"THE SOVIET INTERNET: BEYOND THE BOOK"

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I am Benjamin Peters, author of the forthcoming book How Not to Network a Nation: The Uneasy History of the Soviet Internet. I am professionally a media historian and theorist and currently work as an assistant professor of communication at the University of Tulsa. I earned my PhD from Columbia University in 2010, studied Russian studies at Stanford University, and have held fellowships at the Harriman Institute and at Harvard. I am currently an affiliated faculty member at the Information Society Project at Yale Law School. The reason I cannot be at your conference is because I have previous commitments to present parts of this book¡ªwhich is in many ways a contribution to your community¡ªat Cornell University and at the University of Pennsylvania. Of course I cannot pretend that my comments have captured the OGAS story properly, and I would be surprised and even disappointed if everyone agreed with my interpretation. Instead, I see in this book a first step toward introducing the English-speaking world to the extraordinary story of the OGAS Project. I look forward to the pleasure of returning and working with your community again someday soon about how to tell the story in other relevant languages.

In this talk today I offer a personal introduction to the book, a few comments on how I came into this particular project, a few "eureka moments" in the research project, one close-up snapshot of Soviet computing counterculture, and a few concluding comments about how the book connects to larger questions about information technologies, power, and history.

Let me begin with the big picture. My research focuses on very basic questions: how and why do information technologies take shape differently in different contexts? In particular, how do new information technologies¡ªsuch as networks--take root differently across regimes of space, time, and power?

How Not to Network a Nation sharpens that basic question quite a bit. It tells, for the first time in any language, the book-length story of how, despite thirty years of effort, Soviet attempts to build a national computer network were undone by what appears at first glance as socialists behaving like capitalists. In particular, between 1959 and 1989, Soviet scientists and officials made numerous attempts to network their nation¡ªto construct a nationwide computer network. None of these attempts succeeded, and the enterprise had been abandoned by the time the Soviet Union dissolved. Meanwhile, ARPANET, the America precursor to the Internet, went online in 1969. Why¡ªwe may then be tempted to ask¡ªdid the Soviet network, with genius scientists and patriotic incentives, fall apart while the American network took global root? In the book, I reverse the

usual cold war dualities and argue that the American ARPANET took shape thanks to well-managed state funding and collaborative research environments and the Soviet network projects stumbled because of unregulated competition among self-interested institutions, bureaucrats, and others. The capitalists behaved like socialists while the socialists behaved like capitalists.

To briefly outline the book, after examining the midcentury rise of cybernetics, the science of self-governing systems, and the emergence in the Soviet Union of economic cybernetics in particular, I complicate this uneasy reversal while chronicling the various Soviet attempts to build a "unified information network." Drawing on previously unknown archival materials and dozens of interviews, the book focuses on the final, and most ambitious of these projects, the All-State Automated System of Management (OGAS), and its principal promoter, Viktor M. Glushkov. How Not to Network a Nation describes the rise and fall of OGAS¡ªits theoretical and practical reach, its vision of a national economy managed by network, the bureaucratic obstacles it encountered, and the institutional stalemate that undid it. In conclusion, I consider the implications of the Soviet experience for today's network world¡ªin particular that, despite many dissimilarities, the Soviet case resembles the current network world in its uneasy, even uncanny, threats we face from the overreach of private institutional power. The book is, as the sociologist Todd Gitlin recently put it, a sociopolitical report as well as a delicious tale of Soviet efforts to manage a command economy left them without either command or an economy.

Before I tell you more about the book itself, I'd like to take you briefly beyond it: to the decade long research process that produced the book and will continue to shape my research interests, which I'll do through a series of Eureka moments or puzzles in my research process.

The seeds of this book were first planted in my mind as I stood on the left bank of the Volga river in Balakovo, Russia one Spring evening in 2001. Balakovo, where I was living for several months doing volunteer service, was a pleasant and remote city of roughly 200,000 people deep in Russia's rust belt. The scenery was breathtaking that evening: green trees, rolling hills, and the setting sun reflecting on the surface of the reservoir before me. As I took it all in, I looked again and sensed that something was out of place. Looking again, I noticed a different set of breathtaking features: the Saratov hydroelectric dam, one of the world's hundred largest dams, stretched over 1200 meters across the reservoir; to the right of me stood a thermal heat power plant; and across the reservoir I could see four working nuclear power reactors dotting the horizon. Several blocks behind me stood now windswept warehouses, where, if local rumors were to believed, secret military factories once produced a type of clothe material for the cosmonauts that was so tough that napalm would ball up and roll off it. This peculiar pairing of spring sunset and outsized industrial infrastructure struck me on the riverbank. What force of imagination and statecraft, I wondered, could possibly have decided to graft such hulking

industry onto such a pleasant remote city¡ªand why would it do so? Thus on the riverbank began my interest in the infrastructural imagination of Soviet planning.

These seeds were nourished in the soil of cybernetics studies four years later in Fred Turner's graduate seminar at Stanford University in 2005, the year before he released his history of flower power in Silicon Valley, *From Counterculture to Cyberculture* (which might in fact better be titled, he jested, *From Cyberculture to Counterculture,* given his history's roots in postwar cybernetics). Then two years later, in the Spring of 2007 as a doctoral student, I stumbled on footnote in a biography of Norbert Wiener, a founder of cybernetics. It claimed that, according to a 1962 Central Intelligence Agency report, the Soviet Union was building a "unified information network." That footnote triggered a question that was so tenacious that I had to write this book to shake it: why were there no Soviet developments comparable to the ARPANET in the 1960s? It was the perfect CIA question at first: of course at the height of the cold war technology race, Soviet cyberneticists would have tried to build a "unified information network" and yet, and yet I knew nothing about those efforts or their outcomes. I was hooked: what had happened, and why? Why had there been no Soviet Internet?

That question drew me into far-flung archives and interviews over the next eight years, although my initial trips to Moscow proved only dead ends. Marshall McLuhan once quipped that the first thing a foreigner needs to know about visiting Russia is that there are no phonebooks. His point is that the visitor to Russia needs to have contacts already in place. The Finns have a similar line: in Finland, everything works and nothing can be arranged. In Russia, nothing works and everything can be arranged. And so, with no one to help arrange my work, I found myself shuffling through dusty documents in state archives lit by a single flickering light bulb overhead for weeks. No closer to the story, I wrote out of desperation to the historian of Soviet science Slava Gerovitch at MIT about my search. He replied with a draft of what became the research base of this book¡ªmore importantly, he connected me to contacts in Kiev and in Moscow, and suddenly, especially under the leadership of Vera Viktorevna Glushkova, I saw my research world shift to reveal hidden social networks all around me. Russia¡ªand more importantly Ukraine¡ªhad opened up: dozens of interviews and contacts, out of the way archives, and unprecedented access to historical materials and actors fell into reach. On the surface, this book is about why certain computer networks did not work in the Soviet Union, but that's not the real story. The real story is that social networks in the region have long operated according to their own rhythms and reasons, and the social scientific networks, especially in Ukraine, have a profound history and story worth of global attention.

In the process of researching this book, I realized early on that many people in the West did not know how to think about a Soviet computer network: talking about the topic was effectively a Rorshak test for revealing the person's core beliefs about technology, and not the topic itself.

For example, for many interviewees, especially technologists, the internet and the Soviet Union were like oil and water, or rather carbon and plutonium¡ªtwo fundamentally opposed information projects. Of course the Soviets could not have an internet comparable, I was told, for, one is the salvific vehicle for the invisible hand of modern-day commerce and the other is remembered for its dead hand, or semi-automated nuclear deterrence network; one led to the knowledge explosion that is Wikipedia and, the other, to the nuclear catastrophe at Chernobyl; one produced Linux, and the other the Lada; one, in short, is a haven for techno-enthusiasts, the other, the whipping boy for the same. I heard this kind of binary talk all the time.

And yet, among a different set of experts (usually fewer and better informed), another opposing position emerged just as strongly: for this second group, the internet appears a natural *extension* of the socialist experiment consummated in the Russian revolution a century ago. Both the Internet and the Soviet command economy promise, in a phrase, the revolutionary realization of the means for production on a mass scale. In the fused rhetoric of networking collective consciousness and crowd-sourced collaboration, we see the unlikely alliance of Kevin Kelly's hive mind, Eric Raymond's bazaar, and Leon Trotsky's collective farm: before there ever internet cooperatives, Soviet revolutionaries were promising that workers (think users) could meet the needs of the masses (think crowds) through collective modes of resource sharing (think peer-to-peer production).

And so I wondered, How was I to make heads or tails of such conflicting stories?

The first Eureka moment came as I realized history can sober and ground our most fanciful technology talk. Here, for example, is such a historical fact: since the mid 1950s, Soviet military scientists did in fact build and use at least three functioning national computer networks. There were Soviet military networks. This simple fact suddenly reshaped the question: it is impossible to argue, as many technologists tend to do, that technological backwardness kept Soviet scientists from developing computer networks, when in fact they obviously had the technical know-how to do just exactly that. It was no longer why was there no Soviet networks at all, but rather, Why did military networks take shape, while other civilian networks did not?

The second eureka moment came in the form of a surprising answer to that question: by my account, the first person to propose a civilian national computer network anywhere in the world was also, curiously, a Soviet military man by the name of Anatoly Kitov. In 1959, Kitov was a rising star among military researchers and also the first Soviet cyberneticist. In the Fall of 1959, Kitov, in his "Red Book letter," sent the General Secretary Nikita Khrushchev a proposal that the existing military computer networks be fitted to allow economists and other civilians to use the network during the off hours when the military was not using the computer networks. This would be done to encourage economists and planners to efficiently manage the information flows in the

nation's command economy. As it happens, Kitov's story is a tragic one: his well-intentioned letter to Nikita Khrushchev was intercepted by his supervisors, who were infuriated that he would dare suggest the military share resources with civilian affairs. He was dismissed from the army and spend the rest of his career working in medicine cyberneticist¡ªan early pioneer in modern-day health information science. He also remained a key adviser in subsequent attempts to build a civilian economic network.

With reflection, this discovery also reshaped the question: no longer could I be interested in why one network worked, while another did not, for I began to see cold war technology race biases in the question itself, not to mention heroic invention narratives and other concerns about who crossed the finish line first that still beset the history of technology. A closer read of this story, as well as the literature, revealed that information technology history is always a story of multiple independent simultaneous inventions and innovations. What is interesting is not whether Kitov or Licklider came up with the idea first, but rather why leading scientists situated in the top military basic research laboratories on both sides of the cold war felt compelled to invent the national computer network as the next generation of state and organizational power in the late 1950s and early 1960s.

The third eureka moment came in recognizing that, despite two decades of set backs, the OGAS Project advanced by Viktor M. Glushkov, the leading cyberneticist of his generation as well as a deep thinker of decentralized power, were profoundly innovative on their own terms. Here too the conventional narratives for telling this story fell short¡ªhis network project to manage the command economy by decentralized computer network remains something without precedent. The OGAS, in Glushkov's vision, was designed to be a decentralized network of remote-access computer processing stretching from a central processor in Moscow to hundreds of regional computer centers to as many as 20,000 local computer terminals throughout the country. Moreover, so the innovations that came along with the OGAS Project can be seen as extraordinary and forward-looking apps:

As the book details, Glushkov's promoters see in his team's work the Soviet precursors to electronic banking, paypal, and bitcoin, cloud computing, natural language processing, and even an attempt at immortality through artificial intelligence. His detractors, curiously, agree with his promoters that "Glushkov was before his time," although they accuse him of being ever out of touch with the realities of the day. As the common complaint goes, Soviet computing theorists could not help but see far past the chalkboards they were doing their programming on. In the book, I show how evidence disputes both positions and that the best way to understand the fate of Glushkov's OGAS Project is not a focus on the individuals but on the institutions¡ªthe quicksand into which the history of networks is poured¡ªthat supported these projects.

The fourth eureka moment came in the identification and then deconstruction of dominant national metaphors for the network. In the Soviet Union, the state, it would seem, is that mind of the nation and the network its nervous system, while in America the nation is the distributed networked mind itself. The book traces the implications of these contrasting network metaphors for cold war political economics. Suffice it to say I think that *both* readings make a significant mistake: both take too seriously cybernetic analogies for modern network nations that privilege as supreme the image of the private mind. Both are mistaken yet dominant metaphors we inherent from the cybernetic¡ªand in the end deeply human¡ªhubris that it is the individual human mind that organizes the world.

The fifth eureka moment brings us to the case study in my talk: let me simply note that perhaps the leading scholarly history of Silicon Valley¡ªa book called From Counterculture to Cyberculture¡ªtraces the history of the American computer through the flower power counterculture on the West Coast, and anchors that history in postwar cybernetics and culminates in techno-libertarianism. The case of Cybertonia in Kiev, while only a small snapshot, helps us think differently about counterculture. Indeed, one way of expanding the history of new media and computers is to recognize that countercultural tendencies are not sufficient to sustain or support creative and innovative technological labs, both of which can be found in the work and play of the team behind the OGAS Project.

The curtains on my case study today part on the valley of Feofania in the southern outskirts of Kiev, Ukraine in a forest overrun by songbirds, rabbits, mushrooms, and berries in the summer, and hunted in the winter by rumors of wolves and Baba Yaga (the famous witch of eastern European folklore). In this heavily oaked enclosure we find the curiously natural cradle for the birth of the first stored-memory electronic computer in Europe, the MESM, or malaya electronicheskaya schetnaya machine, or the small electronic calculating machine. And by small, I mean the computer filled a two-story room¡ªthis one (picture) to be exact. The MESM was built in a two-story brick building that had no plumbing near the St. Panteleimon's Cathedral, a high point of Russian revival ecclesiastical architecture since its construction in 1905. The building itself bears the scars of faith, madness, murder, and science: it was built initially as a dormitory for eastern Orthodox priests, and then looted during the 1917 Russian revolution and converted in a psychiatric hospital. In 1941, the Nazis slaughtered its patients and established it as a military hospital. In 1948, the now badly damaged building was transferred over to the hands of Sergei Lebedev, Glushkov's predecessor. Lebedev's charge was to build the newest icon of Soviet atheism¡ªthat triumph of human rationality and creativity, the automated computer. And six thousand vacuum tubes and two years of astonishing effort later, his team had done it: they turned on the calculating machine in 1950.

For years later, a culture of collaboration and autonomy away from the watchful eyes of Moscow

permeated the OGAS team under Glushkov. Researchers who received nearby housing rarely accepted other positions (Glushkov, for example, is rumored to have turned down a million dollars to defect and work at IBM, never mind standing invitations to work in Moscow.) Informal play and merry making abounded during and after work: to the priests' chagrin today, engineers under Lebedev and then Glushkov tested controlled mechanical explosions in the magisterial cathedral. Bus drivers were sent on wild goose chases through the forest, ping-pong balls ricocheted down the hallways on breaks, and volleyball and soccer matches broke on. This is hardly the portrait of staid heroes of the state that either the official Soviet histories present or that might be inferred by comparison with the countercultural histories in the west.

In the 1960s, the OGAS Project in Kiev imagined an afterhours work party that became no more than an after-hour work party and at once no less than an imagined country separate from the Soviet state. They christened it "Kibertonia" or Cybertonia, a sort of virtual country, or "fairytale land" on the New Year's Eve Party of 1960. From there the joke snowballed into a community that offered scientific seminars, lectures, after-hour gatherings, community functions, auctions, artwork, ballads, press releases, news letters, a short film, fake passports, marriage certificates, its own currency, and even its own constitution. That constitution was authorized by "the Robot Council of Cybertonia" that warned jokingly that "anyone who disobeys the Robot will be stripped of their rights and cast out of the country for 24 seconds." The mascot of the country was the jazz-playing Soviet robot, an open gesture to that American cultural export. Merry pranksters waxed on in official reports that compared the task of securing living quarters to hyper-dimensional geometry as well as 1965 title "Executives Incognito: On Wanting to Remain Unknown, at least to the Authorities."

All of this took place incidentally several blocks away from the Institute of Physics, where the Strugatskii Brothers work, the time and ostensible setting of their wonderful sci-fi novel *Monday Begins on Saturday*. These network entrepreneurs and scientists¡ªrather than serving Soviet state power¡ªattempted to resist it with pranks, puns (there are many here), puzzling wit, and privileged intellectual classes. Much like countercultural communes behind Silicon Valley, the blurring of reality and virtuality, work and play, science and art was precisely the point of "Cybertonia." Theirs was a Kyberia away from Siberia, an escape from the great error of Khrushchev and Brezhnev, if not the great terror of Stalin's. Alas, Cybertonia never did grow to become, as the editors of its 1968 symposium had gleefully enthused, an "interplanetary congress." At some point between 1969 and 1970, as the Brezhnev doctrine forced the Warsaw Pact to invade Czechoslovakia, "the entire idea of Cybertonia," one participant recalled, "was buried by the pressure of the Party and government."

In short, this hint of countercultural autonomy, revelry, and subtle protest all grew up in the very militarized knowledge institutions that served the regime these scientists resisted. It is not

incidental that Glushkov titled his memoirs *Despite the Authorities* in 1982. Here is a peak into the alternate history of a different kind of countercultural new (socialist) left that too reproduced its own cultural, institutional, power, and gendered dynamics¡ªand whose work¡ªthe OGAS Project, like that of ARPA military research and subsequent Silicon Valley business culture¡ªtoo serves the very institutions of incorporated state power they sought to resist.

The Soviet state itself resisted the OGAS Project for reasons that may best be left for later eureka moments, but in a brief recap of the story left untold today, the OGAS Project ended up facing extraordinary, ad hoc, and unregulated resistance from at least five groups: (1) except for the Deputy Defense Minister Ustinov, the military wanted nothing to do with civilian affairs, especially the regulation of the command economy that fed its coffers; (2) the economic ministries (especially the Central Statistical Administration and the Ministry of Finance) wanted the OGAS Project under their control and fought one another to the point of mutiny to keep competing ministries from controlling it; (3) the bureaucrats administering the plan feared that the network would put them out of a job; (4) factory managers and factory workers fretted that the network would pull them out of the profitable gray or second economy; and (5) liberal economists were upset that the network would prevent the market reforms that eventually Gorbachev began to introduce. Instead of a national network, dozens and then hundreds of local computer centers were built in the late 1960s and 1970s, and never connected. Glushkov's dream of networking Soviet socialism into a brighter communist future did not come to pass.

In the conclusion, I complicate my initial argument that the history of OGAS depends on a matter of socialists behaving like capitalists, and capitalists behaving like socialists, if for no other reason than that that language rehearses the cold war divide I seek to help deconstruct. Instead, borrowing from the language of Hannah Arendt, I argue that the fate of the OGAS history is but one example in a much larger story about the cold war serving as the staging ground for the consolidation of private power¡ªor what Arendt calls the *oikos*¡ªacross modern states in the new age of high technology. Each of the five groups I specify can trace their behavior back in some sense to the midcentury rise of the private power.

A final work: the OGAS story is not only a tale that took place long ago and far away. It is an allegory of our own fate. The private forces that were hard at work in the OGAS story are also hard at work in the modern media environment. Privacy should perhaps not be understood as the right to control the disclosure of personal information or the right to be left alone; perhaps we should think of privacy as the institutionalization of private power to survey the public: the NSA, Google, and the Communist Party are all run by General Secretaries that record our behavior for the private institutional gain. Informal networks abound, for better and worse. We should not gaze at the OGAS Project from a comfortable distance but realize how close its story hits to home. A world of difference separates all allegories, but looking in the rearview mirror of history, the distance between networked private powers is often closer than it appears.