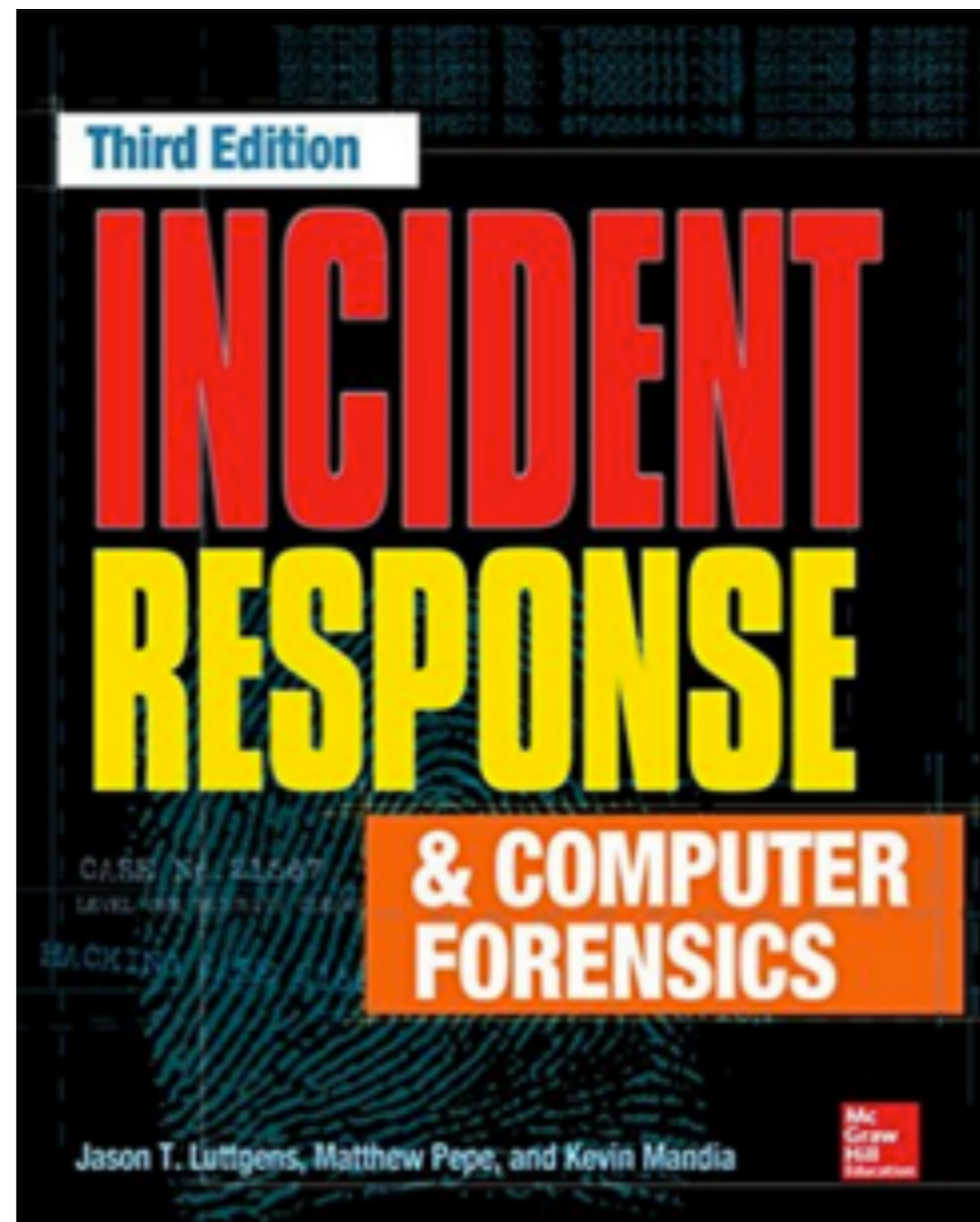
To explain that in the book, I briefly told the story of a colleague of Jart's who was investigating mob activity in St. Petersburg, Russia. The colleague made the mistake of working with the local police. Before he finished his assignment, the man's teenage daughter was kidnapped from her Western country, and the investigator got a message that if he dropped the case, the rest of his children might be okay.

That was five years ago. I had to leave the story hanging in the book because there had been no closure. A couple of weeks ago, the man got a new message. His daughter was in Kazakhstan, and he could have her back as long as he agreed not to look into certain of the gang's activities. One factor in the

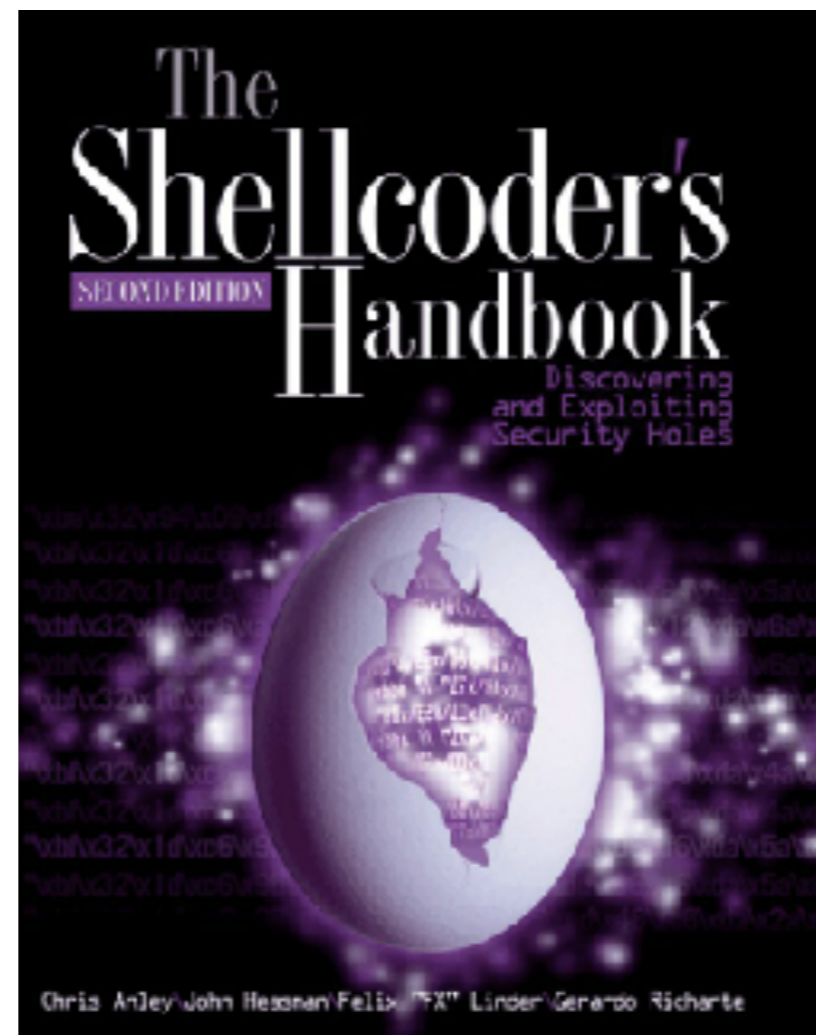
CNIT 126: Practical Malware Analysis



CNIT 152: Incident Response



CNIT 127: Exploit Development



US v. China

for CNIT 160

Sam Bowne

8-26-19

Source



FOR THE MOTION



Michael Pillsbury – Senior Fellow & Director for Chinese Strategy, Hudson Institute

Michael Pillsbury is a distinguished defense policy adviser, former high-ranking government official, and author of... [read bio](#)



Kori Schake – Deputy Director-General, International Institute for Strategic Studies

Kori Schake is the deputy director-general of the International Institute for Strategic Studies and was previously a... [read bio](#)

AGAINST THE MOTION



Graham Allison – Douglas Dillon Professor of Government, Harvard Kennedy School

Graham Allison is the Douglas Dillon professor of government at Harvard Kennedy School, where he has taught for five... [read bio](#)



Jake Sullivan – Former National Security Adviser to Vice President Joe Biden

Jake Sullivan is a Montgomery fellow at Dartmouth College, Martin R. Flug visiting lecturer at Yale Law School, and... [read bio](#)

Pro

- The prospect of China becoming an open and liberal state is now seemingly a fantasy, and recent U.S. policies are finally responding to the threat China poses to the West.
- The U.S. is getting tough on China's rampant intellectual-property theft and unfair trade practices through tariffs. And it's working: China's economic growth is at its lowest in decades.
- China is developing advanced cyber weapons capable of cutting off U.S. access to strategic waters in the region. The U.S. must respond with strength to maintain its global power.

Con

- The United States and China are great competitors – not enemies. It is a mistake to label China as such, particularly when the two countries have economies that are inextricably linked.
- Current tariffs and trade policies are not productive: They are hurting American workers, slowing the global economy, and, some argue, benefiting China more than the United States.
- In getting tough on China, the U.S. is dangerously increasing the risk of escalating tensions. And a miscalculation could lead to unwanted conflict.

China's Importance

- ...all sides agree that **China is the issue of our time**
- ...what we're seeing in the world is a contest of models
- China and the U.S. are in a competition for the most attractive, best, productive model

Taiwan

- ...most important: what the Chinese call **the foundation of U.S./China relations** and there is an incident during the Trump transition that I'll tell you about that tested this foundation.
- It's usually known as our **one China principle** or our one China policy. It was worked out in great secrecy through a series of meetings with Henry Kissinger... And the idea generally speaking was to recognize Beijing as the only China and to turn Taiwan into a non-country.

Trump's Acknowledgement of Taiwan

- Part of the deal is we would not transfer Taiwan to China. They're a non-country, but China cannot have them. They cannot claim sovereignty over them. And the Chinese vociferously said we could never agree to that. So, the compromise was both sides would never mention it again.
- And that's held since 1972 until the president of Taiwan quote unquote, remember it's a non-country, so she's a non-president. She called up to congratulate Donald Trump. He took the call. ... They put out a press release in Trump Tower. **"I just spoke for eight minutes with the president of Taiwan."** You never can imagine the Chinese reaction.

Chinese Provocation

- what the United States is seeking to do is have China a prosperous, powerful China
- ...that's not what China wants.
- Xi Jinping stood in the Rose Garden and publicly promised President Obama that they would not militarize the islands they were building in the South China Sea. They have militarized the islands they've built in the South China Sea.
- They are **not honoring their promises not to hack American businesses**. They are forcing Communist Party commissars onto the boards of American businesses that operate in China, thieving intellectual property from American businesses, threatening American allies.

Allies

- President **Trump is right** to take a different and sharper-edged approach.
- We need allies willing and capable to stand shoulder-to-shoulder with us. We have those kinds of relationships, but we have allies who over the last 30 years have allowed more and more of the responsibility for our common security to migrate to the United States.

Response from Allies

- ...while I would not advocate the **needless antagonism of America's allies** that President Trump has engaged in, the fact that allies are worried about whether the United States will honor our obligations to join in their defense has caused **a strong uptick in activity by those allies** in policy fronts, in defense spending fronts.
- I wish they weren't doing it because the United States was unreliable under President Trump, but in the long run we can fix the reliability problem with **a different president**.
- ...what the president is succeeding at is **driving up the cost to China** of not playing by the rules and resetting China's sense of how it needs to engage the international order and that's actually a productive American policy.

Infrastructure and Immigration

- The first of these is that the single most important thing the United States could do to have a productive approach towards China is **invest in ourselves**, in our sources of national strength. And here, the Trump administration's record is severely lacking. **No investment in infrastructure. Massive proposed cuts to our science and research budget** -- while the Chinese are racing ahead and have, in fact, surpassed us on research and development. We spend one dollar for every three the Chinese spend on clean energy.
- And when it comes to investing in perhaps the greatest source of American strength -- **immigration** -- the United States is putting out a not-welcome sign to the talent of the world, and thereby squandering, perhaps, our greatest advantage over China.

Alienating Allies

- ...what has the Trump administration done ... pulled out of **the Trans-Pacific Partnership**, which was our effort to right the rules of the road in the Asia Pacific.
- They **declared our own allies a national security threat** over steel -- Canada.
- And they've come to the point now, where, in Germany, **more Germans believe China is a trustworthy trading partner than the United States.**

America's Image

- China is presenting an alternative model to the world and if more countries followed them it would be adverse to American interests and values. So, I ask you in terms the American approach to China, **has the last 30 months made democracy as a model look better or worse?**
- Has America presented a more or less appealing face to the world? A recent poll showed two things.
- Number one, that **China's leadership is now more respected globally than America's** and number two, that for the first time in a long time **America is actually seen more unfavorably than favorably** across the Asia-Pacific.

Inconsistency

- ...the problem with our approach to China policy is that there are about six or seven different China policies in this administration.
- One day, **Huawei is a threat to national security**... The next day, it's a bargaining chip at the table
- One day, Mike Pompeo is saying, "**We stand in solidarity with the protesters in Hong Kong.**" The next day, Donald Trump is saying, "That's China issue, and we don't have anything to do it."
- One day, the president is questioning the one-China policy. The next day, they're pulling it back.
- ...the president's erratic behavior has caused the Chinese to wonder whether they are taking the right approach to the United States

Confusion in Beijing

- ...the **Chinese government finds Trump mystifying**, the way many Americans do.
- I've had conversations in Beijing with people who work directly for Xi Jinping, and they say, "**We have an extremely difficult time understanding who this person is**, and what he cares about. We have a conversation, and then there's a different conversation.
- We hear different noises from the administration, as we -- one day Pence gives a speech that declares Cold War 2.0. The next day there's a phone call that says, 'We didn't really mean that.'
- Then Pence sets up a speech that he's going to attack the Chinese for their activity in Hong Kong. All of a sudden, he's not giving that speech this week; maybe next week, maybe the week after."

Grindr

Jan 2019

The screenshot shows a web browser window with the address bar displaying "https://www.washingtonpost.com/news/josh-rogin/wp/2". The page title is "The Washington Post (WP C... (US)". The author is "Josh Rogin" and the category is "Opinion". The main headline reads: "Can the Chinese government now get access to your Grindr profile?"

Mar 2019

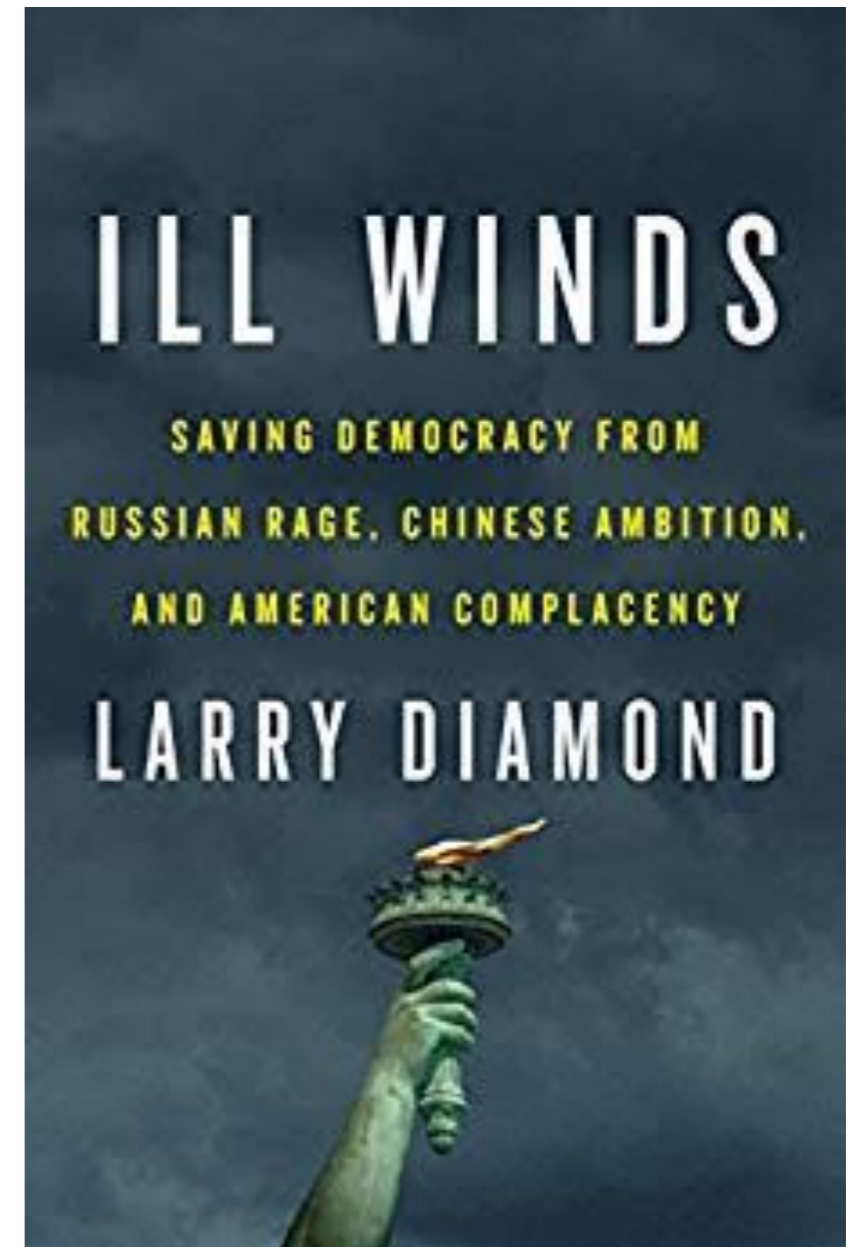
The screenshot shows a web browser window with the address bar displaying "https://www.nytimes.com/2019/03/28/us/politics/grindr-china-national-security.html". The page title is "POLITICS" and the newspaper name is "The New York Times". The main headline reads: "Grindr Is Owned by a Chinese Firm, and the U.S. Is Trying to Force It to Sell".

May 2019

The screenshot shows a web browser window with the address bar displaying "https://www.reuters.com/article/us-grindr-m-a-beijingkunlun/chinas-kunlun-tech-agrees-to-u-s-demand-to-sell-grindr-gay-dating-app". The page title is "TECHNOLOGY NEWS" and the date is "MAY 13, 2019 / 2:06 PM / 3 MONTHS AGO". The main headline reads: "China's Kunlun Tech agrees to U.S. demand to sell Grindr gay dating app".

ILL WINDS

for CNIT 160
Sam Bowne
9-9-19

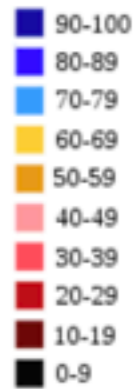


Democracies

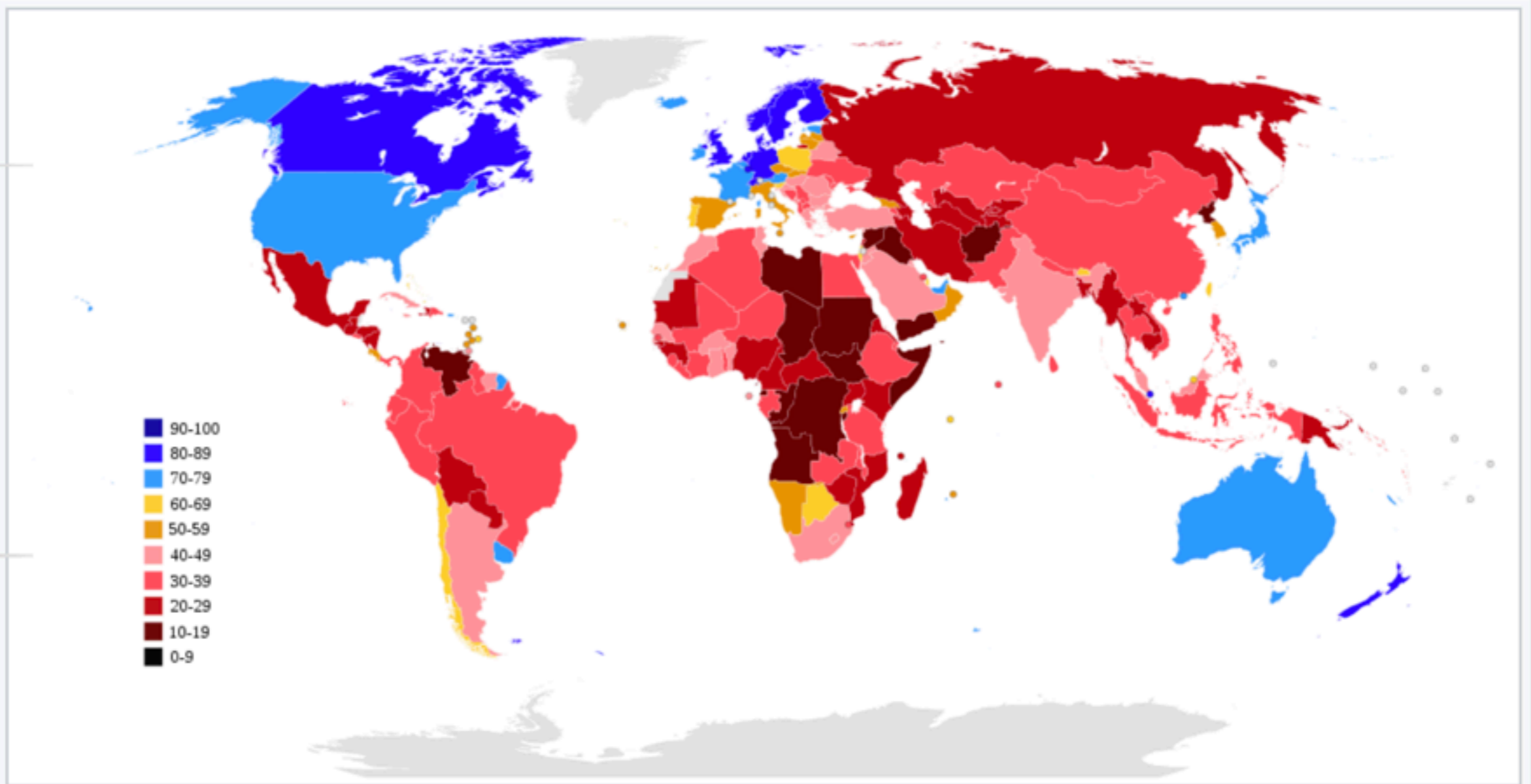
- Democracies fail if they lack **good governance**
 - Endemic **corruption**
 - Scandals over **graft**
 - **Power-abusing presidents**
 - Governments that fail to provide
 - Jobs, rising incomes
 - Lower crime rates
 - Electricity, water, roads, schools

Social Capital

- Successful democracies are a **civic community**
 - People **trust** one another
 - They argue with **mutual respect** and **tolerate differences**
 - Citizens **pay taxes, obey laws, and respect the political system**



Corruption Perceptions Index, 2018



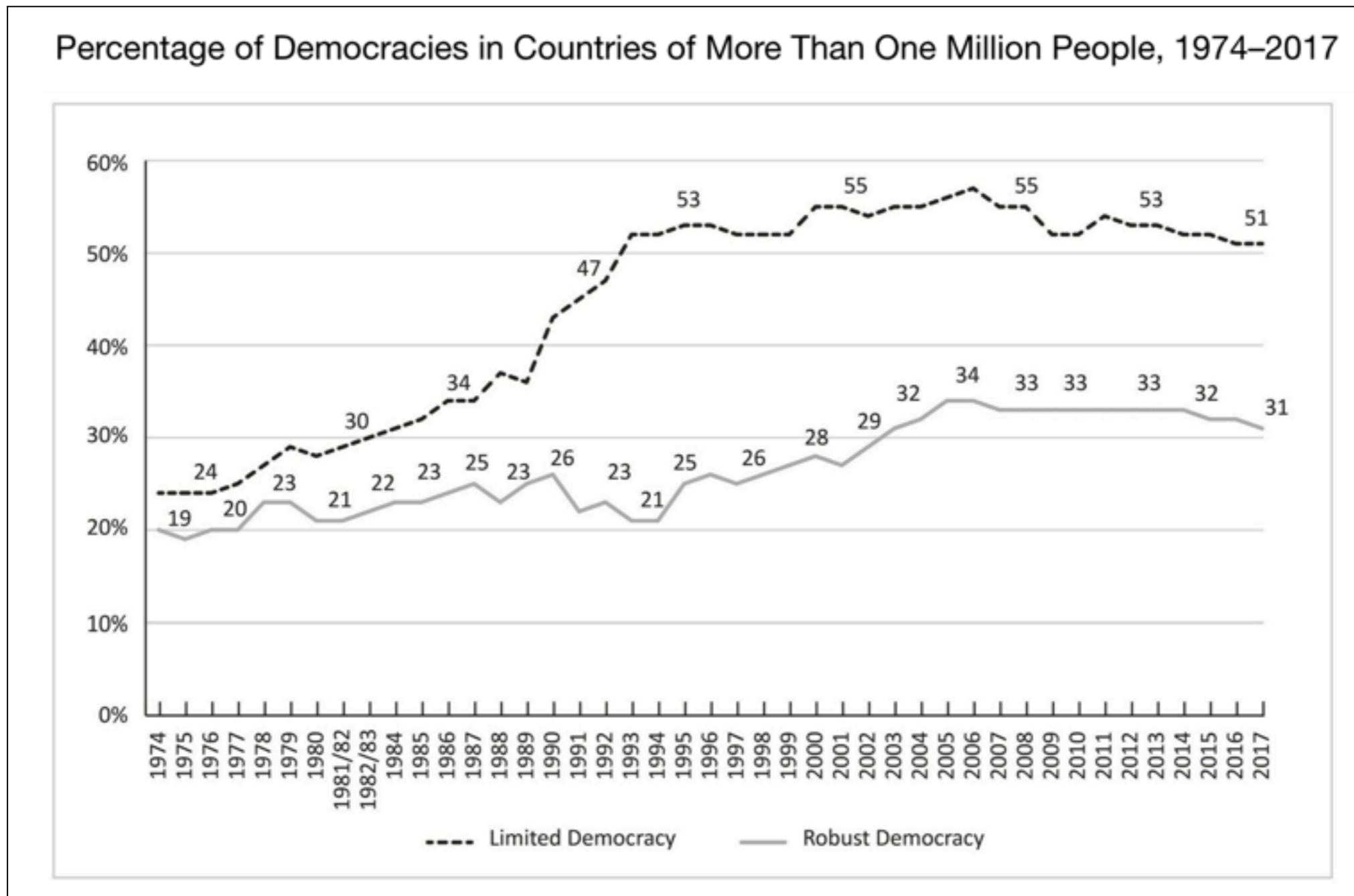
		2018 ^[15]	
Rank ↕	Country or Territory ↕		Score ↕
1	Denmark		88
2	New Zealand		87
3	Finland		85
3	Sweden		85
3	Switzerland		85
3	Singapore		85
7	Norway		84
8	Netherlands		82
9	Canada		81
9	Luxembourg		81
11	Germany		80
11	United Kingdom		80

18	Japan		73
18	Estonia		73
21	France		72
22	United States		71
23	Uruguay		70
23	United Arab Emirates		70

138	Mexico		28
138	Iran		28
138	Russia		28
138	Lebanon		28

168	Iraq		18
168	Venezuela		18
170	Burundi		17
170	Libya		17
172	Afghanistan		16
172	Sudan		16
176	Yemen		14
176	North Korea		14
178	Syria		13
178	South Sudan		13
180	Somalia		10

Growth of Democracy



How Democracies Fail

The Autocrats' 12-step Program

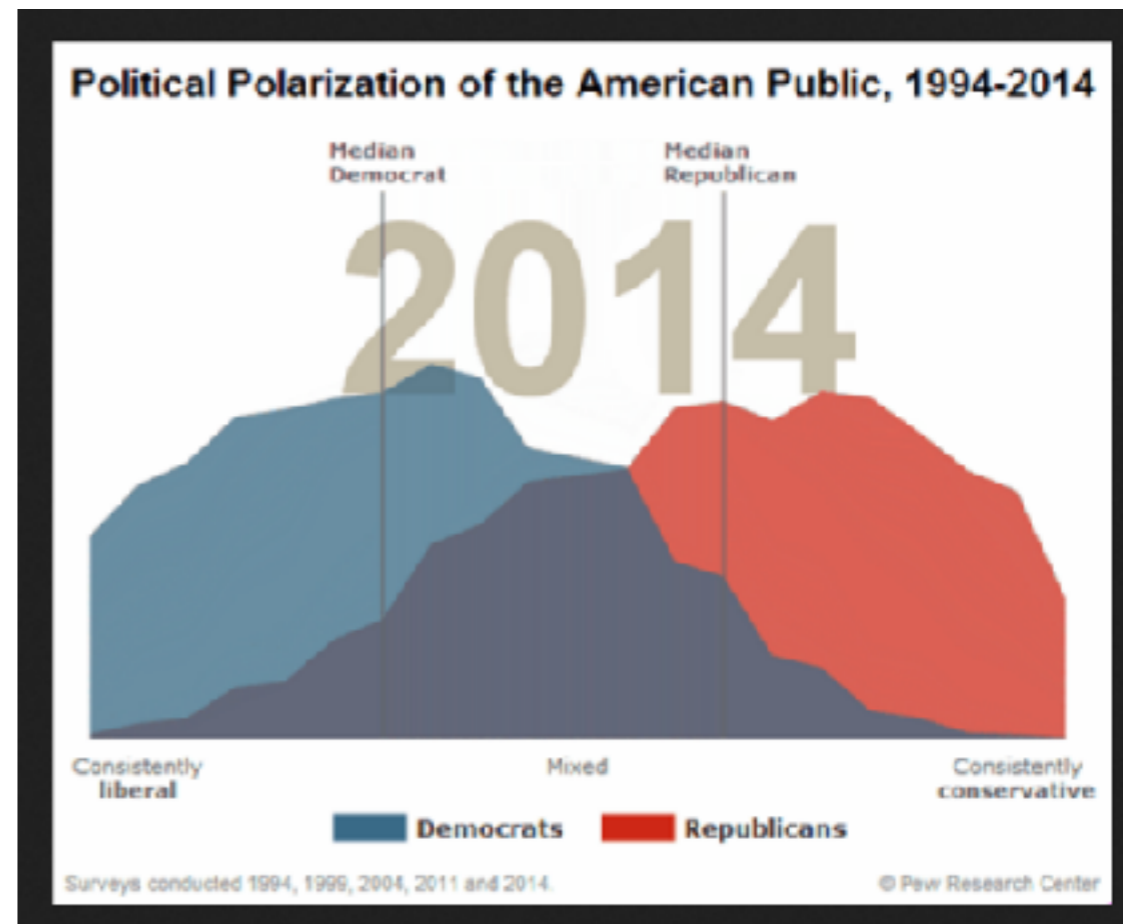
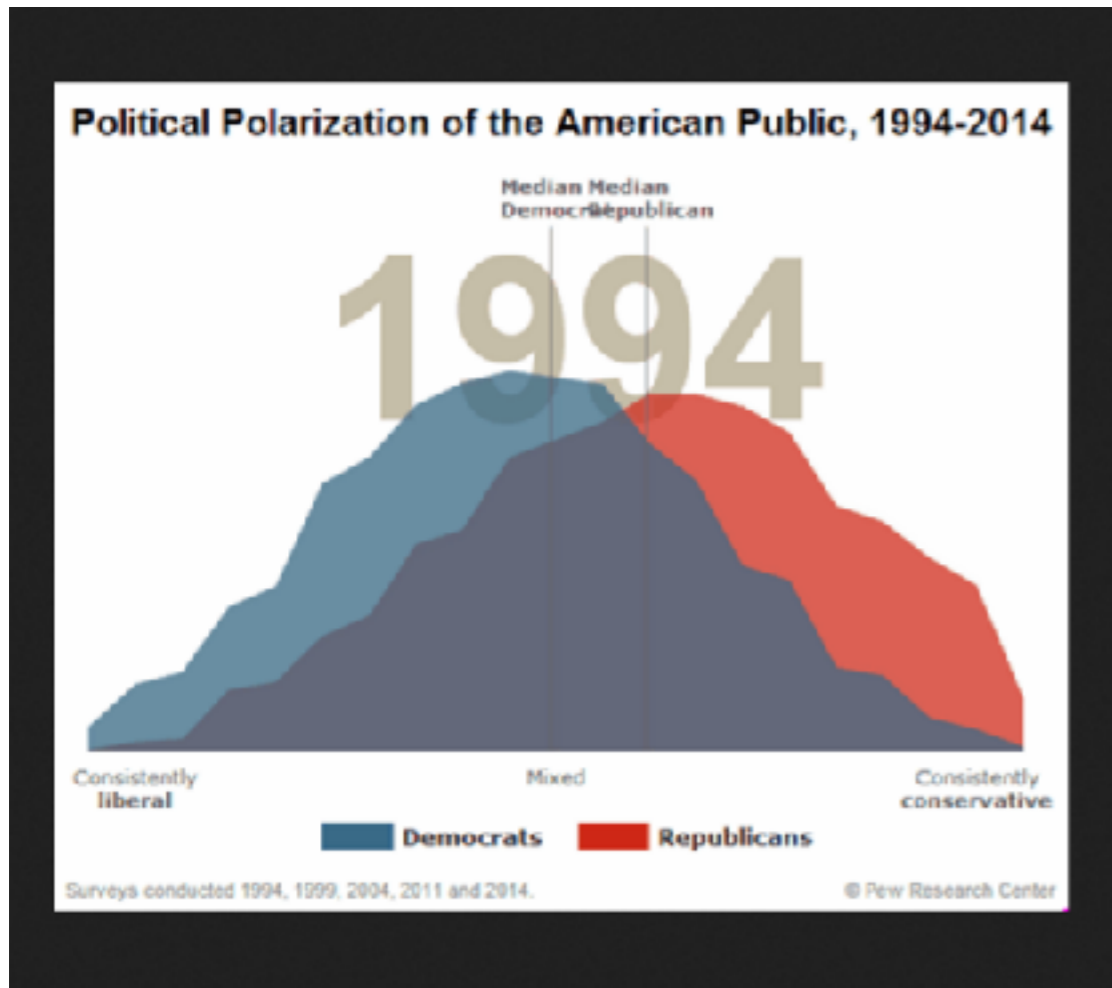
1. Demonize and delegitimize political opposition
2. Undermine the independence of the courts.
3. Undermine the independence of the media
4. Gain control of public broadcasting
5. Constrain Internet freedom
6. Subdue civil society: NGOs, universities, think tanks
7. Intimidate the business community into submission
8. Enrich a class of loyal crony capitalists
9. Extend political control over state bureaucracy & security
10. Rig electoral rules
11. Gain control over electoral administration
12. Repeat steps 1 to 11, ever more vigorously

Trump suggested that if his democratically nominated rival, Hillary Clinton, won, the only way to stop her from picking liberal, pro-gun-control judges would lie with “the Second Amendment people”—a clear reference to gun violence and assassination.

repeatedly branding his foes as traitors—from saying that *The New York Times* had “virtually” committed “treason” by running a critical essay in September 2018 by an anonymous senior administration aide to calling some congressional Democrats “un-American” and “treasonous” for not applauding a passage in his 2018 State of the Union address.

the threat that Trump poses to America’s democratic institutions and norms is unprecedented.

Polarization

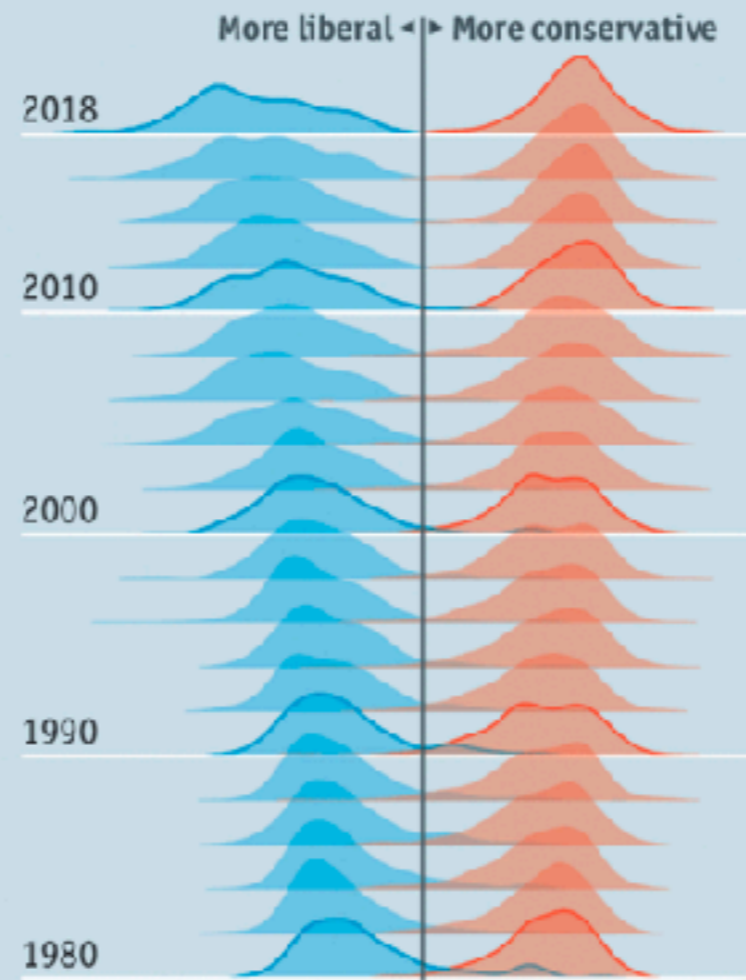


The first, from [The Economist \(Lean Left media bias\)](#), shows the [distribution of ideology of House candidates who won their primaries in 2018](#).

Swing left

United States, distribution of ideology of House candidates who won their primaries

Democrats Republicans



Sources: Professor Adam Bonica; *The Economist*

The Economist

Russia

Under Yeltsin, according to a 2018 U.S. Senate report, “hyperinflation, austerity, debt, and a disastrous privatization scheme combined to decrease GDP by over 40 percent between 1990 and 1998, a collapse that was twice as large and lasted three times longer than the Great Depression in the United States.”³ For most Russians, the demise of the USSR brought not modernization and integration into the West but poverty and national humiliation. And then there emerged a new leader, Vladimir Putin, who vowed, in essence, to make Russia great again.

Since 2000, Putin has made Russia an ever more repressive kleptocracy.

I have concluded that Hillary Clinton would almost certainly have won the Electoral College if there had been no Russian intervention.

China

Like Russia, China seeks to weaken the Western democracies' alliances, undermine the U.S.-led liberal order, and expand its own economic and geopolitical power.

The problem with Russia is managing the anger, insecurity, and resentments of a former superpower; the problem with China is managing the ambitions, swagger, and overreach of a new one.

Beijing's goal is nothing less than "Globalization 2.0," based on the "China model" of authoritarian, state-directed capitalism, which produces impressive growth rates while dispensing with tedious Western standards of accountability or moralistic Western lectures on freedom and rights.

The U.S.

President

Trump's decision to withdraw the United States from the TPP was the most grievous self-inflicted wound to America's global leadership since the creation of the liberal world order after World War II. Trump's pullout was a massive gift to authoritarian China and a body blow to democratic aspirations in southeast Asia. It was also a stunning symbol—and accelerator—of both China's rise and America's descent.

our 2017 survey also measured

people's feelings toward two authoritarian options: "a strong leader who does not have to bother with Congress and elections," and rule by the army. Nearly a quarter of Americans (24 percent) turned out to hanker for a strongman.

Moreover, support for military rule has steadily risen in the United States, from 8 percent in 1995 to some 18 percent in 2017.

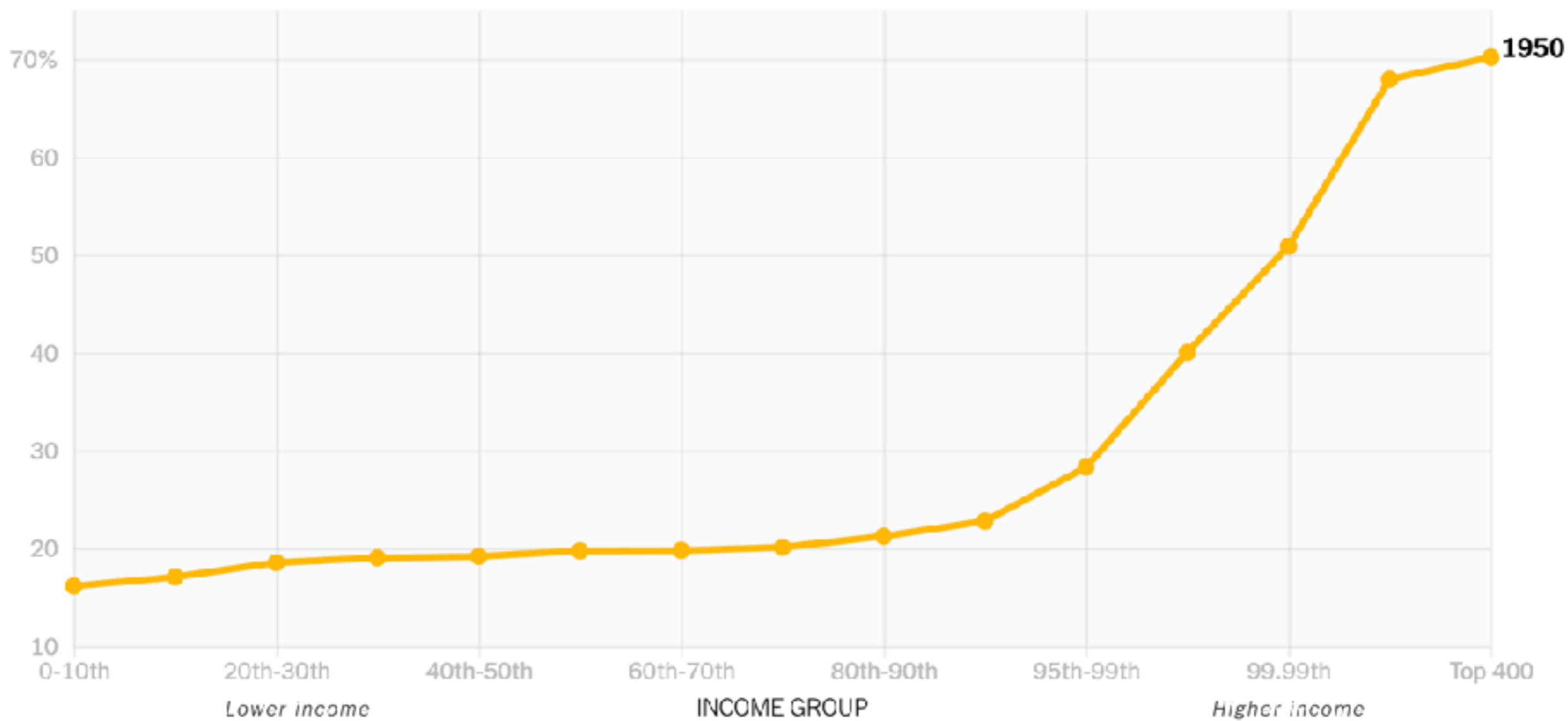
Kleptocracy

The online Cambridge Dictionary defines kleptocracy as “a society whose leaders make themselves rich and powerful by stealing from the rest of the people.”

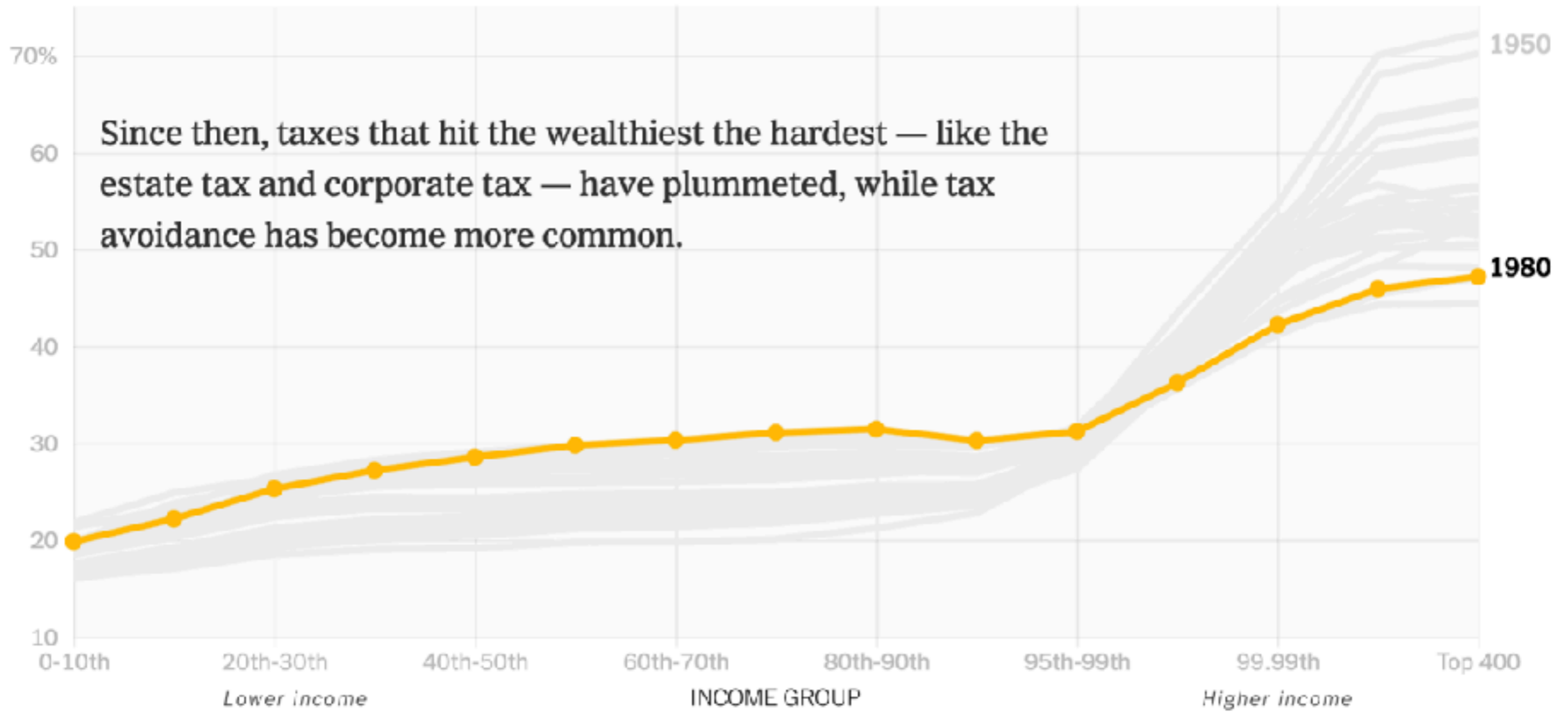
the lack of effective regulation has made the United States, not notorious financial safe havens like Switzerland and the Cayman Islands, “the leading incorporator of anonymous companies.”¹⁰ The U.S. Treasury Department estimates the annual flow of laundered money into the United States at \$300 billion—equal to 2 percent of the American economy.

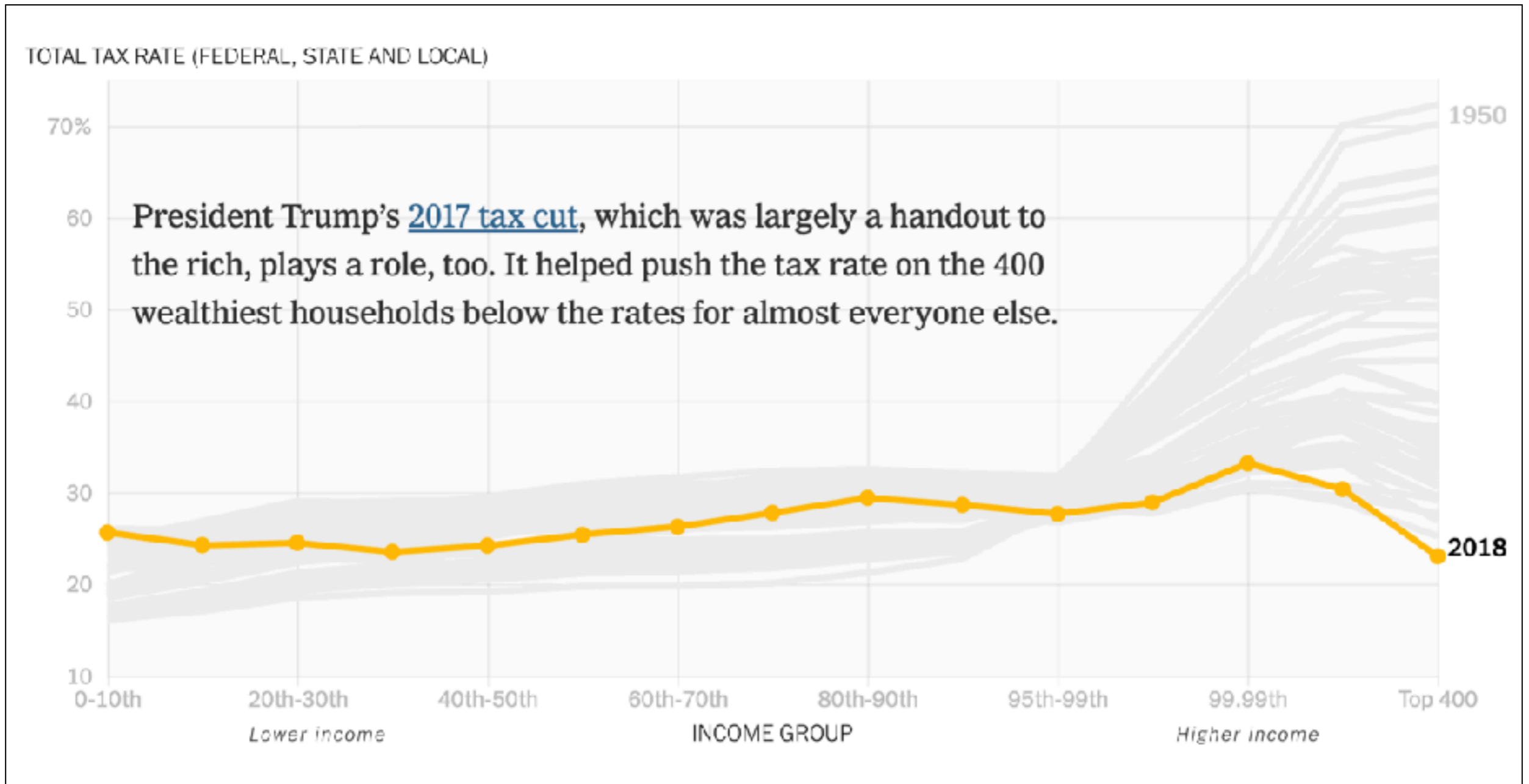
By one estimate, as much as 8 percent of total global wealth, 30 percent of African wealth, and 50 percent of Russian wealth is held in largely secret offshore accounts.

TOTAL TAX RATE (FEDERAL, STATE AND LOCAL)



TOTAL TAX RATE (FEDERAL, STATE AND LOCAL)

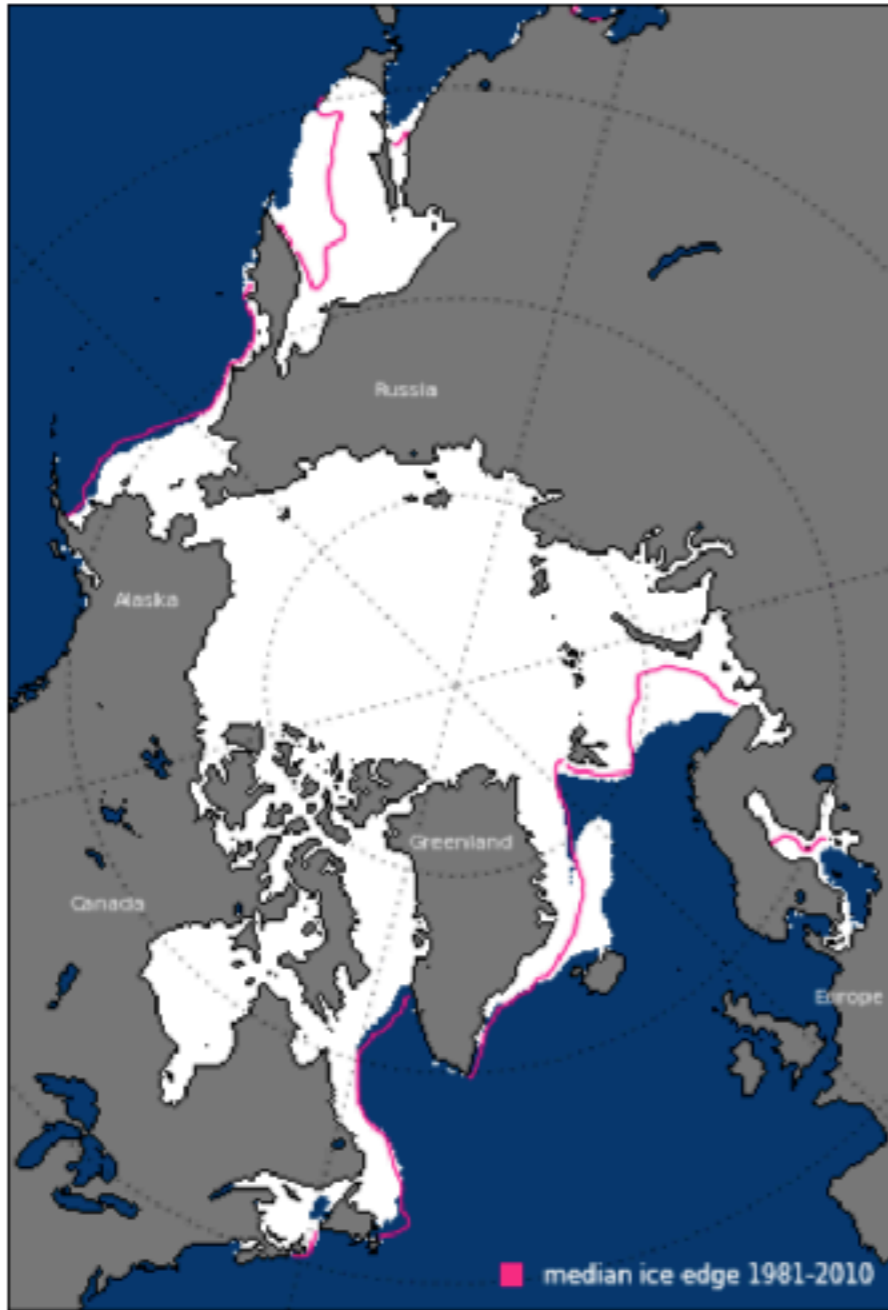




<https://www.nytimes.com/interactive/2019/10/06/opinion/income-tax-rate-wealthy.html>

Select a month: and a year:

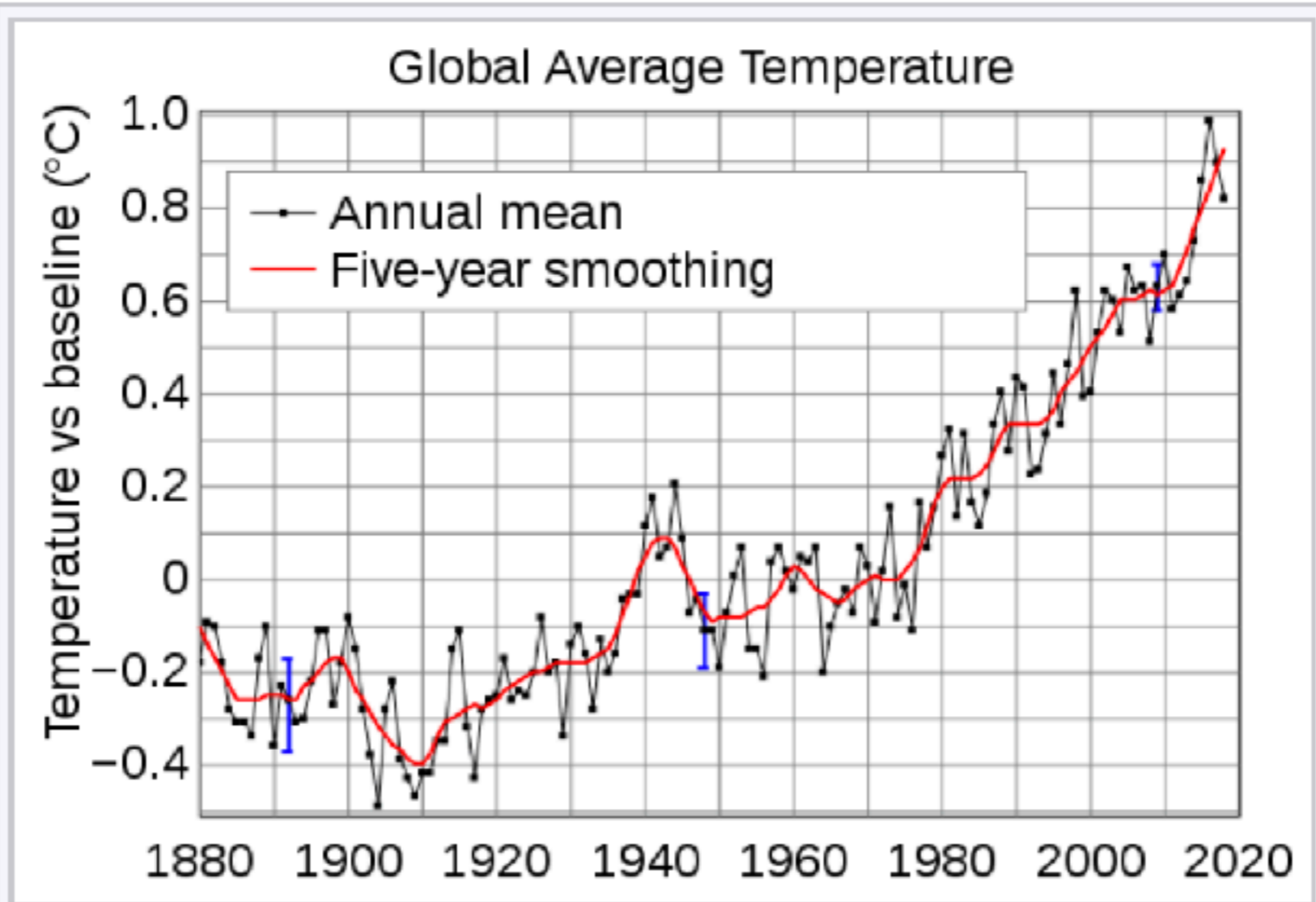
Select a month: and a year:




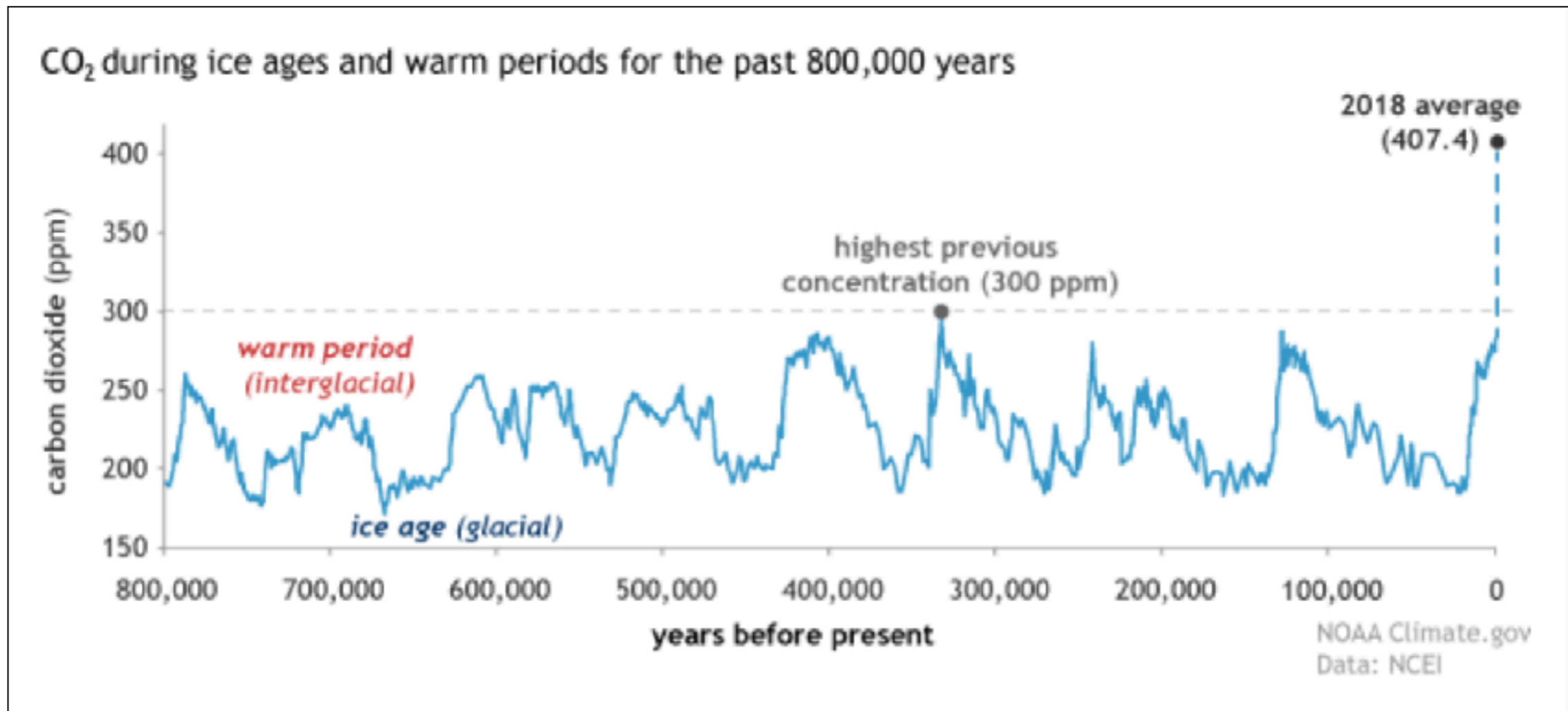
Sea ice extent in the Northern Hemisphere in March 1979. The ice covered an area of 16.4 million square kilometers.



Sea ice extent in the Northern Hemisphere in March 2018. The ice covered an area of 14.3 million square kilometers.



The average annual [temperature at the earth's surface](#)  has risen since the late 1800s, with year-to-year variations (shown in black) being smoothed out (shown in red) to show the general warming trend.



<https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide>





The difference between Nixon and Trump is Fox News

Fox News shields President Trump. But his love for their conspiracies might bring him down.

By Nicole Hemmer | Oct 7, 2019, 8:00am EDT



Support Democracy

The world's democracies should remember one thing above all else: we have the better ideas.

As political scientists have long noted, no two democracies have ever gone to war with each other—ever. It is not the democracies of the world that are supporting international terrorism, proliferating weapons of mass destruction, or threatening the territory of their neighbors.

Few things better project America's "soft power" and democratic values than educational and cultural exchanges. China is dramatically expanding its people-to-people exchanges, with huge increases in funding for students, journalists, and civic and political leaders to visit and study in China. The last thing we should be doing is cutting funding for ours.

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"One of the most important books I've ever read—an indispensable guide to thinking clearly about the world." —Bill Gates

FACT FUL NESS

Ten Reasons
We're Wrong About
the World—and Why
Things Are Better
Than You Think

Hans Rosling with Ola Rosling and
Anna Rosling Rönnlund

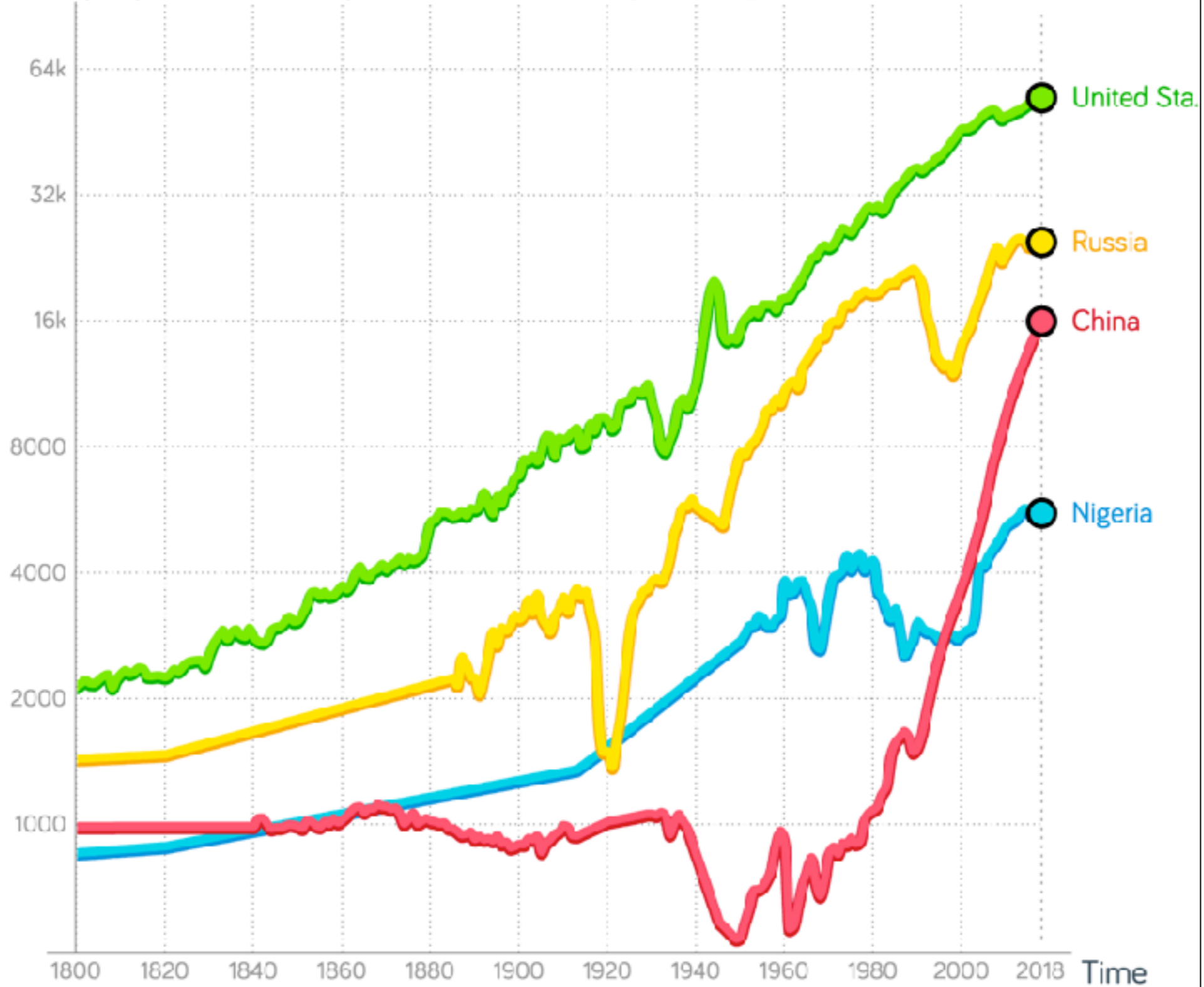
Copyrighted Material

Front Cover

Kahoot!

Income per person (GDP/capita, PPP\$ inflation-adjusted) ?

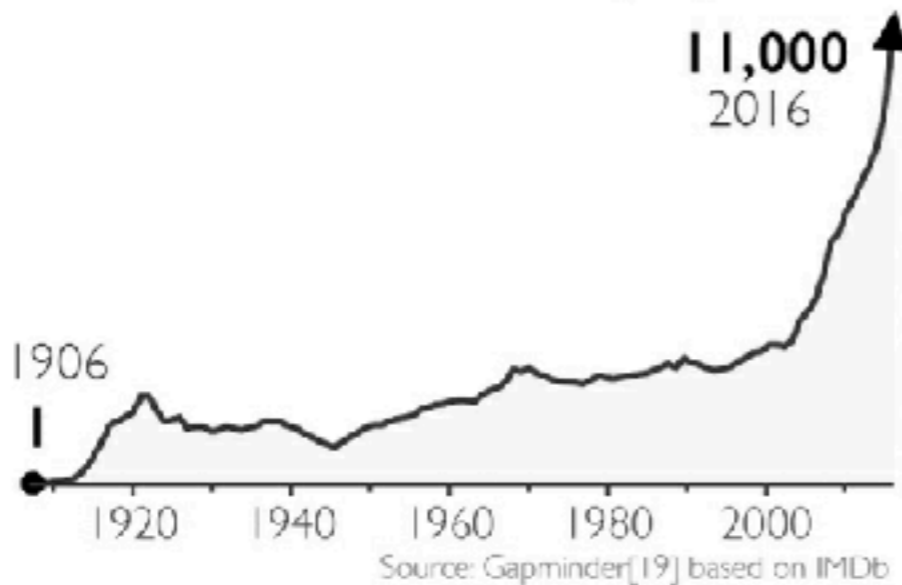
DATA DOUBT



16 GOOD THINGS INCREASING

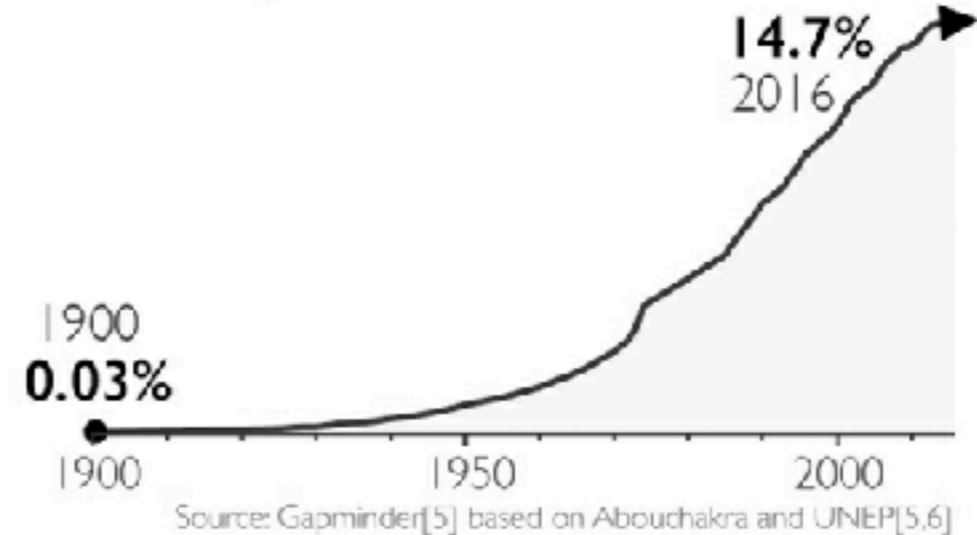
NEW MOVIES

Number of new feature films per year



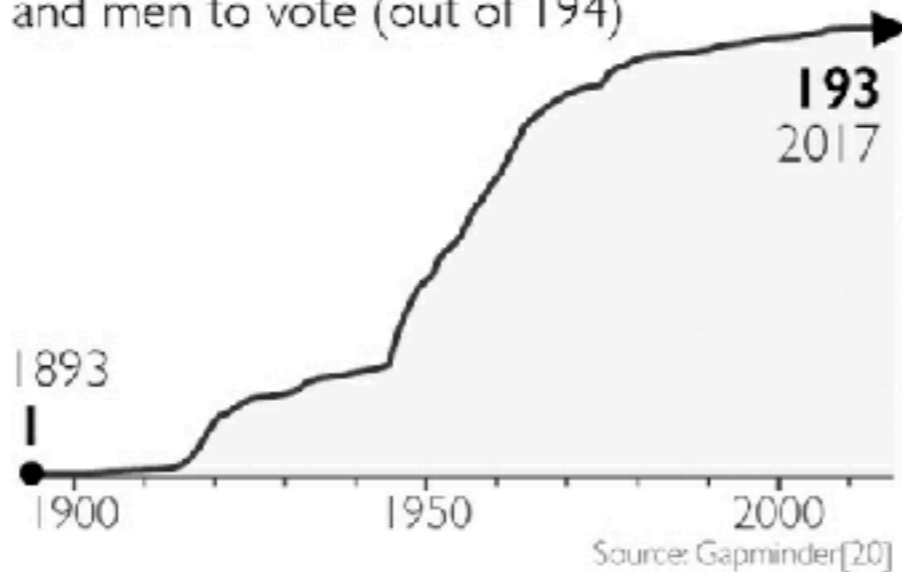
PROTECTED NATURE

Share of Earth's land surface protected as national parks and other reserves



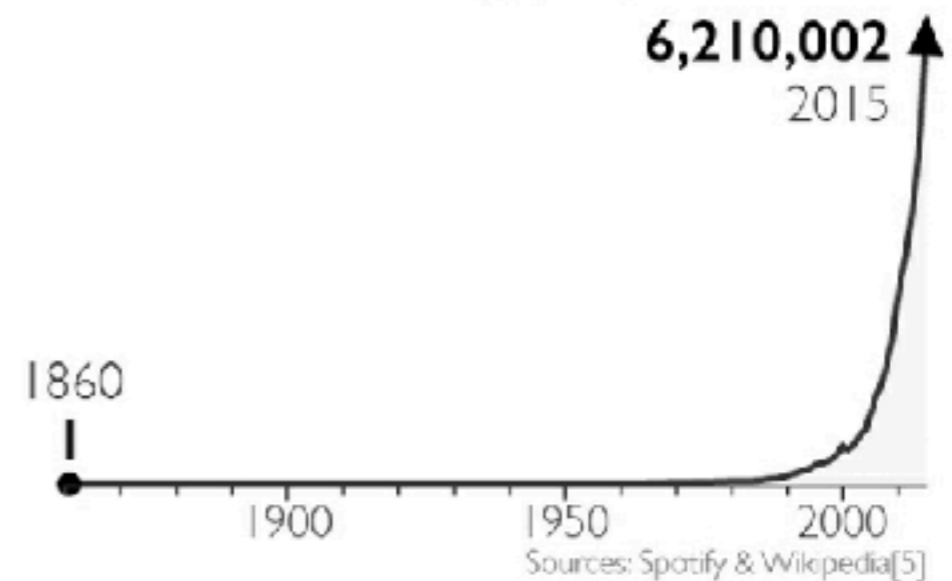
WOMEN'S RIGHT TO VOTE

Countries with equal rights for women and men to vote (out of 194)



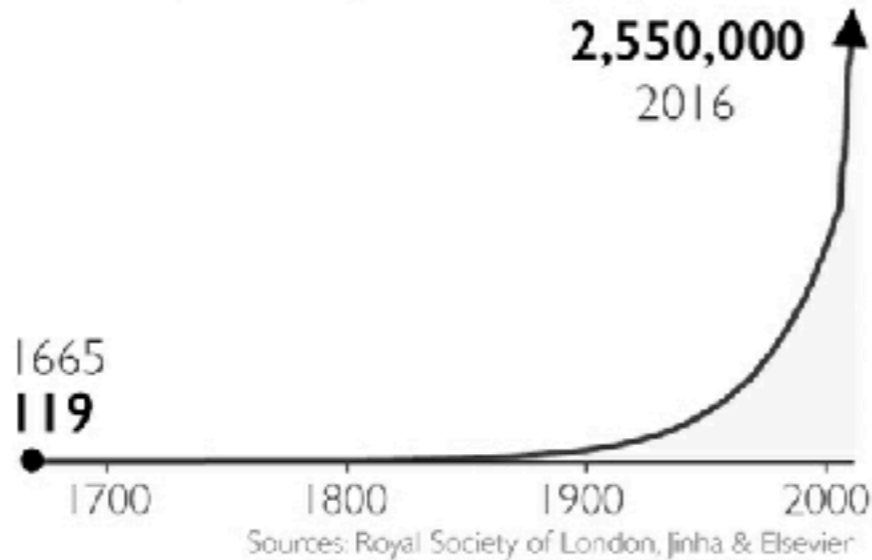
NEW MUSIC

New music recordings per year



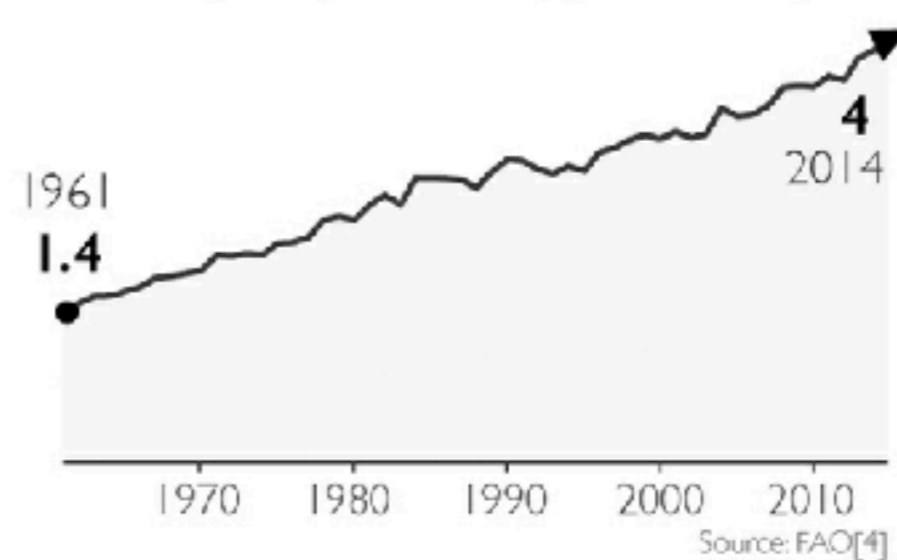
SCIENCE

Scholarly articles published per year



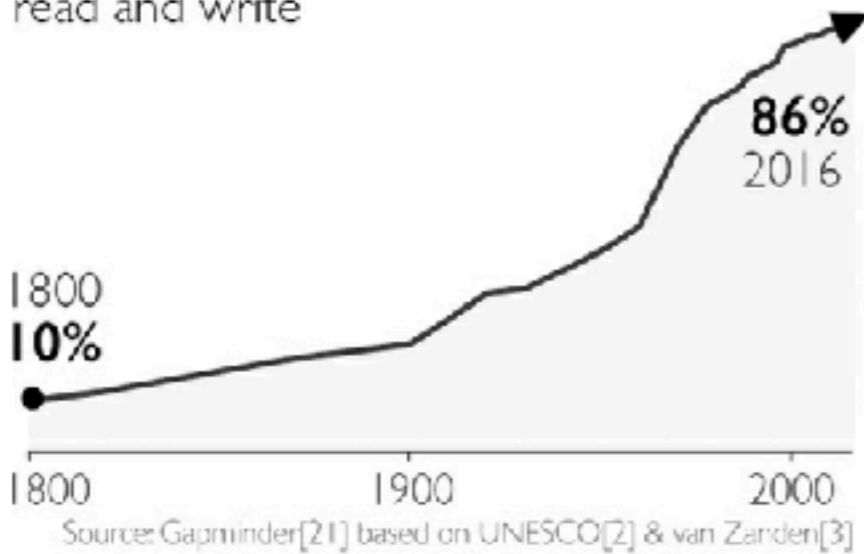
HARVEST

Cereal yield (thousand kg per hectare)



LITERACY

Share of adults (15+) with basic skills to read and write



DEMOCRACY

Share of humanity living in democracy

