

THE NATURAL HABITAT OF SCIENCE: SHIFTING LOCATIONS OF FREEDOM AND CONSTRAINT AMONG MIGRANT RUSSIAN SCIENTISTS

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This paper is an attempt to think through some perplexing ideas about the roles of freedom and constraint in science, arguing that ostensibly universal scientific values actually take on shifting and sometimes paradoxical meanings in transnational cultural contexts. Specifically, I argue that although "freedom" is often seen as one of the necessary conditions for scientific creativity and innovation, the experiences of migrant Russian scientists challenge assumptions, first, that scientific freedom can be located in only one cultural context—that of a capitalist free market—and second, that the current financial and organizational crises in Russian science are necessarily limiting factors in developing scientific creativity.

The extremity of the situation in Russian science is well known. The ongoing financial crisis, combined with a collapse of science's social prestige, has left many research institutes with an almost complete lack of funding for equipment and materials, not to mention months of salary arrears. Beyond this, many scientists identify a decay in scientific values: the use of institute resources to support for-profit enterprises wholly owned by institute directors and deputies, enterprises which have, in many researchers' views, "nothing at all to do with science"; an increase in plagiarism and academic dishonesty; and the rise of multiple "mini-academies," many of which traditional scientists accuse of promoting pseudoscience and superstition.¹ What scientists perceive as the complete disintegration of the mighty Soviet scientific establishment has led many to seek opportunities abroad, and the problem of so-called "brain drain" has inspired much heated doomsday rhetoric both within Russia and outside it. While some Russian voices sound the alarm that the loss of scientists is causing Russia to "give away hundreds of billions of dollars to other countries" (Trigubovich 1999), other Russian and Western observers warn that Russia's nuclear and biological weapons scientists are exceedingly susceptible to the lure of big money from "rogue states" such as North Korea and Iraq (Argumenty i Fakty 1999; Miller and

Broad 1998a; Miller and Broad 1998b; Stout 1999).

The situation of the Novosibirsk Scientific Center, once the shining star of Soviet science and a kind of Academy of Sciences "company town," in many ways mirrors that in other post-Soviet scientific and educational institutions. Yet Akademgorodok scientists (from all but a few particularly troubled institutes) insist that science is alive, if ailing, in the science city, and that they are still doing world-class science, even on limited resources. One of the ways in which they creatively confront the financial and organizational crises is by engaging in what I call "shuttle migration"—trips abroad for periods of from a few months to a few years, often made specifically with the purpose of returning to Russia not only with money, but with publications in Western journals, data, equipment, and materials. Irina, a researcher at the Institute of Organic Chemistry in Akademgorodok, explained to me,

By the example of our institute, even under the current conditions—a shortage of reagents, a shortage of modern equipment—I can say that sometimes very good results are obtained because people go abroad, work, get joint publications, and somehow move forward.

In short, not all brains that drain do so permanently. In fact, according to an Akademgorodok historian's review of the Siberian Division's (admittedly incomplete) statistics on brain drain, in 1994-95 around 400 Akademgorodok scientists spent more than 3 months working on contracts or in temporary positions abroad, while in 1994 fewer than 60 scientists emigrated permanently (Kupershtokh 1997: 138). This shuttle migration brings Siberian scientists into extended contact with scientists from nearly every country in the world: Akademgorodok scientists are working not only in North America and Western Europe, but in India, Zambia, South Africa, Australia, Malaysia, Japan, Brazil, Mexico, China, and many other countries. Many have no intention of leaving Russia permanently; rather, shuttle migration is a

response to the crisis in Russian science and a creative strategy for dealing with it.

Shuttle migration is facilitated by a discourse among scientists which holds that science is universal and international. It is complicated by their experiences working abroad and returning to Russia. It is often argued that scientists form a kind of transnational "imagined community," to appropriate Anderson's (1983) phrase: that the values of science transcend cultural differences between scientists. Communication between scientists of various cultures is often thought to be more or less unproblematic; in fact, Sharon Traweek (1988: 126) asserts in her study of particle physicists that scientists "are fond of remarking that they have more in common with each other than with their next-door neighbors," in large part owing to the specialized language in which they interact (cf. Browne 1998).

Akademgorodok's shuttle migrants feel that despite the limited material resources they have to work with, they are participants in this imagined community. One senior physicist who had worked in Denmark shrugged, "Maybe it's a cliché, but science is international. It doesn't differ anywhere. The possibilities for doing scientific work are different, but science itself is the same." A chemist who worked in the United States echoed this feeling: "I have the impression that science isn't different anywhere, if the people are enthusiastic. Just as Americans are enthusiasts who give themselves over completely to their work, so are Russians. Maybe our conditions are worse, but in any case we move forward, make progress."

Local sociologists who quantitatively monitor brain drain confirm that most migrant and emigrant Akademgorodok scientists expect and report no major difficulties adjusting to work abroad, the whole adjustment process—including language learning—taking about one month (Gordienko et al. 1997: 105,167-168). Yet my ethnographic research found that although scientists often imagine themselves to be participating in a transnational scientific community in which interaction is free and unproblematic, they also narrate tales of professional dissatisfaction resulting from economic, political, and organizational constraints on their work abroad. The liberation from Russia's economic crisis conditions that they often find in the West is countered by other constraints on their research agendas and professional development. Upon their return, shuttle migrants often extol the creativity and ingenuity Russian scientists evince in dealing with the exigencies of their

circumstances. These paradoxical understandings of what freedom and creativity mean to migrant Russian scientists, and what social conditions produce them, point to the difficulty of locating science either in a national or a strictly transnational space.

It was a common statement during my fieldwork that "Russia is the freest country in the world." This not-totally-ironic statement was usually used in response to a news report or some other piece of information about official corruption or crime, and revealed a perception that Russian society has become lawless and uncontrollable, that those in power are abusive of it, and that average citizens have no recourse to authorities. In reference to science, it indicated a variety of situations, including misuse and misappropriation of already-limited institute funds, academic dishonesty, and the proliferation of mini-academies handing out academic degrees in a seemingly indiscriminate fashion. One senior researcher claimed to be able to name ten other researchers (from other Russian cities) who had used his published material in their own articles without citing it; unfortunately, he said, "In Russia we have complete boundarylessness... plagiarism is now in the order of things." Similarly, a physicist complained that within his institute existed a for-profit enterprise, owned by the director and several of his deputies, that bought and sold scientific equipment using institute money. The result of this conflict of interest, he said, was that the institute often bought equipment that was useless for the research projects of its scientists, and was unable (or unwilling) to buy equipment that they really needed. "The government should be interested in where the money for equipment goes—for what it was designated for, or to some big boss, or for some completely unnecessary item. But if the state isn't interested in this, if it won't control this, then all conversations [about scientific research] are pointless."

Inevitably, when pointing out the lack of control, accountability, and legitimate authority in science, Akademgorodok scientists turned to the state for a solution. It was rare indeed that I heard a scientist suggest seriously that the centralized Academy of Sciences needed to be disbanded or radically restructured, and rarer still that someone proposed removing science altogether from its heavy reliance on the state, despite the state's dismal performance in even minimally supporting science in recent years. In fact, it was to the abundance of state support that most scientists

attributed Soviet-era science's comparative success in fundamental research.² Thus, although many migrant scientists appreciated the opportunities to use the latest equipment, particularly computers, in the West, and found that the ready availability of reagents, journals, and other materials facilitated their research, their narratives also revealed a suspicion that the "freedom" from material constraints which they found in the West was circumscribing their research in other ways.

In an article proposing solutions to the Siberian Division's financial woes, Academician Vladimir Nakoryakov weighs the pros and cons of institutes' raising much-needed capital through contracts for foreign firms. He concludes that foreign contracts are only a temporary measure, arguing that reliance on such contracts will lead, in the long term, to the death of fundamental science—and to scientists' creativity and intellectual freedom:

...contract work has no relationship to fundamental science. A contract strictly limits the initiative and logical thinking of the scientist; it interferes with his free choice of the direction of his creative quest. The delight of fundamental science lies in its freedom: a person himself, if he is talented, intuitively understands in what direction he should move... (Nakoryakov 1999).

Nearly every scientist with whom I spoke eventually quoted to me another common aphorism, "Science is the satisfaction of individual curiosity at state expense." Secure and stable state support was seen as the key to the development of fundamental research because it allowed scientists the "freedom" to pursue lines of research that they found interesting or fruitful without strict time limits and without being beholden to the interests of clients and donors (except, of course, to those of the state itself). Those who had worked abroad or who worked on private contracts in their Akademgorodok institutes pointed out the overwhelming influence of capital in delineating between fundamental and applied scientific research. Elena, a researcher at the Institute of Catalysis, worked for a little over a year at a post-doctoral research position at a university in Germany.³ She now buys equipment and reagents for her own fundamental research in her Akademgorodok laboratory with the proceeds from an applied contract she works on part-time for a German firm. She insists that she can be

more scientifically productive working in Russia, despite the depth of the material constraints she has to contend with:

What's bad about working in the West is that you are working "on order" or for someone else, for a person who might...even have lower qualifications than you do. But what can you do? Here, in any case, I have more opportunities to do that same work, because here I have laboratory assistants, technicians, and generally more freedom. More opportunities to do what I want to do. You can't buy that... But what else is there for Russians to do?

Elena saw herself as limited by a number of factors in the corporate scientific culture of the West: by the unpredictability of grant approval and renewal, by the organization of work, by her inability to publish results that were considered either confidential or the property of her boss—a problem that she said limited her ability both to advance in the Russian scientific hierarchy and to obtain better-paying positions abroad, and by discrimination against Russians in Germany. She sighed, "The fact that you're a foreigner, the fact that you're Russian...of course you'll earn less, and you'll have fewer chances to get a more interesting job. You have to prove yourself constantly, so that they keep you there. You have to work twice as hard. You have to earn less and even less."

Vasily, a young microbiologist with the degree Candidate of Science, who is now working on a Western Ph.D. in Germany, noted that fundamental research—a lengthy, expensive project often lacking in immediately visible results—was difficult to sustain in the West because of instabilities and "fashion trends" in funding for science. The Russian approach to science, he argued, was to work slowly toward a full understanding of some kind of phenomenon, while Western science emphasized answering particular, concrete questions. Often, he complained, scientists in the West were forced to follow what was trendy and popular among non-scientists in order to get grants: "In general, Western science is pop science—you get money for popular things... The last Nobel prize in medicine was given for Viagra!" Vasily's information on Nobel prizes aside, his feeling of constraint by the instability of Western funding and its reliance on private capital was shared by scientists from various disciplines—physics, chemistry, even history—who had worked in the US, in Japan, and in France.

Natalia, formerly a researcher at the Institute of Organic Chemistry, who left research about a year ago to take a position as an administrator in the Siberian Division of the Academy of Medical Sciences, remarked on the stifling of creativity by the circumscribed nature of the projects she worked on during her year at a biotechnology firm in Texas and the necessity of doing "busy work" she would not have had to do in Russia. Her job in Texas was simply to synthesize one substance, and she complained that although the top-notch facilities and equipment with which she worked in Texas were sheer pleasure, she often came in in the morning, started the reaction, and sat around the rest of the day waiting. She felt that her creativity had been snuffed out and her qualifications as a holder of the degree of Candidate of Science underrated by the necessity to fulfill orders for the substance she was synthesizing, and moreover by the requirement that she do work that lab assistants or technicians would do in Russia:

In America I had to learn how to work on the K-spectrometer and the UV-spectrometer. Well, a spectrometer, that's easy, but nuclear magnetic resonance? That's really [difficult]. I think that...that's not necessary, because I couldn't measure a spectrum as well as a specialist could. I could lose some kind of information. It seems to me that specialists ought to do their own work.

In other words, Natalia often felt as though she was being treated as a glorified lab assistant, not as a qualified scientist. And although she earned enough money during her year in Texas to buy a three-room apartment for her family, enabling her to end 16 years of cohabitation with her in-laws, she has no plans to return to the US and in fact, out of professional and financial frustration, has left research altogether.

The experiences of these Russian migrant scientists indicate that "freedom" exists in a problematic relationship to science. If scientists appear to hold certain ideas around which they construct their transnational imagined community, one of these might be that scientific creativity is engendered by a free and autonomous science, independent of the social conditions in which it exists. Yet these social conditions clearly create the contexts in which "freedom" is defined and constructed; moreover, in a transnational context these definitions and constructions are frequently, and inevitably, multiple and contradictory.

There is a question raised by much of the historical and sociological literature on both Soviet/post-Soviet and Western science which has been inadequately addressed in the context of brain drain; that is, how do scientists reconcile the cultural "location" of science in the West with either an ideology that demands its transculturality, or with other, local forms of science? Scientific thinking and "freedom" have long been linked in Western thinking. Steven Shapin and Simon Schaffer (1985) discuss how the controversy between Robert Boyle and Thomas Hobbes over the ideology and practice of natural philosophy—an ancestor of the modern scientific method—was critical in shaping the polity, also contested in Restoration England. At that time, they argue, "the answer was unambiguous: an open and liberal society was the natural habitat of science, taken as the quest for objective knowledge. Such knowledge, in turn, constituted one of the sureties for the continuance of open and liberal society" (Shapin and Schaffer 1985: 343). Science and Western civil-society models of freedom were, at their birth, conjoined twins. So how can we—and how do contemporary scientists in motion—conceptualize the complex and fraught relationship between science and freedom as something simultaneously local and historical and transcultural? While ethnographers can simply document innumerable local scientific forms, we also need to examine how these local sciences interact with global ideological, economic, and human flows.

Second, I want to propose that the contested and disjunctive ideas about the roles of freedom in science point to the existence among Akademgorodok's migrants of alternative models of the relationship between science and society. There seems to be little doubt that Akademgorodok's migrant scientists consider "freedom" to be essential to their scientific work. But their ideas about "freedom" are both highly localized—reflecting the particular frustrations of post-Soviet reality and the organization of Soviet science—and influenced by participation in a transnational community with its own "local" values. It shouldn't be surprising, therefore, that rather than creating a population of uprooted, super-cultural scientists, "brain drain" from Akademgorodok appears in fact to root scientists in Russia, in Russian communities abroad, in Siberia, in Akademgorodok, embedding them, in some sense, more firmly in these localities with their associated sciences, rather than detaching them. This movement—of people, of technology,

of ideas—lays bare all the differences and diversities in global “freedoms” and global sciences.

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Notes

- ¹ The Russian Academy of Sciences organized a Commission on the Struggle with Pseudoscience and Falsification of Scientific Research in November, 1998. One of the foci of the Commission’s work has been the proliferation of pseudoscientific publications, particularly in the government newspaper *Rossiiskaya Gazeta* (Kruglyakov 1999; Commission 1999).
- ² Of course, this sense that fundamental science is best supported by the state, rather than private interests, is common among Western scientists as well.
- ³ In addition to funding from foreign contracts, the Institute of Catalysis is the leader among institutes of the Siberian Division in the number of grants it receives from both Russian and foreign sources (Kupershtokh 1997: 138).