

From Icon to Artifact:
The Historiographical Journey of the Simplest Satellite

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From the point of view of an historian and curator, the world's first man-made satellite of the Earth is extremely problematic. In either profession Sputnik is all but impossible to describe. The archival evidence of its existence has not yet seen the light of day. The actual object ceased to exist in January 1958. Judged by the strict standards of either profession, Sputnik does not exist. Of course, that conclusion is absurd, but it does point on the very peculiar historiographic legacy of this satellite. Just as October 4, 1957, marks the beginning of the Space Age, it also marks the beginning of a historiographical dilemma that has plagued historians and curators for the last forty years. Without the traditional reference points for studying the object, the pattern of its study has been the reverse of what historians and curators have been trained to expect. Instead of beginning with the study the material object and its manufacture, the field of Sputnik studies has begun with the legacy and global political impact of the satellite and have slowly moved inward toward the actually satellite. It has been as though the ripples that Sputnik has left have been studied from the outermost inward, with the farthest reaching implications being studied first. It is now the business of historians and curators to explain the history this icon as an artifact of the last half of the 20th century was, who made it, where it fits within the material history of post World War II Soviet Union. Answers to these question also promise to shed light on the historiography of Sputnik as an icon.

The use of the word icon does take on a double meaning within

the context of Soviet history. The word icon means an image, representation, simile or symbol¹ of a human or event(s). But that image is an object (or class of events) in its own right. Over the last 40 years, Sputnik has played the role as a icon representing the spark that marked the beginning of the space age and the space race that transported U.S. and Soviet military and strategic competition to space. Historians have also offered an interpretation of Sputnik as an icon of the efforts of two men, Korolev and Khrushchev, to increase the political profile of their work. Korolev used the launch of the satellite as political currency to maintain support for his own aspirations for the development of a space program. Khrushchev used the launch on the international level as political currency to demonstrate the technological prowess of the Soviet Union. Here in the United States, Sputnik eventually came to symbolize the political wake-up call to end the inter-service rivalry that plagued American ICBM development.²

As an object, Sputnik has a material history that has not been fully explored. Although we have good theories on why it was made we know relatively little about who made it and how. By definition it is an artifact of the political, military, social, economic, and scientific and technological circumstances that surrounded it.³ While the political and military circumstances of Sputnik have attracted attention over the years, we still know very little about its social and economic circumstances. We have good indications as to who designed it, but little of the details on whose hands

actually made the satellite, and what methods were used. Much of the scientific and technological culture of Sputnik has been dismissed as insignificant, because the scientific results of the American Explorer satellite overcame the political shock of the launch of Sputnik. Nevertheless, the earliest scientific and technological evidence about the plans for Sputnik is important to understanding how the object came to be. From that we can ascertain the degree to which manufacture of the satellite was a technological continuation or departure from the past.

Of course the line between icon and artifact is not precise. The same is true for the line between the material and archival evidence of each iteration of Sputnik. But the broad delineation between the two lies in the region in which discussion of the object turns from the implications of the object's existence to the actual material object. To find the true evidence about Sputnik as an object, the historian must look for information that answers traditional questions about the material object and the technology that it represents: who made it, how, and why? This requirement places the historian of Sputnik (the object) in an awkward situation of not being able to experience Sputnik as an artifact, while being responsible for reconstructing the object. In order to reconstruct the object, the historian and curator must rely on the memoirs and official pronouncements and look for the material judgements about the artifact, teasing them out from the larger, iconic meaning of the object.

The first published sources about Sputnik predate the launch

of the satellite, and probably predate the object itself. During the Summer 1957 a series of articles about plans for a Soviet satellite launch during the IGY appeared in the journal Radio. Among these articles was one in which the Soviet Academy of Sciences' Institute of Radio Engineering and Electronics made the first call for assistance in tracking the satellite by amateur radio enthusiasts. This first, discrete announcement appeared on July 7, 1957.⁴ The Institute called on radio amateurs to report on the "preparation for the reception of signals of satellites launched in the USSR."⁵ The announcement accompanied other more detailed articles outlining proposals for and theories about the hypothetical launch of a satellite during the International Geophysical Year. If anything, the initial appearance of Soviet-authored articles of the subject indicate that a considerable amount of thought had been applied to the plans to launch a satellite. The solution to the difficulty of tracking such an object had was the call for ham radio operators to assist in tracing the orbital path of the satellite once in orbit.

After this specialized flurry of information, the absence of initial Soviet comment about the Sputnik right after its launch is striking. Other historians have speculated on the meaning of this silence. But this initial period is a particular choke point of primary information and access to hardware that has shaped the historiography of Sputnik more than any other. As stated before, the normal development of the historiography would begin with detailed technological and material studies of the object and then

grow and develop into studies of the larger ramifications of the object. But the primary information necessary to study the satellite at that level did not materialize at that time.

Given the peculiar situation of Sputnik, the historiography has developed in the opposite direction. The vacuum of documentation has attracted rumors, innuendo, and outright falsehoods, leaving western historians to make critical judgements about motivations and accuracies on most every official and private statement. From the beginning, western historians have had to innovate: piecing together histories from disparate and often questionable sources. A new dimension to this problem appeared soon after Sputnik when the Soviet Union embarked on a controlled plan of hardware display for western inspection, allowing western experts to make comparisons between the encased Soviet hardware and the well-documented space hardware of the United States. Even with limited access to the material culture of the Soviet space program, historians remained dependant on official Soviet statements, rumors, suppositions, and a steady stream of émigré memoir materials as a substitute for the archival evidence that historians are trained to use. The absence of archival materials has been a doubled edged sword. On one side, professionally trained historians outside of the Soviet Union have shunned the field, leaving the history to technically astute amateurs. On the other side, the comparison of the objects has dominated the field, making it unique within the discipline of space history.

On the Soviet side, the situation for historians has been

similarly stifling. Scientists, politicians, and engineers governed the Soviet spaceflight historical community. They set political agendas, and settled personal and professional scores on the pages on historical publications. Soviet historians of science and technology have copiously published pre-packaged internal histories of space science, technology, and rocketry that rely heavily on equations and sketches, but few detailed photographs of actual objects. Held hostage by the ideological role that space was playing in the Soviet Union, Soviet historiography of space did not go through a revival of archival research that many historical fields experienced during the late Soviet era. Memoir materials have remained the most prolific source of information in the field, while still demonstrating the inherent weaknesses of this type of source.

Nikita Khrushchev's example of this memoir literature and its use of the iconic Sputnik is most illustrative of this phenomenon. His two-part memoirs, which began with Khrushchev Remembers have set the tone for subsequent Soviet memoirs on the topic, placing Sputnik firmly within the realm of the politico-military arena.⁶ Khrushchev's recollections of Sputnik begin with his initial involvement in rocket development took place after Stalin's death, as a consequence of Khrushchev's appointment as First Secretary. At this point, even according to Khrushchev's own account, the decision had already been made to turn away from the long-range bomber (Maya-4, Bison) to the development of the ICBM. By his own account, Khrushchev's involvement in selecting this strategic

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technology was his promotion of a competition among design bureaus to make the most efficient ICBM. In his memoirs, released after the Glasnost era, Khrushchev justifies his decision, "Thus we would have a choice of the best design for the mass production of an ICBM, and we could have a way of delivering a retaliatory strike against the potential enemy. That would keep the enemy from attacking the USSR."⁷ It is worth noting that by his own admission the design that ultimately won the competition was not the design that Khrushchev favored. The design that won was the R-7 ICBM that was designed under Sergei Korolev. The R-7 design was the simplest, relying on a set of seven identical liquid-oxygen fueled engines. Korolev's design completed the first successful tests, before the longer-range ramjet prototypes completed any successful flights. Khrushchev had preferred the longer-ranged options.⁸

Khrushchev's initial use of rockets was for propaganda purposes, as a warning to all adversaries of Soviet technical capabilities. In 1957, the Soviet Union had a single successful intercontinental ballistic missile, the R-7. The first test of the R-7 took place in August, thus demonstrating Soviet capability to deliver a nuclear warhead onto the territory of the United States. The second R-7 was launched the first man-made satellite into orbit on 4 October 1957. The second, more publicly acknowledged launch, was technologically redundant to the first, and yet it provided a more impressive political effect. The U.S. had recently failed to launch a satellite of its own. Almost immediately, the word Sputnik became synonymous with American failure in science and

technology and American weakness in the military competition with the USSR. This early, developmental success of Khrushchev's strategy of political preemption deterrence fostered a popular politically significant impression that the Soviets could develop strategic weapons and win a military conflict with the U.S. Khrushchev linked the space firsts and the development with nuclear weapons closely in his memoirs:

But we were the first to launch rockets into space; we exploded the most powerful nuclear devices; we accomplished those feats first, ahead of the United States, England and France. Our accomplishments and our obvious might had a sobering effect on the aggressive forces in the United States, England, France, and of course, inside the Bonn government. They knew that they had lost their chance to strike at us with impunity.

The use of rockets for propaganda purposes was successful, in that the launch of Sputnik and other Soviet space firsts laid the ground-work for the popular and politically beneficial illusion of Soviet technological parity that was to outlive Khrushchev. Khrushchev's political successors continued to keep this essential illusion alive. While enhancing the role of nuclear weapons and related propaganda in the fight to discourage a western attack on the USSR, Khrushchev was able to actually reduce the size of the Soviet military. This was a reduction necessitated by economics, and yet made difficult by the post-war strategic situation.

Khrushchev's strategy was, in many ways, similar to Japanese strategy against the U.S. in 1941.¹⁰ At the time of Pearl Harbor, Yamamoto had planned the attack as a one-time preemptive attack, which would prevent American expansion in the Pacific. Khrushchev's strategy differed from its Japanese counterpart in its

basic focus. Instead of a military raid on the United States, he proposed a political and psychological Pearl Harbor, which would sabotage American resolve to fight before actual mobilization. However, Khrushchev's strategy resembled Yamamoto's in the manner of its execution. Khrushchev conducted a series of political strikes with no plan for ending the struggle. Instead of miscalculating the ability of American industry to mobilize for war, as had the Japanese, Khrushchev underestimated American political resolve and commitment. At the same time, Khrushchev was taxing Soviet economic and technological abilities to their limits. He failed to maintain a balance of military and political forces, allowing his political ambitions to exceed the military and technical capabilities of the Soviet armed forces and economic potential.

Since the final years of the Soviet Union, the potential in the field has changed dramatically. The recent publication of other, less politically (and personally?) invested individuals are beginning to lead us back to the Sputnik artifact.¹¹ Engineers and managers have published unofficial memoirs and diaries. These memoirs provide a critical mass of personal accounts that will allow legitimate comparisons between individual perspectives. Design bureaus, manufacturing establishments, and individuals have recently sold hardware and memorabilia to offset the new harsh financial reality. These sales have placed Soviet-era hardware in the hands of western curators to allow detailed comparison to American and other Soviet hardware. The Russian government has

recently opened a new Space Archive, offering the hope for new archival revelations. Nevertheless, as historians look upon the flood of objects and first-person accounts questions remain about the nature of the sources. Do these changes demand a shift in methodology? Or has the political and economic unraveling of the Soviet space establishment provided historians with more artifacts that require the same critical interpretation that has characterized the field for the last 40 years?

What is the potential significance of further historical and material study of Sputnik? We now possess a multifaceted understanding of Sputnik the icon. But we lack an understanding of the material object and its historical context. We can recount what Sputnik did, but not who made it, how and why. not fully understand what Sputnik really means. Sputnik represents a deliberate use of technology in international competition. In order to understand the function of using technology in politics, we have to better understand the capabilities and origins of the technology. We now have a good idea that Sputnik (the object) was not the first choice of Soviet engineers and technicians, but a was a simplest, fall-back proposal for the mission.¹² The fact that the engineers were not able to complete the more desirable and complex problem indicates that there were signs of technological and economic weaknesses in the space program that predated the Soviet efforts to land a man on the moon. But there remain other questions about the origins of Sputnik. Sputnik is an artifact of the social, economic, scientific, and technological community that

created it, but historians have still not been able to make an historical connection between the seeming simplicity of the satellite and the complexity of its legacy.

1. William Morris, ed. The American Heritage Dictionary of the English Language. Boston: Houghton Mifflin, 1976.
2. The image of Sputnik as a political wake-up call is itself best symbolized by the famous political cartoon of Uncle Sam being stirred from a sound sleep by the "Beep, beep, beep." of the satellite.
3. American Heritage Dictionary.
4. Radio, No. 7. July, 1957. Cited in Kreiger, p. 333.
5. Kreiger, p. 333.
6. Talbott, Strobe, trans. and ed., Edward Crankshaw, intro. and commentary. Khrushchev Remembers. Boston: Little, Brown and Company, 198?, and Khrushchev, Nikita S. Khrushchev Remembers: The Glasnost' Tapes. Boston: Little, Brown and Company, 1990.
7. Nikita S. Khrushchev, Khrushchev Remembers: The Glasnost' Tapes, Boston: Little, Brown and Company, 1990, p. 187.
8. Steven J. Zaloga, "Most Secret Weapon: The Origins of Soviet Strategic Cruise Missiles, 1945-60," Journal of Soviet Military Studies, vol. 6, no. 1 (June 1993), pp. 262-273.
9. Khrushchev Remembers, p. 517.
10. The similarity between Sputnik and Pearl Harbor was first pointed out by American Lt. Gen. James M. Gavin: Steven J. Zaloga, Target America: The Soviet Union and the Strategic Arms Race, 1945-1964, Novato, Calif.: Presidio, 1993, p. 148. For a description of Japanese strategy vis-a-vis the U.S. during World War II, and its shortcomings, see: D. Clayton James, "American and Japanese Strategies in the Pacific War," in Peter Paret, ed. Makers of Modern Strategy from Machiavelli to the Nuclear Age, Princeton, N.J.: Princeton University, 1986, pp. 707-708.
11. These memoirs include those of Vasili Mishin and Boris Chertok.
12. Harford's interviews on the Sputnik 3 and Sputnik design.