

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

By

Robert L. Skinner



FEEL



SEE



HEAR



TASTE

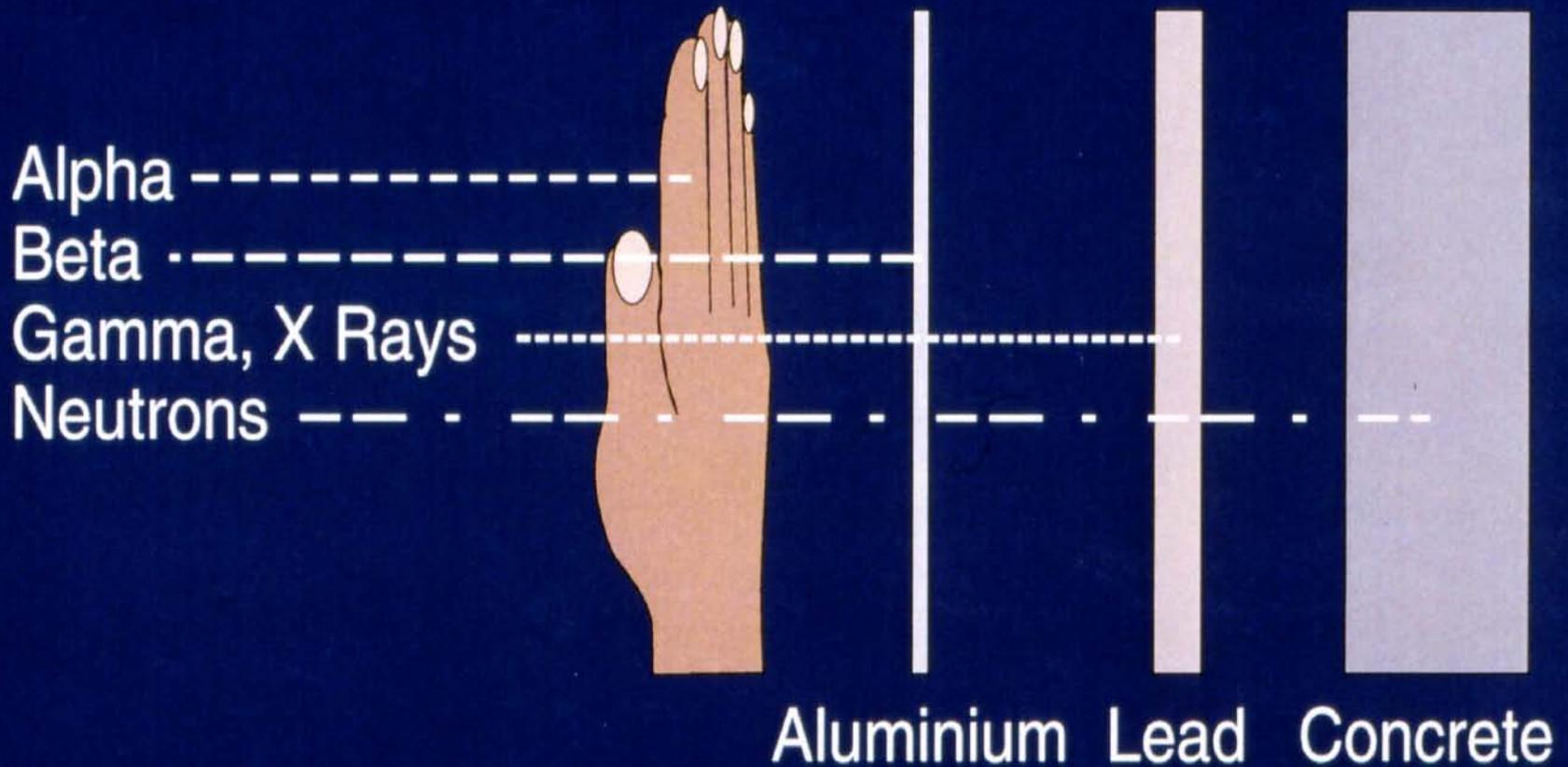


SMELL

RADIOACTIVITY

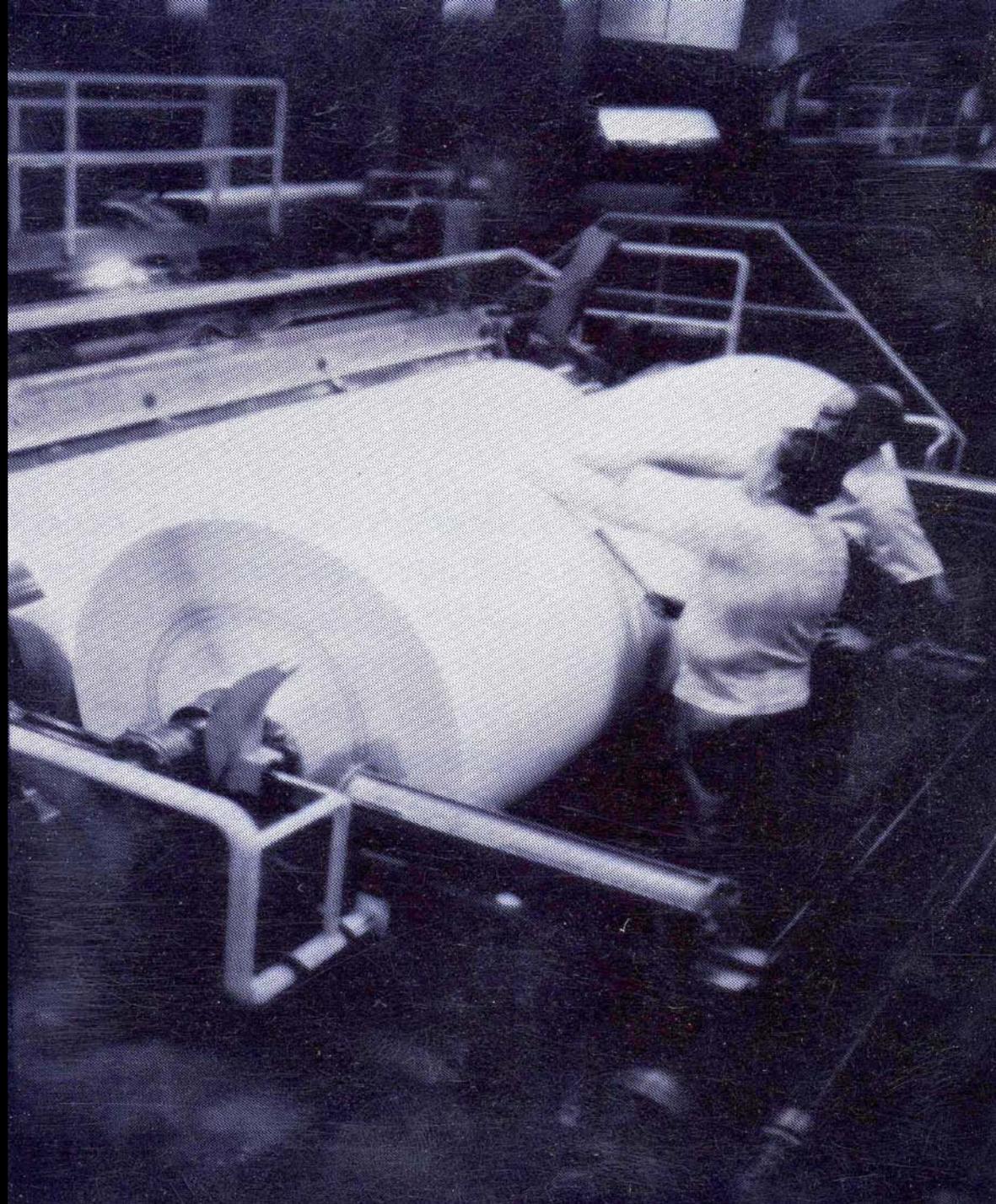
The process by which unstable atoms "try" to become stable, and as a result, emit radiation.

Types of Radiation



Every Day Uses of Radioactive Materials and Radiation





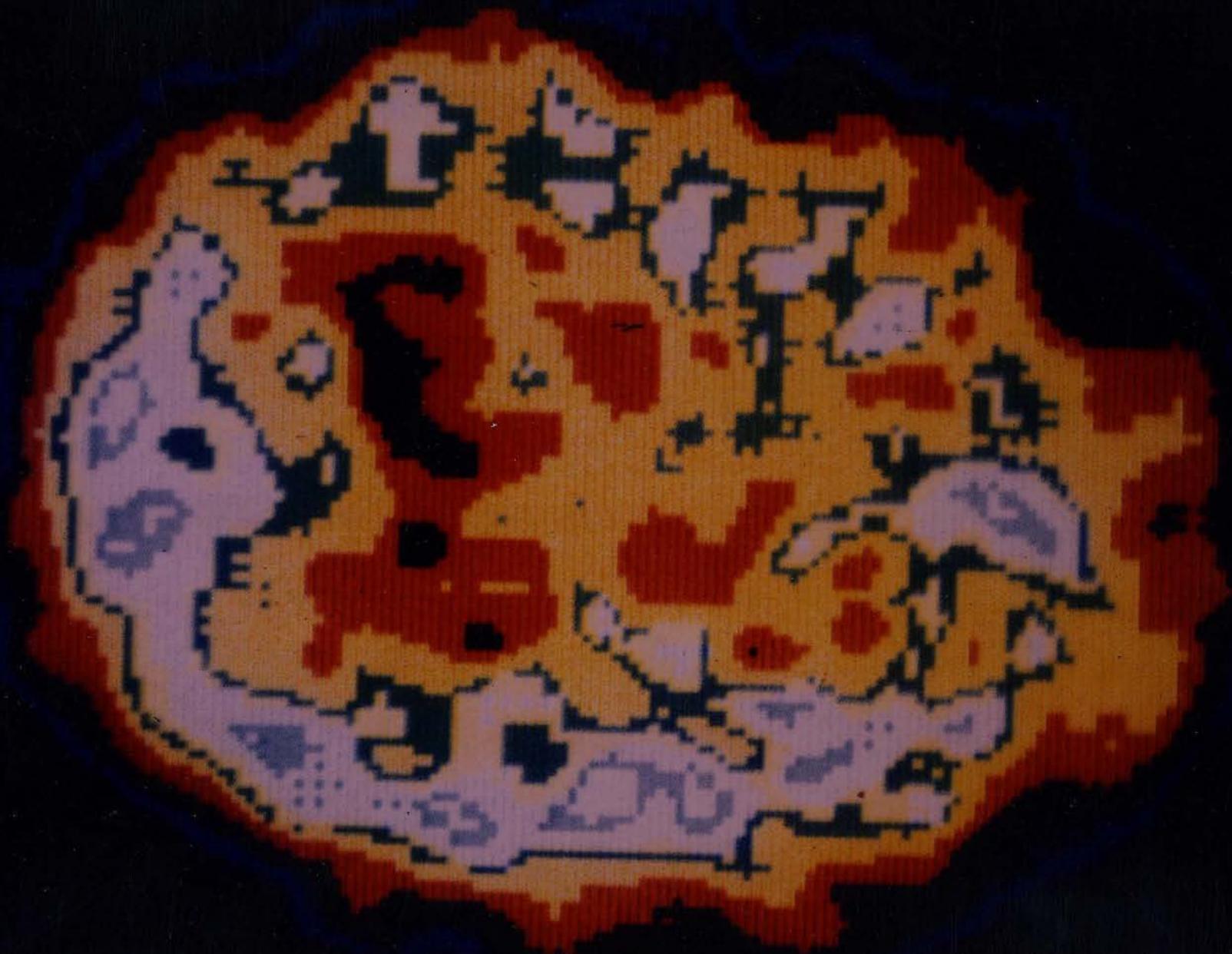


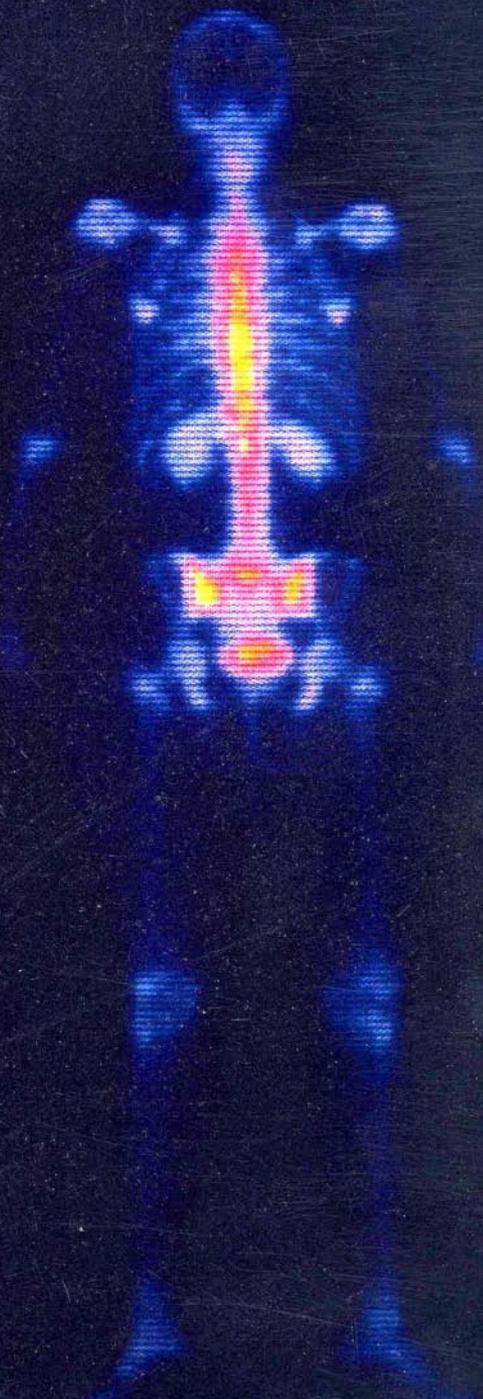


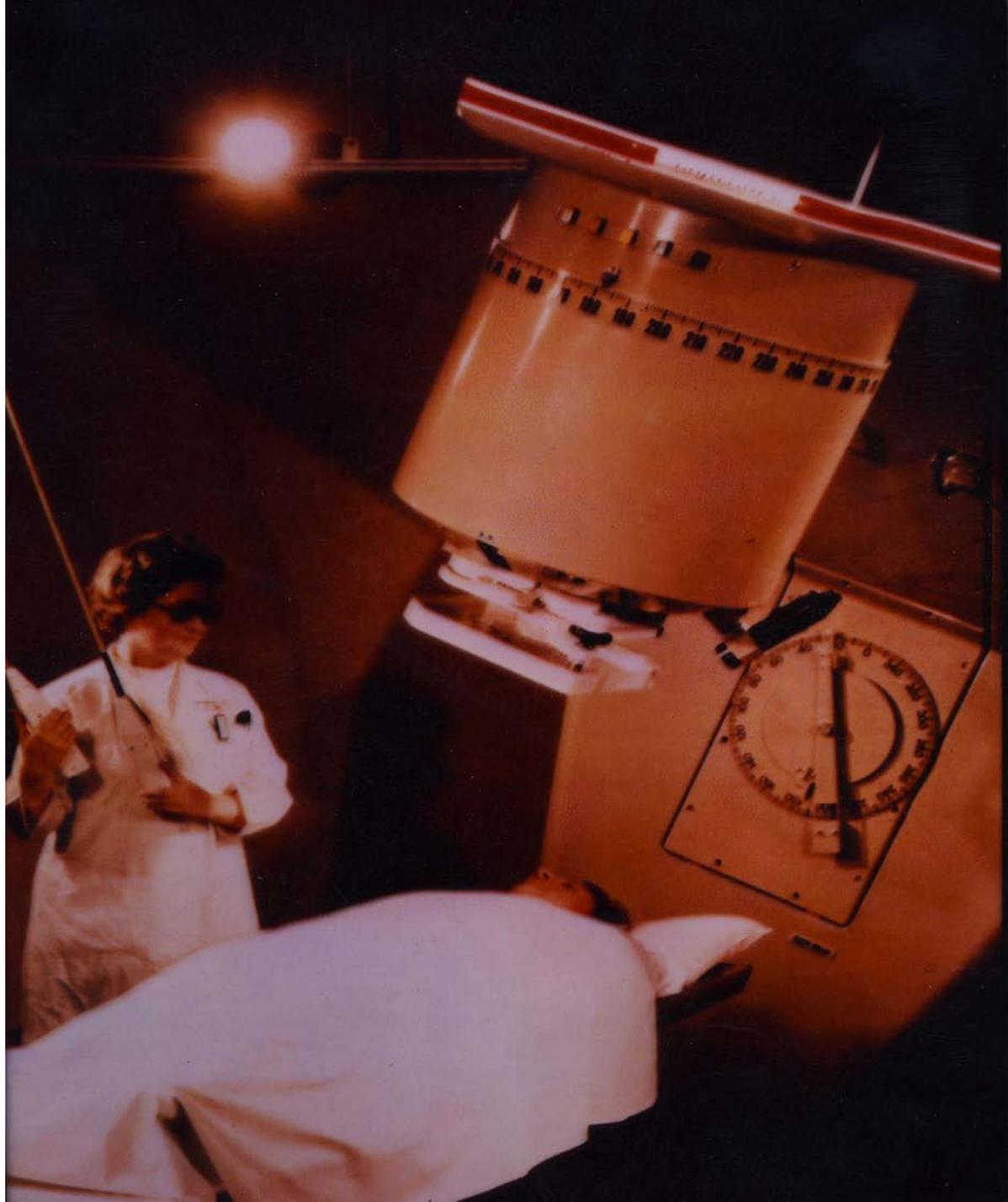


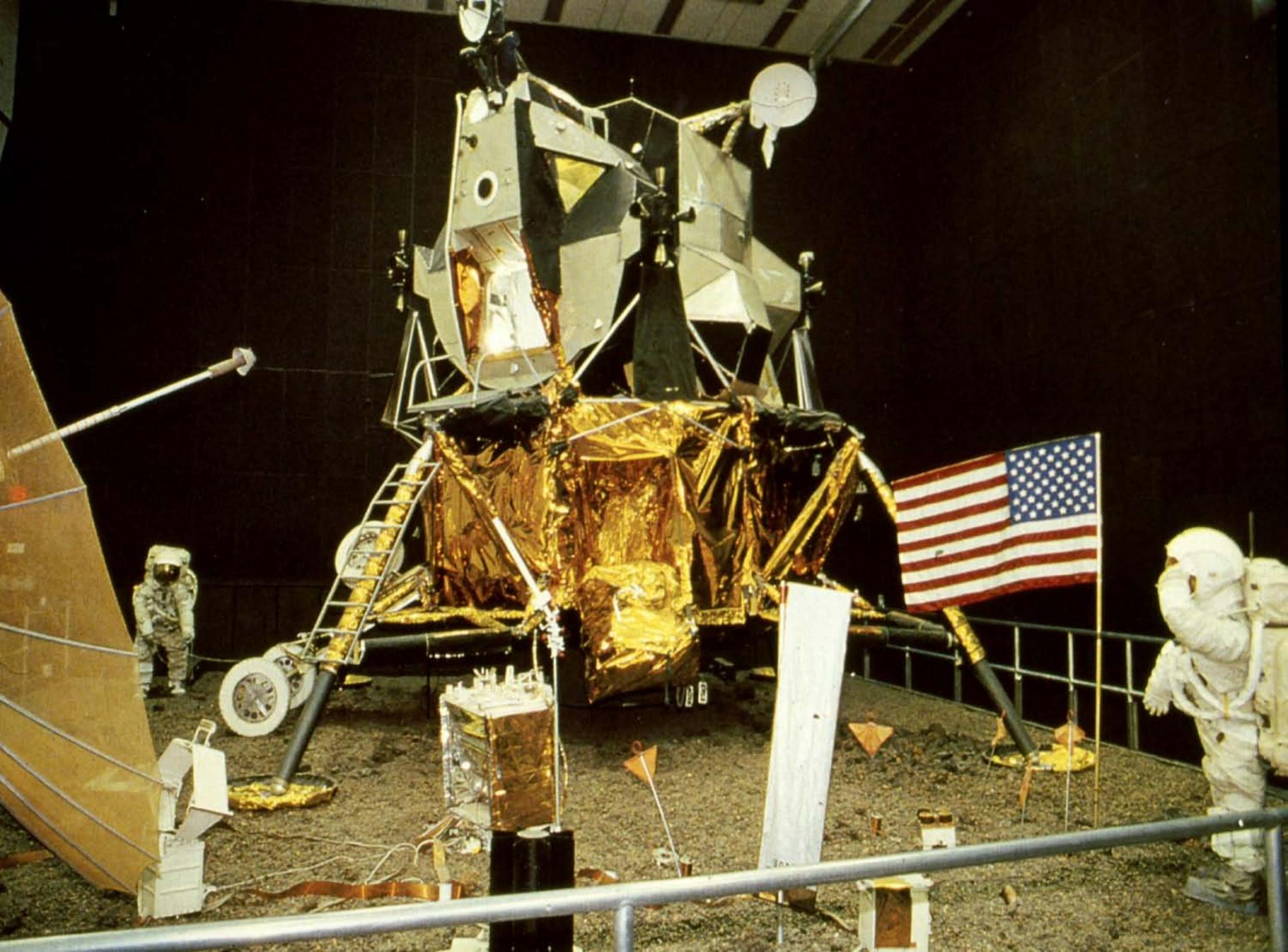
Medical Uses

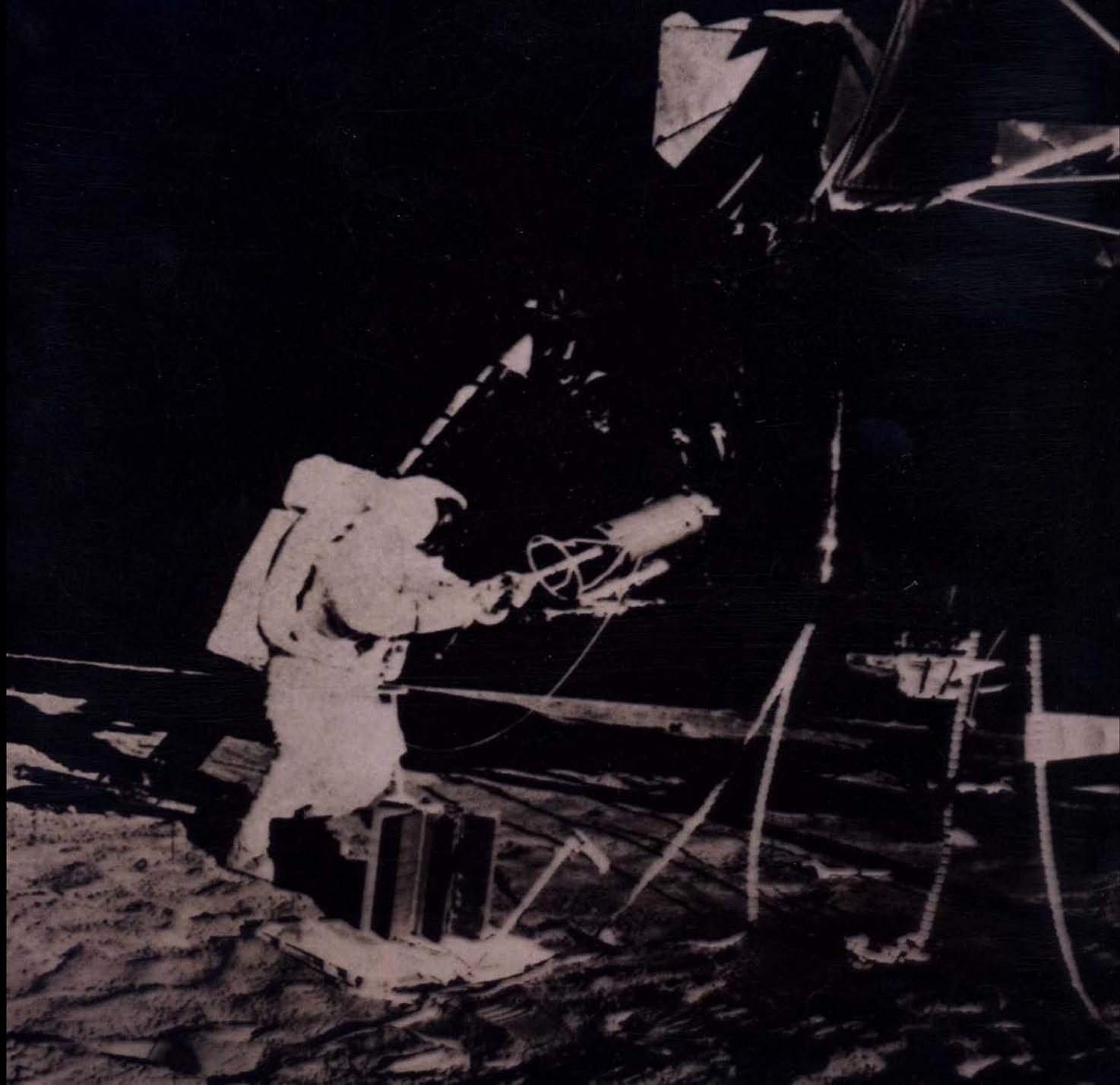
- Picture things
- Measure things
- Destroy things
- Power things



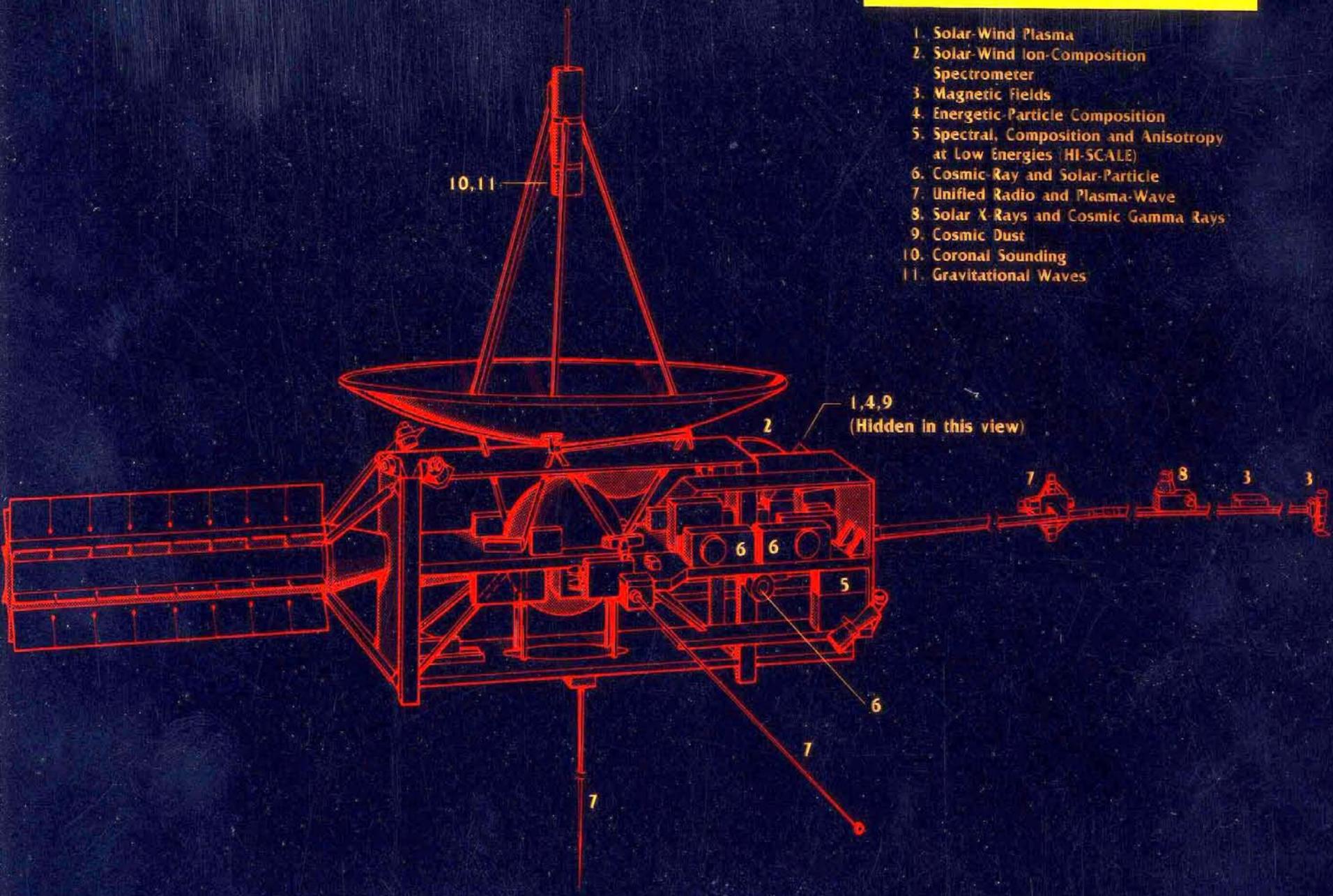




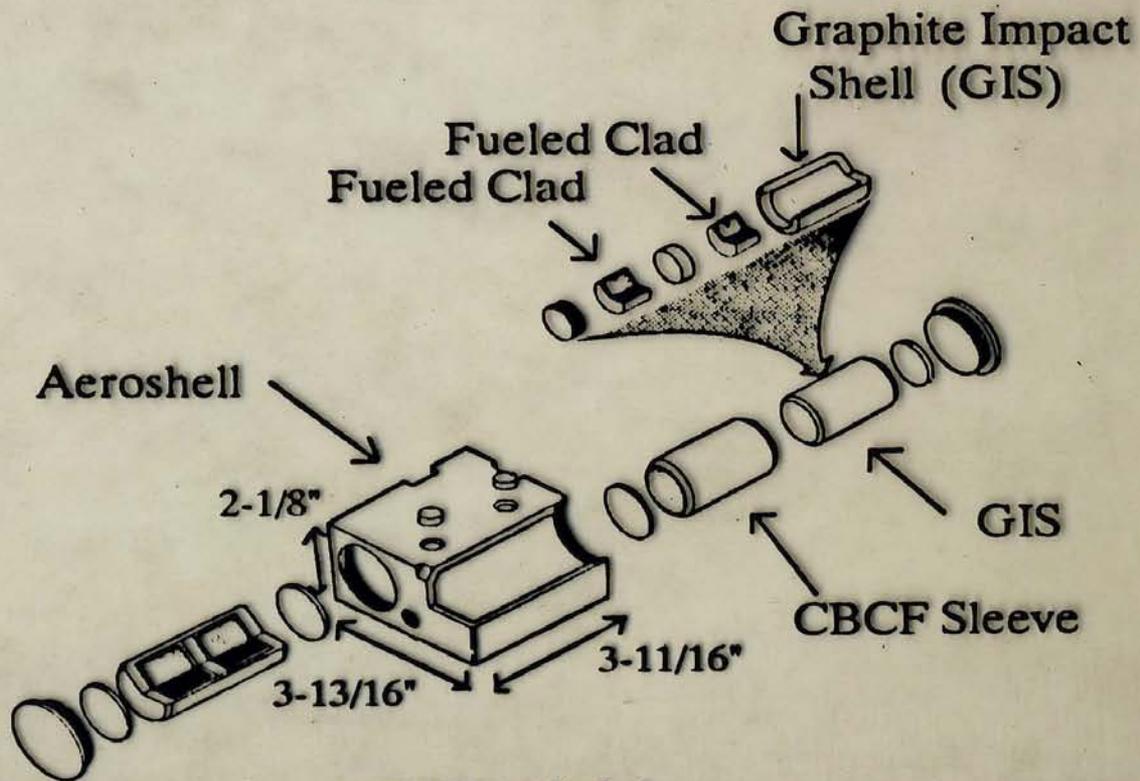
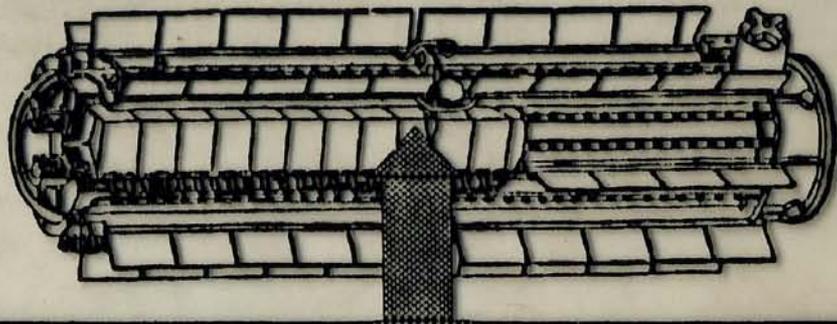




1. Solar-Wind Plasma
2. Solar-Wind Ion-Composition Spectrometer
3. Magnetic Fields
4. Energetic-Particle Composition
5. Spectral, Composition and Anisotropy at Low Energies (HI-SCALE)
6. Cosmic-Ray and Solar-Particle
7. Unified Radio and Plasma-Wave
8. Solar X Rays and Cosmic Gamma Rays
9. Cosmic Dust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



Ulysses RTG



GPHS Module





The background is a gradient of blue, transitioning from a lighter blue on the left to a darker blue on the right. At the top, there are wispy white clouds. On the left side, there is a bright sun that creates a lens flare effect across the middle of the image.

Irradiation of Food





UNTREATED

RADURA[®]





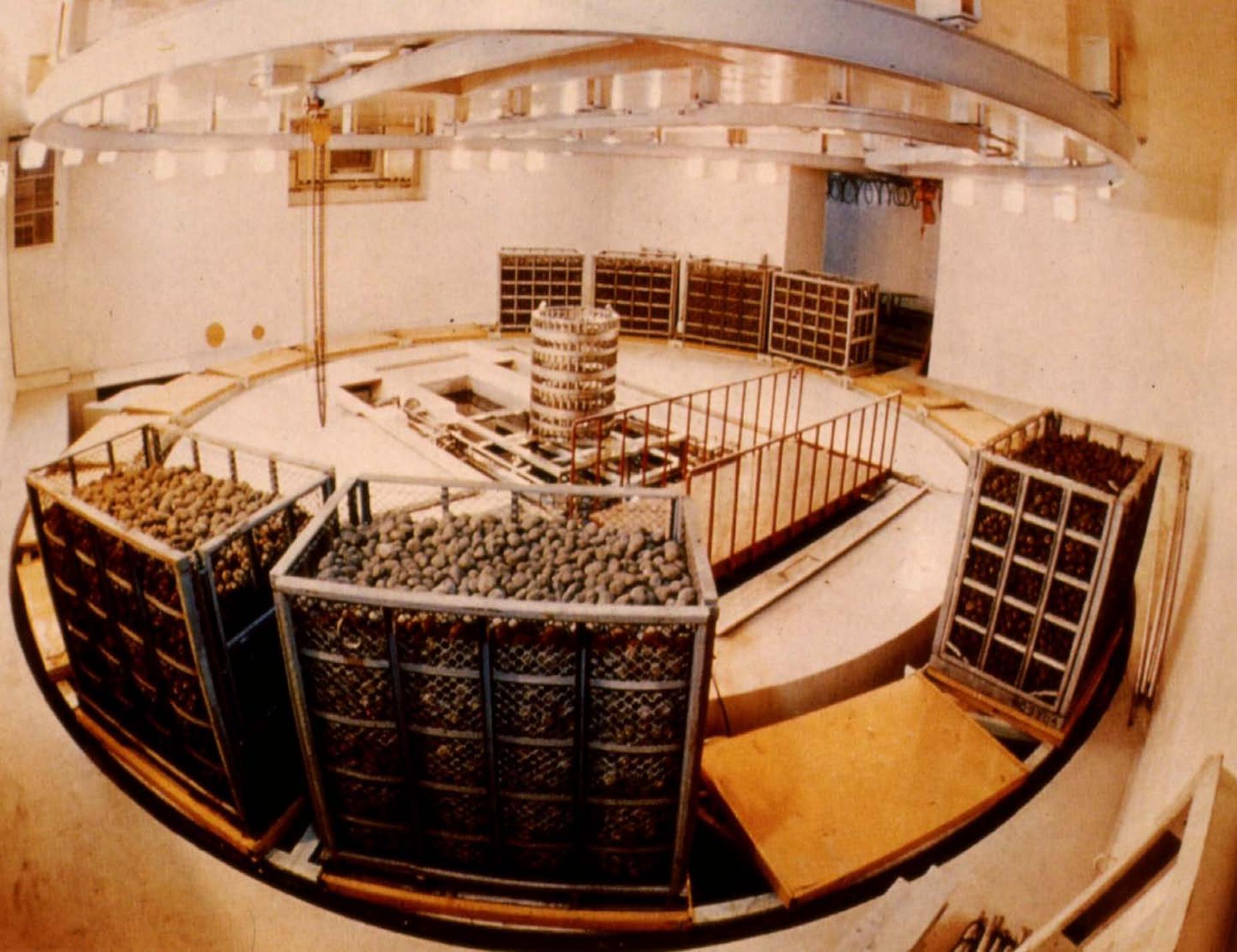
Strawberries
3000
2.95
40¢

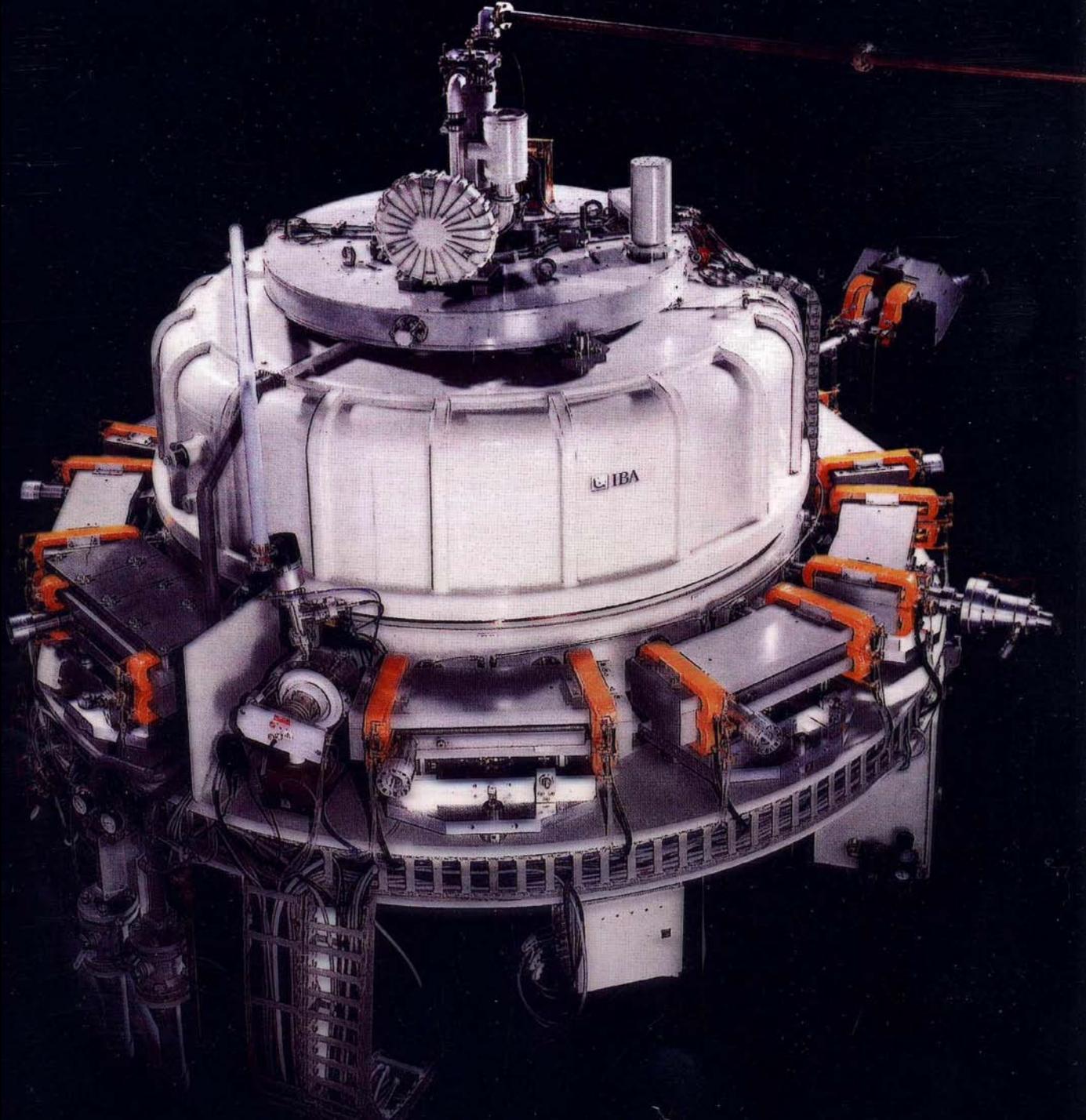

Every one benefits from
MODERN TECHNOLOGY
• Superior nutritional quality
• Superior taste
• Superior value
HEALTHY

Lemons
20¢

Grapefruit
40¢









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

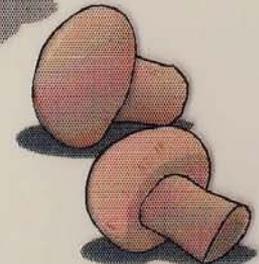
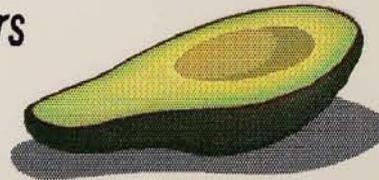
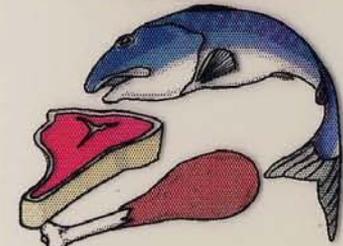
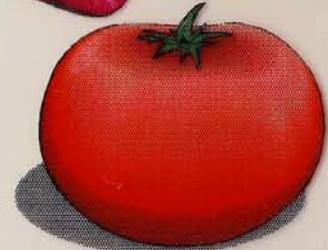
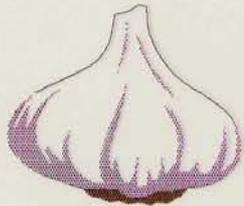
Dried Fruits

Yeast

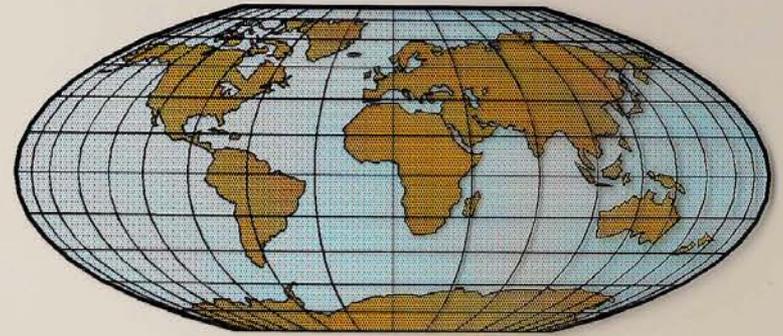
Rice

And Others

Special Hospital Meals



COUNTRIES UTILIZING FOOD IRRADIATION



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



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



WE'RE MAD

NEW JERSEY IS THE MOST POLLUTED... THE MOST CONTAMINATED... THE MOST POPULATED STATE. MUST WE NOW EAT HAZARDOUS FOOD ALSO?

WE'RE NOT GOING TO

AND

IT ANYMORE

URGENT
THE DANGER

EMERGENCY MEETING

The Department of Energy has a solution to the problem of radioactive waste.

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 - THIS "TREATMENT" DAMAGES THE FOOD WHILE RETARDING SPOILAGE AND INCREASING SHELF-LIFE. IT DAMAGES THE NUTRIENT QUALITY, THE VITAMINS, MINERALS, AND ENZYMES. IT MAY CHANGE THE CHEMICAL ADDITIVES ALREADY IN AND ON THE FOOD.
- FACT II - IT DAMAGES THE PEOPLE WHO EAT IT. RADIATION TREATMENT TO FOOD MAY CAUSE CHROMOSOMAL DAMAGE AND BIRTH DEFECTS. RADIATION CAUSES NEW, DANGEROUS CHEMICAL PRODUCTS IN THE FOOD THAT CAN LEAD TO CANCER.
- FACT III - IT DAMAGES THE ENVIRONMENT. RADIOACTIVE MATERIAL THAT IS USED TO TREAT FOOD WILL BE TRANSPORTED TO YOUR NEIGHBORHOOD WHERE ADDITIONAL FACTORIES WILL BE SET UP. THE POTENTIAL FOR TRANSPORTATION ACCIDENTS WILL INCREASE THERE HAVE BEEN ACCIDENTS IN AND AROUND FOOD IRRADIATION PLANTS ALREADY.

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.

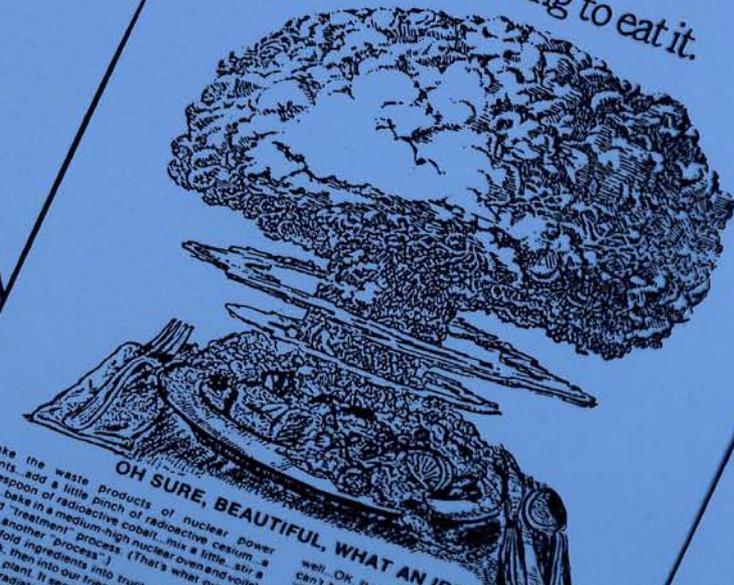
• IN ORDER TO GET OUR BILL PASSED

READ THE LETTER TO THE CONGRESSMAN ON YOUR MIND WHETHER OR NOT YOU AGREE WITH IT. DO AGREE WITH ITS INTENT (AND WE HOPE YOU DO) FOLLOW THE DIRECTIONS ON THE INSTRUCTIONS TO GET THE BILL INTO LAW.

BUT IT CAN HAVE THE SAME COVERAGE AND ALL LINKS IN A NATIONWIDE ENVIRONMENTAL ACT IN UNISON - WE CAN EFFECT CHANGE NOW HOW THEY KNOW WHAT THEY'RE ORGANIZING

NOT A CHAIN LETTER

You're going to eat it.



OH SURE, BEAUTIFUL, WHAT AN IDEA

Take the waste products of nuclear power plants, add a little pinch of radioactive cesium, a little pinch of radioactive cobalt, mix a little, stir a little, bake in a medium-high nuclear oven and you've got a food "treatment" process. (That's what our food needs, another "process".) Now, fold ingredients into truck and irradiation plant. It serves the food and the environment. How will you combine them?

well...OK, it can't be produced. Oh, we



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

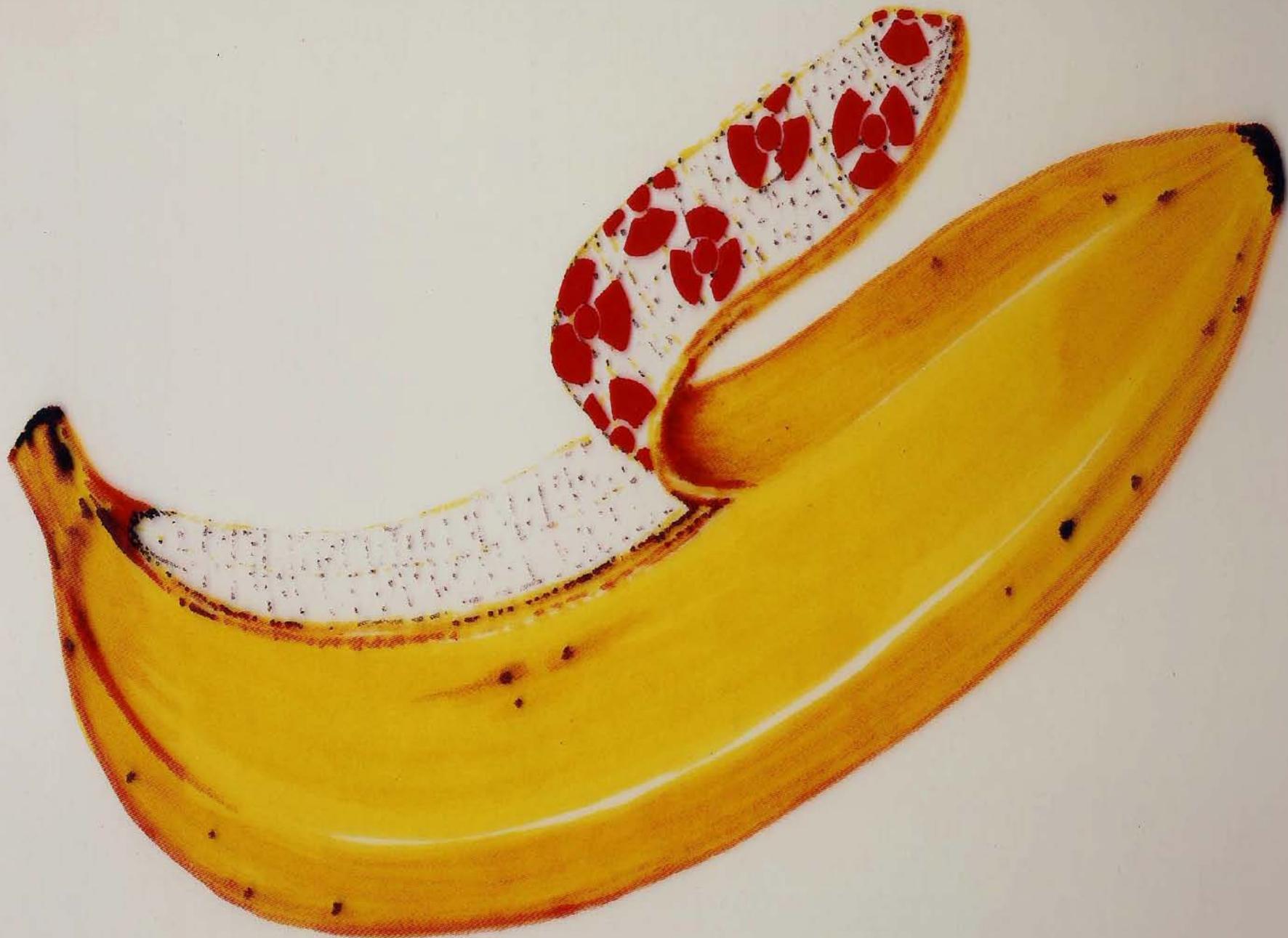
Food-Borne Illness in the U.S.

- 6.5 million cases yearly
- 9000 deaths

Source: National Center for Disease Control

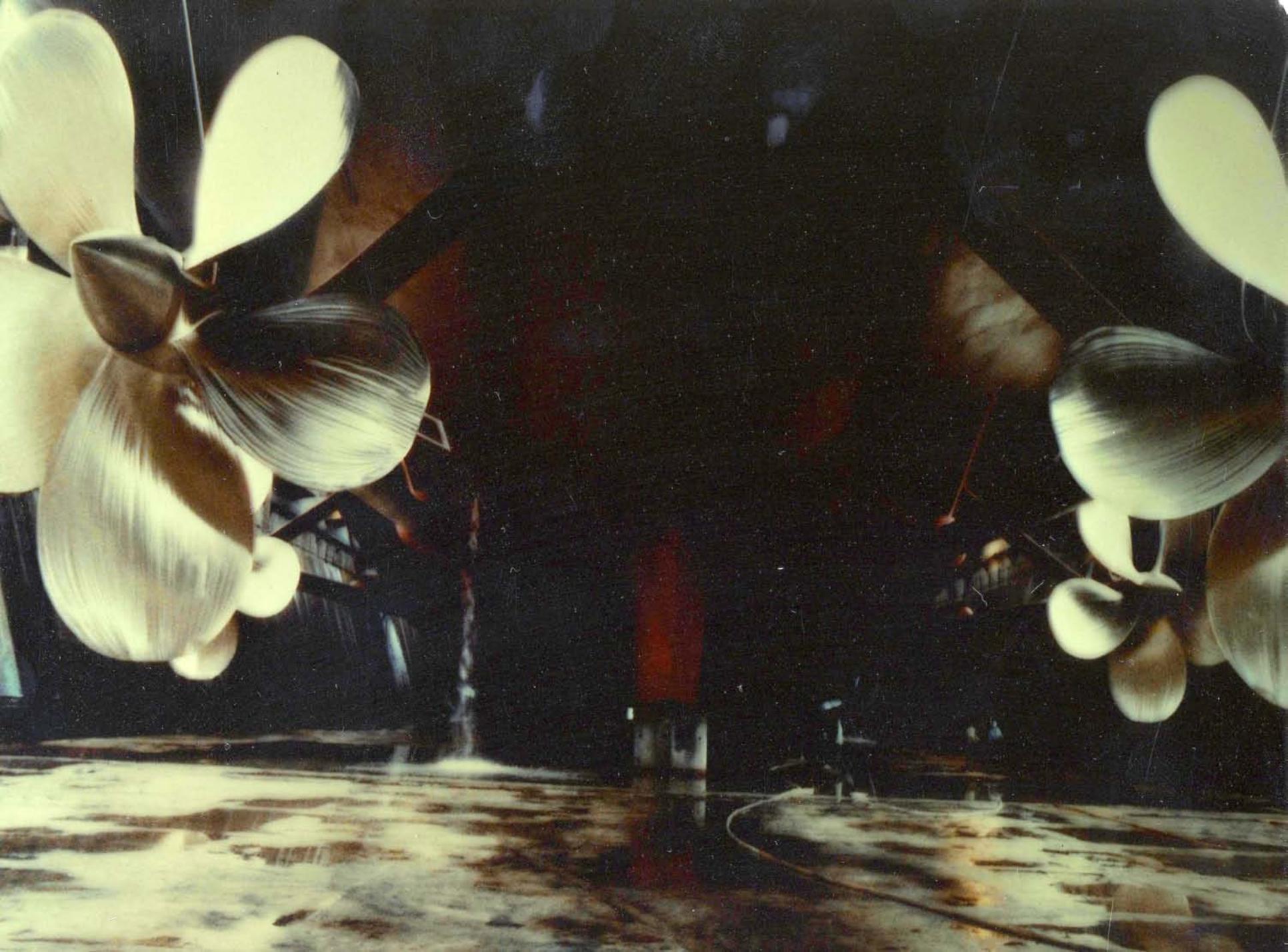
Irradiation is Also Used to Sterilize

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

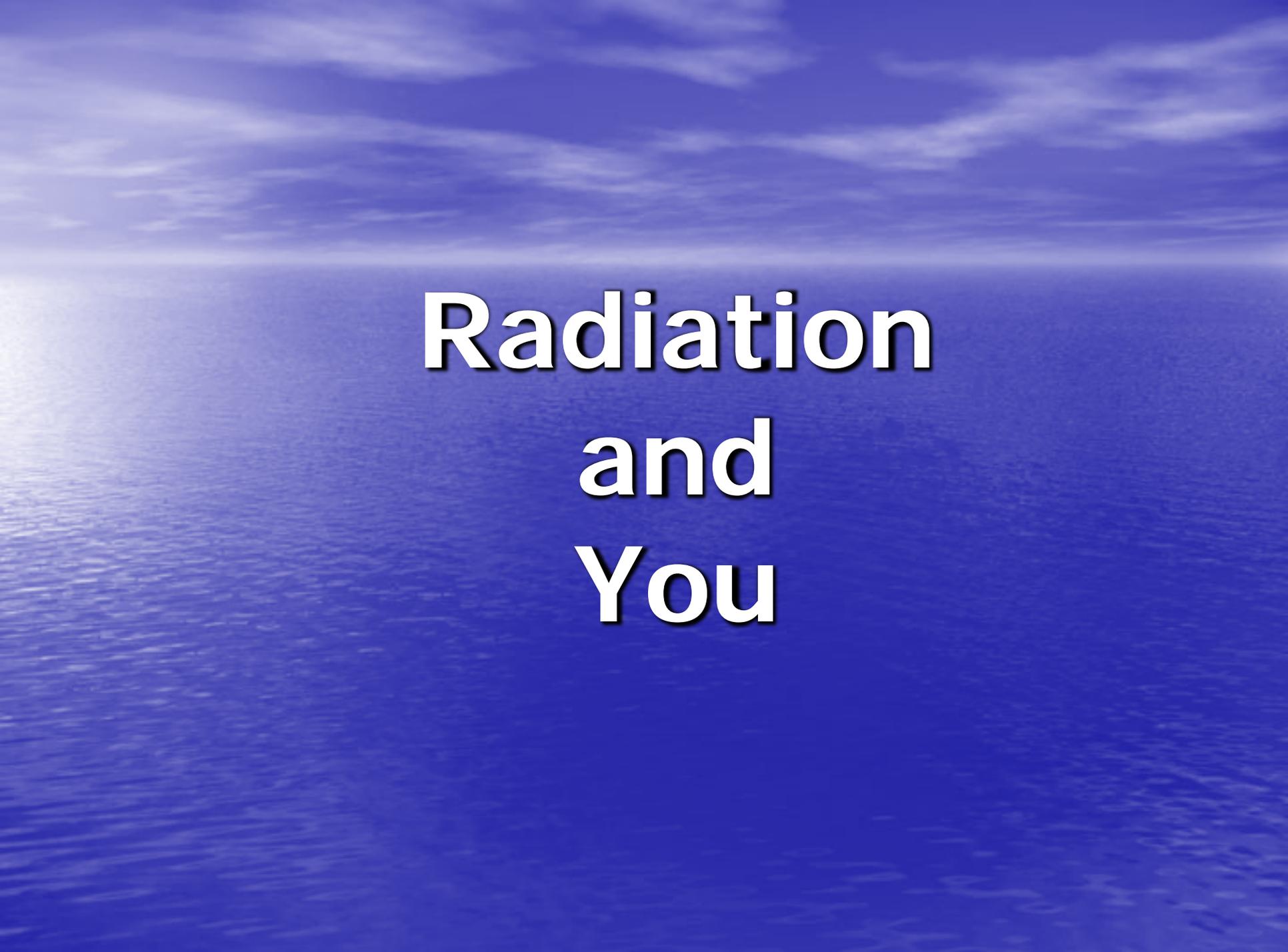






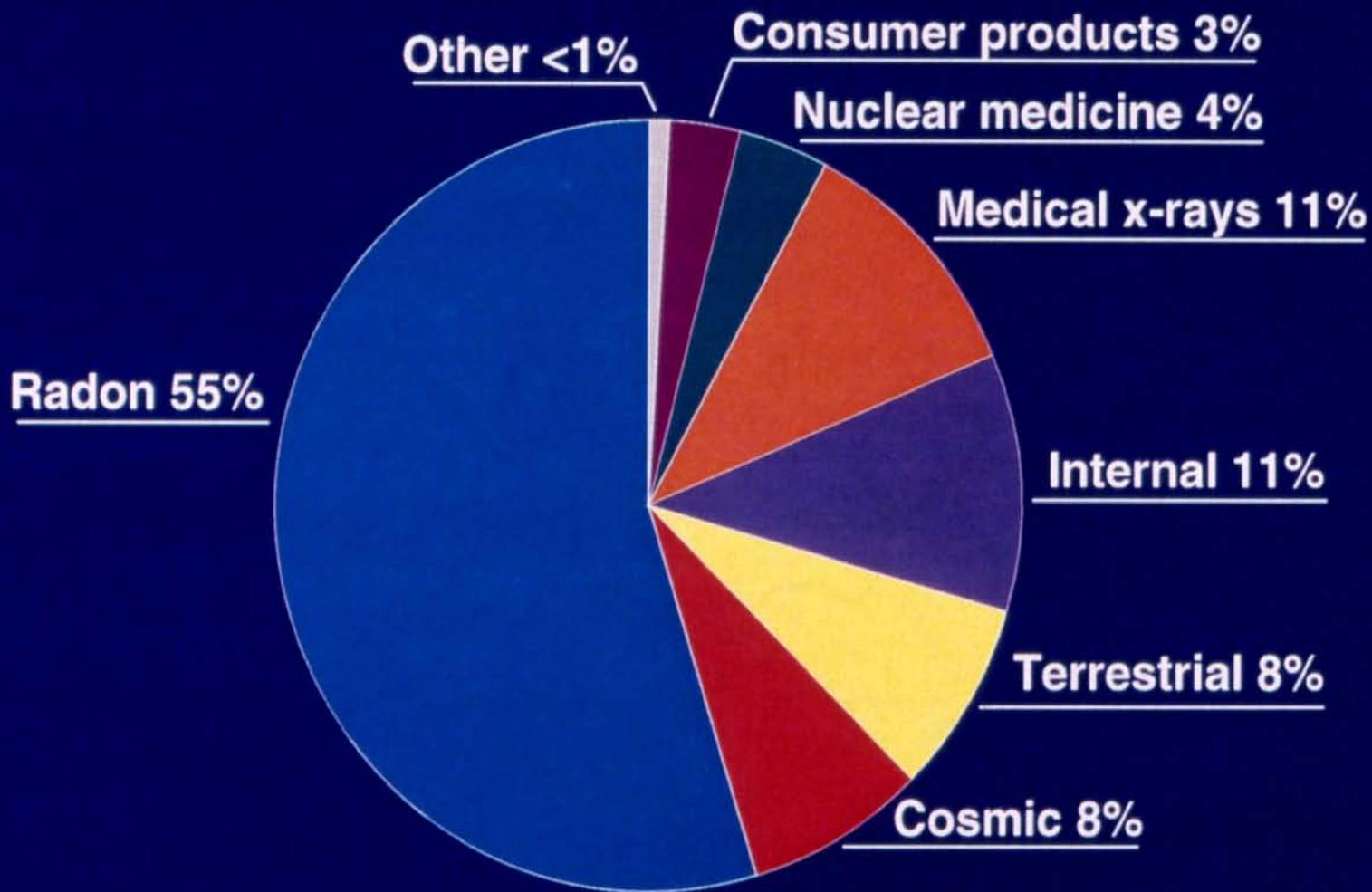






Radiation and You

Sources of Radiation Exposure to U.S. Population

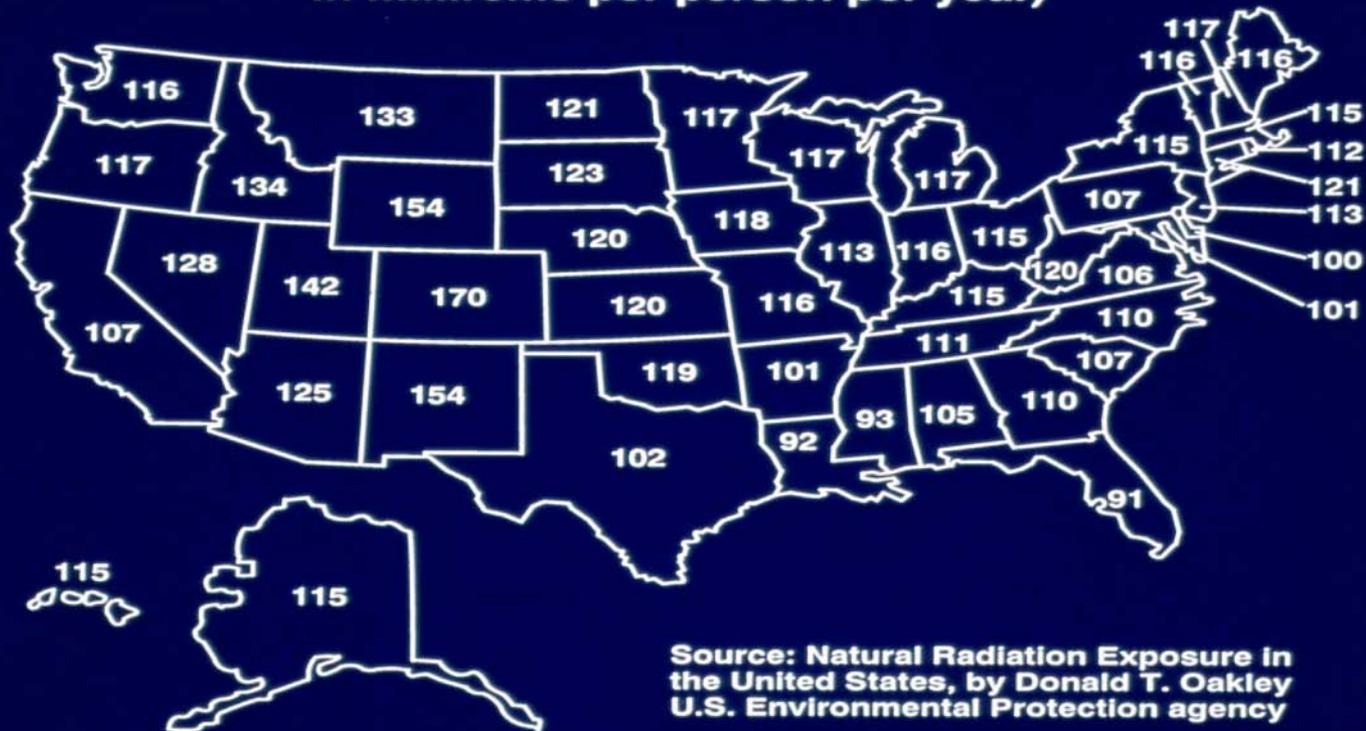


Natural radiation 82%
Man-made radiation 18%

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 Everyday Life (Annual Total)



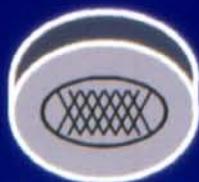
Photogray Glasses
0.1 mrem



Television
1.0 mrem



Natural Gas Stove
0.2 mrem



Smoke Detectors
0.1 mrem



Gas Lantern Mantles
0.1 mrem

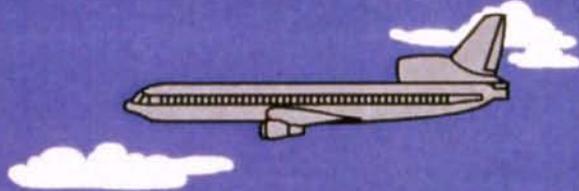


INEL
0.009 mrem

Approximate Additional* Radiation Background

*In Addition to Minimum Natural Background Exposure

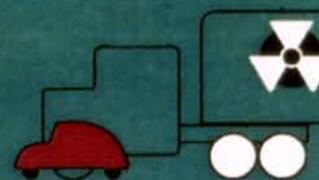
Minimum Human Exposure
is Approximately 125 mrem/yr



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)



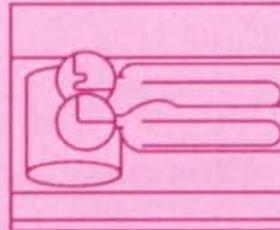
Passing or Being Passed
by a Nuclear Waste Truck

0.01 mrem/per pass
(Maximum)



Living in
Colorado

70 to 90 mrem/yr



Sleeping With
Another Human

1 mrem/yr



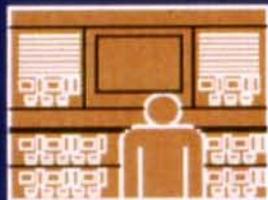
Living Near
Some Granite Rock
Formation

25 to 100 mrem/yr

Approximate Additional* Radiation Background

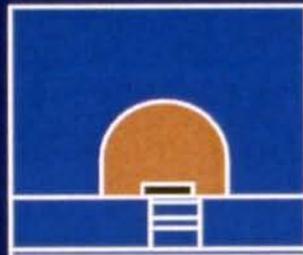
*In Addition to Minimum Natural Background Exposure

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

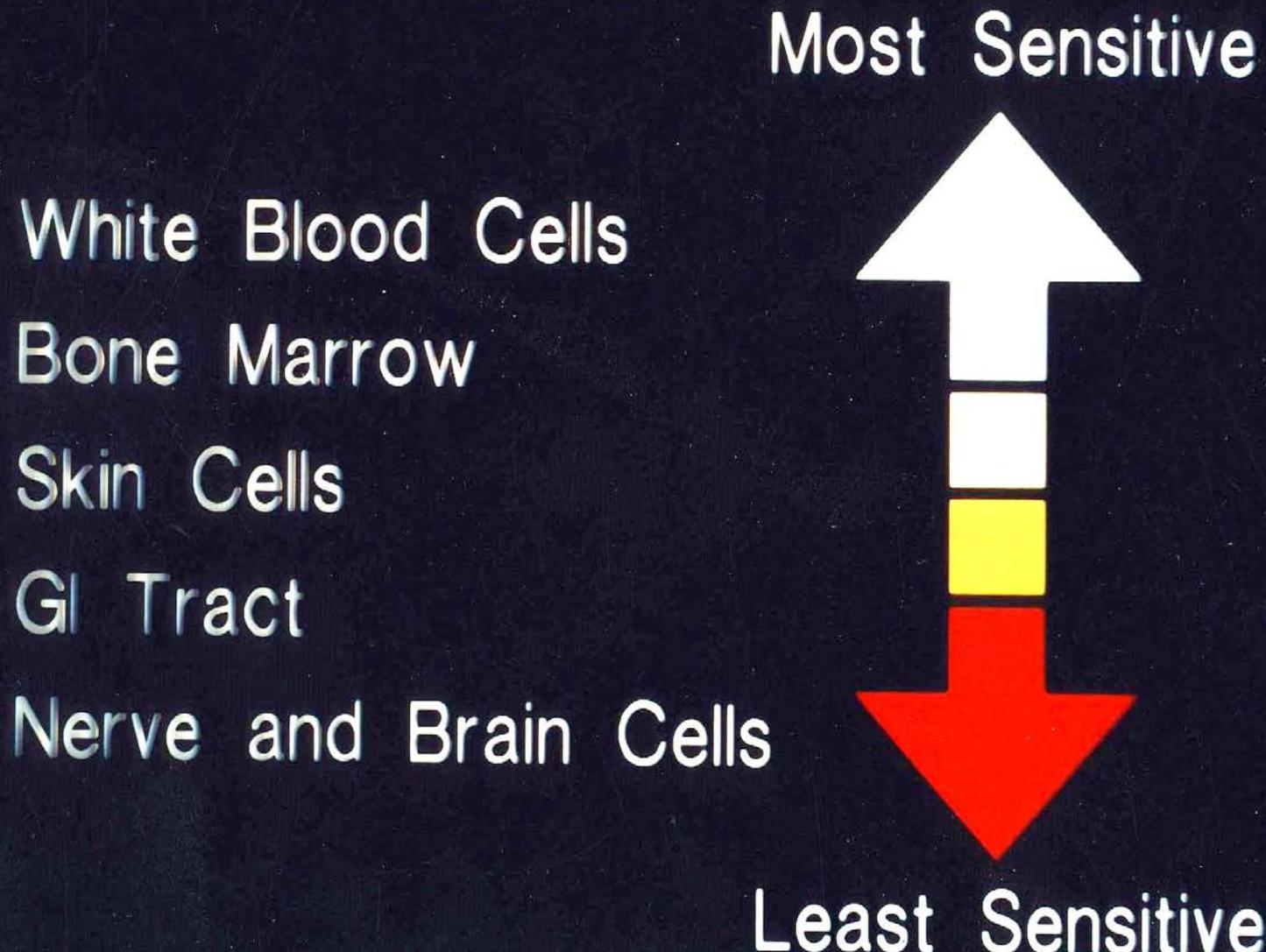
51 mrem/yr

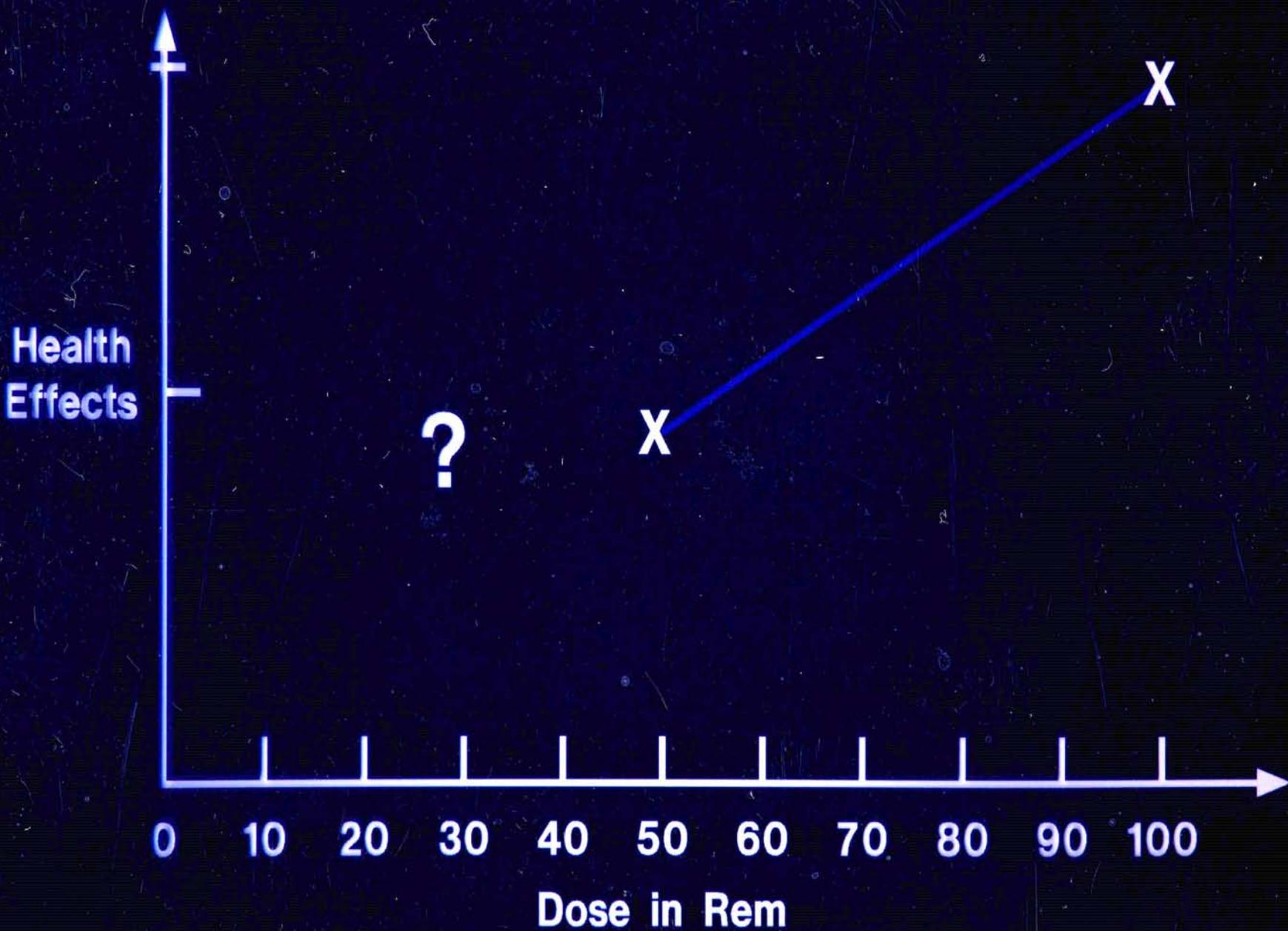


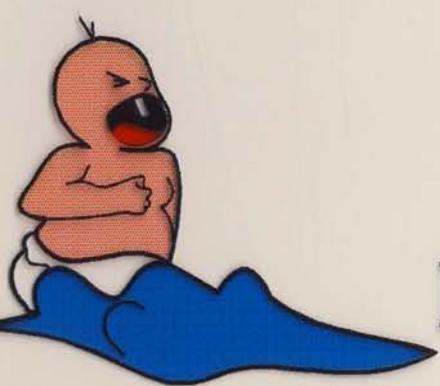
**Grand Central
Station**

120 mrem/per
working year

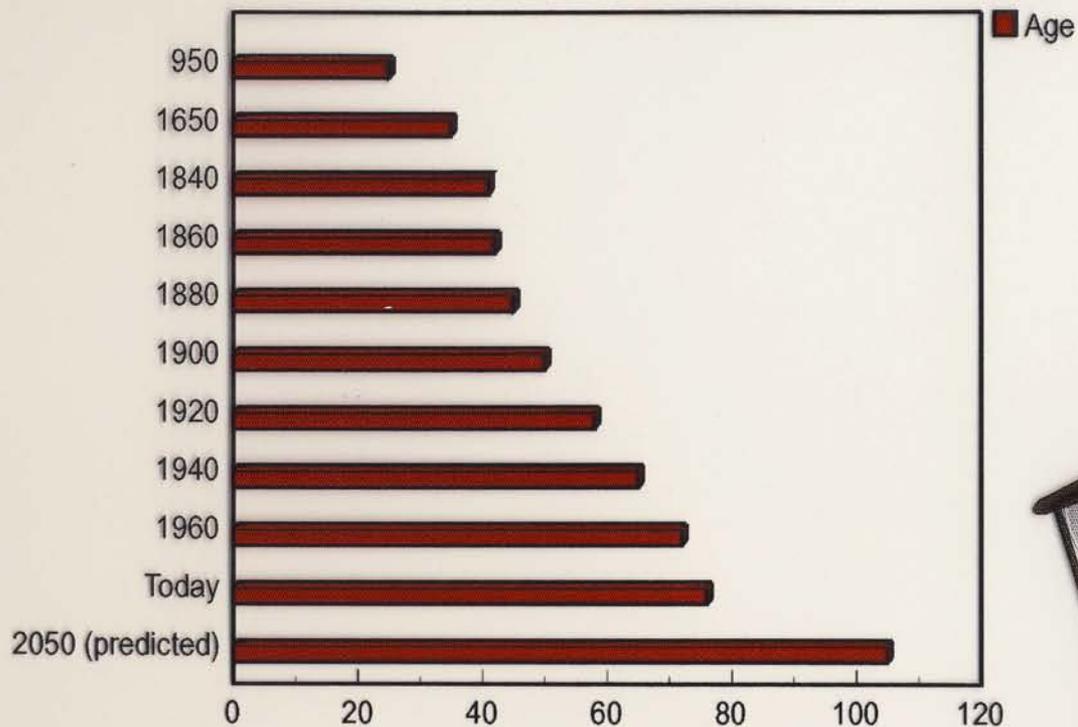
SENSITIVITY OF CELLS/TISSUES



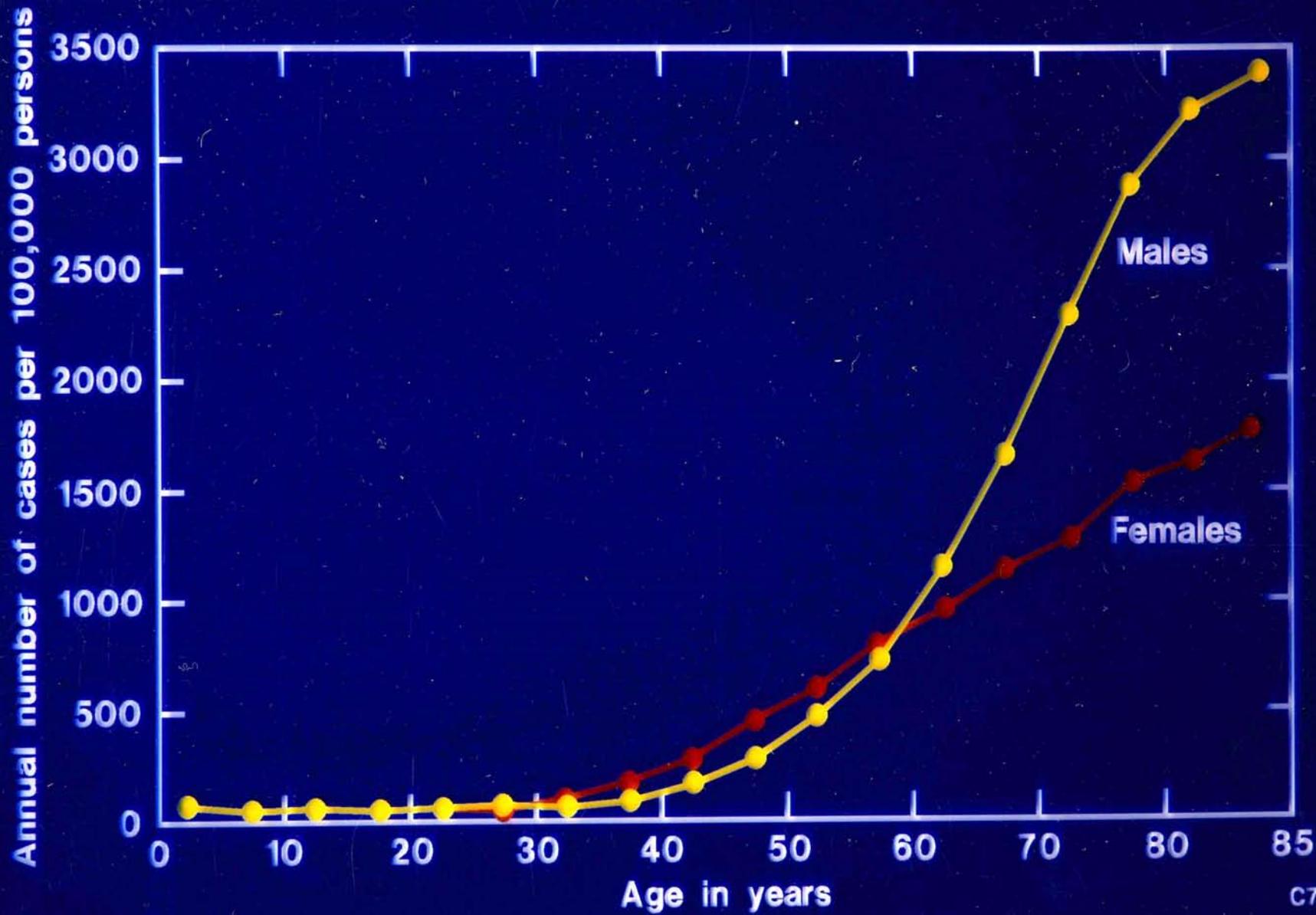




Life Expectancy in Years

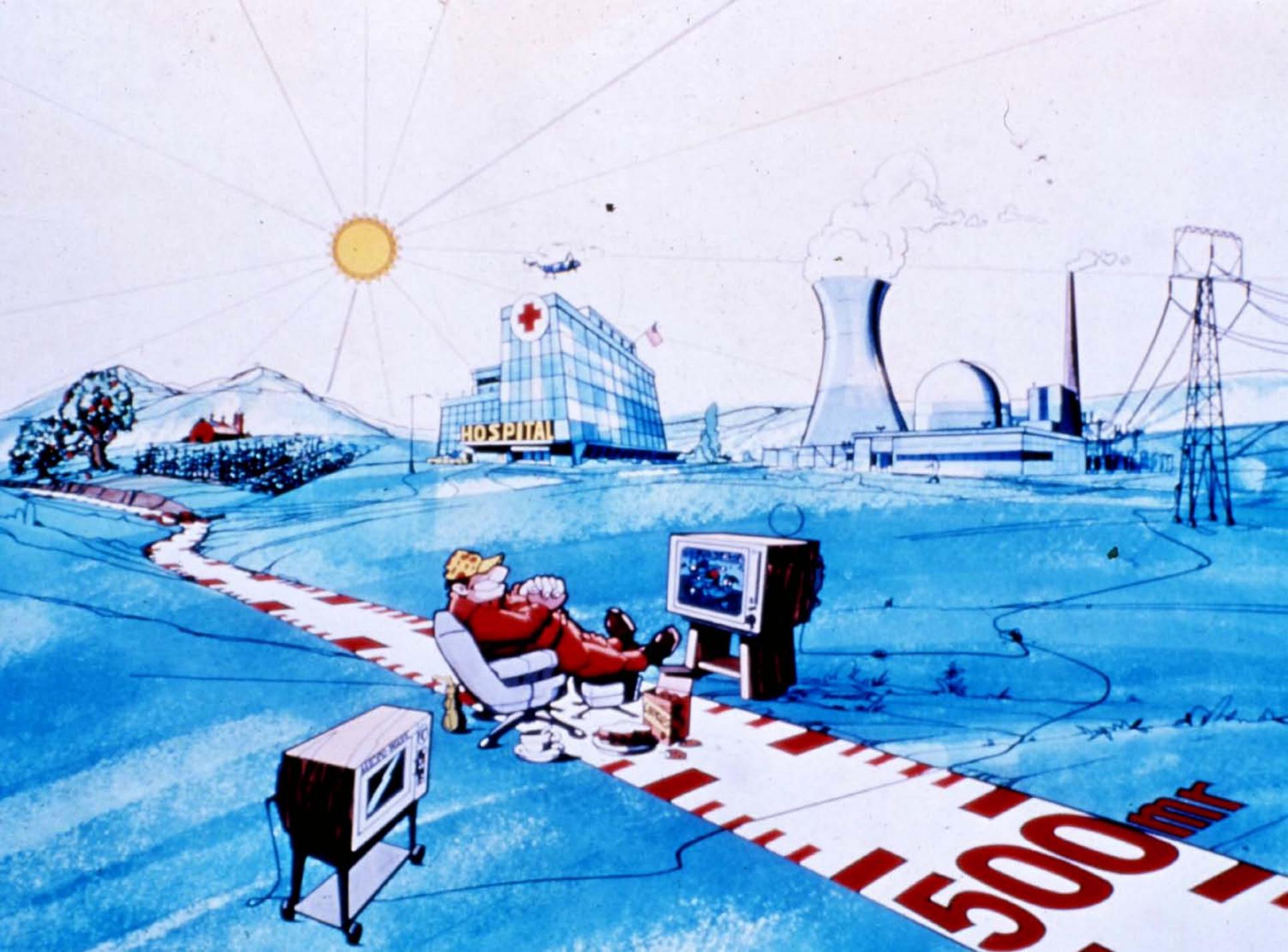


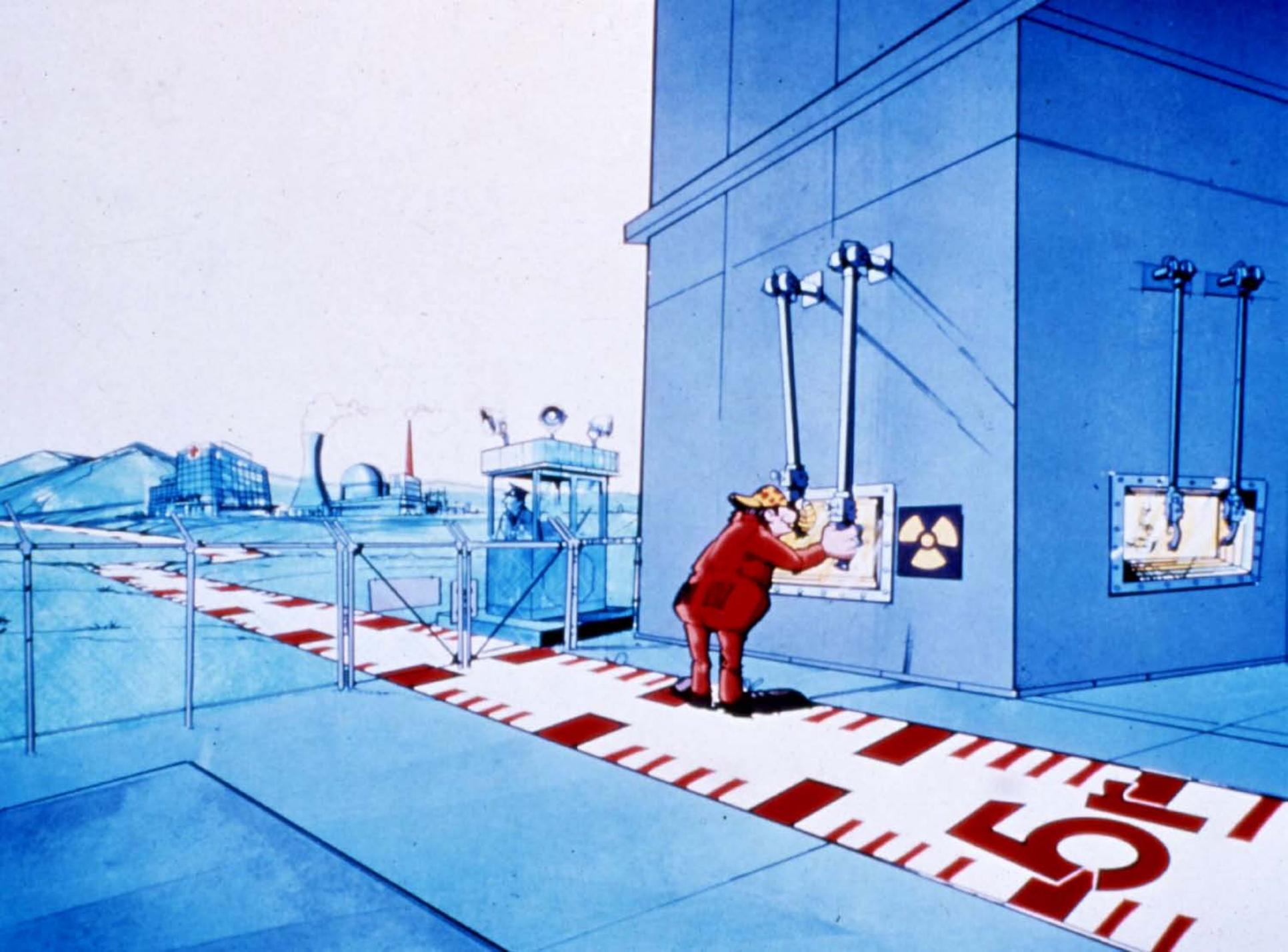
Cancer Incidence at Different Ages in the United States

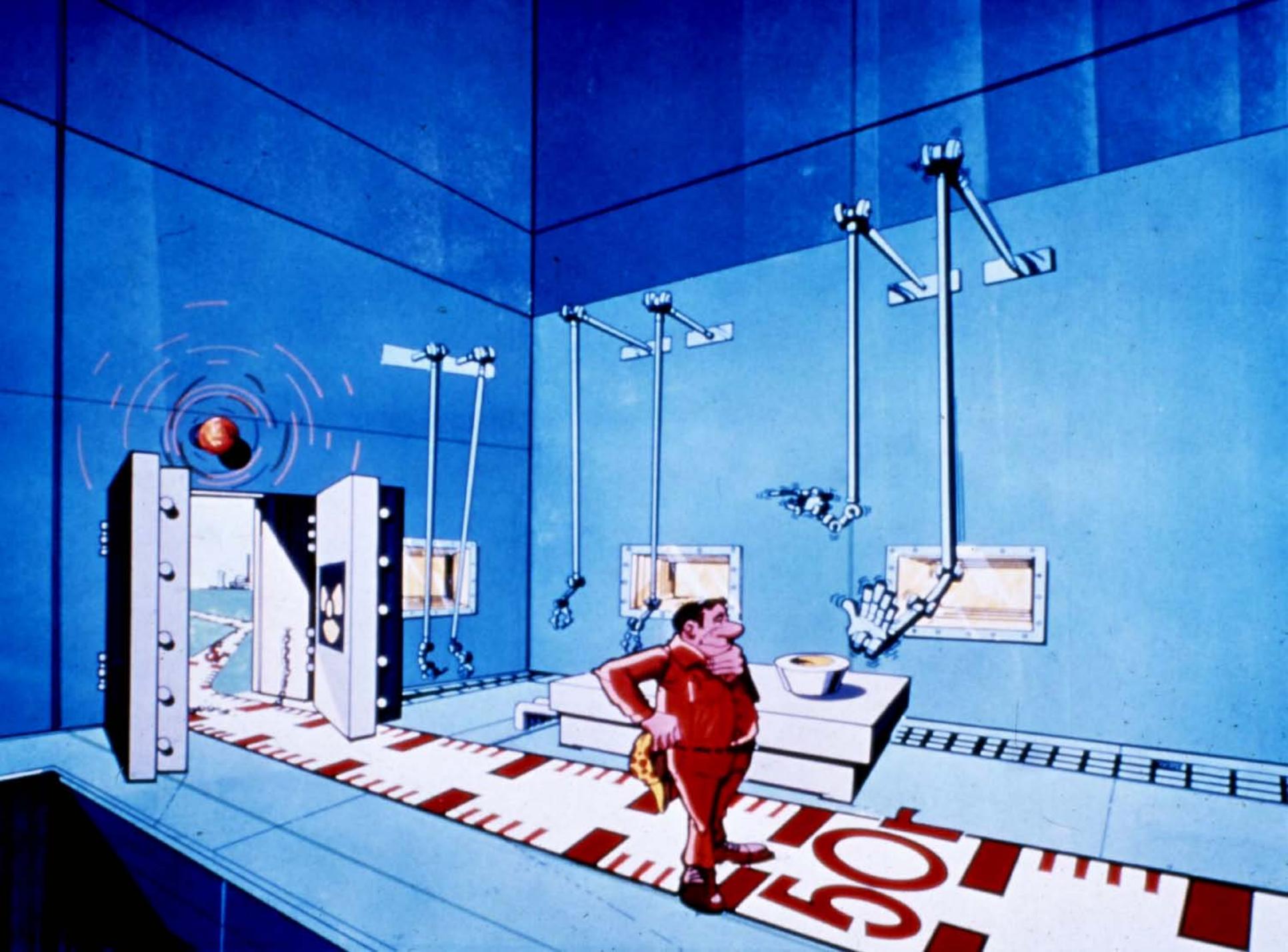


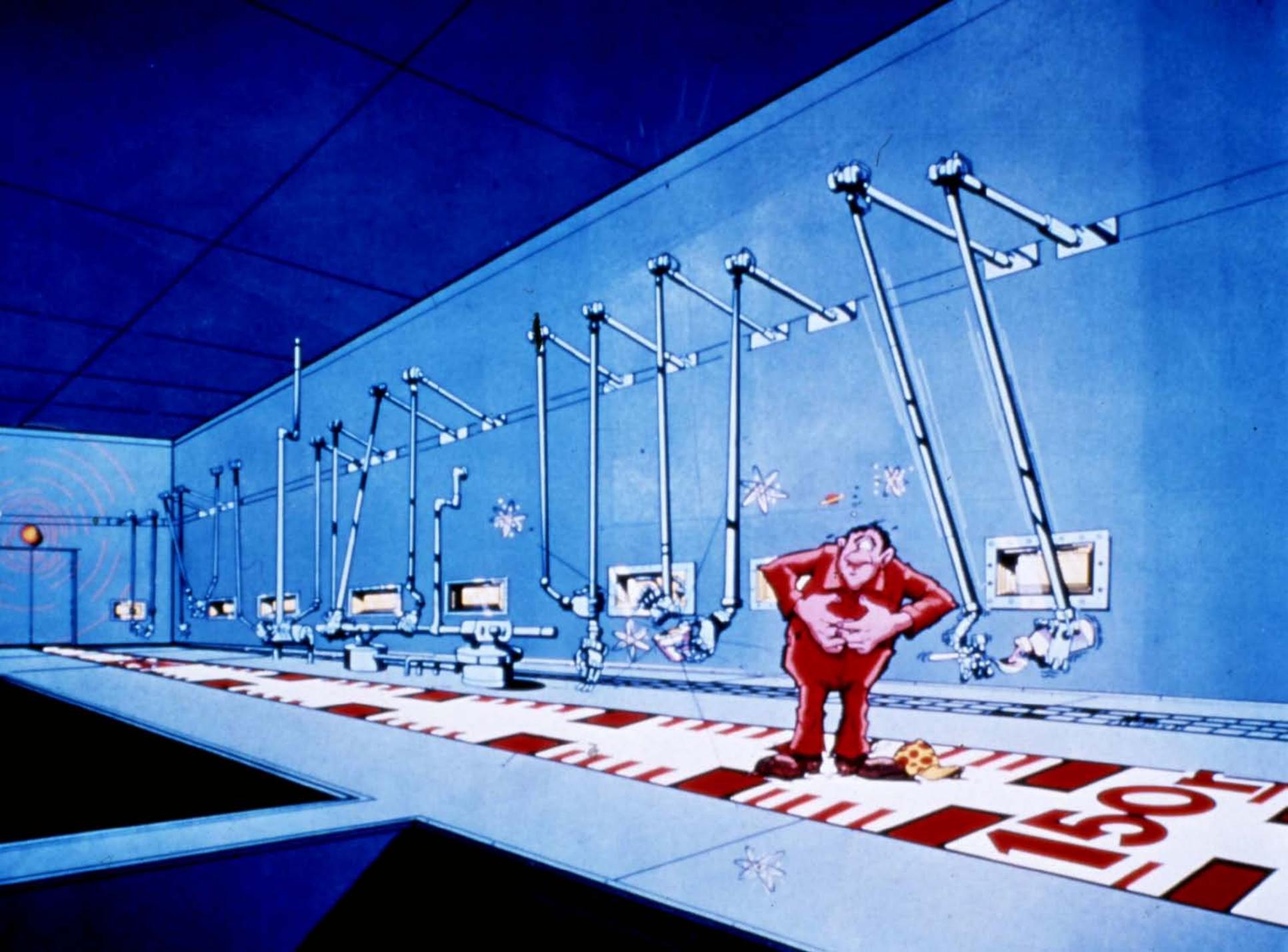














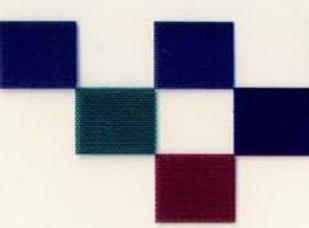
150r

100r

500r



1000r



U.S. Food Irradiation Rules

<u>Product</u>	<u>Purpose</u>	<u>Dose kGy (Rad)</u>
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