

**Boltzmann Shot
Operation Plumbbob**

Sergio Frutos
2017

Acrylic on canvas
110 x 195 x 2 cm

Unique
Signed

SF-P 17-10



About this artwork:

Boltzmann Shot was the first nuclear test conducted on May 28, 1957, as part of Operation Plumbbob at the Nevada Test Site. The event included VIP observers, NATO representatives, and Exercise Desert Rock VII and VIII personnel¹.

Operation Plumbbob consisted of 24 nuclear tests and included other notable shots like Whitney and Fizeau. It was the biggest and the most controversial nuclear test series to ever take place in the continental United States. Between May 28 and October 7, 1957, a series of 29 atomic bombs were detonated as part of a study of the effects that nuclear explosions had on structures, people and animals. About 16,000 American troops were exposed, as well as some 1,200 pigs. Pigs were burned in the blast and showered with glass blast debris². Although some studies are not concluding³, many others show health consequences for the participant troops⁴.

During the Pascal-B nuclear test of August 1957, one of the tests of Operation Plumbbob, a 900-kg steel lid was welded over the borehole to contain the nuclear blast, despite scientists predicting that it would not work. When Pascal-B was detonated, the blast went straight up the test shaft, launching the cap into the atmosphere, making it the fastest human-made object ever⁵.

1. Jaton West and Jeannie Massie, SHOTS BOLTZMANN TO WILSON The First Four Tests of the PLUMBOB Series, Final Report DNA 6008F (McLean, Virginia: Defense Nuclear Agency, 1981). →
2. *Dark Circle*, directed by Judy Irving, Ruth Landy, and Christopher Beaver (Arlington, Virginia: PBS, 1989), DVD. →
3. Caldwell, Glyn G, Matthew M Zack, Michael T Mumma, et al. "Mortality among Military Participants at the 1957 PLUMBOB Nuclear Weapons Test Series and from Leukemia among Participants at the SMOKY Test." *Journal of Radiological Protection* 36, no. 3 (2016): 474-89. →
4. *Mortality of Veteran Participants in the CROSSROADS Nuclear Test*. National Academies of Sciences, Engineering, and Medicine, 1996. →
5. Rebecca Harrington, "The Fastest Object Ever Launched Was a Manhole Cover — Here's the Story from the Guy Who Shot It into Space," *Tech Insider* (New York), May 2, 2016. → 

About the project: Atom

[...]

"And so?" you ask your guide, *the nice one*.

"So, we learned to make stars," he answers.

"I thought you told me that this was already like a sun."

"Oh, yes, but it's not a real sun. Real suns don't work like that. They're much more powerful. So we made real stars."

"I can't believe it."

"And what do you think that white powder you've got there and this thermos I've got here are for?"

"The stuff that stars are made of?"

"Yes. And nightmares."

Antonio Cantó, "Así funciona un arma termonuclear. (How a thermonuclear weapon works)" *La pizarra de Yuri: historias de ciencia al calor del fuego* (*Yuri's blackboard: science stories by the fire*). Guadalajara ;

The project Atom is based on archival photographs from nuclear tests and revolves around how the 'atomic age' is a turning point¹ and to which extent human stupidity can destroy the world we live in. Is possible the survival of humanity and living beings with whom we share the planet as we know it under the current system?

The phrase "atomic age" has been around since 1945 in reference to the world's reframing by the newfound human control over nuclear forces. Nuclear weapons prompted both apocalyptic visions of humanity's annihilation through mutually assured destruction and promises of abundance, progress, and modernity through the utilization of atomic energy.

On the one side, the atrocities of mass destruction in Japanese cities, on Pacific Atolls, and other "testing sites" across the globe forever stamped the self-image of the human as an engineer of death. On the other side, harnessing nuclear power and the emerging nuclear sector were hailed as instruments of national security, a hotbed of technological innovation, a wellspring for electric household energy, and a radically modern means of investigating the natural world and improving human bodies and diets. But soon the smiling side of this Janus face faded, and threat of radioactivity became the scare phenomenon of the second half of the twentieth-century. Radioactive contamination has changed the natural and the social environment to an extent that brings a whole new register into focus: the possibility that life on this planet could end as we know it.²

Our current development, predating the planet, following the dictates of capitalism will certainly drive us to mass extinction.³

Production of steel requires iron, coal, and an immense amount of air which passes through the mix. Today, all the air on Earth contains traces of radioactive residues from the nuclear tests realized since 1945. The so produced metals contain contamination by radionuclides, interfering with the function of sensitive medical and technical equipment. Until recently,⁴ scientists involved in the production of those devices sought metals uncontaminated by background radiation, referred to as low-background steel, low-background lead, and so on.⁵

For many years, for certain sensitive scientific instruments, it wasn't possible to manufacture on Earth steel or other metals without radionuclides, it had to be taken from shipwrecks sunken before 1945, as the German naval fleet that Admiral Ludwig von Reuter scuttled in 1919 to keep the ships from the British,⁶ as lead has been frequently taken from roman archeological sites.⁷

Since the nuclear test race in 40s and 50s, the world has advanced in nuclear technology. Today, a nuclear bomb could target a large-scale attack, at a longer range, and with much greater destructive force. People are increasingly concerned about the potential destructive humanitarian outcomes. So long as nuclear weapons exist, it is inevitable that someday they will be used, whether by design, accident, or miscalculation. The danger of use of nuclear weapons is greater than ever before due to proliferation of nuclear weapons, terrorism, and political instabilities.⁸

1. Paul Crutzen and Christian Schwägerl, "Living in the Anthropocene: Toward a New Global Ethos." *Yale E360*, January 24, 2011. →
2. A. Cundy, et al., "Radioactive Fallout as a Marker for the Anthropocene." In: C. Rosol and G. Rispoli (eds) *Anthropogenic Markers: Stratigraphy and Context, Anthropocene Curriculum*. Berlin: Max Planck Institute for the History of Science, 2022. →
3. Troy Vettese, "A Marxist Theory of Extinction." *Salvage*, January 1, 2019. →
4. Sam Westreich, "Good News! Our Steel is No Longer Radioactive!" *Sharing Science* (blog), *medium.com*, December 25, 2021. →
5. Ed Conway, "The Eerie Story of Low Background Steel." Substack newsletter. *Material World*, June 10, 2023. →
6. Steven Brocklehurst, "Scapa Flow scuttling: The day the German navy sank its own ships." *BBC Scotland News*, June 21, 2019. →
7. Clara Moskowitz, "Ancient roman metal used for physics experiments ignites science feud." *Scientific American*, December 18, 2013. →
8. Shan Xu and Alicia Doodt, "Nuclear Bomb and Public Health." *Journal of Public Health Policy* 44, no. 3 (2023): 348-59. →