

EG:433-L1

**SCENES OF DESTRUCTION: HIROSHIMA AND
NAGASAKI, AUGUST 7-10, 1945**

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EG:433-L1a-P1a
P57

The Urakami Valley area in Nagasaki,
August 10, 1945.

Photograph by Yosuke Yamabata

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EG:433-L1b-P1b
P56

The ruins of Hiroshima in the direction of
the Industrial Promotion Hall, August
1945.

Courtesy of the National Archives

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EG:433-L1c-P1c
P59

Burned streetcar and passengers, near
ground zero in Nagasaki, 11 a.m., August
10, 1945

Photograph by Yosuke Yamabata

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EG:433-L1d-P1d
P60

Search parties, Nagasaki, August 10, 1945.

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EG:433-L1e-P1e
P62

The ruins were still smoking near the Sano
Shinto shrine in Nagasaki at 11 a.m.,
August 10, 1945.

Photograph by Yosuke Yamabata

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EG:433-L1f

"Many corpses were found at places where there was water--rivers, old wells, cisterns, ponds and the like. People who did not die instantly had, it appears, exerted themselves to the limit in their search for water."

A member of the Water Transport Rescue Team, Hiroshima, 1945

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EG:433-L2

COPING WITH CHAOS

The loss of city and prefectural officials, military leaders, hospitals, and medical professionals hampered the organization of relief efforts. Surviving doctors and nurses established makeshift relief stations, but beds, essential medical supplies, and trained personnel were in desperately short supply.

Relief parties moving into the devastated areas discovered that there were few people left to rescue. Their biggest task was the recovery and disposal of tens of thousands of corpses, many of which were buried beneath the rubble of the city.

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EG:433-L2a-P2a
P64

Rescue teams arrive in Hiroshima, August 9, 1945.

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EG:433-L2b-P2b
P66

Refugees in Nagasaki, August 10, 1945.

Courtesy of the National Archives

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EG:433-L2c-P2c
P68

Aid station [label to be determined]

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EG:433-L2d-P2d
P69

Assisting the wounded in Nagasaki, August 10, 1945.

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EG:433-L2e-P2e
P76

Temporary first-aid headquarters, Sumitomo Bank, Hiroshima, August 12, 1945. Anxious family members scan the list of the wounded located in various aid stations.

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EG:433-L3

A STORY OF SURVIVAL

"I thought she was dead, but finally found her alive. I hoped that she could at least die at home, so I borrowed a cart from a neighbor and went to Kuba to take her home. I had brought her up since she was two years old after her father died.... I took her to the Red Cross Hospital every day. I remember someone taking our picture on the way back from the hospital.... She was so pitiful, burned on the left side of her body, face and arm. I still cry when I think of it."

Kohide Matsuda

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EG:433-L3a-P3a
P74

Kohide Matsuda transports her niece, Toyoko, to the Hiroshima Red Cross Hospital. Toyoko Matsuda was on her way to work, 2.6 kilometers (1.6 miles) from ground zero, when the atomic bomb exploded. Her aunt found her alive in an aid station at Kuba, 23 days after the blast. Toyoko Matsuda later married and became the mother of three children. When this picture was first published in June 1973, the two women came forward to identify themselves.

Courtesy of the National Museum of Health and Medicine, Armed Forces Institute of Pathology

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EG:433-L4

COUNTING THE DEAD

The chaotic conditions in both cities following the bombing made it difficult to assess the human dimension of the destruction. The radiation effects complicated casualty estimates, because they continued to cause deaths and injuries weeks, months, or years afterward.

Several studies based solely on the disposal of bodies set the initial toll for Hiroshima at between 42,000 and 93,000. A more detailed survey, combining body counts, unresolved missing person reports, and interviews, was conducted by neighborhood associations during the year following the bombing. It suggests that as many as 130,000 people lost their lives as a direct result of the bomb up to the beginning of November 1945. A similar survey set the final death toll for Nagasaki at 60,000 to 70,000. The exact numbers will never be known.

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EG:433-L4a-P4a

Mortality at Hiroshima: This graph shows the percentage of individuals who were killed plotted against distance from ground zero. More than 90 percent of those who were within 500 meters (1,600 feet) died within one day.

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EG:440-L1
Main title

A DEADLY NEW THREAT: RADIOACTIVITY

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EG:440-L2
Main text

The scientists who designed the atomic bombs knew of these weapons' potential heat and blast effects, but were only partly aware of the long-term dangers of radioactivity. They nonetheless expressed concern over the possibility of radioactive fallout from the "Trinity" test in New Mexico, which was conducted near ground level. But even the leaders of the Manhattan Project were surprised by the contamination produced by this explosion. As a result, they decided that the weapons dropped on Japan should be detonated at a higher altitude to minimize fallout and maximize the blast wave.

Most scientists continued to believe that radiation would not claim many victims when the bombs were dropped. Japanese buildings were so poorly constructed, they reasoned, that those most in danger from radiation would already have been killed as a result of blast and heat. To their surprise, many cases of radiation sickness appeared soon after the bombings.

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EG:441-L1

INITIAL RADIATION EFFECTS

A nuclear bomb emits a concentrated burst of high-energy radiation--chiefly gamma rays and neutrons--at the instant of the explosion. At Hiroshima and Nagasaki, this initial radiation caused damage to the tissues of people and animals located within about 2,000 meters (1.2 miles) of ground zero. People exposed to high radiation dosages close to ground zero often died within hours or days, even if they had been shielded from the other effects of the bombs.

The initial burst of radiation also induced radioactivity in buildings, soil, and other materials located near the centers of the explosions. This contamination caused radiation sickness too, but to a lesser degree than the initial radiation.

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EG:441-L2

RADIOACTIVE FALLOUT: THE "BLACK RAIN"

Radioactive material created by the atomic explosions was carried high into the atmosphere by the mushroom clouds. Soot carried aloft on thermal currents generated by the fires, when combined with this material, led to radioactive rain in or near the two cities 20 to 40 minutes after the bombings.

The "black rain," as it came to be known, carried the radioactive materials back to earth in the form of fallout. The sticky, dark water stained skin, clothing, and buildings. Contact with the skin, ingestion through breathing, or the consumption of contaminated food or water often resulted in radiation sickness.

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EG:441-L2a-P2a

Black rain stains: The dark streaks on this woman's slip were made by black rain that fell northwest of Hiroshima for several hours after the bombing.

Loaned by the Hiroshima Peace Memorial Museum

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EG:441-L2b

"The black rain began to fall and I wondered what it was.... It gave me a horrible feeling.... Later, people said it might be oil rain.... We wondered if it was oil to make fire or to harm people...whether they might be planning to kill all of the people by burning them...or whether this oil would stick to the skin of all the people, making everyone die one after the other...."

Yoko Ota, Hiroshima

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EG:441-L2c

"I went to report to the dean of the college that the patients had been evacuated, but I found him covered by a raincoat and lying asleep on a hill-side vegetable patch with terrible wounds all over his body. Large drops of black-colored rain were falling and spattering on the raincoat. I thought to myself for the first time that Japan had lost the war."

Dr. Takashi Nagai, Nagasaki

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EG:441-L2d-P2d

A white plaster wall in Hiroshima was permanently stained by "black rain."

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EG:441-L3

THE MYSTERIOUS "A-BOMB DISEASE"

Physicians treating bomb victims in Hiroshima and Nagasaki were puzzled by the number of people suffering from unexplained loss of appetite, nausea and vomiting, abnormal thirst, diarrhea, and general malaise. The symptoms occurred alone or in combination within three hours after the explosion in up to 30 percent of the survivors.

Other symptoms also occurred within days and weeks after the bombings. People suffered widespread hair loss, internal hemorrhaging, and reddening and pain in the larynx, gums, and palate. Skin hemorrhages and lesions appeared on the face, chest, neck, and upper arms. The symptoms appeared in over 60 percent of all Hiroshima survivors who had been within 1 kilometer (0.6 miles) of ground zero, but in only 7 percent of those over 5 kilometers (3 miles) of ground zero.

By early September 1945, Japanese physicians and American authorities began to realize that the bomb survivors were suffering from radiation sickness.

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EG:441-L3a-P3a
color
P81

Exposed 1,000 meters (0.6 miles) from ground zero in Hiroshima, this soldier began losing his hair on August 18. He was hospitalized on August 30, when the first signs of hemorrhaging were observed. He lost consciousness on September 2 and died the next day, two hours after this photo was taken.

Photograph by Kenichi Kimura

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EG:441-L3b

"An old woman...died within a few days of the bomb, showing many spots on her body.... I know it is terrible to say this, but those spots were beautiful. They were just like stars--red, green-yellow and black--all over her body, and I was fascinated by them."

Physician, Hiroshima

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EG:441-L3c

"We heard the new phrase, 'A-bomb disease.' The fear in us became strong, especially when we could see certain things with our eyes: a man looked perfectly well when he rode by on a bicycle one morning, suddenly vomiting blood and then dying.... Soon we were all worried about our health, about our own bodies--whether we would live or die. And we heard that if someone did get sick, there was no treatment that could help. We had nothing to rely on, there was nothing to hold us up."

A Buddhist Priest, Hiroshima

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EG:442-L1

LONG-TERM EFFECTS OF THE BOMBS

The immediate crisis in Hiroshima and Nagasaki had passed by the end of December 1945. People who had suffered from radiation poisoning had either died or apparently recovered. However, it soon became obvious that exposure to radiation created longer-term health problems.

Thermal burns became covered with disfiguring scars known as keloids. Severe anemia and other blood disorders, cataracts, sterility in both sexes, and menstrual irregularities appeared. Children exposed to high doses of radiation while in the womb faced a 20 percent risk of being mentally retarded. Some exposed children were born with unusually small heads or other deformities.

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EG:442-L1a-P1a
P26

The keloid scars resulting from initial burns cannot be surgically removed. Keloids permanently disfigured faces and twisted the muscles of arms, hands, and legs.

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EG:442-L1b

"How would people look at me. The more I thought about it the more apprehensive I became.... The burns on my back did not heal for fifteen years, and I had to receive treatment for them continuously. After a skin transplant operation in 1960 the wounds finally covered over, but ulcers soon formed in the [keloid] scars. The ulcers got worse and five years ago I entered another hospital and received another operation to remove them. Subsequently, I have been in and out of the hospital repeatedly.... According to my doctor, modern medical science still knows of no efficient method to treat these lesions."

Sumiteru Taniguchi, Nagasaki

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EG:442-L2

CANCER AMONG SURVIVORS

The incidence of some cancers is higher than normal among bomb survivors. A noticeable increase in cases of leukemia (a cancer of the blood) appeared in Hiroshima and Nagasaki about two years after the bombings. The disease climbed to a peak among survivors between 1950 to 1953.

The incidence of cataracts of the eye and cancers of the urinary tract, breast, lungs, colon, esophagus, and stomach were also higher among atomic bomb survivors. Genetic damage was apparent in the nonreproductive cells of atomic bomb survivors, but there is no evidence that genetic problems have been passed to future generations.

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EG:442-L2a-P2a
P83
Diagram to be redrawn

Estimated relative risks of cancers for individuals exposed to radiation at a distance of 1 to 1.5 kilometers (0.6 to 0.9 miles) from ground zero at Hiroshima and Nagasaki.

Courtesy of the Radiation Effects Research Foundation

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EG:442-L3

THE ATOMIC BOMB CASUALTY COMMISSION

To obtain a better understanding of the effects of radiation on large populations, the U.S. government established the Atomic Bomb Casualty Commission (ABCC) in 1947. The commission would eventually identify 120,000 bomb survivors, establish their precise location at the time of the bombings and their radiation dosage, and monitor their health over an extended period.

The commission was criticized in Japan for its refusal to provide health services to victims. That decision was based on a reluctance to draw patients away from Japanese physicians and on the American perception that treating the survivors would amount to an apology for the bombings. Some Japanese claimed that the U.S. government regarded the atomic bombings as an experiment and the survivors as guinea pigs. In 1975 the ABCC was reorganized as the Radiation Effects Research Foundation with joint Japanese-American participation.

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EG:442-L3a-P3a

ABCC doctors carried out systematic studies of bomb survivors and their offspring, as shown in this 1948 photograph.

Courtesy of the Radiation Effects Research Foundation

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EG:442-L3b-P3b

The Radiation Effects Research Foundation, still active today, has proven invaluable in advising those treating victims of nuclear accidents. Shown here is a delegation of Soviet scientists who came for consultations regarding the 1986 explosion of the reactor at Chernobyl in the Ukraine.

Courtesy of the Radiation Effects Research Foundation

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EG:443-L1

SADAKO AND THE THOUSAND PAPER CRANES

Sadako Sasaki was two years old when she was exposed to radiation 1,600 meters (1 mile) from ground zero in Hiroshima. In 1955 the healthy 12-year-old girl, the fastest runner at the Noborimachi Primary School, was diagnosed as suffering from acute leukemia. According to Japanese folk belief, cranes live a thousand years and are a symbol of good health. Sadako spent the last months of her life attempting to fold a thousand paper cranes. When she died in October 1955, she had completed only 964. Her classmates finished the rest.

Determined to raise funds for a monument to Sadako and the other children who may have died as a result of the bomb, the young people of Hiroshima began a letter writing campaign to schools across Japan. The effort captured the public imagination and established Sadako as a symbol of the cost of war in the nuclear age. Today her statue stands in the Hiroshima Peace Memorial Park, adorned with thousands of paper cranes that arrive each year from school children around the world.

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EG:443-L1a-P14a
P84

Sadako Sasaki as a fifth grader at
Noborimachi Elementary School, Hiroshima.

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EG:443-L1b-P1b
P84a

Dedication of the statue in memory of
Sadako Sasaki and the other "A-bomb
children," Hiroshima Peace Memorial Park,
May 5, 1958.

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EG:444-L1

AFTER THE BOMB: TWO CITIES REBUILD

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EG:444-L1a-Pl1a
P86

The skeletal dome of the Industrial
Promotion Building--a symbol of Hiroshima
for 50 years.

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EG:444-L1b-P1b

The rebuilt Urakami Cathedral in Nagasaki.

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