EXPANSION OF INTERNATIONAL POLLUTION PROBLEMS IN THE BSR
FROM RADIOACTIVE FALLOUT TO TOXIC SUBSTANCES

I RADIOACTIVE FALLOUT

German science, technology and culture created much of our contemporary society.

Atomic warfare
6 and 9 August 1945

Facilities needed to build an atomic bomb in Sweden

Different nuclear weapon policies in the Baltic Sea region

- NATO members (Germany, not in Danish territory): nuclear weapons
- Warsaw Pact (incl. N-W Soviet Union, Poland and DDR): nuclear weapons (Sillamäe, Estonia)
- Finland: nuclear weapons not allowed in the WWII peace treaty
- Sweden started to develop its own atomic weapon right after WWII
- The strategic interests of the USA and the USSR dominated in the BSR as well

From atom to hydrogen bomb: test explosions in the 1950s

In 1961 the most powerful nuclear weapon (code name Ivan or Tsar Bomb) ever is exploded in Novaya Zemlya.
Research to define radioactivity of the Baltic Sea is started in the 1950s

- In Finland scientific measurements are started at the end of the 1950s by Department of Radiation Physics (UH) and Finnish Institute of Marine Research (FIMR)
- The director of FIMR (Ilmo Hela) is nominated in 1961 as the head of the new research laboratory of radioactivity of International Atomic Energy Agency (IAEA) in Monaco, France
- Global concern leads to international cooperation

Partial nuclear test ban, 1963

- United States, Soviet Union and Great Britain negotiated under the auspices of the disarmament commission of the United Nations in Geneva in 1958-1962
- In 1963 an agreement is signed banning nuclear tests in the atmosphere, in the seas and on the ground – China does not sign the ban
- All major powers continue underground nuclear weapon tests and nuclear arms race expands

ATOMIC CULTURE

“This is the D-Day. Total destruction by nuclear weapons, and from this hour forward the world as we know it no longer exists. And over all the lands and waters of the earth, hangs the atomic haze of death. Man has done his best to destroy himself…”


Impact of the partial test ban on the atmosphere

Atomic waste should not be dumped into the Baltic Sea”
Nuclear arms race, development of rocket propulsion and computers started during WWII led to landing on the Moon

• USSR, Juri Gagarin, first man in space, Vostok 1961:
  "Orbiting Earth in the spaceship, I saw how beautiful our planet is. People, let us preserve and increase this beauty, not destroy it!"

• USA, Apollo 8 (1968) and landing on the moon (1969):

Earthrise: "Look at that picture over there! There’s the Earth coming up. Wow, is that pretty."

Outcome of WWII atom bombs and Cold War arms race

Second World War and Cold War created a completely new culture made of:

- Fascism, Communism, Nazism, militarism
- Global warfare, millions of victims, refugees
- Concentration camps, genocide
- The first mass destruction of cities
- Atomic warfare against Japan, nuclear fallout, accidents
- States supported science and technology (nuclear physics, rockets, computers, biological warfare)
- Space race, Earth just one but unique planet in the universe

For the first time people start to think than the human race may cause end of the world

Since August 1945 environmental catastrophism has since been part of environmental awareness and politics

II TOXIC SUBSTANCES

Basic features of toxic substances

• Synthetic chemical products
• Direct toxic impact on living organisms
• Cumulative accumulation in tissues of human beings and other top predators in the food chains
• Disappers very slowly from ecosystems

DDT

• Dichlorodiphenyltrichloroethane, commonly known as DDT, is a colorless, tasteless, and almost odorless chemical compound
• It was first synthesized in 1874 but DDT’s insecticidal action was discovered by a Swiss chemist in 1939
• It was obtained and used on massive scale during and after WWII by the US Army as an insecticide to prevent spread of malaria and typhus among troops and civilians
• In 1948 the Swiss inventor received the Nobel prize in Stockholm

Production and use of DDT in the United States

- [Graph showing production and use of DDT over time]
Debate on toxics in the 1950s and 1960s

- International debate was started by the Minamata Bay scandal in 1957.
- Wastewaters containing mercury of a local factor poisoned hundreds of local poor fishermen and members of their families.
- The outcome was a long and painful legal process that lasted until the 1970s.

The number of seals in the Baltic Sea in 1900-2020

- In the early 20th century there were about 90,000 grey seals and 190,000 ringed seals – in total 280,000 seals.
- In the 1980s the total number of seals was about 10,000.
- In 2020 the number of ringed seals will be about 18,000 and grey seals 38,000 - all together 56,000 seals.

The number of offsprings of sea eagle, 1970-2010 (Finland)

"The last eagles"
- A swedish nature book and nature documentary film (1923)
The decrease of the contents of DDT and PCB compounds and its impact on the fertility of sea eagle and health of seals

Conclusions

- **Radio active fallout**: the contents of radionuclides in the sediments of the Baltic Sea are still high but they are not on a dangerous level anymore
- **Toxic substances**: the contents are still high in certain regards but the overall trend is decreasing and the future seems bright
- **The recovery of species** that were some decades ago on the brink of extinction has been almost miraculous – but also problematic