

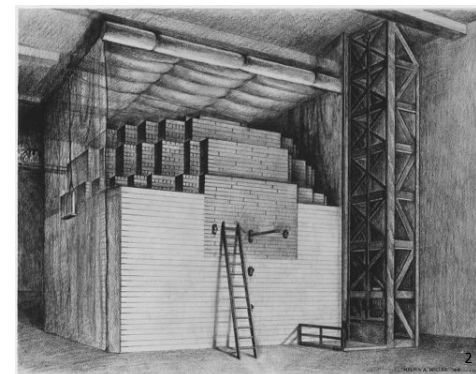
Atomic Age Symposium II, University of Chicago May 5, 2012

Japanese Nuclear Development and the Disaster of the Fukushima NPP

Hiroaki KOIDE: Research Reactor Institute, Kyoto University, JAPAN

Chicago Pile

The first reactor
built by human
beings



Argonne National Laboratory



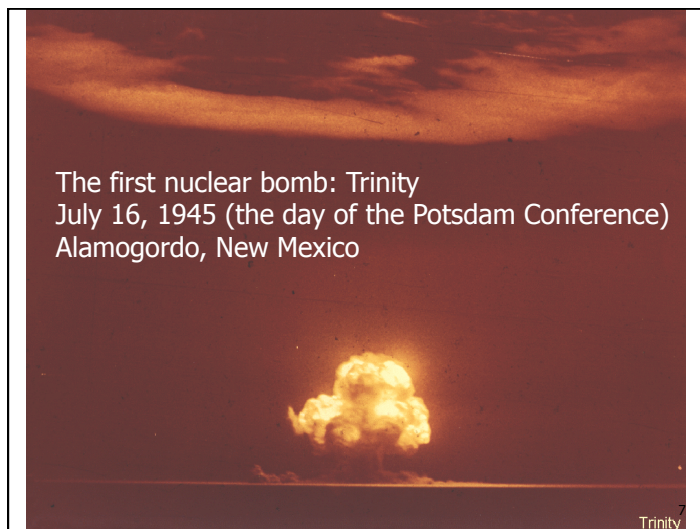


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The last sentence ---
 "There is __ danger to visitors."
 The word "NO" has been scraped
 away.



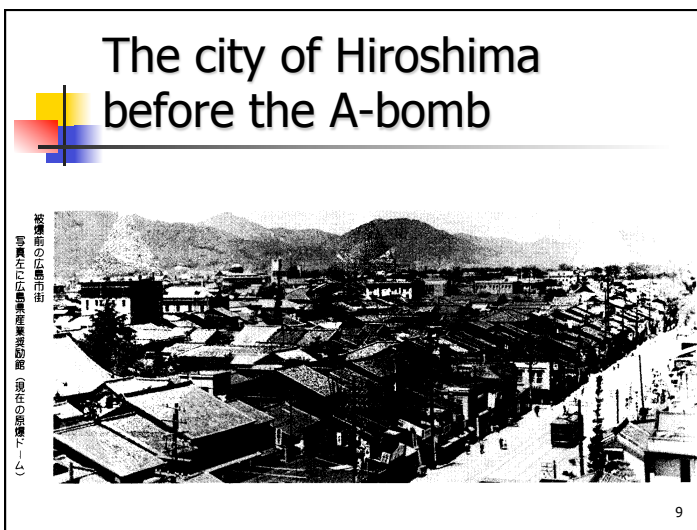
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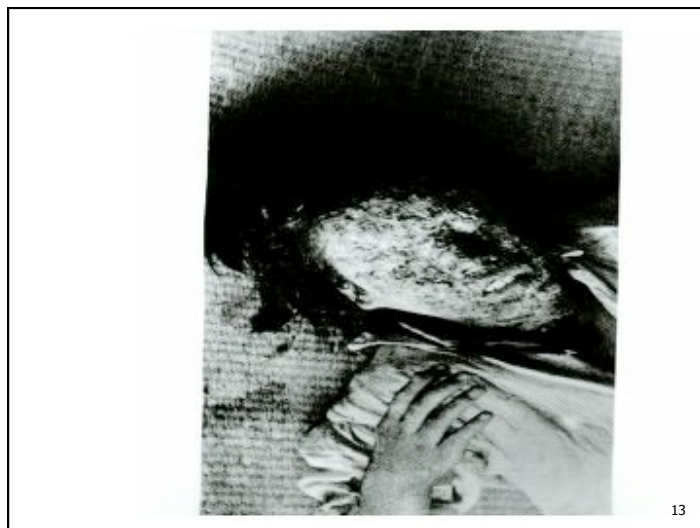


Trinity

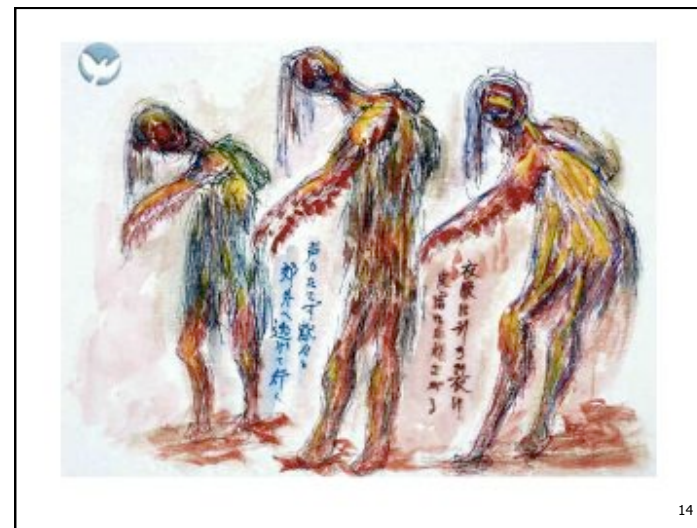


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JCO Criticality Accident (Sep. 30, 1999)



事故発生時の作業状況。大内はウラン溶液を注ぐロウトを支えていた。溶液を注いでいた篠原理人も大量の中性子線を浴びた。
State of operation by the workers at the time of the incident. Ohuchi was holding the funnel to pour in the Uranium solution.
Masato Shinohara, who was pouring the solution, was also flooded with neutron beams.

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Exposed Arm



8 days after the exposure

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Destroyed skin



Same arm 26 days after exposure

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Illusions about nuclear power

"Nuclear power holds unimaginable potential as a source of electricity. Considering how natural resources are gradually disappearing from the face of the earth, we can say that energy from nuclear power is essential for human survival."

"[...] Electricity charges will go down to one/two thousandth of current rates."

"[...] Nuclear power, unlike thermal power, does not require huge plants or smokestacks or storage facilities. It does not need railways or trucks for daily delivery of coal or removal of ash. It does not even need water for boilers since it can use airtight gas turbines."

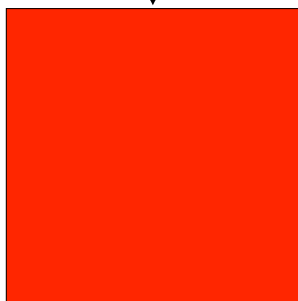
"[...] Nuclear power can be generated in a building basement."

From *The Mainichi* Newspaper, July 2, 1949

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Amount of Uranium-235 fissioned
in one 1000MW NPP annually
1 ton
(equivalent to the weight of fission products)

Amount of
Uranium-235
fissioned in
the Hiroshima
bombing
800g



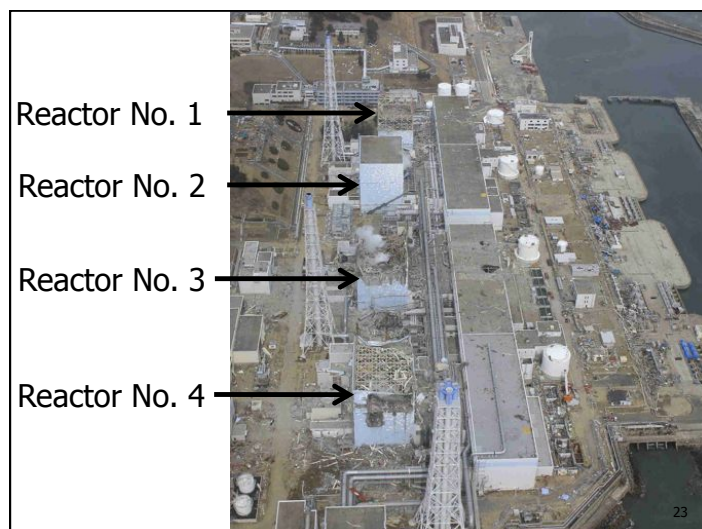
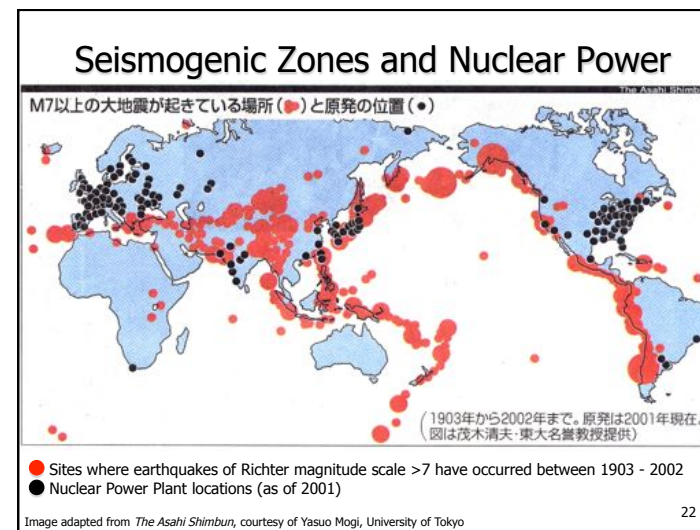
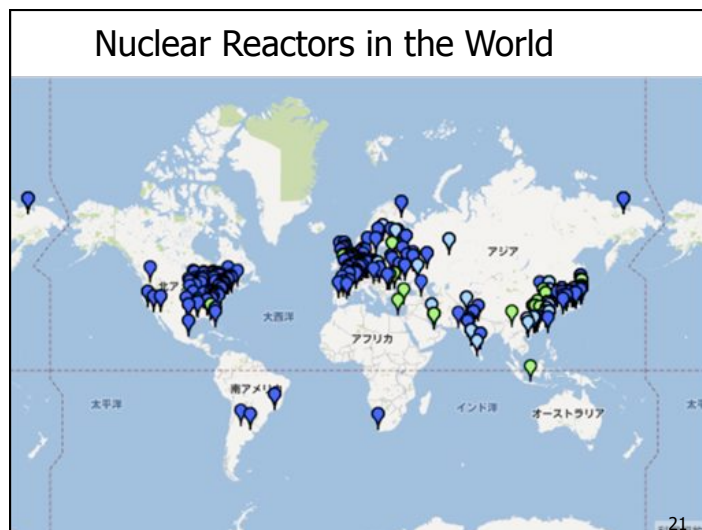
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White Paper on "Nuclear Safety" (2000)

Most of those involved with nuclear power in fact do not think "Nuclear Power is absolutely safe". Nevertheless, how did such a misguided "myth of nuclear safety" come to be created? Here are some factors:

- Excessive trust in a design that emphasized safety more than in other fields.
- Too much confidence in the absence of fatalities over a long period of time.
- Fading memories of accidents in the past.
- Effort to provide clear arguments in seeking public acceptance of NPPs.
- **Strong desire that NPPs be absolutely safe.**

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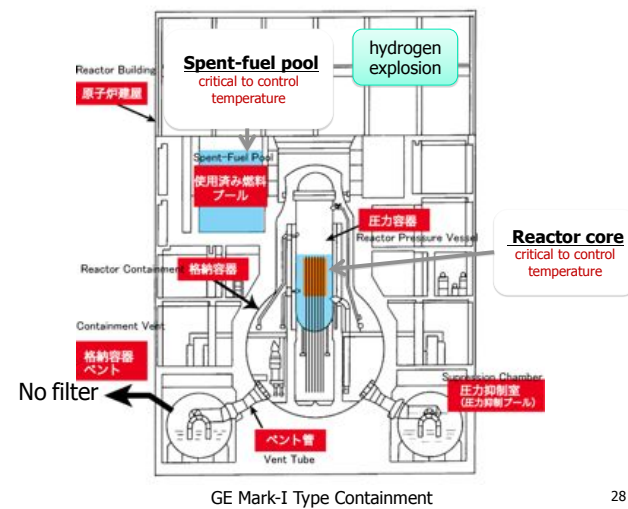
Unit No. 4 Unit No. 3

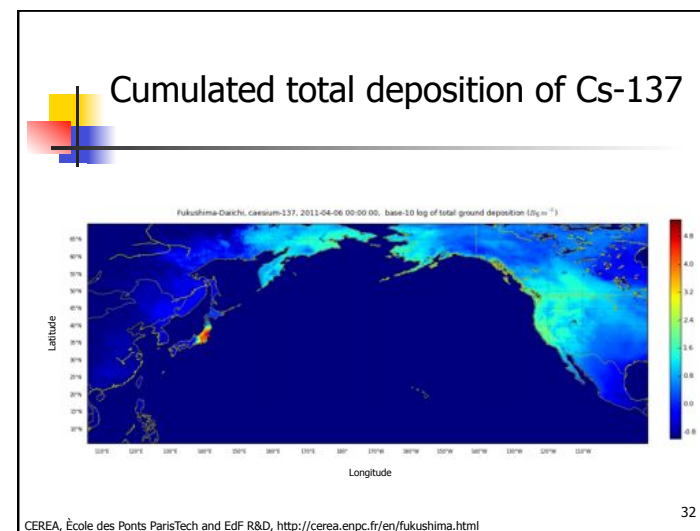
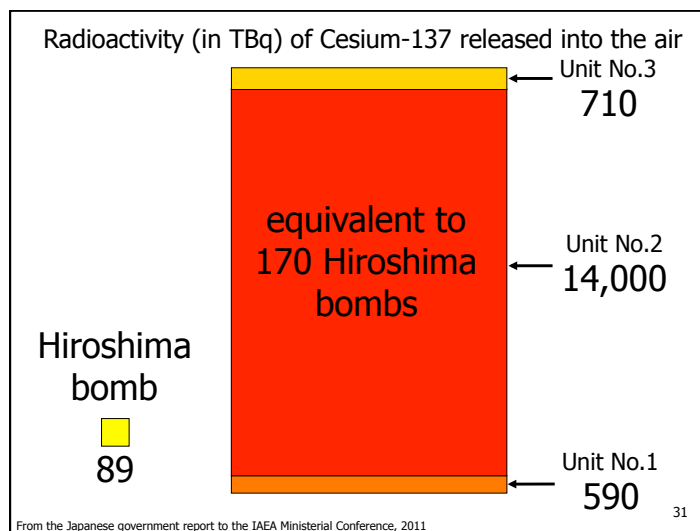
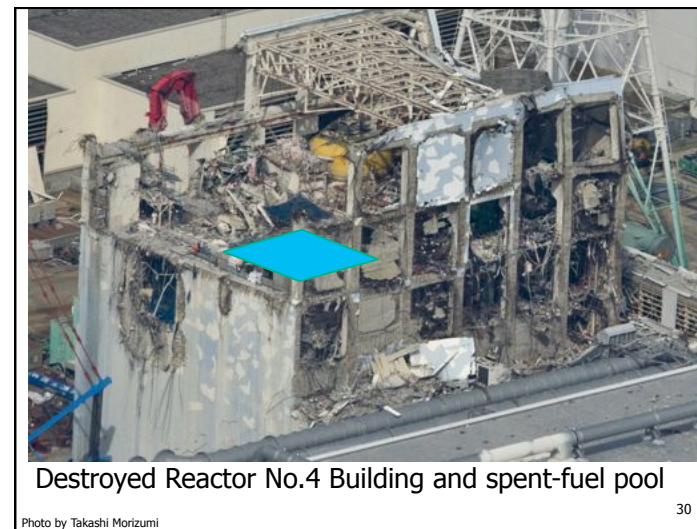
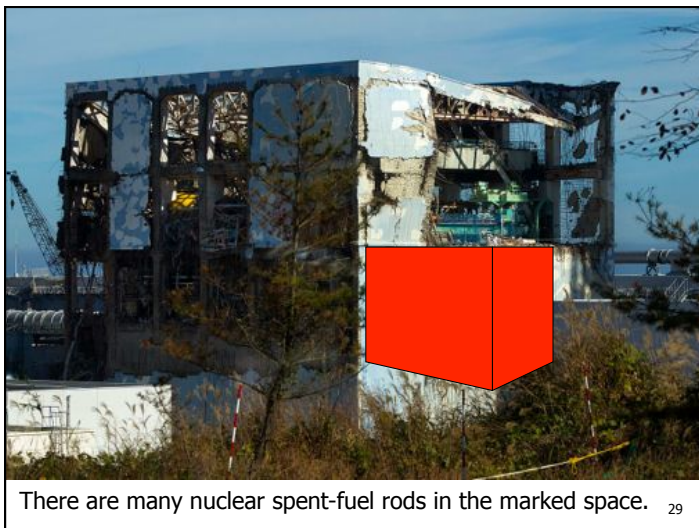


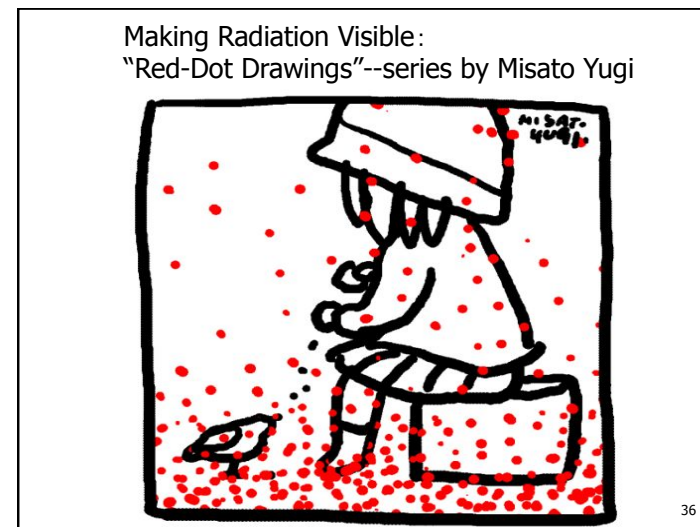
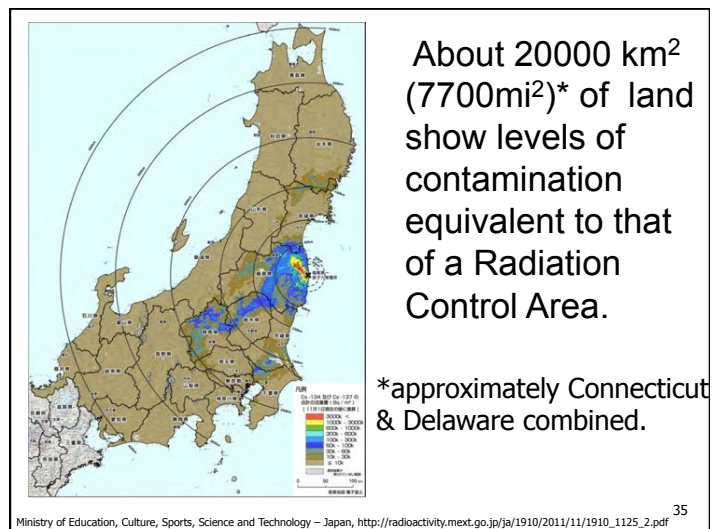
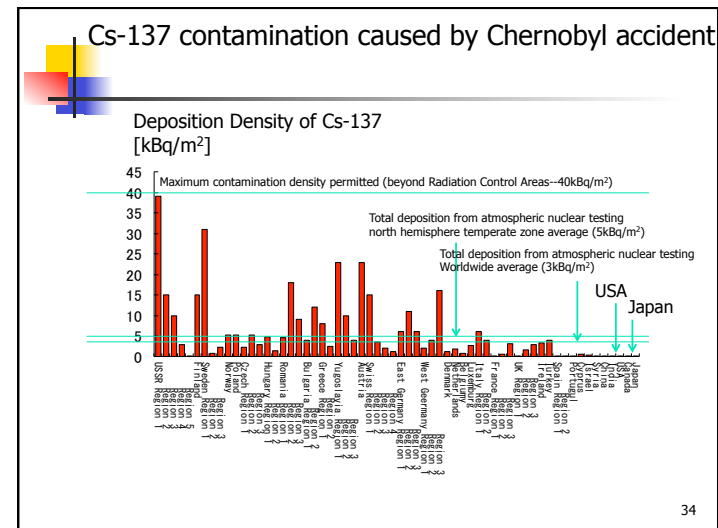
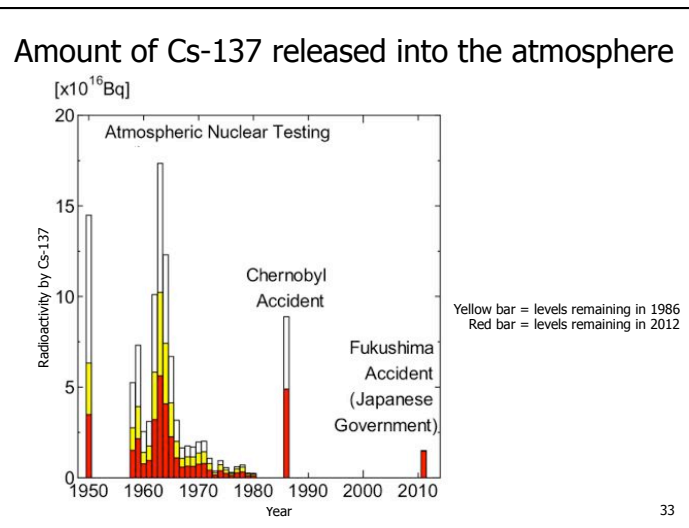
Blackout in the central control room



Workers struggling with only flashlights







毎日新聞
1 2011年(平成23年)4月26日(水)

90人置き去り 患者45人死亡

原発4キロ先で爆発 警官 逃げるしかない

It is said that no one was killed in the accident, but ...

at the time of the explosion, the police said, "Run!"

90 patients were left in a hospital and half of them died there.

The Mainichi Newspaper, Apr. 26, 2011

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Cows are family members

Photo by Soichiro Koriyama

Dead cattle

At a barn within 15 kms from Fukushima No.1 NPP, a cow with eye socket hollowed out and a headless calf.

Photo by Kosuke Ota and Soichiro Koriyama

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Namie Township, within 20km of Fukushima No.1 NPP.

Not only cows but horses are dying in this stable.

Photo by Kosuke Ota

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Evacuated dairy farmers abandoned their cattle.
A herd of cows wander in town, looking for food.



Photo by Kosuke Ota

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Futaba Township. The sign reads,
"Correct understanding of nuclear power brings abundance."



Photo by Rei Shiba

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Is Japan governed by the rule of law?

If a citizen violates the law, he/she is punished.
So is the government obliged to abide by the law.

There are laws about radiation in Japan:

- Ordinary people should not be exposed to doses in excess of 1 mSv/year.
- Materials contaminated in excess of 40 thousand Bq/m² must not be taken out of Radiation Control Areas.

The Japanese Government has behaved criminally in the Fukushima NPP accident.


It is the government that has broken the laws.

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Charles S. Chaplin, Jr
"Monsieur Verdoux"

One murder makes a villain,
millions a hero.

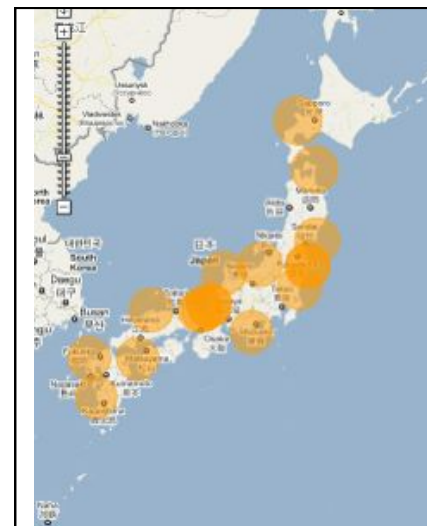
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 The truth of the damage caused by the Fukushima NPP accident


- Loss of vast lands
- Forced exposure
- Collapse of primary industries
- Collapse of lives

The damage is too great for TEPCO to compensate.
It is also too great for the government of Japan.

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 Areas of Japan within 100 km (63 miles) of a nuclear power plant

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 How Close Is Your Home to a Nuclear Power Plant?
(zip code 60637)

How close is your home to a nuclear power plant?

If a crisis at a nuclear reactor happened in the U.S., could you be living in a danger zone? In a 16-mile radius, the Nuclear Regulatory Commission says the air could be unsafe to breathe in the event of a major catastrophe. In 50 miles, food and water supplies may be unsafe.

Enter your address or ZIP code:
60637

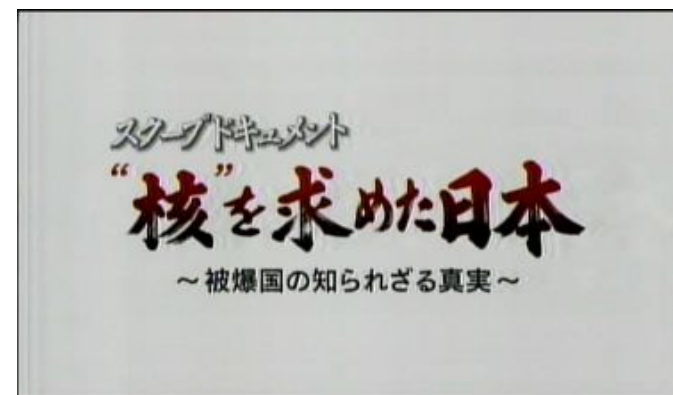
Closest Plants	Distance
Boonville 2, 3	43 mi
Boonville 1, 2	49 mi
D.C. Comb 1, 2	58 mi
La Salle 1, 2	68 mi
Falkenberg	76 mi



CNN Money, http://money.cnn.com/news/specials/nuclear_power_plants_locations/

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"Scoop Documentary" (TV program)
"The Japan That Sought to Go 'Nuclear'
The Unknown Truth of an A-bombed Nation"



Japanese Foreign Policy Outline

For the time being, Japan will adhere to the policy of not possessing nuclear weapons regardless of whether or not it takes part in the NPT (nonproliferation treaty). But Japan will continuously maintain the economic and technical capability for producing nuclear weapons.

The government will cultivate in the people the understanding that policy decisions on nuclear weapons depend on calculations of advantages and disadvantages in international politics and economics.

Foreign policy committee, Ministry of Foreign Affairs, 1969

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Japanese Government Position on Nuclear Weapons (1982)

The Japanese Constitution does not prohibit the maintenance of a minimum of war-waging capability as needed for self-defense.

Accordingly, to the extent it does not exceed that minimum, Japan is entitled to possess weapons, whether nuclear or conventional.

Government response to questioning in the Diet, April 5, 1982

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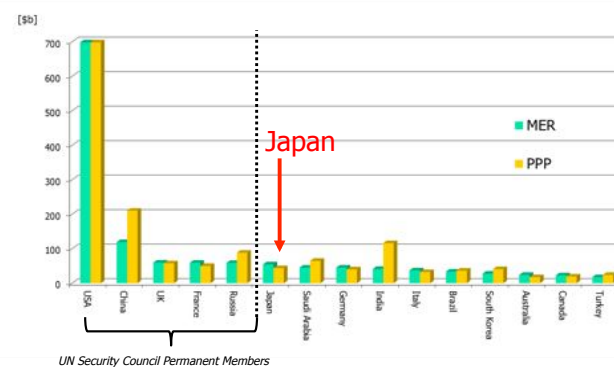
High-ranking official in the Ministry of Foreign Affairs

"In my view, Japan should retain the choice of possessing nuclear weapons as a diplomatic tool. Although we have nuclear capability, for the time being, as a matter of policy we will not own any. We should be accumulating Plutonium and developing rocket technology, which can be transferred to missile production."

The Asahi Shimbun, 29 Nov. 1992

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Military Expenditures




SIPRI (Stockholm International Peace Research Institute), <http://www.sipri.org/yearbook/2011/files/SIPRIYB1104-04A-04B.pdf>

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The End

Thank you .




The world has been changed after
the Fukushima NPP accident.

Places where ordinary people live and work are
contaminated more highly than Radiation Control
Areas.

Land, food, rubble, sludge from sewage—all have
been turned into radioactive materials.


We have no choice but to live in this contaminated
world.



The victims are faced with
difficult choices

Physical harm
through radiation exposure

Collapse of life
through evacuation




The question of responsibility

We will be asked how we lived during this period by
children in the future.

Just like adults who lived through the wars were
asked.

Now, following the Fukushima NPP accident, we will
be presented with the same question.


 Awareness of our own responsibilities

Who is responsible for the Fukushima No.1 accident?

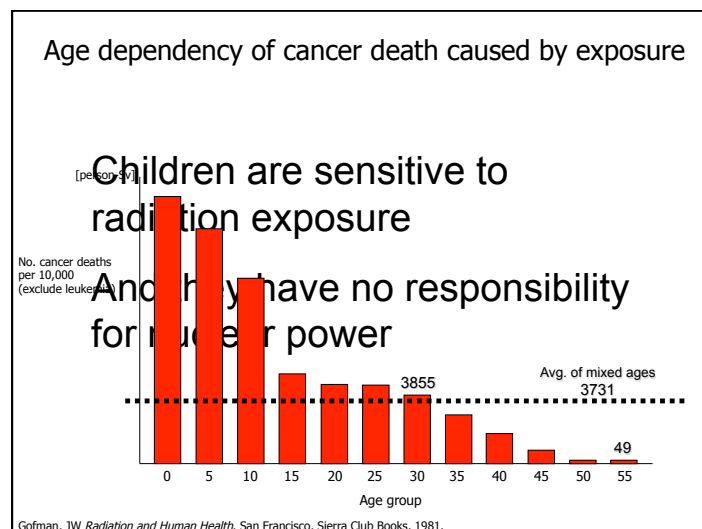
Heavy responsibility must go to...


- The state (the Diet and the government)
- TEPCO
- The nuclear industry
- The mass media
- The judiciary
- The scientists promoting NPPs

I have never promoted NPPs. But, unlike ordinary people, I feel responsible as a nuclear scientist.

 I would like to

1. Protect children from exposure
2. Protect primary industries



 The Japanese government seeks

To conceal the truth of contamination
They establish their standards

Foods showing an excess
are taken off the market.
All other foods are declared safe.

So, there is nothing to worry about.

They must tell the truth about contamination

Primary industries in the compulsory evacuation areas have collapsed.

Foods produced in lands except those areas ought not to be thrown away.

Farmers cannot produce crops intended for disposal.

I myself don't want to eat radioactive food and I don't want anyone else to eat it.

But all foods are contaminated. It is just a question of degree. We have to face up to contaminated food, regardless of government standards.

What TEPCO and the government must do is not to provide compensation for contaminated food, but to measure and disclose levels of contamination.

Fulfilling our responsibilities

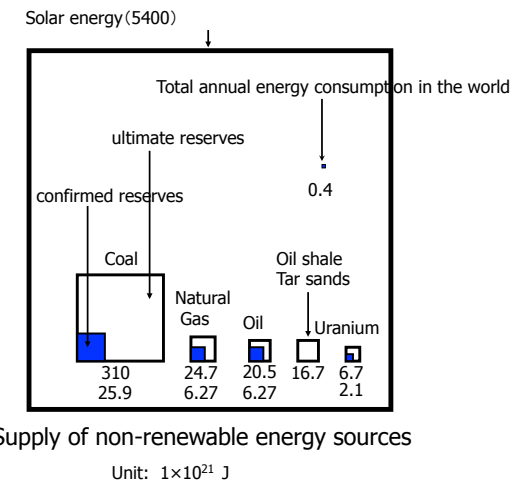
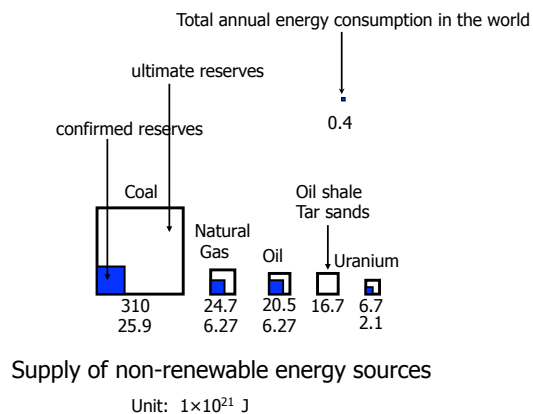
Food contamination must be measured thoroughly

On the basis of such inspection, food should be classified according to the appropriate target category. For example, x should only be for those 40 and up.

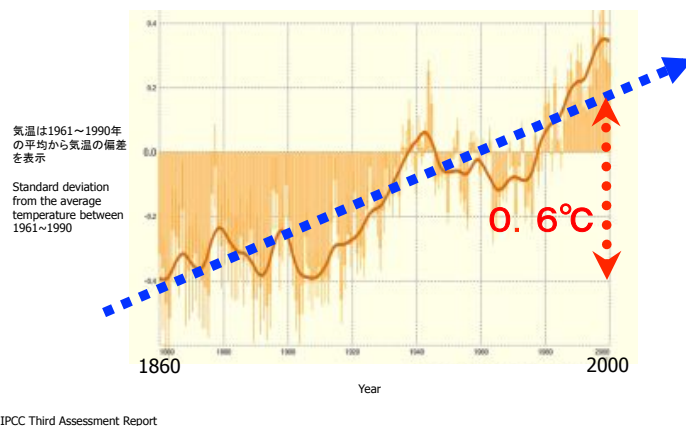
Give children less contaminated food

Have adults who are responsible for this state of affairs, who are less sensitive to radiation exposure, eat the more contaminated food.

Natural resources available on Earth

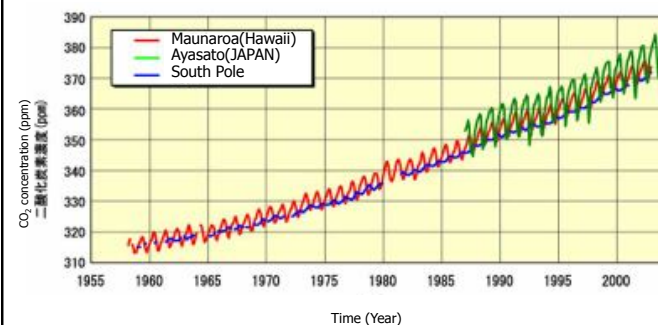


Global warming over the past 140 years

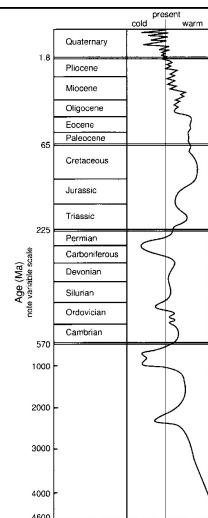


Amount of CO₂ in the atmosphere

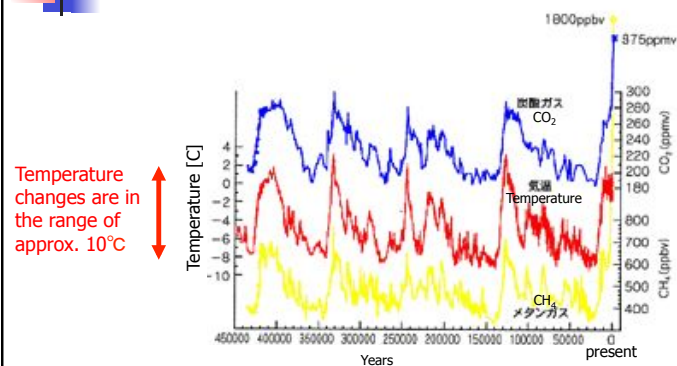
It has increased over the past 50 years

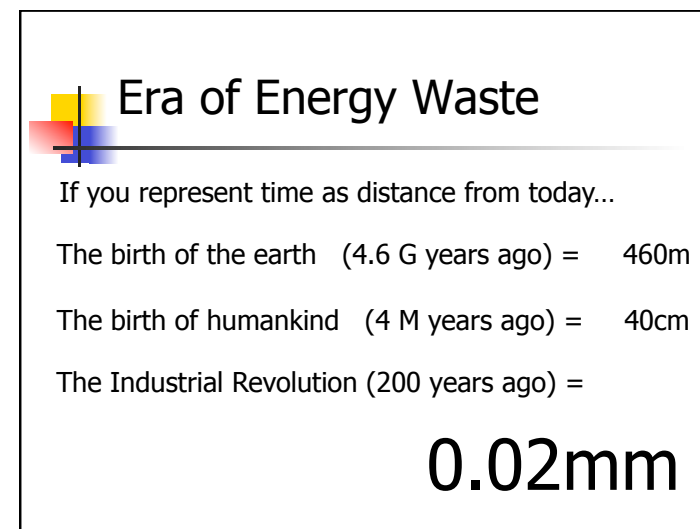
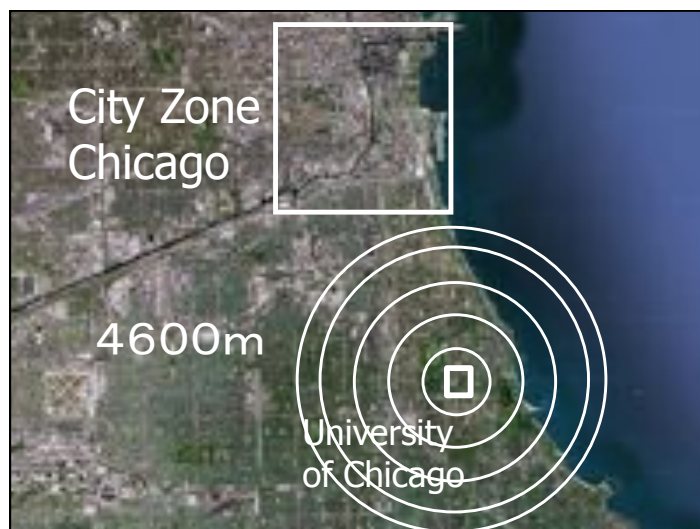
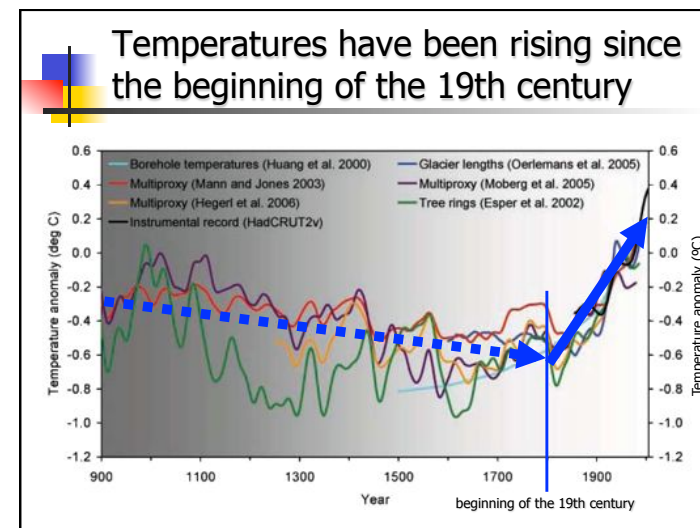
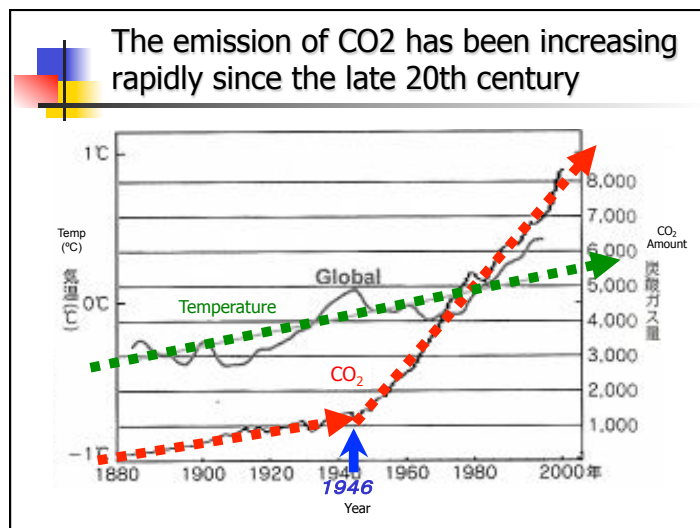


The earth was a warm planet.



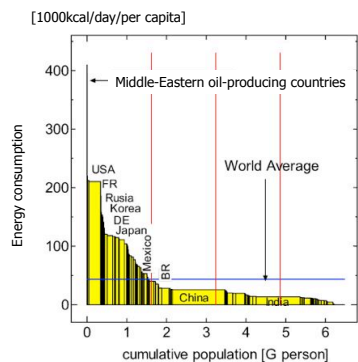
Temperature change and CO₂ in the atmosphere





Gap and Inequality in Energy Consumption

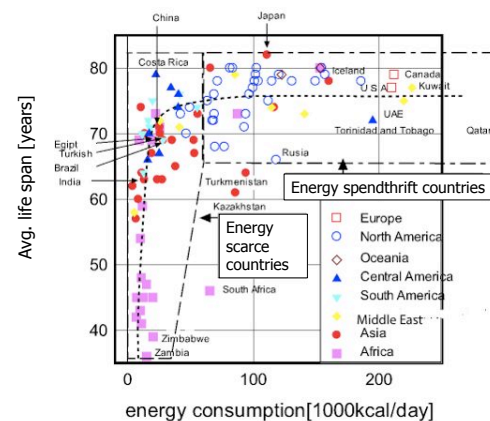
Unfair structure of global energy consumption



* Population as of 2005; Energy consumption as of 2002

Energy consumption and life span

The relationship between energy consumption and average lifespan (2003)



If the world were a village with a population of 100, and if the grains produced in the village were shared fairly, everyone would have meals of 2800 kcal/day.



12-year-old Ukrainian boy looking out of the sewage pipe that is his home. June, 2006

If the world had 100 children, 7 of them live in slums, and 5 of them would be living on street, away from their families.



米軍の強制捜査を受けるイラク人男性と家族。ラマディ（イラク）、06年2月 Photo by Guy CALAF WorldPictureNews/G-Photo
Iraqi man under investigation by US troops in his house. June, 2006

If there were 100 children in the world, 9 of them would live in war zones. 80 of 100 citizens killed in war are women and children.



飲み水を集めるために雨水をすくうスーダンの国内避難民の子どもたち。ダルフル（スーダン南部）、05年4月 Photo by Moses MAJUMDAR/REUTERS
Refugee children in Sudan gathering rainwater to drink. April, 2005

75 out of 100 people would have access to stores with food, and houses to keep out the rain and dew. But 25 out of 100 would not. 17 out of 100 would not have clean, safe drinking water

NPP is a symbol of discrimination

We produce poison that cannot be eliminated.

And leave it for our descendants.

Once there is an accident, the resulting harm is immense

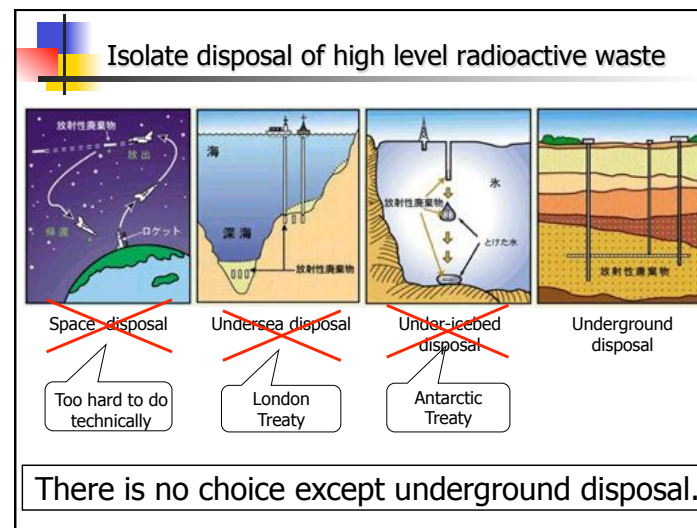
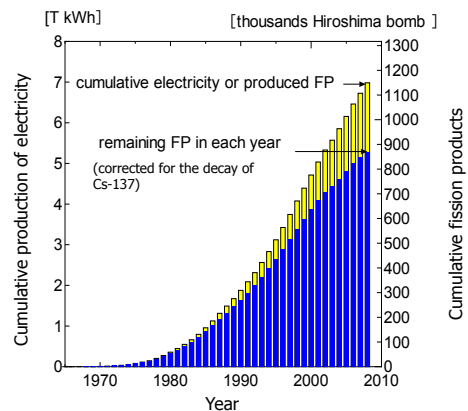
So, NPPs are pushed on sparsely populated areas.

None wants to be exposed to radiation,
so we leave subcontractors to be exposed.

NPPs are apartment buildings without toilets

NPPs produce radioactive materials, nuclear fission products. As yet, we have no technologies for getting rid of them. We need to keep them away from our living environment for 1,000,000 years -- forever!

Japanese NPPs have produced a massive amount of fission products



Japan stands on the edge of environmental crisis

