

Part 1: Framing the bomb

What is the job of a historian?

- History is not just the set of facts.
- History is the work of creating empirically guided interpretations of the past, expressed as narratives
- Empirical does not mean quantitative

Translation of leaflet dropped on the Japanese

- The Truman library said that there were leaflets dropped warning the Japanese. This is not true because the dates and the events do not correspond. It said it was dropped on August 8 and that the Soviets had invaded.
- This is suspicious and there is no context to this.
- Document from General Groves gives context to this document. They started to look at a leaflet as a way of taking advantage of the bomb dropping. They were thinking they wanted to inform the general public. They were making these documents after Hiroshima.
- In the process of doing this, the Russians invade Japan. They tried dropping leaflets the day after they bombed Nagasaki.

Nuclear Narratives

One Common Narrative

- Japan attacks Pearl Harbor
- Japan wages terrible war in Pacific
- Japan resorts to kamikaze attacks
- US fights back
- Japan won't surrender
- Truman chooses to use bomb, things will end faster
- Atomic bombs dropped, war ends shortly after
- Conclusion: bombings justified
- This is called the **Orthodox narrative**. The Stimson narrative. This narrative came from 1947 (when the secretary of war, Stimson, wrote an article in Harper's magazine). This becomes hardened in the coming years.

Another Common Narrative

- Japan attacks Pearl Harbor
- Japan wages terrible war
- Japan resorts to kamikaze
- US fights back
- Japan knows it has lost the war
- Japanese high command seek diplomatic end to the war in summer of 1945 and the US knows this
- Truman knows war will end soon because of the Soviet intervention and without US invasion
- Truman wants to use the bomb to scare the USSR: Cold war motivation
- Atomic bombs dropped, USSR invades Japan immediately afterwards
- Japanese surrender because of the Soviets.
- Conclusion: bombings not justified.

- This is called as the **Revisionist narrative**
- This occurred in 1949. Blackett wrote a book about this idea/narrative.

Orthodox Narrative

Nature of the decision	Careful moral deliberation
motivation	End the war as soon as possible
outcome	Atomic bombs ended the war
Narrative creators	People involved with the bombings

Revisionist Narrative

Nature of the decision	Diplomatic intrigue
motivation	Scaring the soviets into submission
outcome	Atomic bombs weren't necessary to end war, cold war begins
Narrative creators	Critics of the bombing, often Marxists

Big Questions:

1. What are the stakes?
2. What are the consequences of believing one narrative over the other?
3. Why does history have power?
4. Who cares?

Example of Narratives Having Power

- Paul Tibbets dropped one of the nuclear bombs over Japan. In 1993, the Smithsonian was going to put the airplane on display. They were setting up a display and it caused a lot of controversy. Is the goal to educate people or glorify the United States? They were giving off a revisionist narrative.
- A lot of focus on the decision to drop the bomb, a lot of focus on the victims. Jobs were lost from this. Veterans of WW2 were very upset over this. They ended up canceling the exhibit.
- They were going to do a more conservative approach with the exhibit and have less of a focus on controversial concepts.
- Focusing exclusively on the technical is a way to avoid the social and political components of something

Where do these narratives come from?

- There was a publicity program from the government. They were trying to shape the narrative to ensure that the bomb would be received well.
- They hired a NYTimes journalist to help with this campaign among other people.
- The government did a lot of press after this and there were more denials printed than actual stories from the government.
- Military survey: Japan's struggle to end the war.
- "Japan would have surrendered even if the atomic bombs had not been dropped, even if Russia had not entered the war"
- The military was against the bomb. This is from the US Strategic Bombing survey (July 1946)
- Stimson made this narrative because he wanted to show that it was humane. He tried to make it seem like it was a neutral narrative.

The pre-atomic war against Japan

- Initially, Japan invaded China, Korea, a bunch of islands, etc.
- Fight to the last man type only took 200 Japanese prisoners. 6000 Americans are killed.
- The USA by 1945 has their island hopping campaign
- 13,000 Americans killed. 95,000 Japanese killed. Very bloody battles. The Americans are taking back and inching closer to the Japanese mainland.
- B-29 Superfortress was a bomber designed for use in the Pacific theater and it was designed to fly at very high altitudes.

Tinian Airbase

- The USA turns the whole island into an airport. Lots of accidents and crashes, just became a giant airstrip.
- M19 cluster bomb
- Firebombs: blows up when it penetrates something
- When it strikes a surface, then the flames fan out. It sticks to things and goes into cracks
- Meant for destroying civilian structures. 37% of German houses were beyond fire control within 6 minutes once they were hit
- They were testing these fire bombs on mock Japanese houses. 68% of Japanese houses the fires got out of control.

Operation Meetinghouse

- First major incendiary campaign using new tactics devised by Curtis LeMay.
- Against Tokyo and areas nearby.
- Destroyed 25% of the city
- Kills at least 100k people
- Almost entirely civilians
- The single most destructive bombing raid during the entire war
- Made 1 million people homeless overnight
- Bombed Toyama, Osaka with firebombs and other bombs and ensured that the fires caught on things.
- **Henry Stimson's diary entry:** talking to General Arnold and he was upset with the Tokyo bombing. It was not a precision bombing like he was told. Stimson cannot do anything. This was not a political decision. Operational decisions were made by the Military.

At least 67 Japanese cities targeted for firebombing over the course of World War II.

Part 2: Using the Bomb

The atomic bombs of August 1945

- Subcritical mass = neutrons escape before hitting more fissile material
- Super critical mass = chain reaction
- Everytime a uranium atom splits, neutrons live for a very short amount of time and they can only go so far. If the ball is not very big, the neutrons are going to escape the ball.

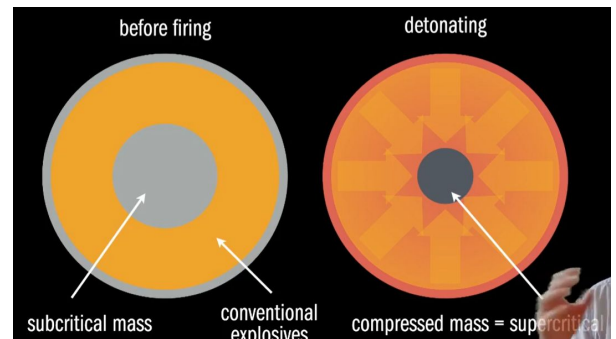
Gun Type bomb: $\sim 1/2$ critical mass on one sided and then they would use a conventional explosive and shoot the other half of the critical mass. They thought this would give you the 60 generations

“Little boy”: 64 kg of 80% enriched HEU (15,000 tons of TNT). This was dropped on Hiroshima. This weighed 4 or 5 tons. By WW2 standards, still a very large bomb

- The little piece is static and the big piece is being shot at it. There is the HEU projectile and the HEU target in this bomb.
- **Problem discovered:** Unwelcome discovery in summer 1944. Reactor-bred plutonium is contaminated with Pu-240; this has a high spontaneous fission rate = too many neutrons = **predetonation (fizzle)**
- Producing plants that cannot be used unless they come up with a better way to do this

New Approach: Implosion

- This would all blast inward.
- **Subcritical mass: neutrons escape before hitting fissile material**
- **Increasing the density decreasing distance between atoms equivalent to increasing mass = super critical mass**
- Explosive lenses use carefully-machined high-explosives with different detonation velocities to achieve highly-symmetrical implosive shock waves.
- Velocity must be correct on all sides. Needed the shock waves to become spherical.



Los Alamos growth and re-organization

- They had to reorganize for this new approach and Los Alamos became super fucking big.
- It has all changed around the implosion problem. They expanded the lab 2.5x
- Aw cute, they have a division named after Fermi!

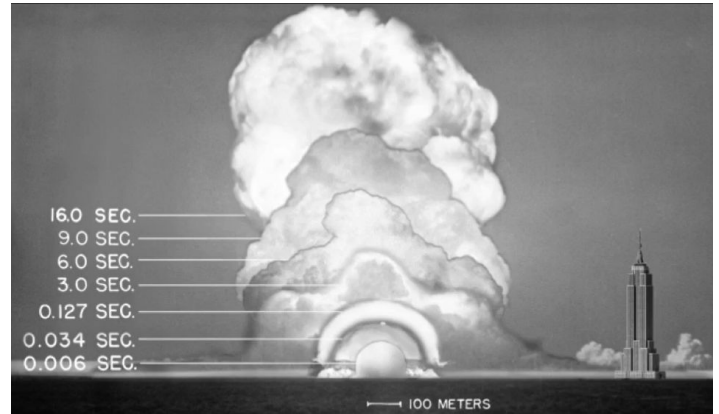
Implosion Design

- There is a pusher which helps standardize the compression
- The tamper is heavy and it is meant to hold everything together(using uranium)
- Then there is plutonium
- And finally the initiator that will get crushed and it will produce neutrons. Electrical engineering was a huge part of this. They created a low impedance switch (aka triggered spark gap). It waits until it reaches the right voltage

“The Gadget”

- They do not know if this bomb will work. They knew the gun-type bomb would work. The implosion design they were not sure if it was going to work.
- You could test plutonium but they had no idea how well the diagnosis would work.

- They needed to do a test. They assembled the gadget. Trinity test (July 1945)
- They put the core at the bottom and they hoisted everything up to the tower. They did not know how explosive it was going to be. They placed bets on this. They took thousands of photos of this.
- 20,000 tons of TNT
- The trinity test had a mushroom cloud.
- How did they keep all of this a secret?
- They sent out a fake press release. They said that a bunch of ammunition exploded.
- **"Fat Man"** bomb: 6.2 kg of plutonium-239. They are very big and very heavy weapons. This was used in Nagasaki.
- For the Little Boy bomb, only 1% of HEU fissioned. Each kilogram of HEU that fissions entirely releases 17 kt of TNT equivalent.
- For the Fat Man bomb, 6.2 kg of Pu = 20 kt. 17% of Pu fissioned. Each kilogram of Pu that fissions entirely releases 19 kt of TBT equivalent.
- Trinity test showed that the plutonium bomb works better than the uranium bomb.



Potsdam and the Bomb

- **Roosevelt and Truman:** Anytime you see a picture of Roosevelt and Truman together, Harry Truman does not know the atomic bomb exists. He was not brought into this by Roosevelt. Roosevelt is a tricky person, he did not document any of his decisions.
- He brought his previous VP into this. Wallace knew exactly what was going on.
- Truman was suddenly the president. This frames a lot of Truman's perspective. He had no idea about the bomb. He had no idea what was going on in Hanford and he was kept out of it. He went from being a senator to being in charge of figuring out the end of WW2.
- **Potsdam Conference, July 1945:** tried to work out a lot of complicated issues with the Soviets. The Soviets really wanted a wall of reliable soviet puppets. Truman had to wrestle with these issues. He said he was in over his head because he had never dealt with foreign affairs.

Japan-Soviet Relations

- The Soviets stayed neutral with Japan.
- The Soviets had their hands full with the Nazis. Both of these parties maintained this neutrality until 1945.

- The Emperor is a military power but he is not involved in the military decisions. He is not that powerful. He was less of a totalitarian leader. Japan had more of a military dictatorship.
- The Japanese government had many changes within the internal government.
- Japanese were worried that America would remake Japan if they were to surrender. Their idea here is to have the Soviets become a mediator and they can talk about the conditions of surrender. They do not want anything to happen to the Emperor.
- The Soviets do not want to be friends. The Soviets were negotiating with the Americans. They were trying to see what they could get from the Americans if they declared war on the Japanese. The United States is able to see all of the Japanese foreign communications. The Japanese were open to surrender.
- Truman is aware of these discussions and he is aware that the Soviets want to take part of the war.
- **Potsdam:** big debate they wanted to issue a statement. Should they modify the unconditional surrender for the Japanese? Into this mix, there is the Trinity test. While at this conference, they get wind on the Trinity test. General Groves sent a note to Stimson and talked about how successful the Trinity test goes. Truman is thrilled and now the bomb is on his mind
- This means that they can make a shit ton of bombs.. They can make 3.5 bombs a month. He finds this a very helpful thing. They do think this might scare the Soviets. This gives Truman a wild card and he can leverage this.
- They also believe the Soviets know nothing about this.
- Truman is told to tell the Soviets about the nuclear bomb. He went up and told Stalin and casually mentioned this new weapon. Stalin took it very casually. Stalin acted like it was not a big deal but later it was found that Stalin already knew. He knows exactly what Truman is talking about. Truman won't know the Soviets have spies until 1950.

Order to Use the bomb, July 25, 1945

- General Groves made the strike order the next day. Truman is nowhere near this. He wanted to put this in writing.
- They want this to occur after the conference to avoid any diplomatic stuff
- Stimson did not want Kyoto bombed. And Stimson got it off the list by going to Truman about it.
- Hiroshima was a major port city with a lot of military presence.
- Nagasaki was a major port city in Japan as well.

Hiroshima, August 6, 1945

- Little Boy, enriched uranium, gun-type bomb, 15 kilotons of TNT
- 60k-140k deaths.
- Destroyed Hiroshima with the shotgun effect. The need was to impress upon the world. They believed that if they made something super awful then they would be able to say we should not be making this. They take no effort to spare Japanese lives.

Japanese and Soviet Responses

- 16 hours after, Truman makes an announcement and everything gets unleashed. The Japanese wanted to find out if it was true and the Japanese did not trust American propaganda.

- August 8th: they get a response saying it is an atomic bomb by measuring the radioactivity in the soil
- The Soviets on August 6th became sad because they wanted to invade Japan in the middle of August.
- After a day, he realizes that the Japanese haven't surrendered and Stalin was like oh my god, let's invade the next day.
- As of tomorrow, we declare war on Japan and you guys are toast (Soviets to Japan). The Soviets cut all telegram communication and they don't specify what timezone tomorrow is. The invasion began an hour later.
- **Soviet invasion of Manchuria:** they start invading all over the place. This is all reasonably close to Japan. This begins at midnight. The Japanese are super upset by this. The Japanese knew that the Soviets did not want peace and they would not be deterred by blood. Japanese got two enemies. Devastating blow for Japan
- They are very distressed by all of this.

Nagasaki, August 9, 1945

- 45k-80k deaths.
- Bomb Nagasaki urban areas.
- They make this run on a plant nearby
- A hole miraculously opens up on the clouds and is able to find where to drop it.
- Nagasaki, everything goes wrong. Big, screwed up mission with the government and technology.
- Last minute target, did not have a strong justification. Military did not want to talk about it. Symbolizes the danger of the nuclear age. It is less controlled than Hiroshima.
- Groves to Marshall: FYI, we are going to drop another bomb in a week. He did not need permission.
- The war is not over yet and if Japan did not end the war, then we would have used more bombs. "It is not to be released on Japan without express authority from the President"
- Truman said he did not like the idea of killing, as he said, "all those kids".
- This is what stops further bombing plans.

End of the War

- August 7: Japanese high command meet
- August 8: invasion of Japan by USSR
- August 9: makes sacred decision to end war
- August 10: Japanese tell US they will surrender according to Potsdam so long as Imperial House is preserved
- US replied that unconditional surrender is required
- Continues conventional bombing of Japan, prepares third bomb
- Japanese cabinet eventually agrees to unconditional surrender on Hirohito's urging
- Attempted coup by junior officers on August 14th, put down by more senior officers
- August 14: Hirohito announces surrender on radio
- Fighting between US/Japan ends but war not official over until Sept 2 (Soviets take Kurils)
- US occupies Japan and allows Hirohito to remain figurehead Emperor if he renounces his divinity

“consensus” narrative:

<i>nature of the decision</i>	accumulation of assumptions (no single “decision”)
<i>motivation</i>	multiple: ending war, scaring Soviets, scaring world, finishing job
<i>outcome</i>	atomic bombs probably contributed to end of war, but unclear of contribution compared to Soviet invasion
<i>narrative creators</i>	academic diplomatic historians

How are they going to use this bomb?

This is a different view than the revisionist and orthodox narrative.