...the Manhattan Project Had Failed?

By Mark Grimsley

On August 6, 1945, the B-29 *Enola Gay* dropped the world's first atomic bomb on Hiroshima, Japan, killing an estimated one hundred forty thousand civilians. Three days later, the B-29 *Bockscar* dropped a second bomb on Nagasaki, killing about eighty thousand civilians.

The United States is the only nation ever to have launched an attack with nuclear weapons, and the bombings of Hiroshima and Nagasaki have remained controversial. Was either attack really necessary? Perhaps a demonstration of the bomb's immense power would have sufficed. Or perhaps the United States could have dropped its insistence on "unconditional surrender" and allowed Japan to retain the *kokutai*—the national identity surrounding the institution of the emperor. The Japanese government could then have conceded defeat by mid-summer 1945.

The usual response to these and other propositions is that because the Japanese government had a well-entrenched pro-war faction, the only realistic alternatives to the bomb would have caused even more destruction. An invasion of the Japanese home islands might have cost as many as a million American casualties; a protracted naval blockade, on the other hand, could have killed a million or more Japanese civilians through starvation and disease.

"What if" scenarios concerning the atomic bomb invariably assume that the United States possessed this weapon in the summer of 1945 but refrained from using it. However, such a scenario has an air of artificiality about it. The United States government had, after all, already given tacit approval to the killing of hundreds of thousands of Japanese civilians in a series of incendiary bomb raids; the fire bombing of Tokyo on March 9, 1945, alone killed over ninety thousand civilians. But what if the United States simply lacked the option of using the atomic bomb? What if the $2 billion Manhattan Project had failed to solve the numerous problems required to produce a nuclear weapon?

Japanese surrender, here before a Soviet officer in Manchuria on August 29, 1945, seemed likely under a variety of scenarios, even without the use of atomic bombs.

Such a failure is not hard to imagine. Project scientists had discovered two ways to create an atomic explosion. The first—which was used in "Little Boy," the bomb that pulverized Hiroshima—involved a gun-type mechanism that fired one piece of enriched uranium into another to generate the supercritical mass required for a nuclear chain reaction. The second—used in "Fat Man," the bomb that flattened Nagasaki—involved an implosion device that would accomplish the same thing using plutonium.

But the "Little Boy" design required U-235, an isotope found in less than three-quarters of one percent of all natural uranium. It took millions of dollars and several false starts to find a way to extract U-235. Most uranium takes the form of U-238, a portion of which scientists learned to convert to the fissionable plutonium used in "Fat Man." Initially they expected to use the gun-type mechanism with this material as well. But the rate of spontaneous neutron emission in plutonium rendered that unworkable and instead required a system with fifteen components, all of which had to function in precisely the right manner to produce a perfectly symmetrical implosion. It was far from inevitable, in other words, that the Manhattan Project scientists would have solved either complex problem by 1945.

So in the absence of the atomic bombs, how would events have played out? The postwar U.S. Strategic Bombing Survey concluded that the Japanese economy was in ruins by early August and that even without the atomic bombs, Japan would surely have surrendered by November 1, 1945—the date of the planned invasion of Kyushu, the southernmost of the Japanese home islands. This conclusion, however,

NATIONAL ARCHIVES

overlooked the fact that the key problem was not one of destroying Japan's ability to make war, but one of convincing the Japanese government to make peace.

In early August the Japanese Supreme Council was divided about the future of the war. Most of its members sought a negotiated peace with the United States—but only *after* a military victory that would give Japan sufficient leverage to avoid occupation, maintain a minimal armed force, and, above all, preserve the kokutai. The bombings of Hiroshima and Nagasaki played an important role in convincing the Supreme Council that the war must be ended at once.

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What is often underestimated, however, is the impact of what happened *between* the two nuclear attacks: namely, the massive Soviet offensive against the Japanese Kwantung Army in Manchuria that began on August 8, 1945. Although the Soviet Union had given notification that it would not renew its nonaggression pact with Japan, the Supreme Council believed it would be several months before the Soviets would enter the war on the side of the Allies. The Soviets' Operation August Storm, therefore, came as a severe shock—indeed, an even greater shock than Hiroshima or Nagasaki, as historian Tsuyoshi Hasegawa concluded in his 2005 study, *Racing the Enemy: Stalin, Truman, and the Surrender of Japan*.

It is possible, then, that the invasion of Manchuria alone might have compelled the Supreme Council to choose surrender. Even if this did not occur, the invasion would have weakened the grip of hardliners who wished to keep fighting. The Supreme Council next would have had to confront the effects of an American strategic bombing offensive against Japan's railroad system. The United States had the plan poised and ready but chose not to execute it after the success of the atomic bombs. Had the war continued, the offensive against the rail system would have begun almost immediately—destroying what little remained of the nation's economy and generating a famine sufficient to cause internal upheaval. "It is reasonable to assume," writes historian Richard B. Frank in *Downfall: The End of the Imperial Japanese Empire* (1999), "that even without the atomic bombs, the destruction of the rail-transportation system, coupled with the cumulative effects of the blockade-and-bombardment strategy, would have posed a severe threat to internal order and subsequently thus impelled the Emperor to end the war."

Even if the war had continued, it is unlikely that an American invasion of the home islands would have occurred in 1945. By early August, American planners were already revisiting the wisdom of the invasion of Kyushu in light of new intelligence indicating the Japanese had twice the troop strength and four times the aircraft than previously estimated. If the United States had also reconsidered its refusal to extend any guarantee concerning the kokutai, then all the conditions would have been met for what historian Barton Bernstein views as an "opportunity to end the war without the A-bomb and without the November invasion of Kyushu." Although not definite, he writes, it does seem very likely that "a synergistic combination" of guaranteeing the emperor, Soviet entry into the Pacific War, and continued strategic bombings and naval blockades would have ended the war by November. Indeed, he ventures, that might have occurred even in the absence of any guarantees concerning the emperor.

Such a scenario, however, involves avoiding another significant "what if"—the possibility that, had the war continued even a few more weeks, Japanese hardliners might have taken control of the government and continued to resist beyond the point where any centrally controlled surrender was obtainable. As will be seen in the next "What if..." column, that possibility was very real. ✯