



Cambridge Centre for Risk Studies  
**Advisory Board Research Showcase – 29 January 2019**

# **Blast from the Past: Replaying the 20<sup>th</sup> Century in Catastrophes**

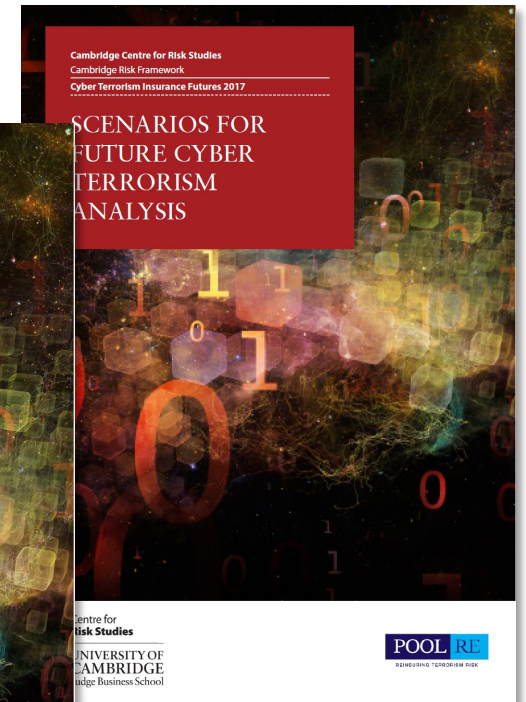
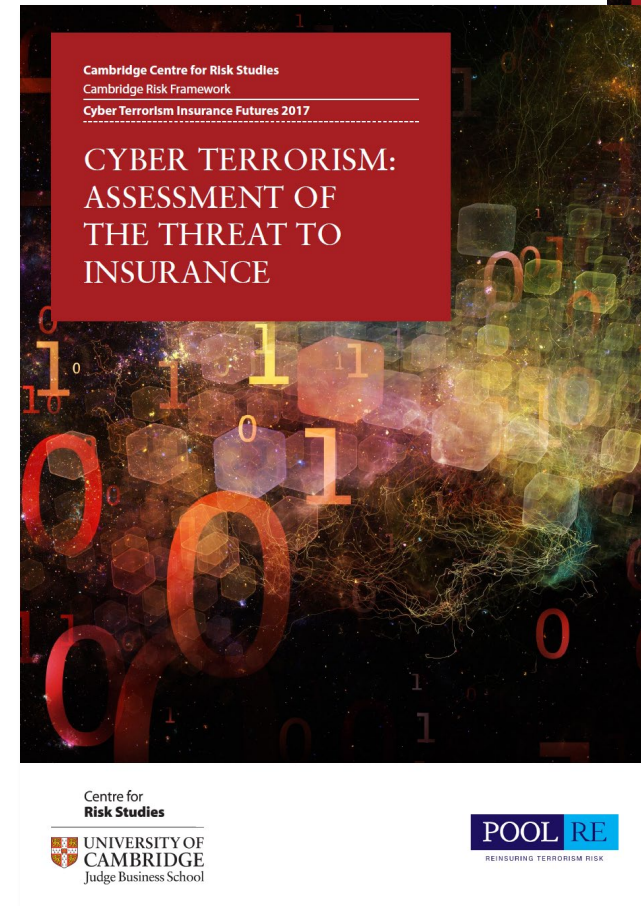
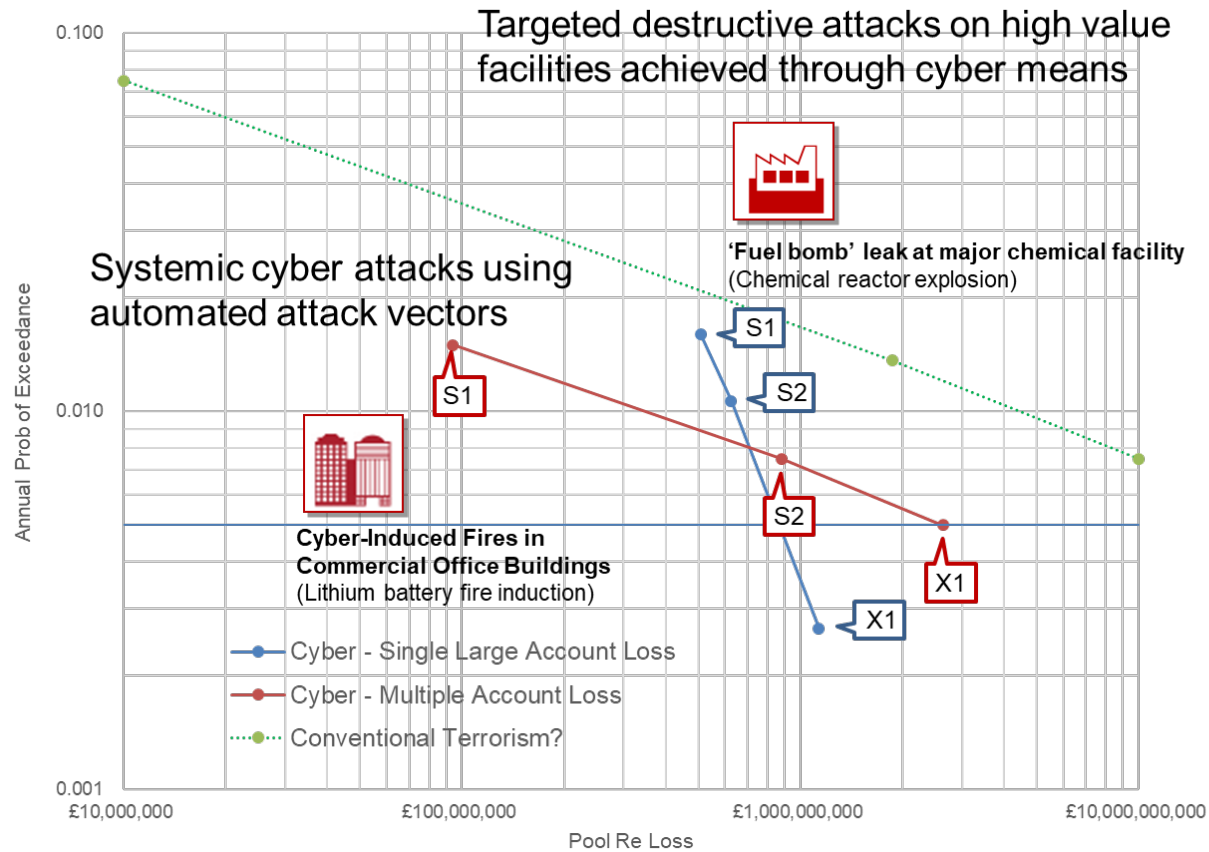
Centre for  
**Risk Studies**



Tamara Evan  
Research Assistant  
Cambridge Centre for Risk Studies



# Cyber Terrorism



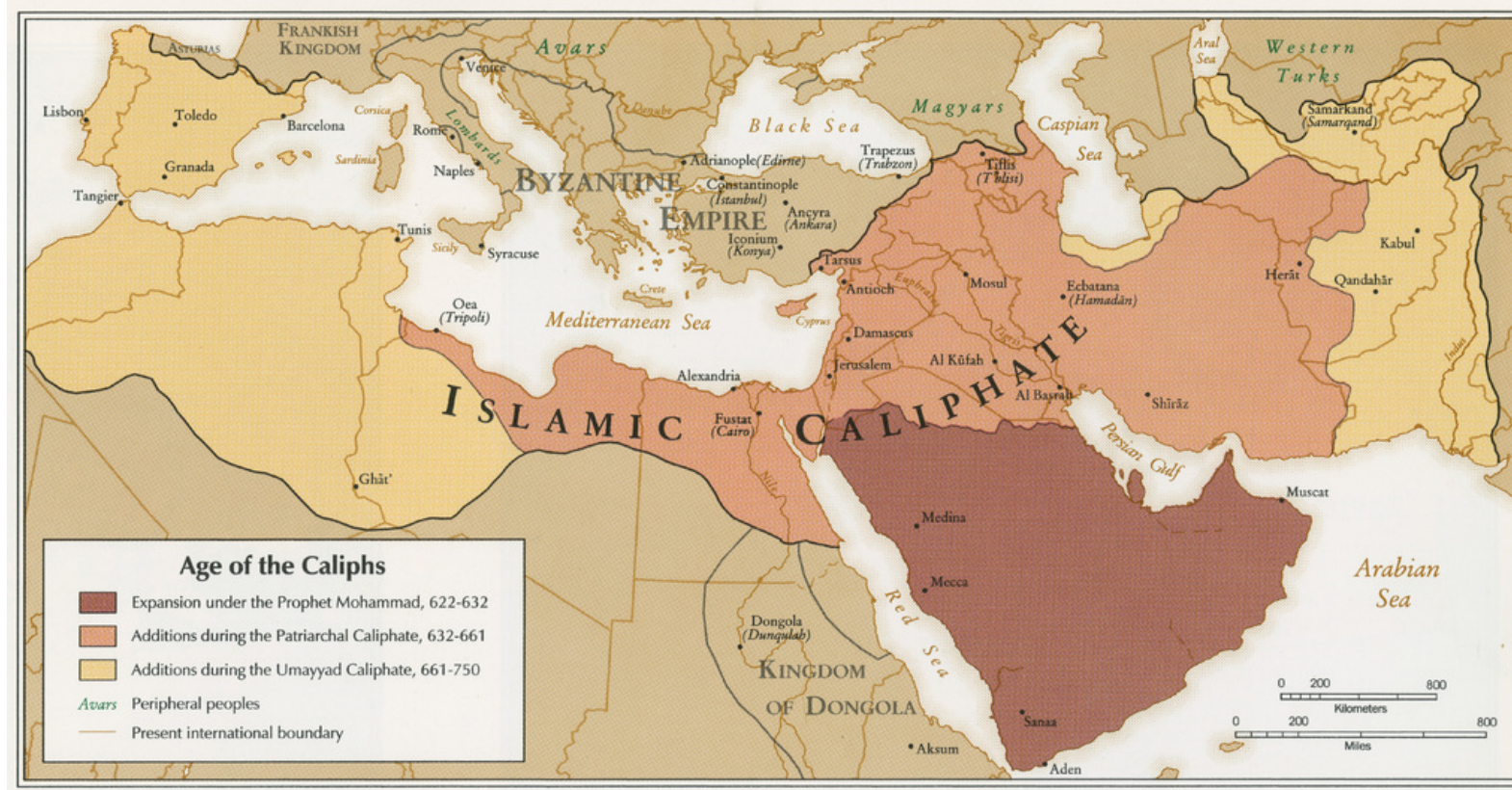
# Cyber terrorism – a threat 1300 years in the making?

- A map published by IS during the height of their power in the Levant during 2016 exhibited their 'masterplan' for a territorial caliphate



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# History is the first stress test



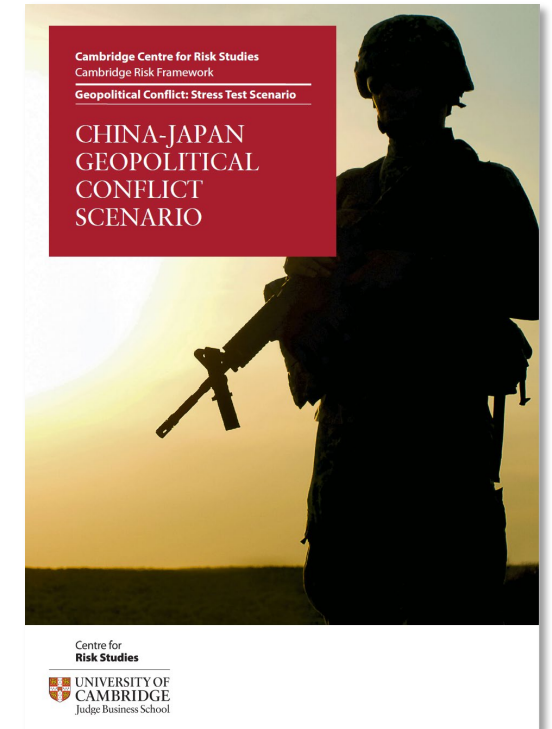
1894



1937



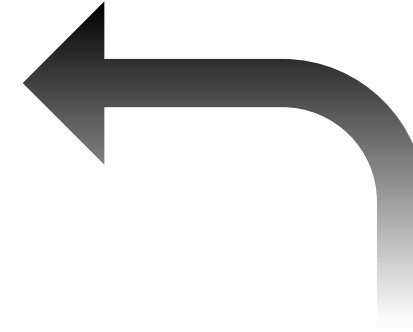
1931



# History is the first stress test



1918 - 1920

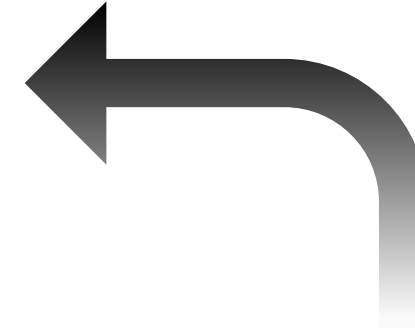
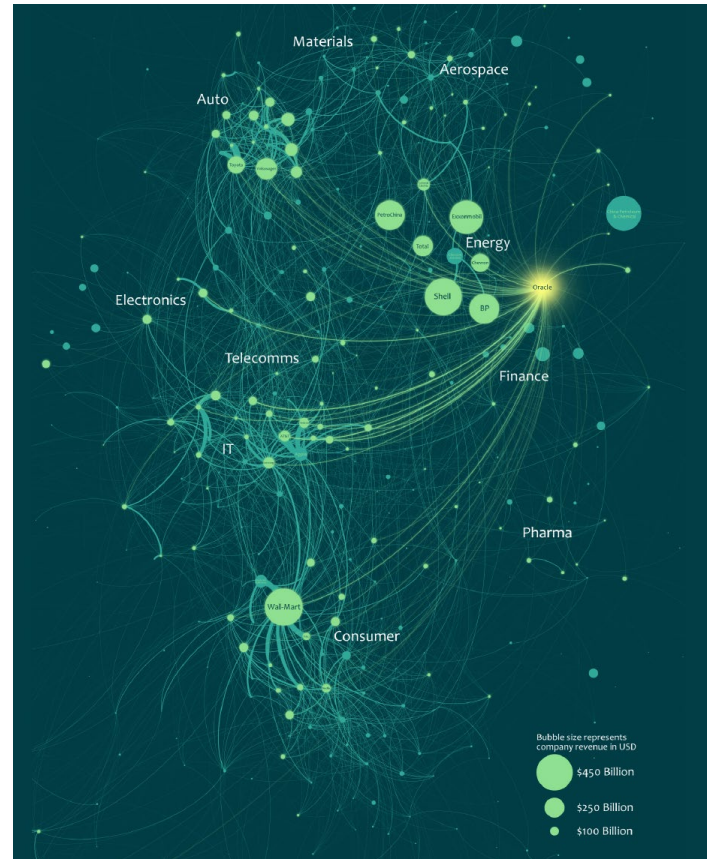


1331-1353

# History is the first stress test

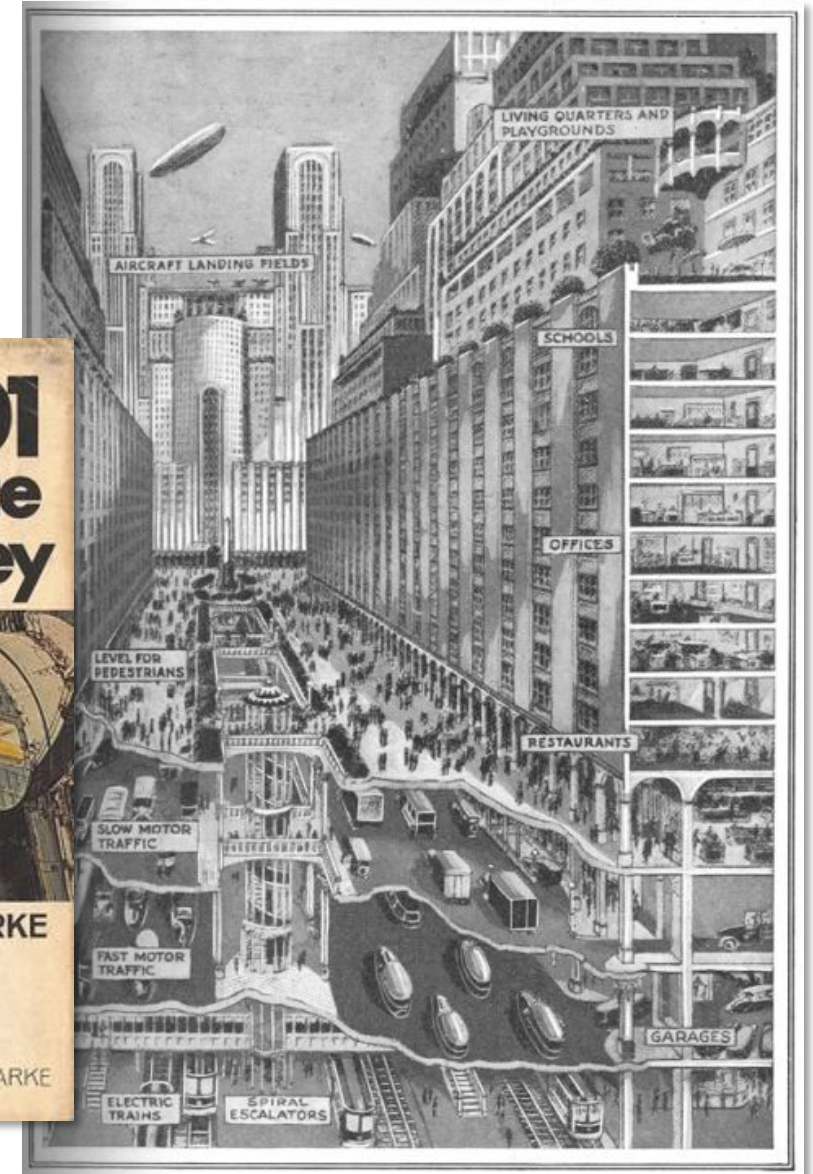
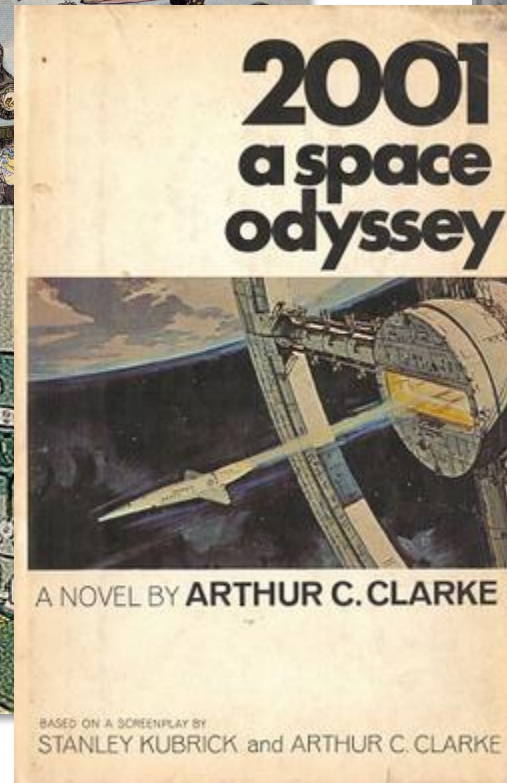
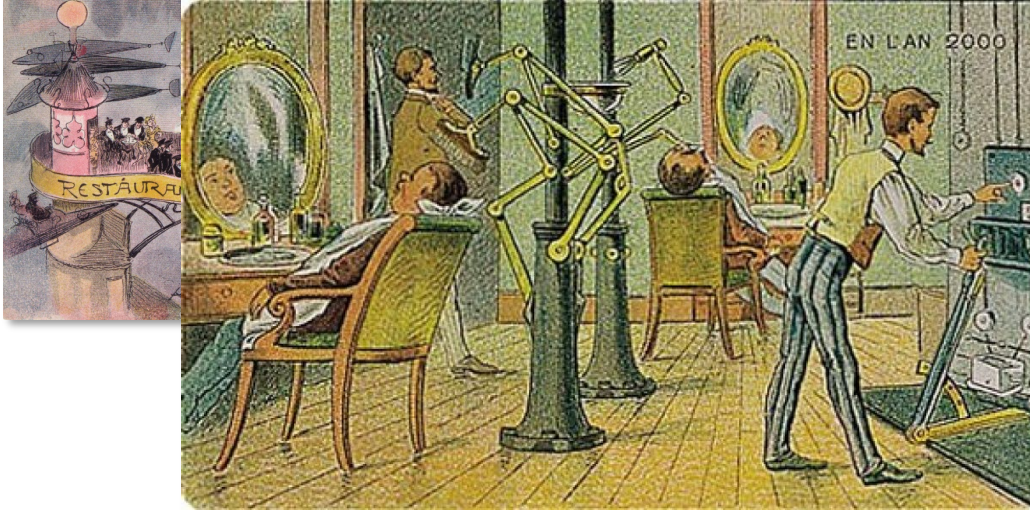


1918 - 1920



1331-1353

# We can't predict the future...



...but we keep trying anyway

## Davos 2019: Multilateralism, Fourth Industrial Revolution Debated



Jan 25, 2019 3:30 am +00:00  
by Rich Dvorak, Junior Analyst

## POMPEO CELEBRATES DEATH OF GLOBALISM AT DAVOS SPEECH: 'NATIONS MATTER'

## How Trump Offered NASA Unlimited Funding to Go to Mars in His First Term

DAVOS WORLD ECONOMIC FORUM - SUI

By Olivia Nuzzi

### Climate change

## We have 12 years to limit climate change catastrophe, warns UN

**Urgent changes needed to cut risk of extreme heat, drought, floods and poverty, says IPCC**

● **Overwhelmed by climate change? Here's what**

## Artificial intelligence will become the next new human right

That is, if Salesforce CEO Marc Benioff is to be believed.

## 'Tipping point' risk for Arctic hotspot

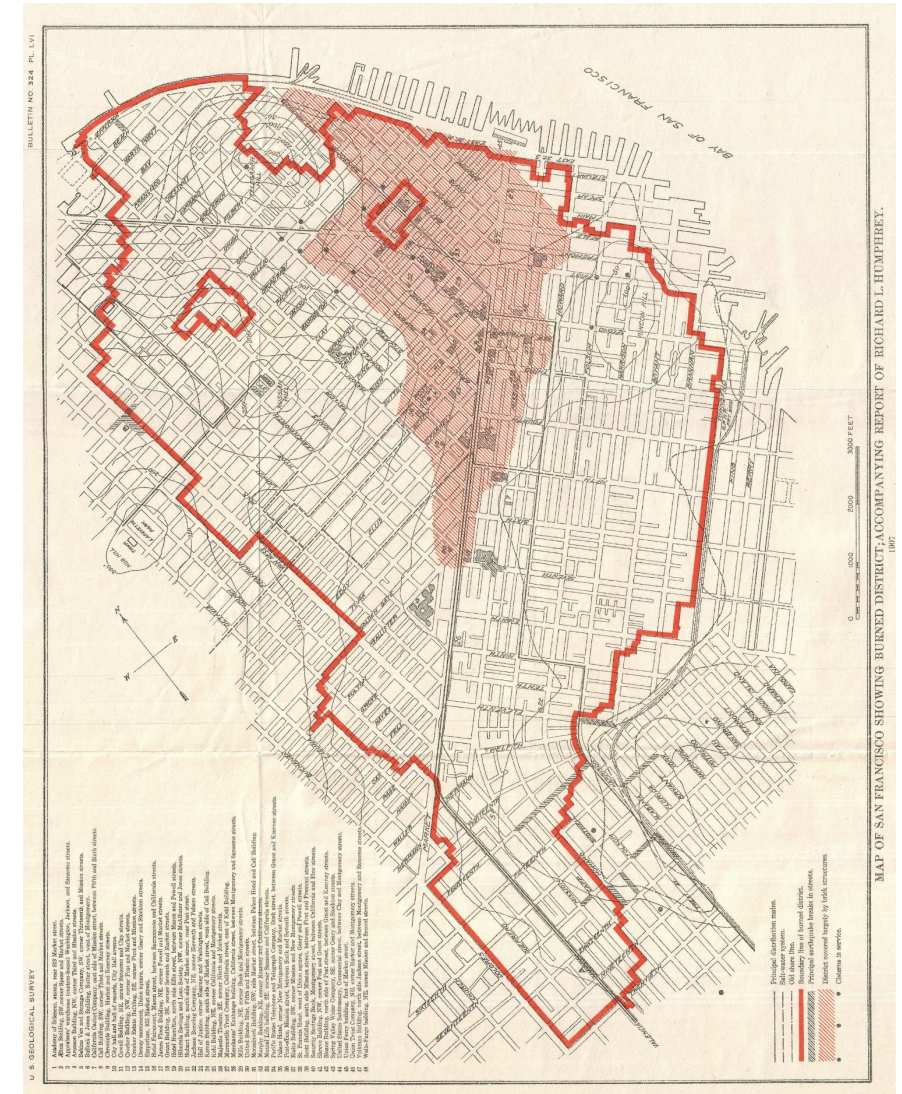
By Roger Harrabin  
BBC environment analyst

🕒 24 January 2019

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# 1906 San Francisco Earthquake

- A 7.9 magnitude earthquake struck Northern California on the morning of 18 April, 1906, levelling 80% of the City of San Francisco, then the 7<sup>th</sup> largest city in the United States
- Ruptured gas lines caused fires which burned 500 city blocks over the course of four days and nights
- Starting in 1885, Lloyd's underwriter Cuthbert Heath had established the market's first 'non-marine' syndicate, which provided \$50 million (now \$1bn) in earthquake cover in San Francisco
- In honouring all policies held in the city, Lloyd's was validated as an overseas risk insurer and the market for nonmarine risks became more competitive
- During the Great Kantō earthquake of 1923, nascent fire reinsurers were vastly overexposed and ambiguous on their policy structures, and thus only repaid 10% of claims on 1.5 billion yen (now \$17bn) in insured losses.



# 100 years in Europe



1900



1949



2000

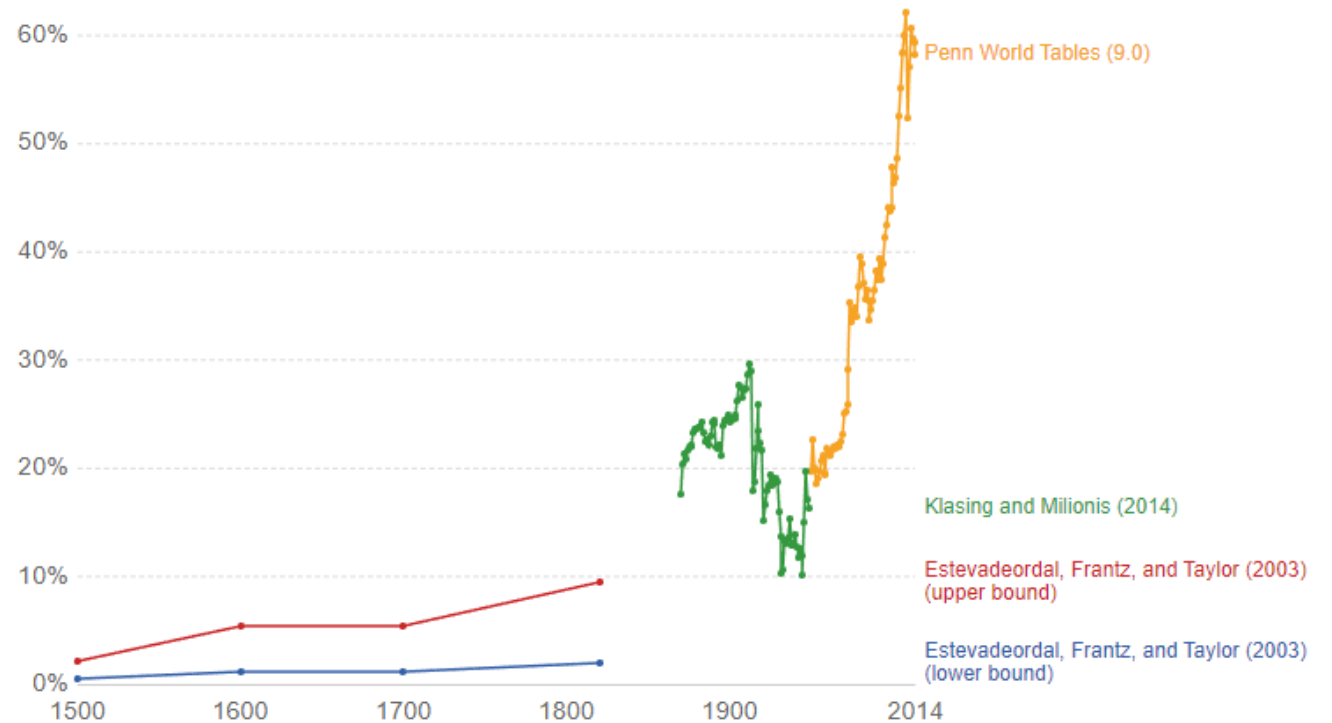


# The rise and fall and rise and fall of globalisation

- The nascent globalisation of the late 19<sup>th</sup> century was marked by falling transport costs, mass migration to the Americas, and a rapid increase in trade
- This process began to break down with the advent of World War I, as the effects of the war led to isolationist measures, social unrest, and demographic shifts
- The 1944 Bretton Woods system led to two decades of unhindered economic globalisation

## Globalization over 5 centuries

Shown is the "trade openness index". This index is defined as the sum of world exports and imports, divided by world GDP. Each series corresponds to a different source.



Source: Penn World Tables 9.0, Estevadeordal, Frantz, and Taylor (2003), Klasing and Milionis (2014)

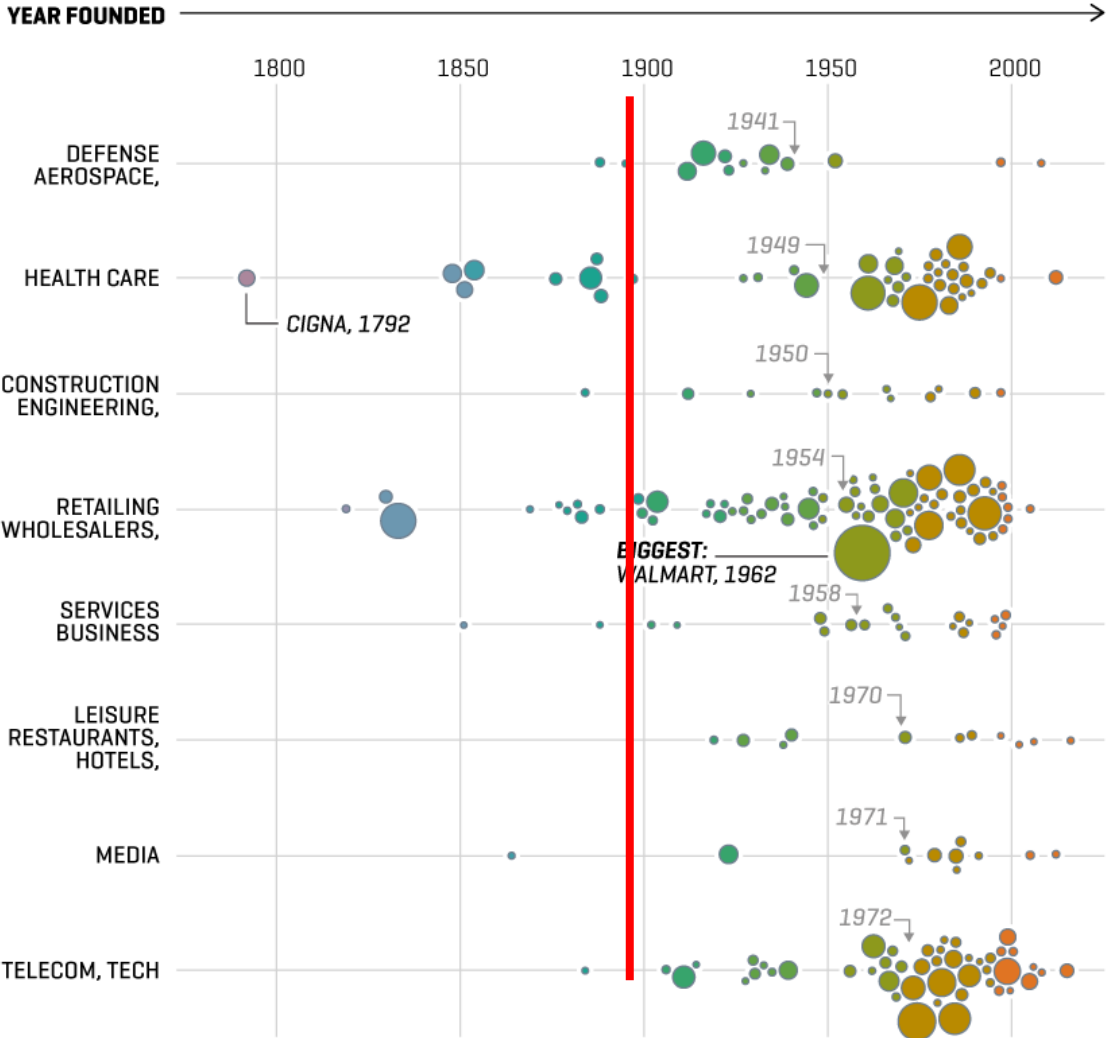
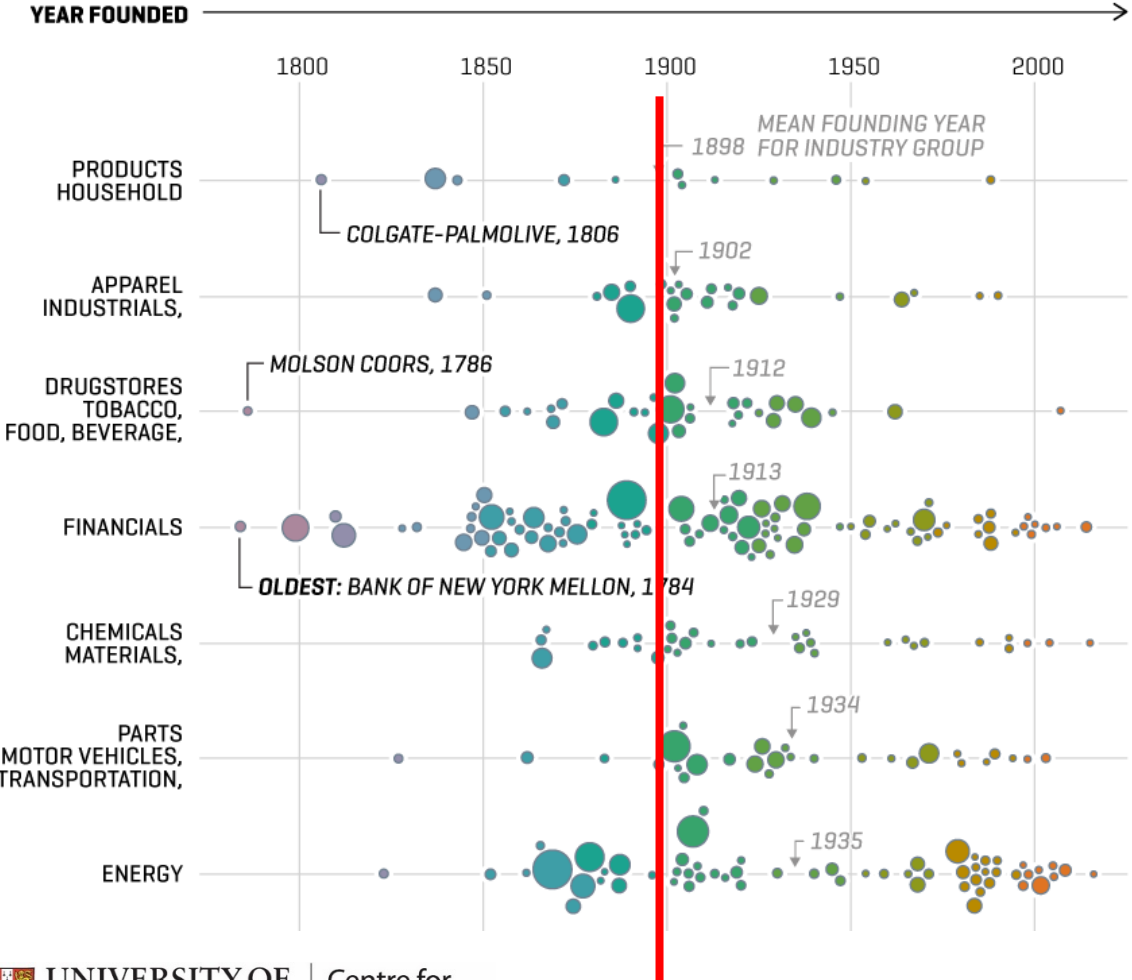
CC BY-SA



# How long can a business last?

EACH CIRCLE REPRESENTS A FORTUNE 500 COMPANY.

REVENUES:  \$500 BILLION    \$100 BILLION    \$50 BILLION    \$10 BILLION



# How long can a business last?















3M	131	97
Abbott Laboratories	320	111
Alcoa	35	262
Archer Daniels	155	48
Avon Products	455	485
Boeing	20	27
BorgWarner	81	301
Bristol-Myers Squibb	419	145
Campbell Soup	88	358
Caterpillar	75	65
CBS	13	197
Celanese	210	455
ChevronTexaco	18	13
Coca-Cola	126	87
Colgate-Palmolive	115	184
ConocoPhillips	30	95
Crown Holdings	268	338
Cummins	434	149
Deere	104	102
Dow Chemical (DowDuPont)	69	47

DuPont (DowDuPont)	10	47
ExxonMobil	2	2
Freeport-McMoRan	443	176
General Electric	4	18
General Dynamics	41	99
General Mills	56	182
General Motors	1	10
Goodyear Tire and Rubber	19	187
Hershey Foods	197	379
Honeywell International	51	77
Hormel Foods	92	323
IBM	435	34
International Paper	36	124
Johnson & Johnson	159	37
Kellogg	186	226
Kimberly-Clark	177	163
Kraft Foods	17	114
Lear	462	148
Lockheed Martin	34	59
McGraw Hill (S&P Global)	380	463

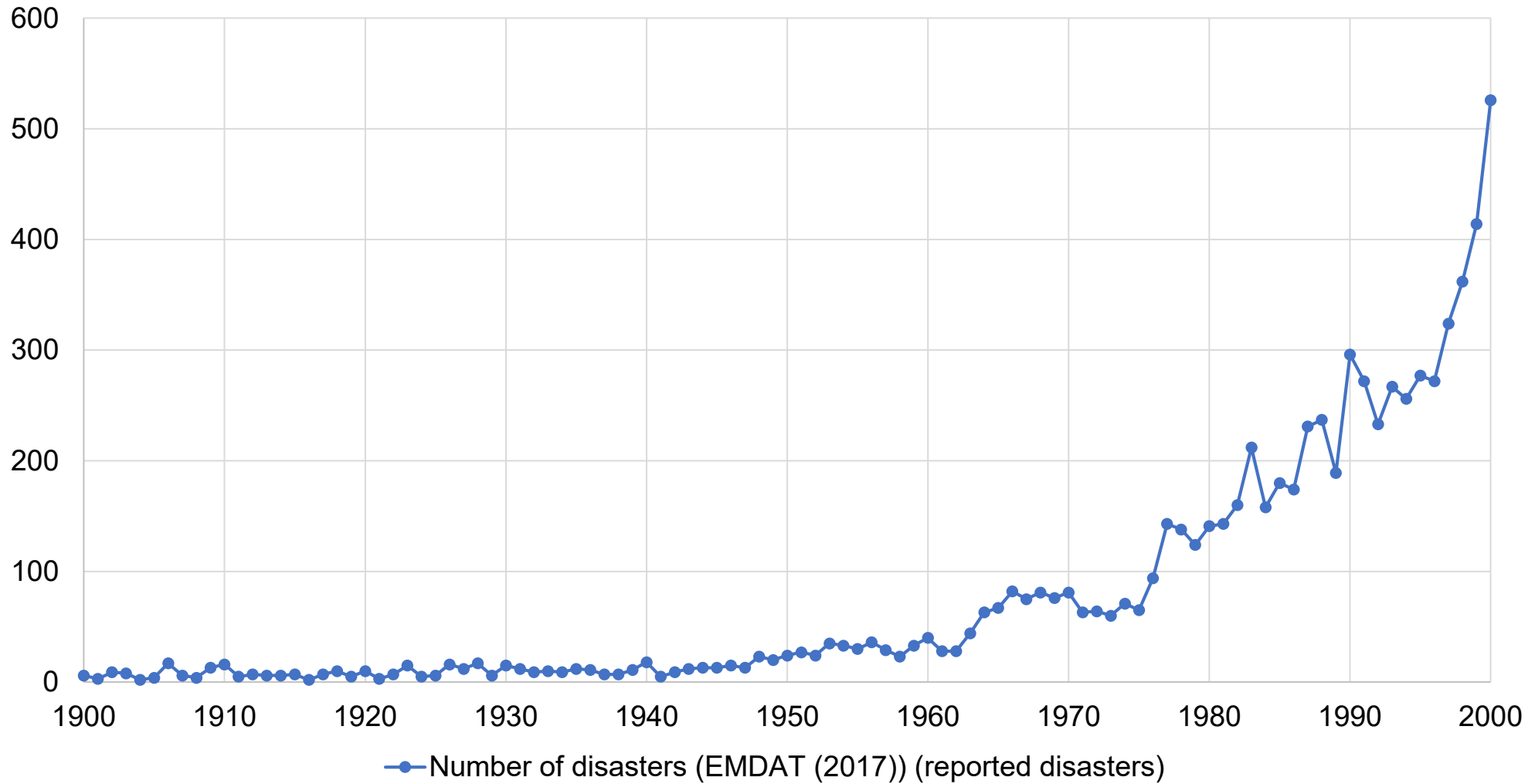
McGraw Hill (S&P Global)	380	463
Merck	212	78
Monsanto	87	199
Navistar International	22	342
NCR	116	432
Northrop Grumman	183	118
Owens Corning	227	442
Owens-Illinois	89	410
PepsiCo	364	45
Pfizer	215	57
Procter and Gamble	27	42
Raytheon	178	119
Rockwell Automation	42	445
Sealed Air	74	456
Textron	292	208
United States Steel	3	246
United Technologies	39	51
Weyerhaeuser	114	394



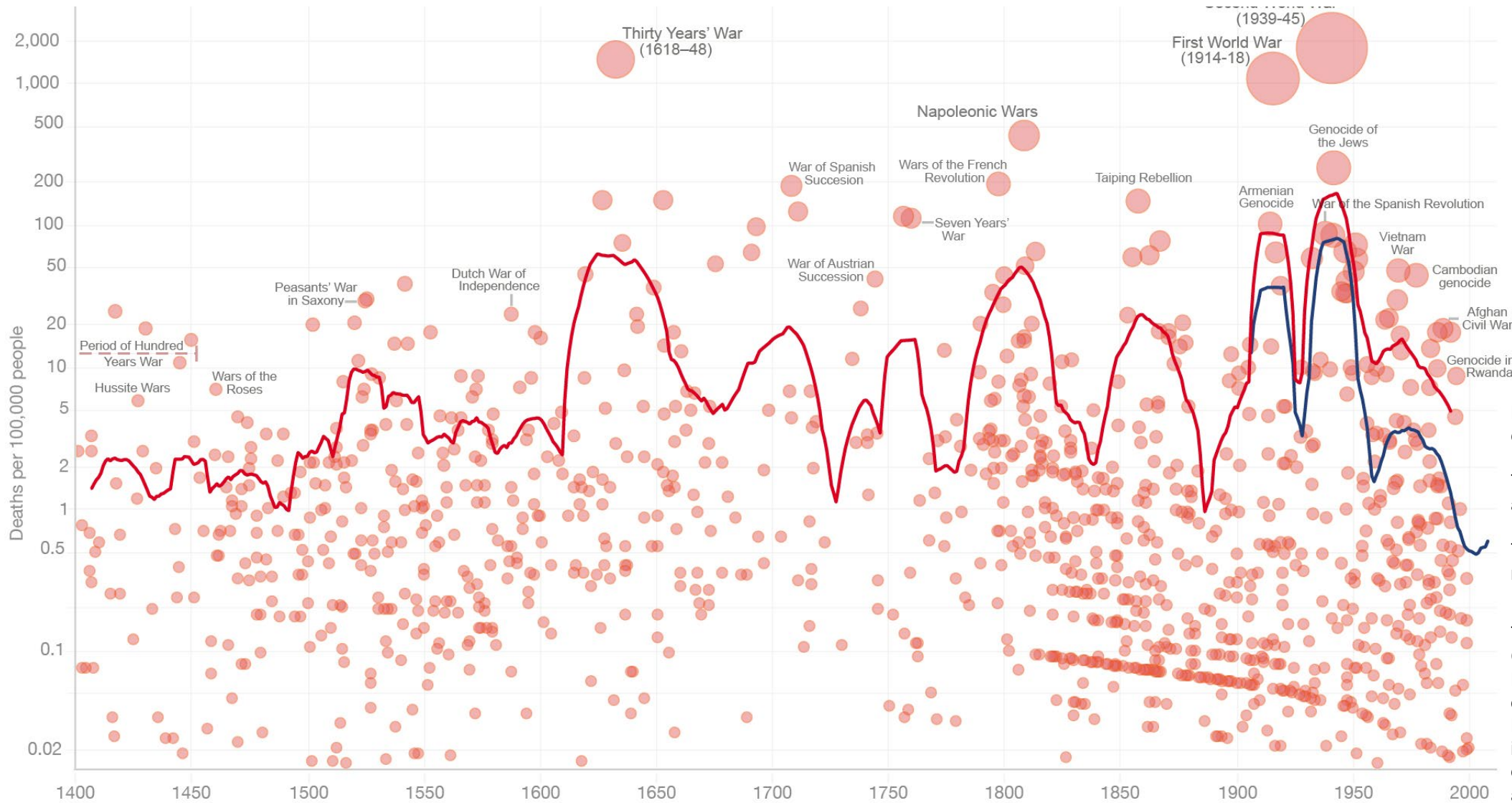
## A replay of the 20<sup>th</sup> Century

-  150 flood events
-  50 heatwaves
-  30 tsunamis
-  70 major eruptions
-  10 drought periods
-  92 earthquakes over 8.0 magnitude
-  55 wildfires
-  26 significant epidemics, including four global pandemics
-  >4 major crop epidemics
-  3 geomagnetic solar storms
-  25 financial crises, including the Great Depression
-  21 major uprisings and revolutions
-  240 armed conflicts, including two World Wars
-  No cyber attacks

## A replay of the 20<sup>th</sup> Century



# What will this teach us?



Each circle represents one conflict.

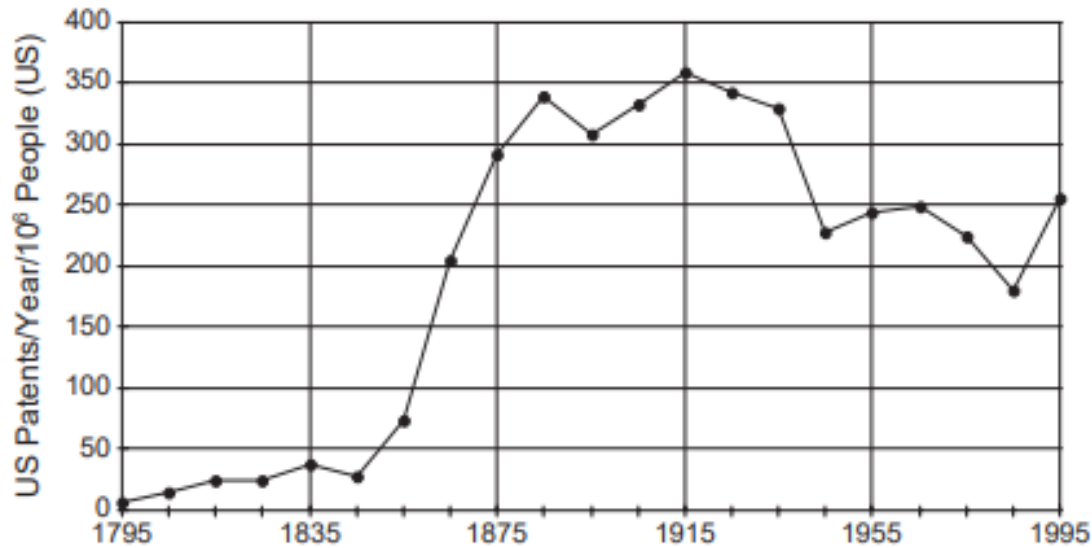
The **size** represents the absolute number of fatalities.

The **position** on the y-axis represents the death rate.

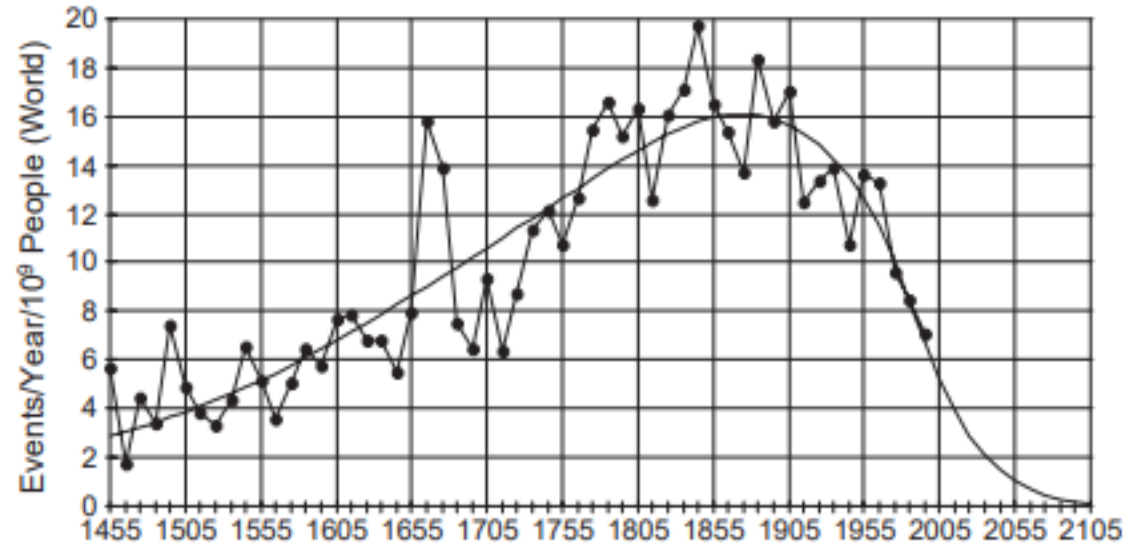
The Conflict Catalog (Violent Conflicts 1400 A.D. to the Present in Different Regions of the World) authored by Peter Brecke contains information on 3708 conflicts, data on parties, fatalities, date and duration between the year 1400 and 2000.



# What will the 21<sup>st</sup> century look like?

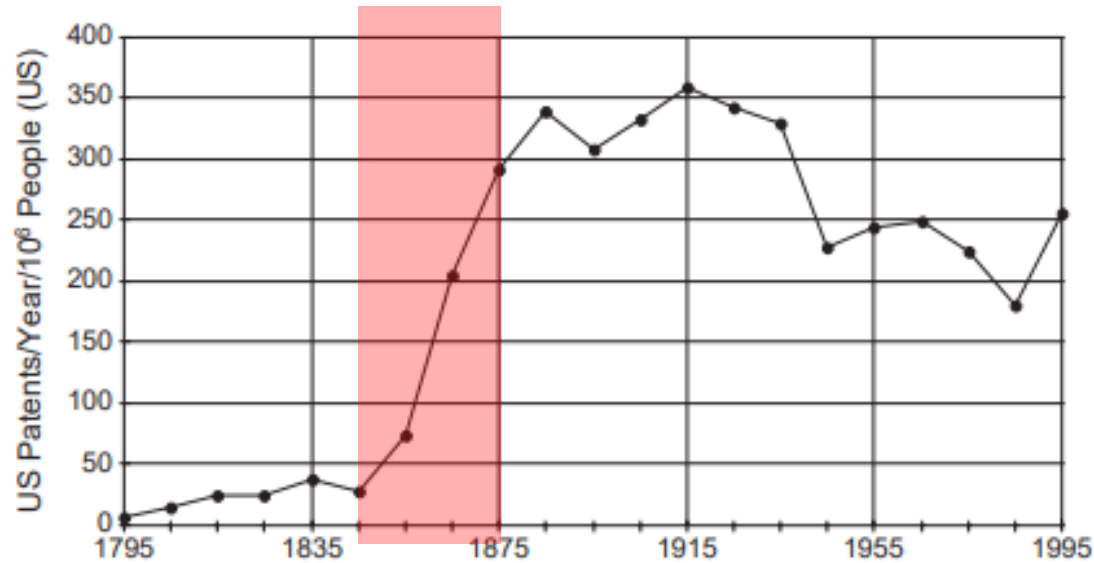


Rate of invention from 1795 to 1999

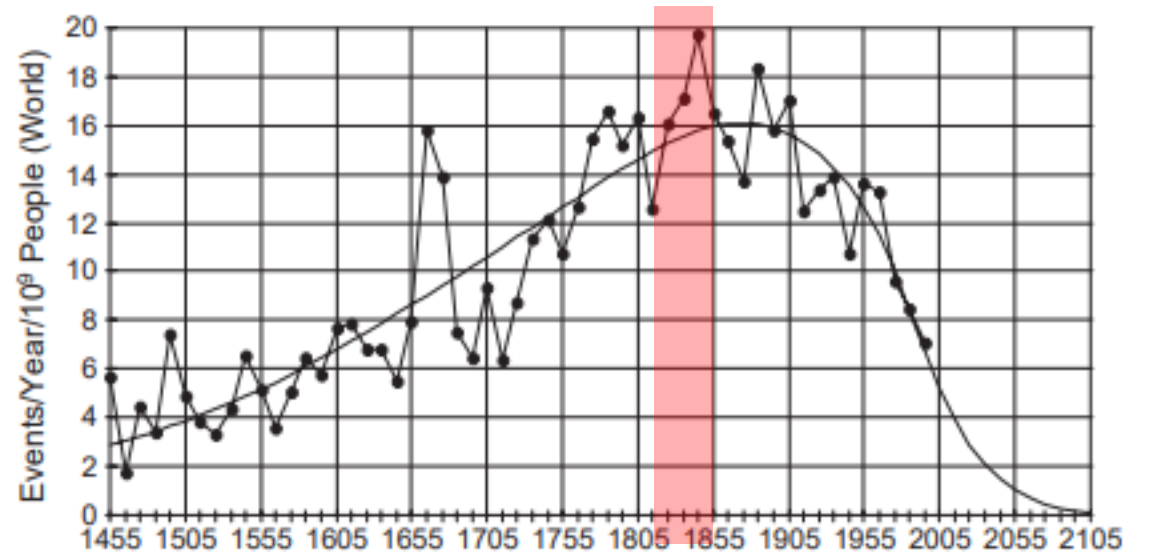


Rate of innovation since 1455 to 1999

# What will the 21<sup>st</sup> century look like?



Rate of invention from 1795 to 1999



Rate of innovation since 1455 to 1999

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