PROSTHETIC PROMISE AND POTEMKIN LIMBS IN LATE-STALINIST RUSSIA

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Frances Bernstein
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Principal Investigator: Frances Bernstein

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Executive Summary

In June of 1948, after several months of closed deliberations, the Stalin prize committee announced its 1947 laureates in the fields of science, medicine, and technology. Among the eminent engineers, scientists, and physicians recognized for their achievements, one name on the list in particular stands out due to the inventor’s very different set of credentials: Viktor Efimovich Kononov, a one-armed, uneducated, blue-collar worker. Kononov’s creation, a mechanical arm, was widely promoted during the war and postwar years, and heralded as of similar strategic importance as another of that year’s prize winners, the Tupolev medium-range bomber (Tu-2). Why “Kononov’s arm” [ruka Kononova] achieved this status, and the cultural and political significance of the device, are the subject of this article.
Introduction

In June of 1948, after several months of closed deliberations, the Stalin prize committee announced its 1947 laureates in the fields of science, medicine, and technology. Among the eminent engineers, scientists, and physicians recognized for their achievements, one name on the list in particular stands out due to the inventor’s very different set of credentials: Viktor Efimovich Kononov, a one-armed, uneducated, blue-collar worker. Kononov’s creation, a mechanical arm, was widely promoted during the war and postwar years, and heralded as of similar strategic importance as another of that year’s prize winners, the Tupolev medium-range bomber (Tu-2).\(^1\)

Why “Kononov’s arm” [ruka Kononova] achieved this status, and the cultural and political significance of the device, are the subject of this article. The prosthetic offered an ideal opportunity to counter the vast material, psychological, and symbolic damages wrought by the war on the bodies of the country’s disabled soldiers. The “rearming” of war veterans mattered deeply to the state. Reemployment of this population, preferably in industry, was vital to rebuilding the country’s devastated economy.\(^2\) It would also ease some of the state’s colossal financial burden of pension provisions. Functional and inexpensive, easy to put on and take off without assistance, the prosthesis was also judged the most life-like of any active device available, a factor deemed especially valuable for mending wounded psyches. Quite literally a self-made man, Kononov demonstrated the possibilities and opportunities to which anyone affixed with an artificial limb could aspire. (Figure 1)\(^3\)

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\(^1\) AMN, f. 9120, op. 3, d. 2, ll. 144, 156 (1948). Kononov was awarded a third place prize (one of 84) and received 50,000 rubles. The purse for first place awards (27 in total) was 150,000 rubles and for second place (also 27), 100,000.


\(^3\) RGANTD filial, f. 180, d. 552, l. 87.
Both in design and in application, the Kononov arm was presented as a masculine object and assumed a male recipient. (Figure 2)⁴ Because disability threatened feminization, rehabilitation necessitated a reassertion of the traditional gender roles and hierarchies on which the nation’s recovery appeared to rely. As with representations of the Red Army more generally, the veterans Kononov’s limb promised to help were inevitably men, even though a substantial number of women fought during the war and sustained the same debilitating injuries.⁵

Ultimately, a device that promised so much delivered very little, and the arm’s potential was never realized. Most significantly, this technological marvel was a technological failure: comprised of defective parts made from substandard materials, fitted poorly and assembled incorrectly, the arm was rejected by the war amputees for whom it was intended or used by them purely cosmetically. That such a fate befell an object receiving so much support allows us to draw broader conclusions about the quality of other prostheses and the defects of the industry as a whole. The history of post-war prosthetics encapsulates the larger story of technology in the Soviet Union: from enthusiasm in its transformative power, through technological quick-fixes, to systemic failure. Our focus on Kononov’s prize-winning arm will allow us to consider more generally the government’s inability to meet the needs of the war disabled, at such a tremendous cost to the state.

It is next to impossible to calculate accurately the number of Soviet soldiers permanently disabled as a result of their war service. Due to the difficulties in establishing disability classifications and the reluctance of the state to do so, the actual figure would have been substantially higher than the official estimation of 2.75 million, with 85% of all injuries to the

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⁴Ibid., l. 82.
extremities. According to statistics compiled by the Ministry of Social Welfare, the state agency administering artificial limb production, about 600,000 prosthetic devices were issued between 1941 and the first five months of 1945; as of January 1, 1945, 70,000 were waiting for prostheses. This number increased many-fold in the postwar period.  

Yet whereas injuries to the upper extremities predominated over the lower extremities, substantially (3-4 times) more lower limb prostheses were produced and distributed. In part this was due to the fact that there were more injuries to left arms than to right, and many amputees could and did get along without their left arm if the dominant one remained intact. Moreover, the significantly wider range of movement of which the arm is capable made it that much more difficult to produce a satisfactory replacement. Thus the development of active arm prostheses, allowing wearers to care for themselves and to return to work, was identified by the state as a priority for the prosthetics industry early in the war.

**Revolutionary Hands**

The hand served as a key visual symbol of the Communist state from the very first days of the Soviet era. In a country where much of the (overwhelmingly peasant) population was illiterate or only semi-literate, the use of visual propaganda was crucial for political education,
serving as a short-hand primer to instill Bolshevik values and behaviors.12 The Revolution’s definitive iconographic figure was the proletarian, usually a heavy metal worker, his hammer raised to forge socialism as it smashed those enemies who would destroy it. In the Civil War years (1918-1921) he was frequently paired with a Red Army soldier, whose raised arm held a bayonet or rifle. During the New Economic Policy (1921-1927), which allowed for the partial return of a market economy and the temptations accompanying it, a larger-than-life hand might snatch a worker away from a bottle of vodka or a rendezvous with a suspect woman. The violence with which the Soviet symbolic hand was often associated became explicit as the state forcibly collectivized agriculture in the late 1920s. (Figure 3) Wealthy peasants, and indeed any who resisted, were labeled “kulaks” —a very different kind of hand— and in a pervasive slogan all loyal citizens assisting in this brutal campaign were exhorted to “beat the kulak with a fist.”

As a potent symbol of and support for the state’s agenda in the 1930s, the mighty Soviet hand enthusiastically industrialized and voted in favor of the Five Year Plans and the Stalin Constitution. (Figure 4) It crushed or strangled both internal and external threats, as well as those enemies who straddled this divide (such as the “Trotsky-Bukharinist” agents of fascism). (Figure 5) Common to all these images is the potential or display of great force. The hand is never hesitant or, for that matter, feminine.13

Whether hoisting his weapon, shielding the innocent, or pointing westward, the Red Army man of World War Two illustrations served as a powerful visual symbol of the country’s bravery, strength, and dedication to the fight against Germany. This leads one to contemplate

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what happens representationally to those same brave soldiers wounded in the valiant effort to
defend the motherland. Beyond the celebration of a few iconographic examples, the portrayal of
disabled veterans was decidedly complicated. Their bravery and sacrifices were hailed in print
and over the airwaves. They figured increasingly in fiction and, eventually, in film. Yet visual
illustrations of the severely impaired are noticeably lacking. In posters, paintings, and
monuments, returning soldiers appeared “intact” (perhaps slightly grazed, a modest bandage
wrapped around a forehead) or they were wholly absent, marked by an empty helmet or an
eternally waiting mother. This invisibility is a notable departure from the practices of the
USSR’s most important wartime enemy and ally.

In those very rare popular illustrations —in years of searching I have found exactly three
posters— that actually depict Soviet soldiers with disabilities, the emphasis is likewise on their
sacrifice and the gratitude owed to them. But significantly, and to the point of this article, the
men featured are all lower-limb amputees.

Kononov’s biography therefore made him an ideal candidate to advertise the promise of
prosthetics, and upper limb prostheses, in particular. For one thing, his disability was unrelated to

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14 On the IOV in literature see Vera Dunham, “Images of the Disabled, Especially the War Wounded, in Soviet
Siegelbaum (Pittsburgh: University of Pittsburgh Press, 1989), 151-164; in commemorative practices, see Nina
15 With one or two exceptions, only in the late 1940s did cinema depict recognizably disabled soldiers; notably, these
parts were played by nondisabled actors. My thanks to Beate Fieseler for this observation. On cinematic treatment see
Liliya Kaganovsky How the Soviet Man was Unmade: Cultural Fantasy and Male Subjectivity under Stalin (Pittsburg: University of
Pittsburg Press, 2008); and Denise J. Youngblood, Russian War Films: On the Cinema Front, 1914-2005 (Lawrence:
University Press of Kansas, 2007). In contrast, a number of high profile American war-themes films cast disabled actors.
Press, 1994), chapter 5; and David Gerber, “Heroes and Misfits: The Troubled Social Reintegration of Disabled
70-95.
16 On Germany see Carol Poore, Disability in Twentieth Century German Culture (Ann Arbor: University of Michigan Press,
2007), chapter 2; James M. Diehl, “Victors or Victims? Disabled Veterans in the Third Reich,” Journal of Modern History
(Chicago: University of Chicago Press, 2004), chapter 1; and George Roeder Jr., The Censored War: American Visual
17 Veterans missing arms as well as legs appeared in the German and American sources.
the war: the incident that resulted in his amputation occurred over a decade before Germany’s invasion. Through its enthusiastic promotion of Kononov’s device, the state could demonstrate its commitment to the war injured at a safe representational remove, referencing the loss without having to engage or depict it too explicitly. In fact, the attention the arm received was distinctly out of proportion to the number of amputees ever eligible for, or in receipt of, the device. Even after it had been adapted to accommodate a wider range of amputations beyond the middle-third forearm for which is had been designed, Kononov’s arm only ever accounted for a fraction of the upper limb appliances produced.\(^\text{18}\) Therefore its value should also be measured by its more symbolic contribution to the war effort: fitted with this life-like and capable prosthetic, the emblematic Soviet arm was made whole again, despite any evidence to the contrary of actual impaired bodies.

The inventor’s personal history reinforced this alternate narrative. Viktor Efimovich was born into a poor family with many mouths to feed, forcing his father to leave the village to find work with kulaks. He died when Viktor was only 10, at which point the boy entered the workforce to help support his family. Drafted into the Imperial Army in 1915, he later worked as an auto mechanic for the OGPU during the Civil War and eventually joined the transport division of the Red Army stationed in Mongolia.\(^\text{19}\)

On October 28, 1928, while driving his superior to headquarters by motorcycle, Kononov was in a serious accident, as a result of which his right hand had to be amputated. Although he was recovered enough to return to his job a few months later, he no longer drove “masterfully, with strength and confidence,” according to a 1940 article promoting his invention. He was quickly disillusioned with the highly touted cosmetic arm purchased from Germany: three

\(^\text{18}\)In 1953, for example, the Marks Moscow Prosthetics Factory produced 10,271 lower limbs as opposed to 1343 upper limbs, of which only 271 were Kononov arms. GARF, f. 413, op. 1, t. 2, d. 2508, ll. 8-9 (1953).
\(^\text{19}\)M. Kirsanov, “Ruka kononova,” Sotsial’nnoe obespechenie no. 10 (1940): 16.
fingers broke off on his very first business trip. Resolving to make one himself, Kononov first turned to the study of anatomy. Taking advantage of his location (and, undoubtedly, his status as a Russian stationed with the occupying Red Army) he appropriated a body from the above-ground burial site in which it had been laid to rest.\textsuperscript{20} With the expertise he gained from the dissection of this unwitting volunteer Viktor Efimovich constructed his first prosthesis, using aluminum and ebony. This crude, unattractive, and passive device enabled him to travel widely on his own by car and motorcycle but he was still dissatisfied.\textsuperscript{21} He wanted a limb with fingers that bent at the joints, capable of grasping objects. To achieve this he fitted the fingers with steel cables running from the tips to a single cable wound around a drum within the palm.\textsuperscript{22} The hand, which could be exchanged for a work-specific tool, was attached by a metal band to a sleeve, itself fastened to a shoulder harness. A movement of the shoulder pulled the cable running from the shoulder to the hand, causing the fingers to bend. Eventually Kononov added a lock mechanism to the sleeve, securing the fingers into position to maintain the grasp for as long as was required. Releasing the mechanism would cause the fingers to release and the hand to reopen.\textsuperscript{23} (Figures 6 and 7)\textsuperscript{24}

In 1932 the Moscow Semashko Factory for Prosthetic Semi-finished Products produced a prototype and Kononov utilized his newly designed limb successfully for a number of years. Hired by the Scientific Research Prosthetics and Orthopedics Clinic of the Social Welfare Commissariat to continue improvements, he returned to Moscow in 1939.\textsuperscript{25} Among the first

\textsuperscript{20}Kapachinkova, “Protezirovanie,” 28.
\textsuperscript{21}**need volume number “V nauchom sovete po protezirovaniiu,” Sotsial’noe obespechenie (February, 1940): 41.
\textsuperscript{22}Originally leather, the fingers were eventually fabricated from rubber. Rubber and foam plastic later replaced the original wooden palm.
\textsuperscript{23}Kapachinkova, “Protezirovanie,” 32.
\textsuperscript{24}RGANTD filial, f. 180, d. 552, ll. 79, 77.
recipients of his invention were soldiers injured in the Winter War with Finland (1939-40). In light of extremely positive feedback, the Semashko factory was given an order to produce 2000 devices. After several years of clinical and probationary industrial trials, the Kononov arm was approved for serial production in the RSFSR in 1946. By June of the following year 47 factories across Russia were selected to begin manufacturing it.

The potential of Kononov’s invention was recognized immediately. It was significantly lighter than models fabricated from metal and allowed for a wider range of motion. Thanks to the simplicity of its design, the component parts could be mass-produced and assembled without additional training by the same workers already making purely cosmetic limbs. The hand was active, in that it relied on the wearer’s own muscular energy to achieve the grasp. Of obvious benefit to those missing one arm, the device would be especially valuable to double amputees who, with the assistance of the accompanying attachments (clamp, hook, ring, pencil holder, etc.) would be able to care for themselves in addition to engaging in certain kinds of labor. Exchanging a hand for a tool was so easy one need not even remove one’s coat; this was deemed a great advantage, given the Russian winter. For those missing upper and lower extremities, a special adaptation designed by a triple-amputee veteran enabled the use of a crutch or walking stick.

For a country evincing such discomfort with the visible marks of the war on its soldiers’ bodies, the benefits of a realistic prosthetic are obvious; Kononov’s arm was especially valued in

26GARF, f. 413, op. 1, d. 37, l. 125 (1941); RGANTD, f. 146, op. 1, d. 2, l. 2 (1940).
27GARF, f. 259, op. 4, d. 2310, l. 33 (1943); f. 180, op. 1, d. 552, l. 114; f. 413, op. 1, d. 37, l. 125.
28RGANTD filial, f. 180, op. 1, d. 552, ll. 91-93 (1948); M. Mikhailov, “Pervoe soveshchanie rabotnikov proteznoi promyshlennosti,” Sotsial’noe obespechenie no. 7-8 (1940): 24-27.
29G. S., “Ruka kononova,” Ortopedia i travmatologiya no. 3 (1938): 137-142.
30Nazarov, “Ruka kononova,” 142.
31 GARF, f. 413, op. 1, d. 431, l. 24 (1944).
this regard. Ideally, an artificial limb would satisfy needs both practical and aesthetic. It would match as closely as possible the capabilities of the missing body part and look and act enough like the real thing to negate the wearer’s being identified as an “invalid.” As senior sergeant, pilot 3rd class Santamov put it, in a 1941 letter of gratitude to the inventor: “I could freely light a match with my left hand, grab the smallest objects and hold them for a long time, open and close a door, carry a briefcase, pick up small change from a table top, etc. There is also the cosmetic benefit: I can wear my suit and my disability (invalidnost’) is for all practical purposes disguised.”

Deemed the most attractive upper limb device available, it was hailed by Soviet prosthetists as being far superior to American models, for instance, which purportedly sacrificed form to function: “Compared to the Kononov hand, the heavy and crude American ‘Wonder Arm’ looks like some kind of nickel-plated sledgehammer, like some armor-clad jousting glove…” This observation nonetheless accords with historian David Serlin’s analysis of American prostheses in the postwar era, when an artificial arm’s efficiency and design were prized over its verisimilitude.

This was no mere superficial consideration. Soviet prosthetists contended that the ability to mask one’s impairment encouraged the process of confidence-building necessary for disabled veterans to achieve self-reliance, itself a precursor of a return to the workplace. D. Reshchikov, a double amputee who resumed his previous occupation as factory technician, credited prosthetics for taking him “from the most depressed condition, from severe psychological suffering, to the

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34RGANTD filial, f. 180, d. 552, l. 115 (1948).
36Serlin, Replaceable You, 50-54.
point at which no trace remains."\(^{37}\) While many amputees employed devices that were impossible to mask (the hook, for instance), they favored realistic-looking limbs even when presented with more “functional” options. Thus, for example, the Efremov leg, likewise designed by a disabled inventor and the recipient of a Stalin prize, was roundly rejected by the veterans for its “ugliness.”\(^{38}\)

Despite a fair amount of resistance from within the Commissariat of Social Welfare and the prosthetics industry itself, Kononov enjoyed significant support from a number of powerful advocates. It was first widely publicized in a January 1943 article in *Trud*, the chief newspaper of the Soviet trade unions, and enthusiasm for the device was such that soldiers hospitalized at the clinic where he worked elected to remain there for many months, occupying scarce beds, rather than accept another model. Eventually the Social Welfare Minister himself, A. N. Sukhov, insisted that they be compelled to select from whatever was currently available.\(^{39}\) Still others demanded it for whom it was not indicated.\(^{40}\)

Kononov’s employment at the Moscow clinic suggests that he enjoyed a certain amount of high-placed support within the profession as well. That not everyone shared this enthusiasm is evident from his subsequent treatment. For reasons not entirely clear the manufacture of his device was soon suspended and Viktor Efimovich, who had been hired as a designer, was instead assigned to repair the clinic’s dishes and forced to search through the garbage for spare parts for his inventions.\(^{41}\) Eventually he was fired. In late 1943 the People’s Commissariat for State Control, which monitored the execution of government decrees, got involved.\(^{42}\) Reporting on the

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\(^{38}\) GARF, f. 413, op. 1, d. 754, l. 141 (1946).

\(^{39}\) GARF, f. 413, op. 1, d. 563, l. 155 (1945).

\(^{40}\) GARF, f. 438, op. 1, d. 279, ll. 66, 69 (1945).


\(^{42}\) GARF, f. 259, op. 4, d. 2361, ll. 18-18ob (1943).
progress (or lack thereof) of a January 1943 Party Central Committee Decree “on measures to improve the treatment of Disabled Patriotic War Soldiers,” it delivered a scathing assessment of the industry and of the Social Welfare Commissariat’s failed leadership. A late 1942 analysis had found that artificial limb manufacturers were producing fewer devices and of lower quality than in the first, chaotic year of the war and that the production of arm prostheses, at only 27.7% of the annual plan, was especially unsatisfactory. It ordered that immediate measures be taken to introduce the Kononov arm and the work attachments into production and to improve the timely provision and quality of all artificial limbs. In early 1944 Kononov was hired by the Moscow Scientific Research Institute of Prosthetics (the successor to the Prosthetics and Orthopedics Clinic) to work as a master craftsman in its experimental workshop, remaining there for the balance of his career.

Opposition to the inventor must have stemmed to some degree from his status as a gatecrasher; this factor clearly played a part in his celebration in the press and in his receipt of the prize, for that matter. As the author of a 1949 article in Sovetskaia kirgiziia observed, “Self-taught, an ordinary driver accomplished what many famous scientists had fruitlessly struggled over for centuries.” Viktor Efimovich capitalized on this blurred identity by consistently referring to himself as a “former worker.” Beyond issues of professional jealousy, industry hostility to his invention was likewise a product of bureaucratic entrenchment and systemic inertia. Supporters blamed a fundamental “conservatism” at the regional and factory level, leading plant directors and medical division heads to reject any kind of innovation or restructuring. Thus in the first 7 months of 1948, overall industry production of upper limb

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43GARF, f. 259, op. 4, d. 2310, l. 12 ob (1943).
44GARF, f. 259, op. 5, d. 1939, l. 25 (1944).
46RGANTD, f. 146, op. 1, d. 62, l. 11; d. 68, l. 20 (1949).
appliances had reached only 81.1% of the annual plan, with Kononov’s arm a lowly 38.0%. A ministry decree issued repeatedly in the postwar years sought to address this resistance: prosthetic manufacturers were directed to suspend production of purely cosmetic hands in favor of those with functional capability.

The widespread ideological campaign of the 1940s and 50s encouraging “bottom-up” innovations was yet another response to this, one which also addressed the wartime brain-drain felt across the technical and scientific arenas. Reaching outside of regular channels and rewarding the amateurs who came up with new ideas might make it possible to circumvent institutional conservatism and resistance to innovation, even if it was the Soviet system itself that created these barriers. Hence the republic- and countrywide contests held by the Ministry to encourage non-professionals to submit designs for new or improved prosthetic devices, such as the 1946 competition won by Viktor Efimovich.

Whatever other more general reasons existed for the promotion of bottom-up innovations, Kononov’s achievement presented a special opportunity to emphasize the state’s dedication to the disabled through the promotion of a new kind of hero, the “invalid inventor” (invalid-izobretatel’), at the same time compensating for the shortcomings of the prosthetics industry. Like Kononov, these were men who, disabled themselves, also designed artificial limbs for other

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47GARF, f. 438, op. 1, d. 550, l. 84-5 (1948).
48GARF, f. 438, op. 1, d. 550, l. 18 (1948).
49On similar efforts by the Health Ministry, see for example GARF, f. 482, op. 49, d. 1519, l. 6 (1950); TsMAM, f. 533, op. 1, d. 1, l. 30b (1955); d. 9, l. 13 (1955). My thanks to Ben Zajicek for sharing these sources with me.
amputees. They provided much-needed, tangible reassurance – despite or perhaps because of the overwhelming evidence to the contrary – that the disabled could still be productive; indeed, it was only after their injuries occurred that they became inventors in the first place. Their achievements took place at a time when the overwhelming majority of disabled veterans were deskill ed as a result of their injuries or refused employment altogether, despite a law on the books protecting their rights, to make room for the returning able-bodied.

“Invalid inventors” likewise served a useful propaganda function in the country’s developing cold war narrative. The Soviets followed international advances in the field closely and, as in other areas of science and technology, the United States represented the ideological yardstick against which all domestic developments were compared. Of course by the end of the war and especially after the KR affair in 1947, this proved a tricky business. The use of foreign designs and technical expertise had to be balanced against accusations of “slavishness and servility” to the west. The celebration of Kononov’s arm as a superior, home-grown alternative to foreign models, and in particular to the American “Wonder Arm,” was an important facet of this promotion.

Whatever hypothetical promise Kononov’s arm may have held is negated with a shift in focus to the realm of lived experience. Deficiencies in planning, communication, training,
transport, materials, and the manufacturing process itself combined to create a “perfect storm” of whole-scale technological failure. Taken together, these circumstances frequently meant that the experience of acquiring an artificial limb would be prolonged and humiliating, if not painful or costly.

The small number of prosthetic research institutes and manufacturers operating at the start of the war were unprepared for and overwhelmed by the demand, exacerbated by the mobilization of much of their workforce and the loss of the Kiev, Leningrad, Khar’kov, and Odessa operations following the Nazi invasion.\textsuperscript{57} During the war departments of prosthetics had been closed in medical schools and not reopened afterwards.\textsuperscript{58}

The scientific institutes designing the appliances provided almost no oversight to the factories producing them. Within the factories, there was little coordination, and often outright hostility, between the medical department (where measuring, casting, and determination of the appropriate device occurred) and the technical division (where component parts were produced and the appliances were assembled, balanced, and adjusted to the recipient). In fact, from 1946 the medical divisions functioned as entities independent of the overall administration of the factories and accountable directly to the welfare and health agencies. According to a complaint published in \textit{Literaturnaia gazeta} in 1950, at the Krasnodar prosthetics factory, “the two sides war openly,” and the factory director was delighted to learn about the high percentage of errors made by the medical staff.\textsuperscript{59} As a rule neither group attended or participated in any of the processes that occurred in the other division.\textsuperscript{60}

\textsuperscript{57}GARF, f. 413, op. 1, d. 234, l. 135 (1942); f. 259, op. 5, d. 1941, l. 6 (1944); RGANTD, f. 146, op. 1, d. 22, ll. 27, 35 (1945).
\textsuperscript{58}GARF, f. 413, op. 1, d. 796, l. 51 ob (1943).
\textsuperscript{60}GARF, f. 413, op. 1, d. 1631, l. 59 (1950).
The Ministries of Social Welfare and Health were embroiled in a lengthy battle over control of the industry, with ultimate jurisdiction shifting from one to the other and then back again three months later. To further complicate matters, each agency bore responsibility for different types of devices: all temporary and therapeutic prostheses used in hospitals and in the treatment of soldiers’ initial injuries were the responsibility of the Health Ministry, as were hearing aids and glass eyes. The Ministry of Social Welfare had jurisdiction over all other prostheses. Calls by industry critics to unify these various and overlapping operations under the direction of one all-union agency went unheeded. Similarly, a 1953 government proposal to combine the two was strenuously opposed by each agency. Unlike their counterparts who worked in the prosthetic factories under the jurisdiction of Social Welfare, physicians employed by the Health Ministry were entitled to housing and were paid substantially higher salaries. Of course many of the doctors employed in prosthetics manufacturing were skilled and devoted to their calling and their clients, regardless of their personal circumstances. But given the inequities in compensation, others worked in the industry as a last resort, whether because of poor performance in medical school, lack of influence, or want of other options.

Inadequate training and understaffing were factors in the production divisions as well. Often those assembling the appliance were unable to read the construction blueprints, if these had even been provided. Primitive conditions made standardization next to impossible. Lacking

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61GARF, f. 413, op. 1, d. 767, ll. 127, 130 (1946).
62GARF, f. 259, op. 5, d. 1939, l. 22 (1944).
64“Eshche raz o protezirovani,” Literaturnaia gazeta, no. 73 (2456), September 11, 1948, 2; Iugov, “Chelovek”; Labok, “Ob’edinit’.”
65GARF, f. 8009, op. 2, d. 1130, passim (1953).
66GARF, f. 413, op. 1, d. 359, l. 15 (1943); RGANTD, f. 146, op. 1, d. 39, l. 7 (1947).
67GARF, f. 413, op. 1, d. 577, l. 18 ob (1945).
the right equipment, some factories were forced to make certain parts by hand. At the farthest possible remove from the assembly line model of production, an individual prosthesis might be entirely fabricated and assembled by hand by a single worker. Condemned by industry critics as “kustarschina,” [amateurish, primitive work] the conditions that still reigned at many wartime prosthetics plants bore little resemblance to the experience of the fictional Aleksei Meres’ev in Boris Polevoi’s novel *Story of a Real Man* (1946). Having lost both legs to frostbite and gangrene after his plane crashed behind enemy lines, Meres’ev is visited in the hospital by Zuev, an elderly prosthetist. A relic of the prerevolutionary craft tradition, the old man takes great pride in his “regal” creations, creating for the pilot artificial limbs that are things of beauty, perfectly constructed and fitted despite the fact that he’d not been previously measured. These wonderlegs render Meres’ev’s disability invisible, so much so that the walking cane he eventually utilizes is mistaken for a dandyish affect.

In real life hospitalized soldiers were rarely so fortunate. In a 1944 letter to the Marks Moscow Prosthetics Factory party secretary, Medical Major Andreev, director of Military Hospital no. 3431, complained bitterly about the impact of the factory’s “careless work” on the recovery and morale of his patients. With the substandard quality of its products and the extensive delays in provisioning, the factory “was undoing all of the hospital’s successful medical treatments.”

Production was likewise compromised by the quality and timely acquisition of parts and raw materials. There were serious deficits in wood, leather, and especially rubber. Often delays

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68GARF, f. 259, op. 4, d. 2361, l. 19 (1942); op. 5, d. 1984, l. 16 (1944); f. 8009, op. 1, d. 502, l. 21 (1944); TsAOPIM, f. 1046, op. 1, d. 4, l. 77 (1944).
70Ibid., 152, 155.
71Ibid., 228, 238.
72TsAOPIM, f. 1046, op. 1, d. 4, l. 237 (1944).
in provisioning stretched for months.\textsuperscript{73} Due to shortages the Marks factory was forced to stop taking orders for any device requiring a locking splint while the Semashko and Ufimsk factories had over two times the standard supply in reserve.\textsuperscript{74} Meanwhile, the Semashko factory’s failure to provide hands caused an enormous backlog in orders for arm prostheses at the Kirov plant. After repeated appeals the latter finally received a scant 25, all of them the right hand.\textsuperscript{75} The same unevenness affected machinery and equipment. Leather and wood arrived moldy, sodden, covered with holes or torn or became so due to improper storage.\textsuperscript{76} The components of a single appliance might be made at several different facilities and assembled at yet another, further increasing the likelihood of malfunction.\textsuperscript{77} While industry guidelines specified that all finished products be inspected there was very little quality control.

According to the official time-table set in 1943, artificial arms and legs were to be ready within 45 days of the initial order, repairs within 10 days.\textsuperscript{78} In 1947 the intervals were revised: new limbs were to be ready even earlier.\textsuperscript{79} Recipients were entitled to a free replacement after two years for a leg and three years for an arm, reflecting the industry’s assessment of the life of the device. By 1947 both were replaceable after two years, with double lower amputees eligible after one.\textsuperscript{80} Those disabled at the front or in the workplace \textit{[invalidy truda]} received their limbs free of charge, as did children under 16, and their transportation costs to and from the factory were reimbursable. In addition, traveling brigades, including both a doctor and technician, served ex-soldiers residing in hospitals or “invalid homes,” or those who lived at a significant distance from the factory. Arm and leg devices were under warranty from manufacturer defects

\textsuperscript{73}GARF, f. 413, op. 1, d. 573, l. 232 (1945).
\textsuperscript{74}GARF, f. 259, op. 4, d. 2361, l. 19 (1942).
\textsuperscript{75}GARF, f. 259, op. 4, d. 2361, l. 19 (1942).
\textsuperscript{76}GARF, f. 413, 1, d. 690, l. 325 (1950).
\textsuperscript{77}GARF, f. 413, op. 1, d. 690, l. 325 (1950).
\textsuperscript{78}GARF, f. 413, 1, d. 342, ll. 131-32 (1943).
\textsuperscript{79}GARF, f. 413, 1, d. 342, ll. 131-32 (1943).
\textsuperscript{80}GARF, f. 413, op. 1, d. 342, l. 132; d. 869, l. 165 (1947).
or poor fit for six months (shoes for one month); repairs during this time were serviced at the
head of the line.81

For those residing outside of the hospital—the vast majority of the disabled—the system
for acquiring an artificial limb was as follows. The applicant was examined by the medical
division of the prosthetics factory located nearest to place of residence. A medical certificate was
then submitted to the factory’s Social Welfare office, which determined the conditions of
payment and wrote up the order. The medical division then took down the applicant’s medical
history and determined the appropriate device, followed by measuring and casting of the limb.
The date of receipt was determined and recorded on the order form. Clients were required to
appear in person for the ready device, and to try it on for adjustments to confirm proper fit.

A process this protracted and laborious to begin with (especially considering the poor
health of many of the patrons) rarely proceeded without additional complications. Delays in the
provision or repair of limbs sometimes stretched for several months, if not years, and the
resolutions passed by NKSO confirming the official deadlines did little to shorten these intervals.
Writing in Literaturnaia gazeta about the deplorable conditions at the Krasnodar Prosthetics
Factory, A. Kulik cited the example of one veteran who was required to visit the factory ten
times for fittings; six days after he received his limb he returned with an open wound. A second
man waited 2.5 years for his device; he had placed the order in 1947 and only just received it in
early 1950.82

Appliances that were shoddily constructed by inexperienced or indifferent workers using
substandard materials tended to break quickly, requiring repeated repairs; one report concluded

81GARF, f. 413, op. 1, d. 869, l. 165.
82Kulik, “Immunitet.”
that it was unusual if an appliance did not break within the first three months.\textsuperscript{83} A prosthesis rejected as substandard by one person would be issued to another rather than destroyed, as was the protocol. Factories disregarded the prohibition against sending orders through the mail, meaning no final adjustments could be made to ensure fit and prevent injury or infection.\textsuperscript{84} Some recipients ended up repairing the limbs themselves, like the Stalinabad amputee whose leg was held together with bandages and wire.\textsuperscript{85} There were also cases of downright duplicity: it was discovered that the Novosibirsk Prosthetics Factory was making (and selling) slippers in lieu of orthopedic shoes; at the Tula factory shoes for the non-disabled were produced instead and distributed to staff, relatives, and friends, with some getting multiple pairs.\textsuperscript{86}

The mobile prosthetics units designed to reach those unable to travel existed mostly on paper due to the lack of available transportation.\textsuperscript{87} Amputees were required to make repeated trips, many over great distances, for fittings and receipt of the devices and subjected to long delays waiting for their appointments. Because employers were unwilling to grant the necessary medical waiver, workers went unpaid during these absences.\textsuperscript{88} There were no accommodations or meals provided for those forced to wait overnight or longer and, once in receipt of their limbs, they were given little instruction in how to use and maintain them. If food was available at the factory at all, it was typically served in unsanitary and insect-ridden buffets.\textsuperscript{89} Enterprises lacked facilities for washing after the cast was taken. The scarcity of separate examination rooms meant that patients might be seen in corners, behind the door of the wardrobe.

\textsuperscript{83}RGANTD, f. 146, op. 1, d. 39, ll. 6-7 (1947); GARF, f. 438, op. 1, d. 218, l. 113 (1944); f. 413, op. 1, d. 240, ll. 8-9ob (1942); d. 562, ll. 140-154 (1945); d. 577, ll. 15-17 and 133-135 (1945).
\textsuperscript{84}GARF, f. 413, op. 1, d.1534, l. 87 (1949).
\textsuperscript{85}GARF, f. 438, op. 1, d.550, l. 339 (1948).
\textsuperscript{86}GARF, f. 438, op. 1, d. 690, l. 266 (1950); d. 2270, l. 213 (1952).
\textsuperscript{87}GARF, f. 413, op. 1, d. 234, l. 135 (1942); f. 413, op. 1, d. 870, l. 51 (1947).
\textsuperscript{88}GARF, f. 413, op. 1, d. 1631, l. 62 (1950).
\textsuperscript{89}GARF, f. 413, op. 1, d. 1538, l. 24 (1949).
The Vladimir Prosthetics Workshop will serve as an all too representative example.\textsuperscript{90} Officially operating since late 1944, it only began production in mid-1945 when it was finally allocated three small rooms in a damp and unheated basement. A broken pipe meant that the workshop was periodically flooded with fecal matter. Because there was no separate waiting area or furniture, amputees were forced to sit, sometimes for hours, on the dirty floor. With neither proper equipment nor qualified personnel, the workshop was unable to produce any upper limb prostheses. The absence of orthopedic shoes meant that many who received lower limb devices couldn’t use them. Provisioned thusly, the Vladimir workshop was only able to provide limbs for 10% of the region’s disabled. Comrades Sergeev, Smirnov, and Borovitskii had been waiting since June 9, 1944, June 12, 1944, and August 1945, respectively (the report was written on December 20, 1945).

Allocated raw materials and semi-finished components were often of poor quality and required substantial reworking: a shipment of 673 parts from the Tomsk factory had to be entirely reassembled. The workshop did not have an orthopedist, necessitating repeated visits for fittings. Lieutenant Klimov was required to come five times for his new prosthetic and three to repair his old one.

Little attention was shown to the patients’ personal needs. With dormitory space limited to twelve beds, 12-15 non-local patients were forced to sleep on the bare floor or at the train station each night. Since the dormitory kitchen had flooded and was covered in a layer of ice, inhabitants received boxed food instead of warm meals. Those coming from nearby regions were entitled to no food, and there was no buffet on the workshop premises.

What is perhaps most surprising about the situation in Vladimir is not the poor conditions, perhaps unavoidable during wartime, but the strenuous and continued efforts made

\textsuperscript{90}GARF, f. 259, op. 6, d. 3388, ll. 107-112 (1946).
by the director to redress these shortcomings. As justification for his persistent complaints, in a model of pithy understatement, comrade Bobrin concluded that: “These conditions make the Patriotic War Veterans extremely nervous.” A disabled former soldier himself, Bobrin first applied to the local office of the Social Welfare Ministry. Receiving little support he then turned to the city and regional representatives of the party, who lost the letter. Bobrin’s direct appeals to the Social Welfare Minister and the director of the Central Administration of the Prosthetics Industry in Moscow were likewise ignored. Eventually comrade Shkol’nikov, the Vladimir region’s representative to the party’s Central Committee, interceded. He contacted first regional party leaders, who forwarded the complaint to Malenkov, who sent it on to Andrei Kosygin from the Council of Ministers and again to the Social Welfare Minister, after which an order was issued by the Central Administration of the Prosthetics Industry to send qualified workers immediately to help organize the shop.

These problems were not limited to the smaller workshops; larger enterprises could be equally inhospitable, especially to those with mobility impairments. The medical division of the Kirov Prosthetic Factory was likewise located in a basement; getting to this room required taking the stairs to the second floor, going down a corridor and descending yet another staircase, this one narrow and steep. At the Marks factory—the country’s showcase artificial limb manufacturer—simply checking one’s coat required an hour’s wait because the coat check was too small to accommodate the number of patients seen daily. Other lines and waits followed: at the registration desk, the doctor’s office, the cashier, the fitting and adjustment rooms. Just

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91GARF, f. 259, op. 6, d. 3388, l. 107 (1946).
92GARF, f. 413, op. 1, d. 1538, l. 24 (1949).
ordering a new part required two trips from one end of the medical section to the other; as its floor had fallen into disrepair, the disabled often stumbled and fell.\textsuperscript{93}

Careless recording keeping exacerbated the situation.\textsuperscript{94} One bi-lateral upper extremity amputee received a postcard to come pick up his artificial leg. Another client missed his scheduled stay at a therapeutic sanatorium because he never received the notification to pick up his orthopedic shoe and couldn’t travel without it: the notice had mixed up his house and apartment numbers.\textsuperscript{95}

Those seeking prostheses encountered the inflexible and often punitive bureaucracy for which the Soviet system was notorious. Veteran Idrisov ordered a right leg, a left arm, and an orthopedic shoe. His request that all his fittings be conducted in the same visit was denied, and he was forced to return to the factory several times for each of the three appliances. Twice he was given the wrong size foot. After his second request to the medical division for a replacement the doctor told him to go talk to the head of the technical shop since “it wasn’t her problem.”\textsuperscript{96} From the hospital where he was receiving treatment, comrade Khokhlov ordered a pair of limbs on August 31, 1946; the order was received at the shop on September 4. Only on September 30 were the limbs ready to be adjusted. On October 14, when the fitting finally took place, “serious defects” were discovered and the limbs were returned for alterations. These began eight days later and continued over the course of an entire month, until November 20, where it was determined that the leather was dried out and the limbs had to be scrapped. The

\textsuperscript{93}TsAOPIM, f. 1046, op. 1, d. 4, l. 240 (1944).
\textsuperscript{94}GARF, f. 413, op. 1, d. 690, l. 326 (1950).
\textsuperscript{95}TsAGM, f. 2035, op. 1, d. 90, l. 77 (1950).
\textsuperscript{96}TsAOPIM, f. 1046, op. 1, d. 10, l. 242 (1950).
patient was informed only on December 2 that he needed to return to the factory to begin the entire procedure again.  

Workers argued in front of the patients over who would get stuck with the more difficult cases. Of the veterans’ frequent grievances about the poor fit and service, the Krasnodar factory’s head doctor Sobolev remarked: “We are accustomed to [their] complaints [and] have developed our own kind of immunity.” Even the Marx factory’s head doctor found it hard to disagree with the outrage expressed by a comrade Lovskii, who announced that: “[our] institution exists for the sole purpose of aggravating sick people.” Likewise, comrade Babenko (the armless veteran who received the postcard to pick up his artificial leg) described the process of acquiring a new prosthesis as causing him “moral and physical” suffering.

Given the heightened expectations surrounding the Kononov arm, a significant percentage of the complaints focused specifically on that device’s shortcomings. Rubber, when available, was often of poor quality and too dirty to use without leather gloves, also in short supply. Procurement of both remained a problem well into the 1950s. Instead of the 40,000 rubber hand coverings the Central Administration of the Prosthetics Industry expected in 1943, the Commissariat of the Rubber Industry delivered 1000. In 1945 prosthetics manufacturers was forced to postpone the introduction of Kononov’s arm to serial production due to the shortage in leather. Whereas 27 factories were scheduled to begin production in the first quarter of 1947 only 8 had done so because the others had never received the hand.

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97TsAOPIM, f. 1046, op. 1, d. 6, l. 97 (1946).  
98Kulik, “Immunitet.”  
99TsAOPIM, f. 1046, op. 1, d. 10, l. 241 (1950).  
100TsAGM, f. 2035, op. 1, d. 90, l. 71 (1950).  
101GARF, f. 259, d. 2311 l. 24 (1943).  
102GARF, f. 413, op. 1, d. 577, l. 18 (1945).  
103RGANTD, f. 146, op. 1, d. 111, l. 19 (1952); d. 98, l. 130 (1951); f. 413, op. 1, d. 1631, l. 60 (1950).
A Welfare Ministry investigation into continued delays also faulted the Prosthetics Industry Central Administration for lack of oversight. Many factories had never received blueprints or any other technical documentation (even the prototype), much less training, either in the production of the component parts or in the assembly and fitting of the appliance. In spite of its touted simplicity, few industry workers understood how to put the arm together. Kononov himself came to the same conclusion during a tour of regional factories: he rejected all 100 of the devices he examined at the Stalingrad factory as incorrectly assembled.

In late 1948 the worker attachments that made Kononov’s arm so valuable had still not been introduced into mass production. Addressing an industry congress not long after receiving the Stalin prize, Kononov expressed his frustration with the continued delays: “This has dragged on four years already. We produce the hand, but what does the hand do for us? Nothing. You can pick up a glass, bread, but after all you still have to earn that bread.” In 1951 the hand was still being given without the attachments, even at the Marks factory.

As manufactured, the appliance was significantly heavier than the 12-15 kg promised. It was noisy, parts broke quickly, the lock mechanism jammed, the rubber hand covering tore, the cable broke and punctured through the leather sleeve, ripping the wearer’s shirt. This would be unfortunate under any circumstances but a real misfortune at a time when many people owned only one set of clothes. Or the sleeve broke and the attachments fell out. By far the biggest complaint was with the grasp mechanism of the hand: either the fingers didn’t close completely or the grip couldn’t sustain anything heavy. The muscular power required for the grasp was far

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104GARF, f. 413, op. 1, d. 893, ll. 46, 82 (1947).
105GARF, f. 413, op. 1, d. 1024, l. 108 (1947).
107GARF, f. 413, op. 1, d. 431, l. 23 (1944).
108GARF, f. 438, op. 1, d. 550, l. 192 (1948).
109RGANTD, f. 146, 1, d. 98, ll. 46, 213 (1951).
110GARF, f. 413, op. 1, d. 1538, l. 50 (1949); Kapachnikova, “Protezirovanie,” 79.
greater than what most amputees could achieve.\textsuperscript{111} Both the hand and the prosthesis were modified repeatedly to address these complaints, though not always successfully. While a 1949-50 redesign improved the grasp, this new model couldn’t be used with the worker attachments—defeating the very purpose of the limb itself.\textsuperscript{112} It was discovered in 1952 at the Marx factory that the appliance was being assembled on the old equipment, now incompatible with the newly designed components; the new equipment was found lying on a shelf.\textsuperscript{113}

A 1951 assessment determined that Kononov’s arm was used actively for six months on average before breaking. Thereafter a majority used it purely cosmetically. For some this was prompted by financial considerations: no one knew who was supposed to pay for transportation to and from the factory.\textsuperscript{114} For others it was a matter of never receiving the necessary training.\textsuperscript{115} There was absolutely no follow-up once recipients left the premises.\textsuperscript{116}

Despite repeated Ministry and state edits to factories to promote the Kononov limb and especially its functional capabilities, a marked lack of enthusiasm persisted on the local level, even in Moscow and Leningrad. In a late 1952 letter published in \textit{Literaturnaia gazeta}, veteran S. Evstigneev described his experience retrieving his new prosthesis at the Marks factory: he attempted to pick up his briefcase, which held two small books, with his new hand. The case immediately fell from its grip. The prosthetist-technician issuing him the device responded “bluntly” and “honestly”: “You’ve already worn two Kononov devices as purely cosmetic. Do the same with this. Don’t count on anything more.”\textsuperscript{117}

\textsuperscript{111}GARF, f. 413, op. 1, d. 577, l. 18; d. 690, l. 325 (1951).
\textsuperscript{112}RGANTD, f. 146, op. 1, d. 98, l. 213 (1951).
\textsuperscript{113}TsAOPIM, f.1046, op. 1, d. 13, l. 297 (1953).
\textsuperscript{114}RGANTD, f. 146, op. 1, d. 98, l. 213 (1951).
\textsuperscript{115}RGANTD, f. 146, op. 1, d. 163, l. 4 (1955).
\textsuperscript{117}Evstigneev, “Ne tol’ko”; TsAOPIM, f. 1046, op. 1, d. 12, l. 132 (1952).
The aesthetics of the appliance were also questioned by some. In 1954 the Prosthetics Institute was called upon by the Central Administration of the Prosthetics Industry to address a letter published in the newspaper Meditsinskii rabotnik highly critical of the arm. Assistant director Dikkert described as “slander” letter writer Vasin’s claim that staff members had constructed the hand with the express purpose of inducing trauma in the disabled. Because Stalin Prize Winner Kononov both designed and utilized this model, the accusation was unjustified. The same went for Vasin’s description of the arm as ugly. Dikkert concluded, somewhat speciously, that: “this did not reflect reality, since of all existing models this hand is the most attractive.”

Doubtless part of the dissatisfaction with the look of the Kononov arm had to do with a lack of variety in the available models, attributed to the continued rubber shortage. While the industry was also criticized for its failure to produce appliances sized for women and for children, most criticism in this regard focused on the needs of adult male amputees. Despite repeated promises and directives to make more rubber available (including one signed personally by Stalin in late 1949), hands continued to be produced in only one (masculine) size, as opposed to the 6 planned, and one skin shade, as opposed to 4. Medical divisions were compelled to substitute a different make of hand, interfering with the prosthetic’s proper

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118TsAGM, f. 2035, op. 1 d. 90, l. 42 (1950).
119RGANTD, f. 146, d. 146, l. 7 (1954).
120GARF, f. 413, op. 1, d. 750, l. 7 (1946).
121GARF, f. 413, op. 1, d. 1311, l. 2 (1949).
122In this case the Rubber and Chemical Industry Ministries, which bore responsibility for the outer rubber coverings, were at fault. GARF, f. 413, op. 1, d. 1631, l. 12 (1950); f. 438, op. 1, d. 615, l. 2 (1949); RGANTD, f. 146, op. 1, d. 98, l. 130 (1951); d. 111, ll. 18-19 (1952); d. 112, ll. 44, 93 (1952). On race as a factor in the determination of limb shades in the US, see Beth Linker, *War’s Waste: Rehabilitation in World War One America* (Chicago: University of Chicago Press, 2011), 115.
functioning, or utilize the one available size, which could be noticeably out of proportion with the other hand or with the remaining segment of the limb.  

As in the example of the Vladimir workshop, change — or at the very least attention to the problem — often necessitated outside intervention. Beyond the letters addressed to high-placed state and party personnel were the countless appeals by those who turned as a last resort to the central press. Throughout the late-Stalinist era, leading publications published editorials, articles, and letters documenting the manifold failures of the prosthetics industry to meet the needs of disabled veterans. Moreover, in 1946 Pravda organized a nationwide “raid” of prosthetics manufacturers and workshops, carried out by local newspaper and party personnel, to detail industry deficiencies. Typically following the publication of a critique, representatives from the faulted institution(s) would hurriedly meet, confirm that the situation as described “corresponds fully with reality,” and issue a set of resolutions about improved service and quality. A year or two later the paper would revisit the matter and conclude that little had changed.

Beyond the predictable self-criticism and promises of renewed commitment, there was also a great deal of institutional finger pointing. In 1944 the Social Welfare executive board censured the Prosthetics Institute for “intentionally misleading the Ministry” in its claim that the Kononov arm had been developed after, rather than before, the inventor’s transfer there. In turn the Institute blamed the Central Administration of the Prosthetics Industry for its “indifference” to quality control and factory oversight and its continued failure to procure the

123GARF, f. 438, op. 1, d. 615, l. 2 (1949); f. 413, 1, d. 690, l. 274 (1950); TsAGM, f. 2035, op. 1 d. 90, l. 42 (1950). There were also complaints that the Kononov hand was being used by other factories in purely cosmetic prostheses.  
124See for instance TsAOPIM, f. 1046, op. 1, d. 4, l. 157. (1944); GARF, f. 413, op. 1, d. 562, l. 133 (1945); d. 1311, l. 75 (1949); d. 1597, l. 38 (1950).  
125GARF, f. 413, op. 1, d. 446, l. 31 (1944).
rubber that would allow the production of the Kononov arm in more than one size and shade.  

It and the Institute charged one another of being hostile to inventors’ new proposals. In a 1952 dispute over culpability for defective parts the Semashko factory accused the Institute of producing inaccurate blueprints and the Institute blamed the factory for misreading them. The Ministry faulted the Institute for failure to assess newly proposed rubber coverings; the latter insisted it had never received them in the first place.

Efforts at the ministerial level to address ongoing problems with the arm were uneven. The agency mandated the distribution of pamphlets on care and usage along with every appliance. In late November 1948 (following a summer exposé in Literaturnaia gazeta) it sent repeated requests to recipients asking for their feedback. It required prosthetic factories in their annual production reports to list separately data on the number of Kononov arms produced and distributed (typically figures for other individual appliances were not specified) and followed up with those who had failed to introduce it. Beginning in 1950 (after another highly critical article in Literaturnaia gazeta), every factory was obliged to hold annual meetings with its customers in the presence of ministry representatives to elicit feedback. But pressure from above also prompted the Social Welfare Ministry to intervene in ways that exacerbated existing problems. Thus following another unfavorable article about Kononov’s arm in Literaturnaia gazeta in late 1952, the agency compelled the Prosthetics Institute to rush into production a new

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126RGANTD, f. 146, op. 1, d. 111, ll. 9-10 (1952).
127GARF, f. 413, op. 1, d. 446, l. 32 (1944); f. 438, op. 1, d. 550, l. 109 (1948); RGANTD, f. 146, op. 1, d. 145, l. 1 (1954).
128RGANTD, f. 146, op. 1, d. 115, l. 100 (1952).
129RGANTD, f. 146, op. 1, d. 127, ll. 19-20 (1953).
130See for example A. R. Kreslin and K. I. Ivanov, Pamiatka po osvoeniiu, pol’zovaniiu i ukhodu za protezom predplech’ia s aktiwnoi kist’iu konstruktii laureata staliniskoi premii V. E. Kononova (Moscow: Minsobes RSFSR, 1952).
131GARF, f. 413, op. 1, d. 1539, l. 132 (1949).
132GARF, f. 413, op. 1, d. 1534, passim (1949); d. 1841, l. 61 (1950).
133Kulik, “Immunitet.”
134GARF, f. 413, op. 1, d. 1597, l. 35 (1950).
hand model over its strenuous objections: the planned industrial trial had yet to be concluded and there remained serious design flaws.\textsuperscript{135}

Yet these attempts to monitor production proved largely unsuccessful. In 1948, for instance, several factories simply lied in their response to the Ministry query about the number of Kononov arms produced the previous year. An audit discovered that some enterprises had yet to master assembly of the limb, including several whose reported introduction of the device helped qualify it for the Stalin prize.\textsuperscript{136} Explanations for both low and high production figures could be misleading. Factory directors explained away low rates and unfulfilled plans as evidence that the demand for artificial limbs had been met and that quality had been improved sufficiently to permit limbs be worn until the scheduled replacement date; workers at an internal technical meeting at the Marks plant interpreted these data quite differently, arguing that the quality was so poor that hardly anyone used their prostheses and thus never needed to replace them.\textsuperscript{137} The celebratory declarations by the Chief Administration of the Prosthetics Industry about the increased availability and provision of Kononov’s arm were equally disingenuous, since annual factory reports indicated only the number of appliances distributed, not whether or how they were employed.\textsuperscript{138}

Conclusion:

Kononov’s arm was heralded as an emblem of the state’s commitment to the disabled and the mechanism by which those same disabled could redevote themselves through labor to the

\textsuperscript{135}GARF, f. 146, op. 1, d. 116, l. 182 (1952); d. 127, l. 19 (1953).
\textsuperscript{136}RGANTD, f. 146, op. 1, d. 39, l. 1 (1947); RGANTD filial, f. 180, op. 1, d. 552, ll. 91-93, 106 (1948); GARF, f. 413, op. 1, 1023, ll. 105, 108 (1947); d. 1024, ll. 85, 95 (1947); d. 1534, ll. 29-31, 75 (1949); d. 1537, l. 73 (1949); f. 438, op. 1, d. 550, ll. 57, 84 (1948).
\textsuperscript{137}GARF, f. 413, op. 1, d. 754, l. 18 (1946); d. 1311, l. 178 (1949); RGANTD, f. 146, op. 1, d. 39, l. 6 (1947); TsAOPIM, f. 1046, op. 1, d. 13, l. 33 (1953).
\textsuperscript{138}RGANTD, f. 146, op. 1, d. 98, l. 211 (1951).
state. Nonetheless, the distance between the prosthesis as totemic promise and as heavy, noisy, faulty contraption was never breached. The inadequacies of the industry outlined above continued through the 1950s, and every declaration of success can be countered with evidence of failure. In June 1955 Institute director Popov reported to the Ministry for State Control that the arm was still serving primarily as a cosmetic device since no one taught the amputees how to use it. Summing up the accomplishments of the Institute on its 15th anniversary two months later, Popov concluded that Kononov’s arm “looked fully modern.” Ironically, he considered the appliance their only successful upper limb prosthesis, even though the latest modification still required too much muscular effort for most amputees to utilize it. That the prosthesis was considered a success based upon its “modern” appearance,” and despite the fact that it could not be used for its intended purpose, unintentionally confirms its designation as a Potemkin limb. As with so many other technological showpieces of the Soviet state, form trumped functionality.

Like the factories, the Institute was accused of remaining hostile to innovation. As Loren Graham has argued with respect to the engineering profession, aversion to innovation or change appears a logical career move given the potentially dire consequences of unwanted attention. It is not surprising, therefore, that so many of the proposals for inventions came from those who, similarly to Kononov, operated outside of the academic establishment. The “invalid-innovators” represent a state response to a problem of its own creation through its repression of the scientific and technical communities. Replacing the previous decade’s accusations about overvaluation and reliance on the west, scientists and engineers were now criticized for failing to keep up with international developments. At a 1955 party cell meeting at the Marx factory, for example,

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139RGANTD, f. 146, op. 1, d. 166, l. 118 (1955).
engineers were faulted for experimenting with materials and processes that were already “last year’s technology” elsewhere.141

Still traveling the country in 1956 to popularize his invention, Viktor Efimovich was fighting what had been, and remained, a losing battle.142 A full decade after Kononov’s miraculous invention won the Stalin prize advocates sadly reported that many war amputees had never heard of it nor, for that matter, of active prostheses in general.143 This is not surprising in light of the findings of an industry investigation in late 1957, which determined that far fewer upper extremity amputees were working in industry than those missing lower limbs. The author laid the blame for this imbalance squarely on the professionals most closely involved in the ex-soldiers’ care. Among social welfare personnel, i.e. those responsible for finding disabled veterans suitable employment, “somehow the idea has taken hold that the armless are utterly incapable of working and generally helpless.”144

Praised over American and other European models for its simplicity of design, Kononov’s invention was never simple enough to be mass manufactured. Serial production defeated Kononov’s arm just as Kononov’s arm defied serial production. Well into the late 1950s manual labor on the shop floor prevailed, even at the Marks factory.145 Ironically, the “kustarshchina” decried as a mark of industry failure proved a chief source of Kononov’s (limited) success: only those produced by Kononov personally, or by those personally supervised by him, or in the Institute workshop received consistently favorable appraisals. Making a suitable limb required an individualized, craft relationship, a personalized touch—the very opposite of the goal of serial production.

141TsAOPIM, f. 1046, op. 1, d. 15, l. 49 (1955).
145TsAOPIM, f. 1046, op. 1, d. 15, l. 73 (1955).
The direct, personal link of the inventor to his invention was built into the limb itself. Available in only one size and shade, this Soviet answer to the American “Wonder Arm” was ultimately only Kononov’s wonder arm. Worker attachments were often unavailable or unusable with the “improved” models. Given that the grip was too weak and the arm too heavy (for industrial labor), by the early 1950s it was recommended that the appliance only be given to white-collar workers. Kononov’s creation was no longer fitting for those amputees for whom it had been designated: industrial laborers for whom the lack of an arm was the only thing standing in the way of erasing the memory of war and getting them back to work.

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146RGANTD, f. 146, op. 1, d. 98, l. 213 (1951).
147Kapachnikova, “Protezirovanie,” 198.
Figure 1: Kononov at his workbench
Figure 2: the Kononov arm’s intended recipient
Figure 3: “Let’s root out spies and saboteurs, the Trotsky-Bukharinist agents of fascism!” (1937)
Igumov www.davno.ru/posters/искореним-шпионов-и-диверсантов-троцкистско-бухаринских-агентов-фашизма.html
Figure 4: “Let us fulfill the plan of great works” Г. Г. Клуцис. «Выполним план великих работ!». Плакат. 1931. Or 1930 Иллюстрация "Клуцис Г. Г. Клуцисом Густавом Густавовичем «Выполним план великих работ!»" в Большой Советской Энциклопедии http://bse.sci-lib.com/particle012474.html  
http://softsalo.com/sovet_41_politik/politik_22.html  
www.plakaty.ru
Figure 5: “Rid the collective farm of the kulak”
Figure 6: design for the grasp

Figure 7: design for the prosthesis