WP3/17 SEARCH WORKING PAPER

Academic brain drain and its implications for scientific manpower reproduction in Russia

Alexander Chepurenko

May 2013

SEARCH
SHARING KNOWLEDGE ASSETS: INTERREGIONALLY COHESIVE NEIGHBORHOODS

EUROPEAN COMMISSION
European Research Area

SEVENTH FRAMEWORK PROGRAMME

Funded under Socio-economic Sciences & Humanities

The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2010-2.2-1) under grant agreement n° 266834

ACADEMIC BRAIN DRAIN AND ITS IMPLICATIONS FOR SCIENTIFIC MANPOWER REPRODUCTION IN RUSSIA

Alexander Chepurenko, Prof. Dr.
National Research University Higher School of Economics
(Moscow, Russia)
Faculty of Sociology
e-mail: achepurenko@hse.ru

ABSTRACT

The paper looks into Russian researcher migration to the EU supported by international science foundations, by Humboldt Foundation (FRG) in particular. Examination of the specific involvement of highly skilled Russian experts in the current cross-border academic mobility helps answer the following question: does the wide-scale involvement of Russian researchers in international scientific community in the context of growing internationalization and globalization hinder or promote brain drain? It also makes it possible to assess the role of Western foundations in the development of Russian science, in particular, formation, academic development, integration in formal and informal international academic networks of the most skilled Russian researchers. Consideration is given to the factors influencing the current transboundary migration of Russian academics. Special attention is given to the role played by foreign non-commercial science foundations (A.Humboldt Foundations as an example) in formation, academic development, integration in formal and informal international academic networks of the most skilled Russian researchers.

KEYWORDS Migration, researchers, scientific foundations, Russia, EC

JEL Classification: J240, O180, O470, R110

1. INTRODUCTION

Russian scientists have turned to be, within a historically short period of time (1990-2010) a rather specific group of Russian migrants. A great role in promoting Russian academic migration, particularly at the early phases of market reforms, was played by international science foundations providing for involvement of highly skilled Russian professionals in cross-border academic mobility. Most prominent among the foundations is the Humboldt foundation (FRG). As of today, the Russians came to be one of three most numerous ethnic groups amid A. Humboldt fellows and award winners. Especially big were numbers of those leaving for internship along the Foundation line in the early post-perestroika years (mid- second half of the 90-s).

A project "Reproduction of academic elite in Russia: contribution of foreign science foundations (A.Humboldt Foundation case)" supported by Moscow Scientific Foundation and A.Humboldt Foundation in cooperation with SU HSE was carried out in 2003-2004. The project was the most encompassing empirical study of the causes, mechanisms and effects of highly qualified researcher migration from Russia to EU countries, therefore its findings will largely be drawn upon below.

The outcomes of the project survey suggest a number of conclusions relative to the Humboldt Foundation (and western science foundations at large) as to the mechanism of reproduction of Russia's elite academic talent.

In autumn 2012 in the framework of the SEARCH project additional expert survey was conducted to analyse some selected cases of researchers' circulation between the EU countries (Germany) and Russia and to assess the role of cross-border researchers' interaction in the context of growing internationalization and globalization. The objective was to analyse whether the deep inclusion into international academic community is preventing or stimulating the brain drain in these countries. The case of Russia seemed to be an appropriate case in this context. Basing on a special survey (2004) and expert interviews (2012) it became possible to check the changes in the cross-border mobility and its impact on the academic environment in Russia. The

sample size and the method used to collect the data are described below; the field studies were been conducted by HSE experts.

2. EMPIRICAL BACKGROUND

The survey was conducted in December 2004-February2005 through direct mail, by using the address database provided by A. Humboldt Foundation and Moscow Humboldt Club. The survey population was made up of both Foundation fellows and A. Humboldt award winners (about 660 persons currently residing, at least nominally, in Russia).

It was assumed prior to the exercise that, given availability of comfort letters addressed to Humboldtians by Humboldt Foundation management and an intensive telephone prescreening, the response rate would roughly amount to at least 25%-30% of the population. These expectations were realized at 28% (Table 1). Note that the respondents represented different fields of research (Table 2).

2.1. The contribution of researchers' participation in cross-border mobility to personal career

It turned out that the bulk of Russian Humboldtians, while formally retaining the status of Russian research and education institution associates, actually spend a lot of time on academic missions and internships, and work on contract abroad. Then, two thirds of the respondents had been involved in at least one to three projects funded by foreign foundations, and over one third of them headed at least one to three projects (Table 3). In other words, the survey sampled population was made up of highly skilled professionals capable of conducting world level studies and strongly entrenched in international scientific community. At first glance the Humboldt Foundation programs, promoting strictly individual exchanges, are in fact a rather effective tool for building local research communities around German universities and research centers: over ¾ of researchers keep maintaining somehow or other close scientific ties with their former advisers and institutes thereof. One interesting question is why are the Foundation programs so appealing to representatives of Russian scientific elite? Table 4 deals with this issue.

Table 1. Survey response rate across cities

Cities	Total participants in Foundation program*	Number of responses	Number of denials
Moscow	335	89	246
Saint-Petersburg	137	38	99
Novosibirsk	38	12	26
Chernogolovka (Moscow region)	20	5	15
Dubna (Moscow region)	12	2	10
Gatchina (Leningrad region)	10	2	8
Ekaterinburg	10	4	6
Kazan	9	3	6
Krasnoyarsk	8	2	6
Nizhny Novgorod	8	4	4
Ufa	8	1	7
Troitsk (Moscow region)	7	1	6
Vladivostok	5	2	3
Izhevsk	5	3	2
Tomsk	5	3	2
Pushchino (Moscow region)	4	1	3
Rostov-on-Don	4	1	3
Irkutsk	3	1	2
Obninsk	3	1	2
Saratov	3	1	2
Voronezh	2	1	1
Dolgoprudny (Moscow region)	2	0	2
Petropavlovsk-Kamchatsky	2	1	1
Protvino (Moscow region)	2	1	1
Samara	2	0	2
Chelyabinsk	2	0	2
Barnaul	1	0	1
Kaliningrad	1	0	1
Kaluga	1	1	0
Kursk	1	0	1
Magadan	1	0	1
Novokuznetsk	1	0	1
Novocherkassk	1	1	0
Omsk	1	0	1
Penza	1	1	0
Perm	1	0	1
Severodvinsk	1	0	1
Togliatti	1	0	1
Tumen	1	0	1
Ulianovsk	1	1	0
Khabarovsk	1	0	1
Elista	1	1	0
Yaroslavl	1	1	0
Total:	663	185	478
	100%	28%	72%

*)The total number of Foundation program participants was picked up from Humboldtians database provided by the Foundation and Moscow Humboldt Club

Table 2. Respondent specialization by sciences (*as % of number of respondents*, N=185)

Natural	71
Engineering	4
Health	2
Social	2
Humanities	21

Table 3. **Distribution of answers to the question: "Have you ever been a scholar of a foreign science foundation? Have you ever been involved in projects funded by foreign science foundations?** *(as % of number of respondents, N=185)*

Were scholars of other foreign foundations	52
Were involved in projects funded by foreign foundations	65
including those who were team leaders	35

Table 4. Distribution of answers to the question: "Which outcomes of internship along the line of Humboldt Foundation programs turned to be most beneficial for your further research activities? (select no more than three most important answers)**"**

	For entire sample	**Natural sciences**	**Humanities**	**Younger than 35**	**36-50 years of age**	**51-65 years of age**	**Over65**	**Moscow**	**SPb**	**Other cities**
1 – using perfect research facilities	34	44	0	31	33	40	33	33	38	30
2 – access to scientific literature and archives	47	35	85	48	51	46	24	43	55	48
3 – mastering best practices of foreign colleagues	25	24	33	28	25	25	20	23	15	37
4 – contacts with foreign colleagues	75	72	80	70	78	61	86	74	83	70
5 – adopting fundraising practices (search for funds for scientific research)	4	5	0	3	6	0	5	6	3	2
6 – gaining experience in research product commercialization	1	1	0	0	1	0	0	1	0	0
7 – opportunity for attending scientific conferences in Germany and Europe in the course of internship	28	32	15	21	30	21	33	30	28	26
8 – general cultural contacts and impressions	36	32	49	31	43	29	24	37	37	33
9 – opportunity to set a fraction of scholarship apart	33	36	23	41	27	43	38	35	18	41
10 – miscellaneous	7	7	5	3	5	11	10	6	7	4

Worthy of note is a low appreciation given by Russian respondents to the results of internship along the Foundation lines such as adopting fundraising practices and research output commercialization. This is quite illustrative: Russian scientists, including representatives of academic elite, apparently still believe that to look for funds needed for their own research activities, and the more so to turn the results of intellectual work into cash "is not their business".

Responses of representatives of natural sciences and humanities differ sharply from one another. Whereas very important for the former turned to be an opportunity for using perfect research facilities and attending scientific conferences, then for the latter – libraries and archives, general cultural impressions of Germany and Europe, as well as mastering best practices of German colleagues. The overwhelming majority of former Humboldtians become multipliers of general cultural information of Germany in the first place. Over 80% of them introduce their undergraduate and post-graduate students to Humboldt and other foreign foundation programs, i.e. perfectly perform the function of Germany's "science envoys". This constitutes an extra effect for Germany and German (and European in general) science of Russian scientist participation in the Foundation programs.

As for personal benefits from participation in cross-border mobility, table 5 summarises this information. The survey showed that a mere 5% of Humboldt programs participants failed, upon their completion, to improve their scientific qualification, research or occupational status, in some or other way (Table 5, row 8). In this sense, to win a Foundation fellowship or become A. Humboldt prize winner is a rather important factor of intellectual wealth appreciation. The most common way of raising academic level is to publish articles in authoritative foreign journals. This opportunity was seized, somewhat more frequently than sample average, by Petersburgers, representatives of middle age group. It is predominantly representatives of middle and elder age groups, who had a chance to intern as early as prior to 1991, managed to write and/or defend a doctoral thesis upon completion of the Foundation programs (nearly twice as often as sample average). Promoted were primarily Humboldt prize winners among whom, as it is, were scientists boasting a high status in Russian science: Drs. (1.5 times more often than PhDs), scholars, and on the whole – respondents aged between 36-50. Scholars and respondents aged between 36-50 manage to publish one or several books abroad much more frequently.

Table 5. Distribution of answers to the question: "Do you think that the internship promoted (or provided opportunity for) the following?"

Forms of scientific, professional, career advancement	For entire sample	Natural sciences	Humanities	Younger than 35	36-50 years of age	51-65 years of age	Over 65	Moscow	SPb	Other cities
1 – prepare/defend thesis	32	31	44	24	39	36	5	32	28	37
2 – get promotion in academic rank (be elected as corresponding member, academician of RAS, RAMS, RAAS)	12	13	10	3	15	14	10	13	13	11
3 – win promotion	27	25	31	24	32	25	10	28	28	24
4 – win national or international prize	15	18	5	14	15	14	24	14	15	17
5 – publish a monograph / monographs abroad	20	12	39	-	20	32	19	18	23	20
6 – publish an article / articles in peer reviewed scientific journals	77	79	74	72	84	68	57	76	85	72
7 – raise one's scientific status in some other form	14	15	15	10	13	25	14	20	5	9
8 – nothing of the above occurred	5	5	5	3	4	7	14	6	3	7

According to the respondents, Humboldt internship provided much greater opportunities primarily for staging research at world level, for improving skills and well-being (Table 6). Quite impressive favorable balance was also noted relative to issues such as demand for research projects abroad, as well as opportunities for subsequent activities within the established scientific micro team.

Opportunities for conducting world level research particularly increased, as is evidenced by the survey data, for representatives of regional research centers and higher schools (over 95% of respondents mentioned that) and for 36-50 year-olds. This was also noted by those who managed, in the wake of internship, to defend doctoral dissertation, be promoted to a higher position or scientific rank.

It is noteworthy that the high rating of significance of the opportunity to conduct world level studies, gained thanks to internship, was actually unaffected by either repeated internships, or winning international or national awards, publication of a monograph or scientific papers abroad

or finally the desire of individual respondents to leave Russia for good.

And the opportunity for skills improvement thanks to Humboldt fellowship turned to be, in the eyes of respondents, monotonically increasing, and this relationship was quite explicit: the later the respondent had a chance to leave for the first time along the Foundation line, the higher the significance of skills improvement was for him/her. At the same time it is not Western foundations to be blamed for the current brain drain. Emigration sentiments are intensified primarily by the scientific elite rating of the state of Russian science in general and of their own field of research, in particular, as well as the dynamics and direction of the observed changes.

Table 6. Distribution of answers to the question: "Has anything changed in your research activities as a result of participation in foreign foundation programs?" (as % of the number of respondents)

As a result of participation in foreign foundation programs …	Your opportunities …:		
	worsened /lowered	remained unchanged	improved /increased
Opportunities for conducting world level research	0	15	83
Opportunities for improving skills	0	18	78
Financial circumstances	1	18	78
Demand for projects, interest in continuation and development thereof abroad	0	24	73
Opportunities for future joint activities within the established research team/conditions for establishment of such team	1	26	70
Opportunities for career advancement, progress in science	2	33	63
Conditions for independent search for sources of funding for future research activities	1	36	61
Scale of project funding	2	46	49
Demand for projects, interest in continuation and development thereof in Russia	3	50	45
Opportunities for research output commercialization	2	77	14
Opportunities for registration of title to intellectual property	3	84	8

*Each row sum amounts to below 100% as 2% of respondents have not yet completed their internship; several respondents (1-3%) found it hard to answer some questions

The survey showed that the main forms of international cooperation for respondents, following their involvement in Humboldt programs, turned to be attendance of scientific conferences and individual international research projects (Table 7). To put it differently, becoming a member of Humboldtian community implies taking an active part in international scientific cooperation, largely on personal level. This is particularly visible in middle aged categories, in groups of scientists from Saint-Petersburg and other regions, as well as scholars. Meanwhile, according to the respondents, the numerous achievements of Russian science are linked to synergies arising

within the frameworks of scientific schools. What is more achievement of research outcomes, particularly in natural sciences, is the result of team effort. It is precisely foreign collectivities that act as such teams for many participants of Humboldt programs.

The survey results showed that Russian scientists get more interested, with aging (and higher official position), in cooperation between research and educational institutions of former Humboldtians and their research partners abroad.

Table 7. Answer to the question: "Please indicate what forms of international cooperation resulted from your internship along the Humboldt or other foreign foundation lines" *(mark all suitable response options)»* *(as % of the number of respondents in each group)*

	Entire sample	Natural sciences	Humanities	Younger than 35	36-50 years of age	51-65 years of age	Over 65	Moscow	SPb	Other cities
1 – invitation to seminars, conferences, symposia	77	74	85	59	84	79	67	73	85	80
2 – contracting out to Russia	15	14	18	3	18	18	5	19	13	7
3 – contractual employment abroad	22	24	8	28	23	11	19	20	20	26
4 – joint international research projects at individual level	69	74	59	62	73	75	52	67	70	74
5 – joint international research projects of your research institute/higher educational institution and your foreign partners	26	30	13	17	24	32	38	31	25	15
6 – visits of foreign colleagues to Russia for lecturing /work on joint projects initiated by you	35	31	41	17	33	46	57	27	38	50
7 – drafting plans, jointly with foreign colleagues, for promoting their outputs, and commercialization, thereof	10	10	8	3	9	14	24	14	8	4

Note: some 5 % mentioned other issues, and roughly the same number found it hard to answer

2.2. The role of Western foundations in the development of Russian science

How do Humboldtians – people familiar firsthand with the programs and practices of foreign science foundations – evaluate the role of these foundations in the development of Russian science? The survey showed that they take a balanced approach to this problem (Table 8). The group of those of them who believe that western foundations stimulate brain drain is rather small across all age, sectoral and status groups of respondents. Only among the group of young respondents (below 35 years of age) it amounts to about 1/5. As for the opposite standpoint, then it is supported nearly one and a half times more often by Humboldt prize winners.

Thus the *elite segment of Russian scientific community sooner rejects than accepts the idea, frequently articulated by the national media, that the foreign foundation activities lead only to degradation of Russian science*.

Table 8. Distribution of answers to the question: "What in your opinion is the predominant effect of Russian scientist participation in the programs of foreign science foundations for reproduction of research personnel in Russia?" (as % of the number of respondents in each group of respondents)

	For entire sample	Natural sciences	Humanities	Younger than 35	36-50 years of age	51-65 years of age	Over 65	Moscow	SPb	Other cities
Induces scientific talent drain from Russia	13	14	8	21	13	18	5	14	17	9
Provides for Russian scientific elite involvement in international scientific networks, thereby promoting its entrenchment in Russia	24	25	18	14	24	25	29	22	20	30
Both equally	55	53	67	52	56	46	62	56	52	54
Miscellaneous	5	4	5	10	4	7	-	5	5	4
Hard to answer	3	4	3	3	3	4	5	3	5	2

As even and balanced is the assessment of the motives which, according to respondents, foreign foundations are guided by in their activities (Table 9). All age, sectoral and residential groups of surveyed Humboldtians first said that foreign foundations aim at supporting science in their countries and, incidentally, in Russia too. The respondents believe that ranking third amid the incentives is collection of information on the state of Russian science. Finally, the desire of these

foundations to foster brain drain from Russia is at the bottom of the list.

In other words, Russian Humboldtians believe that the activities of foreign scientific foundations are directed, both objectively and subjectively, at fostering free intellectual exchanges which enhance development of science and education in the respective countries, but strongly prop up research activities in Russia too.

Table 9. Distribution of answers to the question: "Why do you think foreign science foundations render assistance to Russian scientists? (chose no more than two options)**"** (*as % of the number of respondents in each group*)

	For entire sample	**Natural sciences**	**Humanities**	**Younger than 35**	**36-50 years of age**	**51-65 years of age**	**Over 65**	**Moscow**	**SPb**	**Other cities**
Eager to support Russian science and education	52	52	46	28	52	71	67	49	45	65
Promote development of science and education in their country	80	84	67	93	79	71	76	77	80	87
Elicit information on directions and level of research conducted by Russian researchers	22	18	33	21	21	21	24	23	22	17
Promote departure of professionals from Russia	5	6	5	10	5	7	-	6	7	2
Miscellaneous	5	4	8	3	7	4	5	7	5	2
Hard to say	4	2	10	3	6	-	-	5	5	-

2.3. To leave or stay at home: strategies of leading Russian scientists and factors behind them

Orientation at leaving Russia for a long time ranks rather low amid the motives of relationships with western partners; the main goal instead is casual work abroad on concrete projects. Thus in response to the question "What is mostly driving you in relations with western partners/countries?" four fifths of respondents chose an option: "Occasional visits to the West for work on concrete projects with a view to advancing in my field of expertise". Some respondents extended their answers, pointing to "opportunity for a fruitful scientific cooperation"; "opportunity for collaboration"; "perception of common cause because of involvement in

international science and personal contacts with its representatives from different countries"; "acquaintance with new branches of science", etc. Such projects are generally well funded, therefore prospects of earning a little do matter, which was noted by nearly one half of respondents.

Proponents of extreme positions make up nearly one third: 15% of respondents are planning to move to the West for a long term or for good, and another 14% said they would never leave Russia (Table 10).

Table 10. Distribution of answers to the question: "What is mostly driving you in relations with western partners/countries?" (as % of the number of respondents)

Occasional visits to the West for work on concrete projects with a view to advancing in my field of expertise[1)]	82
Occasional visits to the West for fringe earning[2)]	47
Involvement with research subcontracts without leaving Russia[3)]	32
Movement to the West for a long time or for good, research activities	15
Movement to the West for a long term or for good, giving up research activities	0
Miscellaneous[4)]	3
Hard to say	5

Note: In interpreting "Miscellaneous" item, 6% of answers were referred to the respective readymade response options:

1) opportunity for fruitful scientific cooperation; opportunity for cooperative work; perception of "common cause" due to involvement in international science and personal contacts with its representatives from different countries; science is international; opportunity for mixing with colleagues; scientific ties, contacts; opportunity for maintaining scientific atmosphere as such (contacts, literature, etc.); familiarization with new research areas; search for new information and new contacts; interesting work; adopting positive practices; introduction of Russian scientific achievements to world science; opportunity for realizing one's ideas; personal enrichment; meeting with friends and acquaintances, academic development; presence in both academic environments boosts projects

2) lavish funding

3) hope for joint studies into Russia's nature

4) sophisticated equipment, communication with civilized people; change of climate and an opportunity for having respite from Moscow everydayness, casual earnings as a scientific adviser/interpreter for foreign scientists in Russia.

Responses of scientists from different fields of science actually do not differ in relation to other points either. Commitments to emigration differ depending on family structure, age and place of residence of scientists on the date of survey. Featuring stronger commitments are respondents having children (the share of scientists having a family with three and more children and committed to movement is nearly four times as big as that of bachelors), scientists younger than

35 (one in three of them is committed to move, whereas only one in six of those aged between 36-50, and none from elder age groups responded in this way) and those working abroad on the date of the survey (nearly one half of them).

Answers to the question as to under which circumstances the respondents would leave Russia, identified four main factors: financial hardships, lack of proper conditions needed for work, situation in Russia and no demand for science on the part of the state (Table 11). As practice shows, the situation in this country is only deteriorating along all of these lines. Hardly any optimism is inspired by the review of potential causes of emigration, also mentioned by many respondents, which are in fact implications of the first four factors: fear of losing a chance for conducting world level studies and impossibility of materializing one's ideas. Note that a factor such as no market for scientific product was mentioned by a mere 8% of respondents.

Table 11. Causes for potential emigration in respondent ratings *(as % of the number of respondents)*

Financial circumstances	38
No proper working conditions (required equipment, personnel)	35
Macroeconomic (political) situation in this country	35[1)]
No demand for science on the part of the state	34
Fear of losing a chance for conducting world level studies	27
Impossibility of materializing one's ideas	26
No research product (idea) market	8
Other **a) personal and family problems**	3[2)]
b) opportunity for working in the specialty abroad	1[3)]
Under no circumstances shall I leave the country	14
Hard to say	14

Question: What circumstances could make you leave this country for permanent residence?

Note: In interpreting "Miscellaneous" item, 5 answers were referred to the respective readymade response option, and the remainder were banded together into two groups:

1) Return of totalitarianism; civil war; war; political persecution, political regime change in this country

2) Direct threat to life; family circumstances; health problems;; apprehension of children future; threat to family life; personal problems

3) Opportunity for working in the specialty abroad; free permanent position for working in the specialty abroad.

All of the above circumstances more frequently act as decisive factors for junior scholars and those who happened to stay abroad on the date of the survey (interestingly, none from the given group said that under no circumstances would he/she leave Russia).

As applied to young people, top on the list is the factor such as inadequate working conditions. For the next age group it is financial difficulties, and for elder generations it is no demand for science on the part of the state (Table 12).

The decisive factor for the colleagues abroad is the situation in this country: for Muscovites it is no adequate working conditions, and for residents of St.Petersburg and residents of other cities most important of the set of causes for migration is no demand for science on the part of the state.

As for respondents having no children, it is aggravating situation in this country that would be decisive for making emigration decision, while for families with children it is financial circumstances.

Table 12. Causes for potential migration depending on family structure, age, place of residence and field of science

	Natural scientist	Scholar	Number of children				Age				Place of residence			
			0	1	2	3 и >	<35	36-50	51-65	> 65	M	SPb	Other	Abroad
Financial difficulties	38	39	23	43	42	36	48	46	21	10	32	38	36	55
No adequate working conditions (required equipment, personnel)	38	31	33	34	39	36	59	38	25	10	34	31	26	55
Macroeconomic (political) situation in this country	32	44	41	36	35	29	48	41	25	10	29	41	21	69
No demand for science on the part of the state	37	26	28	42	28	29	41	33	36	29	29	37	36	38
Fear of losing opportunities for conducting world level research	30	18	28	25	26	36	35	27	21	19	22	25	26	41
Impossibility to realize one's ideas	26	21	23	26	23	36	41	24	14	24	22	22	21	41
No scientific product (idea) market	8	8	10	8	5	14	7	12	4	0	8	16	0	10
Under no circumstances shall I leave the country	17	8	13	10	19	21	7	13	11	33	19	19	15	0

Situation in this country is the most significant factor for scholars too, whereas for natural scientists it is not as important, ranking only fourth.

In relation to their own children, less than one half of respondents are opting for Russia, as a mere 40% would like their children to stay in the motherland; as many found it hard to give a definite answer, and another 1/5 of respondents strive for the West (Table 13).

Table 13. Distribution of answers to the question: "Where would you like your children to study and reside?" (as % of the number of respondents)

In Russia	39 + 1[1)]
Overseas	15+ 2[2)]
Study abroad and reside in Russia	2[3)]
Hard to say	22+ 6[4)]
Have no children	12 + 2[5)]

Note: In interpreting "Miscellaneous" item, answers were arranged into groups as follows:

1) "In Russia, but having opportunities for going abroad for study and work"

2) "In Russia but not in the current conditions"; "In principle, in Russia but currently abroad"; "It would be nice for them to become cosmopolitans"

3) "To study abroad and live in Russia"; "Education both in Russia and abroad" (3 answers)

4) "Let them decide for themselves" (5 answers); "It makes no difference" (4 answers); "Where they would be in-demand as experts"

5) They have completed their studies in Russia (3 answers)

Work-in-Russia sentiments get stronger depending on family structure and age of respondents (Table 14). Less patriotic are apparently scholars compared to their natural science counterparts and scientists working abroad on the date of the survey.

Table 14. Distribution of answers to the question: "Where would you like your children study and reside?" depending on family structure, age, place of residence and field of science *(as % of the number of respondents)*

	Natural scientist	Scholar	Number of children				Age				Place of residence			
			0	1	2			0	1	2			0	1
In Russia	44	26	26	37	45	61	26	35	54	50	41	36	46	24
Abroad	14	21	9	21	14	8	11	20	8	10	16	8	18	17

2.4. Russian scientists abroad: survey outcomes

By 2004, over 250 individuals of roughly 800 Russian Foundation fellows and A. Humboldt prize winners have been permanent employees of or on long-term contracts with research centers abroad, including nearly 100 persons working in Germany. The highest concentration areas

were, in particular, FRG capital Berlin and Potsdam; Rhine – Ruhr area with university and research centers in Bonn, Cologne, Dusseldorf, Dortmund, Essen, Bochum; Munich and research centers around. At the time of the research about 40 of Russian researchers – former Humboldtians – worked in these three major centers of science and higher education. The remainder are scattered across different cities of Germany. Note that they are relatively few in the ancient university centers such as Gottingen, Heidelberg, Marburg, Tübingen now losing leadership in scientific research. On the other hand, quite many – over 40 people – are working at universities and research centers in cities located far from both centers of traditional deployment of first-class universities and the major industrial and financial centers of the FRG, which therefore may be referred to as "peripheral".

Thanks to financial support of Humboldt Foundation, several business missions were undertaken for in-depth unformalized interviews of Russian scientists, de-jure or de-facto long working and living in Germany.[1] To draw a differentiated picture, the majority of them were conducted in the major German research centers, but several interviews in "peripheral" cities. Altogether, 21 persons were interviewed in Berlin – Potsdam, Rhine – Ruhr area and in a several cities in the north-western and central regions of Germany.

The interviewed former Russian Humboldtians were dominated by "opportunists", i.e. the people who had not planned to remain in Germany for good, but upon evaluation of the current dynamics in Russian science and having seen a chance for further work in the selected scientific specialty abroad, based on rational measurement of costs and benefits, preferred to remain in Germany.

The respondents can, in terms of their status, be classified into three groups:

- Those having life professor appointments in Germany, who had surrendered Russian citizenship (or intending to change it)
- Those having long-term contracts in Germany and intending to extend them, but not ruling out a possibility of coming back to Russia, sooner just for a short period of time until a respective position abroad is found (primarily in Germany)

[1] To this effect, the survey adds up to the data and estimates gained in the course of project "Dialogue with the Diaspora" carried out by Center of Information Support of Science under N.N.Andreev Acoustics Institute in 1998-2002 (see Yegerev S. "Dialogues with the Diaspora". Otechestvennye Zapiski, 2002, No. 7, pp/ 273-285)

- Those currently in Germany on contract but planning to come back to Russia as they still treat it as the primary place of employment

Most numerous of the above three groups was the second one, i.e. those having a certain high status in Germany but still not completely or strongly entrenched there in terms of work and everyday life.

Note that the overwhelming majority of respondents retained Russian citizenship, though children of many of those, who have long lived in Germany, have a permanent job or renewed contractual employment, particularly sons who would have to serve in the Russian army, had become naturalized in the FRG and do not identify themselves with Russia

Having life, highly paid, prestigious professor positions is a relatively rare case amid our interviewees in Germany. The majority of them said that their positions in Germany, in conformity with positions BAT1 or BAT 2, which roughly correspond to positions of lecturer and senior lecturer in Russia, are provisional, and upon contract expiration it would be necessary to look for a respective project funding. Naturally, thanks to their experience and skills, many hope for a more or less smooth contract renegotiation, yet this segment of interviewees are still somewhat uncertain about the future. This bears on the people's plans: they try not to draft long-term plans relative to place of work and residence in Germany, which has a particularly negative impact on the feeling of those Russian scientists whose families have secondary school age children.

Finally, the project helped identify as to which conditions and prerequisites may prompt remigration of elite Russian academics in medium- or long-term perspective. The interviews confirmed that the return to Russia is possible and desirable for some segment of Russian émigré scientists primarily for those who had left for Germany in ripe age, had no plans to have employment abroad by all means and have no life professor positions, given decent financial means and material conditions (including availability of facilities required for scientific activities) and possibly continued close contacts with western scientific community. Many of them maintain close contacts with Russia, host young Russian scientists, take part in summer schools, and otherwise cooperate with scientific and education institutions in Russia. Such respondents, though critical in general towards the state of Russian science, notice positive

dynamics in a number of areas, more frequently speak of availability of capable young people at research institutes and higher educational institutions, etc.

2.5. Expert Survey 2012

An expert survey, held in November 2012, aimed at identifying the changes that had occurred in the nature, mechanism and inducements of cross-border migration of highly qualified scientists in Russia.

Invited to participate in the expert survey were representatives of various fields of research, mostly middle-age scientists (35-60), who had been involved with different fellowship and grant programs run by international and foreign foundations, as well as those who had been repeatedly involved in the more or less protracted fellowship programs or project activities abroad. Altogether 12 persons were interviewed. The interviews lasted on average between 30 to 50 minutes. Three experts refused to take part in the survey for some or other reasons (engagement, lack of interest in the topic, etc.).

According to the experts, their personal contacts with international scientific community have largely intensified, the same - with a few exceptions – holds for their field of research on the whole. And they feel that the academic brain drain from Russia has on the whole waned for the past ten years. This is due to both exhaustion of potential (because of the "age hole" formed in the 1990s the cohort of young and medium age scientists has contracted) and changes in the motivation system, emergence of new career opportunities in Russia. Besides, academic mobility of a fraction of Russian researchers is turning away from the US and Western Europe. This is what one of the experts said (interview 3):

"During the 1990s and earlier Humboldt Foundation played a significant role, from Russian scientists standpoint, in shaping international cooperation, primarily with German scientists. This role has abated markedly by now due to a considerable expansion of scale of and opportunities for international cooperation, including that at the expense of involvement in that cooperation of Pacific Rim countries (China, South Korea, Taiwan, Japan, Australia, Singapore). The policy of attracting foreign talent for work (and undergraduate and post-graduate studies) along with providing the respective lavish conditions and funding is brought to the level of national priorities in many countries.

Russian academic immigration has grown younger. While in the 1990's and before, these were primarily mature scientists, then now this process generally starts at master and post-graduate level abroad. Naturally, chances for getting employment abroad are higher.
At present foreign foundation fellowships are below the payroll rate for young scientists at commercial enterprises and state corporations in Russia, and given the planned increase of wages in science and education fields in the forthcoming years, the conditions offered by some foreign foundations will come to be less competitive. Hence the interest of potential applicants is waning".

Nearly all the experts said that they advise their graduate students to participate in foreign foundation grant programs, including those assuming academic mobility.

Today, experts believe that the greatest danger for Russian science, in staffing terms, is departure of promising researchers to commerce, and in part – changes in socio-political system and moral environments in this country: *"constituting a real danger is … deformity of the imposed … "vertical world, depriving young people of academic interest in the problems, killing their financial interest in existence in science as such"* (expert interview).

Experts referred the following shifts in the area of cross-border academic migration, compared to the situation in the first half of 2000s, described above, to the 2-3 most important ones: *"Migration (children of the educated upper middle class) starts earlier, immediately after school or undergraduate program, deliberately aiming at integration abroad (it is not wherefrom they leave, but whereto). Will they manage to become part of the foreign academic class is a separate question."* (expert interview 4).

" *… the main trends are still there but emerging are some new factors associated with orientation at higher international ratings of Russia and introduction of the respective stimuli for publication in international journals. That said, the expanding contacts in the field of social sciences and the utmost inhomogeneity of Russian postgraduate studentship demonstrate to young researchers that it is much better to graduate with PhD from western universities to be successful in competition in the international market. This does not always mean orientation at leaving this country but, on the whole, there are much more opportunities for integration with global academic networks, and the young people use them readily"* (expert interview 2).

As it seems in the social sciences major changes have occurred as follows:

1. *The number of researchers concurrently holding positions in Russia and abroad has reduced, for scientists leave for the West earlier, they have no positions in Russia, and they are in no way connected with Russian academic system*
2. *… the number of researchers considering emigration, from the very beginning, as the main objective has sharply increased – in any case those leaving at the phase of doctoral studies sooner strive precisely towards this. The number of opportunistic migrants is declining*" (expert interview 11).

"Russian academic emigration has grown younger markedly. While in the '90-s and earlier these were largely mature researchers, then now the process generally starts at the level of master's program and post-graduate course abroad. Naturally, chances to get employment in specialty abroad increase" (expert interview 7).

Thus, in summary, the main changes are associated with:

- Earlier mobility (before taking a degree)
- Declining number of "seasonal workers" working concurrently in Russia and abroad.

3. CONCLUSION

The main hypothesis was that compared to the early 1990s, when a critical in the decision to go abroad were financial considerations, the key factors behind such decisions made in the last decade by highly qualified scientists – thanks to the growing national funding of the major research programs and directions as well as adaptation to the current realities and use of various sources of additional income, come to be purely scientific reasons, primarily fear of impossibility of world level research activities. On the whole, this hypothesis proved true during the field studies, though the financial factor still plays a significant role as regards the decision on leaving for an internship or a job abroad with respect to junior academics.

The analysis indicates that in spite of the generally lower contribution of western foundations to funding science in Russia, they play a significant role in reproduction of national academic elite. That said, participation in their programs is a two-way road – while promoting, no doubt, emigration of a segment of Russian researchers (primarily young people) it, on the one hand, acts as a major prerequisite for professional advancement and involvement in international scientific community, a safeguard against a potential trend towards provincialism, which is quite realistic given the present day funding and physical infrastructure of Russian science. The relationship between the two facets of international mobility of Russian scientists is no constant: first, the mass "exodus" in 1990s is long gone and, as our survey revealed, the most common strategy pursued by a certain segment of Russian elite researchers in this respect sooner transformed into a kind of "seasonal work" – while working mostly in Russia, take regular opportunities for migrating to the West for short terms so as to conduct studies on a more sophisticated equipment, and improve one's financial circumstances, at that. The involvement with international informal and formal networks permits scientists to be more efficient in Russia – and in this sense, the assistance provided by western foundations to Russian researchers, in terms of international scientific cooperation thereof, helps retain the academic wealth at home, while the fear of loss of such opportunity becomes the strongest motive for brain drain. Hence, since Humboldt Foundation fellowship and other programs guarantee close academic contacts with foreign counterparts then in case they are *cleverly and effectively used by Russian scientists, and if meaningful measures are taken by the management of the institution from which the given researcher left for internship to Germany,* they enhance retention of highly qualified personnel in this country, i.e. reproduction of the academic elite of Russia.

As a result, the negative balance for the country between the losses incurred from brain drain and gains from higher professional skills of researchers coming back to Russia has somewhat changed.

Secondly, under the circumstances when "the shuttles" become a prerequisite for maintaining and developing human capital of the elite group of scientists, the state of national science gets increasingly dependent upon the level of inter-state relations bearing, for example, upon the toughness of visa requirements. To this extent, Russia is no less and possibly even more then the EU interested in shaping the common humanitarian space (solution of visa problem, in the first place): the more scientists are sure of the possibility to enter and come back without restriction the fewer reasons they will have for the desire to leave this country for good or for a long term.

Thirdly, one cannot but see the reverse of the medal: “academic seasonal work”, work on subcontract without foreign travel – and other forms of Russian scientist attachment to foreign sources of funding being a form of temporary resolution of the most acute problems, affect in the long term both the topics of research carried out by Russian scientists and their academic status – many turn in fact into highly qualified assistants of their foreign partners and employers.

Fourth, the relative financial autonomy, possibility to conduct studies at the expense of outside sources, which emerged thanks to foreign foundations, reduces dependence of elite researchers on hierarchical structures still intact in the national academic research and higher education system and, in their turn, promote shaping and strengthening temporary (project teams) and network forms of interaction. This is an important organizational and cultural innovation, which first emerged largely thanks to foreign science foundations.

Pendency of institutional, financial and organizational problems in the Russian science and the gradual adoption of the Bologna process in the practice of higher education arrangement facilitating student mobility, has led, according to experts’ opinions, to the fact that, currently the international mobility became younger – rather students (in particular in order to consolidate in academic community) than advanced researchers go to the West.

Finally, compared with the beginning of the 2000s, to all appearance, a number of researchers working simultaneously in Russia and abroad has decreased due to decisive choice of answer the question "To leave or stay" by most Russian elite scientists.

4. REFERENCES

Caglar O. and M. Schiff (2005), 'International Migration, Remittances, and Brain Drain'

Beine, M., Docquier, F. and H.Rapoport (2001), 'Brain drain and economic growth: theory and evidence', in: Journal of Development Economics, Vol. 64, 1, p. 275-289.

Cheng, L., & Yang, P. Q. (1998), "Global interaction, global inequality, and migration of the highly trained to the United States. International Migration Review, Vol. 32, p. 626-94.

Gaillard J., and A.M. Gaillard (1997), 'The International Mobility of Brains: Exodus or Circulation?', in: Science Technology & Society, Vol. 2, No. 2, p. 195-228

Kitova, G. Kuznetsova, T. Kuznetsov, B., (1995), 'The mobility of scientific personnel in Russia : scale,structure, results', in: Problemy prognozirovaniia, no 4.

Massey, D. S. and J. E. Taylor (2003); 'International Migration: Prospects and Policies in a Global Market', online edition

Mullan, F. (2005), "The Metrics of the Physician Brain Drain", in: New England Journal of Medicine, Vol. 353, p.1810-1818, online version

Malakha, I. A. , 2005-03-05, "Brain Drain in the Era of Globalization: The Case of the Post-Soviet Russia" Paper presented at the annual meeting of the International Studies Association, Hilton Hawaiian Village, Honolulu, Hawaii Online <.PDF>. 2009-05-26 from http://www.allacademic.com/meta/p71931_index.html

Meyer, Jean-Baptiste, Network Approach versus Brain Drain: Lessons from the Diaspora, in: International Migration, Vol. 39, 5, p. 91 - 110

Migratsiia spetsialistov Rossii : prichiny, posledstviia, ocenki. - M., INP RAS and RAND Corp.,

USA, p.10.

Nikipelova, E., Gokhberg, L. and I. Mindeli (1994), 'Emigratsiia uchenykh : problemy i real'nye otsenki'.

Tanguy A. de, and Wenden, C. de. 'Eastern Europe : What Benefits from the Brain Drain ?', in: The

OECD Observer, No. 184, Oct./Nov., p. 33-36.

Ushkalov, I. G. "Utechka umov'i sotsial'no-ekonomicheskie problemy rossiiskoi nauki" [The "Brain Drain" and the Socio-Economic Problems of Russian Science], Vestnik RGNF, 1996, No. 2, pp. 71-76.

Iurevich, A. V. and I. P. Tsapenko, Nuzhny li Rossii uchenye? [Does Russia Need Scientists?] (Moscow: Editorial URSS, 2001)

Urevich, A., Emilianov, E. and M. Iaroshevskii (1995), 'Materials of sociological survey of attitudes to foreign support of Russia Science', Moscow, Center for research of public attitude of researchers