

# Biological weapons and biotechnology

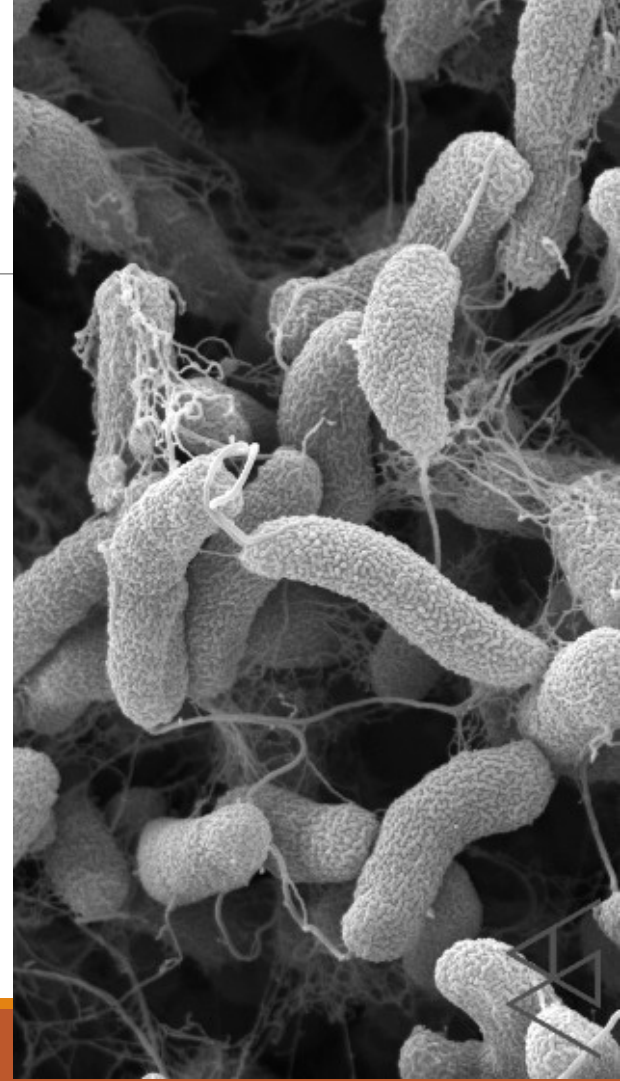
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21.11. 2018  
JAKUB DRMOLA

# Types

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- bacteria
  - anthrax, cholera, salmonella, tetanus, tularemia, yersinia pestis, rickettsia, typhus, Q fever, glanders
- viruses
  - encephalitis, smallpox, marburg virus, ebola
- fungus
- toxins
  - botulotoxin, ricin, enterotoxin
  
- in some cases, animals can also be considered as biological weapons (dogs, dolphins, snakes, bees, ...)



# Vectors of infection

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- inhalation or consumption
- through blood or skin
  
- aerosol dispersal (trucks, planes, drones, missiles)
- detonation (problematic)
- infiltration (water, food, ventilation)
- other organisms (humans, rats, fleas, mosquitos, ...)



# Targets

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- people
  - to kill
  - to incapacitate
- animals
  - as food
  - as transport
- plants
  - as food
  - against drugs



# Strategic and tactical aspects



- operational support
- demoralize enemy
- attack population
- annihilation
  
- highly dependent on weather and environmental conditions
- quite unpredictable
- friendly fire
- latent and hard to detect

# History

- ancient history (poisoned arrows, wells, during sieges, use of snakes and wasps, and even plague?)
- native americans decimated by smallpox
- vaccination discovered 1796
- deployed during WW1
  - mostly against animals
- deployed during WW2
  - esp. by Japan in China (2-500 000 dead)
  - plans to attack USA: “Cherry Blossoms at Night”
  - other powers quite behind, eager to “learn”
- very active development during Cold War on both sides



# GRUINARD ISLAND

THIS ISLAND IS  
GOVERNMENT PROPERTY  
UNDER EXPERIMENT  
THE GROUND IS CONTAMINATED  
WITH ANTHRAX AND DANGEROUS.  
LANDING IS PROHIBITED  
BY ORDER 1950



## Spanish Flu

- 1918-1920
- global population around 1,75 bil.
- WW1 casualties:
  - 15-20 mil.
- WW2 casualties:
  - 40-100 mil.
- Spanish Flu:
  - 50-100 mil.
  
- Black Death:
  - 75-200 mil.



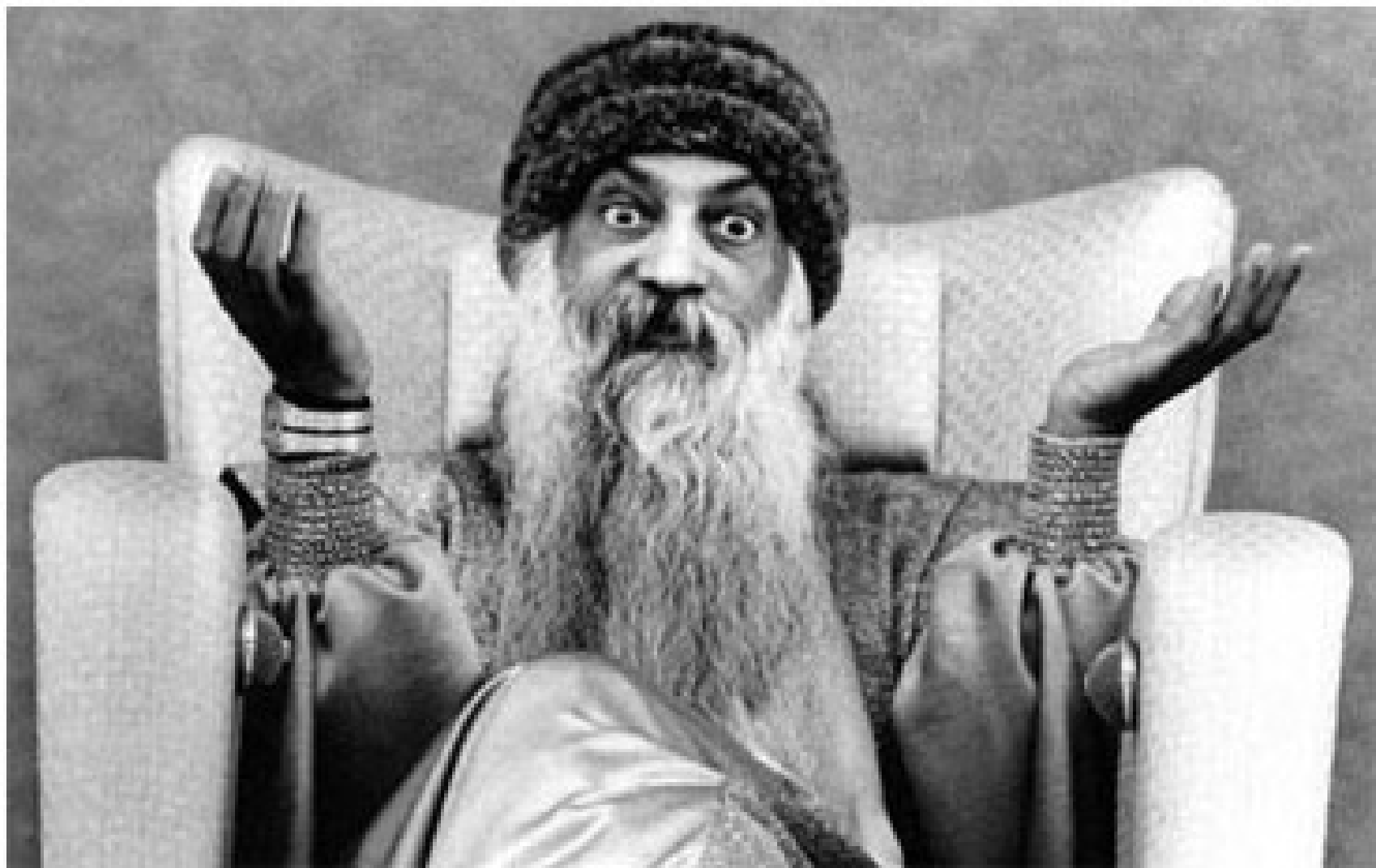


# Terrorism and assassinations and others

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- 1978, Bulgarian dissident, Georgi Markov killed by ricin pellet
- 1984, Dalles, Rajneesh and salmonella
  - 751 infected, 45 hospitalized
  - today known as Osho, still popular
- 1990-5, Aum Shinrikyo
  - unsuccessful attempts to deploy anthrax, botulin and ebola
- 2001, Bruce Ivins, anthrax letters
  - 22 infected, 5 dead
  - ended with suicide, still unclear motivation
  
- many unfulfilled threats and plans from a number of organizations







4TH GRADE  
GREENDALE SCHOOL  
FRANKLIN AVE NJ 08824

SENATOR DASCHLE  
509 HART SENATE OFFICE  
BUILDING  
WASHINGTON DC 20540-0000

09-11-01

YOU CAN NOT STOP US.  
WE HAVE THIS ANTHRAX.  
YOU DIE NOW.  
ARE YOU AFRAID?  
DEATH TO AMERICA.  
DEATH TO ISRAEL.  
ALLAN IS GREAT.

TOM BROKAW  
NBC TV  
30 ROCKEFELLER PLAZA  
NEW YORK NY 10112

09-11-01

THIS IS NEXT  
TAKE PENACILIN NOW  
DEATH TO AMERICA  
DEATH TO ISRAEL  
ALLAN IS GREAT

Edison  
New York Post  
1211 Ave. of the Americas  
New York NY 10036

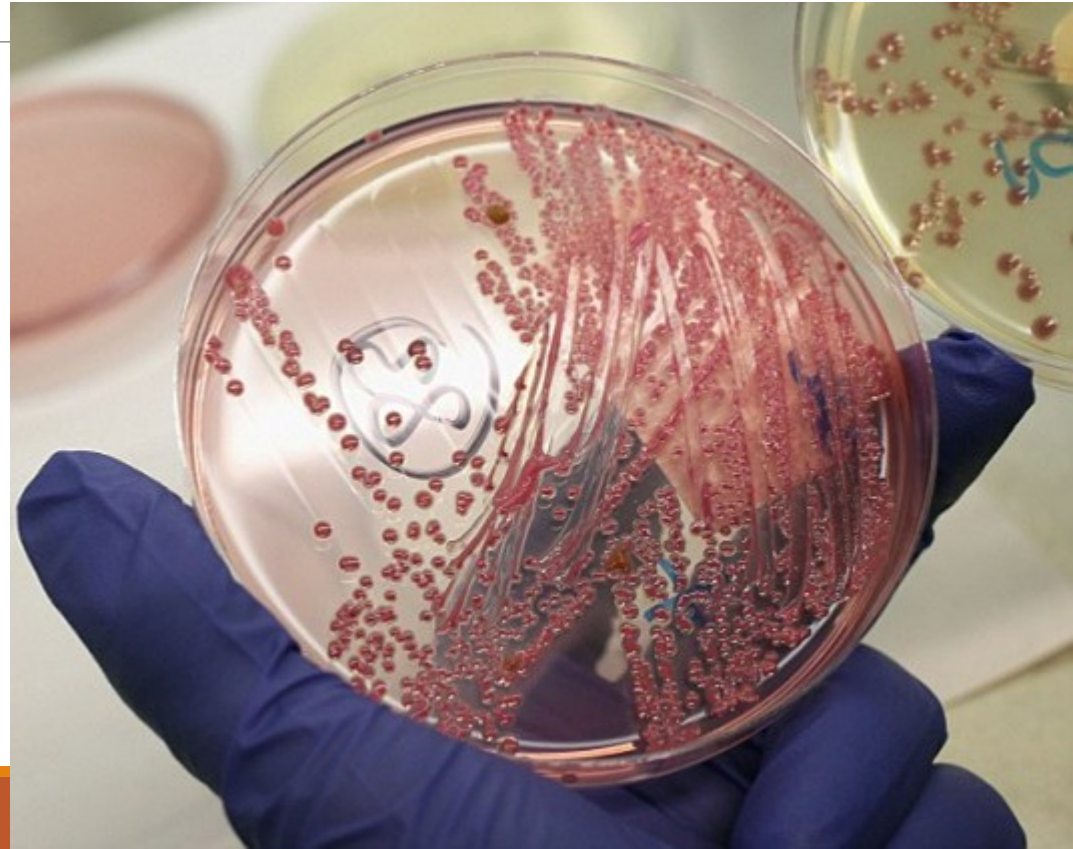
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# Current situation

- development relatively cheap, but difficult
- deployment very difficult
- growing bacterial resistance
  - <https://www.youtube.com/watch?v=plVk4NVIUh8>
- can be directly genetically modified now
  - chimeras, deimmunization, genetic targeting
- can accidentally leak or be acquired by terrorists
- engineered anti-material bioweapons possible



# Other controversies

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- designer babies
- artificial organs
- synthetic organisms
- GMO food
- gene editing

