Everything You Wanted To Know About Radiation But You Just Never Knew Who To Ask

By

Robert L. Skinner

FEEL

SEE

HEAR

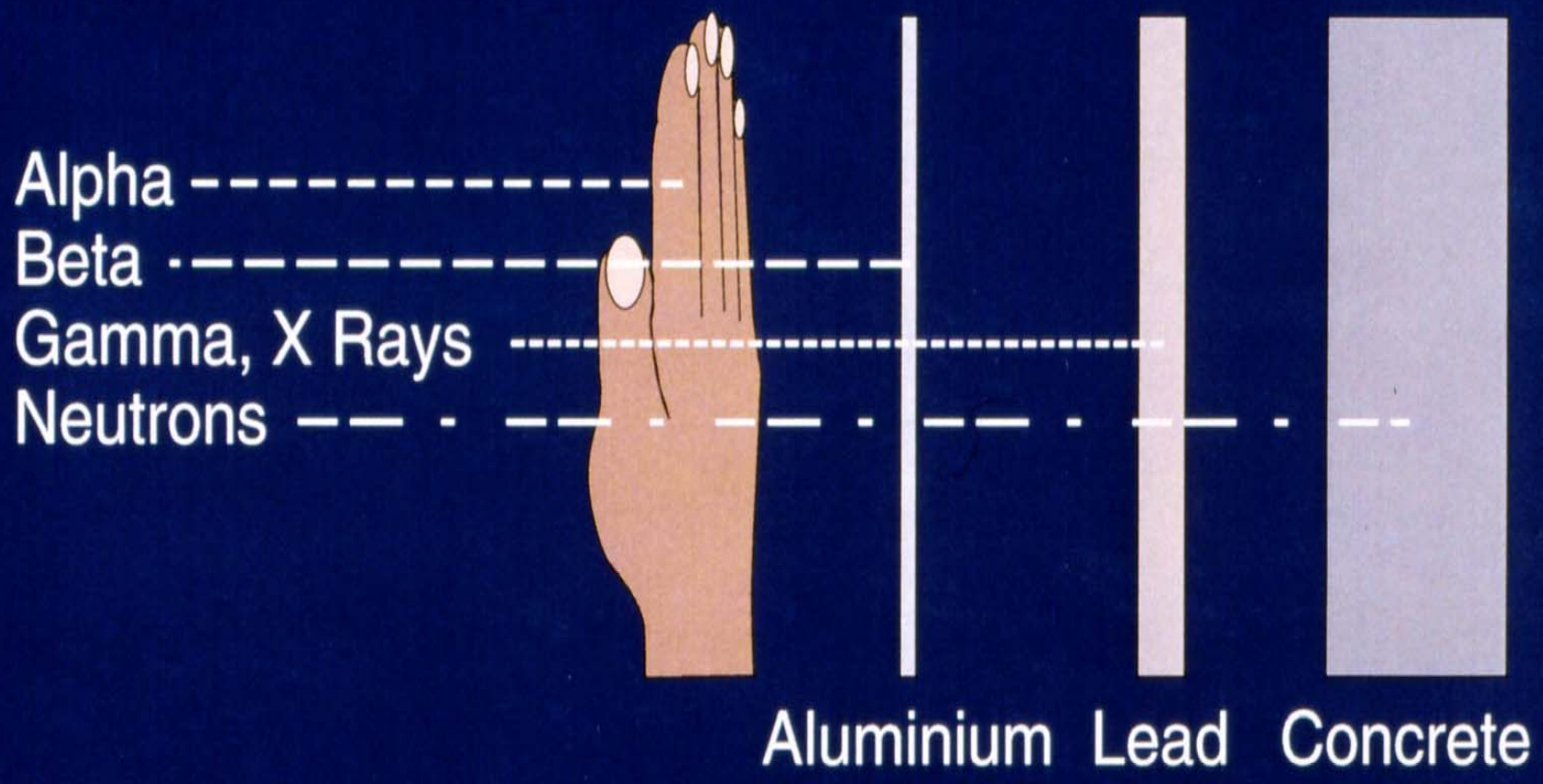
TASTE

SMELL

RADIOACTIVITY

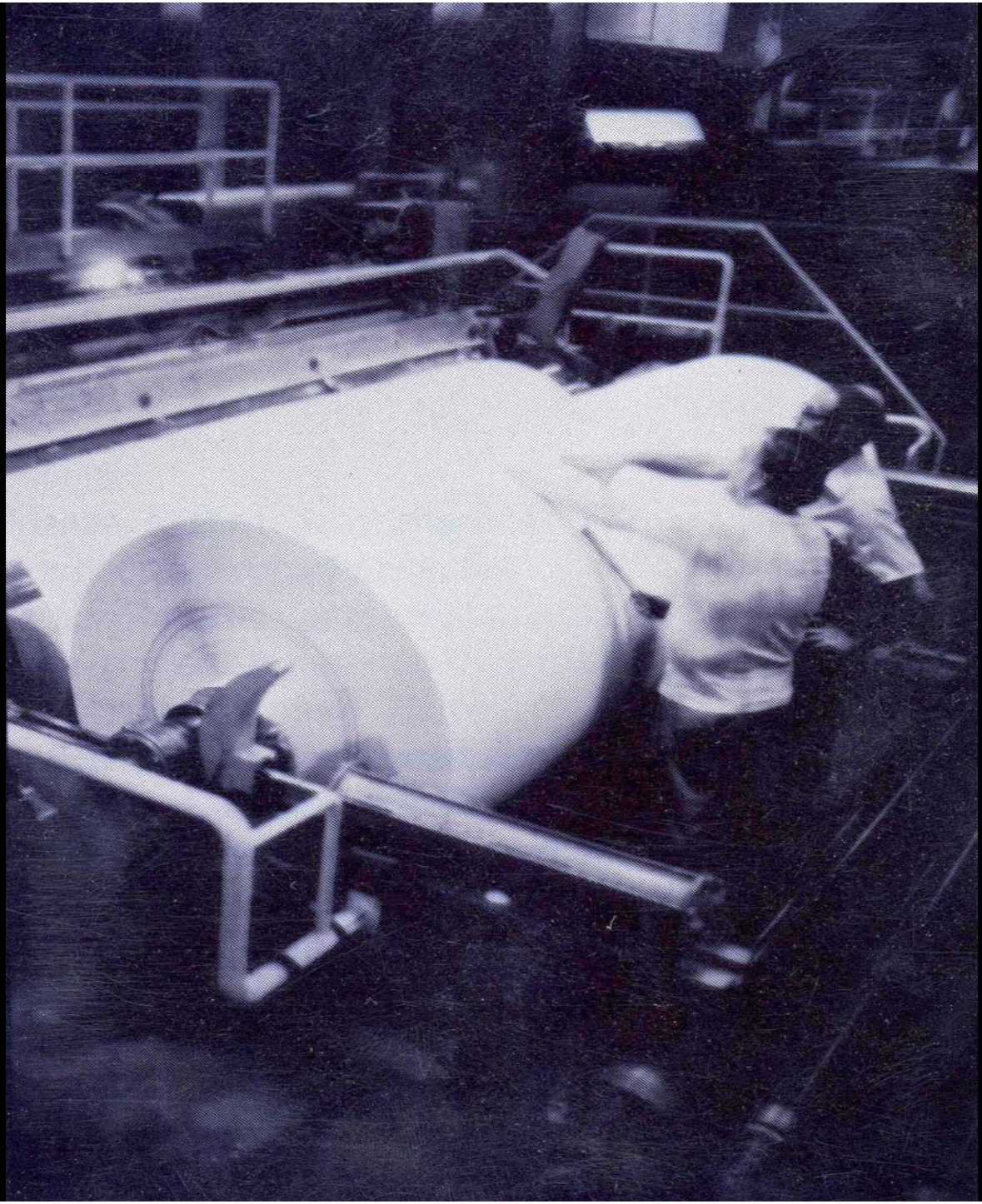
The process by which unstable atoms "try" to become stable, and as a result, emit radiation.

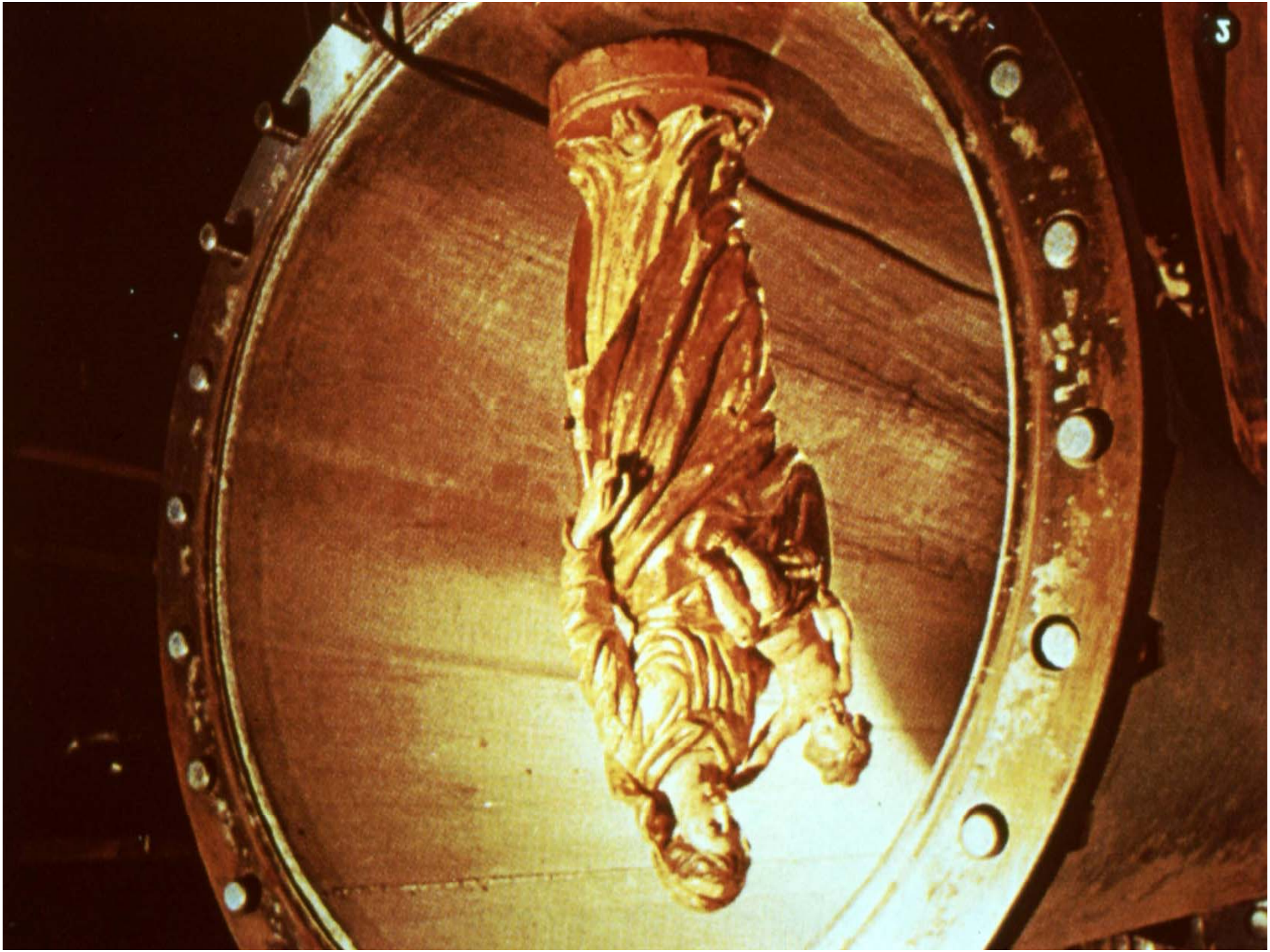
Types of Radiation



Every Day Uses of Radioactive Materials and Radiation

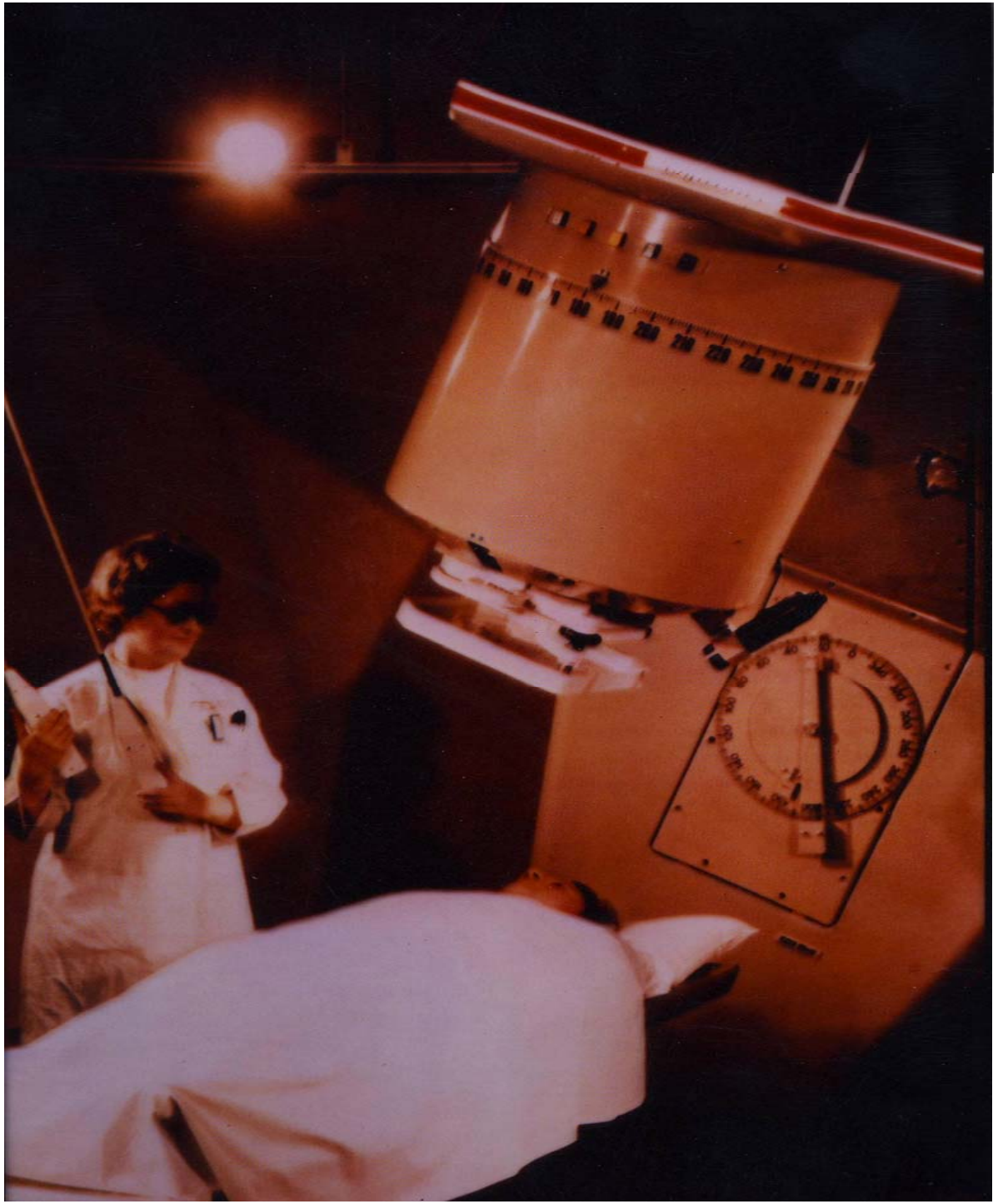
DELTA
DELTA

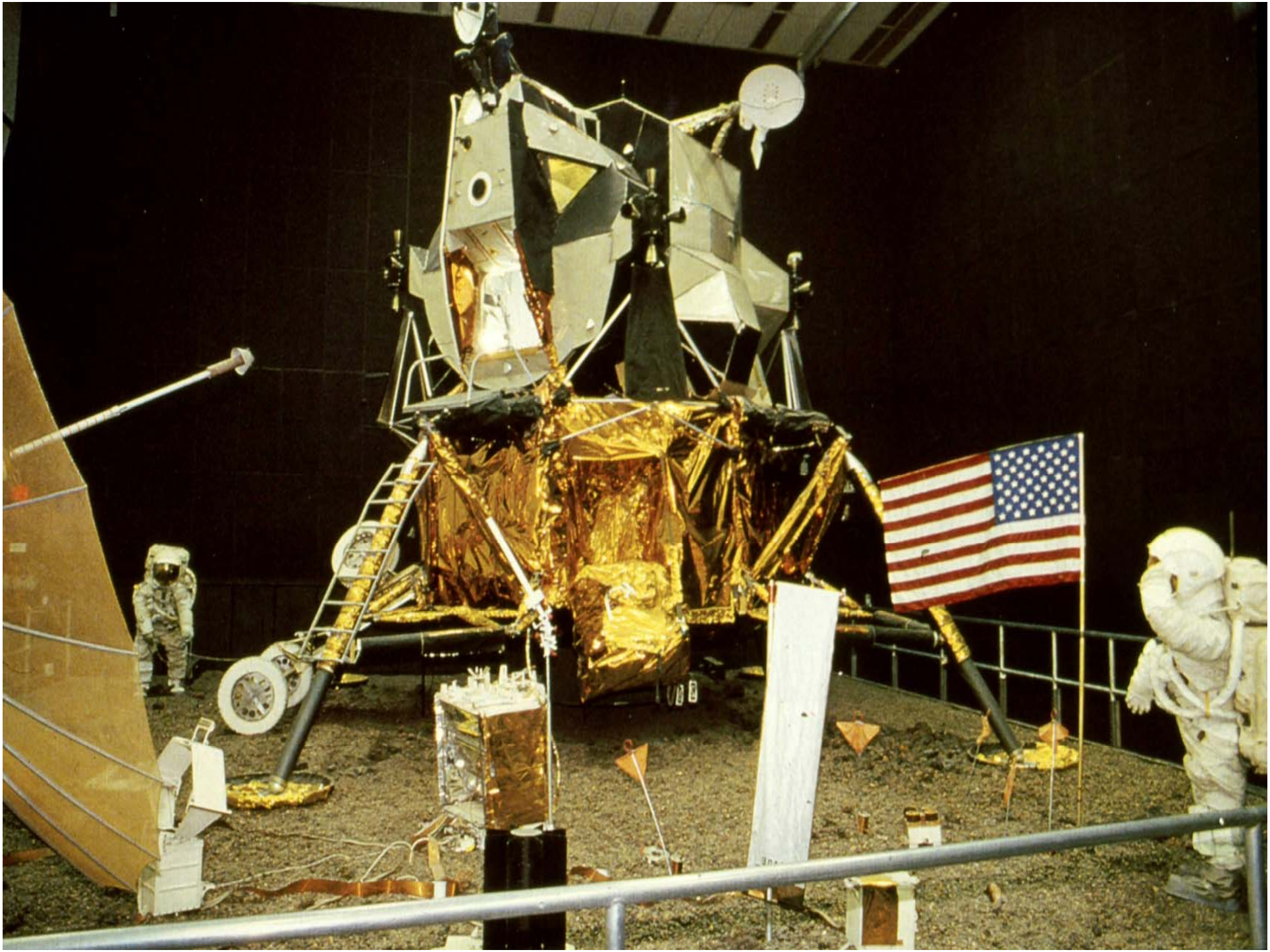


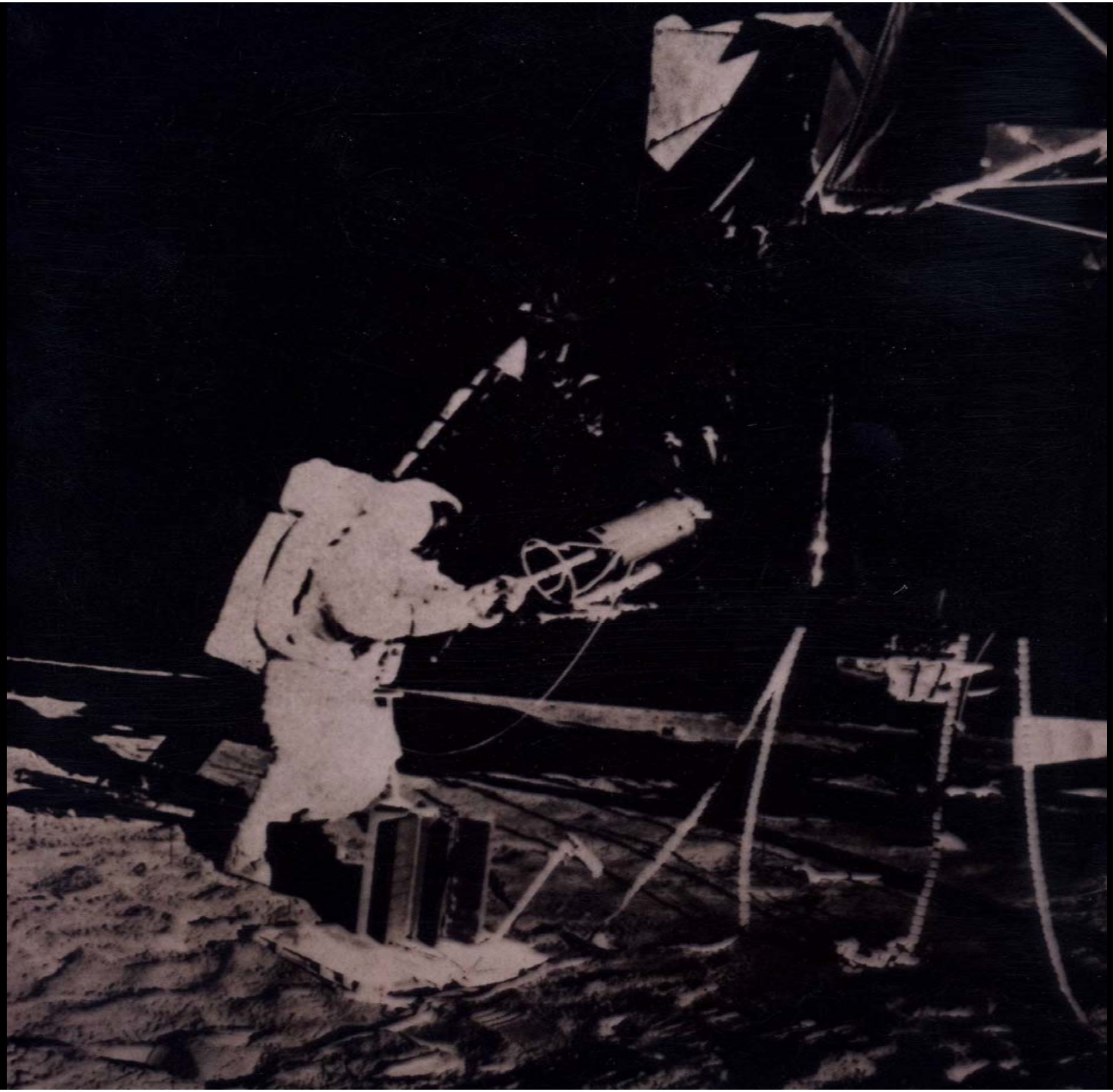

5

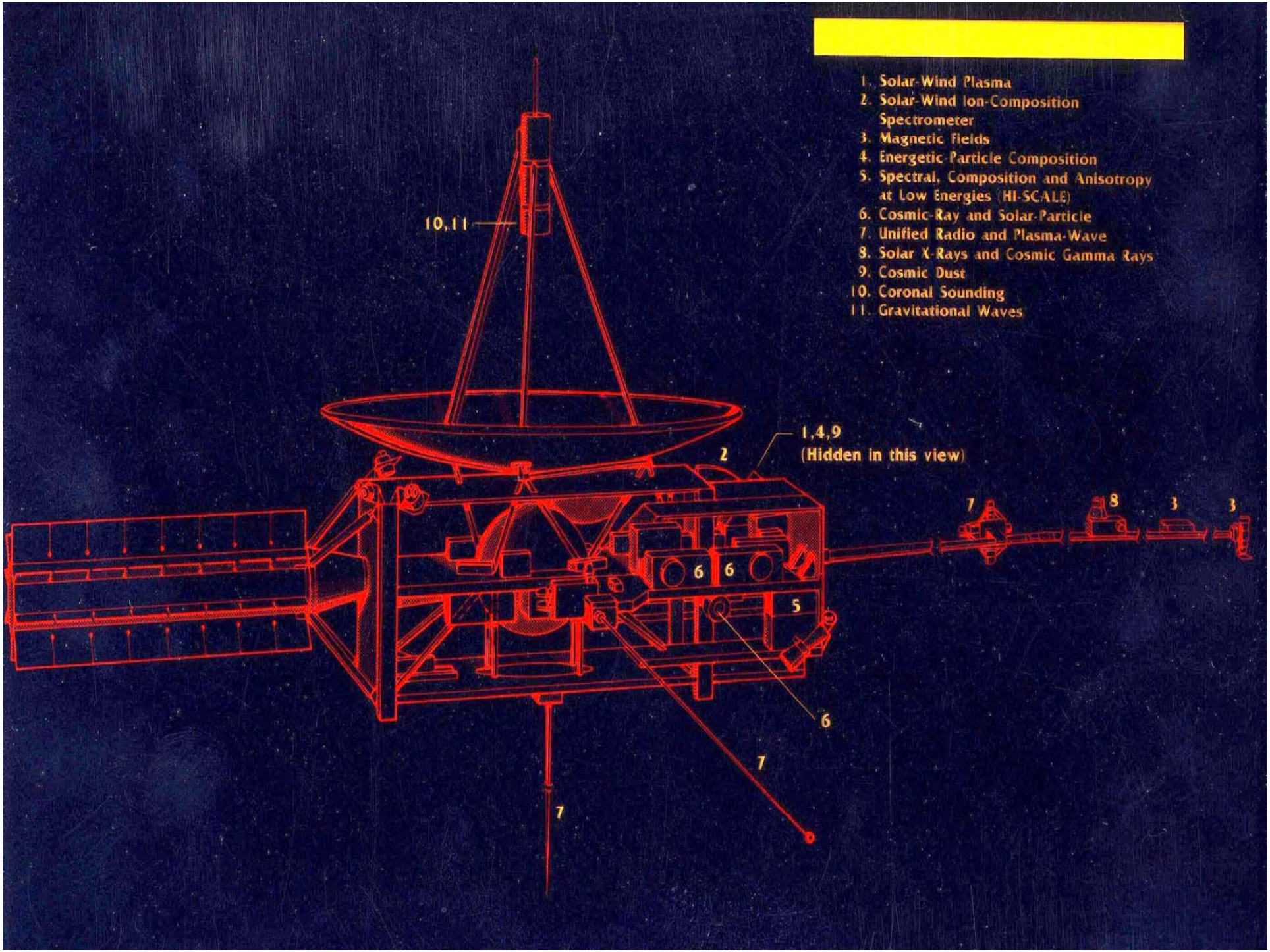
Medical Uses

- Picture things
- Measure things
- Destroy things
- Power things

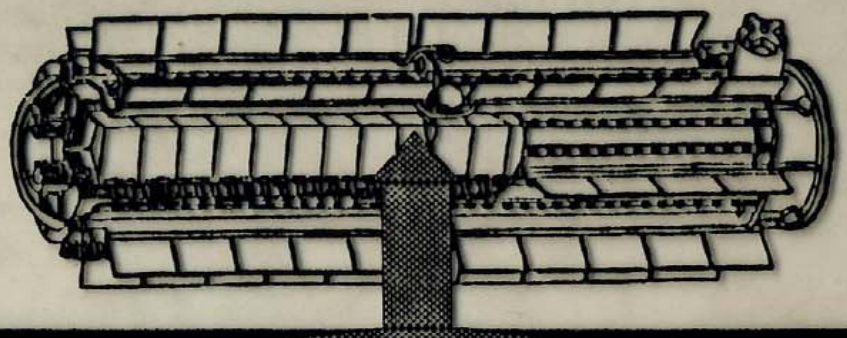


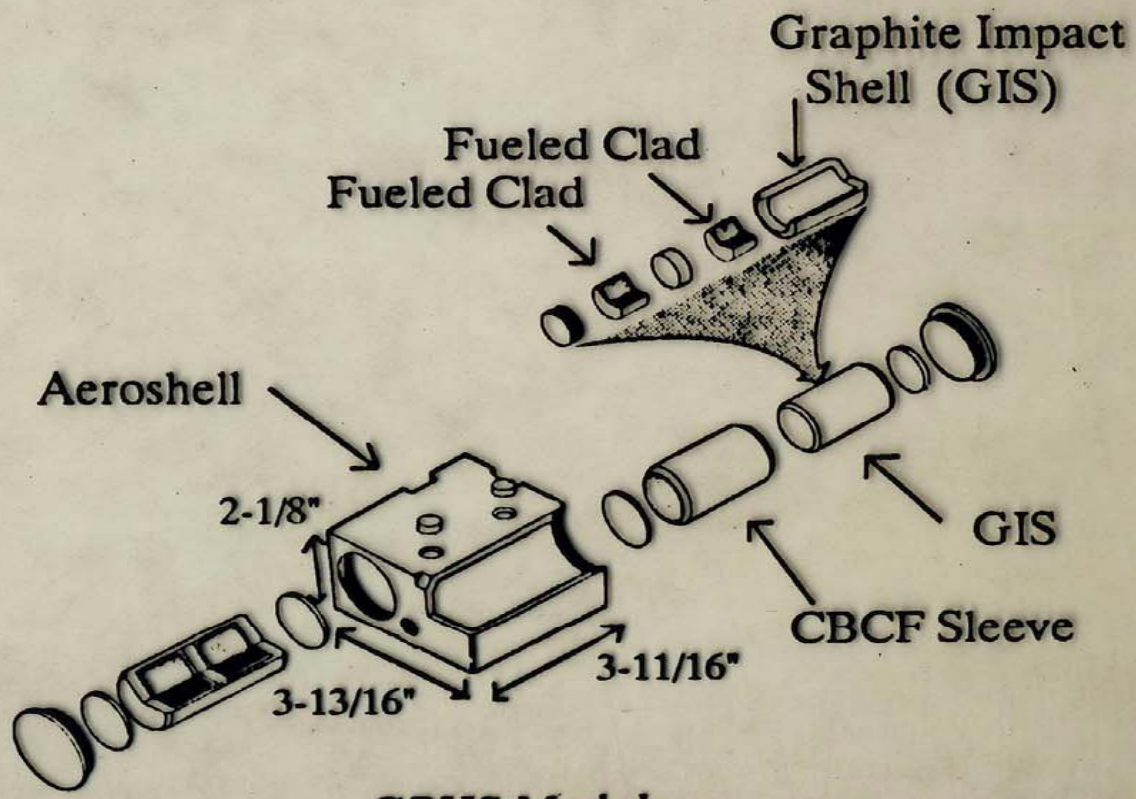




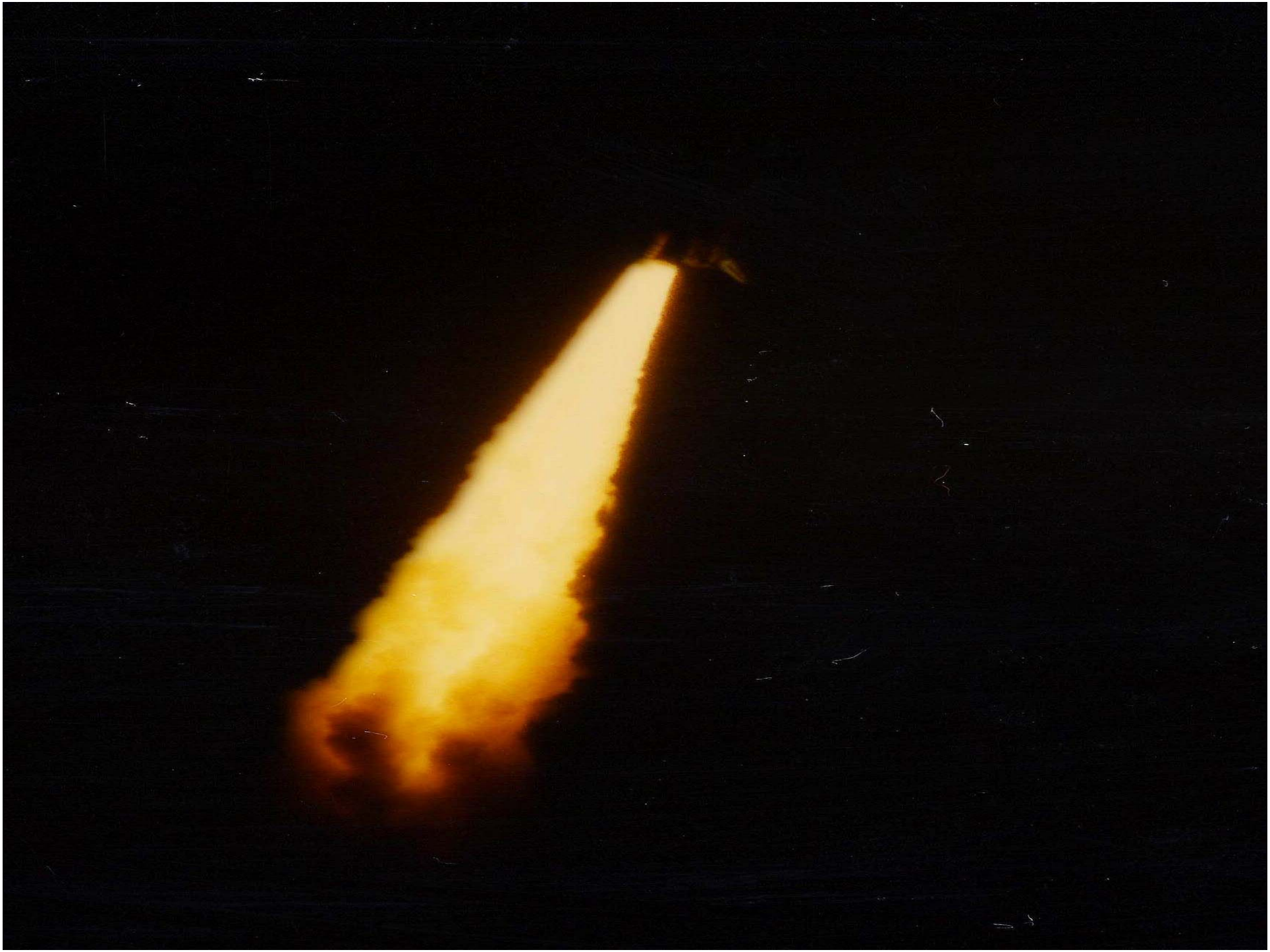

1. Solar-Wind Plasma
2. Solar-Wind Ion-Composition Spectrometer
3. Magnetic Fields
4. Energetic-Particle Composition
5. Spectral, Composition and Anisotropy at Low Energies (HI-SCALE)
6. Cosmic-Ray and Solar-Particle
7. Unified Radio and Plasma-Wave
8. Solar X-Rays and Cosmic Gamma Rays
9. Cosmic Dust
10. Coronal Sounding
11. Gravitational Waves
10,11
1,4,9
(Hidden in this view)
2
7
8
3
3
6
6
5
6
7
7

Ulysses RTG



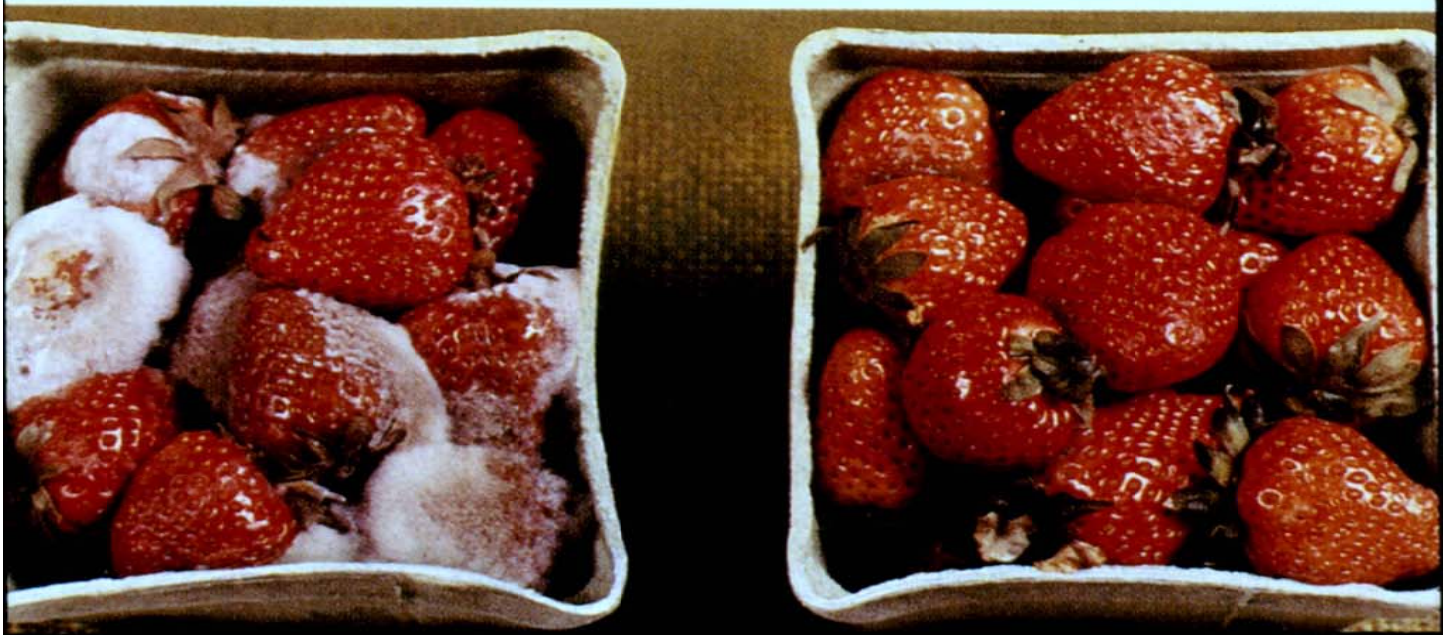


GPHS Module

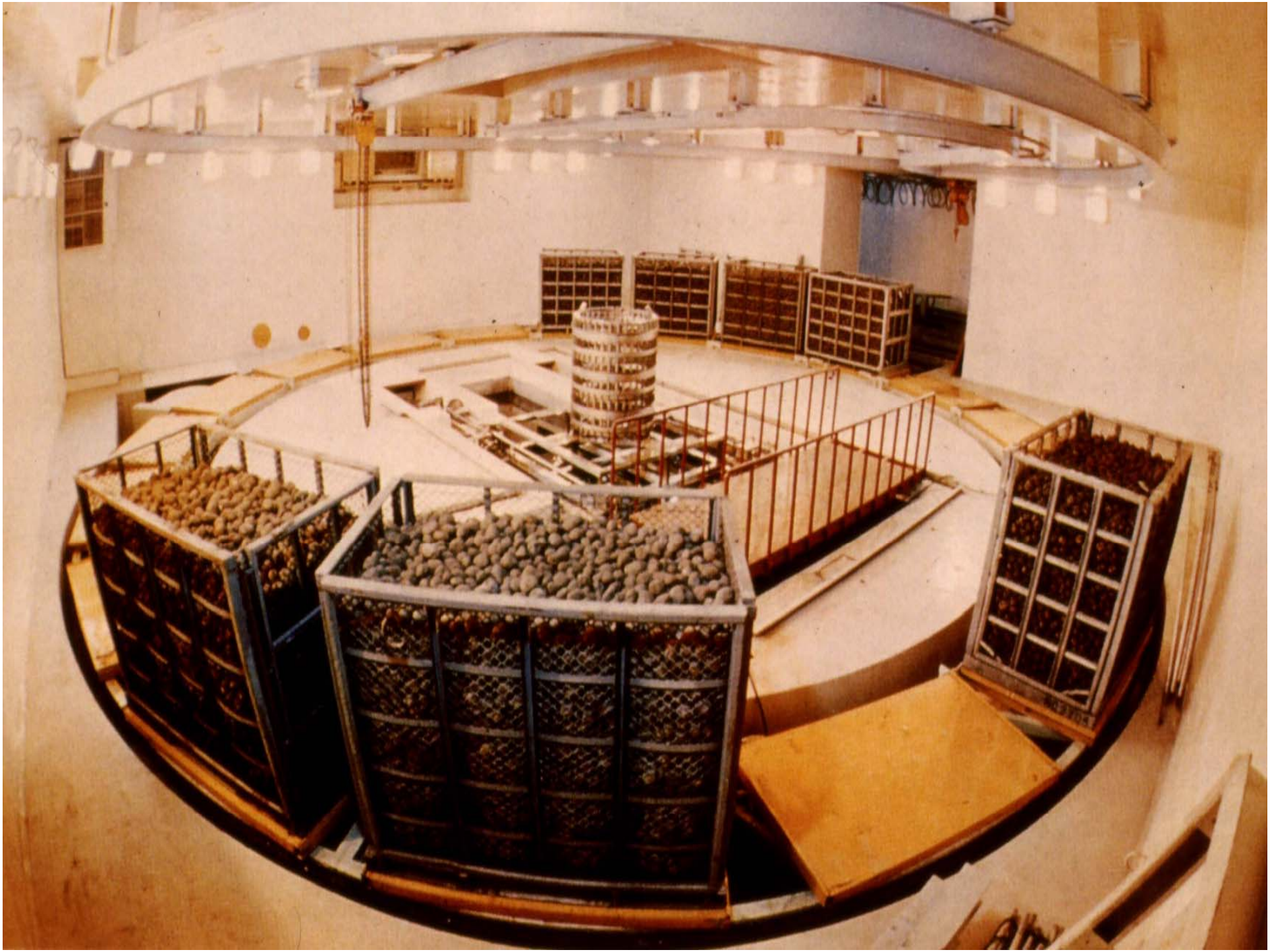


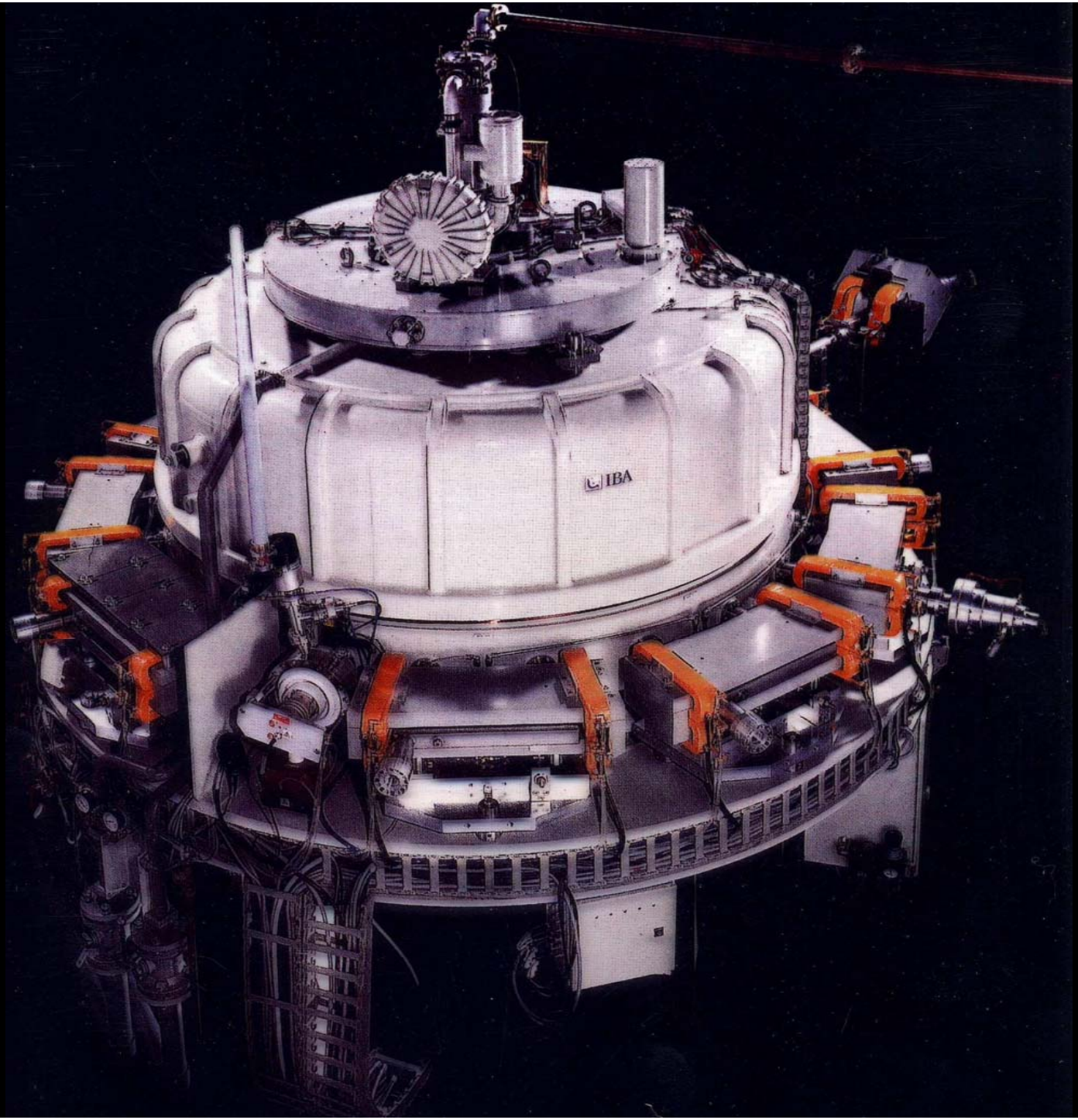
Irradiation of Food

PAPINO
COUNT
GRADE
CODE
PAPINO
PAPAWS
UNTREATED
RADURA

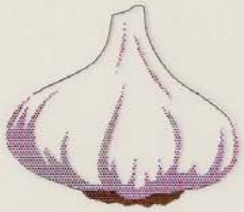


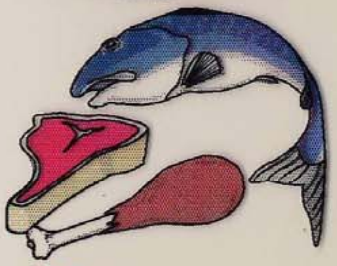
Strawberries
3000
A PLT
40c
Lemons
20c
Grapefruit
40c

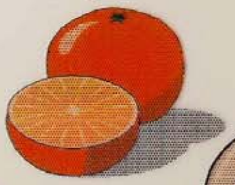


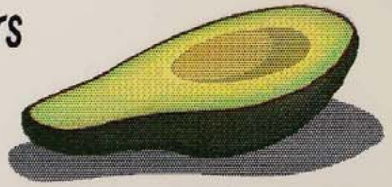

IBA

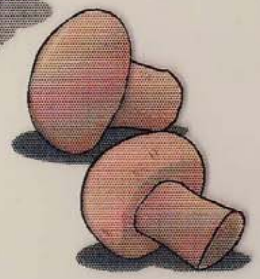
FOOD ITEMS CURRENTLY IRRADIATED







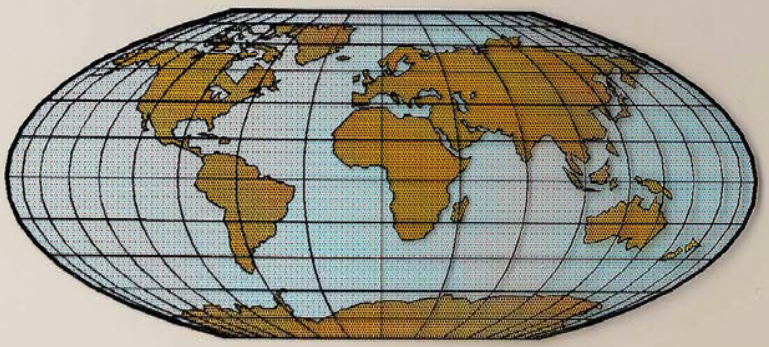




Citrus	Tomatoes	Potatoes
Onions	Garlic	Strawberries
Papayas	Mushrooms	Avocados
Spices	Tea	Beans
Flour	Chicken	Frog Legs
Pork	Shrimp	Fish
Frozen Juices	Grain	Cherries
Grapes	Dates	Apricots
Pears	Asparagus	Bread
Dried Fruits	Yeast	Rice
	And Others	

Special Hospital Meals

COUNTRIES UTILIZING FOOD IRRADIATION



Argentina
Bangladesh
Belgium
Brazil
Bulgaria
Canada
Chile
China
Cuba
Czechoslovakia
Denmark
Finland
France
Germany
Hungary
India
Indonesia
Israel
Italy
Japan
Korea
Mexico
Netherlands
New Zealand
Norway
Pakistan
Philippines
Poland
South Africa
Spain
Syria
Thailand
Russia
United Kingdom
USA
Uruguay
Yugoslavia
Vietnam

ENDORSES FOOD IRRADIATION

American Medical Association
American Veterinary Medical Association
American Meat Institute
Food Technology Institute
Institute of Food Technologists
Kiplinger Agricultural Letter
Mayo Clinic
Prevention Magazine
U. S. Department of Agriculture
U. S. Food and Drug Administration
U. S. Public Health Service
World Health Organization

DANGER
NEW JERSEY IS THE MOST POLLUTED.... THE MOST CONTAMINATED... THE MOST POPULATED STATE. MUST WE NOW EAT HAZARDOUS FOOD ALSO ?
WE'RE MAD
WE'RE NOT GOING TO
AND
IT ANYMORE
EMERGENCY MEETING
YOU MAY BE FORCED TO EAT IRRADIATED FOODS
A NEW POTENTIALLY HAZARDOUS FOOD TREATMENT IS UPON US. WE MAY NOT EVEN KNOW WHETHER OR NOT OUR FOOD HAS BEEN EXPOSED TO COBALT-CESIUM RADIOACTIVITY AS A SPOILAGE TREATMENT BEFORE IT IS SOLD TO US IN OUR FOOD STORES
FACT I
FACT II
FACT III
But wait . . . WE ARE LUCKY TO HAVE A BILL BEFORE CONGRESS! (CONGRESSMAN BOSCO INTRODUCED BILL #H.R. 4762)
WE NEED OUR PEOPLE TO GET THEIR U.S. REPRESENTATIVES TO SUPPORT THIS BILL . . . BECAUSE THINGS MAY BE TIPPING OUR WAY AT LAST!
THIS BILL IS A BLESSING. THAT IT HAS ALREADY BEEN INTRODUCED IN THE U.S. HOUSE OF REPRESENTATIVES WAS A LUCKY BREAK FOR ALL OF US. THIS BILL WILL INSIST ON PROPER SCIENTIFIC RESEARCH BEFORE WE ARE FORCED TO EAT CESIUM-COBALT IRRADIATED FOODS. IT WILL ALSO PREVENT ANY IRRADIATED FOOD FROM BEING SOLD TO US UNMARKED IN OUR SUPERMARKETS AND FOOD STORES
• IN ORDER TO GET OUR BILL PASSED
READ THE LETTER TO THE CONGRESSMAN
YOUR MIND WHETHER OR NOT YOU AGREE WITH IT
DO AGREE WITH ITS INTENT (AND WE HOPE YOU D
FOLLOW THE DIRECTIONS ON THE INSTRUCTION
GET THE BILL INTO LAW
BUT IT CAN HAVE THE SAME COVERAGE AND
ALL LINKS IN A NATIONWIDE ENVIRONMENTA
ACT IN UNISON — WE CAN EFFECT CHANG
NOT A CHAIN LETTER
The Department of Energy has a solution to the problem of radioactive waste.
You're going to eat it.
OH SURE, BEAUTIFUL, WHAT AN IDEA

TREATED BY

IRRADIATION

Salmonella Bacteria

- Found in 30-40% of all poultry sold in U.S.
- Poisons 2,000,000 people yearly
- Kills 2,000 people yearly

Source: National Center for Disease Control

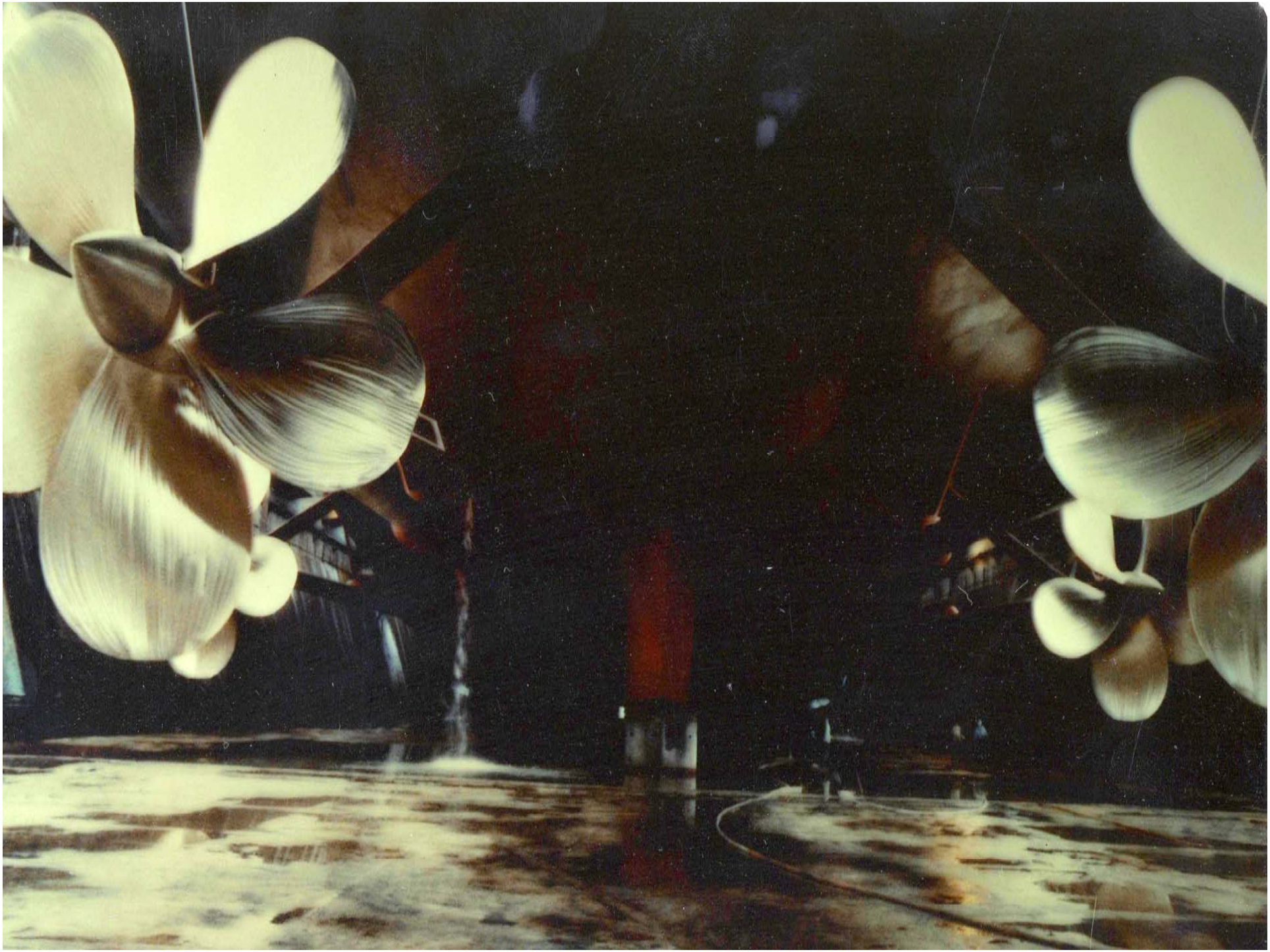
Food-Borne Illness in the U.S.

- 6.5 million cases yearly
- 9000 deaths

Source: National Center for Disease Control

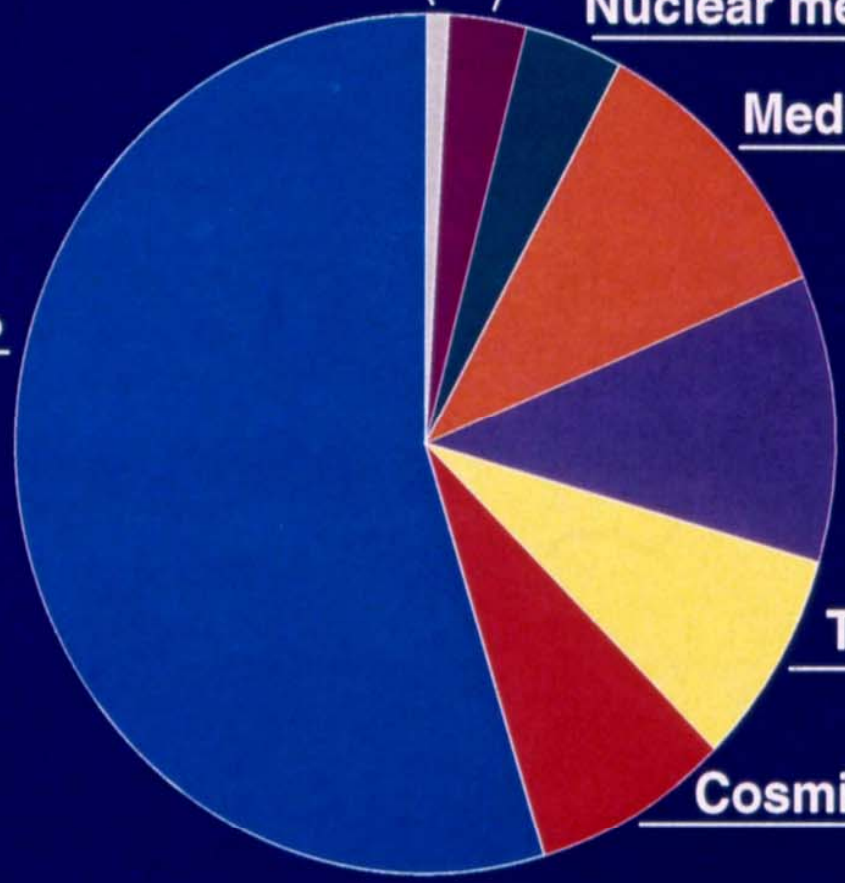
Irradiation is Also Used to Sterilize

- Medical supplies
- Baby bottle nipples
- Disposable diapers
- Milk cartons
- Cosmetics



Radiation and You

Sources of Radiation Exposure to U.S. Population

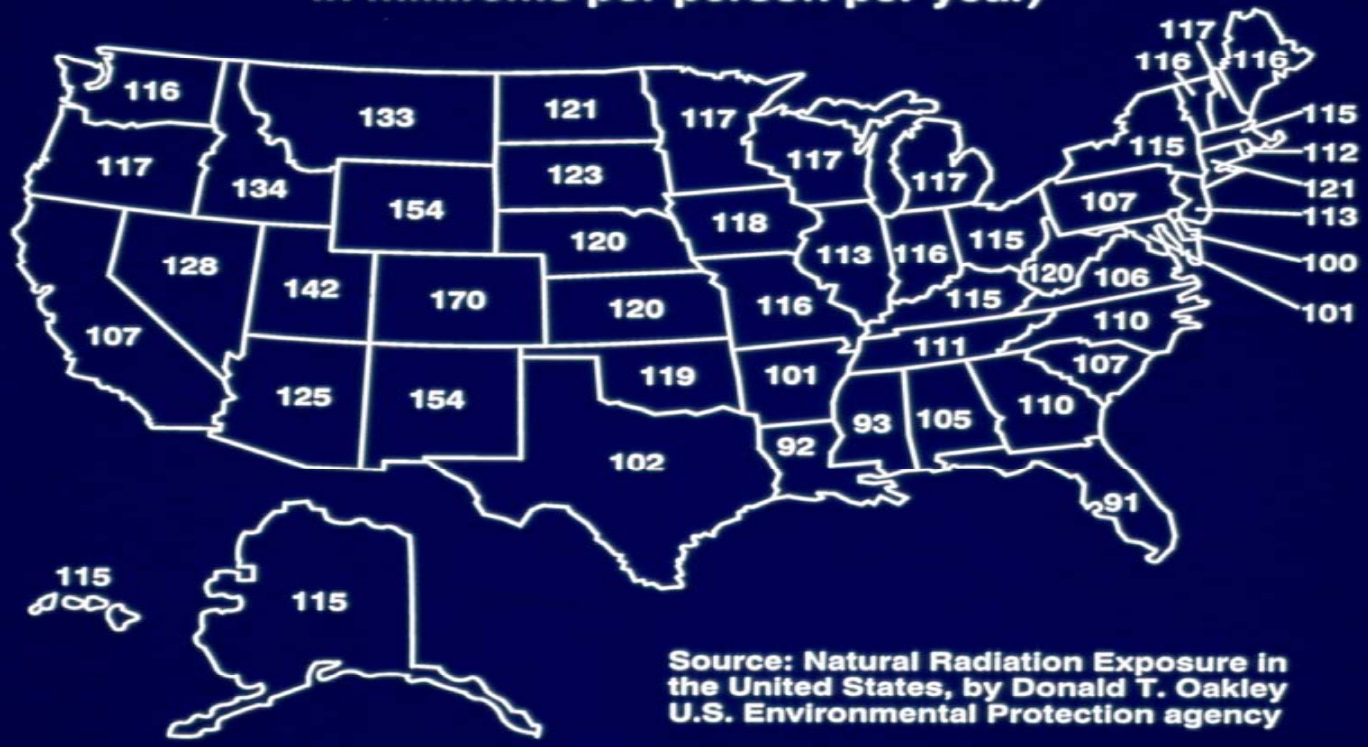


Natural radiation 82%
Man-made radiation 18%

Source: National Council on Radiation Protection and Measurement 11/87

Average Natural Radiation* Background By State

(cosmic, terrestrial and internal body radiation in millirems per person per year)



Source: Natural Radiation Exposure in the United States, by Donald T. Oakley U.S. Environmental Protection agency

VARIATION IN RADIATION LEVELS IS CAUSED PRIMARILY BY DIFFERANT ALTITUDES ABOVE SEA LEVEL, AND BY NATURAL ROCK FORMATIONS CONTAINING TRACES OF URANIUM OR THORIUM AND THEIR RADIOACTIVE DAUGHTER ELEMENTS.

Radiation Exposure From Everday Life (Annual Total)

Photogray Glasses
0.1 mrem

Television
1.0 mrem

Natural Gas Stove
0.2 mrem

Smoke Detectors
0.1 mrem

Gas Lantern Mantles
0.1 mrem

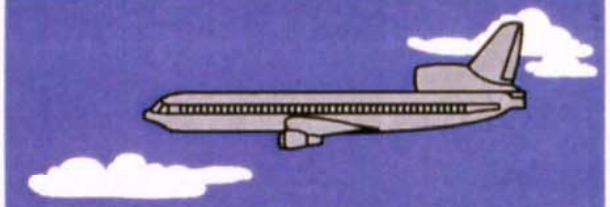
INEL
0.009 mrem

D90 1511

Approximate Additional* Radiation Background

*In Addition to Minimum Natural Background Exposure

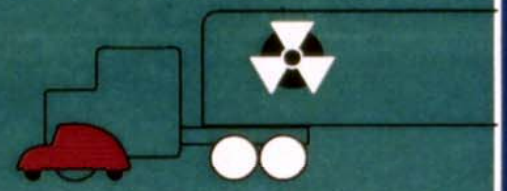
Minimum Human Exposure
is Approximately 125 mrem/yr



Flying in Airplane Above 33,000 ft.

0.5 to 1.0 mrem/hr

(The higher you are and the further north you go the higher the exposure level)

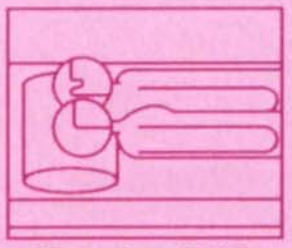


Passing or Being Passed By a Nuclear Waste Truck

0.01 mrem/per pass (Maximum)

Living in Colorado

70 to 90 mrem/yr



Sleeping With Another Human

1 mrem/yr

Living Near Some Granite Rock Formation

25 to 100 mrem/yr

Z92 0053

Approximate Additional* Radiation Background

*In Addition to Minimum Natural Background Exposure

Minimum Human Exposure is Approximately 125 mrem/yr

Nuclear Power Plant Operating Room

50 mrem/per working year (2000 working hours)

Gate House of Nuclear Power Plant

0.1 mrem/yr

U.S. Capital

20 mrem/per working year

X Ray Technician

51 mrem/yr

Grand Central Station

120 mrem/per working year

Z92 0052

SENSITIVITY OF CELLS/TISSUES

Most Sensitive

White Blood Cells

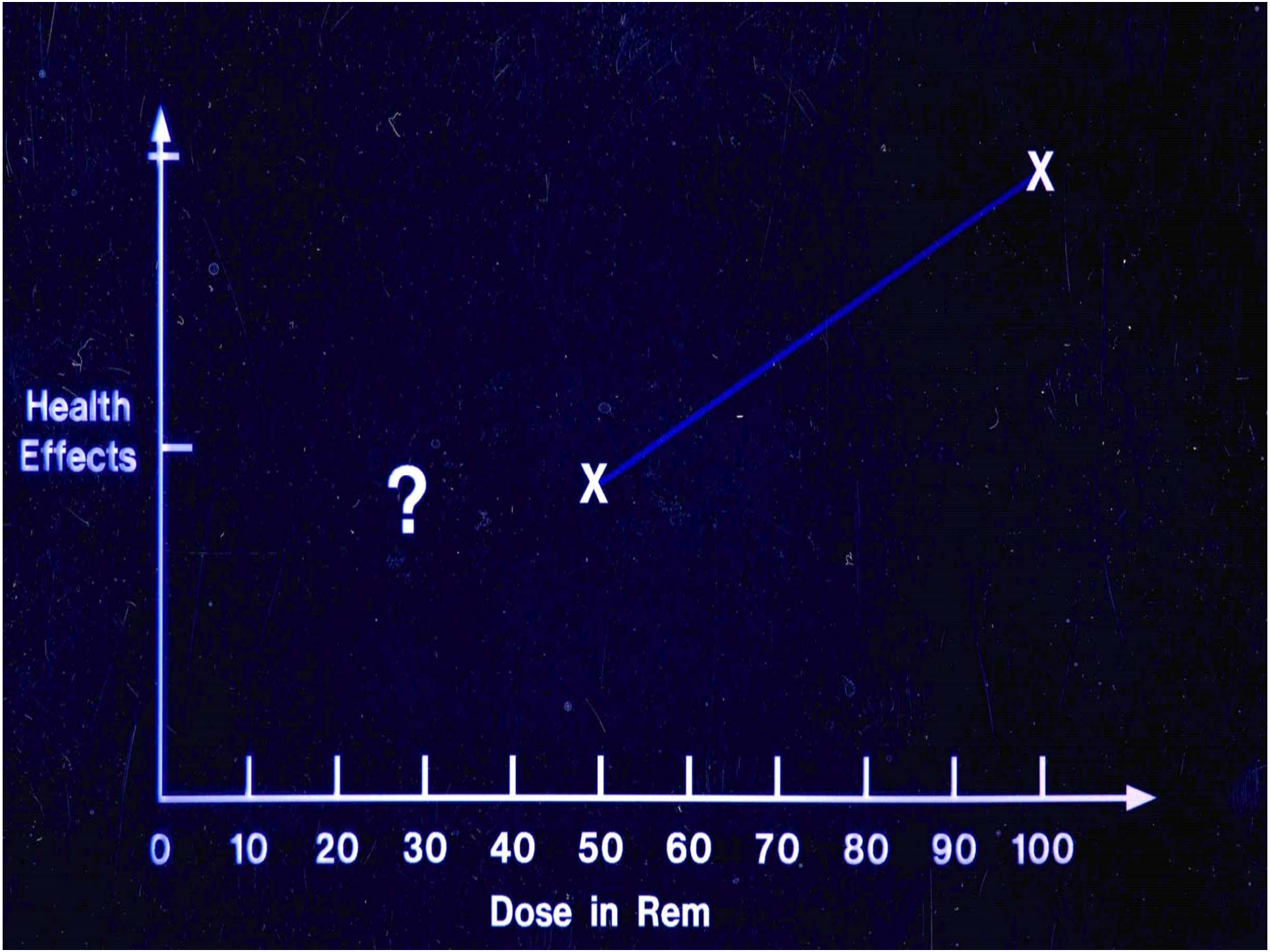
Bone Marrow

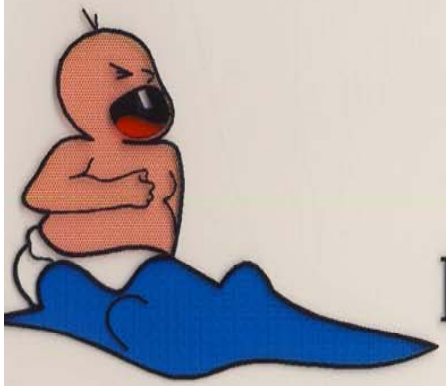
Skin Cells

GI Tract

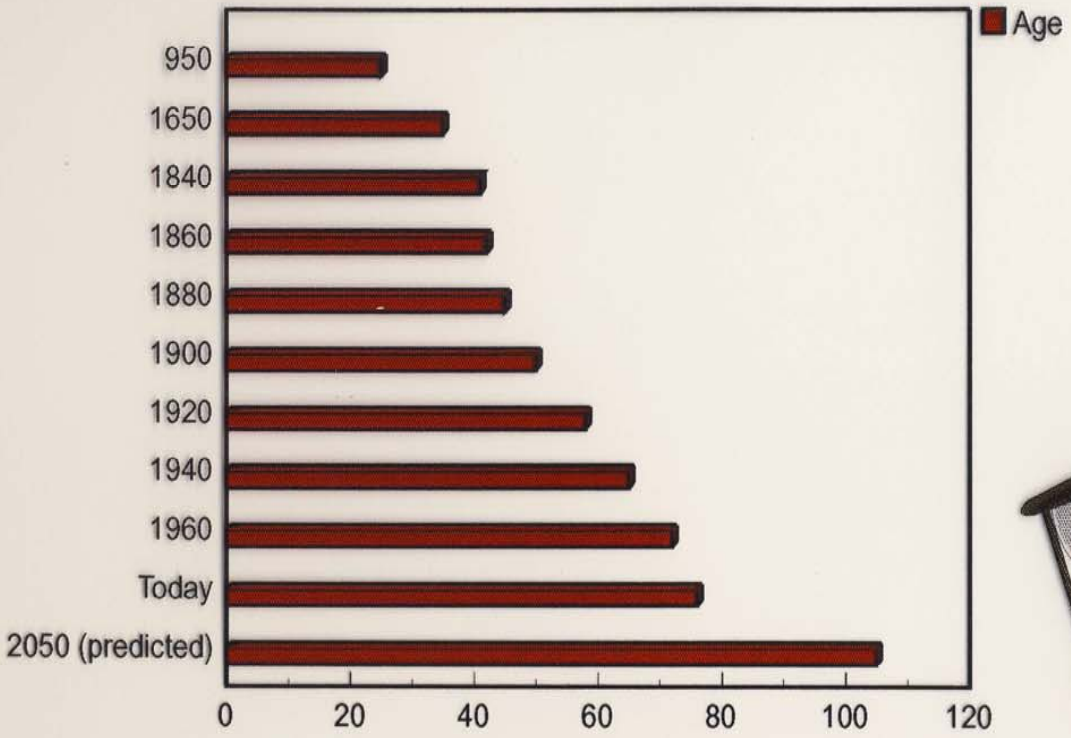
Nerve and Brain Cells

Least Sensitive

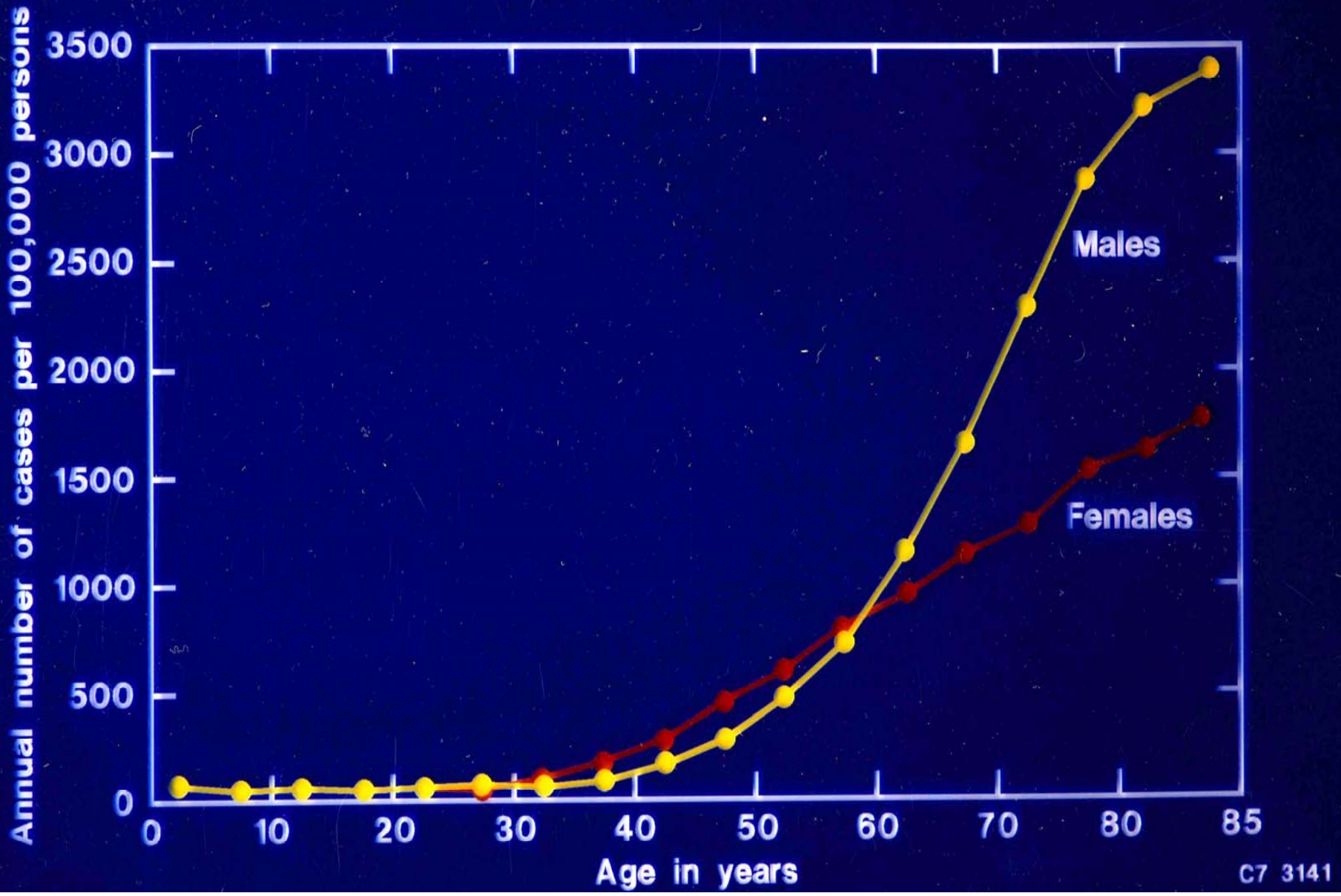

Health
Effects
?
X
X
0
10
20
30
40
50
60
70
80
90
100
Dose in Rem



Life Expectancy in Years

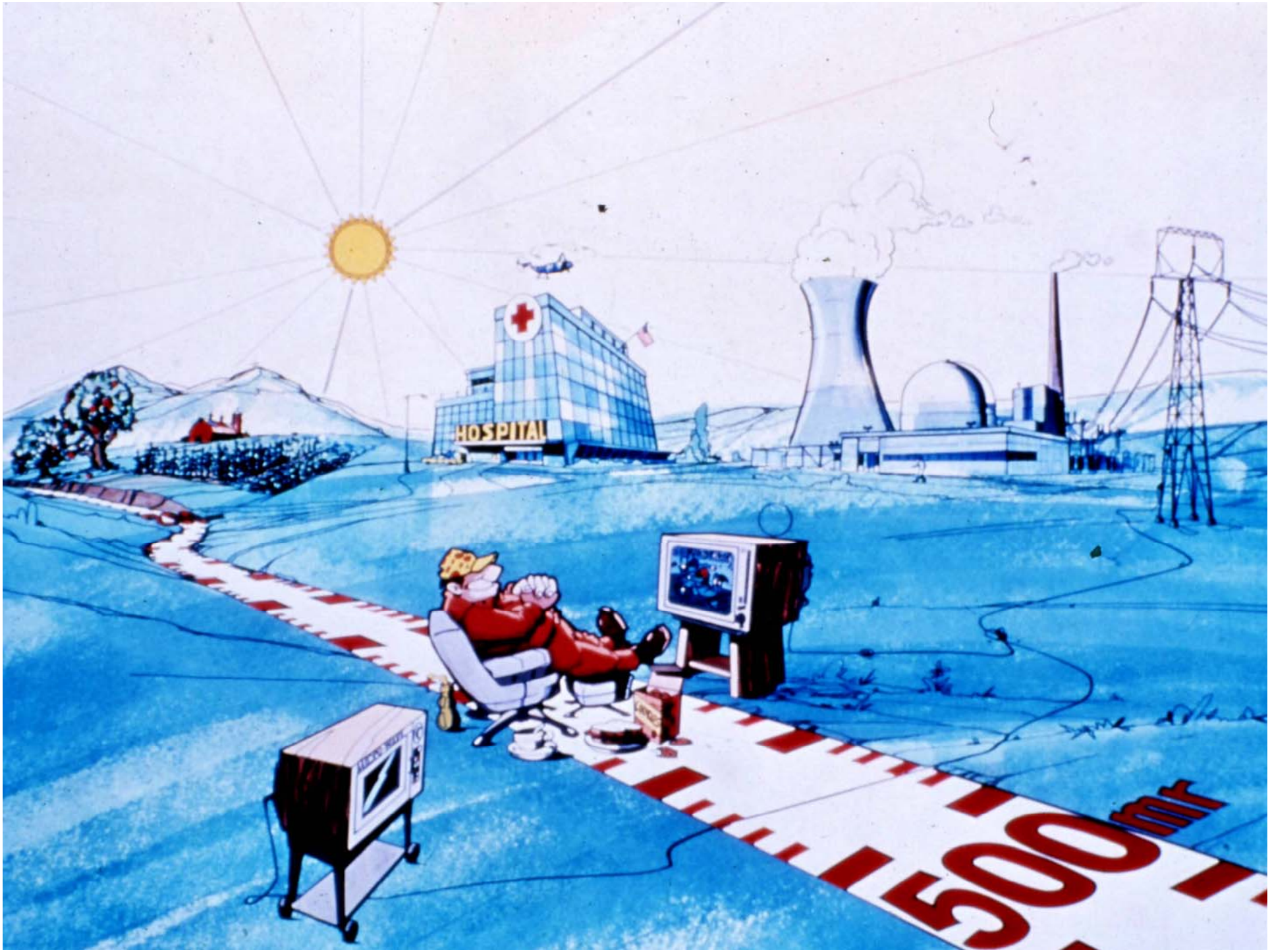


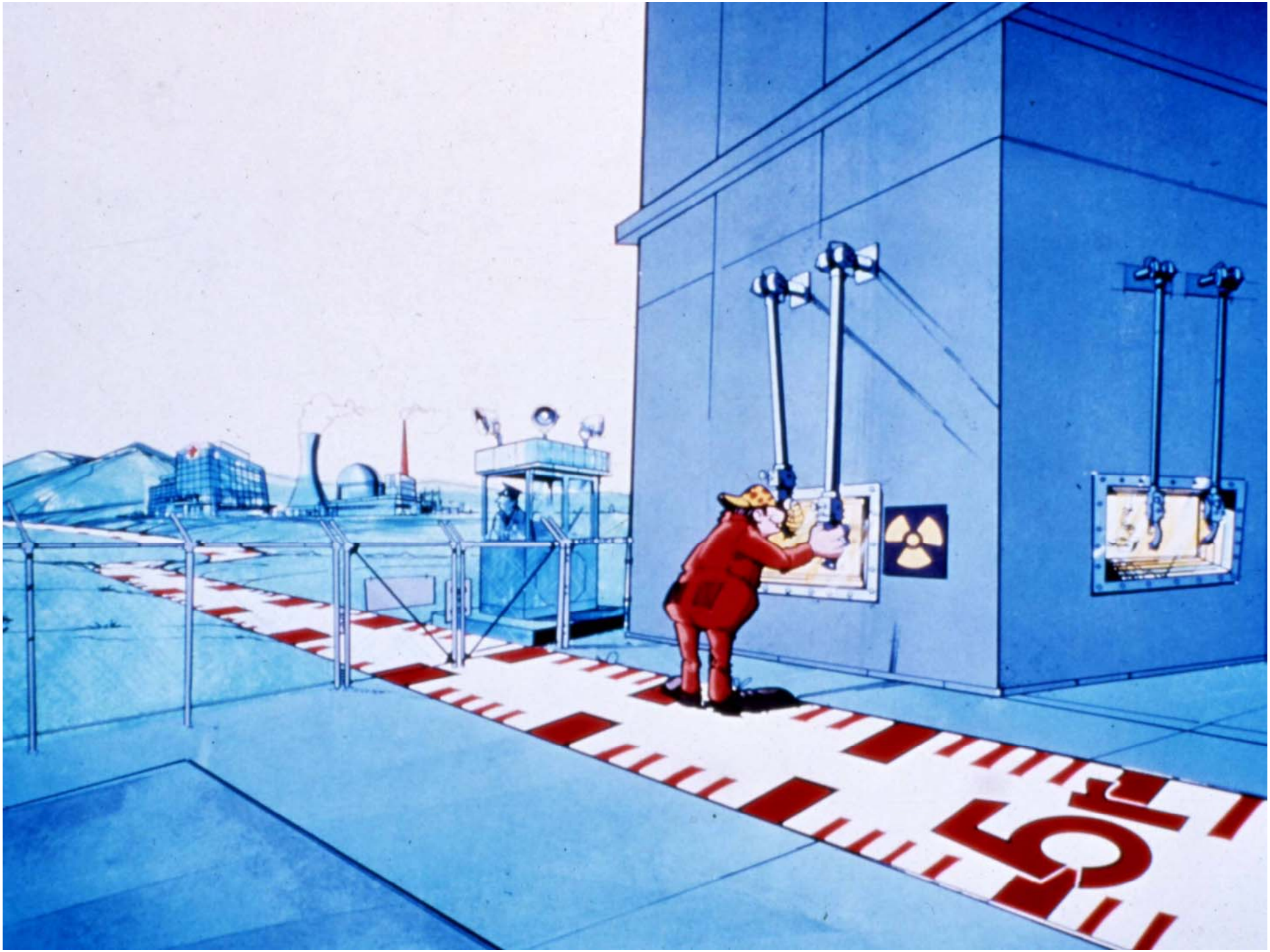
Cancer Incidence at Different Ages in the United States

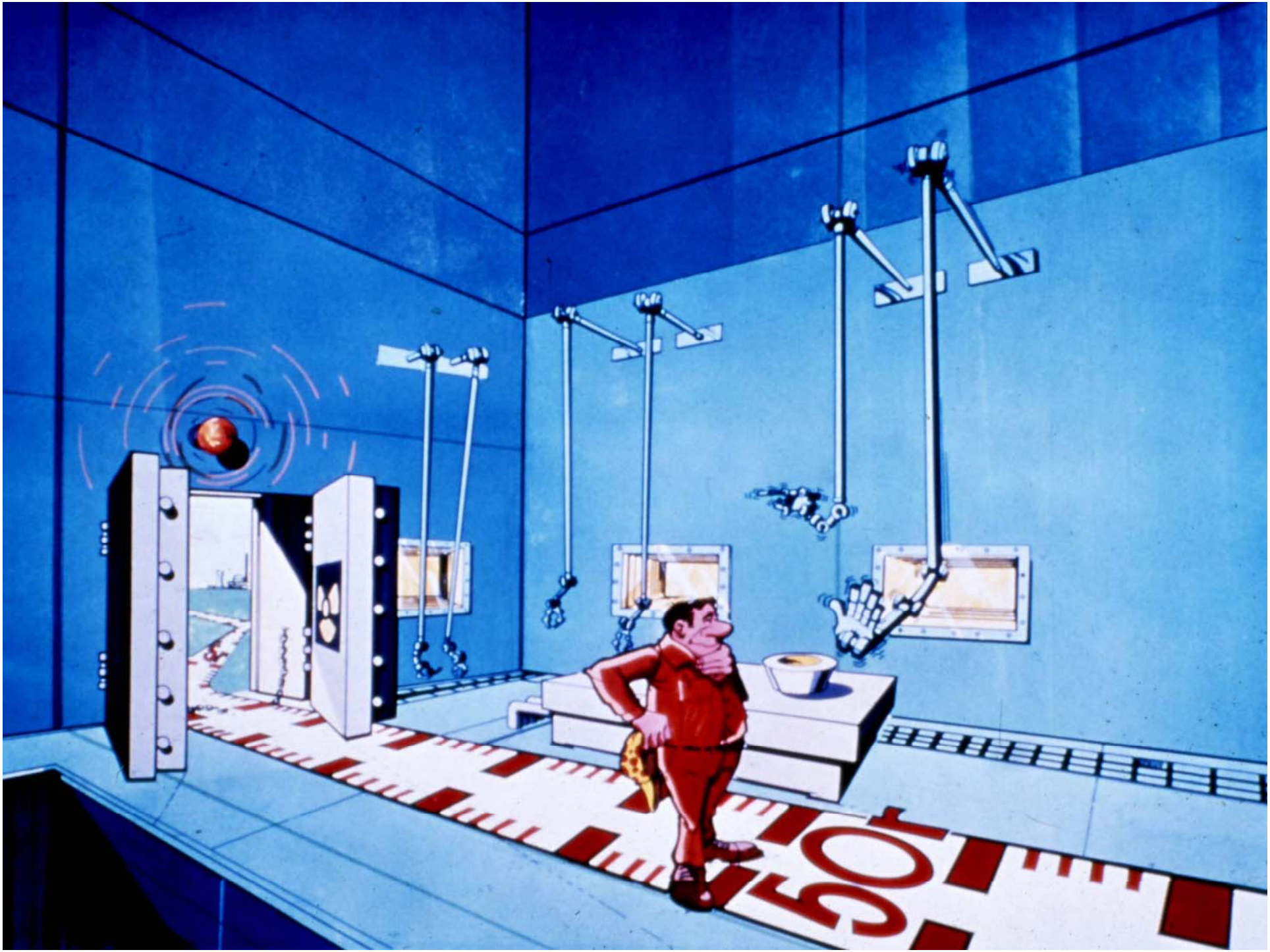


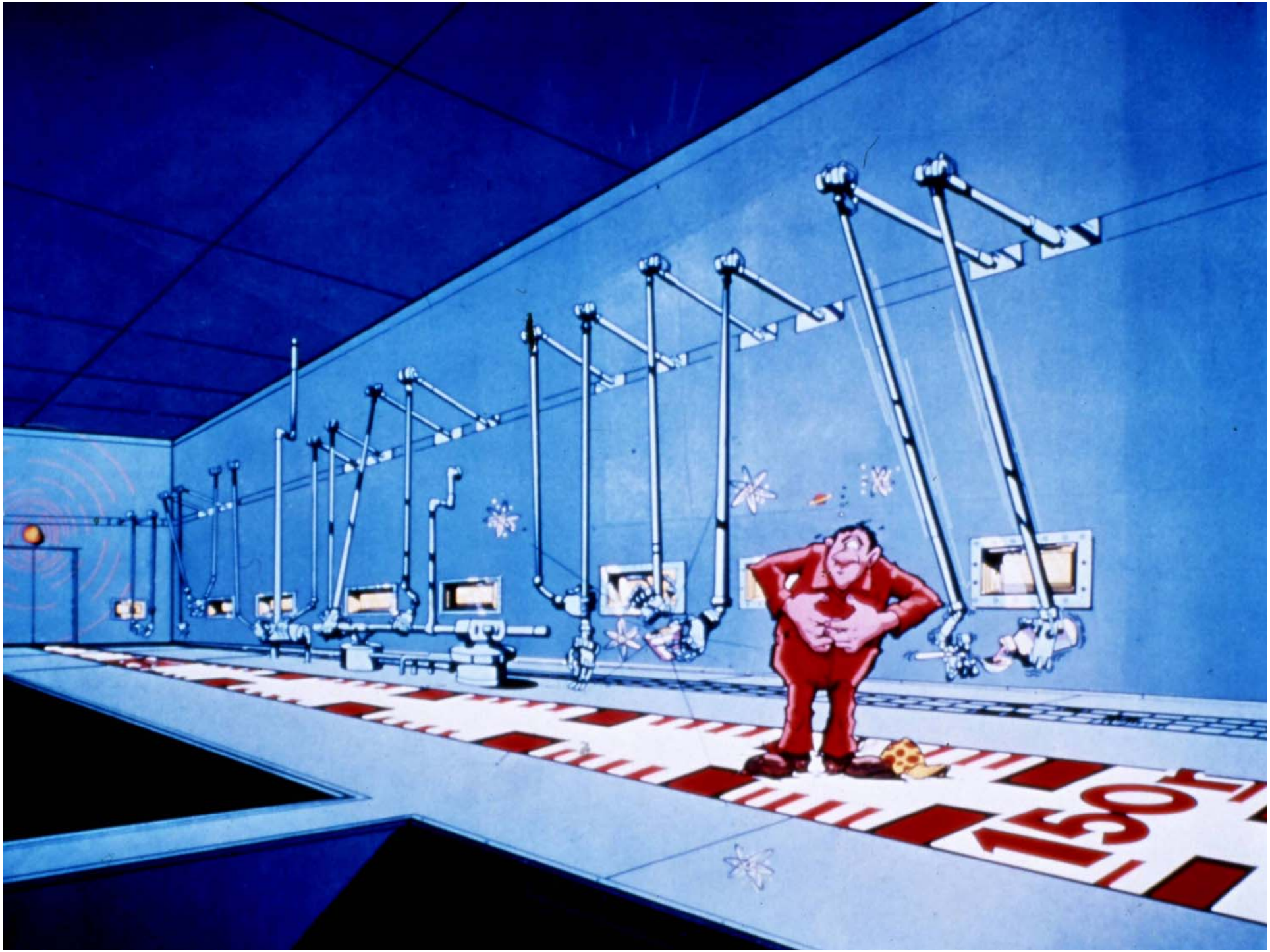
0mr
50mr

200mt

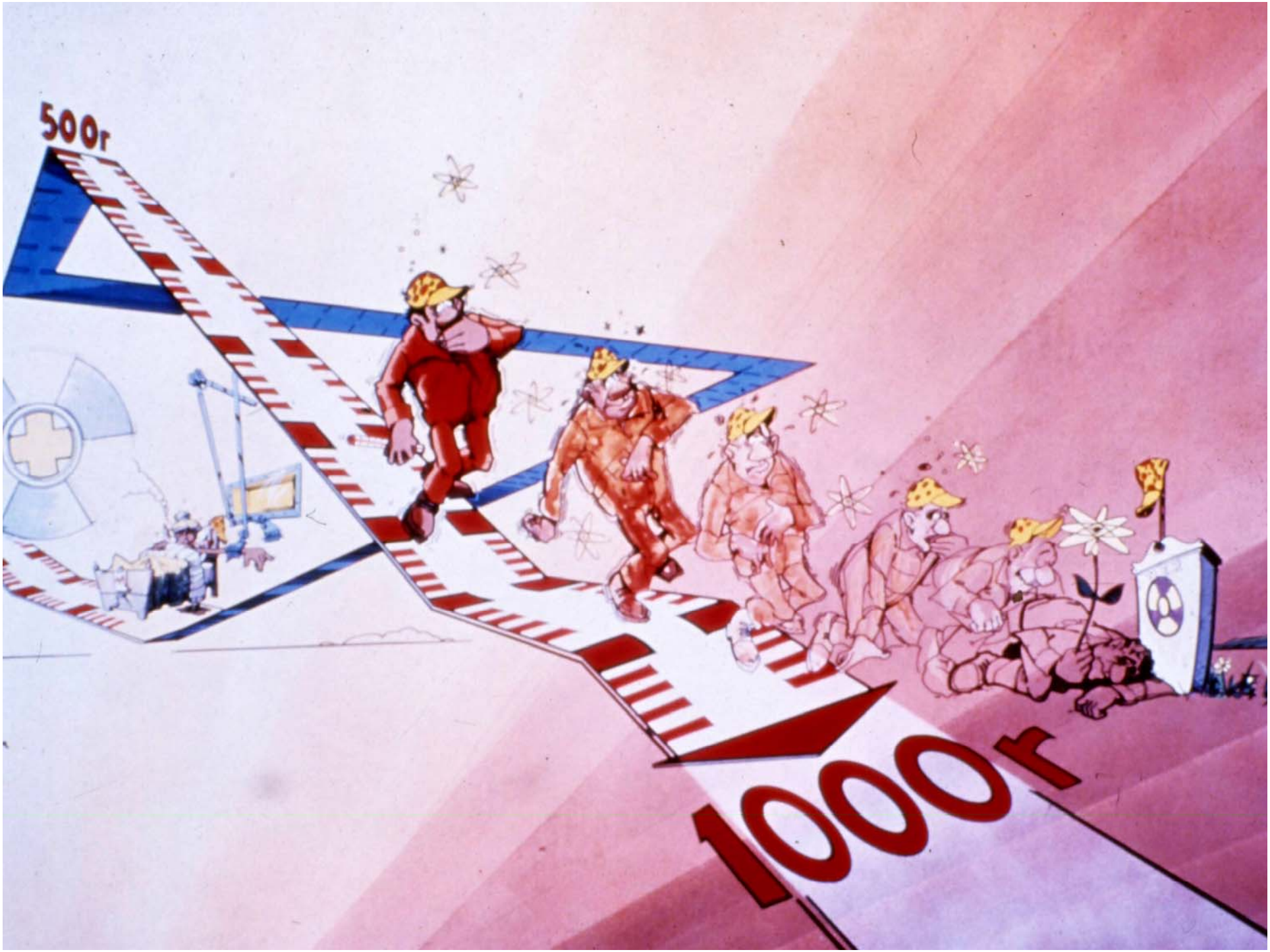

HOSPITAL
1500mr







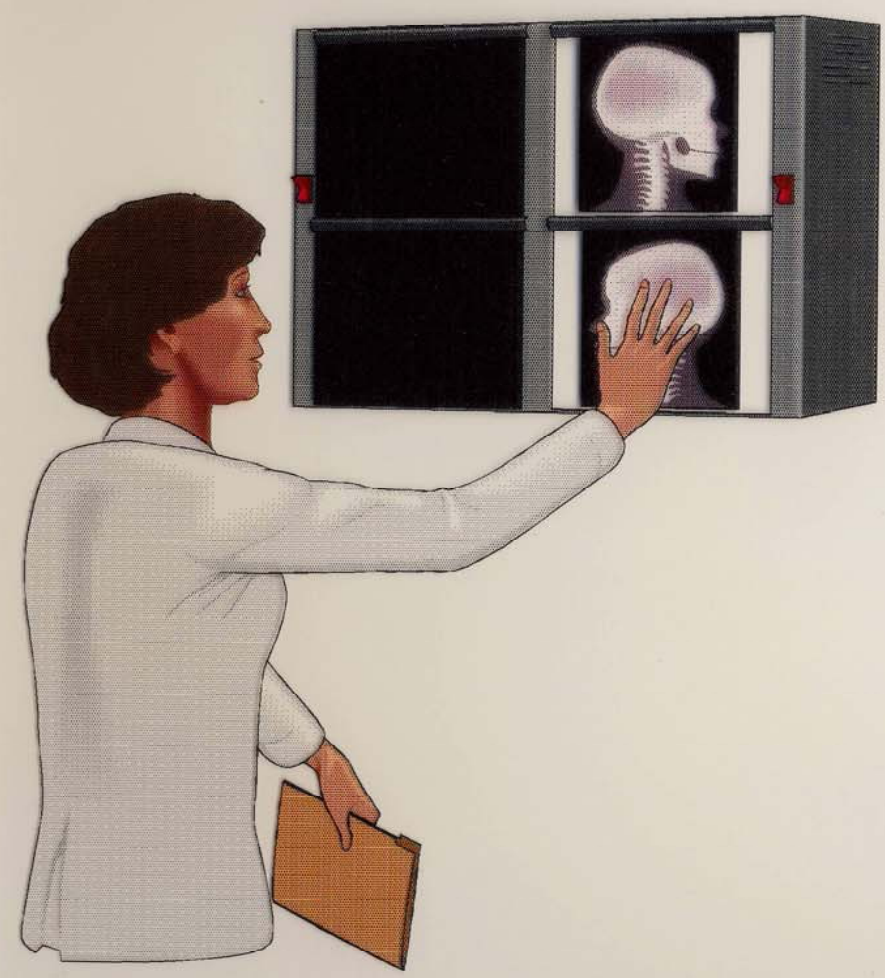
150r


500r
1000r

U.S. Food Irradiation Rules

Product	Purpose	Dose kGy (Rad)
Wheat	Insects	0.2 - 0.5 (20,000 - 50,000)
Potatoes	Extended Shelf Life	0.05 - 0.15 (5,000 - 15, 000)
Spices	Insects	30 (max) (3,000,000)
Pork Carcasses	Trichinosis	0.3 min - 1.0 max (30,000 - 100,000)
Fruits & Vegetables	Slow Ripening	1 (100,000)
Poultry	Salmonella	3 (300,000)

9 of 200



Forms of Cancer Can Be Caused By Radiation

Radiation Protection Factors

- Time
- Distance
- Shielding
- Quantity

All substances are poisons. There are none which is not a poison. The right dose differentiates a poison and a remedy.

Paracelsus 1493-1541