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Distinctive features of academic mobility in today's Russia

The paper investigates practice of international mobility in Russian science. Special attention is paid to the experience of the BRIC group in the field of migration management. Characteristic features of academic mobility, both international and Russian, are brought to light. Significance and prospects of academic mobility are assessed.

Keywords: science, scientific community, intellectual elite, migration processes, management of migration processes.

> ...Nowadays migration is a global problem. It is not an European private property, but the universal phenomenon. And it'll never end: it is our future whenever we like it or not, whenever we happy about it or not.
>
> *Zygmunt Bauman*

According to the outstanding sociologist Z. Bauman the peculiarity of modern social institutions and *modi vivendi* of individuals can be accurately and succinctly described with the "fluidity" metaphor. International intellectual migration is a socio-anthropological phenomenon and not the recent invention. Suffice it to say about the Middle Ages, when famous university cities pulled together students from all over Europe, and, thanks to Latin, education had become international.

International mobility has always played a prominent role in Russian science and in shaping of the scientific elite. Russian science has to a large extent been formed and enriched by the international mobility of scientists. The Russian Academy of Sciences owes its origin to well-known fact: a pleiad of brilliant young scientists came to the country and their work resulted in the creation of the Academy of Sciences as well as science itself. It is also well-known that during the XVIII and in early XIX century many German scientists came to Russia and a lot of them became professors and adjuncts in the Saint-Petersburg Academy of Sciences and Russian universities. To be educated in leading European, especially German, universities and higher technical schools meant a lot for the successful professional career of Russian scientist in XIX — early XX century. International mobility of scientists

acquires new features in modern society: it is institutional in its nature and is formed by new forms of social organization of science and unique traits of its competitive environment.

Since the early 1990s there is a growing outflow of Russian scientists abroad. This phenomenon (comprehended in terms of "brain drain" and "emigration of highly-qualified specialists") has become a subject of fierce discussions conducted by specialists in science studies, foreign researches and experts in the field of state science and technology policy.

In studies of directions of migration researchers usually use two verified theoretical constructions: "repulsion and attraction" and "core — semi-periphery — periphery" (Safonova, 2011: 262–263). Those constructions are rather complementary than mutually exclusive. Streams of migrants are under the influence of centripetal force: highly-qualified specialists move from the "periphery" to the "core" with its concentration of capital-intensive industry requiring intellectual skills and education and high quality of life. Alma Maldonado-Maldonado, who investigates the challenges of globalization in the sphere of science and education (Cantwell and Maldonado-Maldonado, 2009) and the migration of highly-qualified specialists in particular, insists on strict distinction between the concepts of "brain drain" and "brain exchange". And if the first describes characteristic features of migration in the periphery countries, then the second represents peculiarity of scientific mobility in the core countries, the centers of research and development.

Emigration of highly-skilled specialists, i. e. brain drain, has been traditionally negatively evaluated, and its consequences have usually been connected with the threat to national security of a donor county and aspiration to turn back the stream of intellectual migration. The periphery countries respond to the brain drain with a number of measures in the sphere of science and technology policy aimed at repatriation of scientists. Researches have assessed the situation in the post-Soviet Russian science differently. For example, B. M. Firsov in the article "The reproduction of scientific elite" (Firsov, 1998) pointed out that "the fact that scientists go abroad and that some of them have to give up professional research work is the most significant factor, which will decide the fate of this social group".

But in the course of time discussions on the migration of scientists conducted by sociologists and specialists in science studies if not ceased to be disturbing, then assumed another character. As a rule, in recent years researches become increasingly aware of the fact that migration plans of representatives of scientific community (to begin with academic elite, including its future members) make decisive and positive impact on the fate of the "parent" scientific environment, making widespread motto "international character of science" come true.

In Soviet Russia functioning of science, formation of the scientific community and reproduction of the scientific elite were inseparable from such an important element of self-organization of the scientific community as the "scientific school". Scientific school played very significant role in Soviet science. But this idea is devalued in the eyes of new generation of scientists (including middle-aged, forty-year-old researchers). Their professional development fell on the 1990s with their institutional instability and intense outflow of highly-qualified specialists, who represented some established scientific schools. In this situation "personal characteristics" of a young scientist, his or her ability and talent not only for research work, but also for management, have become the dominant factor of reproduction of the intellectual elite. Young scientists got accustomed to new rules of the game: nowadays their professional viability depends not so much on government support, as on ability to obtain means of the implementation of research and development from additional sources. At this point Russian scientists' connections with the international scientific community,

which were minimized during Soviet times, have acquired a new quality. We are speaking about programmes for the international mobility of scientists, research grants given by international foundations, internships, academical exchange between different institutes, etc. For local researchers those are new ways of entering into international research networks which are as a matter of fact transnational and open. It seems that today it is international scientific network that plays an important role in the process of functioning of science, reproduction of the scientific community; its significance is comparable to the role played by Russian research schools in the past. Nowadays mobility (both virtual, i. e. with usage of Information and Communication Technologies (ICT), and real) is a way to shape a "new generation" of scholars, who'll constantly have to prove their worth to their colleagues, to experts when applying for a grants, to managers and, after all, to public who wishes to know how tax money is spent and what are the practical benefits of research and development. And that is why modern scientist is a public figure: he or she is able to present himself, to expound clearly his or her achievements, to be is involved in scientific networks and, of course, mobile.

Several years ago Russian scientists (members of the National Research University — Higher School of Economics) obtained data indicative of significance of international mobility (Gohberg, Chepurenko, eds., 2005). The study examined an impact of overseas internships on scientific potential and professional strategies of scientific elite. The authors noted that scientific potential of the majority of the respondents, who went abroad for internship, has risen to a whole new level; they also listed the positive results of internships, which was mentioned by scientists themselves: contacts with foreign colleagues, visits to academic conferences in Europe, possibility to conduct research at the global level, to use scientific equipment of high quality, to improve the academic qualifications and the material conditions. The main results of scientific internships are articles, published in international journals, and successfully defended dissertations. After their return to Russia those representatives of the academic elite are strongly attached to foreign research centers; they identify themselves with the international scientific community rather than with Russian science and thus contribute to involvement of Russian scientists into the international scientific community.

We believe that there are reasons to assert that nowadays international mobility is an important new tool which enables to maintain the status of the scientific community and reproduction of the scientific elite; even more so: international mobility has become one of the most important means to integrate Russian science into the global scientific community. The participation of Russian scientists in the international division of labor allows us to solve a number of difficult problems of post-Soviet science, including the problem of generational shift.

In their search for determinants of migration modern theories depart from a number of factors, which in the long run are defined by cross-country differences in economic, social, political, and demographic spheres. Apart from such important factors as historically established interrelations, an extensive network of social contacts within the diaspora, proximity and knowledge of the language, the quality of life becomes the main impulse determining the direction of migration. This means that developed countries are the main recipients of highly-skilled professionals, while developing countries with transitional economics become the donors. Intellectual migration fits into this scheme: for example, the flow of scientists — emigrants from Russia — heads first of all for the USA, Germany and France.

The fact that the developed countries as well make an intensive exchange of intellectual assets is also worth attention. Thus, according to a study by F. Dokera and A. Marfuka, the majority of highly-skilled migrants living in member countries of the OECD (Organization for Economic Cooperation and Development) are from the UK (1441 thousand), Germany (848 thousand), Canada (515 thousand), USA (431 thousand) and Italy (408 thousand). (Tsapenko, 2009: 83). To explain this fact we should try to understand how the field of science is organized and what requirements it imposes on its agents. The key notion is the notion of scientific capital, "which is a form of symbolic capital, consisting in recognition granted by a group of colleagues and competitors within the scientific field" (Bourdieu, 2001: 56). The varieties of scientific/symbolic capital include involvement in the recognition and initiation rituals (defense of theses resulting in awarding of master or doctoral (PhD) academic degrees, conference presentations, participation in expert councils), academic titles and awards, patents, publications in journals with impact factor and, finally, a high citation index. This so-called institutionalized capital is expressed in formal evaluations and seemed by managers working in the field of education and science as the main indicator of scientific productivity.

The quest for a high rating causes competition within the scientific and educational environment: universities try to "outbid" highly successful specialists, thus increasing their symbolic capital. A by-product of such a policy is the circulation of scientists between universities of the world and the intensification the intellectual mobility which is one of the forms of organization of modern science. Participation in international internships (i. e. becoming a research fellow) and academical exchange programmes has already become an essential part of professional development, which contributes to the increment of scientific capital. Science is international by nature and the scientists engaged in research and development are drawn to well-equipped laboratories, up-to-date experience and leading experts; to buy "brains" occurs to be economically more profitable than to shape them. The famous Hungarian sociologist, professor P. Tamas believes that the issue of "brain drain" is not a scientific problem, but a special case of the general problem which can be formulated as follows: the need for highly-educated specialists is growing faster than the country's ability to produce them. All industrialized countries suffer a "gap" between supply of personnel and demand for it, and the demand is growing at 7–8 % per year. It results in "withdrawal" or "exhaustion" of such a personnel by highly developed countries. Personnel should be not "kept" but "bought".

Nowadays strategies of the international mobility have fundamentally new character. It is obvious that intellectual migration cannot be stopped as well as prohibited. But it is possible to change the "looking glass" reflecting this social phenomenon: to replace traditional ("conservative") one with "liberal". In this case a scientific diaspora can be seen as a resource for scientific and technological development of the "parent" science, and intellectual emigration is a necessary aspect of the global movement of human resources "from the periphery to the core". It should be noted that in the modern world the word "diaspora" gets new connotations. Today "diaspora" — is not so much an ethnic group of immigrants which "physically" occupies some territory as a collective agent of scientific and technological cooperation, emerging on web pages and within online social networks. H. Jimenez points out that over the past twenty years diaspora's knowledge networks and new "invisible colleges" have been formed which "conceptually transformed the traditional "brain drain" into "brain gain", the loss of human resources into the assets of influence networks in science and technology. In several countries science and technology policy has been switched

from attempts "to return" expatriates to endeavors "to interact" with them. Transfer of knowledge and technologies is the main advantage obtained by the countries from which specialists depart abroad. Expatriate investments, outsourcing, remittances and lobbying for social and political interests are of equal importance to the development of the country.

Thus, nowadays we have to get a different view of academic mobility: it is not the "brain drain" but "brain gain". Of course, the "pendulum" international mobility is not a threat to the intellectual asset of the country. But irretrievable migration and migration presupposing maintenance of relations with motherland imply that a scientist changes his or her permanent place of residence; the International Labour Organization regards those kinds of migration as a cause of losses in scientific potential of the state, especially when migration becomes widespread and turns into a "brain drain". In this situation mobility is a negative factor in the process of national science development, since ever-increasing scale of emigration threatens the existence of certain fields of science or science of certain region or country in general.

J. Jimenez and his co-authors (Jimenez et al., 2010: 67–89) in the article "Mobility or 'brain drain"? The case of Mexican scientists" describe the current strategies used in the sphere of international mobility. The USA, the EU, Korea, Canada, China and Japan encourage repatriation of scientists and subsidize professional associations and networks of local and expatriate researchers. The Chinese government takes active measures to make expatriate scientists come back but does not abandon its "open doors" policy for students. It is impossible to stop flows of student migration from developing to scientifically and technologically developed countries (i. e. "to close the door"). Moreover, many developed countries actively use various programmes to attract foreign students and financially support their education. More and more countries (the USA, Canada, Switzerland, France, Japan, Australia, New Zealand, Ireland, Germany etc.) provide foreign students with employment opportunities after the graduation, and grant them firstly student and then work visas. So, what practices, which make it possible for a donor country to turn emigration of highly-qualified specialists to advantage, exist today in the world? Researchers point out at least two ways: 1) scientific diaspora networks, which owe their existence to application of new communication and information technologies, shape scientific elite in a developing donor-country; 2) the diaspora's participation in scientific projects conducted in homeland is an important tool allowing expatriate scientists from developing countries to enter the global scientific community. It must not be forgotten, though, that effectiveness of diaspora networks depends first of all on science and technology policy of a donor country.

The scale of the international scientific mobility in Russia is not comparable with those in the world and should be increased. Nowadays Russian authorities make some moves to stimulate mobility of Russian scientists while working out programmes designed to get expatriate researches involved in cooperation in the sphere of science.

Russian science management seeks to employ foreign models for organization of educational and research process, and the sphere of academic mobility is not an exception. In "The Concept of the Federal Target Programme for the Development of Education 2011–2015", approved by the Government in February 2011, necessity of "improvement of academic mobility rate for teachers and students" providing "interaction of different educational systems" is indicated (Concept, 2011). Encouragement of intellectual migration and invitation of foreign specialists (including members of Russian diaspora) are the main trends of modern science policy. However, there is no panacea for all the problems. Since in 1990s the theme of the "brain drain" has been discussed at all levels, including government circles,

but only recently programmes designed for "partial" return of Russian scientific diaspora had been worked out and came into operation. A certain turn in Russian scientific policy can be noted: now it is obvious that flow of much needed specialists cannot be stopped while the migration is inherent in the organization of modern science. But it is possible not to lose researchers who left the country: to achieve this goal it is sufficient to choose the healthy pragmatism as a ground for cooperation; it'll allow to turn the "brain drain" into the circulation of highly skilled human resources.

In 2010, in accordance with the Government Decree "Measures to Attract Leading Scientists to Russian Educational Institutions", the Ministry of Education and Science announced a competition of mega-grants which would support the invitation to Russian educational institutions leading scientists living abroad; scientists of all nationalities and countries of residence were eligible to apply. All in all a visiting scholar should spend at least 4 months working in a Russian educational institution while having direct control over conduction of the research. Among the 40 specialists, who have won the competition, there are representatives of Russian diaspora: prominent scientists who have earned international recognition. If these trends continue, the scientific potential and symbolic capital of universities and research centers will grow. The Federal Target Programme "Scientific and Scientific-Pedagogical Personnel of the Innovative Russia" for 2009–2013 years (Activity 1.5. "Performing scientific investigations by groups under the leadership of the invited specialists") is another project designated for cooperation with expatriated scientists. Invited foreign specialist is a scientist of Russian origin, who has (had) Russian (Soviet) citizenship. This project presuppose that this foreign scientist will participate in educational process: he (or she) will deliver lectures, organize seminars and workshops, as well as be in charge of students', post-graduates' and doctoral students' research work; the duration of his (or her) direct participation in the research work shall not be less than two months. The Government has allocated 12 billion rubles (in the form of 100 competitive grants) for this programme. There is one more project of the Ministry of Education and Science in 2011 which enters into the series: that is Presidential scholarships for undergraduate and graduate students, implemented in cooperation with RASA (Russian-Speaking Academic Science Association Home), an association uniting scientists of Russian origin belonging to 12 research groups from Europe and the USA and led by Russian expatriates. This programme focuses on the development of priority areas of modernization (power efficiency, nuclear maintenance and software, medicine and pharmacology etc.) and aims for adoption expatriate professors' practices of scientific work organization and exploration of new experimental techniques, in the laboratory of ICAS (International Center of Advanced Science) in particular. Thereupon we should remember about a project which is currently being developed by the presidential administration and the Government of the Russian Federation: to support overseas internships for 500–1000 students and postgraduates annually at the expense of the federal budget. After their return those specialists will take important positions both in Russian business and in institutions of higher education.

All of those mobility programmes focus first of all on cooperation with expatriate scientists of Russian origin and aim at reproduction of scientific personnel and training of young specialists.[1]

[1] An eloquent example gives the foundation of a competitive laboratory in the Saint-Petersburg State University under the guidance of a visiting scholar, the German professor Jörn Thiede, an outstanding specialist in marine geology. "The laboratory should become a research platform for young

The scientific community discusses a number of problems which impede effective cooperation. Those are the difficulties relating to the legal regulation of the relationship between a visiting scientist and a host organization, to the problem of government purchases (for purchase, however small, amount of reagents it is necessary to announce a tender), to impossibility to invite colleagues from abroad to found a laboratory, etc. At the same time benefits, which parent science earns thanks to interconnections with members of the diaspora, are undeniable. The projects under the guidance of expatriate scientists attract "motivated young people", the results of research are quickly introduced into academic curriculum, geography of scientific communications (including online-communications) becomes wider. The leading scientists emphasize the need to develop new areas of cooperation with the important role of educational component: a visiting scholar should take upon himself a responsibility for lecturing, postgraduates' and students' training, supervision over work on dissertations and monographs. As to pedagogical projects it is worth to learn from the West: the practice of granting financial support for researchers (invited, for example, as "visiting professors") and (on a competitive basis) for those, who want to carry out a national or international conferences and summer schools, where guest lecturers could actively participate in the training of young specialists, should be developed in Russia.

In general, a positive trend in science policy towards Russian scientific diaspora has recently been noted. New ways of cooperation with expatriate Russian scientists are associated with the pendulum mobility, and Russian diaspora is kind of a "mediator", allowing Russian science to become a part of the global scientific networks.

From this point of view the experience of other vigorously developing transition economy countries, especially China, seems to be interesting. Mobility of Chinese scholars and students is rather high: for example, according to the data for 2009, since at least 2002 Chinese scientists constitute a majority of doctoral students studying in Germany (2019 people); in this competition China has left other countries (India — 1037 people, and Russia — 789) far behind.[2] In 2009 47 % of the students, studying natural sciences and engineering in the USA, were from China and India.[3]

Science policy in China designed to attract expatriates for research work in their motherland seems to be extremely effective. China does not begrudge money for science: its annual outlays for research work increase by 18 % per year, and to 2020 China expects to become an innovative country. There are many repatriates in Chinese research and education centers[4]: as a rule they have undergone extensive training in the USA and Germany.

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scientists", — Vice-Rector for research (SPbU) Nikolay Skvortsov says, — "That is why a visiting senior scientist — in this case, Jörn Thiede, — plays a double role. He ought not just to guide the research, but also to transmit his knowledge and skills (both scientific and methodological) to young people, so that our students and postgraduates could understand what the modern global science looks like" (Blagodatova, 2011).

[2] Statistics is provided by the German Academic Exchange Service (Deutscher Akademischer Austauschdienst, DAAD) together with the German research institution "Hochschul-Informations-System" (HIS) (Wissenschaft weltofen, 2011).

[3] The data are given by the National Science Foundation (the USA) (National Science Foundation, 2011).

[4] The UNESCO Science Report (2010) has noted that "despite the large amount of materials on migration it is almost impossible to make a systematic quantitative picture of long-term migration of highly-skilled specialists all over the world". The case of China isn't very different. The number of repatriates in China is assessed very differently: it varies from 100 people (which seems to be incorrect

More than half of the heads of Chinese research institutions had already worked abroad. Two models of modernization for academic science have appeared: the Shanghai Institute of Life Science is an example of the first one. It combines several academic institutions and research centers. One of these institutions is headed by Gang Pei, a young scientist, who has returned from the USA. Very favorable conditions are offered to the scientists, who decide to return to China. The "guest" laboratories established on the grounds of mutually beneficial international cooperation can be considered an example of another model. E. g. the "guest" laboratory of German Max Planck Society works as a part of Chinese Institute of Cell Biology. The Chinese Academy of Sciences pays salaries and overhead expenses of scientists, while the Max Planck Society provides laboratory with all the necessary scientific equipment (Melikyants, 2001).

On the basis of this model a "100 Talents Programme" has been worked out; it aimed at the invitation of the most productive expatriate scientists, who had been worked in the USA, Japan and Australia. Those scientists had to organize research laboratories, to recover lost or to create new scientific schools for the training of young specialists. From 1998 to 2004, 778 specialists under age 45 have gone through this programme (Sterligov, 2008). It is important to note that this programme assumed the possibility for a scientist to keep his or her position in a foreign scientific institution. Repatriates' salaries were twice as much as average salary of Australian scientists and almost equal to that of American scientists. In addition, significant extra fees were paid to stimulate the publication of articles in scientific journals or elaboration of lecture cources. Apropos of duration of contracts, foreign scientists (or expatriates) have been contracted for different periods of time from 2–3 weeks to 3–5 years: in this respect conditions of cooperation were very flexible.

Nowadays China funds research and educational work not only at home but also abroad. The country partially pays salaries for those foreign scientists, who participate in Chinese projects, i. e. teach Chinese students. In 2007 in China a resolution was adopted, according to which students studying abroad at the expense of the state have to work after the internship at home for at least two years, and only after that they can continue their studies as postgraduates. Otherwise they have to pay a considerable penalty. Such a restrictive measure seems to be rigorous but effective: the vast majority of students prefer to return home.

It is obvious that Chinese experience of work with expatriates should be considered. Russian scientific policy in this area can be described as not active enough, unlike the Chinese, more "aggressive" and methodically considered, but also extremely flexible.

Speaking on the exceptional importance of mobility in the organization of modern science, we should not reduce it only to return of Russian scientists, who once have gone abroad. It seems that Russian universities and academic institutions should just invite leading scientists — the Germans, the Americans, the Chinese, and so on, — and create the appropriate working conditions (as our football clubs, which "buy" the best football coaches and players and offer them terms of cooperation not vey different from those throughout the world, do). We also should pay attention to the CIS countries (Armenia, Azerbaijan, Ukraine, Belarus), since our shared historical interrelations are considered by experts in

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and understated) to 200,000 people (which is probably an overestimation). It is well known that 81 % of those who have studied and worked abroad have returned to the Chinese Academy of Sciences; it'll be 54 % for the Chinese Academy of Engineering. In 2009 the Chinese government has approved a programme aimed to attract to China in the course of 5 years about 1500 leading scientists who had achieved remarkable progress in various fields of science (Echo of Moscow, 2009).

the field of sociology of science as one of the determinants of mobility. Intellectual resources of our neighbors can fill up the gap which has emerged as a result of "Russian brain drain".

New forms of research and teaching which are actively introduced by educational management contribute to the intensification of mobility.

The emergence of high-status universities (http://univer.ntf.ru/p55aa1.html and http://mon.gov.ru/) is a result of implementation of business strategy aimed at integration and differentiation of educational institutions, which led to formation of Federal universities. The main directions of development of these institutions are claimed to be "the arrangement of conditions for academic mobility of students, teachers and researchers, the integration of the university into the world educational space and the achievement of international recognition for university curricula in order to export educational services and technologies". Thereby it is clear that the reorganization of institutes of higher education designed also for encouragement of mobility.

All in all it should be noted that academic mobility in Russia has become an integral part of the process of Russian scientific community's entry into international scientific and educational space. It contributes to the international recognition of Russian science, helps to overcome national isolation of Russian researchers as well as to gain an access to the European and world labor market. Participation of Russian scientists in the international division of labor makes it possible to solve such a difficult problem of post-Soviet science as generational change.

Russian science will never resemble Soviet science. In these conditions, the role of international mobility is exceptionally important: it is difficult to overestimate it. Academic mobility gives Russian science an opportunity to enter into the international scientific community, to become a part of this community and to become truly international.

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A Programmed Interview with Dr. Niu Jianlin from the Institute of Population and Labor Economics (the Chinese Academy of Social Sciences), which has been given on the 1st of December, 2011 in the Institute of Population and Labor Economics (CASS, Beijing).

A Programmed Interview with Dr. Li Chunling, Professor of the Department of Sociology of Education, the Institute of Sociology (the Chinese Academy of Social Sciences), which has been given on the 30th of November, 2011, in the Institute of Sociology (CASS, Beijing).

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Boris E. Raykov's activity as a natural science historian in the Institute of History of Natural Science and Technics (1940–1960-s)

This paper presents the overview of activities of the famous historian of science and educator Boris E. Raykov. The motives that led him to the history of science were examined. Attention is paid to his work both in the Institute and before.

Keywords: Boris E. Raykov, Institute for the History of Science and Technology, evolutionary biology before Darwin.