

# MODERN TECHNOLOGIES AND CONFLICTS

History, overview and ethics

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"WE'VE ARRANGED A GLOBAL CIVILIZATION  
IN WHICH MOST CRUCIAL ELEMENTS  
PROFOUNDLY DEPEND ON SCIENCE AND  
TECHNOLOGY. WE HAVE ALSO ARRANGED  
THINGS SO THAT ALMOST NO ONE  
UNDERSTANDS SCIENCE AND TECHNOLOGY.  
THIS IS A PRESCRIPTION FOR DISASTER. WE  
MIGHT GET AWAY WITH IT FOR A WHILE, BUT  
SOONER OR LATER THIS COMBUSTIBLE  
MIXTURE OF IGNORANCE AND POWER IS GOING  
TO BLOW UP IN OUR FACES."

- CARL SAGAN, 1995

## LONGTERM TRENDS

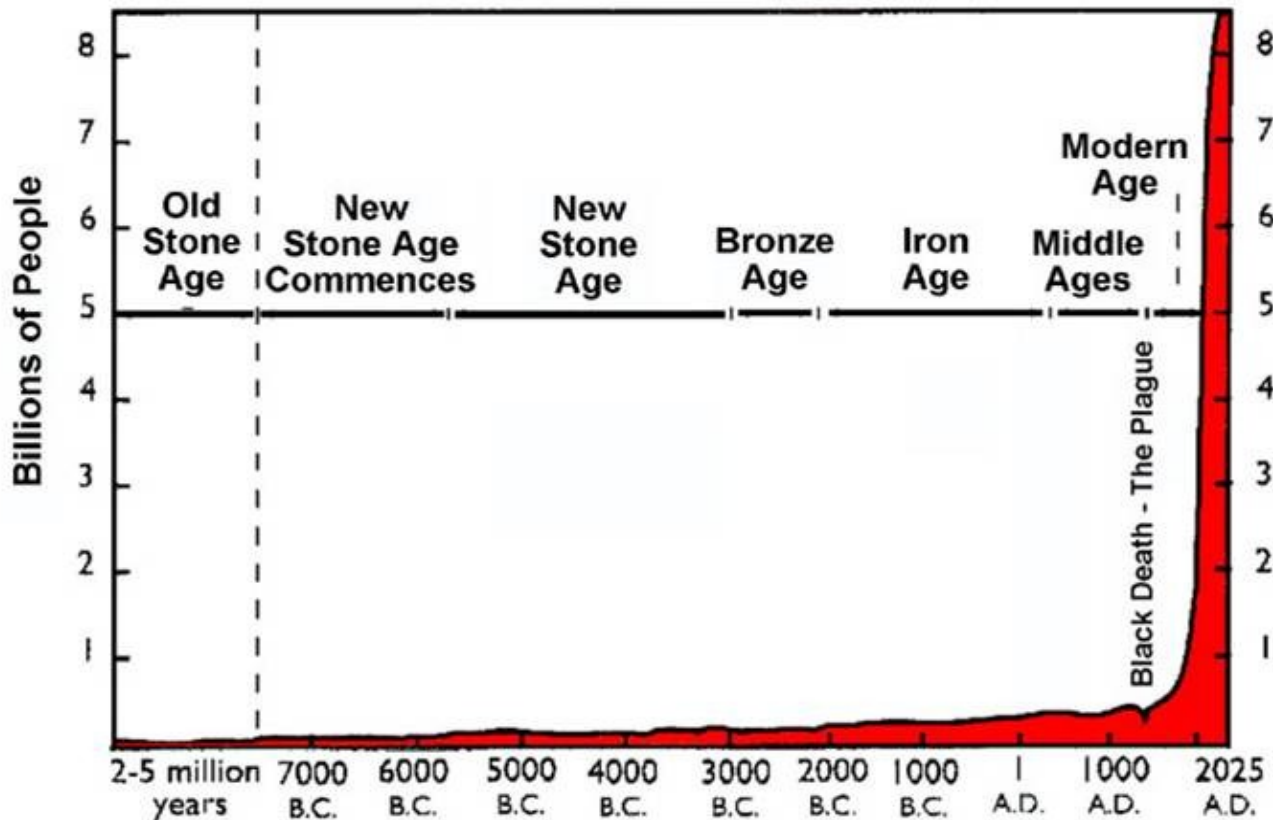
- technology frees up people from doing previously necessary work and enables them to do something new instead
- new professions and sectors are created, influencing the rest of society
- all kinds of conflict (military and social) drive new science
- it is never possible to predict all outcomes of research

# FRITZ HABER

- 1918 Nobel price for the “Haber-Bosch process”
  - fixation of atmospheric nitrogen into ammonia ( $\text{NH}_3$ )
  - currently uses about 1-2% of global energy budget
  - we produce about 400 million tons of it
- pillar of agriculture (fertilizer)
  - quadruples effectivity
  - $\frac{2}{3}$  of produced food
- it was a prerequisite of the population boom



# World Population Growth Through History



From "World Population: Toward the Next Century," copyright 1994  
by the Population Reference Bureau

# FRITZ HABER AND THE WAR

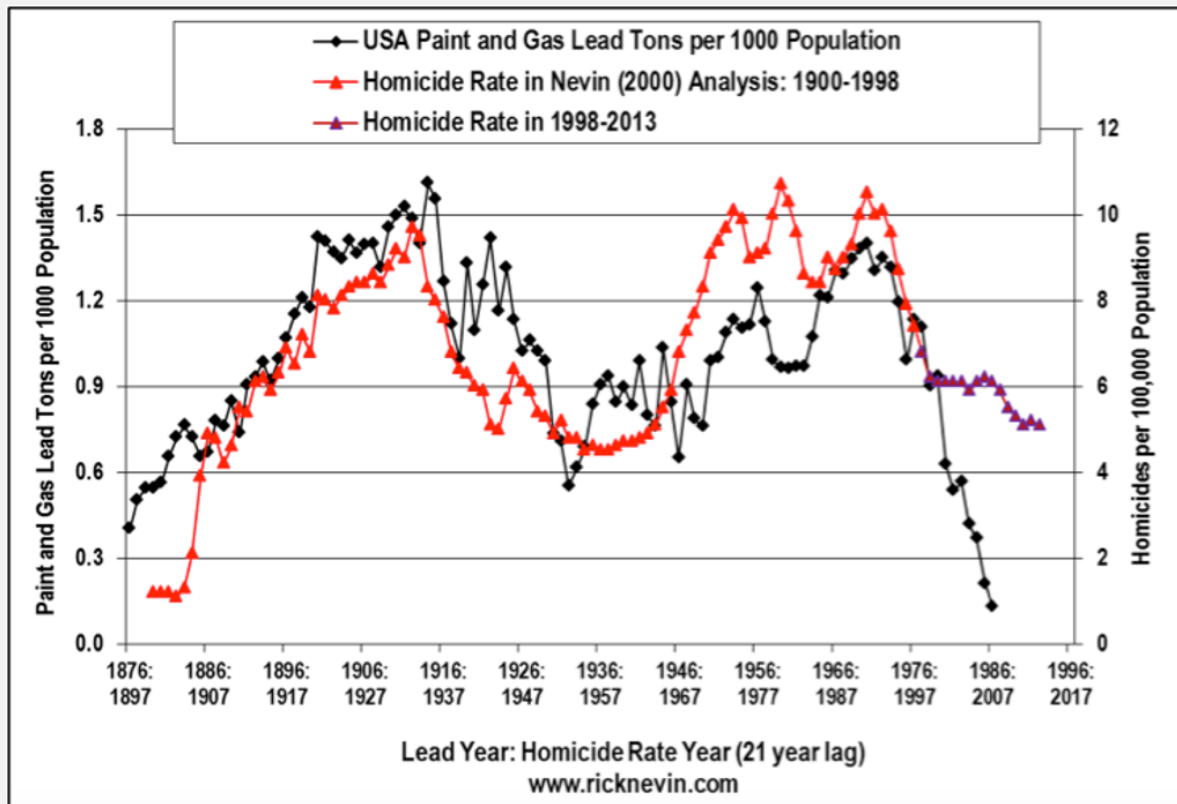
- but nitrogen is also used in explosives
- and he worked on chemical weapons:
  - chlorine gas
  - yperite (mustard gas)
- and his work was basis for future development of Zyklon A
  - (originally used as insecticide)



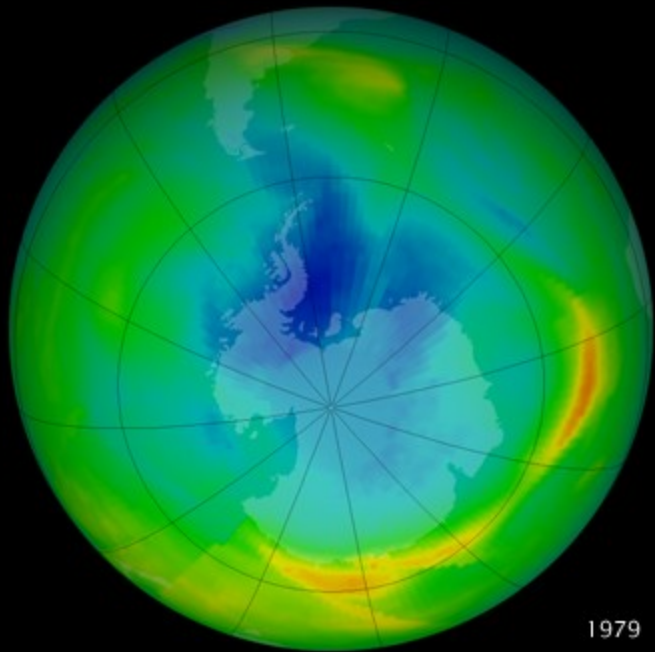
## THOMAS MIDGLEY

- famous and decorated chemist
- 1921 invented leaded gasoline (TEL)
- 1928 invented freons (CFCs)

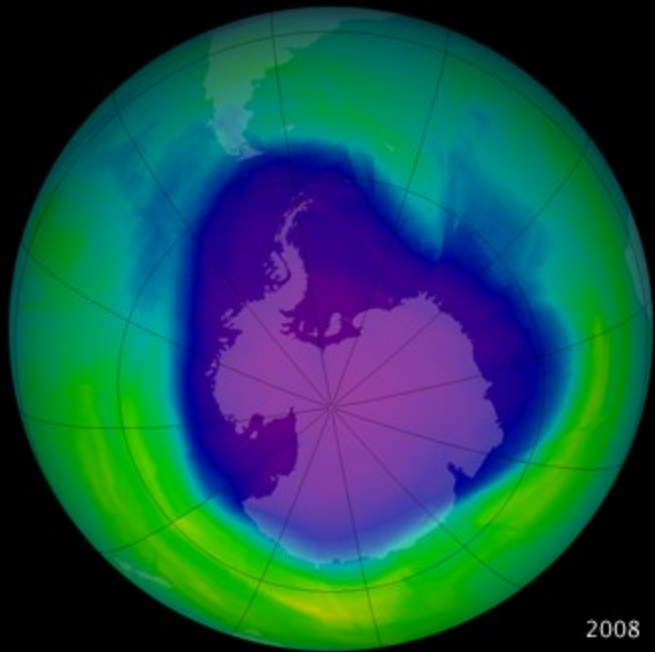








1979



2008

"Give your throat a vacation..."

# Smoke a FRESH cigarette"

If the cigarette you have been smoking stings or burns your throat, switch to Camels and see the difference.

It's the peppery dust left in tobacco by inefficient cleaning methods that makes you cough.

It's the unkindly hot smoke of harsh, dried-out tobacco that burns and irritates your throat.

There is no peppery dust in Camels—that's whisked away by a special vacuum-cleaning process.

There are no stale, crumbly, parched tobaccos—the fine Turkish and mild Domestic tobaccos of which Camels are blended come to you in prime, factory-fresh condition, thanks to the Humidor Pack.

This scientific germ-safe wrapping—not plain ordinary Cellophane, but moisture-

proof Cellophane which costs nearly twice as much—seals in all the natural aroma and freshness, seals it so tightly that wet weather cannot make Camels damp, nor drought weather make them dry.

Camels are milder and more throat-friendly because they are dust-free and fresh.

Give your throat a vacation, switch to Camels for just one day. Then leave them—if you can.

There is CAMEL QUARTER HOUR featuring Martin Browne and Tony West in Camel Gardens, Havana, Jamaica, Trinidad—Columbia Pictures—every night except Sunday



# CAMELS

Mild... NO CIGARETTE AFTER-TASTE



Don't remove the moisture-proof wrappings from your package of Camels after you open it. The Humidor Pack is protection against dust and germs. In offices and houses, even in the dry atmosphere of artificial heat, the Humidor Pack delivers fresh Camels and keeps them right until the last one has been smoked.







# NUCLEAR WEAPONS

- Ernest Rutherford discovered atomic nucleus (1911)
- Germany vs. USA
  - <https://dai.ly/x6ptg1x?start=913>
    - 15:13-20:13 (Feynman)
  - <https://vimeo.com/128088968>
    - 15:06-21:21 (Bagge + Weizsacker)
- various rationalizations
- impact on future?
  - Hiroshima, Nagasaki
  - Cold War
  - energy generation



# MEDICINE

- intimately connected with wars and human experimentation
- Archibald McIndoe (plastic surgery)
- Dwight Harken (heart surgery)



- PTSD/Gulf War Syndrome/Shell Shock





# ARTIFICIAL LIMBS



- [https://www.youtube.com/watch?v=F\\_brnKz\\_2tl](https://www.youtube.com/watch?v=F_brnKz_2tl)



# ETHICS AND REGULATION OF SCIENCE

- are wars good for science?
- can science be separated from politics and should it?
- who should decide what to research?
- who is or should be responsible for the results?