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Social Sciences. Politology. Economics

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On the creation and development of specialized shipyard “Arctic – Shelf”



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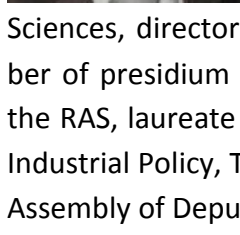
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Abstract. The article proposes the concept of a specialized shipyard business project, geographically dispersed within the boundaries of the Arkhangelsk agglomeration, which aims to develop production cooperation, existing competencies and technologies in the creation of the Arctic marine equipment and vessels

Keywords: *Arctic, shelf, vessels, sea platforms, topside facilities, modular units, expertise, special shipyard, technologies, shipbuilding*

Introduction

Russia has entered the time of hydrocarbons' development on the Arctic shelf. In a relatively short time it is essential to solve difficult engineer, organizational, managing and other challenges. A complex of such challenges is considered to be a strategic state problem for current century. In the nearest ten years a practical exploitation of the Arctic region's values sets a mission of creation and development of industrial infrastructure, which could be able to provide full functioning of the Northern sea route and ecologically safe conduct of operations on prospecting and exploitation of mineral resources in coastal areas and offshore zones including those at great depth and even under ice. These challenges face not only Russia, but also other countries of circumpolar basin.

Reclamation of the Russian Arctic shelf

Nowadays the main Russian companies who work on the Russian continental shelf are considered to be OJSC «Gazprom», JSC «Rosneft'» and private company JSC «Lukoil». The company «Lukoil», which at the proper time created a sleet-proof oil terminal «Varandei» in the Pechora sea, nowadays works mostly on shelves of the Baltic and Caspian seas, and it would like to back to large-scale projects in the Arctic. Oil production license is now achieved by «Rosneft'» and «Gazprom». Also foreign states show interest and actively prepare themselves for Arctic values' exploitation, but only those states, who are parties of the Arctic Council.

According to the national approach, a question was escalated about coordination of work for all the interested companies, regions' administration, scientific establishments, industrial and other enterprises and organizations of the country; the main issue concerned practical exploitation of the Arctic shelf, including ways of state-private partnership.

Current circumstances speaking about exploitation of the shelf is alike a situation which took place in the USSR at the end of the 60s — beginning of the 70s when working on direction «oil-and-gas exploration in the sea». A picked up direction was supervised by three relevant ministries: Mingeology, Minnefteprom and Mingasprom. By 1975-78 retardation of the USSR from other countries in this field became evident. In 1978 a «Glavmorneftegas» (Head office on exploita-

tion and development of sea oil and gas resources) was founded within Mingasprom. By the middle of 80s in «Glavmorneftegas» there were more than 30 enterprises, which had more than 500 floating equipments. A program of platform and other technical equipment creation for shelf was dedicated to realize to shipbuilders of Viborg and Astrakhan, and project works — to CDB «Korall» (Sevastopol). Herewith procurements of ships and marine techniques were made in Poland, Yugoslavia and Finland. Results were not low to arrive. During the period 1978-1989 deposits in the Barents, Pechora, Baltic seas and on the shelf of the Sakhalin Island were discovered.

Demand in marine facilities and ships for shelf exploitation

Nowadays there are different estimates of demands in ships and marine facilities when exploitation of the Russian shelf on both from the part of different expert societies and energetic companies by way of adopted proper investment programs. This is one side of the coin, the other side is considered to be those territories, grounds and production capacities, where orders for creation of the arctic marine facilities must be placed, as well as marine ships for exploitation of the shelf.

Main problems of the Russian shipbuilding are known well: lack of shipyards' specialization, necessity of new technologies' implementation, unstable during period of time (from the beginning of development to the end of works) funding, for example during creation of MLSP «Prirazlomnaya» and SPBU «Arkticheskaya», insufficient inter-branch and interplant cooperation, faint localization of allied productions in Russia, etc.

In October 2013 an audit and consulting company «Ernst & Young» (U.K.) estimated a possible level of exploitation in the Russian Arctic in 50-60 mln tones of oil equivalent (o.e.) annually up to the year 2030¹. Of special note is the fact that implementation of this estimation is possible only by completion of exploitation and infrastructure works during near 10-15 years. In such a way, according to experts' opinion for solving of such a great challenge it is important to create a groundbreaking park of marine facilities and ships: for about 250 ships for shelf exploitation, including 34 platforms, 27 scientific ships, 35 tankers, 23 gas carriers, 20 ice-breakers, 90 service ships and 25 ships for mechanical and underwater works.

JSC «Rosneft'» estimates a demand in marine ships and facilities when exploitation of its license places in the Kara sea for 30 perspective structures in 106 items of production platforms

¹ Эксперты: для достижения нефтедобычи в Арктике 50-60 млн тонн к 2030 году надо создать инфраструктуру за 10 лет. Арктика-Инфо, 11 октября 2013. URL: www.arctic-info.ru/News/Page/eksperti--dla-dostijenia-neftedobici-v-arktike-v-50-60-mln-tonn-k-2030-gody-nado-sozdat_-infrastryktyry-za-10-let (дата обращения: 24.10.2014).

and in 500 items of various intended purposes ships, platforms and other facilities². On the 30th of August 2013 in Vladivostok during the led by Russian president meeting on perspectives of Russian commercial shipbuilding, it was mentioned that backlogs of orders in shipbuilding program of such companies as «Gazprom», «Rosneft'» and «Sovkomflot» up to the year 2030 assemble 512 ships, which will be required for exploitation of the shelf and year round run of the Northern sea route. When speaking about all the segments of commercial shipbuilding for the same period of time (up to the year 2030), demand of companies will compose 2200 items of marine facilities. On the meeting which took place on the 13th of November 2014 on issues of shipbuilding complex creation at the premises of JSC «Far-East factory «Zvezda», V.V.Putin pointed out that it is «necessary to use the practice and groundworks of Russian shipbuilders in production of drilling platforms, geological prospecting ships and supply agents, ice-class vessels. These competitive positions must be materialized into real and economically effective projects»³.

Production unloading of shipyards, diversification and construction of platforms for Arctic

Power supply of JSC «USC» is mostly specialized in enforcement of Defense Procurement and Acquisition (DPA) and are fully busy. But speaking about enterprises of ship-industrial complex in Severodvinsk, from the middle of 90s of the past ages and to the current times, these enterprises, except DPA, at the same period executed orders in both building of marine techniques, commercial shipbuilding and military and technical cooperation (MTC) with other countries. Let's suppose, that such summary of process utilizations was practically 100%. Than it becomes evident that implementation of just SDO for the short-term and especially after 2020 will not provide acceptable on socio-economic grounds loading of shipyards. It is well-known that shipbuilding has long-term and flexuous (spasmodic) production cycles: it is subject to both usage of shipbuilding platforms and production charge of providing workshops.

For shipyards in Severodvinsk orientation on production of just arms production poses risks which could again lead to failure which already took place in Severodvinsk territorial-production complex in 90s of the 20th century. Famous shipbuilders D.G.Pashayev and G.L.Prosyankin who led Severodvinsk productions in the recent past, told that for sustainable development and non-admission of great social problems appearance, «Plants had to have both two and better

² Shorthand report of the meeting on perspectives of Russian commercial shipbuilding development. 30th of August 2014, Vladivostok. URL: <http://www.kremlin.ru/transcripts/191077> (accessed 28.10.2014.)

³ Meeting on creation of shipbuilding complex in the Far East. 13th of November 2014, Vladivostok. URL: <http://www.kremlin.ru/transcripts/47006> (accessed 19.11.2014).

three feet on the floor». It means that in addition to SDO, a program of non-military production release for energetic branch as well as MTC production must be formed [1].

It is enough to put in remembrance that during building of OIFP «Prirazlomnaya» and SEFDR «Arkticheskaya» in 2009-11 there was noticed a peak recruitment of labor forces — it composed more than 10 thousand workers and specialists of SevMash, «Zvezdochka» and SVE «Arktika», exclusive of partners. It is known that according to technical complexity, measure of labor intensity, production lead time, research intensity and also to variety of specialists and workers, who are engaged in creation of new marine arctic techniques, these objects don't relinquish to the most difficult ships of Navy - nuclear submarines and aircraft carriers.

Against the background of JSC «OSK» development concept, modern realities set a mission of a state level before our country: to find an optimal way of development of state shipbuilding's different segments and other branches to start exploitation of the shelf in existing conditions, thus to «strike a happy medium, not to lose but to enrich». Such buildup reflects necessity of searching of new opportunities and ways of development on the assumption of current situation understanding and practice of Severodvinsk shipyards productions' diversification, received from 90s of the XXth century up to modern times.

The nearest to Arctic fully and productively working shipyards are considered to be plants in Severodvinsk: JSC «PA «Sevmash», JSC «Center of ship repairing «Zvezdochka» and JSC «SVE «Arktika». Because of strategic initiative of RAS academician E.P.Velikhov and Hero of Russia D.G.Pashayev historically by the end of 80s — beginning of 90s of the 20th century these greatest plants in Severodvinsk worked at ground zero of offshore industry in the European North of Russia. Nowadays they are considered to be leaders in this branch of national industry.

Completed construction of platforms «Prirazlomnaya» and «Arkticheskaya» - are real practical results in creation of national marine techniques for Arctic shelf. Realization of these projects was connected with great difficulties and when bringing them over, the above mentioned productions achieved unique competence of non-military shipbuilding and marine techniques manufacturing cycles, such as: management of difficult engineer projects; active participation in development of constructions and technologies of these objects' creation; equipment and materials procurement, including foreign producers; production; specialists' education and training; practice of unique marine operations actualization, including technologies of under-water weldout.

In 2005—09 JSC «PA «Sevmash» built two all-purpose supporting bases with free double-hulled flat for semisubmersible mounting of the 5th generation «Moss CS-50». The weight of the base composes 15 thousand tones with sizes 118×70×40 meters and its flat is ready to support

constructions of topside facilities with weight up to 20 thousand tones. Depending on procurement, «Moss CS-50» could be used at the depth of 80-2500 meters. A Norwegian company Moss Maritime AS appeared to be customers [1].

When building new technologies in designing and construction of non-military objects were captured. A system CAD installation «Foran» was implemented for operational 3D simulation and submission issue. Full 3D model of a work-in-progress construction project let to shorten Vendor documents launch time and to create piping systems without labour-intensive process of pipework routing on-site. A technology of assembly of foundations in bulk right afloat with usage of jointly coastal cranes and marine crane load-carrying ability 300 tones. If when for construction of the first foundation there were bought in extensive transition elements of connections between pontoons and columns, then for the second foundation they were created on JSC «PA «Sevmash», what could pull in fair financial resources.

A successful construction of all-purpose supporting bases for semisubmersible marine platforms upon the foreign class project, standards and demands of Norwegian Maritime Registrar DNV showed a high adaptiveness of existing production and engineer-technical staff for further production of marine techniques. Gained experience of construction for foreign customer will be useful for future construction of marine techniques for exploitation of the Russian Arctic shelf.

By 2009—11 the result of Severodvinsk production-industrial complex's work in creation of marine techniques became development and exploitation of production technologies of three platform types: 1) stationary gravity (OIFP — offshore ice-resistant fixed platform) for drilling, mining, storage and export of oil; 2) self-elevating floating drilling rig (SEFDR) for purposes of development and exploitation drilling; 3) broad-based semisubmersible mounting (SSM of the fifth generation) for deep depth with opportunity to arrange different ways of superstructures, defined by prescriptions and conditions of exploitation.

Modern exploitation of the Russian shelf

From the 12th of June 1990 (since adoption of Declaration of State Sovereignty of the Russian Federation) to August 2014 on shelves of various Russian seas there appeared seven stationary and one complex platforms for oil-and-gas production, one deposit is exploited with the application of offshore subsea solutions.

In contemporary history of Russia the first stationary platform was fixed in September 1998 on the shelf in Sakhalin Island, the sea of Okhotsk — this platform «Molikpak» is a project «Sakhalin-2». On the 27th of June 2014 a platform «Berkut» was formed on the deposit Arkutun-Dagi in the sea of Okhotsk within the project Sakhalin-1: the upper structure of platform, created in the

South Korea, was pointed and strengthened on the gravity-based structure, fixed in 2012 on the deposit.

Since 2012 till today in Astrakhan continues production and construction of the complex, which consists of nine platforms for deposits named after Filanovsky in the Northern sector of Caspian sea (ice stationary platforms, living quarter platforms, central processing platforms, riser block, wellhead platforms, etc.).

When analyzing completed projects of platforms' construction, we can emphasize three basic approaches to their creation (see table):

1. In-depth modernization of platforms, which were already exploited.
2. Creation of high-technology superstructures beyond Russia, and less constructable supporting bases — in the Russian Federation.
3. Creation of platforms in cooperation of shipyards on the territory of the RF with the involvement of both Russian and foreign subcontractors.

The first and the second approaches were used for construction of objects for island Sakhalin's shelf (projects «Sakhalin-1, 2»). The third approach was and is used when realization of platforms' construction for deposits in the Northern Caspian, Baltic and the Barents sea.

Table 1

№	Name	Place of installation	Deposit	Project / operator	Year of installation on the deposit	Participants of construction, contractors
1	Upgraded platforms					
1.1	«Molikpak» (PA-A)	the sea of Okhotsk	Piltun-Astohskoye	«Sakhalin-2» / Sakhalin energy	1998	ASP (OO for drilling rig)
1.2	«Orlan»		Chaivo	«Sakhalin-1» / «Eckson neftegaz Ltd.»	2005	ASP (EPCI contract for modernization of a platform), HHI since June 2004 — completion
2	Platforms of full-cycle construction					
2.1	«Berkut»	the sea of Okhotsk	Arkutun-Dagi	«Sakhalin-1» / «Eckson Neftegaz Ltd.»	2012 – OIT 2014 – BC	USP — DSME, GBS — PMC «Vostochny»
2.2	«Piltun-Ashotskoye—B» (PA-B)		Piltun-Astohskoye	«Sakhalin-2» / «Sakhalin energy»	2007	USP — SHI, South Korea; GBS — PMC «Vostochny»

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2.3	«Lunskaya-A» (Lun-A)		Lunskoye		2006	USP — SHI, South Korea; GBS — PMC «Vostochny»
2.4	OIRFP D-6	Baltic sea	Kravzovskoye	«Lukoil»	2004	USP and GBS — «KLIEVER»
2.5	Complex of platforms (IRFP-1, IRFP-2, transit bridge)	Caspian sea	named after Korchagin	«Lukoil»	2009	IRFP-1, IRFP-2 of Astrakhan SPO
2.6	Complex of platforms (IRFP-1,2, LQP-1,2, CTP, RB, WhP 1,2,3 transit bridges)		named after Filanovsky		beginning 2012	General contractor — GSE
2.7	OIRFP «Prirazlomnaya»	Pechora sea	Prirazlomnoye	«Gazprom нефть shelf» («Gazprom нефть»)	2011	JSC «PA «SevMash» LQ, UM — JSC «Viborg SSZ»

Comments:

OIRFP — offshore ice-resistant fixed platform

LQ — living quarters

IRFP — ice-resistant fixed platform

UM — utility module

LQP — living quarter platform

HHI — Hyundai Heavy Industries (South Korea)

CPP — central processing platform

DSME — Daewoo Shipbuilding & Marine Engineering (South Korea)

RB — raiser block

SHI — Samsung Heavy Industries (South Korea)

WhP — wellhead platform

«Kliever» — JSC «Kliever», Kaliningrad (till Sept. 2012-plant on construction of metal structures LUKOIL-Kaliningradmorneft')

USP — upper structure of platform

ASY — Amur shipbuilding yard

GBS — gravity-base structure (bullet-proof)

ЗPMC «Vostochny» — Plant of marine constructions «Vostochny», Nahodka

FP — foot of pile (metal)

Astrakhan SPO - production plant of group of companies «Caspian energy»

SB - supporting base

GSE — JSC «Globalstroy-Engineering»

Each deposit on the shelf possesses its unique characteristics and parameters, which define eventually the choice of technological scheme of deposit's development, according to economic, technical and technological practicability. Arrangement and exploitation of Russian shelves' deposits with the help of fixed platforms is applicable for mainly depth up to 100—150 meters. For achieving and gaining of shelf exploitation experience «Gazprom» in the year 2013 brought into opera-

tion Kirinsk deposit of the project «Sakhalin-3», in which subsea production complexes for the marine part of the project is used. This was the first practical step for new technologies of submarine oil-and-gas production to appear in Russia. But we should notice that nowadays Russia doesn't possess all the competences, «Know-how» and technologies to localize construction and production of such systems in our country; dependence on foreign technologies and equipment is still preserved.

The first fixed platform, fixed on the 28th of August 2011 on the shelf in the Arctic region, was OIRFP «Prirazlomnaya». Construction of the platform and production of its components was created by mostly with Russian participation, which didn't exclude attraction of foreign parties there, where it was needful.

For further exploitation of the Arctic shelf development of underwater mining technologies for deep depths (up to 100—150 meters) is needed. Nowadays such technologies are not created for conditions in the Arctic, and, consequently, they are not proved in practice. Creation of underwater technologies of the Arctic shelf exploitation are at the stage of R&D and initial project preparations [2]. A great work on creation and finishing up of underwater mining technologies is expected in this direction for practical realization including in Russia.

Plans of «Rosneft» and sanctions aspects

Coming of I.I. Sechin in OJSC «Rosneft» otherwise in May 2012 opened a new page in the history of the company and gave an extra pulse in native Arctic projects. The company really projects to place a supporting shore base for providing western Arctic shelf projects in urban-type settlement Roslyakovo (Murmansk region) over an area of JSC «82nd shipyard» (82 SY). For putting this plan into practice 82 SY is planned to relocate in JSC «35th shipyard» (35 SY) situated in the region Rost in Murmansk. At that, on the territory of SY 35 there will be repair of naval forces ships in dock-ship PD-50 with a lifting capacity of 80 00 tones prior to initial operation of modern dry dock. Concerning Murmansk «Rosneft» also plans to locate plants on production of underwater fittings, concrete blocks, helicopter airdrome, logistic base for warehousing and transshipment of cargoes, and also to create the center of Arctic competence as part of Murmansk State technical university for staff training.

Decision of interdepartmental challenges containing detachment of secure territories based on example of 82 SY is possible at the state level. For solving state challenges it is real to cover and solve urgent problems of bureaucratic interests of Ministry for Industry and Trade, Ministry of Defense, JSC «United Shipbuilding Corporation», JSC «Rosneft» and other parties concerned.

Realization of construction of large-capacity shipyard complex «Zvezda» on the Far East shows how difficult and thorny the way is. Nowadays approximate actual deadline of the project is 2009—16 (instead of initial period of accomplishment — 2021). Later consortium Closely-Held Stock Company «Sovremenniyе Technologii Sudostroyeniya» (Modern technologies of shipbuilding) is planning to construct on the Far East not only non-military orders, but also provide SDO works under output obtained into ownership from JSC «Dalnevostochny center sudostroyeniya i remonta» (Far-East center of shipbuilding and repairing) which earlier entered JSC «United Shipbuilding Corporation». In such a way, for consortium «STS» appeared difficult questions of managing incidental shipbuilding costs with high potential of diversification. Nevertheless, future works on reorientation of 82 SY means the necessity to solve the same challenges, which were solved during reconstruction of the Far East «Zvezda» — but now taking into account climate conditions of North of the Arctic circle, actual physical position of chief funds, new major construction work, managing challenges, political, economic risks of global international relations' crisis.

We consider the program of ships' and marine techniques' construction for exploitation of the Arctic shelf to be more reasonable to *possess in number of platforms in Russia*, including European north of the country. It is determined with historic practice of development of number deposits in the western Arctic in 80s of the 20th century. Introducing of sectoral economic sanctions against Russia, imposed by the policy of foreign countries, makes actual such a logic. It is mostly probable that sanctions transform from short-term into long-term. This risk determine for Russia necessity of reorientation, reconstruction, development and creation of specialized mights for goals of shelf exploitation. A production cooperation and strong collaborative partnership of such platforms when reasonable coordination of production processes would help as a whole solve challenges of double quick exploitation of the Arctic shelf and development of native technologies for Arctic conditions.

An apportioned shipyard and its localization

There has formed such a situation on enterprises of Severodvinsk production-industrial complex, that there are no equivalent orders such as «Prirazlomnaya» and «Arkticheskaya» in the coming years. It leads to loss of qualified and experienced personnel, which was involved when construction of platforms. Specialists, who have got through the school of both projects' realization, are considered to be carriers of unique gained knowledge, information and competence (know-hows). Gained competence are becoming less demanded and could to a large extend be lost.

In the current situation, taking into account state interests, it is necessary to preserve and develop the available intellectual, production and technological potentials of the Severodvinsk enterprises in the branch of construction of marine oil-and-gas assets. Backgrounds for such an activity and creation of Specialized Apportioned Shipyard on the European north of the RF in Arkhangelsk agglomeration are following:

- a) an increased global competition for Arctic resources;
- b) the longest Arctic maritime boundary of the RF;
- c) geographic proximity to the Arctic region;
- d) true output to the basin of the Arctic ocean;
- e) historical maritime traditions;
- f) Russian arctic vector being declared as top-priority;
- g) Northern Sea Route, which needs qualified technical supply, development and fitted out with marine technique and ice-proof offshore structures;
- h) United Shipbuilding Corporation flexible strategy (multi-variety of development in a number of basic scenarios);
- i) necessity and real opportunities of science-research and educational fulfillment of the Northern Arctic federal university named after M.V.Lomonosov (NArFU);
- j) achieved competence while realization of non-military shipbuilding and marine techniques projects.

It is supposed to solve this challenge by means of creation of a Specialized Shipyard (SS) of apportioned type «Arctic-shelf» (operating name). Arkhangelsk SS will be oriented on production and output of difficult and unique marine techniques, modules, upper structures of platforms, marine constructions of various profiles and ships for exploitation of the Arctic shelf and Northern sea route. The shipyard could be consisted of number of different platforms, which would be united by the same production-technological process. SS «Arctic-shelf» would let to use high potential of Arkhangelsk and Severodvinsk enterprises by means of production cooperation and development of related branches in regions of oil existence.

There is a practice of apportioned shipyard in Russia since Soviet times. Such production platform and even nowadays is considered to be «Astrakhan Shipbuilding Production Association» (ASPA) — subdivision of production division of asset management company «Group Caspian Energy». ASPA itself consists of three platforms: ASPA Leading Yard and ASPA Platform №3, which are situated in Astrakhan, and the plant ASPA «Lotos», situated in Narimanov town, 45 km from Astrakhan.

A production line of ASPA includes opportunities of mobile drilling rig systems' construction (SEFDR, semisubmersible drilling rigs, drilling barges), winning technological platforms, construction ships (crane boats, pipe layers, barges), special ships (supply, anchor handling tugs, fire-

protections, harbor fleet), transport ships (bulk, dry-cargo, passenger) and steel constructions of marine infrastructure.



Picture 1. Hutton TLP Platform (the North Sea)

The practice of foreign shipyards which created marine platforms for exploitation and production of oil and gas exists. For example, the first platform in the world of TLP type (Tension Legs Platform) was constructed for Hutton deposit in the North Sea on two worksites in Scotland at the beginning of 1980s. Construction of integrated superstructures was put through on shipyard «McDermott Scotland Ltd.» in Ardersir City and supporting base was created dry dock of «Highland Fabricators» shipyard in city Nigg Bay. Platform was accumulated in summer 1984 in Mory Fert bay in the North sea narrowly spaced from shipyards — connection point was 25—30 km. During construction of this platform an approach was implemented, which was put in definition of apportioned shipyard.

New native shipyard (Arkhangelsk CS) could fulfill a function of the united centre of the off-shore industry competence with localization of its basic platforms in Northern Dvina River estuary — in Arkhangelsk, Severodvinsk and their neighborhood. A possibility of territorial localization of production platforms in North-Western region is not excluded. A variant of production cooperation, distribution of platforms in Murmansk and other geographical points is also possible. It is suggested to organize an operational activity of such a shipyard through the managing centre

(company) which will provide integration of all the production processes throughout the life cycle of marine Arctic technique.

At any way, all the existing shipyards of Severodvinsk will remain centers of military direction competence in future. And while management centers of both competences a direction and specialization of shipyards will be taken into account: military or non-military, what doesn't exclude their strong production cooperation. Such an approach will let to combine both military and non-military components in working processes of shipyards and to minimize the conflict of interests.

Speaking about potential of CS localization in the region Arkhangelsk-Severodvinsk, we could overview following ways of its distribution: 1) on the right, firstly, and probably on the left shore of the Northern Dvina river; 2) on the right side of M-8 route in Arkhangelsk-Severodvinsk segment; 3) platforms of closed/stand-by plants in Arkhangelsk-Severodvinsk agglomeration; 4) other alternative platforms within the so-called «Big Arkhangelsk». Platforms for SC must take into account access to water areas; it is more preferable to place them geared to the left (Nikol'sky) distributary of the Northern Dvina River (along the prolonged federal M-8 route).

Nowadays within the Arkhangelsk city carries out production and business activities LLC «MRTS Terminal». Territory of the enterprise is situated right in front of sea-and-river station in Arkhangelsk and currently it is in stage of remedial works, arrangement and major construction work. Earlier, during 2009-2011 JSC «Mezhregiontruboprovodstroy» (JSC «MRTS»)⁴ carried on searching of ground in the northern regions of Russia for construction of its production-logistic resting base for participation in the Arctic projects. As a result, the appropriate platform was found in Arkhangelsk region and since 2012 LLC «MRTS» is presented in Arkhangelsk. By the end of 2013 its "sister" subsidiary LLC «MRTS Terminal» was founded. Today LLC «MRTS» is involved in projects on Yamal peninsula exploration — it takes part in construction of new port installation in Obsk-Tazovsk bay (port Sabetta) as part of project realization «Yamal SPG». Development of production-logistic base in Arkhangelsk and its final molding is provided by the strategy of associated company development by the year 2020.

⁴ JSC «MRTS» was created in 1999 as association of specialized building organizations with long experience in construction of major pipelines in the regions of high north. Nowadays JSC «MRTS» is a company, which provides construction of underwater-technical objects of major pipelines of oil-and-gas complex «key ready» and it has its own flotilia. Among the customers of JSC «MRTS» - «Gazprom», «Transneft'», «LUKOIL», Exxon Neftegas Ltd, «Rosneft», «Norilsky nikel» and many others. Geography of projects is wide: Volga, Angara, Enisey, Pour, Yamal peninsula, the Barents sea, etc. including Kaliningrad and the Far East. Web-site of the company: URL: <http://www.mrts.ru/>.

Appearance of new platform CS «Arctic-shelf» within the Arkhangelsk—Severodvinsk agglomeration would let to fulfill the potential of cooperation in shipbuilding industry of the region in a new way and create a serious capacity for placement of big orders, connected with exploitation of the Russian Arctic resources. In an appropriate well-balanced approach connected with material matter and technical decommission of main funds, such a base platform for CS «Arctic-shelf» could become dockyard «Krasnaya Kuznica» — branch of JSC «CS «Zvezdochka» in Arkhangelsk, which are situated on the islands Solombala and Moseev, where in 1693 native military shipbuilding started.

Allied challenges, solved during construction of apportioned shipyard

When providing the future team work of all the production complexes and shipyards of the region and solving of questions of import substitution a challenge appears, which is connected with possible localization in Arkhangelsk—Severodvinsk agglomeration of allied productions, necessary for sustainable functioning of marine subjects in the Arctic zone of the RF. For example, these allied enterprises could be oriented on creation of some component parts and equipment, including for shelf projects, for technical provision of Northern sea route service bases and for working oil-and-gas complexes (marine techniques, equipment for underwater mining, duplicate parts and service kits for ships, etc.). Justification of such statement of work is following: in non-military shipbuilding population of ship equipment is 60%, while for stationary platform — about 70%. Construction of CS «Arctic-shelf» would let to form a specialized niche in innovation territorial shipbuilding cluster of the Arkhangelsk region through the efficient cooperation and development of allied enterprises. It is well-known that multiplicative effect of investments in shelf projects from allied branches arranges about 1 to 7. As a result for our region we could achieve the extra pulse to development of regional economy and its future clustering.

When using a complex approach, CS «Arctic-shelf» could also become the instrument for decision of a number of accompanied practical challenges, which we are formulated at the state level of the Arctic region exploitation. Firstly, they are:

- I. Service and post-guarantee maintenance of actual Arctic platforms.
- II. Construction of a number of logistic bases in delta of the Northern Dvina River (reference point — development of the port «Ekonomiya» in Arkhangelsk on services of shelf projects, NSR subjects and expansion of new service bases - mother-ships, docks and storage areas through the NSR.
- III. Training of specialists of beginners, medium and higher professional levels in NArFU named after M.V.Lomonosov and other educational establishments.
- IV. Exploitation of Arctic and NSR through joint specialized domestic enterprises in cooperation with foreign companies.

Suggestions on creation of Arkhangelsk apportioned shipyard

Engaging in the project of Arkhangelsk CS construction of eventual buyers (investors) could let to divide existing and potential risks. When developing the investment potential of the region, it is needful to organize a long-term prospective work. Engaged investors must be considered not only as partners for both joint participation and co-managers of future Arctic projects, but also as participants of the working process, involved in management of key risks during realization of projects, including observing discipline on project life and budget, as well as quality of works [3]. When realizing such an approach it is possible to engage such investors as OAO «Gazprom» / OAO «Gazpromneft», JSC «Rosneft», JSC «Lukoil», in the long term — JSC «Noril'skiy nikel», JSC «NOVATEK», JSC «Zarubezhneft», JSC «Sovkomflot» and other Arctic stakeholders.

Accelerated reclamation of the Russian Arctic shelf is possible. This challenge is solved with the help of existing might and capacities with synchronous technological development of domestic industry and construction of new industrial locations. Quickness of construction and erection of objects on the shelf directly depend on greatest possible unification of constructions. Unification of space structures is necessary for upper structures of platforms (integrated decks, superblocs, block-modules, etc.), as well as for shallow waters substructures (depth up to 20 meters), platforms for depth up to 50—100 meters and more, and also for ships and other marine technique including technique for underwater mining. For example, for creation of new generation of substructures for Arctic, usage of technological capacity and development from the branch of underwater shipbuilding is possible.

Construction of superstructures performed by block-modules and integrated decks for marine platforms is absolutely real to carry out in Ship-Repair yard «Krasnaya Kuznica» - Arkhangelsk branch of JSC «CS «Zvezdochka». By that way, in practice, perfection of technological potential of the production with some limited financial expenses will be required. Series-produced creation of integrated multifunctional structures and constructions of various profiles for Arctic is also possible in JSC «CS «Zvezdochka». Automated flow line of installation and welding of plain sections (designer, constructor and supplier is JSC «Centre of Shipbuilding and Ship repairing Technologies» Saint-Petersburg)⁵, which is estimated for arrangement in AB Ship-repair yard «Krasnaya Kuznica», could let to cut labor intensity, time and cost of production of superstructure steel constructions and solid modular constructions of various profiles (manufactures). High accuracy of section di-

⁵ Joint stock company «Centre of Shipbuilding and Ship repairing Technologies» is a leading technological centre of shipbuilding in Russia, Saint-Petersburg. Organization has a status of State scientific centre of the Russian Federation, provides fundamental and research studies in the area of construction of modern technologies for shipbuilding and engineering, including based on usage of powerful energy sources and new physical phenomena, actively takes part in development and realization of large scale investment projects. Web-site of the company <http://sstc.spb.ru>

mensions created in flow lines could let to cut number of works on adjustments and corrections of constructions when final formation of products «in bulk». Production spaces and capacity of a plant afford to organize future filling of manufactures with technical equipment and construction of the object «key ready». Position of a plant in the central part of Arkhangelsk and hydrologic characteristics of the Northern Dvina River in the area of the plant give an opportunity to ship off all the finished items directly to carriers and special barges.

We suppose, that development of potentials for taking-part in Arctic projects is efficiently to organize in cooperation with Severodvinsk productions. The way of diversification of shipyards' productions, which was defined in 80s of the 20th century, appeared to be right and successful. According to practice, presence of commercial jobs on shipyards favorably influences socio-economic situation in the region and considers to be the driver of not only Arkhangelsk region development, but also of the regions, which are included in North-western federal area (for example, Murmansk and Vologda regions, Saint-Petersburg). Construction of CS «Arctic-shelf» could give a qualified impulse of oil-and-gas production development in the region for decades. International practice shows that such a positive experience already exists. As an example we could give practice of Stavanger development — oil-and-gas capital of Norway, Aberdin (Scotland) and Houston (the USA).

A forecast becomes evident, that in recent years in Russia there will be an explosive growth and development of industry of Arctic shelf orientation [3]. Arkhangelsk region could and must make efforts for preservation and accrument of its leader positions, conquered since 90s of the XXth century. Otherwise, recovery of give grounds will worth great pain, resources and will expand for years.

Based on analysis of the situation and solving the denoted challenges, Arkhangelsk region has the possibility to form industrial oil-and-gas complex CS «Arctic-shelf», which will be considered to be an active element of Shipbuilding innovation territorial cluster of the Arkhangelsk region [5]. Such a complex could actively work in with science-research and project-technological



Fig. 2. Platform «Prirazlomnaya»

organizations of Saint-Petersburg, where scientific and experimental basis of shipbuilding branch is concentrated, and also of other productions of oil-and-gas industry,

including foreign participants as it was during constructions of platforms

«Prirazlomnaya» (Pic.2) and «Arkticheskaya» (Pic.3). Taking into account vast extension of Russian sea borders, we suppose that sustainable development of the shelf in the long-term is possible involving a number of centers of the offshore competences.

Acquisition of such competences on bulk shipbuilding and construction of marine objects for North-Eastern Arctic shelf by productions, located in the regions of Vladivostok, will be implemented in recent years under common guidance of asset management company UAB «Sovremenniye Technology Sudostroyeniya» («Modern Technologies of Shipbuilding») on Far East.



To our mind, marine sleet-proof oil-and-gas structures, including technique for subsea/subice works in extreme ice conditions and also ships and other objects of marine techniques for the Western sector of Arctic is more reasonable to construct right in the area of Arkhangelsk - in close-bodied cooperation with Severodvinsk enterprises. Right here for the first time in native shipbuilding practice appeared the idea and was collected a unique practice of marine objects' construction with usage of module-aggregate method of constructions, mechanisms, equipment, complicated structures and complexes. Here as economically as possible could be successfully implemented innovation solutions, concerned creation of unified module constructions of substructures and superstructures of ice-resistant platforms, which could help to reduce its construction price if we would use a proven practice project-technological solutions of submarine shipbuilding.

Conclusion

We suppose that the stated concept of specialized apportioned shipyard project's business idea is necessary to capture in strategic documents of different levels' development: of the RF Arctic zone, USC, socio-economic development of the Arkhangelsk region, Federal special purpose program, General Outlay and others. On the regional level for purposes of future business planning we suggest this concept to include in plan of actions in realization of regional legislation on industrial policy and in plan of innovation territorial shipbuilding cluster development [5].

In such a way, construction of industrial complex CS «Arctic-shelf» in Arkhangelsk region, which is oriented on production and output of unique marine techniques, structures and ships for exploitation of the shelf and for technical equipment of marine and offshore control stations of the Northern sea route, is considered to be current, advanced and economically feasible taking

into account already gathered experience by enterprises, which are included in the structure of Arkhangelsk innovation shipbuilding cluster.

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Specifics of design and construction of low-rise buildings in the Arctic



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Abstract. As a result of low storey buildings reconnaissance in the European part of the Arctic zone of Russia for a period of about 30 years, a number of peculiarities of their designing, construction and exploitation in conditions of frigid climate have been found out. The imperfection of currently in effect federal building law is marked. An average cost of square meter of living space in federation territorial entities by the end of 2014 has been analyzed. Suggestions for federal and regional legislation improvement have been developed

Keywords: *Arctic, infrastructure, buildings, low storey, projection, construction, laws*

Introduction

Land territory of the Russian Federation Arctic zone (RFAZ) consists of Murmansk region, Nenets Autonomous Area (NAE), city of Arkhangelsk, Novodvinsk, Severodvinsk as well as Primorsky, Mezen, Onega areas, Novaya Zemlya Island in Arkhangelsk region and other insular territories of the Russian European North¹. Construction of rapidly erected comfortable low storey buildings increases quality of people's lives in frigid climate and their more equal and rational settlement through the underdeveloped territory of RFAZ with extreme climate conditions. Such a way of settlement together with wide usage of modern technical equipment systems of automated monitoring could provide effective Russian land and water zone development in Arctic. One of the principles of state management in Russian Arctic becomes creation of procedural and institutional mechanism, which coordinates «appropriation of budget investments for building and modernization of housing resources and communal infrastructure with mandatory application of block-module and energy-conservative technologies as well as independent life-support systems» [1, p. 346]. It is evident, that nowadays for modernization of Arctic infrastructure there must be involved innovation approaches including modern technologies, national safety, preservation of environment and sources of funding [2, pp. 176-177]. By that means, as scientists notice, infrastructure challenges are characterized by limited numbers of objects which promote development

¹ Edict of President of the Russian Federation 02.05.2014 № 296 «Russian Federation Arctic zone land territories». URL: <http://www.garant.ru/products/ipo/prime/doc/70547984/> (accessed 16.11.2014).

of innovation activities in most of Northern regions [3, p. 78], and its reacting is refrained by underdevelopment of infrastructure of economic entities' confidence, which embarrass the launch of innovation projects also in Arkhangelsk region [4, pp. 177—181].

Practice of designing and construction of timber buildings in Arctic

Norway has a great practice of use of comfortable energy-efficient timber buildings with self-efficient engineering systems of life-support in Arctic. During the period 1999—2011 in Arkhangelsk a great Russian-Norway scientific-educational project «Energy-efficient timber house for North-western part of Russia» was successfully carried out including ground works, which was finished with construction of experiment double-storey house in Arkhangelsk State technical university (now — NArFU). Its technical equipment and design solution allow conducting complex tests of new protective and decorative coverings. The house consists of five modules: four main and portal, as well as set of roof. Modules had fine finish, mounted engineering systems of life-support and in-built furniture including kitchen equipment. They were brought from Norway by means of marine transport and in a few hours they were assembled in ready foundation, connected with elements of exterior autonomous system of life-support engineering nets. A number of sections were organized in building envelope, where it was possible to set new types of insulants and provide its systems tests in real conditions of the Arctic zone. By that through all the building envelopes a sensing system was fixed, which registered all the deformations, changing of construction materials' and environmental temperature-humidity conditions.

Timber buildings are radio transparent, they don't disfigure natural electromagnetic phone. It allows using wireless sensors not only inside, but also outside the house with the aim of environmental parameters' monitoring, visual control and objects. Lack of line communications except perils of networks' damage and provide furtivity of various radio controlled sensors' location. Different types of sensors are used, which work on the basis of wireless connections: fire safety system, for temperature, humidity and deformations measurement and other. For increase of special accumulators' resources sensors' measurement transmission is carried out inconstantly, but only in standard conditions in asked radio-frequency signal in keeping with accepted method of monitoring. For comparative control of their test value for research goals a system of sensors with line communications is also used. Sensor values on-line are delivered through internet in the centre of automatic processing, then the processed information comes back to explorer of the house to his computer or mobile phone. During the first year of house exploitation on alarm signal of sensors, which came at nighttime on the phone of explorer, who was abroad, flooding of the house ground floor was prevented. This flooding was a

consequence of break in socket joint of cold water supply. Accident prevention was carried out by duty officers of the university by operator command.

Needful for researcher characteristic curves of registrable parameters are lined up automatically while processing of indications. It allows to develop new materials and enclosure structures for arctic zone. The house is fitted with effective controlled system of recuperation, which provides heat exchange between ingoing and deaerated air with demanded intensity of its substitution in houses. There are great horizons for a system of automized monitoring for management of house indoor environment characteristics with the aim of creation of comfortable conditions for habitation of people and economy of power resources.

Damage accumulation in protective/decorative coatings and constructional materials takes place in the Arctic zone manifold faster than on the territories with milder climate because of fleet process of sweating while changing of temperature-humidity conditions of exploitation. Intensive destruction is caused by water volume expansion in constructional materials by its freezing. By that, design, construction and exploitation errors of real property appear rather fast. Remedies of faults come at a greater price in the Arctic zone than in other territories.

A system analysis of low-storey buildings in the European part of Russia Arctic zone for the period of over 30 years was carried out for recognition of characteristic faults in design, construction and exploitation. As a result of conducted researches a negative influence of the Russian Federation legislation on quality of construction and lifetime of objects was noticed. Federal law 27.12.2002 №184-FZ «On technical regulations» recalled Construction Standards and Regulations (CS&R) as well as all-Union State Standards (GOSTs) beforehand, though the system of technical regulations was not ready at that time. Building legislation of the Russian Federation provided inspection of design specifications and estimates of low-storey buildings with areas up 1500 square meters only in cost account checks. An expertise is not carried out in project documentation such objects of major construction work as apartment buildings with not more than three storeys, which consisted of one or more bays, not more than four, in each of which there are number of flats and communal areas, and each of which has individual entrance hall with exit to the territory of communal areas. Just since 1st of April 2012 changes in town-planning complex (TPC) of the RF were introduced, article 49, part 3.4 about that planning documentation of all the objects, which construction is funded through the budget system of the RF, are entitled under state inspection. But when acquisition of such buildings by program of resettlement from hazardous and ramshackle buildings an essential state expertise of projects and state technical supervision are not provided by laws in force.

Nowadays a government business enterprise «Support Fund for the Reform of the Housing and Utilities Sector» cuts down public funding on account of private investment involvement, by that fact 90% of houses are bought but not constructed. Introduction of amendments to laws in force is current nowadays, what is especially important for RFAZ, where about 90% of new houses, taken into use, are low-storey. That's why a suggestion was proposed to make in project FZ №171692-6, article 49, part 3.4 following changes: «Planning documentation of all new objects, which are either constructed or bought through the budget system of the RF, are entitled to expertise». For development of low-storey housebuilding it is important to overview the project FZ №526013-6 on changes of town-planning complex of the RF and Code of administrative violations in State Duma.

In current practice of housebuilding grounds for building constructions of social and municipal housing in territorial entities of the RF are often given in urban fringes, where parcels of land are cheaper but social, transport and engineering infrastructure is less developed. Resettlement of citizens to urban fringes from the well-known areas is stressful for them, develops the feeling of social injustice and creates social tension. Most time of their lives they begin to spend in transport during their work trips. Housing density in houses, constructed according to size standards of social and municipal buildings is high, though the parking structures and garages usually provided in minimum allowed norms, and they are usually not enough. During design and construction in urban fringes it is important to take into account that cars help to increase mobility of citizens, obtain more well-paid job and to improve their material well-being. It is primarily important for active and independent young people.

Nowadays it is normal to reduce the size of social flats and the height of buildings to minimum permissible dimensions for costs reasons. There are more costs on designing of such buildings, but it is less comfortable to live there. Designing on the principle of fitting of floor spaces to minimum holds down amenities and ergonomomy of housing. The possibility of gaining economic effect from use of modular dimension building products to the full extent is ruled out. During construction everything has to be snubbed and fitted, that's why labor contributions and amount of waste products grow. As a result judgmental factor effect on common quality of housing rises steeply. By the current approach in construction of new houses the main goal — increase of living standards — is not achieved, though budget funds for that are spent to the fullest extent.

Of special note is specific character of Arkhangelsk geological profile. Its main part is situated in muck territory, which used to be the bottom of wide estuary of the Northern Dvina River. Depth of turf in Arkhangelsk is higher (in some areas — more than 20 m) than in Saint-Petersburg, for example.

Great number of mud bands of different thickness are represented on the territory of Arkhangelsk. Necessity of pile foundations use boosts cost and period of construction, and Arctic climate conditions additionally generate a negative impact. In such a way relative density of fundamentals in common value of buildings is higher than during construction without stilts. As a result a real total cost of 1 square meter of housing in muck territory of Arkhangelsk is much higher than during construction in more mild geological and climate profiles. Pointed out misbalance adversely affects quality of construction and lifetime of works as well as it seriously complicates attraction of investors from other regions.

Nevertheless, when calculating the cost of 1 square meter of housing, which is constructed financed from the budget, it isn't taken into consideration to the full extent. Moreover, not all the builders from other regions, who win competitive tendering by means of price low-balling, have the practice in construction of pile foundations and are not ready for appreciation and difficulties of construction in cold climatic conditions. A number of incidents are noticed when in pursuit to minimize financial charges and time consumption (during erection of reinforced-concrete foundations technological intervals are needed for hardening of concrete, its expensive heating up because of low temperature and special chemical additives) during construction of two- and three-storey apartments, some builders used rotary bored cast-in-place piles. Pile of such a construction has propeller driven cap beneath and hollow supporting pipe-baluster. During exploitation steel walls of such a pile are actively coordinated at the level of ground surface, which could result in failure of permanent apartment building. Working life of such piles is lower than erected constructions on them, which is unwarrantable. That's why during construction of building it is forbidden to use rotary bored cast-in-place piles in the form of balusters, made of hollow tubes, which have wall thickness from 4 to 10 mm (deviations are possible). For such piles eccentric loading is especially dangerous, which happens during its installation under foundation frames with yield from designed pins.

Practice of construction in frigid climate shows that special attention should be paid to quality control of design considerations and productions of construction work when use of foam polystyrene panels. Number of incidents are educed when for costs reasons some builders used cheap foam polystyrene with low fire resisting property in comparison with design consideration. Back draught is especially dangerous. Moreover, it is important to take into consideration the fact that by variable temperature-humidity exposures with extreme lapse rate of temperature during long exploitation of foam polystyrene fire retarding materials could expulse. In case of fire it constitutes a danger for people's life. By that special attention is important to pay to evaluation of quality of magnesium oxide boards, which are often used for outside finish of enclosure and load carrying structures with the aim of fire protection. The problem is that on the construction site it is impossi-

ble to estimate the proportion and quality of Magnesium oxide boards in a proper way. It can be done only in laboratory settings with use of expensive X-ray crystal analysis. If a major emergency arises timber houses on nailed connections «jump the piles», «roundly defecting» because of dowel pin's flow, without further progressive collapse (as distinct from houses of other construction), ensuring escape of human losses.

Fundamental legal principles of designing and construction works

Federal law 02.07.2013 №185-FZ «Technical standard of buildings' and constructions' care»² was adopted with the aim of protecting people's life and health, different forms of property; natural environment protection, protection of animals' and plants' life and health; caution of actions which disorient buyers; providing of energy efficiency of houses and constructions. This legislative act sets forth the minimum necessary requirements on providing safety of houses and constructions (including nets and systems of engineering infrastructures), as well as connected with houses and constructions processes of designing (including survey investigations), construction, rigging up, balancing, exploitation and utilization (wracking). Demands of overviewed law contemplate organization of mechanical and fire safety; safety by dangerous natural processes and phenomenon and (or) man-made impacts; safe for people's health conditions of living and residence in houses and constructions; safety when use of houses and constructions; availability of houses and constructions for disabled people; energy efficiency of houses and constructions; safe exposure level of houses and constructions on environment.

The pointed out legislative act establish in article 41 rules of voluntary (not necessary) compliance assessment of houses and constructions, and also connected processes of designing (including survey investigations), construction, rigging up, balancing, exploitation and utilization (wracking). A voluntary compliance assessment of houses and constructions, and also connected processes of designing (including survey investigations), construction, rigging up, balancing, exploitation and utilization (wracking) is provided in the form of non-state examination of engineering survey investigations' results as well as planning documentation, architectural supervision, investigation of houses and constructions, conditions of foundations, building constructions and systems of engineering infrastructure in forms, set forth by Russian legislation. A voluntary compliance assessment of houses and constructions, and also connected processes of designing (in-

² Federal law 02.07.2013 №185-FZ «Technical standard of buildings' and constructions' care (with amendments 02.07.2013)». Adopted by the State Duma on the 23rd of December 2009 and approved by the Federation Council on the 25th of December 2009. URL: <http://docs.cntd.ru/document/902192610> (accessed 16.11.2014).

cluding survey investigations), construction, rigging up, balancing, exploitation and utilization (wracking) is carried out according to the procedure established by Russian legislation.

By the Federal law 18.07.2011 №243-ФЗ³ the duty is established to provide the designer's supervision of design organization, which developed the documentation during construction, reconstruction, major repairs, technical re-equipping, conservation and dissolution of dangerous manufacturing site. This point was added since the 22nd of July 2011 by the Federal law 18.12.2006 №232-ФЗ; in editorial board, which was put into effect since 22nd of July 2011 by the Federal law 18.07.2011 №243-ФЗ.

According to current building regulations BR 48.1330.2011⁴, designers provide architectural supervision during construction of dangerous manufacturing sites, as well as special danger technically complicated and unique facilities. In other circumstances architectural supervision is carried out just by the wish of investor (owner), who could abandon it under color of cost cutting and it will be legally. Such a situation takes place practically all over the country.

The overviewed building rules are accepted by former RF Ministry of Regional Development, registered by the Federal Technical Regulation and Metrology Agency but they are not included in list of construction standards and regulations, necessary for use and serve as guidelines. This statutory document is not spread to housing and constructions, which building, according to urban development legislation, could be carried out without building permission, and also to private residential structures constructed by builders (private persons) by themselves on their private territories, including labour power intake. Consequently, current statutory document (BR 48.1330.2011) doesn't provide designer supervision's conduct of construction of low-storey buildings (high up to three storeys and more than four section) with common floor area up to 1500 square meters⁴.

Unprincipled investors and contractors widely use the right not to let oversight bodies to enter their projects under construction. They go through the main efforts not of providing service reliability and lasting quality of newbuilds, but of their «beautiful» decoration. As usual, they try to settle this buildings as fast as possible, breaking building legislation and paying punitive damages.

³ Federal law 18.07.2011 №243-FZ «On introduction of amendments to Town Planning Code of the RF and to other certain legislative acts of the RF». Adopted by the State Duma 07.07.2011, approved by the Federation Council 13.07.2011. URL: <http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=116984> (accessed 16.11.2014).

⁴ Rules and regulations BR 48.1330.2011. Organization of construction. Revised edition construction standards and regulations 12-01-2004. Adopted by the Ministry for Regional Development of the Russian Federation with the order of 27.12.2010 №781. Put into effect since 20.05.2011. URL: <http://suprom.ru/id-3/48133302011.html> (accessed 17.11. 2014).

By attempts to realize complex of actions on corrective measures in new buildings, local government authorities usually meet appearance of local social tension among housemates because of establishing inconveniences for them.

The overviewed set of rules BR 48.1330.2011 extends to construction of new buildings, and reconstruction and demolition of already existed houses and constructions, which are done according to building permission, achieved in accordance with the established procedure. These rules also extend to land improvement of the site and land use engineering. During construction of line structures, electric power transmission and communication lines, delivery pipes, and other facilities of technical infrastructure as well as railways right of way, right of roads and other transport routes must be additionally taken into account demands of current statutory documents. Pointed rules also don't extend to production of materials, items and constructions on enterprises of construction industry and construction materials producing industry.

Unfortunately, during the choice of contractors for accomplishment of exploratory and designing fieldworks, situated in remoted Arctic area, which includes investigation of objects and estimate of their technical state, as well as expertise of design specifications and estimates, according to the Federal law 05.04.2013 №44-FZ⁵, lowest price is considered to be the basic index. By that, existence of positive practice in extreme conditions of the North by potential builders and contractors, proper account is not taken. For risk reduction of dingy participants' win, customers try to add into preliminary specifications list of technically justified special objectives during documents preparation for holding of competitive tenders or auctions. But, as a rule, companies' lawyers by outgoing methods with use of applications and litigations protest them. And they grasp these contracts with dumping prices. Further inordinate savings entail a great number of mistakes, on which clearance great budget funds of the RF are applied. Some contractors use unskilled staff, low-quality materials and lagging technologies. Analysis of the practicing experience of competitive tenders and auctions show that some lawyers abuse «legitimate interests» for lucrative purposes, which are given to them also because of imperfection of current laws; and they negatively influence financial standings in the field of construction.

Records of staffing qualification and supportability, which are announced by contractors and investors in self-regulating organisations for achieving permit to corresponding works, are often not answerable to state of things. Control on correspondence of declared and actual values

⁵ Federal law 05.04.2013 № 44-FZ «On contract system in the field of public procurement». Introduced since 01.01.2014, edited 21.07.2014. URL: http://www.consultant.ru/document/cons_doc_LAW_165972/ (accessed 17.11.2014).

on behalf of public prosecution service and other regulatory agencies is often conducted after already happened emergency situations or accident involving injuries. Preventive maintenances in this field is not practiced nowadays as is considered to be overviewed as administrative barrier.

Sometimes there are cases, when operational safety and lasting quality of designed new buildings don't correspond to the goal⁶. Results of work of State autonomous institution of the Arkhangelsk region «Management of state examination», which possesses qualified experts with solid groundings in work with buildings, exploited in territories with extremely frigid climate, attest to that fact. During 2007 from 237 given expert findings for design specifications and estimates, 91 (38,4%) of project considerations (including cost calculations), experts had to return on construction, 2008 from 263 — 142 (54%), 2009 from 273 — 100 (36,63%), 2010 from 425 — 195 (45,88%), 2011 from 359 — 128 (35,65%), 2012 from 436 — 160 (36,7%), 2013 r. from 345 — 100 (28,99%), for 9 months of 2014 from 208 — 66 (31,73%). Because of it, later, great expenses for control of intolerable errors, which were inevitable during realization of flaw designs, were prevented.

After accomplishment of Parliament procedures in the State Duma of the RF, RF Government Decree № 984 from 25.09.2014 «On making amendments in some acts of the RF government» was adopted. Some changes were introduced in organization and carrying out expert examination of design documentation and results of engineering investigation concerning objects which are constructed by means of state budget as well as in inspection procedures of consistency of buildings' costing. Ministry of Construction, Housing and Utilities of the Russian Federation in a two-month period was charged to approve specifications of e-documents' formats, which are presented for carrying out of design documentation state expertise and of engineer surveys results. It was determined that consistency checks of capital construction projects' costing, which is constructed by means of state budget, as well as State expert examination of planning documentation and engineering investigation concerning objects which construction and reconstruction is done by means of state budget, which beginning took place before the overviewed law with its edition, must be accomplished by bodies (state establishments) who had already begun it. At the state level carrying out expert examination on federal ownership objects and state enterprises objects, for example, JSC «Sevmash» and JSC «Zvezdochka» has already been stopped.

⁶ Federal law 02.07.2013 №185-FZ «Technical regulations on building and construction security (with amendments from 02.07.2013r.)». Accepted by the State Duma 23.12.2009, approved by the Federation Council 25.12.2009. URL: <http://docs.cntd.ru/document/902192610> (accessed 16.11.2014).

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In Arkhangelsk region, where construction of low-storey buildings prevails, suggestions of expert society on creation of regional law on construction of low-storey buildings are being over-viewed. These suggestions are discussed in mass media, in conferences and meetings with active participation of deputy corps of Arkhangelsk regional deputy meeting and in community boards. A working group on preprocessing of regional building legislation was founded in regional administration.

In keeping with item 5.2.38 of article 5 of Charter of the Ministry of construction and Municipal Affairs and Housing of the RF, approved by RF Government Decree 18.11.2013, № 1038 order of 88.09.2014, №525/pr⁷ indexes of average market price of one square meter of accommodation floor area in territorial entities of the RF for the IVth quarter of 2014 were accepted. These indexes are entitled to be used by regional and federal executive authorities for sizing of social transfers for citizens, to whom these social insurance benefits are given for purchase of accommodations by means of state budget. Specified indexes of average market price of accommodation floor in territorial entities of the RF are given in table 1.

Table 1

Indexes of average market price of one square meter of accommodation floor area in territorial entities of the RF for the IVth quarter of 2014

№ Ser. No	federal district	number of territorial entities	average market price of one square meter of accommodation (rub.) / territorial entities of the RF		
			average value	Min	Max
1	Central Federal District	18	35 821,94	25 601,00 the Kursk Region	90 400,00 Moscow
2	Northwestern Federal District	11	39 944,64	31 884,00 the Kaliningrad Region	56237,00 St. Petersburg
3	Southern Federal District	6	29 276,67	24 170,00 the Republic of Kalmykia	34 780,00 the Rostov Region
4	North Caucasian Federal District	7	26 211,43	23 073,00 the Karachayevo-Cherkessian Republic	30 000,00 Chechen Republic
5	Volga Federal District	14	32 020,14	26 967,00 the Saratov Region	38 627,00 the Nizhni Novgorod Region

⁷ Ministry of construction and Municipal Affairs and Housing of the RF decree 08.09.2014 №525/pr «on indexes of average market price of one square meter of accommodation floor area in territorial entities of the RF for the IVth quarter of 2014». Registered in Ministry of Justice of the Russian Federation 30.09.2014, № 34202. URL: <http://www.garant.ru/hotlaw/federal/568403/> (accessed 17.11.2014).

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6	Urals Federal District	6	37 845,33	29 108,00 the Chelyabinsk Region	46 122,00 the Yamalo-Nenets Auto- nomous District
7	Siberian Federal District	12	33 666,25	31 333,00 the Republic of Khakassia	38 926,00 Krasnoyarsk Krai
8	Far Eastern Federal District	9	41 912,78	32 793,00 the Chukotka Autonomous District	51 989,00 the Sakhalin Region
9	the Crimea	2	29 500,00	29 000,00 Republic of Crimea	30 000,00 Sevastopol
	Russian Federation	85	34 810,47	23 073,00	90 400,00

When accommodation of people's resettlement is bought at the price higher than the given one, the difference must be paid from regional and (or) federal budget. It is forbidden to draw funds of state corporation «Support Fund for the Reform of the Housing and Utilities Sector» in these purposes.

The highest price of one square meter of accommodation floor area is recognized in Moscow — 90 400, Saint Petersburg — 56 237, the Nenets Autonomous District (NAD) — 53 481. More than 40 000 rub. for 1 m² are recognized: in the Yamalo-Nenets Autonomous District — 46 122, the Sakha Republic (Yakutia) — 45 442, Arkhangelsk region — 40 889, the Khanty-Mansiysk Autonomous District — Yugra — 40 882, the Republic of Karelia — 40 145. It is worth noticing that accommodation in the Leningrad Region is cheaper than in the Arkhangelsk region because for government of regions with frigid climate it is difficult to achieve success in out migrations, especially of qualified specialists, who are in demand at labor market. Analysis of the data given in table 1 shows that an average market price of 1 m² of accommodation floor area in 85 entities of the RF including Crimea is 34 810,47 rub. The highest price of accommodation is in Far Eastern Federal District — 41 912,78 rub., and the lowest — in North Caucasian Federal District — 26 211,43 rub., h.e. 1,6 times lower.

Analysis of current practice of construction in the RF with use of budget funds showed that, for example, houses made from brick and expanded plastic cardinaly vary in prime costs, level of solidity and safety, and price of 1 square meter in these houses is practically the same. In future such a situation organizes risks of socio-economic problems and makes difficulties for all vertical power structure.

Situation must be changed. Firstly with the help of regional mass media it is worth organizing a purposeful and system-based activities to inform population on disadvantages and disadvan-

tages of houses of different constructions. It will allow to form a qualified consumer demand for accommodation and will influence the development of social control over the field of construction. An indispensable condition — activity of experts, who will be enlisted the services, must be really adequate and unprejudiced.

Moreover, it is important to promote activities for bringing to responsibility of those advertising providers, who give corrupt and aggressive advertisement. It is worth taking into account, that in conditions of market according to regulations, the chief goal of any commercial activity is to market as much as possible of their products and services to obtain marginal profit. Out country's particularity is that most of citizens of older and average ages save credence to mass media because their thinking, which is common to socialist society, based on collectivism and authority credibility, who is obliged to take care of them, hasn't practically changed. Their vision of private property is limited to everything connected with family and as usual it doesn't extend to production facilities and resources.

Senior executives in administration of all the branches must be chosen on grounds of professionalism. More often senior executives are «dislodged» when change of leadership after elections. Many of those who came recently in the first instance are not ready to solve the challenge by themselves and they even don't know where to find those who are able to solve it. By the time, when recently come executives accumulate enough experience, and become professionals who are ready to defend a decision and their opinion another change of leadership takes place. Number of changes happen again but at the same time already formed professionals. Solve of this challenge becomes harder because of lack of enough number of qualified specialists, especially of technical profile.

Social estimate of the situation with old housing stock on the North witnesses the fact that many citizens who live in city centers in two-storey old log apartments on timber piles, obtain conveniences not to the full extent, though they are patient in these difficulties. Their motivation includes the fact that they value habitual comfortable infrastructure of the center of the city. Their children attend schools, nursery schools on an area basis, there are rather low prices in neighborhood supermarkets, theaters, museums, other cultural establishments and athletic facilities e.t.c. are situated nearby. This factor must be anyway taken into account during design of new construction with use of budget funds.

When location of new houses on the outskirts social and economic effects from state's investments in housing construction become lower. It leads to write down of commercial price of small-size accommodation. Citizens who achieved small-size accommodation in the center could when it is needful to change their accommodation for other of the bigger size, though not in the

center. Lack of clear building demands to location of social and municipal housing leads to system weakness in town-planning policy. Taking into account great volumes of state investments in residential development it considers to be a serious economic felony. Hostages of the situation with imperfection of current legislation in the area of construction are considered to be chiefs of territorial entities and municipal districts, especially of chief architects' service, projects expertise, architecture-building supervision, construction customers and others. It is worth noticing that in administration establishment of some country municipal establishments there are no qualified and skilled professionals of architecture-construction profile with management skills and knowledge of budget discipline. At the same time chief architects of municipal territorial entities assume responsibility for all the risks in future in future, when signing a statement of a building approval, where they acknowledge the compliance of safety and energy efficiency according to Federal law 185-FZ from 02.07.2013⁸. By that they are not entitled to influence the decision making but have to act cameral, just on technicalities, based on given for them documentation, during which preparing prejudicial data submission is not excluded.

For law enforcement officers it is well-known that in thickly settled regions with low incomes risk of criminalization and creation of social tension grow. That's why in Germany and other developed countries, for example, new buildings are preferred to be located not in certain microdistricts, but along the territory of locations. Because of it society is provided with reduction of differences on level of living standards, as well as focal concentration of population density is not allowed. The overviewed last factor is important for organization of transport optimal performance, distribution of car parkings, underground garages or many-storey garages and so on.

Conclusion

Examination of the practice of modern housing construction in our city shows, that changes in the RF legislation in the branch of specification of claims on location of accommodation designed on social and municipal norms escalated⁹. Even distribution of such buildings in inhabited areas of city and country settlements could allow to increase user value of efficiency apartments. State investments in major construction work of longstanding, comfortable and ergonomic small apartments could give social and economic effect, including the Arctic zone of the RF.

⁸ Federal law 02.07.2013 №185-FZ «Technical regulations on building and construction security (with amendments from 02.07.2013r.)». Accepted by the State Duma 23.12.2009, approved by the Federation Council 25.12.2009. URL: <http://docs.cntd.ru/document/902192610> (accessed 16.11.2014).

⁹ Set of rules SR 42.1330.2011. Urban development. Urban and rural planning and development. Current edition SNIIP 2.07.01-89. Introduced 20.05.2011. URL: <http://fire-union.ru/information/sp%2042.1330.2011.pdf>. Set of rules SR 54.13330. 2011. Multicompartiment residential buildings. Current edition SNIIP 31-01-2003. Introduced 20.05.2011. URL: <http://dokipedia.ru/document/1724236> (accessed 17.11.2014).

With the goal of perfection of current legislation it is viable to introduce current changes in set of rules SR 42.1330.2011. To add current explanatory note to paragraph 5.5. section 5 «residence buildings»: «Buildings designed according to norms of social and municipal housing must be uniformly placed on the territories of living zones of city and country settlements taking into account current or designed social, transport and engineering infrastructure». All the suggested innovations in the RF legislation pass examination procedure in administration of Arkhangelsk region and city chamber of deputies. The pointed suggestion must be taken into account during development of technical regulations of the Customs Union, which are accepted by decision of Council of the Eurasian Economic Commission.

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The threat of terrorism in the Russian Arctic



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Abstract. The article examines the legal, institutional, socio-economic and political issues that promote terrorism. Based on the analysis of the facts of the modern history of terrorism in Russia, proposes actions to deal with it, legal instruments, anti-terrorism policies, including the Russian Arctic.

Keywords: *Russian Arctic, terrorism, extremism, socio-economic factors, young people, corruption, legal instruments, anti-terrorist policy*

Introduction

The topic of terrorism is current for Russia as a whole, and for its regions, including Arctic and Northern territories. Geography of terrorism expansion is not restricted to particularly southern regions of the country. Terrorism has social roots there, where appear problems in socio-economic development of territories, in national politics of state, activities of governmental bodies and regulatory bodies of the RF territorial entities, local government, in work of law machinery. The idea of this article includes that when disclosing questions on subject matter of terrorism, its social fundamental principle and legal evaluation, specifics of regional displays, — to show possible threats of such activity in the Russian Federation Arctic zone. One of the first attempts is done to show terrorism as the instrument for restriction of geoeconomic and geopolitical sovereignty of Russia in Arctic in modern conditions. Naturally this topic is not completed with one article and demands continuation of researches on noted problematics.

On subject matter, social fundamental principle and modern specifics of terrorism

Analysis of outlook on subject matter of terrorism let us educe its main characteristics: special ideology, violence (threat of violence), the very picture of fear by unlimited range of persons and (or) presence of intention to influence decisions of governmental bodies. We would like to pay attention to the last characteristic. From the point of view of most of international legislative instruments and federal legislation, terrorism, terrorist activity and act of terrorism are aimed at influence on decision making of government authorities, local authorities or international organizations. In such a way, according to p. 1 p. 1 article. 3 of Federal law №53-FZ from 06.03.2006

«On counter-terrorism», terrorism — is ideology of violence and practice of influence on decision making of government authorities, local authorities or international organizations, connected with horrification of population and (or) other forms of illegitimate coercive actions¹.

Alike intension — destabilization of activities of government authorities or international organizations or influence on their decision makings — is pointed in p. 1 article 205 of the Criminal Code of the Russian Federation («act of terrorism») ². By that, lack of such an intension by guilty as if strikes out such an activity from the category, which meet the criteria of terrorism. Practice shows, that this instance is arguable. From one side, horrible acts of terrorism are considered to be well-known developments: bursting of houses in Moscow and Volgodonsk (1999), tragedy in theatrics center in Dubrovka (2002), acts of gunmen in Ingushetia and Grozny, acts of terrorism in Moscow metro and in airdrome «Tushino», air disasters of two planes, tragedy in North Ossetia city of Beslan on the first of September 2000, «Nevsky express» bomb attack (2007), burstings in Volgograd (2013) and others.

But, together with doubtless acts of terrorism, judicial-investigative practice also refers to terrorism some facts, which from the formal point of view are not so correct to refer to. For example, bursting of the house no. 120 in Sovetskih Kosmonavtov avenue in Arkhangelsk³. Tens of persons in charge throughout the days and nights in those days thought — what crime to allege to the guilty person — act of terrorism, vandalism or just slaughter according to current point of the article 105. Actions of the fitter were determined in three articles of the RF CC: «terrorism», «murder of two or more persons, made by general dangerous way» and «intended destruction or damage of property by means of bursting». The court fully agreed with exaction of State prosecution and adjudged such a punishment, which it inquired, though impute guilts still stayed disputable among lawyers. By the way, the juries have struck out from the verdict the words about terrorist character of acts. Doubtful still is considered to be the fact of presence of terrorism characteristics in acts of two drunken men, who committed harm to train tracks near Arkhangelsk with the aim of train accident. There are and other facts [1, p. 32].

Lower fundamentals of native being nowadays create backgrounds for conducting acts of terrorism. At that, beyond of main hotbed of tension (North Caucasus and adjacent territory), acts

¹ On counter-terrorism: federal law 06.03.2006 № 53-FZ // Rossiyskaya gazeta (Russian newspaper). 06 March, 2006; SZ RF. 2006. №11. article. 1146; 2006. №31. article 3452.

² On introduction of amendments to particular legislative acts of the Russian Federation: federal law 05.05.2014 №130-FZ // Rossiyskaya gazeta (Russian newspaper), 7 May, 2014.

³ Hostler in Arkhangelsk was sentenced to 25 years for bursting of dwelling-house and death of 58 people in December 16, 2005 URL: <http://palm.newsru.com/russia/16dec2005/25jail.html> (accessed 20.03.2014).

of terrorism are possible not only from the true terrorists, but from for example accomplices of gunmen, dissatisfied people, excluded people, those at a loose end, outcasts, extremists and criminals. From the other hand, this «low» terrorism by its effects is even now can be compared with the true one.

Here we must set definitions. «*True*» terrorism in Russia largely supported by foreign «friends» and Central Asia «emirs». Training of mujahidins in camps (Middle Asian, Pakistani, Tajik, Afghan, Arabian and in number of Russian regions) forms a person to the level of «mature gunman». He, trained to disguise and skulk, adapts fast to the living environment of potential area of activity. Firstly, to the specific of North Caucasus. Its foothills and mountains are difficult to approach and they cause reasonable difficulties without acts of special purpose troops (district itself and presence of disloyal to federal troops settlements). These regions are considered to be the most strained focus of instability. Caucasus itself and adjacent territory in geopolitical context is for a long time used by different forces and as a foothold to regions of hydrocarbon deposits, as well as strategic platform for creation of the so-called Islamic Turkestan, and as place of attraction for other purposes. Interest of the West became even more intensive during «Cold war»: in 1970s Britain secret-service agent Bernard Lewis suggested the USA Presidential Administration of Carter plan of destabilization of the USSR by means of induction of Islamic discontentment in Caucasus and Middle Asia [2, p. 61]. As we see, this plan is successfully realizing by our «kind colleagues».

Modern zones of geopolitical interests, as it is known, are considered to be through-passages, including crude oil and gas pipe lines, passing through the Caspian Sea and North Caucasus regions («the Blue Stream», «South Stream») as well as crude oil line — Baku—Tbilisi—Ceyhan. Evidence of «interest attraction» is considered to be geographic areas, which became synonyms to aches and pains for many peoples. These are Afghanistan, Chechnya, Nagorny Karabakh, Adzharia, Abkhazia and South Ossetia (August, 2008). Nowadays it is Dagestan and Ingushetia, Kabardino-Balkaria where acts of terrorism took and take place on an annoyingly regular basis. Social circumstances of solution by force of problems of terrorism looked forward to it won't be long: it appeared migration of its carriers in other regions of the RF.

Statistics of terrorism is an important evidence of incompleteness of struggle with it. 2005 there was 251 acts of terrorism (including in Chechnya — 111, in Dagestan — 77, in Ingushetia — 36). Then the number of registered acts of terrorism became lower. But by that number of crimes of a terrorist nature since 2008 till 2010 was at the same level, in 2011 reduced in practically 2 times, but then in 2012 again increased up to 260 [3]. According to announcement of Chief of the RF Investigation Committee A. Bastrykin during 2013 it was registered 661 crime «of a terrorist

nature, including 31 acts of terrorism»⁴. Numbers are indicative of some kind of reduction of number of acts of terrorism, but it is pointed, that terrorists are reaching after push to more remote from Caucasus regions of Russia. They change their tactics of searching for carriers and performers of terrorist ideas, tactics of training of their followers, and more often change from attacks against power structures to less protected areas. Interest of terrorists to national islamic regions of Russia has greatly risen. Here they try to destabilize socio-economic situation and to exasperate religious enmity⁵.

Directions and concrete objects (victims) or terror are being changed. Interest of bandits are more often becoming large industrial enterprises of the centre of the RF, transportation facilities, fuel and energy industry, public areas and facilities of worker of law enforcement agencies. National antiterrorist committee pointed out, that just 2010-2011 it was educed and prevented more than 30 subversive terrorist acts in the areas of industry and transport. We must pay special attention to these indicators, because urgency of the topic is deterministic not only to the growth of number of acts of terrorism, but also to facts of prevention of terrorist threats [4].

Together with objects of power, transport, law enforcement agencies and intelligence agencies rather new vectors of terrorism are becoming vulnerable or incapable to protect facilities of the social infrastructure: schools, nurseries, hospitals and the most indefensible population group — children (Beslan and others). Consequently researchers notice, that «when earlier terrorists mostly tried to exert violence against «famous» people, political leaders, rulers, nowadays the goal is to get as great as possible resonance and to face down as many as possible people» [5, p. 37].

Tactics of terrorism in recent times has very «pointedly» approached to country's politics events. Particular acts of terrorism, made by both terrorists and criminals, imitating terror, point this. In such a way, happen in the first decade of the 21th century in the RF number of tragic occurrences coincided with electoral campaign. For example, «Nevsky express» bomb attack happened before elections to the State Duma (2007), bursting in Arkhangelsk in Sovetskih Kosmonavtov av. was during Arkhangelsk region gubernatorial campaign (2004). Such an analysis of longstanding statistics testifies that many «actions» are consciously coincided by gunmen with either political events or some remarkable dates for terrorists (datas of chiefs or companions death).

⁴ Investigation committee counted acts of terrorism in 2014. URL: <http://rusplt.ru/news/sk-podschital-teraktyi-za-2013-god-99700.html> (accessed 09.04.2014).

⁵ Poletayev Vladimir. Terrorism v prigovore [Terrorism in sentence]. Rossiyskaya gazeta [Russian newspaper], 20 August, 2008.

During latest raids practice of «diverting attacks» is successfully developed by terrorists. So, before occupation of TC in Dubrovka gunmen carried out burst by «McDonalds». Before acts in Beslan took place acts of terrorism with two planes, burst at the bus stop by metro «Rizhskaya». We can make a conclusion that presence of «small» act of terrorism must point to opportunity of bigger act of terrorism. Consequently, thereafter announcement of operations of antiterrorist direction (like Cell-antiterror) in its primary idea has an intention to predict future acts of terrorism and (possibly) to apprehend getting about adjoining area criminals.

Nowadays Russian reality has to do with terrorism in double-sided dimension. *From one side*, not each resonant guilty act is possible to acknowledge as terrorist according to the Law. Often the last argument to adjudge particular «terrorist» criminal action of alike is just alcoholic or drug intoxication of a person, rightly endorsing social threat of special significance.

From the other side, modern Russia is considered to be developing state, which firstly met the problem of terrorism. Moreover, with existing internal problems (criminal, corruption, poverty, drug addiction), the so-called «friends» of our country actively add politics of «double standards» from the view to terrorists as to «ideologic fighters» and fund them. Attempts of getting out of some mass media, internet resources, which propagandize terrorism and extremism of state control are encouraged. In such conditions it is very difficult to save society from terrorism.

Problem of unemployment of young people is especially current nowadays, because for already twenty years in North Caucasus there is no positive answer to the question what to do for young and green generation. Level of unemployment there is practically 80%. Meanwhile, since 1991 the situation has become not much better. According to mass media, 2013 lowest personal sector were in North Caucasus regions⁶. Grading of moral life baseline leads to life disorientation. Young generation of population, who doesn't work and has no sphere where to put his energy, often is influenced by radical nationalism, social and religious ideas. Moral and intellectual puerility of youth, especially of homeless preteens, plays its negative role. «Well-timed attention» to youth is paid by terrorist ideologists, who usually use for spirital disarmament nets of the so-called «educational establishments» in unstable regions. Information on continuing of attempts of introduction in educational establishments and carrying out of «professional conversations» by ideologists of Wahhabi in universities of Caucasus republics (in particular in Dagestan State university) still continue to arrive. We could expect the same activity of Wahhabi ideologists and other terror-

⁶ Zikova T., Markelov R. Subjektniy vzglyad [Subjective view] // Rossiyskaya gazeta [Russian newspaper]. 12 March, 2014.

ist sects in higher educational establishments of other territorial entities of the Russian Federation.

From the gleaned situation, to our point of view, there are two conclusions. For current development of Russian State it is necessary, *firstly*, establishment of effective ways of acts of terrorism, finances system and its further consistent counteraction. Then adoption of urgent solutions on amending current legislation with the goal to approve legal framework of reasonable prosecution of people, who carry out crimes of terroristic (threatened) nature. *Secondly*, strategically adjusted definition and social fundamental principles of terrorism are necessary, its preventative measures and improvement in life quality of the whole population, paying special attention on youth.

By current development trends of the Russian State, to our point of view, each criminal action, where there are noticed marks of threatening, intimidation of the person and population, marks which touch problems of safety, even without goals of its destabilization, influences on government decisions could and must in fact be recognized as act of terrorism. That's why we suggest to add article 205 of the RF Criminal Code with particular part (or to bring in new article in the CC), where pointed in p.1 article 205 goal must be left out or must be the other. For example, the goal could be, as I.L. Trunov notices, brood of distrust by population of government which is unable to put everything in order [6, p. 25], or «psychological influencing on society in particular region» [7, p. 50]. In common, we could adopt for the goal any other, because since the beginning of 1990s it is noticed objective shift in emphasis of goals. Now, as points interior ministry member A. Shcheglov, the goal of terrorism — is not the murder itself, but threatening and demoralization of the victim, and the chief subjects are not those, who became victims, but those, who stayed alive [8, p. 43]. By that, it was successfully materialized the idea that the power of terror — is in fear of the unknown, in horror of loss of a person of peace and safety feelings.

Qualified circumstances, which limit specialities of particular types of acts of terrorism, could be legal wordings on person's particular goals. For example, destabilization of public security, cause death or bodily injuries to considerable number of people, stop/business interruption of big industrial enterprise, destroying of transport infrastructure, amount of inflicted (possible) damage, death (possible) of considerable number of people and use of increased risk facilities during commission of crime. By that, *it is important not to forget, that differentiation of terrorists' target strengths will not neutralize the political goal of terrorism itself*. Inasmuch as terrorist activities anyway will touch all generally valid (it means also socio-political) problems — are problems of safety. Safety, which includes public and personal safety — are considered to be indispensable

condition of existing and successful development of a person himself, society and state. It touches such mass public interests, that they will instantly become interesting to different political bodies. Thereby, the goal of influence on power decision making will be changed into indirect goal, which will «screen» itself before another goal, as for example, threatening of a person, or in reality of many persons.

Also rather appropriate we consider setting a question of focusing on analysis of specialities of main socio-political background of terrorism in Russia, analysis of statistical information for attack and correct prediction of terrorists' objects of threats. It will allow people, who render decisions at the higher level of government to take into account situation of industrial and financial branches of the state as well as socio-economic conditions of a citizen. In a word, without understanding of the specifics status quo of current Russian socio-economic reality it is impossible to study and change specialities of everyday Russian living conditions, which are considered to be prime principle and basis of terrorism display.

Possible threats of terrorism in the Russian Arctic

Above represented diagnostic of terrorist activity within the territory of the RF particular aspects has a conceptual meaning for the Russian Federation Arctic zone (RFAZ) because vectors of geopolitical interests of many countries are met in Arctic and possibility of confrontational activities of particular countries' representatives and international organizations is high in struggle for Arctic resources and transport communications. Potential threat of extremism and terrorism in the RFAZ demands for system estimation of factorial threats and enforcement of complex counter-terrorism measures. «Strategy of the Russian Federation Arctic zone development and providing of national security for the period up to the year 2020» (2013) laid the basic model of state mechanism of providing industrial security and stability of government and authority institutions functioning. It provides prevention of extremist and terrorist threats. Principal instrument of anti-terrorist vector of management strengthening is considered to be state program of «Socio-economic development of the Arctic zone for the period up to the year 2020» accepted in April 21, 2014, destined for providing of local infrastructure of life sustaining security and improvement of the population quality of life.

Set in these documents challenges reflect specifics of geopolitical basis of states' relations on problems of management and control over the Arctic world. We will underline at once, that security of population life and industrial activity in the RF Arctic zone — is a characteristic of country's sovereignty respect. Partners on international relationship in Arctic are not always politically correct speaking about national interest of Russia. Well-known actions of «Greenpeace» in rela-

tion to «Prirazlomnaya» platform, to tanker with Arctic oil — are confirmation to it. Here is important to underline, that port terminals, harbors of atomic ice breaking and transport fleet of ice class, atomic icebreaker fleet itself, storage of hydrocarbons and tanker communications attract the most attention as possible objects for terrorist attacks. Right here special security measures are necessary, which will really reduce its possibility.

New directions in development of economic and political relations with China potentially could provoke into activation of terrorist activities in their struggle to cause damage to the process of delivery of hydrocarbons and other natural resources from the Arctic (Yamal), Siberia and the Far East in the regions of Celestial Kingdom, Russian Arctic unfortunately is not secured from terrorist activities at the extraction and hydrocarbon transportation facilities. Transport experiences purposeful and permanent attacks of terrorists: more often — railway, and less — planes. Here we could see strict dependence: works on increase of aviation-related security even more complicate activities of law breakers. Accessibility and insecurity of most of infrastructure objects of railroad, communications and lines of transport, fragility of railway vehicles themselves, as well as possibility to cause effect by one action — here are the main reasons for saving of dynamics of terrorist acts number in railways. Railway terrorism didn't pass the Arkhangelsk region, which is included partly into the Russian Federation Arctic zone, even at the grassroots. 2004 at the running line Isakogorka - Arkhangelsk by railway engineer it was founded jointing of trunk tracks — in half an hour before supposed freight train with oil. Judicial scrutiny established that lawbreakers «thought that until everything blows over to ask governor or government executive of Arkhangelsk one million dollars, «or there will be a new catastrophe». The people guilty of terrorism were sentenced to 9 and 11 years of imprisonment in colony with a strict regime⁷.

In Russian reality it is highly demanded introduction of efficient but not supposed anti-terrorist decisions, of working technical security features. Introduction of real, but not papery agencies (destroying of terrorists in lagers of their training). The whole information blockade at the place of act of terrorism is necessary, but not some other actions in media freedom. All that demands for great financial, economic and human resources. For example, expensive for any enterprise will be highly-qualified video control system, but its presence will give an opportunity to find circulation of under cloud people, to detect their way up to commission of crime, to prove identity, possible specialities of their psychology, to make composite sketch, to foresee their fur-

⁷ Pravda Severa, 2006. July, 15.

ther actions. When these facilities are used after crime, «functionality of such facilities on watching after the accident underlines act of infringing of society interests» [5, p. 37].

Prognosticative foresight of security threats in all the phases of project enforcement of gas-and-oil exploitation is even current especially on the shelf. Length (10-20 years) of construction and industrial exploitation of producing capacities creates backgrounds for act of terrorism. Unfortunately, we must take into account tendency of behavior of some geopolitical players when not to isolation but to derogation of Russian positions in Arctic. It could be a background for stimulation of extremist actions of «independent» non-governmental organizations, lack of their public denouncement. In other words, international partners in order to put pressure on Russia could turn to uncivilized instruments of geoeconomic struggle.

It is important always to remember: Russian North, though being remoted from main hotbeds of tension and terrorist actions, is considered to be one of critical areas in Russian map. And, unfortunately, number of famous events, don't make us to put Northern territories to «uninteresting» for terrorists objects of our motherland. Not for nothing number of terrorist actions (thanks God for instruction) riot policemen held in the Kola Bay. As a rule, extremists threaten wholeness and functioning reliability of regional socio-economic complexes, trying to destabilize situation in the Arctic region under the auspices of local population. In this we can see as minimum two factors: economic depression and legal nihilism (criminalization of consciousness).

What economic backgrounds provoke people to extremism? Loss of psychological assurance in achievement of material welfare, longstanding being in the phase of moral depression, supported by poor economics. One of results of market reformation of economy in Murmansk, Arkhangelsk and other territories of the RFAZ by the end of the twentieth century became the process of cachexia of basic branches of regional complexes. Negativity of reforms is felt and in the past decade, when we noticed breakdown of core enterprises, especially in northern single-industry cities. On the surface it is sometimes created the impression that in one or another territorial entity of the RF economics as if exists the stagnation, but lack of necessary investment fundings in basic funds fatally leads to cachexia of regional infrastructure and liquidation of particular enterprises. In Arkhangelsk during 2010-2013 were practically closed two greatest enterprises — pulp-and-paper and sawing-wood-processing factories. Its result is characteristic — freezing of dynamics of population income, search of nonsocial methods of realization of material wants by citizens.

Citizens with criminal motives of behavior, when confirming allowability of *nonlegal regulation of socio-economic living conditions*, became one of possible sources of thickening of social re-

lations. This group of people could be vastly transformed into subject of local extremism. Marginal values of inhabitants facilitate transition to corruption and to neglect of duty. All these are considered to be a peculiar kind of accelerators or sponsors of organized underworld and induction of terrorist processes. *Corruption in Russia long ago became a peculiar kind of accelerator of organized underworld and anyway influences development of terrorism. We surely speak not about direct patronage but about disparaging criminal agency to criminal intents. For example, in disguising of drug industry, nonlegal export of natural resources (oil, oil products, wood), sale and smuggling of untraceable gun, slave trade, possible schematic model of disguise (legalization) during issuing passports and registration of bandits.*

Negligent performance — is neglect conduct of official responsibility. Neglect performance of storage of hazardous substances in Russian reality facilitates for terrorists succeeding their ideas. Moreover, when neglect performance of storage and turnover of gun and explosive substances — is not such a rarity. According to the information of Chief Military Prosecutor's Office, in 2012 by military prosecutors it was revealed more than 13 thousand of lawbreakings during provision of safety conditions of storage, exploiter and utilization of military equipment⁸. In 2013 by coast guard it was impounded 32 weapons, 1790 ammunition, more than 14 kg of explosive substances and founded 12 arms dumps. During transfer operations at one of parts of the Arkhangelsk port it was for example forfeited 8 kilograms of ammonium-nitrate explosive⁹. It belonged to «Expedition-2» of the Federal agency of the RF atomic energetics (Minatom), which used northern port as storage area. But an alarm sign of this fact was information hiding by atomists. They declared it only after coming to Novaya Zemlya. Banal statement about it, that it was lost time efficiency for establishment of a moment and place of lost is added by enlargement of future seating operations geography. Firstly it was conducted from the Urals to final point. But nevertheless, undercover men pointed the place and circumstances of flagrant violation of requirements for transportation of hazardous cargo to the cargo ship, and soon it was founded explosive. 2007 in one of garages in Arkhangelsk public law enforcement officials impounded one of the greatest even founded in the city arsenals of weapons. The same arms dump was founded by Novodvinsk.

Cyberterrorism is becoming more dangerous. In Murmansk and Arkhangelsk regions there are situated and work highly technological enterprises of defense-industrial sector, shipbuilding companies, objects of naval service and space-based defenses. Also technological progress of ore

⁸ From the report of human-rights ombudsman in the Russian Federation for 2013 // Rossiyskaya gazeta [Russian newspaper], 09 April 2014

⁹ Zorge Alisa. Vsrychatka v portu [Explosive in the harbor]. Vedomosti Pomorya, 21 December 2005.

mining and ore mining-chemical complexes enterprises of the Murmansk region, which are in competition in the world market, is attractive for criminal industrial intelligence. For example, the object of cyberattack could become operations of drilling device based on computer technologies. By electronic system compromise it is possible to deactivate the equipment and cause dangerous ecological damages [9, pp. 4—7]. Naturally, these possible incidents in industrial activity could be cogent argument for accusation of Russia in environmental incompatibility of politics of hydrocarbon Arctic resources development. There exists the threat of breaking in by cyber-terrorists of branches of economy, which carry communication component and fulfill important state functions.

All these threats demand for building of reliable defense system of data bases of many business subjects, state run and military public authorities on the territory of the RF Arctic regions. By that, the defense must be sought-after in both technological and organizational ways. We must also take into account, that means of cyberterrorism are information wars not only with business rivals, but also between states, what we can see nowadays in interpretation of military conflict in the Ukraine. This dangerous tendency of strengthening of potential influence on people changes in consciousness and psycho, forcing him to sell commercial or state secrets. That's why paying attention to already existing facts of entering in information systems of the RF Arctic regions' enterprises and state institutions, it is necessary always to have successful system of counterterrorism. In one word, management of Russian enterprises must not only foresee the threats, but also provide necessary resources for eliminating of cyberterrorism circumstances.

Current direction in the struggle against extremism is considered to be its *preventative measures in youth culture*. For development and implementation of effective educational-preventative work it is important scientific diagnosticity of reasons for young people's interest to terrorist instruments. Roots of such a motivation are hidden in situ of community development, in common «...social sickness, which deeply touches substance of regulations in society, more and more embracing the younger generation» [5, p. 34]. So, among the participants of extremist organization «Spas» (to which participants are accused according to article 205 RF CC in organization of burst in Moscow Cherkizovsky rink) there were mostly young people with well-defined pseudo-patriotic, misogynistic views and ideas of national intolerance¹⁰.

The whole system of educational establishments on the territory of the RF territorial entities must be under reliable anti-terrorist monitoring. And Northwestern Federal District with its

¹⁰ Moskovsky komsomolec. 9th August, 2007.

higher educational establishments in this means is not the exception. Their graduates more than half will fill local zones of terrorists' interests attraction on the coast of White sea, Barents and Kara seas with strategically important objects. University's life in all means is demanded to minimize possible risks and threats of terrorism in the RFAZ, to form positive socio-cultural atmosphere of northern territories, foreign for realization of any acts of terrorism.

The utmost importance in main sources of terrorism in Russia is current social situation in the Russian society, which keeps everyone in fear and constant exertion, which creates danger to life and health, especially in the periods of political and financial and economic crisis (2014-2015), adoption of sanctions and attempts to isolate Russia. Because of permanent stress, the person begins to feel economic insecurity, mental abnormalities, realization of changeability, disadvantages from normative behavior. This sickness in modern world acquired number of negative forms of that, what the author is supposed to name home, local terrorism. It is dissipation of street crime, inability of law enforcement to increase currently low clearance rate. Nondisclosure of crimes wrenches principle of justice. Here we also include increasing influence of criminal, common social instability, massive substandard living conditions. In this list there is also a fall in the level of industrial activity, loss of working places by most of active population with respective consequences, problem of uncontrolled migration and increase of criminal by migrants.

Migration from former republics of the USSR, which became poor in within a matter of weeks, provided inflow of disadvantaged population for Russia. As a result we see escalation of the conflicts, growth of criminal activity by of the former USSR countries descents. So, noticing positive moments in activity of renovated Ministry of Internal Affairs, President V.V. Putin said that there is still a tendency to growth of crimes made by foreigners — its amount has increased over 10% [10]. Ordinary terrorists sometimes disguise as migrants. Successful registration, alien's residence permit, home and working place are achieved by such people with the help of bureaucrats in registrar offices. As a result the situation in number of Siberian regions is becoming urgent.

Eventually, indigenous population gradually loses their advantages. Aliens got defense and patronage — in society we can see priority maladjustments (aspiration to defend minorities in the prejudice of majority, administrative recourse for displaced persons interests promotion) and appear some inevitable extremist events. Russian President in recent times has paid attention to increase of number of extremist events, not long ago he pointed to the RF Ministry of Internal Affairs, that «it is unwarrantable to close eyes and underestimate extremist pranks from any who», and called into to struggle against display of xenophobia, nationalism, religious struggle and to start preventative measures in youth culture...» [11].

Conclusion

Complex preventative measures against terrorism appears to be an effective instrument of its limitation by following some conceptual ideas.

Firstly, we need beforehand diagnostics of socio-political and economic processes in the regions of the RF development, which are susceptible to inherent instability.

Secondly, must be carried out projects and programs of successful solutions of socio-economic problems of the RFAZ, realization of human rights for dignified socio-cultural environment in frigid conditions of the North.

Thirdly, systematic realization of institution of punishment under criminal law of people, who is accessory to any phase of preparation and performance of acts of terrorism.

Fourthly, it is necessary to increase official liability of state institutions personnel for quality of strategic-analytical actions on caution of terrorist activities.

Fifthly, we must draw a lesson from anti-terrorist practice of modern history of Russia, from serious collapses of counter-terror by forceful institutions of our state. In such a way, any area of public relations development will appear to be the barrier for extremist, terrorist tendencies and pathologic feelings of radical citizens.

Difficulty and inconsistency of cause and effect relationship of such an phenomenon as «terrorism» and of struggle with it, in the context of Russian reality, underline opportuneness of conclusion, that «for Russia is current the system-related defense of its moral history, within which happens negative changes of its character, which opens gateways to life feeling depression with further shot of social extremism» [11, p. 130-132]. We would like to repeat, that this topic demands for further research because of its urgent character, scholarly and practical importance for life-sustaining activity of the whole Russian society, including such a difficult macro region as the Russian Federation Arctic zone.

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Culture, synergy and balance of Northern Russia's strategic management processes



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Abstract. The article briefly marks current problems of culture, synergy and balance of strategic management processes of Northern Russia. Spread of subservient culture, the need to democratize based on the culture of participation and the creation of a balanced system of strategic management is noticed.

ticipation and the creation of a balanced system of strategic management is noticed.

Keywords: *Northern Russia, strategic management, subservient culture, the culture of participation, the synergy, balancing processes*

Introduction

Strategic management of processes of Arctic and Northern Russia development is carried out under current politico-managerial relationship in the country. It is closely connected with development of subservient culture of bureaucracy and necessity of democratization of management system based on culture of participation, synergy, creation of balanced system of consideration for society, based on initiative, democracy and legitimacy.

Bureaucracy, managerial culture

Strategy of Russian Federation Arctic zone development and national security protection for the period up to 2020, programs of territorial development are to a large extent oriented to development of regional community and their adaptation to changing state goals and challenges of exploitation of the North (RFAZ — part of Northern Russia). Centrally established system of state management leads to inconspicuous involvement of government institution in organization of strategic state policy in Northern Russia [1]. It leads to inconspicuous concernment in efficiency of socio-political programs of Russian Arctic zone in northern regions of Russia strategic development realization.

It is worth noticing that high degree of political management centralization results in consolidation in the country of administrative-bureaucratic management system [2]. This system appears in development of mechanisms of subordinative management, reduction of strategic management value, group methods of management decision making and local initiatives. As a result of consolidation of political management subordinative system appeared development of subservient culture of

bureaucratic management. This culture as a pattern of bureaucracy — is an accepted behavior model [3], settled in both strategic management and in innovation and scientific spheres. It at the same time decreased the value of initiative and creativity and increased formalism in problems of innovation development of Northern regions enlisted in entities of RFAZ and in the country as a whole. The pointed problem nowadays must be overviewed as an insider threat of Russian system of democratic management and civil society development together with corruption, economic depression and low social security system of country's population.

An important consequence of formalization of innovation programs development should be considered reduction of communication, integrative and synergetic qualities and characteristics of subsystems of common strategic management system. In particular, mechanisms of intelligibility and aggregation of interests by Arctic population in the process of strengthening of administrative-bureaucratic methods and management culture [4]. As a result of the process of consolidation of subservient management culture became reduction of connecting mechanisms of bureaucratic branches and their efficiency value. As a basis of such a management becomes fear [5; 6; 7]. It is evident, that by pointed reasons of management innovation and scientific spheres will not be able to function and develop, which could lead to reduction of its efficiency.

Grade of the synergy and centeredness of management systems

By the pointed specifics of management, namely existing subordinative-bureaucratic model, subsystems of state management institutes should be overviewed as independent systems weakly interacting with each other, which could lead to reduction of adoption of the whole system of Northern Russia strategic management functioning. When appreciating the level of management systems' synergy, based on cultures of participation or subservient, their substantial controversies should be noticed (view table 1):

Table 1

Level of interaction synergy of management system elements in dependence to the type of management culture

№	Critegia	Types of culture	
		Culture of participation	Subservient culture
	Level of interaction	Parts of system interact as subsystems based on mutual advantage and rivalry, drawing on common values, goals and standards	Parts of system practically don't interact (just officially), they are committed to set from above task. Each part of a system works as independent system and it doesn't provide full-bodied activity of other subsystems

Clarity	Activity of each subsystem is open for estimates and could be examined «externally»	Results of each subsystem's activity could be corrected «from inside», it is difficult to get reliable information
Activity base	Initiative focused on achieving common goals and interests	Headship fright
Legitimacy	Irreproachable posteriority of principle of legality	Possibility to correct system's activity for save of its stability
Level of planning	Planning according to estimate of real environment including all the factors of influence	Planning is based on private goals and attitude of headship, who can be scientifically and ideologically «corrected» and settled down
Sociability	System is open for participation according to the principle of legality	Real values and goals are formed behind closed doors, access to mechanisms of adoption and realization of management decisions are constrained
Attraction of institutional settings to activity of the system	Real time existing and supported by society institutions are attracted	Loyal for headship institutions are attracted or created by the headship
Direction of system's activity	Subsystems operate for system goals and challenges	Each subsystem could have its own goals and challenges, being an independent control elements

Modern systems of interregional political interaction in the Northern Russia and functional interaction of strategic planning establishments nowadays have no obliged mechanisms of joint regional interconnection which in conditions of its «close» activity lead to lost of integrative potential in problems of prospective development of Arctic territories and population. Success of the system of strategic management development in the region is predicated upon balanced functioning and cooperation of number of elements.

For increase of the system structural parts it is important to develop democratic methods of management on federal and regional levels, improve quality of communication mechanisms and interaction between subsystems of strategic management institutions.

Important problem of strategic management system efficiency, including RFAZ, is considered to be negative opportunity of its «conservation» in conditions of socio-political crisis, which could lead to its inability to educe, analyze and react to real inside and outside challenges and threats, including sanctions against Russia. To prevent this threat democratic mechanisms, oriented on initiative, creativity, legitimacy, sociability and clarity, must become the base for strategic management system.



Picture 1. Model of a balanced system of Arctic process development strategic management (author's view)
 URL: <http://vestnik.uapa.ru/ru-ru/issue/2014/01/02/>

Conclusion

It is worth noticing that main foreign principle of strategic management is considered to be the widening of living space of the territory [8], and domestic political principle must become principle of creation and support of balanced system of national interests consideration of the state, society and person, based on initiative, democracy and legitimacy; creation of effective management system based on culture of participation, synergy, activity of persons and civil society. Pointed problems in this article are extensively investigated in monographs and other articles of the author.

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Development of transport networks of the Republic Sakha (Yakutia)



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Abstract. In modern conditions exploration of the Arctic is impossible without development of transport, introduction of new technologies.

The author proposes the creation of a net of transport corridors in the Republic of Sakha (Yakutia) on the basis of existing transport nodes, in particular the port of Tiksi, and the usage of new technologies.

Keywords: *Arctic, transport, transport hub, port Tiksi, technology, trailer, lightweight railway*

Introduction

Main transport provision of industrial and social infrastructure in Arctic currently consists of chief air and marine transport. But in conditions of expansion of production it is required a systematic organisation of connections between arctic, circumpolar territories and inner regions of the country, exploitation of arctic territories by means of development of Northern sea route (NSR) and complex use of all means of transport and creation of effectively working transport networks.

Based on multiannual researches of Northern Russia author suggests to reclaim arctic and surrounding circumpolar territories of the Sakha republic (Yakutia) by the method of creation of transport corridors on the basis of biggest ports, for example Tiksi. Transport networks (arctic hubs), which holistically combine marine, vehicular, railway, river and air transport, will effectively work for speedy exploitation of already existed and search for new mineral deposits in Russian Federation Arctic zone (RFAZ).

Use of innovation technologies on the transport, different means of transport for exploitation in severe conditions of Arctic and Northern Russia: special road-trains, «Light» railway, methods of construction of automobile beds from materials, which are produced during work on diamondiferous and other deposits are suggested.

Demands of the Sakha Republic in development of transport networks

Development of complex transport network (hubs) in the Russian Arctic is overviewed in the context of analysis of the Sakha republic (Yakutia) demands. Mineral resources potential of the republic based on estimates of the RF Ministry of Natural Resources in 2006 is 78,4 trillion rubles. Besides deposits of hydrocarbon crude, deposits of coal with book inventory 14,3 billion tones, iron stones — 5,7 billion tones, precious, rare-earth and other metals, non-metallic natural resources, as well as deposits of fresh, mineral, thermal and industrial groundwaters are explored [1].

During semicentennial preconceptual studies in Yakutia it was founded and approved more than 1500 primary and placer kimberlite deposits, which are concentrated in Yakutia diamantiferous province. Its square is about 900 thousand km² [1]. But it is just a part of great Russian Federation Arctic zone (RFAZ), which includes land territories of Murmansk region, Nenets Autonomous Area, Yamalo-Nenets Autonomous Area, the Chukotka Autonomous District, urban district «Vorkuta» of the Komi republic, 5 settlements (districts) of the Sakha republic (Yakutia), Norilsk and two districts of Krasnoyarsk Krai and seven municipal districts of Arkhangelsk region¹. Nowadays in RFAZ one of the most industrially developed territories is considered to be Western Yakutia, where known reserves of kimberlite deposits spread up to the Arctic Ocean (pic. 1). In the plan of transport networks' construction (Arctic hubs) for exploitation of new territories in Western Yakutia one of the most interesting is considered to be port Tiksi, situated on the shore of similarly named bay near the Lena river estuary, founded 1933. It is considered to be the main base of supply and provision of all the marine cabotage trade in the eastern part of Russian Arctic. Mainly food, manufactures and equipment are imported there. The only current problem of the port is shallowness; it could take only ships with draft not more than five meters. That's why construction of different ways of carrying ships over it is important. 1987 port capacity was 850 thousand tones, to the year 2011 it reduced to 55 thousand tones. At year-end 2012 capacity of the Tiksi branch — FSI «PFM Vostochny» — arranged 358,4 thousand tones [3].

Currently Tiksi port, according to the author's point of view, is considered to be mostly ready for exploitation of Arctic and surrounding northern territories of Yakutia with its finished infrastructure and rather large cargo turn-over. It is recommended to begin implementation of plans in construction of transport corridors in the northern zone of the Russian Federation from it, as being the most devel-

¹ Land territories of the RFAZ. Rider to RF President's decree 2nd of May 2014 №296 «On land territories of the Russian Federation Arctic zone».

oped metallurgical and transport complex for exploitation and transportation of diamondiferous deposits, especially in Western Yakutia.

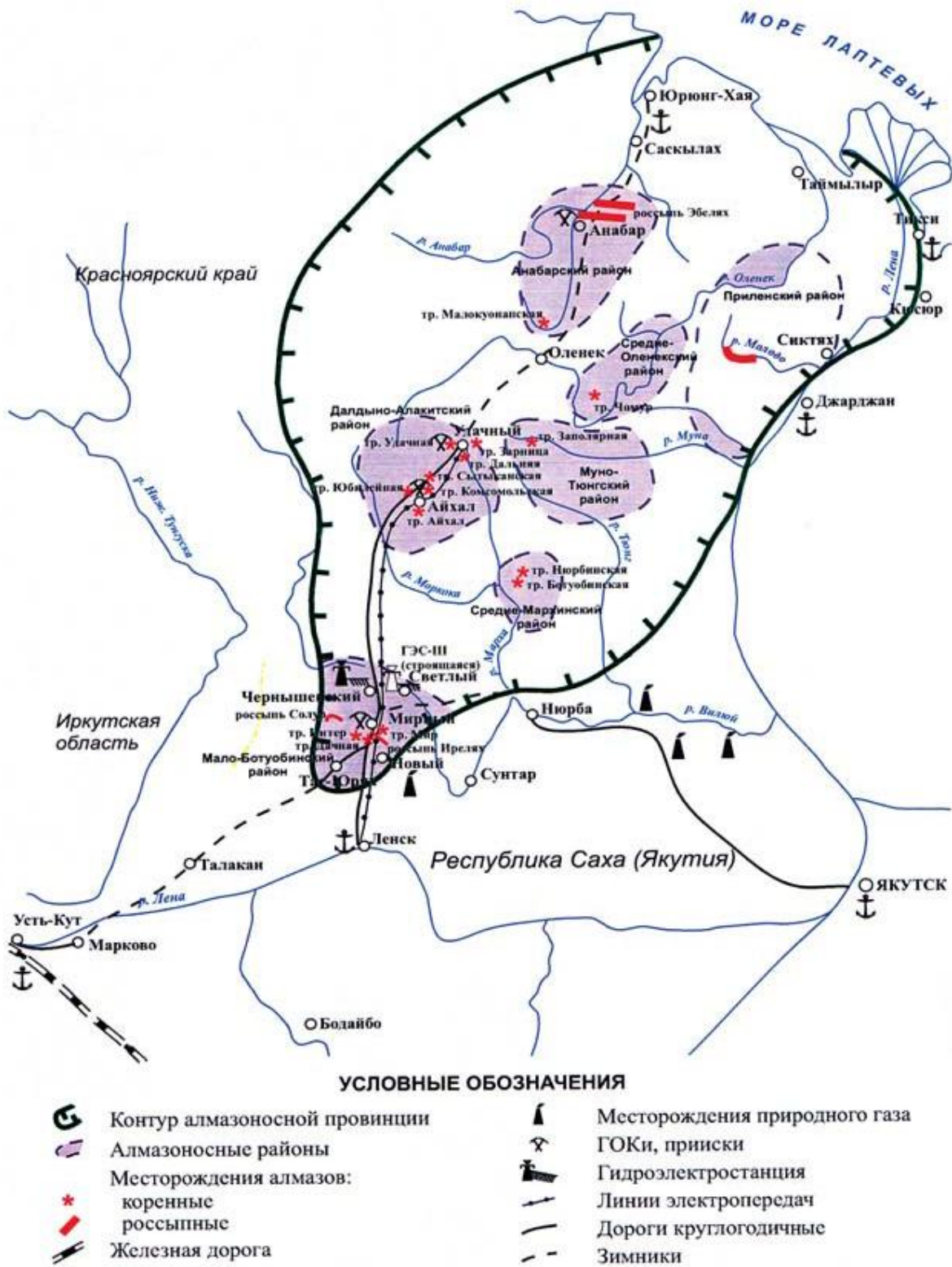


Fig. 1. Map of Western Yakutia deposits

Also a good variant is considered to be use of Yurung-Hai settlement, which nowadays has smaller cargo turn-over, but more comfortable location in comparison with Tiksi. As well as there is no necessity to build the bridge over the Lena river. Creation of modern transport networks corresponds with the needs of economic development.

Use of new technologies on transport in conditions of the Arctic

It is important to understand clearly that for full use of recourse potential of northern territories a complex implementation of new technologies in different branches is necessary. Specifics of works on the territory of high north predetermine the necessity of non-routine decisions' adoption in the sphere of natural resources mining. But speaking about the process of transporting of mined rocks the approach was always traditional. Important issues were and are always high mobility of technique, rather cheap exploitation, possibility of fast release for use and dependable service in conditions of low temperatures. These arrangements determine wide use of automobile and probably for further extension special type of railway transport. It is worth noticing that the main problem of pit-run technique in conditions of kimberlite pits of Yakutia considers to be the fact, that during transporting of minerals there are absolutely different conditions of transport facilities exploitation (head fall of roads in southern pits up to 10%, works on weak soils in northern deposits in conditions of arctic zone with transportation distance from 10 to 150 km with gradient up to 2—3%). After performing number of economic calculations it was founded that the greatest economic effect could be achieved by the use of multilink trains in automobile or railway order [1]. Works on search and development of specialized pit transport vehicles for conditions of the North together with URAN Institute of Mining Affairs are carried out by National academy of sciences in Belorussia, JSC «Belorussian automobile factory», Russian group of diamond-mining companies «ALROSA» and others.

At the initial stage during the period of prospection, when there are no constructed roads, it is possible to use air-cushion transport. Nowadays commercial prototypes ready for batch production are constructed: «Corsar» (3 passenger seats, capacity — 300 kg), ASVP «SK-20» (10 passenger seats, capacity — 1000 kg). Efficiency of usage of suggested ASVP is 1 times cheaper than the helicopter technics. Project of air-cushion cargo platforms construction with capacity 30 (GSPVP-30 with 6 seats for passengers) and 60 tones (GSPVP-60 — 12 passenger seats). Amphibian off roaders «SK-10» are produced by ZAO «Transecology» together with LLC «Stroykomposit».

On subsoils with low carrying power (bog, virgin snow, lack of road, rough wooded country) snow and swamp-going vehicles found its use. Constructions of both Russian and foreign wheeled and tracked running gears of famous enterprises which create swamp-going vehicles, such as: JSC

«Zavolzhsy factory of caterpillar tractors» (ZFCT), JSC Engineering company «Vityaz» (Ishimbay), Sweden company Hägglunds Vehicles, LLC «Altaytransmash-service», Ekaterinburg factory of specialized vehicles EFCM «Continent». Their production is available during carrying out of construction, installation and enablement works, and also as a supporting technics for providing of enterprises' functioning. Different variants of vehicles' performance are possible: for conveyance of persons; flatbed truck; search-and-rescue; fire trier module; driller; adjustable platform-elevator; crane-boom equipment; medical module; location of technical aid; transporter for carriage of long-blade indivisible loads; platform for digger, cisterns and location of other technological equipment of various profiles [1].

Problem of poorly marketable removed kimberlite pits, situated in the northern part of Western Yakutia is that it is not of economic benefit to construct dressing plants near deposits, and the best way in such conditions is considered to be organization of delivery of crude ore over the distance 10-200 km to the place of its processing. In this regard creation of technological transport arteries from automobile and railway roads is suggested, which would penetrate the whole territory of Yakutia diamantiferous province and at the same moment could become the basis of Yakutia transportation corridor. It could let to connect for the West Yakutia region all diamantiferous and other enterprises, and for Russia through Tiksi to connect land part with Northern sea route; through Ust-Kut with western part of Russia; through Yakutsk with eastern part of Russia up to the Pacific Ocean. By that it is important to take into account that nowadays construction of Federal route Ust-Kut—Mirny is conducted and construction of railway Tommot—Yakutsk, and then Yakutsk—Magadan is being finishing.

It is recommended on automobile roads to introduce special multielement road-trains of long length and correspondingly of high capacity, developed by NAS of Belorussia. Currently it is one of the most promising directions of development of cargo, including pit and auto technics. Developers and operating organizations notice its high efficiency during transportation of cargoes in conditions of the RF Arctic zone. In work «Explanation of ways of transport vehicles development for exploitation of Russian northern territories» [1] description of this mean of transport is given and following main advantages of all-wheel drive multielement road-trains are pointed, which were developed by NAS of Belorussia together with URAN Institute of Mining Affairs in comparison with single vehicles with the same capacity:

- a) road-train has productivity 1,5-2 times higher, and production costs of carriage during its appliance reduces over 20-35%;

- b) increase of capacity of road-train and its productivity in comparison with single vehicles is not connected with overloading;
- c) road-train is cheaper;
- d) for last of trail cars and semitrailers less inputs are demanded for construction of support of repair-sponsor base and storage areas in inter-time;
- e) motor dromedary demands less inputs for repair and service support of smaller depreciation;
- f) higher productivity of road-trains determine smaller park;
- g) road-trains effective range;
- h) technological motor roads with low intensity or lack of road public traffic;
- i) motor roads with satisfactory condition of roadway;
- j) by considerable distance of carriage (20—200 km);
- k) by wide annual output of carriage.

Most significantly is that during work on weak soils transport axis pressure on ground is important. Within this framework use of road-trains is more preferable than of hard dumpers with the same capacity. Because during exploitation of developed road-train turning is not demanded, it means that shuttle principle is provided, its length is not considered to be a serious problem. It is worth noticing that in Arctic conditions transport vehicles are used in different conditions: auto run in pit under definite gradient changes for acclinal after running from it. In different parts different engine out-of-work is needed.

More fully-featured exploitation of northern territories is possible second-stage during construction and exploitation of railways. But use of «light» railways is more preferable. It is determined by the fact that during exploitation of usual railway in Arctic conditions it is not always possible to provide cargo turn-over, which could use it effectively, and reloading from one mean of transport to another is problematic. In suggested variant of «light» railway it is thought to use container type of carriage. «Lightweight» type supposes construction of railway based on automobile, which is built according to distance of transportation and volume of carriage. Its implementation is possible according to distance of transportation in one or two direction variant with all technological structures but in easier way. Construction of different structures and transport vehicles for normal railway could be defer to a later time when needed or it could not be needed during exploitation on temporary shares to definite deposits, where road-trains could be used.

Availability of railways to certain pits is necessary only during the period of its exploitation. And then, because of small ore reserves and lack of other deposits in this direction ways could be dismantled and moved to another places, thus to any other objects. Cost of tracks construction for special «lightweight» railway will be significantly lower because of reduces of materials consumption and level of effort (rails, cross-ties, height of roadbed, etc.). The suggested form let to use main

advantages of earlier used light narrow-gage railroads (rate of construction, effectiveness) and to liquidate its main disadvantage — necessity of reloading when run-off from one narrow gage line to normal with width 1520 mm.

«Lightweight» railway involves use of lightweight rolling equipment (wagons and locomotives). Speaking about use of wagons the solution could be use of classic and lightweight high-sided wagons, which are used on a daily basis in public and non-public tracks by various enterprises. As a lightweight locomotive traction could be used locomotive TGM4BL (mechanical-hydraulic drive locomotive with 610 kilowatt) with weight 68 tones or superlight TEM31M (electric motor drive locomotive with 420 kilowatt) with weight just 46 tones. The above overviewed locomotives are proposed for switching and export operations and are mostly used by industrial enterprises. For moving of trains through «arteries» it is viable to use electric propulsion locomotive TEM31M, which efficiency factor in comparison with allhydraulic drive at the speed of 10 km/h is significantly higher. For moving of trains over short distances (formation of trains, export works near pits) more proper is TGM4BL.

Use of container principle of transport arteries could let to provide its exploitation on all the transport vehicles — automobile, railway, air, river and sea. Containers are of different capacity, which could allow the customer to choose the most proper variant for him. In our variant it is 20-25 tones. To the main advantages of container carriage we identify:

- I. Flexibility of containers. Standard sizes of containers let to transport the carriage independent from bulks, sizes and weight by practically each means of transport — railway, marine or air.
- II. Safety of cargo. Container is a kind of safe, which guarantees safety of inlying cargo. Inherent vise during such carriage is minimal.
- III. Speed and convenience. Cargo carriage in containers — is a fast and comfortable way to transport cargo over long distances.
- IV. Cost effectiveness. At the cost of the fact that containers could be loaded with great amount of cargo, filling the whole container, expenses for carriage are saved significantly. In this turn reduction of transport and logistic expenses will increase profitability of cargo, and it could lead to profit markup.

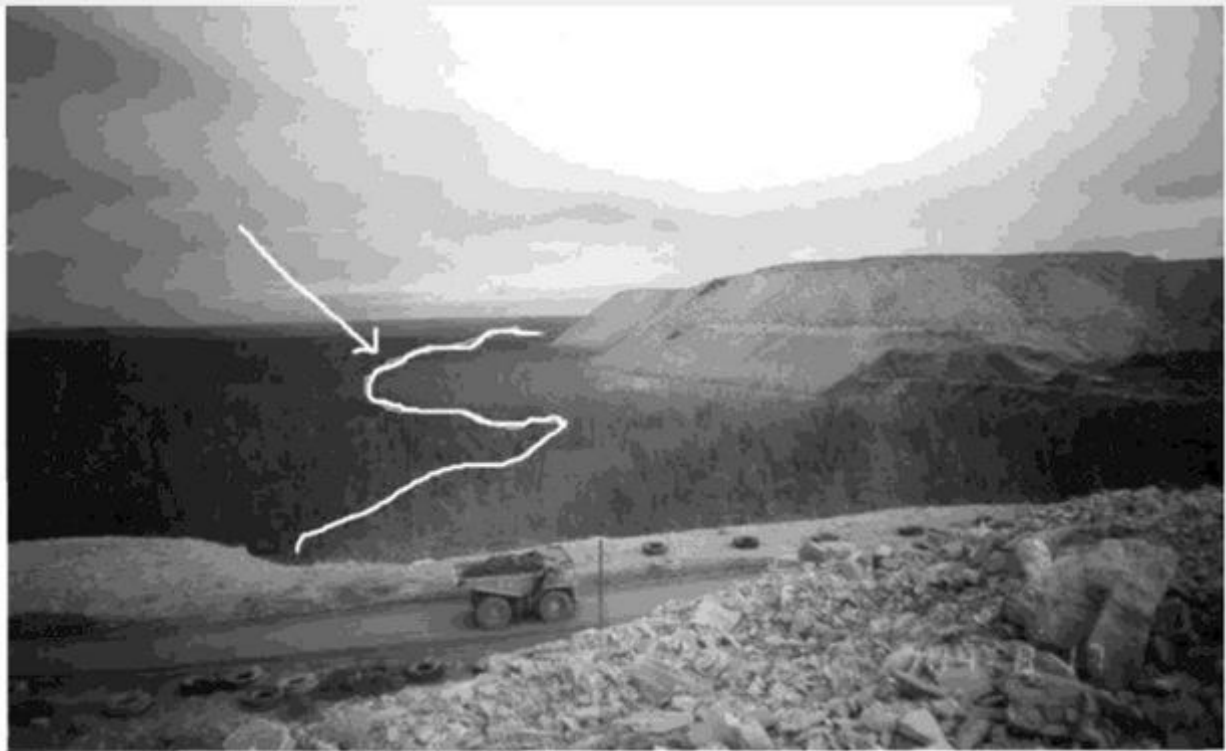
On picture 2 you can see the suggested network of «lightweight» railways, which connects the biggest populated localities of Western Yakutia: Yakutsk—Mirny—Ust—Kut—Udachniy—Tiksi (or Yurung-Haiya) and first of all Mirny—Udachniy. When anthropogenic terrain variation

hydrological regime of grounds is troubled and bog formation of contiguous to receiving pits territories takes place. Except bog formation we can notice mechanic move of sole clay fraction, which appeared on the spot of soil by water and air flows.



Pic. 2. Suggested network of «lightweight» railways

Comprising wide range of macro- and micro-elements, high concentrations of toxicant salts and substrates of refuses negatively influence the state of natural soil and vegetation cover of boarding with refuses territories, forming wide bands of «dead forest», which edges refuse piles (Pic. 3) [4].



Pic. 3. «Dead forest», formed near Western refuse of Udachninsk mining and concentration complex (line shows border of «dead forest»)

As a result of pits' composition of rocks researches it was founded that materials, which were recovered in between during development of diamondiferous deposits of Western Yakutia, based in refuses and with volume over hundreds of millions m^3 , are suitable for use during construction of roads. For kimberlite formations wide variant composition is characteristic, which eventually strongly influences during both projecting and exploitation of the object [5] (pic. 4). There is no strong border between different layers in refuse, but the common structure of kimberlite allows to use it for creation of foundation bed of roads and other objects, as it doesn't contradict to construction standards and regulations 2.05.07-91 «Industrial vehicles» and industry building code 84-89 «Research, designing and construction of automobile roads in regions of perpetually frozen soil». This method not only positively influences from the economic point of view, but also leads to reduction of negative influence of works on environment. In future this method could fully exclude creation of refuses. By that, material, removed from the pit will be carried by specialized road-trains of Belorussian

RAS directly to the constructed part of the road. But hereby, machine builders must additionally develop and implement complexes for dismantling of refuses, crushing of oversize, as well as special transport and car loading facilities.



Fig. 4. Schematic geological sheet of Mir deposit

Author suggests creation of transport networks on the base of already existed settlements in the Northern territories, which would provide markup of the region's raw materials source and additional workplaces. Potential partners of this program could be following establishments: Russian group of diamond-mining companies «ALROSA», JSC «Russian railroads», JSC «Corporation of Middle Urals development», JSC Corporation «Ural Industrial — Ural Polar», JSC «Belorussian automobile factory», URAN Institute of Mining Affairs, Federal Government Budgetary Science RAS Institute of Comprehensive Exploitation of Mineral Resources, National Belorussian Academy of Sciences, Ural State University of Lines of Communications, JSC «Zavolzhsy Crawler Vehicle Plant», JSC Engineering company «Vityaz» (Ishimbay), LLC «Altaytransmash-Service», Ekaterinburg factory of specialized machines «Continent» and others.

Rigth with the first transport network in Tiksi, which will connect in future marine, railway, automobile, river and air means of transport, which possesses nowadays the most favorable conditions, including fact, that there will be created and implemented special road-trains, «lightweight» railway, methods of construction of automobile beds from materials, winning in between during works on diamondiferous deposits, practise will be attained and mining-industrial equipment, which could let to continue research and use of Russian Federation Arctic territories. During further work it is necessary to make economic assessment of suggested projects and determine volume of needed investments and payback period.

Conclusion

In such a way, the idea of multielement transport use on weak soils of remoted kimberlite deposits correlates with necessity in the RF of transport corridors creation which will allow to connect the Northern sea route with continent transport network up to main Trans-Siberian railway and is based on a number of factors speaking about the Sakha Republic (Yakutia).

- I. Necessity of development of remote poor-commercial kimberlite and other deposits, which are situated in Western Yakutia up to the Arctic Ocean.
- II. Necessity of transportation of mined rock from pits, which are situated in the Arctic to working enriching factories.
- III. Demands in technological roads for pits under definite succession of their construction in Arctic direction, which could possess the base for creation of Yakutia transport corridor, which connects the Northern sea route with main Trans-Siberian railway (there is no the same possible opportunity in the RF).
- IV. Presence of pit heaps with great volumes of mined rocks, which are situated near enriching factories and which can be used for construction of road bed of automobile and railway tracks.
- V. Possibility to transport mined rocks from pit heaps with loading of road-trains backwards from enriching factories to pits, in other words to any place where construction of road bed takes place.
- VI. Development of drilling-and-blasting as well as crushing-and-sorting complexes for pit heaps' dismantlement and getting from them ballasts of different fraction.
- VII. Use of multielement road-trains of the Belorussian Republic, which have the opportunity to move wheels within wheels and facility which prevents the possibility of «stowage» of road-train.
- VIII. Presence in the Western Yakutia of metallurgical complex JSC «ALROSA», which is situated nearest in Russia to the Arctic zone, and presence of needful deposits up to the Arctic Ocean, which are available for exploitation on behalf of JSC «ALROSA» and Russia.
- IX. Possibility to use state and private investments as well as state-private partnership.
- X. Substantiation, development and possible production of special waggons by JSC «BeIAz», as well as presence in Arctic conditions and surrounding territories of the RF exploitation of «lightweight» railway with organizing of container carriage.

Nowadays northern regions of our country are considered to be underexplored in comparison with other territories in the RF. Specifics of works demand for changes in traditional ap-

proaches in different challenges. And just complex use of world scientists' achievements as well as positive practice of foreign countries on implementation of new methods and technologies could become perfect allies in problem of the Far North exploitation.

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Eastern Yakutia: demographic processes in the Post Soviet Period

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Abstract. This article reflects the statistical analysis of all demographic indexes of East Yakutia for the post-Soviet period (1989—2010), which shows its deterioration. Also depopulation occurred. However, despite negative processes, there are prerequisites for recovery of demographic potential. Optimism is connected with megaproject implementation, which can revive it. In 2007 the investment project “Complex Development of the Tomponsky Mining Region” was adopted for realization in the republic.

Keywords: *East Yakutia, region, demographic processes, birth rate, mortality, natural increase, megaproject*

Short characteristics of the region

Under East Yakutia authors of the article mean territorial community of Oimyakon, Tompon and Ust-Maisk municipal districts of the Sakha Republic (Yakutia), which is emphasized as inter-republican socio-economic region since 1981 [1, p.26]. When defining economic regions in Russia, analysis of different region-forming factors are traditionally made the cornerstone. Leading of these factors is considered to be territorial public division of labour, which determines differentiation of particular region’s economy in different types of industrial activity as well as region-forming activity of primary development of particular branches of industry and agriculture (and favorable conditions), economic fixation to cities and other centers, communication lines, etc. It is evident, that other factors are also overviewed: natural resources and conditions, demographic, transport and other.

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Socio-economic district occupies an area of 323,1 thousand square km. or 10,5% of the republic's territory. Population to the beginning of 2013 — 30,9 thousand people. It borders in the North with Morsk and Verhojansk regions, in the West with Kobiyask, Namsk, Tattinsk, Churapchinsky and Amginsky regions, in the South with Aldansk region and in the East with the Khabarovsk Territory and the Magadan Region.



Fig. 1. East Yakutia at the map of the Sakha Republic (Yakutia)

The relief is everywhere mountain with deeply incut river valleys, except southern part of Tompon district, where relief of Prialdnsk plain is lowland. The development of productive forces of the region in 30-40s of the last century gave an impulse to presence of rich mineral raw material base, especially of gold. Here, in the Soviet period were founded rich deposits of placer and hard-rock gold mine, which became the base of gold mining industry — the leading industry of the

region. Moreover, rich deposits of coal, stannum, complex ores, stibium, wolframite and other natural resources are situated in the region. According to geologists' estimates, territory of the region is considered to be promising for finding of raw hydrocarbon deposits.

Economic-geographical position of the region (pic. 1) in reference to source of raw materials and energy, inhabited localities, marketing outlets and transport networks have an adverse impact on socio-economic development and is notable for disadvantaged position to the center of republic — city of Yakutsk. The region is situated rather far from the centre of republic and most of inhabited localities of the region are hardly accessible for their regional centers, which is considered to be constraining factor for successful development of industrial economy.

The East Yakutia itself by the similarity of regional problems hasn't been formed yet in the single socio-economic complex, which is influenced by lack of regional center ready to tie up all the external environment to it. Moreover, Ust-Maisk district is not yet connected with two adjacent districts with the traffic road, there is no transport system of the region, urban skeleton hasn't formed yet (there is no road, which connect the transport network of Ust-Maisk district with federal road «Kolyma»). The existed federal speedway «Kolyma» connects Handiga and Ust-Nera (regional centers), ventholes the region not only to the regional center — Yakutsk, but also to the Magadan region. Nowadays the republic road «Aldan» is being constructed with length over 310 km., which will connect the regional center of Handiga with working settlement Eldikan in Ust-Maisk district through the regional center Ust-Maya. After the construction of this route the region will attain the backbone of routes, which will connect all three administrative regions as unified whole. Nowadays East Yakutia is removed from not only the center of republic, but also from both Russian and world economic and financial centers. It has the northern position at the Asian continent as has neither direct yield of neighbor states nor economic connections with the Magadan region. The region is characterized with presence of rough natural-climate conditions for development of agriculture, underdevelopment of economic downstream, dependence of region's economy from supplies of ready manufactured goods and materials for its preparation.

Main problems of the region, which cramp an active economic development of the region, are following.

- I. Depopulation because of constrictive reproductivity (mortality is higher than birth rate, migration outflow of population). Demographic potential is practically over.
- II. Significant depletion quality of mineral-raw basis of stream-gold because of many-years intensive processing. The basis demands for specification because its doesn't answer

purposes of modern economics. Primary deposits of gold have begun to be exploited rather recently.

- III. Transport inaccessibility of many deposits and populated localities.
- IV. Weak development of energetics and electricity supply network of administrative districts.
- V. Necessity of great investments in development of rich naive metalliferous deposits, which are no in municipal districts. Development of the territory is possible only as the result of complex exploitation of natural resources by program methods based on state-private partnership with multibillion investments.

Prospects of socio-economic development of the region are connected with comprehensive solution of overviewed problems in demography, energetics, transport access and social development, the main of which is considered to be the problem of demography. It is well-known that population, labour resources in particular, is considered to be the source of social development and economic progress. That's why in this article the main emphasis of the article is on statistic analysis of demographic processes, which happen in east socio-economic region in the Post-soviet period of development.

Analysis of the demographic situation

Formation of the East Yakutia population began in 30s of the last century from exploitation of auriferous placer and coal deposits firstly on the territory of Ust-Maisk and later of other districts of the region, as well as active agricultural reclamation. With development of productive forces the demographic potential of the region also increased. The maximum population was by the end of the Soviet period of development. In population census of 1989 the population was 76,2 thousand people and was 7% of the whole population in Yakutia. Potential of the population increased mostly by means of migrants (who mostly came into gold mining industry, energetics and infrastructure branches). The population was concentrated in 14 urban-type settlements, where lived 68,5% of the whole population in the region and 50 rural settlements.

During post-perestroika east Yakutia is characterized with low estimates not only in socio-economic development, but also in population density of particular regions and development of demographic processes.

Population density of each of region's districts was 0,1 people per square km, which was lower than through the republic (0,3 people/km²). The modern demographic situation in the region was influenced by changes, which took place in economic and social life in the country as a whole, as well as in the Sakha republic (Yakutia). The most important tendency of the region's demographic

development during post-perestroika period is considered to be reduction of the common population size (in 45,3 thousand people).

From the 90s, with dissolution of the Soviet Union and formation of new sovereign States on the territory of the former USSR, economic and social market reforms, which took place in the country, as well as difficulties with receiving of loans for gold-mining, recession of production level, persistent payment arrearages and instability of government contracts let to the fact, that the most of core companies of the region in rural settlements faced critical situation. This ultimately influenced mass exodus of population outwards the Yakutia as well as redistribution of the population domestically [2, p. 158].

To the beginning of 2013 the population sank to 30,9 thousand people, that means that 60% of pre-perestroika population left the region, which includes more than 61% of townsmen and more than one-fourth of all countrymen. Reduction of population through the urban area in absolute terms advanced the reduction of countryside population over 18,7 thousand people (table 1).

Table 1

Dynamics of east Yakutia population size during the period of 1989-2013, thousand people¹

Years	whole population				urban population				countryside population			
	Oymyakonsk	Tomponsk	Ust-Maisk	East Yakutia	Oymyakonsk	Tomponsk	Ust-maisk	East Yakutia	Oymyakonsk	Tomponsk	Ust-maisk	East Yakutia
1989	32,3	23	20,9	76,2	22,1	13,3	16,8	52,1	10,3	9,7	4,1	24,1
2002	14,7	15,3	11,6	41,6	10,9	9,2	8,7	28,8	3,8	6,2	2,8	12,8
2010	10,1	14,1	8,6	32,8	7	8,3	6,2	21,5	3,1	5,8	2,4	11,3
2013	9,3	13,7	7,9	30,9	6,3	8,1	5,7	20,1	2,9	5,6	2,2	10,8
Difference between 1989 and 2013	23,0	9,3	13,0	45,3	15,8	5,2	11,1	32,0	7,4	4,1	1,9	13,3
B %	29	60	38	41	29	61	34	39	29	58	54	45

¹ Results of the all-Soviet population census January, 12, 1989. Statsbornik no 2. Yakutsk: Yakutsk statistics management, 1990, 81 p.; On short results of all-Russian population census of 2010 in the Sakha Republic (Yakutia) (in October, 14, 2010). Yakutsk: TOFS GS in SR (Y), 2012, 44 p.; population size of the Sakha Republic (Yakutia) to January, 1st, 2013. Statistics digest no 102/194. Yakutsk, TOFS GS SR (Y), 2013, 78 p.

Oymyakonsk district has mostly suffered from the migration outflow; nowadays here live less than one third of the population which inhabited this district in 1989, more than 70% of population has both left urban and countryside areas. 62% of post-perestroika population has left Ust-Maisk district, two third of which were citizens and more than half of countryside population. The Tompon district has left 40% of the population, mostly countryside area (more than 40% of all population live in the countryside); in the Ust-Maisk countryside area live just 28% of the population. It is worth noticing that in 1989 32% of the whole population of the region lived in the countryside, and to the beginning of 2013 — 35%.

Also such demographic estimates as birth rate, mortality and natural increase also influence the population census. During the years of perestroika the characteristic phenomenon in demographic processes was reduction of birth rate, increase of mortality and as the result low natural increase. The common result of population size was mainly influenced by migration outflow of the population, mostly of active and efficient population, who was ready to production and in the point of physical activity.

The indicative tendency of the whole post-Soviet development (1990—2010) for the region became reduction of the birth rate general coefficient for 4,5% (for republic — 2,6%), in the urban area (reduction 3,7%), in the countryside (5,9%). The biggest reduction was noticed in the countryside area of the Tomponsk district (10,1%), and the smallest in the Oymyakonsk district (less than 2,5%) (table 2), and as a whole the natural increase became negative, except countryside area.

Table 2

Common coefficients of birth rate, mortality and natural increase of population in east Yakutia, ‰²

	number of born for 1000 of population				
	1990	1995	2000	2005	2010
Common in republic	19,4	15	13	14,3	16,8
east Yakutia	17	11,5	10,7	10	12,5
urban population in the Sakha republic (Yakutia)	16,4	12,7	12,3	13,8	16,5
east Yakutia	15,4	10,8	10,3	9,4	11,7
countryside population	25,5	20	16,1	15,1	17,4
east Yakutia	20,1	13	11,9	11,5	14,2

² Demographic annual of the Sakha republic (Yakutia). 2011: coll. works / Sakha (Yakutia), 2011, 198 p.

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	number of dead for 1000 of population				
common in republic	6,7	9,8	9,7	10,2	9,8
east Yakutia	5,6	9,9	11,2	11,9	14,3
urban population in the Sakha republic (Yakutia)	6	9	9	10	9,9
east Yakutia	4,7	10,4	11,9	12,4	15,2
countryside population	8	9,6	9,5	10,3	9,6
east Yakutia	7,8	8,7	10,1	11,4	12,4
	natural increase for 1000 of population				
common in republic	12,7	5,5	4	4,1	7
east Yakutia	11,3	1,6	-0,6	-1,9	-1,8
urban population in the Sakha republic (Yakutia)	10,4	3,7	3,3	3,8	6,6
east Yakutia	10,7	0,4	-1,6	-3,0	-3,5
countryside population	17,5	10,4	6,6	4,8	7,8
east Yakutia	12,3	4,3	1,8	0,1	1,8

Here it is worth noticing that the level of birth rate is usually influenced by population makeup according to sex and age. Despite the high level of birth rate in the Yakutia countryside, birth rate in the region declines because of high outflow of youth from the countryside, as well as the fact that the population looks to quasi-plant families. Except these reasons, the level of birth rate was influenced by decline of economic and social standing. For reproduction it is considered to be a negative process which influences the reduction of the birth rate average level.

Mortality in the region, as well as in the republic, is increasing, during the years of perestroika the level has increased in comparison with 1990 to 2,6 times, just as in the republic to 1,5 times (table 2). In the urban area of the region the coefficient of mortality during the same period has increased to 3,3, times, and in the countryside area 0 to 1,6 times.

When overviewing this process in territorial section, increase of mortality in 2010 in comparison with 1990 is noticed in all the districts of the region. Coefficient of mortality in Ust-Maisk district was higher than 11,6%, including in the urban area — 13,1% and the countryside area — 6,8%.

Such high level of mortality is caused by not only changes in age and sex structure (aging of population takes place), but also by changes in socio-political sphere. Common coefficients of mortality in urban area of the region were much higher than in countryside. The highest coefficient of mortality was noticed in Ust-Maisk district in 2010 — 18,4%, which grew in comparison to 1990 over

3,5 times and has overshoot the coefficient of the republic (in 1,8 times) and of the region itself. The lower coefficient of mortality was characteristic for the territory of the Tomponsk district — 13%, which had the common coefficient of mortality since 1990 has increased 2,7 times. Indexes of common mortality coefficient in the countryside area in 1990 was 7,8%, and in 2010 — 12,4%, that means that during the twenty years the increase of the coefficient appeared 1,6 times. The common coefficient has mostly increased during these years in Ust-Maisk district, it has increased 1,8 times and constituted 15,5%, which is higher than the average in republic in 1,6 times. Increase of mortality level in the region during the post-Soviet period is connected with decline of socio-economic standing of families: lack of money, no food, appreciation of food, high unemployment, transport inaccessibility of regional centers to many settlements (table 3). In such a way, decline of common birth rate coefficients, and increase of mortality coefficients during the post-Soviet period led to degradation of common coefficient of natural increase. During the last decade balance of natural increase became negative in the region — depopulation is evident.

Table 3

Dynamics of mortality coefficients ordering in east Yakutia (in ‰)³

	whole		urban area		countryside area	
	SR (Y)	east Yakutia	SR (Y)	east Yakutia	SR (Y)	east Yakutia
1990	6,7	5,6	6	4,7	8	7,8
1995	9,8	9,9	9	10,4	9,6	8,7
2000	9,7	11,2	9	11,9	9,5	10,1
2005	10,2	11,9	10	12,4	10,3	11,4
2010	9,8	14,3	9,9	15,2	9,6	12,4

Situation with infant mortality has improved in the dynamic during the post-Soviet period, it has fallen in the region during this period practically 5 times. Infant mortality of the population in east Yakutia during 1990—2000 was at lower level, than in the republic, and after 2000 has become equal to average indexes of the republic, but as a whole, in the urban and countryside areas of the region the tendency to decrease of the coefficient of infant mortality is synchronous to the processes in the republic in common.

Development and successful adoption of measures on reduction of population mortality is possible just upon conditions of its reasons knowledge. That's why during development of programs in

³ The Sakha Republic (Yakutia) demographic annual. 2011, collected works Sakha (Yakutia), Yakutsk, 2011, 198 p.

preventative measures and reduction of illnesses, mortality and increase of average lifetime it is important to judge from analysis of the structure, level and dynamics of population mortality reasons.

In the whole republic as well as in republic's regions among the main reasons of mortality in 2010 the first place was taken by circulatory diseases (mortality coefficient for 100000 people: republic — 469,5; Oymyakonsk district — 796,7 (1,7 times more than the average republic index); Tomponsk district — 636,3 and Ust-Maisk district — 770,3 people). Accident mortality, toxication and infractions is at the second place (195,4; 255,7; 155,5; 413,9 for 100000 of population correspondingly). By that, this index is higher in Ust-Maisk district over 2 times. Cancer mortality is at the third place (120,7; 78,7; 162,6; 184 for 100000 of population correspondingly) and reflects wide range of values: 2010 minimum of mortality coefficient was in Oymyakonsk district (less than the average republic 1,5 times), and maximum was in Ust-Maisk district (184 people), which is higher the average republic level 1,5 times. In the republic during the post-Soviet period the cancer mortality index was about 120 deaths among 100000 people, and the Ust-Maisk district during this period the tendency to situation decline is evident, number of deaths since 1990 (73,9 people) grew to 184 people (maximum, which speaks about either decline of ecological situation or wrong circumstances with decease prevention in the district's health systems).

The formation of population, its size, birth rate and natural increase is mostly influenced by population matrimonial state. Judging statistics, during the post-Soviet period number of marriages and divorces has declined in common. The reasons could be both common reduction of region's population and creation of families without marriage.

As a whole, the number of marriages is higher than the number of divorces, but in 2011 number of marriages in Oymyakonsk district dropped 2,5 times, of divorces — 2,6 times; in Tomponsk district — 2,2 times and divorces — 1,5 times; in Ust-Maisk — marriages 2,7 times and divorces 2,2 times correspondingly. During the last decade of the last century the situation has mostly declined; the reason for it is considered to be the beginning socio-economic crisis in the country, impoverishment, population wealth divide, grow of unemployment, great migration (to foreign countries as well as inside the republic), population and mostly youth turnaround speaking about marriages.

Migration has always played the most important role in population size of east Yakutia. During the Soviet period balance of migration was positive, together with high birth rate it gave positive natural increase and the population usually grew. Since perestroika balance of migration has practically become negative, significantly lower number of people came to the region. During 1991-2011 more than 33 thousand people came to the region, and more than 63 thousand people

migrated. By that, the main migration outflow took place during the last decade of the last century. During this decade more than 70% of all the come population migrated. Since 2000 outflow of migrants became significantly lower, but number of arrived in the region population is lower, than those who migrate.

Nowadays the biggest populous district is considered to be Tomponsk district. According to national census in 2010 here lived 43% of the region's population (more than 14 thousand people), in Oymyakonsk district — 31% (more than 10 thousand people) and in Ust-Maisk — 26% (more than 8 thousand people).

Till current times the region is considered to be the most urbanized territory of Yakutia. Share of urban population in all three districts in comparison with 1989 has lowered insignificantly, but it is still higher than through the whole republic (in urban area live 65% or 20,1 thousand people and in the countryside area — 35% or 10,8 thousand people).

Ust-Maisk district is considered to be the most population in the urban area. Urban population here is 72%, in Oymyakonsk district — 69% and in Tomponsk — 59%. Since 90s growth of urban population was more intensive than the countryside one. The reason for it can be considered to be influence of Russian national economy crisis in the 90s of the last century (in the region — reduction of industrial production, liquidation of core companies and major budget revenue generating enterprises, migration from the republic, crisis of gold mining industry). Countryside population in the region declines slower, what is connected with lower social mobility and domination of indigenous peoples in the countryside (the Yakuts, the Evenkis and the Evens), who prefer to deal with native activities: cattle breeding, horse herd farming and deer farming.

Analysis of population sex composition is important from the point of view of marriage and creation of population family structure. Over time (1989—2010) region's population sex composition has changed a bit as a whole, its decline took place. When 1989 everywhere (in both urban and countryside areas) men population dominated over women one (89 women for 100 men), according to population census 2010 women population began to dominate over men in all the countryside of east Yakutia (102—105 women for 100 men). Domination of men population in the Soviet period is caused by domination of particular branch of industry — coal and gold-mining and connected with them, of auxiliary productions, where mostly men worked, and after beginning of perestroika because of reduction of working places in these branches migration of population happened, mostly of men population out of bounds of Yakutia.

In Russia in state statistics it is accepted to emphasize three main aging groups, who has different economic importance and to whom different demographic and socio-economic politics is ap-

plied. In region's population age composition changes also took place, which reflect demographic obsolescence (increase of proportion of population of old age). Such a situation happens because of reduction of birth and increase of life expectancy. According to international criteria population is considered to be old when number of people aging 65 years and older in the whole population is over 7%. At an average the world population age structure looks in such a way: share of children — 34%, adults — 58% and old — 8%. According to national census of 2010 in the Russian Federation number of children younger than 16 years old is 16,2%, of working age population — 61,6% and of retired persons (men over 60 and women over 55 years old) — 22,2%. That means that age structure of population in Russia refers to the first type of production and reflects aging of population. Nowadays in east Yakutia population structure of three age groups is following: children — 17,7%, adults — 67,8% and old — 14,5% (RPC of 2010), while as in the Sakha Republic (Yakutia): 23,2%, 64% and 12,6% correspondingly. East Yakutia population age structure is characterized with low percent of children and rather high percent of retired persons. Such an aging structure is worse than in the republic in average, but a little bit better than in the whole RF. Demographic aging of population has far-reaching consequences and tells about problems with birth rate and death of population, common increase of population size due to natural increase and deficit of labor resources.

By ethnic composition the base of population compose two nationalities: the Russians and the Yakuts. Their balance differs through regions but Russian population dominates (Ust-Maisk — 57%, Oymyakonsk — 52% and Tomponsk — 44%), though their proportion during the whole post-Soviet period has evident tendency to reduction (in the Tomponsk district Russian population shortened 13%, Oymyakonsk — 11 and Ust-Maisk — 7%). Density of Ukrainian population decrease, who had rather big share (more than 10) among all the districts of the region; after breakup of the Soviet Union many of them went to their motherland, though share of them among the whole population is less than 6%. Since 1989 number of the Yakuts has increased in all the districts: in Oymyakonsk from 11 to 29%, in Tomponsk — from 22 to 38 and in Ust-Maisk from 7 to 9%⁴. Density of small indigoes peoples (the Evenkis and the Evens) has increased greatly. In Ust-Maisk number of the Evenkis has increased from 9 to 23%, in Oymyakonsk and Tomponsk districts number of the Evens became significant — 4 and 7% correspondingly. Buryats live in Oymyakonsk district (1%), in other districts they are not represented. The Tartars live in all the districts and

⁴ the Sakha Republic (Yakutia) statistic annual for 2011 [Digital recourse]. Yakutsk, TOFS GS, 2012 — 1 disk

constitute 1% of the population. Other nationalities are from 5 to 6% from the density of the nationalities.

Population size is directly depends on such processes as birth rate, death and migration, which in their turn depend on not only socio-economic living conditions, but also on territories and districts for living (urban and countryside), because annually people who live in a definite territory have their own demographic behavior (unspoken historically formed social norms which determine for example age of marriage, preferences of number of children, moral values, attitude to lifes, etc.

Conclusion

Nowadays we can confirm that to the beginning of the second part of the 21st century districts of east Yakutia have practically lost their demographic potential. Human population of east Yakutia is in great crisis and can't get out of it all alone. But, inspire of some negative processes, there are backgrounds for reconstruction of demographic potential. Optimism is connected with mega projects, who will be able to revive the potential. In 2007 the republic adopted the investment project for realization «Complex development of the Tomponsk metallurgical district», which provides involvement of gray volumes of labor resources for works on providing of industrial and infrastructure objects. The attracted for realization of the investment project labor force (local people as well as people from other regions who meet qualification requirements) must relieve the demographic situation and lower the labor market tension. Together with great residential development (comfortable apartments, but not barracks and hostels) there is a hope that many non-resident specialists will stay in the Tomponsk district and will increase the demographic potential of east Yakutia.

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Positioning of Russia in the Arctic: problem aspects



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Abstract. The issues of the present situation in the Arctic, Arctic challenges and features of the economic development are analyzed. Basis for the development of the Arctic economy model, the need for organizational

changes effective management of the Russian Federation Arctic zone are identified.

Keywords: *Arctic, the Arctic economy model, environmentally responsible business model, Arctic Federal district, administration, the principle of accuracy, the principle of planning redundancy*

Introduction

This article overviews problematic aspects of the Russian Arctic (the Russian Federation Arctic zone) positioning in the context of the changing world taking into account climatic specificity of economic management in conditions of Far north and geopolitical situation. Problems of integrated space organization in the economics and management by means of Arctic federal district creation are noticed. Backgrounds for development of the Arctic economy model taking into account environmentally responsible business model as well as principles of planning — accuracy, redundancy and personal responsibility are under investigation.

Arctic challenges and features of the economic development

During last five years the mean of Arctic has grown greatly in terms of world geopolitical and geoeconomic processes because of global climate changes and opening opportunities of natural resources and communications use. Number of researchers [1, 2] pay attention to potential significance of the Arctic among the world correlation of forces as for established fact. Right Arctic will show, who will be leaders in the XXIst century in the global society when using Arctic resources. Arctic is considered to be the key to doors of the whole future world, the key which is rather peculiar and unfriendly to people speaking about climate conditions.

Russia faces not only economic challenges of its geographical neighbors but also of geopolitical pretensions of other players on the international arena, which are interested in Arctic resources, which could lead to rather deplorable consequences for our country. In particular, China, South Korea, Japan and other countries could ask for access to Arctic natural resources according

to international norms based on current UN Law of the Sea Convention (1982). Russia could lose here substantial part of raw hydrocarbon deposits, which under conditions of depletion of energy resources will lead in the future to loss of the status of energy empire.

Might of each state is determined by mainly economic basis [K.Marks], which in particular is confirmed by rampant development of China, which concentrated on mostly economics and in a rather short period of time became «the world workshop». Russia doesn't try to dominate economically in the Arctic macro-region, when using its practice and competitive position. But without sustainable economic development of the Russian Federation Arctic zone loss of part of Arctic territories and offshore areas is possible, moreover it could happen beneath our eyes. Economic, financial and political sanctions against Russia, going back to times of the Cold War just exacerbate the situation in the Arctic. Here it is important to take into account, firstly, particular dependance of Russia from Western countries in problems of deep water drilling, shipbuilding, use of modern technologies and equipment; secondly, rise of financial-political crisis in 2014-2015, which is connected also with oil price downturn. In modern conditions of unipolar world ancient Roman phrase «Si vis pacem, para bellum», which means «when you want peace — be ready for war», became absolutely distinct. That is why it is no coincidence that the Russian Federation take definite actions to secure its geopolitical and socio-economic positioning in the Arctic, up to creation of the Arctic force grouping¹.

It is necessary to come up with the choice of priorities and efforts concentration on economic development of the Russian Arctic in complicated geopolitical situation, moreover, no participant of the Arctic pool has any such practice of business model in Arctic conditions as Russian Federation has, beginning from coal development on the island Spitsbergen, Northern sea route and up to large-scale researches of the Soviet period. But this competitive position is melting like «pebble-leather», other interested states and arctic stakeholders like mad strengthen their positions in the Arctic.

At any way it is necessary to establish prevailing challenges, when the challenge is rightly formulated it already has a solution. Speaking about Arctic such circle of challenges is issued as $AC = P + I + T + E + AS$, where: AC — Arctic challenges, P — people, I — investments in the economy and infrastructure, T — technologies, E — ecology and saving of cultural and natural environment

¹ Arctic forces will be created in Russia. URL: <http://www.arms-expo.ru/news/archive/v-rossii-budut-sozdany-arkticheskie-voyska27-03-2009-13-00-00/> (accessed 14.09.2014)

of the RFAZ, AS — Arctic solidarity and integration [3, p. 28]. These challenges must be answered, this equation must be solved mostly appropriate within a short time.

When overviewing special aspects of economic activity in Arctic (traditional economic structures are not overviewed in the article), we can notice some of them, which could become the basis for future development of the Arctic economy model.

1. *Climate and ecology*. The first and the chief special aspect is total influence of climate conditions and ecology, which serve as limiter of economical activity in high latitudes. As Pilyasov, A.N. notices: «cold uncomfot here exercises limiting influence on all types of activities and poses risks to survival of a man» [4, p. 479]. With such an understanding of climate special aspects agree many researchers. It is worth noticing, that the environment itself here is situated in the extreme location, and possibility of auto regeneration of natural systems is marginal.

Taking into account trend of global warming one of dangerous threats nowadays becomes perpetually frozen soil, because its melting could appear not only the collapse of economic activities, but also destruction of Far North inhabitants' living model, which could lead to negative consequences, change of all landscape of Arctic territories. Account of climate factors is reflected in developing Arctic economy model, which one of the main criteria is considered to be ecology. Ecological restrictive guidelines on the continental shelf of the Arctic temporarily restrain nowadays increase of hydrocarbon production not only in Russia, but in Alaska, Canada and Norway.

Demand in development of model and norms of economic subjects' activities taking into account climate and ecological specialities, which must be strongly kept up, appears. Russian partners on Arctic club used ecological challenges as soft power tool to force Russia out of Arctic, which was especially showed in conflict with participation of Greenpeace on the platform «Prirazlomnaya»². Just severe measures of Russia helped to stop this provocation. Right economic constituent lets us speak about environmentally responsible business model in the Arctic, when the priority in management solution is given to ecological challenges, but not just profit earning.

2. *Resource direction* reflects in the fact, that Arctic economy is mostly oriented on extraction of natural resources. Functioning of other branches is constrained here, though with development of economy of knowledge development of IT-industry is possible, moreover Arctic climate promotes mental activities. But in any cases direct state regulations of activities are demanded in many cases.

¹ Greenpeace attacks the platform «Prirazlomnaya». URL: http://www.bellona.ru/articles_ru/articles_2012/1345814437. 87 (accessed 24.08.2014)

3. *Northern delivery* is characterized by the fact that resources, necessary for economic activities and population life-sustaining activities come from external environment. Domestic resources — labor, financial and energetic in a number of RFAZ territorial entities can't provide sustainable development. That's why robust scaffold of Russian Arctic economy didn't form, what leads to light economic relationship of subjects to ecology and causes complex of «temporary workers».

4. *Investments*. Because of large-scale investments necessity in the economic activity, just state structures and/or transnational corporations could work in the Arctic. Small business in the industrial sector of economy is practically impossible. State presence in the Arctic is considered to be prescription but not a result of market relationships, which could be chief conditions of business. Financial speculator will not enter Arctic, it is too expensive for him, the process of attaining margin is too long, it is too riskily even at the levels of capital market, effective output is too small; moreover, fundamental knowledges of Arctic ecology, climate and economic are necessary. The Arctic will be entered by either state itself or industrialist under the state support.

5. *Transport*. The formed transport direction of Arctic economy model doesn't satisfy modern purposes. Russia during the Soviet period used the Arctic as a transport corridor which connected European part with the Far East. Nowadays transport is necessary to change into new quality state, which will let to unite the Russian Arctic as a whole. This is considered to be the base of socio-economic integration of the RF Arctic regions [5, p. 22].

6. *Labor resources*. There is great dependence of those who work from results of enterprise's activities, especially in mono-cities. Question of existence, and even survive of people fully depends on effective organization of activity. In the Arctic it is impossible to live «in tent eating pasture» when you try to find work after discharge. Discharge, under conditions of lack of help from surrounding people (it is just theoretically, because team spirit is basis of human beings in the Arctic) aggravates a problem of surviving. Therefore, we can speak about some «arctic bondhold», when there is a deficit of working places. Much depends on the head of enterprise, and that doesn't exclude malversation. That's why state presence is necessary in business organization in the Arctic and substantial legal control at the labor market.

Problems of management organization in the Russian Arctic

The main problem of economic development which must be solved firstly — is an organizational problem, problem of Arctic management. A paradoxical suggestion takes place but this paradoxicalness just underlines the trueness of N.P.Zalyvsky's words, that unsatisfactory features of socio-economic development fortunately are also historically considered to be part of Russian ad-

vantages [6, p. 14]. Russia needs to use this advantage together with others in development of the Arctic. Solving problems of economic development of the Arctic contradictions of the idea of «territory settlement», which were brought to light by V.I.Ulyanovsky and A.A.Dregalo [7, pp. 178—179], must be taken into account. Clever organization of economic activities, quality of management allow to use current resources in the optimum way and to accomplish identified goals.

The Russian Arctic in organizational structure is broken indeed — there is no single point of responsibility and management at the federal level of government. In organizational context the situation is alike dissipated broom, as in the well-known fairy-tale, which rods could be easily broken to pieces one after one. But in the Arctic this broom is in extreme conditions and it will be impossible to find the new one, we must manage to collect all the rods in the structure, till new brooms performed by foreign countries appear. Geographically, climatically and with inherent transformation of any national mentality in the Arctic mentality, including other factors of live-sustaining activities, the Arctic is united — it is just necessary to formalize it.

Within the European North, S.I.Shubin suggests to form Northern federal district within the borders of Northern economic region, or greater region called Dvino-Pechora krai, which could include Arkhangelsk region, Komi Republic and the Nenets Autonomous District [8, p. 90]. Developed by him maps-schemes of the Russian exoskeleton allow to speak about necessity of corporation in one administrative district which borders on the Arctic Ocean territory — Russian Federation Arctic zone. Necessity of formation of the unique arctic economic and administrative district by means of creation of the Arctic Federal district is driven by the fact, that construction of all the existed federal districts, which borders enter the arctic territories, expresses fatal contradiction, caused by different climate conditions in the northern and southern parts of the district, and consequently differences in economic effects from business activities. This contradiction under the condition of positive dynamics could be come through the form of unequal development of northern and southern territories of the federal district, and this fact could lead to social tension. Just with solving of organizational challenges of management we could speak about build-up of economic power in the Russian Arctic.

In issues of effective management of RFAZ it is not always required to relay on market mechanisms, except particular services. Southern market of free market economy to survive in Arctic conditions must have stout walls of state regulations, must have the roof of state physical presence, warmth of state support; but in classical understanding it is already not a market but state economy. Problems of effective management are rather wide that's why in this article we are overviewing just new challenges of management in Arctic conditions. The basis of effective man-

agement has always been planning. Together with main principles of management we must additionally take into account special characters of Arctic planning in following principles.

The principle of accuracy. Approach to planning must be serious, and include the whole production cycle, because the mistake in planning of resources, which is consisted in their insufficiency on the issue of survive, firstly because of existing of up to the mark tight transport windows. Mistake in planning of resources, which took the form of their oversupply, leads to simple negative profits for enterprises, in the Arctic it is impossible to sell the obtained resource. To return the received goods to a supplier is much more expensive because of Arctic transport logistic specifics than to take them; moreover cost of transportation could be higher than the cost of the resource itself. It is even difficult to present it, they's why it is better to pension it off when bearing the costs of storage, utilization and other expenses within the environmentally responsible business model, which role will always increase.

The principle of planning redundancy must be carried out, *firstly*, based on two different methods, and *secondly*, by two specialists within the same methods but just under approximation of results we can speak about thoroughness of planning procedure.

Principle of compulsive personal responsibility of a manager. Taking into account all above mentioned principles of planning it is necessary to introduce a compulsive personal responsibility of managers for results of planning in high latitude conditions.

Conclusion

In such a way, growth of economic presence of Russia in the Arctic is considered to be the basis of economic might of our country and is driven by geopolitical magnitude of this region. The country must increase its weight in the Arctic, so that partners (rivals) in Arctic club would not turn us out of doors. It is necessary to answer Arctic challenges to the full extent, taking into account the specifics of business activities in Arctic, demand in development of Arctic model of economy. Environmentally responsible business model must become the basis for human and enterprises activity. For economic and organizational incorporation creation of the RF Arctic Federal district is possible. State presence and control of business entities in the Russian Arctic must become the necessary condition. For effective management it is necessary to take into account specifics of the Russian Federation Arctic zone, for example, in planning, when adding them with principles of accuracy, redundancy and compulsive personal responsibility.

It is necessary to pay attention to timeliness continuation of large-scale scientific researches of phenomenon of business activities in Russian Arctic, creation of Arctic economy model including all ecological specialities, lighting of other problematic aspects of positioning Russia in Arctic. At that way, depth and systematic of purification of special characteristics of Arctic management must possess also academic scientific character (N.P.Zalyvsky) and clearly expressed orientation to achieving practical results and balance between economy and ecology (Y.F.Kulin). Editorial board and editorial staff want to continue publications on problems of socio-economic development of the Russian Federation Arctic zone taking into account appearing ecological and other problems under the code name «Economy and Ecology in the Arctic». We invite you to take part in discussions and publishing on this problematic aspect.

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Dvina land: in search of identity



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Abstract. As a historic-geographical term, Dvina Land is localized by archeologists since the 10th century and is identified with Zavolochye. Administratively it was a part of Velikiy Novgorod (10—16th centuries), Grand Duchy of Moscow and centralized Russian State, transforming into Dvina uyezd (16—18th centuries) and Dvina province (1719—1785). As a multidisciplinary research object, it is systematically defined in several dimensions: landscape and natural, historic-geographical, administrative and governmental, cultural, socio-economic, mythical.

Keywords: *Dvina land, Zavolochye, Velikiy Novgorod, identification, history, maps, location, chronology, management, landscape, artifacts*

Introduction

The problem is now becoming ever more relevant, *firstly*, because of insufficient of all the package of sources and literature, evidently, «Forgotten» and unused in both the period of Soviet civilization and during transformation processes of pole shifting since the end of the 20th century. *Secondly*, interdisciplinary approaches use of web-analytics and other methods create great opportunities for historical science and any reader, which was impossible to dream about. Electronic resources allow to publish not only dull scientific, sometimes even boring text, but also pictures, illustrations, maps in color, what enrich readers' perception.

During preparation of an article we used general scientific methods of analysis and synthesis, historicism, consistency, interdisciplinary approaches and web-analytics. Following sources were used: historical and crucial charters of great dukes with Novgorod; clerical charters of great Moscow dukes; private charters of Veliky Novgorod; Acts of archeography expeditions (AAE, vol.1); Monuments to diplomatic relations between Muscovite state and England from 1584 to 1604 (RIO, vol. 38); archive documents of SAAR (State archive of Arkhangelsk region), f. 57; Complete set of Russian chronicles (Novgorod, Kholmogory, Dvinskoy letopisec, etc.); archeological artifacts. Study of object and subject of research is done taking into account preceding scientific

publications of Demchuk G.V., Edovin A.G., Zorina A.A., Klyuchevskiy V.O., Krestinin V.V., Ovsyanikov O.V., Platonov S.F., Sadikov P.A., Sudarenkov V.V., Tihomirov M.N., Yanin V.L.

Problems of chronology and localization of the Dvina land

Deterministic dominance and the living base of the whole Dvina land in historical past was the Northern Dvina river. Without water, given by God to dozens of generations, Northern lands could have appeared to be inaccessible and undeveloped. Along rivers and lakes, with use of log-ways, water systems continued to develop areas of Russian North, Pechora, Yugra, Siberia, coasts of White and other areas; connection with center and north-west of Russia was provided.

Importance of the Dvina land is determined, first and foremost, by existing natural and cultural landscape, as well as by number of other factors of historical evolution.

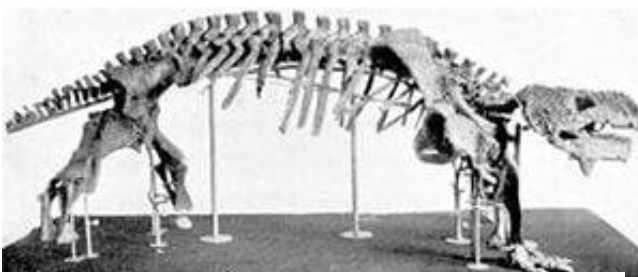
- ✚ Hydrologic system of the Northern Dvina with its affluents was connected during centuries through log-ways, channels, hydraulic structures, other rivers and lakes with other parts of Russia, had a gate through the White sea to three world oceans: Arctic, Pacific and Atlantic.
- ✚ The richest natural resources of Dvina and other northern lands gave opportunities for colonization and their exploitation in the era of Veliky Novgorod, in the period of socio-economic development of Russia as centralized state.
- ✚ Human capital — is people, who from way back reclaimed coasts of northern rivers and the White sea, transport routes and natural resources, has always been reproduced in the Russian North, promoted development of shipbuilding, sea, river and timber industries, culture and participation in Arctic expeditions here.
- ✚ Sea route from England to Persia through the White sea, trading route in the Volga and the Caspian sea composed the basis of Russian transport infrastructure in external and internal trading, had geopolitical meaning, promoted development of Russian economy. Arkhangelsk in the Northern Dvina river's offing became famous meeting place of Russian orthodox and west-european civilizations, the first Arctic sea port in Russia, which has not lost its significance.
- ✚ Traditional culture of the Northerners, which included artifacts, buildings, tools and subjects of labour, culture, clothes, customs, people's relations, their values and inward habit, some kind of conservatism during a long period of time was preserved in the Russian North.

All these in its civilizational aggregate and change of generations through time created the so-called natural and cultural environment, historical and modern landscape. «Russian natural landscape science can be considered as great evidence in science, especially its «natural» direction, oriented to exploitation of undeveloped land. Objectively it was brought along geographical features of Russia, its vast space, low density of population and unbroken (natural) landscapes», — underlined V.V. Sudarenkov, noticing magnitude of landscape as investigated, social, national

(ethnic) and historical spaces [1]. «Basins of Sukhona, Northern Dvina and its left afflux of the Vaga river were the richest and the most populated in the whole Russian North. This region equitably could be called the Dvina land», — appointed a famous historian M.N. Tihomirov [2, p. 229].

Dvina land, historically transforming in time and space, as multidisciplinary object of research could be determined systematically in different dimensions: landscape-natural, history-geographical, administrative-managerial, cultural, socio-economical, geopolitical and mythic. Sometimes pointed dimensions are concentrated together and it is important clearly to separate the key one among them.

Firstly, Dvina Land — is natural landscape (locality), environment, inside of which chief landscape components were formed and existed without people's participation. The Northern Dvina with the square of 357 thousand sq. km and the length of 744 km. is the main such a component, and the length of all rivers in the basin of the Northern Dvina is 7693 kilometers. Natural landscape of the Northern Dvina basin, pouring in the White sea — is genetically single natural-territorial complex which has mostly alike geological fundament, type of relief, climate, and natural boundaries. The characteristic criterion here — is historical appearance of the river Northern Dvina itself, its affluents, on which coasts began to evolve life. Landscape was permanently changing, including the influence of man, and being under cultivation. How these territories could be called in future, they were, are, and will stay always the Dvina land according to its landscape-environmental geolocation. In this idea we can historically overview Dvina area in different epoch and times from the Paleolithic age to modern era, speak about changes in climate, landscape, different cultural-ethnic waves of civilization, closely connecting evolution of Dvina land with wider history-geographical, geological and paleontological concepts since those times, when the Northern Dvina river flows, running into the White sea.



Picture 1. Skeleton of the Dvina barbs. URL: <http://s53.radikal.ru/i140/0811/b1/3ec404487624.jpg>

Exposition of red clays of permian period on the coasts of the Northern Dvina provide evidence of, for example, those times, when here were tropics, and the age of founded interment (Sokolki and others) of theromorphs reptiles of permian period is determined in 270—250 million years [3]. Permian sediments

in river Sukhona and the Upper Northern Dvina investigated and conducted diggings in Sokolki a famous Russian geologist, paleontologist Vladimir Prohorovich Amalitsky (1860—1917), who explored unique «Dvina» barbs, which bones were called as national treasure and form «North-

Dvina gallery» of paleontology.

Geological past of the Northern Dvina is investigated in work of L.L. Ilyina and A.K. Grahov [4]. Northern territories, the Arctic were populated by first primitive men, when there geologically didn't exist even the Northern Dvina river itself, which is rather young and is not older than the peak of Valdai icing [5, p. 5]. That's why materials of excavator archaeology of ancient paleolithic sites in Arctic, in the North possess evident scientific interest.

Secondly, Dvina land in Scandinavian and other sources, on maps was usually identified with mythic Bjarmeland, on which localization there are still different supposes, reflected in legends (Iceland sagas), on foreign maps and in literature. This mythic dimension of Dvina Land rouses artistic imagination, but the resource basis by that is rather limited and not always accessible. It failed to find any remains of Bjarmeland in Russian chronicles, and foreign sources, including sagas, are extremely contradictory. Myths of Dvina Land are founded in Russian chronicles. Lands in delta of the Northern Dvina were inhabited from war back, — Dvina chronicler tells us: «Жители убо двинские вначале именовашуся заволоческая чудь, последи же, реки ради великия Двины, проименовахуся двиняне»¹ («Inhabitants of the Dvina were firstly named Zavolocheskaya chud', but later, in behalf of the Northern Dvina, they began to be called Dvinyane»). But discovery by archeologists of placement of primitive men dated back to times, when there was no mentions about «chud'». Colonization of Northern territories took place in Late Glacial Period, when warming was felt under foot, flora appeared, forests began to move to the North, in other words it appeared environmentally-climatic conditions, suitable for human being. Dvina Land, Belomorie North — were long ago the habitat of life-sustaining activity, archeological cultures, unknown for us, insufficiently investigated, unidentified to a full degree. Ancient reclamation of Solovetsky Islands in Belomorie, for example, began at the turn of Mesolithic and Neolithic eras in the middle of the Vth century BCE [6, p. 311].

Name «Dvinyane» is founded in Vologda-Perm chronicle at the beginning of the 14th century: «В лето 6832 (1324). Иде великий князь Юрьи Данилович с Ноугородцы на Заволочье, и взяша Устюг на щить и поидоша на Двину, и добиша ему челом *Двиняне*, и отъиде» («In summer 6832 (1324). Goes great duke Yurii Danilovich from Novgorod to Zavolochye, and occupying Ustyug they came to Dvina, and making their bow to *Dvinyane*, they left»)². Population of Dvi-

¹ The whole complete works of Russian chronicles (PSRL) / Dvina letopisec, volume 38, L., 1977, p. 148.

² Full Collection of Russian Chronicles / Vologda-Perm chronicle. Vol. 26. M.-L.: USSR AS publ., 1959, p. 110.

na land were called Dvinyane in letter of Grand Duke Johann Vasilyevich, contrary to kargopol'cy, onezhane, turchasovcy and pomorcy (16th century).

Thirdly, in source studies and native historiography Dvina Land is identified with Zavolochye, which are used as identical definitions, though they are not the same. In crucial chapters of the XII-XVth centuries is founded term «Zavolochye», but there is no mention of «Dvina Land». One of the first mentioning of Zavolochye dates back to 1264 in crucial chapter of Novgorod with Tver great duke Yaroslav Yaroslavovich³. Name «Dvina Land» is clearly identified in historical Dvina charter of great Duke Vasiliy Dmitrievich of 1398⁴. Definition «Zavolochye» and «Dvina Land» are written in clerical letters of the XVIth century independently. In «Dvina Chronicle», composed by by L.L. Titov, he uses such terms as «Dvina region», «Dvina Krai»⁵.

Fourthly, living time of Zavolochye and Dvina Land demands for improvement. Chronological frames of Dvina Land in encyclopedias are pointed rather approximately and not so reasonably: as historical name in the 14—16th centuries territories in the basin of the Northern Dvina, in the 11—15th centuries — demesne of Novgorod, in 1397—1398 under the power of Moscow, since 1478 in centralized Russian state; up to the 15th century it was known under the name of Zavolochye. But these chronological frames not always correspond to reality. On the basis of artifacts, A.G. Edovin, A.A. Zorina, O.V. Ovsyannikov, V.L. Yanin and other scientists refer appearance of Slavic settlements in Zavolochye to the 10th century. Dvina Land, Dvina province, Dvina district really existed, transforming as administrative-territorial structures of government in Novgorod republic, Grand Duchy of Muscovy and in Russian State up to 1775.

It considered earlier that active intrusion of Slavic people to the territory of the Russian North began since turn of 11-12th centuries. Appearance of Novgorod people in northern territories a well-known historian dated back to, for example, first half of the 11th century, based on chronicles on campaign of Ulyba in 1032 against Zhelezniye Vorota. Earlier dating of Dvina Land is possible and based on archeological artifacts, because written and other sources have practically run out of steam. V.L. Yanin, for example, refers his «locks» in sacks for taxes to 10-12th centuries. According to researches of famous archeologist O.V. Ovsyannikov alien Slavic population entered the North in 10-13th centuries. A.G Edovin viewed Zavolochye as historically geographical defini-

³ Letters of Veliky Novgorod and Pskov / edited by S.N. Valka; ready for press by V.G. Geiman, N.A. Kazakov, A.I. Kopanov, G.E. Kochin, R.B. Muller and E.A. Ridzevskaya; USSR AS institute of history, Leningrad dept., M.-L., USSR AS publ., 1949, no. 1.

⁴ Acts, collected in libraries and archives of Russian empire by archeographic expedition of Imperial academy of sciences (later — AAE), vol. 1, Arkhangelsk eparchy, 1294—1598. Saint-Petersburg, 1836.

⁵ Dvina chronicle / Titov L.L. Moscow, 1889, preface, p. XI.

tion, which in 10—11th centuries meant lands in midstream of the Northern Dvina, where burial grounds were founded. In his thesis research (2001), A.G. Edovin pointed that about the existence here of slavic settlements in 10—11th centuries there give evidence multiplicity of funeral memorials, and consequently, great density of population. When in X—XIth centuries these were lands in midstream of the Northern Dvina, where burial grounds of those times were founded, by the 12th century they develop over the whole Podvinye, occupying zones of both slavic and Finno-Ugric settlement [7, p.15].

Historical geography of Zavolochye in X-XIIth century was knowledgeably and particularly investigated in thesis research of A.A. Zorina [8]. There is no point to repeat historiography in this profile. Among the authors are named: A.N. Nasonov, M.V. Bitov, T.A. Bernstamm, Y.S. Vasilyev, M.V. Vitov, A.K. Matveev, N.A. Makarov, V.V. Pimenov, E.A. Ryabinin, A.M. Spiridonov, V.A. Sheleg, V.L. Yanin and others. Among number of current publications we would like to mention the book of Arkhangelsk historian G.V. Demchuk «Land formation in Dvina county in the 17th century» [9]. It conceptually overviews the whole system of landownership from the point of view of legal status of taxation and labour lands, character of interaction of all participants of land relations. Work of G.V. Demchuk is based on deep and comprehensive study of sources of different types and applications. These are: 1) cadastral sources in the form of cadasters, census, payment, estimate and account books of the Dvina land, as well as *sotnaya vypis'* (abstracts from cadasters, given to landowners, tradespeople and peasants for their right to own lands and which was basis for computation of taxes) of the Dvina and other counties for the 17—18th centuries; 2) legislative acts (Law Books, charters and tsar's decrees); 3) economic documentation of volost churches and monasteries counties for different years of the 17—18th centuries (account and payment books, property registers, etc.); 4) materials of running registering in XVII-XVIII centuries; 5) individual act material of the 17-18th centuries, which included *poryadniye zapisi* (documents for various contracts in Ancient Rus); 6) chronicles. In six appendixes of his book, G.V. Demchuk it is published extracts from cadasters of Miron Velyaminov 1622—1624 and other documents from Russian national archive of ancient acts (RNAAA). Information scholarly apparatus (abbreviation list, index of names, geographical index) was carefully accomplished.

Among the historians there are expressed different views on localization of Zavolochye. Some think Zavolochye to be a vast territory between basins of Onega and Pechora rivers. Others think that it was just a basin of the Northern Dvina river, identifying it with Dvina land. V.O. Klyuchevsky in his lectures about Veliky Novgorod, for example, besides Novgorod pyatina (territorial entity, «fifth part of the land»), he also specified counties in the North-west — «Zavolochye or

Dvina land», in other words he identified them. These are, according to Klyuchevsky, lands situated out of voloko (part of dry land, situated between two basins, through which goods were delivered), great dividing range, separating basins of Onega and Northern Dvina from the basin of Volga. From Dvina land to north-west was situated Pechera county on both banks of the same called river, and then across Ural Yugra county; on banks of the White sea - Tre county and Tersky brink. Even in XIth century inhabitants of Novgorod went to take taxes across the Dvina to Pechora and in the XIIth century to Tersky brink [10, pp. 57—58]. To widening of territories favored not only military-industrial but also peasant, monastery colonization of Northern territories. V.O. Klyuchevsky underlined priority of *boyar (commercial) colonization* over peasant and monastery (agricultural). Process of Novgorod colonization led to appearance on the banks of the Northern Dvina River of *burial grounds (pogosty)*, understood as administrative districts, small districts, from which taxes were taken (podatnaya edinica), place of parish churches. Most of mentioned burial grounds in Obonezhye, on banks of the Northern Dvina River and its affluxes was localized with the help of researches made by Doctor of historical sciences A.N. Nasonov (1898—1965). One of the earliest mentions on burial grounds on Dvina in other places dates back to 1137.

In Rule by duke Svyatoslav Ol'govich, dated «summer 6645», where were fixed charges to saint Sofya from judicial incomes of duke, the fixed sum of annual tithe was 100 hryvnas, independent from real incomes of duke, which must come to Novgorod Master (archbishop), it is determined order of gathering and norms of ducal rent for each burial ground⁶. In this document *there is no practically direct mention of the term «Zavolochye»*, but just burial grounds are localized. *In Tudorov* burial ground — situated by Tudoszero, not far from south-east coast of the Onega Lake; *in Ivan'* burial ground — according to A.N. Nosov belongs to Ivanovsky burial ground, included in Kholmogory; *in Rakula* — along the Northern Dvina River, 58 km higher than Kholmogory; *in Spir'kovka* — in the district of the River Pid'ma offing in Svir'; *at Vihtuya* — according to A.N. Nosov at the River Pinega; *in Pinesa* — on the River Pinega; *in Kegrel'* — in middle reach of the Pinega River; *Em'ze offing* — offing of the Emza River; *Vag offing* — offing of the Vag river; *at Puita* — River Puya, *left afflux of the Vaga River*; *at Chudin* — Chudskoy bank in 120 km from Vologda; according to A.N. Nasonov — in the region of Shenkursk; *at Liguya* — according to B.D. Grakov Lidul-fost; *at Vavdit (Vivdit, Valdit)* — in the district of Vadlo Lake; *at Vel'* — Vel'sk at fall of Vel' into Vaga; *at Vekshenza* — River Vekshenga, left afflux of the Suchona River; *at Borku, in Toima* — at the left

⁶ Legislation of ancient Rus. Volume 1. Duke regulations and charters. Judicial letter / editor in chief, corresponding member of the USSR Academy of Sciences, doct. of hist. sciences, professor V.L. Yanin. Publ. «Yuridicheskaya literatura», 1984. URL: <http://forum.yurclub.ru/index.php?app=downloads&showfile=5460> (accessed 24.10.2014).

coast of the Northern Dvina; at *Pome* — head of the River Sysola; at *Toshma* — Tot'ma or Shozhma; at *Penenich* — at the river Pinega; at *Porogopustysh* — by the river Onega; at *Voloza in Mosh*a — at the Lake Mosh; at *Yem'* — by inhabitants of Koreliya⁷. Collectors of taxes (judicial tenth) — a duke «*domazhirich*» from territories of low Dvina and its affluxes (Pinega and others) was situated in Onega. In articles 6 and 7 is was mentioned (these additions could have appeared later) *Obonezhsky ryad* — lands along the rivers Svir', Pashe, Syasy, Oyati, Olonke (Olonec), between Ladoga and Onega Lakes and others; as well as *Bezhicky ryad* near demesnes of Suzdal' at the low Volga, burial grounds along the rivers Mologa and Osen', Rybinsk by fall of Sheksna into Volga, etc.

One of the first written mentions of the concept «Zavolochye» (still other dates are unknown to us, though they could be) appeared only 1264 in Conventional letter of posadnik Mikhail, tysiatskii of Kondrat, from all captains and seniors and from the Novgorod with Great Tver duke Yaroslav Yaroslavovich⁸, where made rules of their relations: to follow the same tax, as the father; not to deprive land no-fault; not to give letters without posadnik of county. Were listed following lands: Bezhiche, Gorodec, Melecha, Shipino, Egna, Vologda, **Zavolochye**, Koloperem, Tre, Perem, Yugra, Pechera; they were under Novgorod rule and were taken taxes [GVNP. №1]. North-eastern areas Zavolochye, Tre, Perem', Yugra and Pechera were listed in two further letters of Novgorod 1266 and 1270 with the same duke Yaroslav Yaroslavovich⁹.

Zavolochye was traditionally mentioned in the XIV-XVth centuries in Conventional letters of Novgorod with dukes: in 1304—1305, 1307—1308 with Tver grand duke Mikhail Yaroslavovich; in 1326—1327, 1371 with Tver grand duke Alexander Mikhailovich; in 1435, 1456 (about peace in Yazheblicy) with Grand Duke of Moscow and all Russia Vasily Vasilyevich¹⁰. In Novgorod letter about peace dated back to August, 11, 1477 with Grand dukes of all Russia Joannes Vasilyevich and his son Joannes Joannovich «from Novgorod posadnik Timofey Ostafyevich, Novgorod tysiatskii Vasiliy Maksimovich, from all the Veliky Novgorod and his posadniks: Ivan Lukinich, Yakov Aleksandrovich, Fefilat Zaharyinich, Luka Feodorovich, Ivan Valilyevich; from inhabitants: Luka Ostafyevich, Aleksandr Klementyevich, Feodor Ievlich, Okinf Vasilyevich, Dmitry Mikhailovich», — there was mention of Zavolochye: «Torzhok, Bezhichy, Gorodez Palez, Shipina, Melecha, Egna, Zavo-

⁷ Zimin A.A. Memorials of Russian justice. Vol.2. Memorials of feudal-fractionary Rus of XII-XV centuries. Moscow, state publ. of juridical literature, 1953. URL: <http://adverbium.org/ru/s-pamrusprava2.htm> (accessed 24.10. 2014).

⁸ Letters of Veliky Novgorod and Pskov. - Moscow, Leningrad, USSR AS publ.,1949, no. 1 URL: http://www.vostlit.info/Texts/Dokumenty/Russ/XIII/1260-1280/Gramoty_otn_Novgoroda_knjaz/1-20/1.htm (accessed 18.10. 2014).

⁹ Collection of state letters and treaties, kept in State collegium of international affairs. P.1, Moscow, 1813. URL: <http://www.runivers.ru/upload/iblock/cd4/sobranie%20gos.%20-gra-mot%20i%20dogovorov.%20T1.pdf> (accessed 18.08.2014).

¹⁰ GVNP. № 7, 9—10, 14—15, 19, 22. M.-L., 1949.

lochye, Tigr, Perm, Pechera, Yugra¹¹.

Used in Novgorod letters names «Zavolochye, Tre, Perm, Yugra, Pechera» mean dependent on Veliky Novgorod *volost'* (*volost'* — power), situated in remoted north-eastern territories. Novgorod inhabitants called their lands «Land of saint Sophia». The word «*volost'*» in Old Russian had number of meanings: «power, law», «region, country under one common power» and «private ownership». *Volost'* — is a small territorial entity under the same power. Inside Dvina land, according to some sources, — as considers G.V. Demchuk, — in the 14—15th centuries the term «*volost'*» was not used as administrative-territorial or tax-payment unity. Institution of *volost'* was later introduced by Moscow dukes [9, p. 112].

On content and structure of Dvina settlements we can learn from charters and letters of dukes, lists of Dvina lands, other published acts (AAE), where are mentioned tenths of generations, situated both in upper and lower Northern Dvina river, basins of rivers Vaga, Emca, Onega, Pinega, Mezen¹². Letter of grand duke Andrey Aleksandrovich *about Dvina* with information about heels and carts for for three grand duke gangs, going to tradings, dates back to 1294—1304 [GVNP № 83]. In Novgorod letter of 1328—1341 are mentioned Dvina *posadnik* in Kholmogory and Dvina boyars: «From grand duke, from Ivan, from *posadnik* Danil, from *tysiatskii* Avram and from the whole Novgorod to Dvina *posadnik* in Kholmogory and to Dvina boyars. Ordered Mikhail to go to the sea with twenty people». This letter, aimed to resolve a conflict and regulate relationship between Mikhail and Mikifor, notices «Kegrolsky and Volock burial grounds» [GVNP. № 85].

The most important source is considered to be Dvina charters of Grand duke Vasily Dmitrievich of 1397, where, *firstly*, the name «Dvina land» is mentioned, but not «to the Dvina»: «It is I, Grand duke of all Russia Vasily Dmitrievich, who granted **Dvina land** to my Dvina boyars, as well as to *sotskiy* and all the rabbles»; «in Dvina land». *Secondly*, Dvina settlements are mentioned, existing since the end of the 14th century, when Mikhailo-Arkhangelsk monastery was founded, which gave birth to Arkhangelsk. Among Dvina settlements were pointed: Orlenzy, Matigory, Kholmogory, Kurostrovo, Chuhchelema, Ukhtostrovo, Kur'ji, Knazhostrov, Lisichostrov, Konechniye dvory, Krivoye, Rakula, Navolok, Chelmakhta, Emca, Kal'ji, Kiriegor, Toimy Nizhniye; settlements on the bank of the White sea: Nenoksa, Una, Umba; and also trade route to Ustyug, Vologda and Kostroma [GVNP. № 88]. In charter of Novgorod *veche* (town's meeting in medieval Russia) to or-

¹¹ AAE, vol.1. № 57, 91. — Saint-Petersburg, 1836. GVNP. no 26. M.-L., 1949.

¹² AAE, vol. 1. Arkhangelsk episcopate, 1294—1598, no. 1, 2, 13 and others. Saint Petersburg, 1836. pp. 1, 8, 72—73, 80.

phans of Terpilov burial ground of about 1411 it was mentioned name «Dvina sloboda» (settlement) or «dvina inhabitant slobodchanin» [GVNP. № 89].

According to letters of internal governance, personal letters of Veliky Novgorod (Dvina, Vaga, Obonezhje) we have an opportunity to analyze localization of tenth of burial grounds, grounds, agricultural lands, rivers, islands, fishings, churches, ancestral lands of Mikhailo-Arkhangelsk, Nikolayevsk, Chuhchemsky¹³, Solovetsky monasteries, personal names of Dvina inhabitants [GVNP. №123—278, 279—282, 283—330]. In these chronicles is shown various life activities of Dvina land, when and what was sold, bought, presented to monasteries and heritors. Names of Dvina settlements (countries, villages, burial grounds, monastery settlements), personal names of Dvina inhabitants at the end of the XIV-XV centuries are mentioned in ecclesiastical, merchants', personal and heritable letters. According to one of merchants' letters of the end of the 14th century, hegumen Luka from Mikhail monastery with starosta and all conventual community, for example, bought from Gavrila Nosov land «left to Kurje». For half a settlement they gave seven rubles, one hundred squirrels for one ruble, and borders they determined in Top pass [GVNP. № 124]. According to merchants' letter of the first quarter of the 15th century Grigory Vasilyevich bought from Grigory Semyonovich village Doroninskoye: yard, court, lands, stubbles, priterebs (tilled fields), agricultural lands, everything what had Grigory Semyonovich, for 30 forties (30 x 40 = 1200) of squirrels and half of cow [GVNP.№133]. Mikhailo Ofromeevich bought from priest Ortemiy settlement in Malaya Kehta for 9 forties (360) of squirrels and half of calf with all lands, stubbles and fisheries... [GVNP. №134]. Yakov Dmitrievich in 1445 signed away to Mikhail-Arkhangelsk monastery his property in Nenoksa, Knyazhostrov and river Syus'ma [GVNP. № 148]. In 1445 he bought from Osey and Grigory Baishiny part of Baishina settlement with agricultural lands [GVNP. № 149]. Schemamonk Grigory Ivanovich in ecclesiastical letter of the middle of the 15th century confirmed sale of his village at Lukino to Nikolayevsk Chuhchenemsky monastery [GVNP. № 155]. Given by Ivan Mikhailovich with wife Fedosya to Nikita Fedorovich and his daughter Evdokiya «village of the land Onashinskaya in Kurgonem', as well as two pants, fur and corbeille girl Fenya», — dates back to XVth century [GVNP. № 254]. Samson Porfirievich bought in the XVth century from Stepan Andreevich village «on Yemichi» and land on island Maliy [GVNP. № 264].

¹³ Uspensky Lyavlenskiy, Mikhail-Arkhangelsk, Nikolo-Karel'sk and Nikolaev Chuhchenemsky monasteries were founded not later than the second half of the 14th century. Chuhchenemsky monastery was founded by inhabitants of Kholmogory county, build at the end of the 14th century by different counties, who gave it number of areas. It was done, as peasants explained later: «for purple prayers and heartsease, to pray for parents and for cropping of almsmen, distressed, who are roaming the world». 1611—1613 it became patrimony of Troitse-Sergiyeva Lavra. URL: http://hram-svyatih.ucoz.ru/index/nikolaevskij_chukhchenemskij_monastyr/0-56 (accessed 29.10.2014).

All in all in letters of Veliky Novgorod and Pskov [Moscow-Leningrad, 1949] to Dvina are concerned 156 private letters no. 123—278; to Vaga — 4 no. 279—282; to Obonezhye — 37 no. 283—330. In such a way, greatest mass of merchants', ecclesiastical, personal and other types of letters was preserved right about Dvinyane (inhabitant of Dvina), about their properties, presents, buy and sells of lands, fisheries, villages, settlements and stubbles. More often among all *merchants' letters* are founded (60,9% from 156 of all Dvina letters).

Highly important historical significance have lists of Dvina lands. In reality - they are legitimized register of properties of all the Dvina land and its owners by the end of the XVth century. A.A. Shahmatov in his work noticed, that «Dvina land constituted unity: probably contrary to some Pomor settlements, based and inhabited by half-free migrants of Novgorod boyars and their orphans» [11, p. 47]. In lists of Dvina land 1462—1471 are introduced placenames of districts, lands, rivers, burial grounds and settlements: Verhnyaya Toima, Sel'tso, Zaostrovje, Osinovo pole, Emezky burial ground, settlement in Emca, Pinega river's offing, Vaimuga, Matigory, Knyazhostrov, Mehren'ga, Solombala, river Solga and others. In Belomorje are listed lands to the winter coast from Dvina offing to Onega offing, Nenoksa, Una and Unba; to the summer coast from Dvina river offing to Mezen offing, included in Dvina land.

All lands on Dvina belonged to grand duke of Moscow, and to the «winter coast from Dvina offing to Onega offing, all are lands of Grand Duke», as well as Una, Nenoksa, Korela Varsuiskaya and Umba. To the summer coast from Dvina offing by the sea to Mezen offing, and in Pinega. Together with it, other owners of lands along rivers Vaga, Kului and Vel', as well as some small rivers and places are noticed. For instance, Morzhov mountain, Shastoozero, Emetskiy town, river Siya — it belonged to Konstantin Vladimirovich Rostovsky. It was written 18 lists from judicial records about Dvina lands, among which 10 lists on lands, 3 lists against them, 5 lists on abbrochments. In the third list it were pointed areas, given to Novgorod Grand duke Vasiliy in Pinega and Mezen'.

One of ancient Arkhangelsk settlements — *Solombala* is founded in the list of Dvina lands in 1471 together with other settlements, by that names «Solombala» and «Solonbal'» are met at once. Before, *in the beginning of the 15th century* Solombala was mentioned in ryadnaya (seizure of trousseau with act of its disposal) of Valiliy Fyodorov with Novgorov posadnik Ivan Danilovich about bought of Andreev land in Solombala (Yakovcev and Karpcev islands), Izhma, Lod'ma and Una [GVNP. № 130]. «*Solombala village*» is mentioned in three documents of Arkhangelsk region Regional archive of 1519 and 1523¹⁴. This vkladnaya of Afanasiy Nikitin to Arkhangel-Mikhail mo-

¹⁴ ARRA, fund 57, list 2, cases 3,4,6.

nastery for Solombala village, bought from Pavlovy, dates back May, 17, 1523¹⁵. Solombala, in fact, with its island territories and small village really in 15–16th centuries was territorial part of Arkhangelsk together with Mikhail-Arkhangel monastery. By all that, Solombala settlement was officially included into Arkhangelsk (connected to the city) just by the order of Aleksandr from February, 18, 1863. According to one of variants, name «Solombala» comes from Karelian word «solenba» and translating into Russian mean boggy, marshy and dirty island. There is also one beautiful myth about staying there of Peter the Great, who, in honor of floating of the first military native ship, organized the «ball on straw», with which he ordered to line mud. From here is the name of this area — Solombala (ball on straw). In reality, on May 18, 1694 Peter the First after the essential attendance of Kegostrov church went right to Solombala shipyard. On May the 20th, 1694 tsar himself undercut staging of built in Solombala shipyard in 1693–1694 of 24-gun military sailing-ship «Saint Paul», and later arranged a great banquet on it with cannonade [12, p. 58]. Myth on organization of a ball on straw is not proved out, but inhabitants of Solombala could rightly consider themselves to be first inhabitants of Arkhangelsk. Really, Solombala is older than Arkhangelsk military fortress, built 1583–1584. This is doubtless historical fact, confirmed by archeological researches. And myths themselves are necessary to attract tourists from other Russian cities and foreign countries, for creation of positive image of Solombala right here and now.

Letter of Veliky Novgorod to Dvina land on taking an oath (lipping the cross) of Novgorod to number of lands, which are becoming the property of duke Ivan IV dates back to August — December 15, 1471. All posadniks, tysiatkiis, boyars, people, merchants, bondmen, the whole Veliky Novgorod and Varoslavl veche were in point of fact given to Gran dukes of all Russia «to Pinega, and to Kegrola, and to Chakola, and to Perm, and to Mezen, and to Beliyе gory, and to Nemyuga, and to Pineshka, and to Viya, and to Sura» [GVNP. № 98].

Certain structure of Zavolochye and Dvina land is determined also on the basis of analysis of ecclesiastical letters of Moscow grand dukes of the 14–16th centuries. From 11 studied by me bequests of grand Moscow dukes since 1339 to 1572 only in two of them are mentioned five fifths of Veliky Novgorod, as well as Zavolochye and Dvina land. In bequests of grand dukes Ivan Danilovich Kalita (about 1339), Dmitry Ivanovich (April, 13 — May, 16, 1389), Vasily II Vasilyevich (Temniy) (May, 3rd, 1461—March, 27th, 1462) Zavolochye and Dvina land are not mentioned. After joining of properties of Veliky Novgorod to Grand Duchy of Muscovy in 1478, Grand duke Ivan the third Vasilyevich by ecclesiastical letter, made by him in June, 16th of 1504, signed away to his son Vasily not only his ancestral

¹⁵ ARRA, f.57, list 2, case 6, list 1

lands (Grand Duchy of Moscow), but also Veliky Novgorod with five fifths, with burial grounds, and all taxes; also «all Zavolotskaya land, Onega, Kargopol, all Poonezhye, Dvina, and Vaga, and Kokshenga, and Veliky Pogost, and Kholmogory, and all Dvina and Zavolotskaya land»; «and in Zavolotskaya land Rostov, Pinega and Kegrola, and Chakola, Perm, Mezen, Nemjuga, Beliy gory, Pineshka, Viya, Toima, Kirji gory, Emskaya gora on Vasa and Antonov passage, Korbola island, Shogogora, Karchella, Sura, Lyavlya and everything, which belonged to these lands». In ecclesiastical letter of tsar Ivan Vasilyevich (June—August, 1572) it is practically duplicated the same text: «I bless my son Ivan with Grand Duchy of Novgorod, with five fifths; «*Zavolotskaya zemlya*: Onega and Kargopol, and all Poonezhye, and Dvina, and Vaga, and Kokshenga, and Veliky pogost, and Kholmogory, and *the whole Dvina Land*, how it was by me»¹⁶. Zavolotska land included the same settlements, which were mentioned earlier in 1504 by Ivan the Fourth. Definitions Zavolochye and Dvina Land are written in letters of the 16th century independently.

After annexation of Veliky Novgorod to Moskovy Duchy in 1478 *Dvina land was divided into three lands: Dvinskaya, Vazhskaya and Onezhskaya*. Dvina land is mentioned in charter of tsar Fyodor Ivanovich to English merchants from January, 1st, 1586¹⁷, in letter from February, 12, 1587 about Arkhangelsk faubourg. Tsar Fyodor makes a trading in Arkhangelsk, where must be concentrated all the trade from the whole Pomorie, «from their ancestral lands *Dvina lands* and from Kola [13, p. 55]. Kholmogory, which in the 15—16th centuries were considered to be administrative and trading-handicraft center of the Dvina land, lost its historical significance in 1702, when administrative and military center was transferred from Kholmogory to Arkhangelsk.

By the end of the 16th — beginning of the 17th centuries Dvina, Kevrol, Kola, Mezen and Pustozero uezdes were excluded from Dvina land. Dvina uezd in point of administrative relations seized lower course of the Northern Dvina river and southern coast of the Kola peninsula. In the 16th century to Dvina uezd belonged Uмба and Varzuga districts (volosti), situated on the bank of the White Sea. In 1565 Dvina uezd was taken away in oprichnina (political and administrative apparatus established by Ivan IV), but in 1577 «Kargopol and Dvina merged together» [14, p. 127].

In the 20s of the 17th century in Dvina land there lived about 31,6 thousand people, ground mass of whom were peasants, engaged in agriculture [9, p. 5]. Land possession was presented by: a) state labors; б) lease taxation lands of three types — chernososhniye (personally independent), servage and monastic. *Chernososhniye lands* prevailed in the Russian North land possession struc-

¹⁶ Cherepnin L.V. Ecclesiastical letters and charters of Grand and appanaged dukes of the 14—16th centuries. Moscow-Leningrad, USSR RAS publ., 1950. URL: <http://www.hist.msu.ru/ER/Etext/DG/> (accessed 15.08.2014).

¹⁷ RIO, vol.38. Saint Petersburg, 1883. pp. 176—179.

ture of the 16—17th centuries. According to the first concept peasant was interim bearer, user of land, but the owner was state. According to another point of view, peasant was owner of land with the right to rule, personally independent and paid taxes in profit of state. Observed sources allowed G.V. Demchuk to make a conclusion, that in Dvina county chernososhny peasant was the owner of his taxation land, given during the process of mobilization land, but not right of its disposal and invested labor [9, pp. 108—115].

Owners of *servage lands* was state, and peasants and other servage people, including volost — were just owners-farmers. Labor-rent were rent, which size, in spite of permanent growth, was much less than taxation. the law «*land of Gand duke, by my ownership*» belonged to servage lands, which in the XVIth century were servage-taxation (ducal).

Monastic lands were in corporate property of frank pledge. Ancient ancestral lands and their population were under the jurisdiction of responsible taxpayer — monastery. Taking chernososhniye lands after penmen in 1587, monastery became the part of volost. Taxation innovation of the end of the 16th century put land ownership of monasteries on double control — state (system of fisk (Receipt of the Exchequer) and volost (joint guaranty for tax) [15].

Dvina uezd in 1708 went into the again created by decree of Peter the Great Arkhangelogorodsk province and existed for more than seventy years.

According to senate decree from May, 29th, 1719 about arrangements of provinces, Arkhangelogorodsk province was divided into 4 provinces, including Dvina with center in Arkhangelsk, Velikoustyug with center in Veliky Ustyug, Vologda with center in Vologda and Galich with center in Galich.

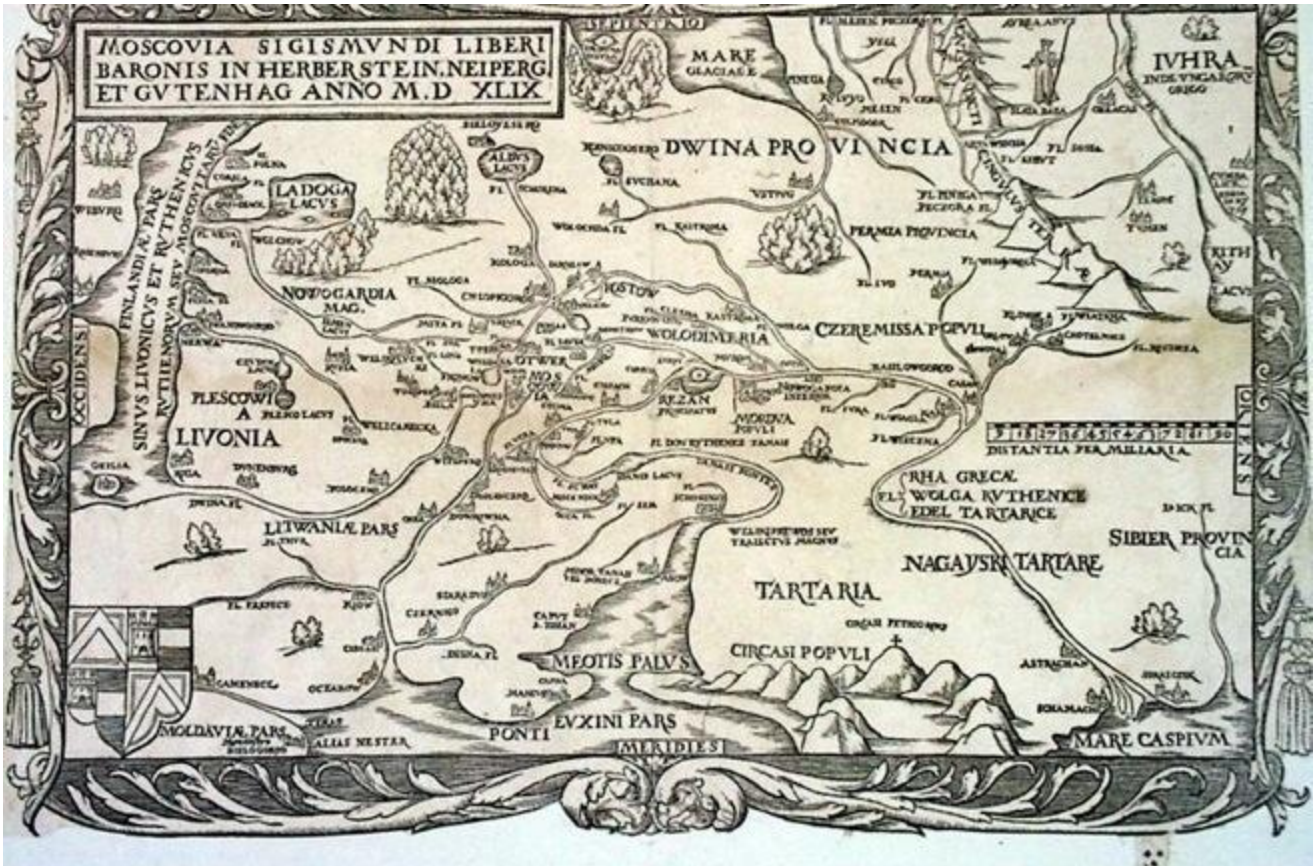
Dvina province included 6 uezdes: Vaga, Dvina, Kevrol, Kola, Mezen and Pustozero. It was huge territory from banks of rivers Northern Dvina, Vaga, Mezen, to the coasts of the White, the Barents and the Kara seas. Evidently, such a territory with the name «Dvina province» was one of the greatest in the history of Dvina lands transformations at the administrative-territorial and history-geographical level since Novgorod republic times: Dvina land (10—16th centuries), Dvina uezd 16th century — 1780, Dvina province (1719—1775). Represented in three maps of 1745 Dvina County (North-West, South, North-East) occupied great part of existed in those years Dvina province (1719—1775), as administrative-territorial entity.



Picture 2. Dvina uezd, 1745.

URL: <http://dic.academic.ru/dic.nsf/ruwiki/1280626>

It is interesting to know that «Dvina province» appeared in the foreign map earlier, even in the 16th century. On the map of Moskovy created by baron Sigmund von Gerberstein in 1546, there were such names as Novogardia, DWINA PROVINCIA, Piniga, Mesen; it was bed of the Northern Dvina River without name. In later published «Notes of Moskovy» it was added another map, engraved in the tree by Y. Gastaldo, but the name DWINA PROVINCIA was preserved, as well as in other later copies of this map.



Picture 3. Map of Moskovy by S. Gerberstein, 16th century

Division into provinces was annihilated on November, 7th, 1775 by the decree of Ekaterina II «Constitutions for control All-Russian empire governments», according to which provinces liquidated (in number of governments inside of them were marked regions), vicegerencies were founded, division of counties was changed and other changes according to new administrative-territorial division of Russian State were conducted.

In 1780 instead of Arkhangelogorodsk government it was established Vologda vicegerency, which included Arkhangelsk, Veloustuyg and Vologda regions. In March, 26th, 1784 by decree of Ekaterina II Arkhangelsk region transformed into Arkhangelsk vicegerency, which included 7 uezdes: Arkhangelsk, Kola, Mezen, Pinega, Onega, Kholmogory and Shenkursk. Dvina uezd stopped finally to exist under former name since 1780, transforming and given its lands to other uezdes. From its northern volosty (districts) was created Arkhangelsk uezd (1780—1917). From southern volosty (districts) in 1780 Kholmogory uezd was created (1780—1917).

By the end of Ekaterina II reign, Russia was divided into 50 vicegerencies and governments and one region¹⁸. In 1796 Arkhangelsk vicegerency again transformed into Arkhangelsk government. From the territorially greatest Mezen uezd in 1891 Pechora district with the center in Ust-

¹⁸ Maps of Russian vicegerencies, 1792. URL: <http://redkie.ru/?p=898> (accessed 15.08.2014)

Cilma was excluded. In 1899 center of Kola district was transferred to city-harbor Aleksandrovsk, and the district itself was renamed in Aleksandrovskiy, which was part of Arkhangelsk government till 1921, then it began to be called Murmansk government with the center in Murmansk.

In such a way, the study undertaken by us allows to:

- a) Determine Dvina land as natural landscape, which includes basin of the Northern Dvina river with all its affluxes, which age is over millions of years BCE, as history-geographical, socio-economic, territorial-administrative, cultural and mental concept.
- b) Localize Dvina land and Zavolochye as sometimes identical history-geographical concepts, but together with it, not identified in the full way in both structure of places and settlements, and owners of land property.
- c) Show transformation of administrative-territorial space of life and government of Dvina land, Dvina county and Dvina province as part of existing in national history State formations: Novgorod republic, Grand Duchy of Muscovy and Russian State.
- d) Determine chronological lifetime of Dvina land in different administrative-territorial images: Dvina land (11—16th centuries), Dvina uezd (16th century — 1780), Dvina province (1719—1785), using not only written testimonials, but also dating of artifacts of the 10—11th centuries, found and studied by archeologists.

Nowadays «Dvina land», «Dvina province» and «Dvina county» are studied as history-geographical, socio-economic and culture-mental definitions in Russian history. They are remembered in memory, culture, literature of modern Russian society. Such concepts as «Belomorie» and «Pomorie», which are not considered to be identical with Dvina land, problems of modern Pomor-study, views of Russian historians on Pomorie and Pomors, functioning of Solovetsky administrative-patrimony district in 1591—1764, Committee for help of Russian North Pomors and other problems require further study.

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Stalin's neonep as the precursor of mass repressions of 1937—38s in the European North



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Abstract. The article reveals the author's version of one of the causes of mass repressions of 1937-38 arising from the phenomenon of NeoNEP (New Economic Policy) of 1934-1936, which lasted for a short time in the

country after the derationing and a kind of a respite after the overarching of the new Bolshevik-built socialism.

Keywords: *NeoNEP, derationing, results of the "great" fracture, accusations of sabotage, mass repressions and their consequences*

Introduction

It is written a lot about repressions, including basing on the materials of the Northern Territory. But these researches have mostly emotional-empirical character. In this article the author tries to follow some logic of repressive politics of the 1930s, paying attention to three factors: *firstly*, open the phenomenon of NeoNEP of 1934—1936, which appeared in the country after derationing as one of the reasons for mass Stalin terror; *secondly*, to appreciate the character of accusation in «sabotage» and its influence on massive repressions; *thirdly*, to show consequences of «purges of staff» in 1937—1938 for socio-economic development of the European North.

To resist at the helm of state at rough spots of crucial point in 1929—1930 Stalinist government could just because of strict repressions. Later repressions became necessary as covering of reforms' inefficiency at the first half of thirties, which didn't achieve the promised results especially in the social branch.

The question is that parallel to staff terror in 1929—1933 there was forming government of nomenclative bureaucratism, which was connected by ration-card benefits and which had no backing of mainstream population. By 1934 Stalin, who possessed the overriding sixth sense, couldn't help feeling the breakup between population and privileged party-Soviet bureaucracy. Staying in the South on October 22, 1934 he wrote to Kaganovich: «We must have 1 milliard 400-500 million of poods of bread to destroy the bread rationing system by the end of this year, which used to be necessary and useful not long ago, but which became chains for state industry nowa-

days» [1, p. 790]. According to the author's point of view, in historiography there was no reflection of the contemporaneity of two very important events: canceling of bread rationing system in November 1934 by the Central Committee of the All-Union Communist Party of the Bolsheviks plenum (beginning of quasi-market economy of NeoNEP) and murder of S.M.Kirov. When Sergey Mironovich died, in the same day Stalin himself prepared the USSR CEC resolution, which was called «Law from the 1st of December», according to which practice of conviction and destroying of accused persons without their being in the court and without cassational appeals was introduced [1, p. 790]. In such a way Stalin got around two problems at once: 1) by canceling of rationing system he on some extent he adjusted human social situation in possibility to provide their survival and prosperity at the expense of self-realization; 2) repressions against formed nomenklatura the headman in a monarchial way tried to «make peace» with people.

But during the process of such an original social warming, in the form of maybe and inferior market NeoNEP, in 1935-1936 not only the intensity of class contradictions has reduced, but also appeared a natural question on responsibility for consequences of precede transformations, which resulted in hunger, forfeitures and deaths of million of people. Analysis of problems of precede to NeoNEP period was caused mostly against centers will to puzzle out what was done in conditions the so-called broad beginning of socialism.

This speciality is noticed by well-known historian and philosopher M. Gefter: «One noble man, talented historian, who has passed all circles of hell told me with smile remembering both 1934 and 1935, — he writes: «It was spring. Spring of writing conference and canceling rationing system, liquidation of political departments and cession of land for «perpetual use» to kolkhoz, reduction of industrialization and emphasis on prosperity, spring of renaissance of forgotten historians together with rehabilitation of chosen epochs and figures from «damned past», spring of preparation of new constitution and annihilation of the barriers of classes. Self criticism was in full swing. From party and non-party people (joint active assets) it went to People's Commissars» [2, p. 353]. Matter of Stalinist NeoNEP was developed by V.Rogovin in his work [3].

Documents of those years help to understand beginnings and meaning of mass repressions of 1937—1938 in a better way. It appears that not all the accusations brought against for example government of the Northern region were groundless. It is evident, that mistakes were caused by, as usual, insufficient competence of governing, first of all of party government or, as said in those days, of directive, who relied not so much on judgment as on Bolshevistic dogmas and furious aspiration of regional leaders to create a carrier and of ruling coterie to save the power. In a short period of NeoNEP this incompetence became evident to some extent. It is difficult to quarrel with,

for example, logic of NeoNEP criticism of the Northern region government, who became the basis in the end of 1937 of indictments of new wave of repressions.

Enthusiasts and victims of «great» breakup

However, let's give the word to documents and drop peculiar for those times espionage and felonious rhetoric. Harmful activity, according to accusative documents, in timber industry aligned in following way: breakage of logging operations; wrecking at drivings; wrecking at sawmilling and timber export — sales at low prices to foreign states; exasperation of workers because of impossible cultural and living conditions, unpaid wages. «Wood — is the basis of development of our North, — it was noticed earlier, — to cut up, disorganize and destroy this basis — means to knock for a goal in the whole economy of the North. That's why it was keynoted by all the possible measures and methods to destroy woods of the North, ...to gang up on the wood by the whole world, to cut right and left, where it was possible, to work in the forest wear and tear, not to gather branch wood...It is enough for our century»¹. Let's read further: «Cut of wood was done randomly, and were at the end of the season. Storms were organized — proven method of enemies: to delay, and then, when it was impossible to drag feet, it was necessary to take appropriate actions. Hundreds of people were discharged from industrial enterprises and were taken to the forest. In such a way they killed two birds with one stone: from one side, cramming, which didn't do anything but harm, and from the other side, reorganization of dozens and hundreds of establishments, because heads of these establishments were in the forest»².

As a result of this cramming it is registered later in accusations for the heroes of «wooden Donbas», — «...annually in the forest by stub there was left from one and half to two million cubic meters of timber...According to the most approximate estimates during 1931—1936 by the stub there was left more than 12 million cubic meters of timber... Littering of forest led to windfalls, comfortable facilities for infestation of forests with pests (timber beetles) and for woods fires»³. Accusers didn't forget that «...workers every summer asphyxiated from wooden fires, collective farm workers in hundreds and thousands were detached from kolkhoz field works. When counting up all other losses, it will be astronomic number which pales in comparison with all the numbers of losses from direction on the North by general Miller»⁴.

¹ The Arkhangelsk region Record office. Department of documents of socio-political history (Later ARRO. Department of DSPH). F. 296. Op. 1. D. 262. L. 32.

² The same. D. 45. pp. 13-14.

³ The same. D. 44. pp. 2-4.

⁴ The same. D. 262. pp. 91-92.

It was called to mind that «...enemies especially actively operated in drive, where enemies' activity was concentrated mostly in following directions: а) breakdown of preparations to drive; б) destroy of Northern original rivers; в) disregard and breakdown of governmental decisions on prohibition of log drifting; г) breakdown of drifting mechanization; д) transfer of main difficulties of bundling works to the autumn period; е) breakdown of timber drive to the Arkhangelsk port»⁵. It was announced for all to hear that«...drifting was considered to be the central part of sabotage. Enemies did a lot for timber to be carried away to the sea. As a result, under strong estimates along one hundred kilometers of the Unsk bay on the left shore it was laying as minimum two millions cubic meters of timber. In the same conditions were shores of the Onega and Mezen bays and the whole right shore of the White sea»⁶.

Argumentations of accusations of ascetics of the «great» breakdown was rather decisive because it was impossible to deduce economy of great region to timber industry: «It is impossible to forget that the region is rich in natural resources. We have coal, zinc, oil, granite, gneiss, great number of construction materials, limestone, gypsum, etc. Enemies, who entered geological trust tried to conceal treasures of our Soviet land. Speaking about economy of the Arkhangelsk region we must with all the evidence underline great value of agriculture, ...we must not forget that it is considered to be the motherland of wonderful cattle breed — Kholmogory cattle»⁷.

Logic of conclusions is practically irrefutable, it was really the result of critical understanding of «socialism storm» on the cusp of 1920—30s years during the short period of NeoNEP in 1935—36. Right during that time drift floating along the Northern Dvina river was delayed, a question on necessity of relocation inland the Northern taiga of timber industry facilities, construction of pulp-and-paper mills was accelerated. With adoption of new kolkhoz regulations in 1935 the atmosphere in northern villages changed for the better. It could be named as the so-called sobriety after ultra-social «soak» comparable with 90s of the last century and therefore still current nowadays.

Each period of time has its own heroes

Dmitrii Alekseevich Kontorin was the so-called hero on the eve of mass repressions again according to documents. He worked in Arkhangelsk since 1927, firstly as instructor of party governorate committee, then department supervisor, secretary of the town committee, since 1929 in Northern regional committee he was department supervisor, third secretary, since January 1932

⁵ ARRO. Department of DSPH. F. 296. Op. 1. D. 45. pp. 14-15.

⁶ The same. D. 262. p. 93.

⁷ The same.

— the second secretary, and since February to October 1937 he was the first secretary of All-Union Communist Party (Bolsheviks) regional committee firstly of Northern and later of Arkhangelsk region⁸. He made well disposed because when he came to a power he tried to change bends of «great» fracture. In the book «Cold house of Russia. Documents, researches, thoughts on regional priorities of the Russian North» his public speakings in regional committee bureau on questions of the third year-plan period from the 19th of June 1937 and memorandum report to Stalin and Molotov with claim to change attitude to Arkhangelsk in supplying goods from the 29th of June of the same year were published. Performing before his subordinates he pointed the challenge «...elevation of timber production. How many wastes there are in the forest? From full-length log we take 30% of needful timber, and more than 60% we throw in the forest. Why can't we think of small gas-generating plants and small enterprises?»

His other view was connected with problems of electrification. «The upshot is that in the draft plan or hand labor and all the others is ignored, or they go right to electrification. Either everything is with chopper or electrification. And where are intermediate links? ...We are rich in water, why can't we use it to obtain energy. Why do we have equipment for wind turbines which lie around the ATTI for already three years and we don't use it? On the North Pole wind turbines give energy and we can't use this idea in Arkhangelsk? We must balance everything to ease the labor of a worker and move along the way of reconstruction of all the branches of national industry». Secretary of the regional committee was anxious with many problems. «And Arkhangelsk? — he asks a question to his people. — How long will we move along one street? We must cardinaly put a question on development of Kotlas, Veliky Ustug and Naryan-Mar. Take port industry, what investments do we have there. There is no art and culture in the plan...» [4, pp. 278-279].

D.Kontorin was really judgmental in his memorandum report to Stalin. He underlined far and wide the role of Arkhangelsk for the north of our country and he also payed attention of the USSR government to «...it is not payed enough attention from the part of leading central bodies. Northern All-Union Communist Party Bolsheviks regional committee asks to equate Arkhangelsk speaking about provisioning to cities, which use privileged provisioning of above-cited goods»⁹.

Expressing the spirit of times, D.Kontorin calls attention of his subordinates: «We must think over all the questions, especially questions of quality, because the 3rd five-year plan period will be probably focused on cultural effervescence (emphasized by the author) of production as a

⁸ Arkhangelsk regional organization of CPSU in numbers.1917-1981. Arkhangelsk, 1982. p.168

⁹ ARRO. Department of DSPH. F. 296. Op. 1. D. 1. pp. 24-25.

whole, and in different branches. We have enough money to start in the area of culture»¹⁰. Again, as in the period of NeoNEP, terrible for the Stalinist period word «culture» became current, which could only provide immune resistance from totalitarianism. Splash of repressions of 1937—1938, to our point of view, was induced, from one hand, by the fear of central government before striving of people to open true reasons of misfortunes of socialism «storm», and from the other hand, it was used by the center for horrification of society, for suspension of the process of cultural life in the country for survival which was formed during fracture of political regime.

Machiavellist Stalin

Stalin again approved himself as a wonderful machiavellist. In the struggle with former popular in the party N.I.Buharin he «presented» at the end of 1936 new year holidays (which were forbidden in 1929), Constitution and «free elections». But shortly before adoption of the Constitution, on September 25, he sent (together with A.Zhdanov) a well-known telegram to L.Kaganovich, V.Molotov and other parties of Politburo: «We consider it to be absolutely necessary and urgent to appoint Ezhov as People's Commissar for domestic affairs. Yagoda evidently appeared to be not cognizant speaking about debunking of Trotsky—Zinoviev coalition. *OGPU was four years behind time*. All the workers and most of regional representatives of NKVD (People's Commissariat for Internal Affairs) (author emphasized)» [5, p. 32].

In the resolution of February—March plenum of the CC of All-Union Communist Party of Bolsheviks in 1937 according to report of N.Ezhov «Lessons of sabotage, diversions and espionage of Japanese-German-Trotsky agents» this telegraph arrangement acquired the strength of party act. Mass repressions must compensate «four-year lateness». Moreover, on this plenum Stalin formulated more strictly thesis on sharpening of class struggle in measures of «ahead to socialism» promotion¹¹. In June 2, 1937, CC AUCP (b) suggested to regional committees of party in five days to introduce «...composition of three people, as well as number of those, who came under execution and number of those, who came under expulsion» [6].

Mass repressions began in the capital of the North after arrival in the beginning of September 1937 of new head of NKVD department in the Arkhangelsk region V.F.Dementiev. But a special range in Arkhangelsk, Vologda and Syktyvkar they achieved after the visit of the CC AUCP (b) secretary A.A.Andreev and handled by him in November, 4-5 of Arkhangelsk regional commit-

¹⁰ The same. D. 35. L. 5.

¹¹ The same. L. 33.

tee plenum. More detailed these events were described in the book «Repressions in Arkhangelsk. Documents and materials», published under the editorship of R.A.Hantalin in 1999 [7].

Announcing the first Arkhangelsk regional party conference on June, 15, 1938, a new secretary of the CC AUCP (b) regional committee A.F.Nikonorov, also later victimized, said: «Enemies, anyhow they disguised, anywhere they hid, anyway were overtaken by the bright searchlight of Stalinist directions and were caught red-handed by our great Soviet reconnaissance headed by the best Stalinist — People’s commissar of NKVD Ezhov Nikolai Ivanovich. Bandits, killers, incendiaries, intelligencers, diversionists were revealed, destroyed and will be destroyed in the most pitiless way, because when destroying all scoundrels and villains, ...our party clear conditions for mighty growth of communism, when destroying agents of fascism, it performs big deals of all the modern mankind»¹². Head of the Arkhangelsk department of NKVD V.F.Dementiev in his aspiration to make the capital of the North as «unassailable fortress of socialism» spoke even more figurative: «To scrape out from these holes everyone to a man, to the last filthy little toad, to scrape out and to find out» [8, p. 55].

New wave of terror in a great measure repeated the practice of «great» breakdown. But when at those times the main strike was mounted at proprietors and their defenders, now a new excellent way of struggle with «enemies and sabotage» was founded. Excellent in the way that much of done during the prior period, as we had already noticed, could be really be referred to wide interpretation of the word «sabotage».

And as feeling instability and ambiguity of accusations to the address of regional heads, who executed will of the center, heads of the party tried to live in an ivory tower. During party and Soviet forums, judicial processes and in mass media the idea was suggested, that local politics of the party Central Committee, which was consciously blemished, was presented as the working people's party’s platform, «...they curved the man so to make everything to the contrary»¹³. We can understand in what difficult situation were northerners, who were hold in conditions to search for enemies among the former idols. Strength of Stalin and his circle involved rude manipulations with truth and falsehood. Northern men were again curved, they were despoiled any orientation, except absolute obedience to the will of one power holder — Stalin.

Scaffold or dissimulation — here is the logic of totalitarianism

¹² ARRO. Department of DSPH. F. 296. Op. 1. D. 262. P. 2.

¹³ ARRO. F. 1322. Op. 1. D. 1016. L. 15.

It was really difficult for a normal person to survive in such a situation, logic of repressions led either to scaffold or to dissimulation and leg-pulling. Here is characteristic speaking engagement of the Nenets district party committee secretary Koltakov at the VIIth plenum of the AUCP (b) Arkhangelsk regional committee in March, 16, 1939: «The former enemy heads, who during a long time operated in the region, anyway didn't pay enough attention to development of reindeer breeding. For example, development of reindeer breeding wasn't planned. Plan of development of reindeer breeding didn't exist, wasn't given to collective farm workers, but there was a plan of killing, that means that instead of development killing was planned, reduction and cutback of reindeer breeding»¹⁴.

«Evidently, the truth must be proved just by spoils», — justifiably wrote made away with himself chairman of the Nenets regional consumer's association Kozharin Ivan Matveevich, who was excluded from All-Union Communist Party (Bolsheviks) «for relations with foreign class elements, for obstruction of machinery by strangers»¹⁵.

It's real, that in those conditions just the very few people found energy to stay honest men, to maintain their attitude, as it was done by secretary of the Nenets district committee of the party Arkadii Dmitrievich Evsugin [8, pp. 131—142], or one of the brightest representatives of Arkhangelsk intellectuals of those years Andrei Andreevich Evdokimov. His published communication with his family once again underlines power of the human spirit of one of the brightest representatives of Arkhangelsk intellectuals and at the same time absolute inhumanity of repressions' facilitators [9].

Persecution, mass destroy of «public enemies» led not just to reduction of common skill level of northerners, but to elementary deficit of qualified specialists and leaders. During two last months of 1937 in Arkhangelsk were arrested more than 1100 of leading employees [8, p. 24]. Practically two hundred people were convicted in Syktyvkar after the All-Union Communist Party (Bolsheviks) plenum of Komi regional committee in November, 1-2, 1937 [10, p. 244]. In 1937-1938 for critical activity were proposed about four thousand people instead of victimized. And these were just first victims of terror in the North. Later in the regional office of Federal Security Department in the Arkhangelsk region there were rehabilitated more than 21 thousand people [8, pp. 56, 65].

In Arkhangelsk, as well as in Vologda and Syktyvkar regional leaders were beheaded. In report for Stalin «On situation and work of party organization» from November 27, 1937, in three

¹⁴ RGA SPI. F. 17. Op. 21. D. 248. L. 2.

¹⁵ ARRO. Department of DSPH. F. 296. Op. 1. D. 65. L. 65.

weeks after the beginning of his leadership in the Arkhangelsk Regional Committee and in State Committee of party, A.Nikanorov wrote: «It is not worth speaking about difficulties of work, as Central Committee know about it. I would just report following: in the Regional Committee there just two department supervisors, and no one. Regional Executive Committee is simply empty, there is no one who control forest trusts, as all of them are arrested» [2, p. 287]. (author emphasized).

By the end of 1938, announcing Stalin of employment policy state, Nikonorov wrote: from 119 secretaries — first, second and third — 111 have been working as secretaries for one year and less» [5, 57]. Certainly, such an employment policy could not but had negative impact on development of the region. Plan of timber harvesting of 1938 was fulfilled just for 56%, of timber hauling just for 65%; in 1939 it wasn't better. First secretary of AUCP (b) Arkhangelsk Regional Committee A.Nikanorov was removed from his post «for unsatisfactory leadership of timber harvesting» and in 1940 he was victimized. In the decision of the plenum of the AUCP (b) Regional Committee in February, 26, 1939, it was noticed, that together with unsatisfactory leadership of timber industry «...Regional Committee office didn't organize the true Bolshevistic struggle on liquidation of sabotage consequences in timber industry»¹⁶.

In March 1939 during the XVIIIth meeting of the party repressive practice in the North was criticized, but indirectly. Facilitators, or to be more right, performers, as well as ascetics of «great» breakdown, became also «public enemies». It has emerged that «destruction of party apparatus was planned for subversive activities»¹⁷ (but not of their superior fathers. — S.Sh.). Hypocrisy of the party leaders and ready for new campaigns in the spirit of previous ones was evident. It is enough to open the history of any other region of the country to understand it. CC secretary A.Andreev not long before his arrival to Arkhangelsk «gave a start» to repressions during the plenum of AUCP(b) Regional Committee in Kuibyshev, where he, particularly, announced: «CC thinks, that we have no struggle with enemies, we must just mobilize Kuibyshev party organization to expose enemies». About the atmosphere which was after this in Kuibyshev Regional party Organization is witnessed during report of G.M.Malenkov at the plenum of CC: «Nobody in the Regional Committee knew how many District Committees were disbanded: firstly they told about 13, than about 20, and when they were told that 30 District Committees were disbanded, they were surprised. And now it appears that there were disbanded 34» [11, pp. 25—27].

¹⁶ The same. D. 480. L. 2; D. 481. L. 1-3.

¹⁷XVIIIth meeting of All-Union Communist Party Bolsheviks. 10—21 March 1939.: Verbatim records. M., 1939. P. 521.

Conclusion

Horrification, terror, repressions were considered to be ways of society suppression, providing unity and cohesion in condition of NeoNEP abeyancy in the second half of 1930s and in 1920—30s. In such a way, the formed top party-state nomenklatura became leading-privileged class and at the same time it cramped other social classes to express themselves both socially and regionally; it didn't stop achieving their goals any length.

Especially difficult in this inside war was for a North, because peculiar for its people senses of validity, lenity, compassion and love to each other were supported with lack of suspiciousness and leadership credibility. Repressions became the so called test for revelation and destroying of genius. Pomor high blood, as noticed D.S.Lihachev, in Northerners, was losing. Consequences of this process had an impact on development not of our region, but of the whole country.

Mass repressions against nomenklatura, which were restarted by Stalin in 1937—1938, helped him again in a Machiavellian way to find common enemy of the chief and people, who in his core doesn't feel socialism. «To rule the great, led to nothingness general population — who hates the leadership — is impossible without introducing class division of this mass, — fairly wrote one of the wisest foreign Russians of those times G.P.Fedotov» [12, p. 352]. Viktor Topolyanski in «Common newspaper» rightly noticed that «in the leadership of the party and earlier found «public enemies». But they were firstly accused not in «antiparty activities, but in sabotage and espionage», thus in antinational activities [13].

But it didn't succeed to achieve unity in the Soviet society short before the Great Patriotic War. About it bespeak declassified reports of OGPU regional government¹⁸. The outside great was can be considered to be the rescue of Stalinist nomenklatura socialism, based on the inside war. But for victory Stalin had to scramble to the true Russian ideals of Motherland through antinational regime. We know too little about the degree of Soviet society unity before 1941. And «head of all the nations» felt it best of all, who lost his head during the first years of war not from its sudden beginning but from diffidence in his people, which he couldn't feel preceding the war years. It could explain, to our mind, backwardness of Stalin's radio message, and unusually heartfelt words to his people in July, 3, 1941: «Comrades! Natives! Brothers and sisters! Fighters of our army and fleet!» (author emphasized) [14, p. 13].

¹⁸ ARRO. Department of DSPH. F. 290. Op. 1. D. 1433. L. 78-81; ARRO. F. 621. Op. 3. D. 412. L. 14; Rodniki parmi. Syktyvkar, 1990, p. 124.

About it provides strong evidence a famous chin-chin for confidence of Russian people to leadership and to himself during the zero hour of Great Patriotic War, which was told by Stalin at levee in the Kremlin in honor of commanders of the Red Army troops in May, 24, 1945¹⁹.

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¹⁹ Speech of J.V.Stalin at levee in the Kremlin in honor of commanders of the Red Army troops in May, 24, 1945. URL. http://www.hrono.ru/dokum/194_dok/194505kreml.php (accessed 28.10.2014).

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ECOLOGY

UDK 551.1/4(571.65)

Specific character of relief and loose sediments forming in the coastal zone of tidal icy seas (in the context of the northern part of the sea of Okhotsk) ecosystem



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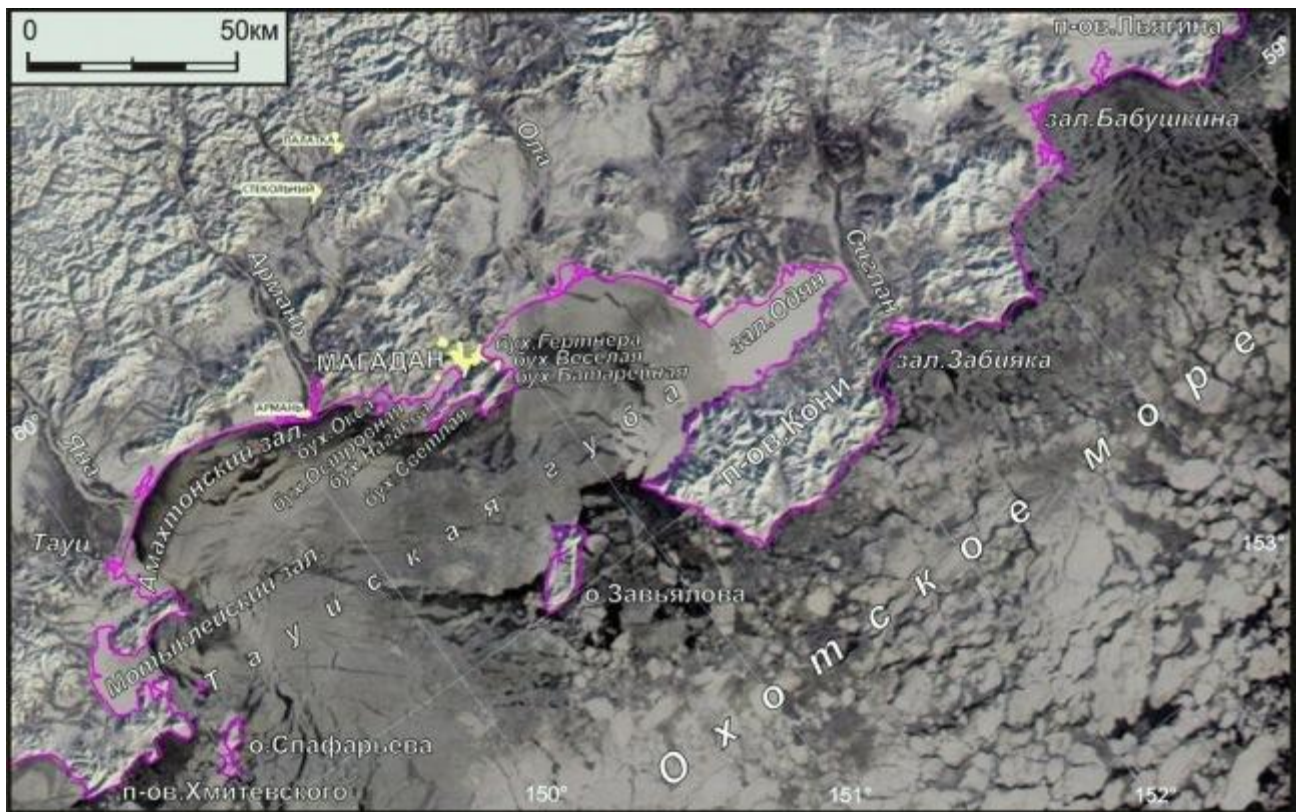
Abstract. The results of field studies and remote sensing data are used to describe some peculiar features of forming land surface and loose rocks processes as due to a combined action of sea tides and ice cover in the sea coastal zone ecosystem.

Keywords: *ecosystem, tidal seas, coastal zone, fast ice, ice hummocks, ice hummocking, ice transposition, Sea of Okhotsk*

Introduction

Magadan part of the Northern part of the Sea of Okhotsk — from Hmitievsk peninsula to Piyagin peninsula differs of wide areas, which border from the West and the North-east with greater indentation of the coast line with many bays, harbors, peninsulas and islands (pic.1). Insularity of bays and harbors because of direct influence of long period waves of the high sea specifies display of processes of relief formation and soft sediments of coastal zone¹. It also determines some other character of participation in such processes of ice coverage. And moreover the dynamics of both wave processes of relief formation and soft sediments and with participation of ice coverage are applied periodical changes of sea level because of tidal power. Here prevail incorrect lunisolar semidiurnal tides (in Tauiskaya bay) and lunisolar diurnal tides (near the Koni peninsular) with maximum amplitude of 5 meters and more [2]. Specifics of morpholithogenesis in the coastal zone of tidal Arctic waters is very weakly reflected in fundamental works dedicated to relief of sea coasts [1, 3, 4].

¹ Under the coastal zone man understands the total of coast and offshore under idea of V.P.Zenkovich, O.K.Leontyev and V.V.Longinov [1].



Pic. 1. Typical for midwinter icy scenery in the Northern part of the Sea of Okhotsk (picture was made in January, 31, 2007). We can see: slough ice which drifts to the west in the high sea; piled from the coast huge ice floes in Tauysk bay; stationary shore ice belt in Motykleyevskiy, Odyan, bays, in Gartner, Nagayev, Oksa harbors and in the western part of Amachtonskiy bay near the river Tauy

As showed longstanding field and distance researches with use of aerial imageries and satellite images 1 meter-resolved from internet services Google Earth and SASPlanet, formation of relief and soft sediments (morpholithogenesis) in the coastal zone of Magadan is done under the influence of abrasion swash sea activity; coastal slopping processes with use of cryogenesis, provoked by abrasion; ice hummocking and ice transposition of fragmentary material; diastrophic movement; seismic intensity, tsunami, etc. In this article because of volume limits we overview mostly processes of morpholithogenesis with participation of flexible ice cover, caused as a result of activity of tidal forces. Other publications are dedicated to other variants: ready [5-9] and soon-to-be.

Dynamics of ice cover

Harbors of Magadan — Nagaev, Gartner, Veselaya, Batareynaya, Svetlaya, Ostrovnyaya, Oksa and others — up to six-seven months a year (from November-December to April-May) are covered with fast ice, which reach to the end of winter the thickness 1—1,5 meters (pic.1). By that, in water areas of Tauysk bay and the whole sea of Okhotsk the ice situation is more dynamic. Here prevails the drift of great (in tens and hundreds of kilometers) ice floes, which are changed during severe winters for some period of time (one, two months) by their stoppage, congealing and ad-

freezing to coasts [2]. Under the actions of storms, especially at the beginning and at the end of winter, drift starts again. Destruction of fast ice in bays happens usually not because of melting in the field, as for example in enclosed water bodies, but because of separation from coast and shifting to the high sea. It usually happens — when there are no extreme wind or others influences — in the first, second or sometimes in the third decades of May, when ice depth becomes less than 1 meter, and tidal cracks stop regulating even at night.

Wind-tidal forces essentially are more effective on fast ice — up to its often destruction and shifting — in more open bays: Gartner, Batareynaya, Ostrovnaya, than in practically bottle-shaped, for example, Nagayev bay. By that wind waves in the Nagayev bay have smaller period, than in the Gartner bay. The role of filter, which doesn't pass long period waves, plays tight entrance to the Nagayev bay. Along the shore ice edge of all the bays — in contact with its drifting ice — appears wind-waves cracks, leads and hummock zones.

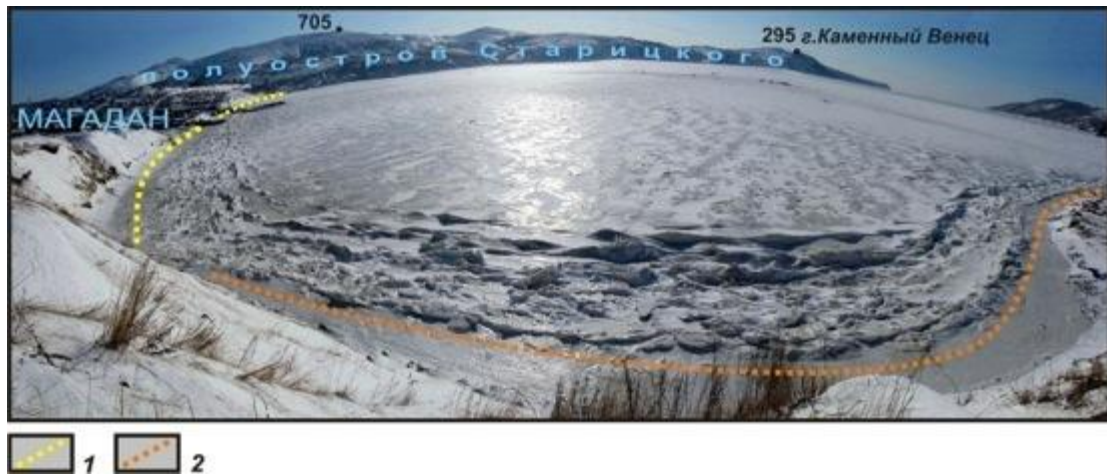
In the shallow Gartner bay in littoral with width up to 1,5 km, the fast ice is crashed with the system of tidal cracks, which play the role of joints for tidal fluctuations in sea level during lunar cycle with amplitude of maximum up to 5 meters. They are sometimes renewed and again healed by young vertical-striped ice (pic.2). Number of cracks at the littoral grow — with growth of fast ice and its hardness — up to 10 things and more. In the Nagayev bay this process is less expressed because of deeper waters and smaller width of littoral; also because of impaction of fast ice by landing places, 300 meter rock breakwater and sunken weasels at the enter to the bay.



Fig. 2. Tidal articulated crack in the Nagayev bay (February, 17, 2008), which is healed by vertical-striped ice in between high-amplitude vertical ice shoves

Ice hummocking

In winter at the water level appears ice terrace with ice depth of coming to maximum amplitude of tidal oscillations (pic 3, 4). It differs from the other part of fast ice (which is afloat and has the depth up to 1-1,5 meter) in the way, that it freezes to a coast and is absolutely immovable, in comparison with joining dynamic part of fast ice, which always shifts vertically because of tidal oscillations and horizontally because of ice hummocking; it is separated from it by the system of cracks, which is regularly renewed and again frizzed.

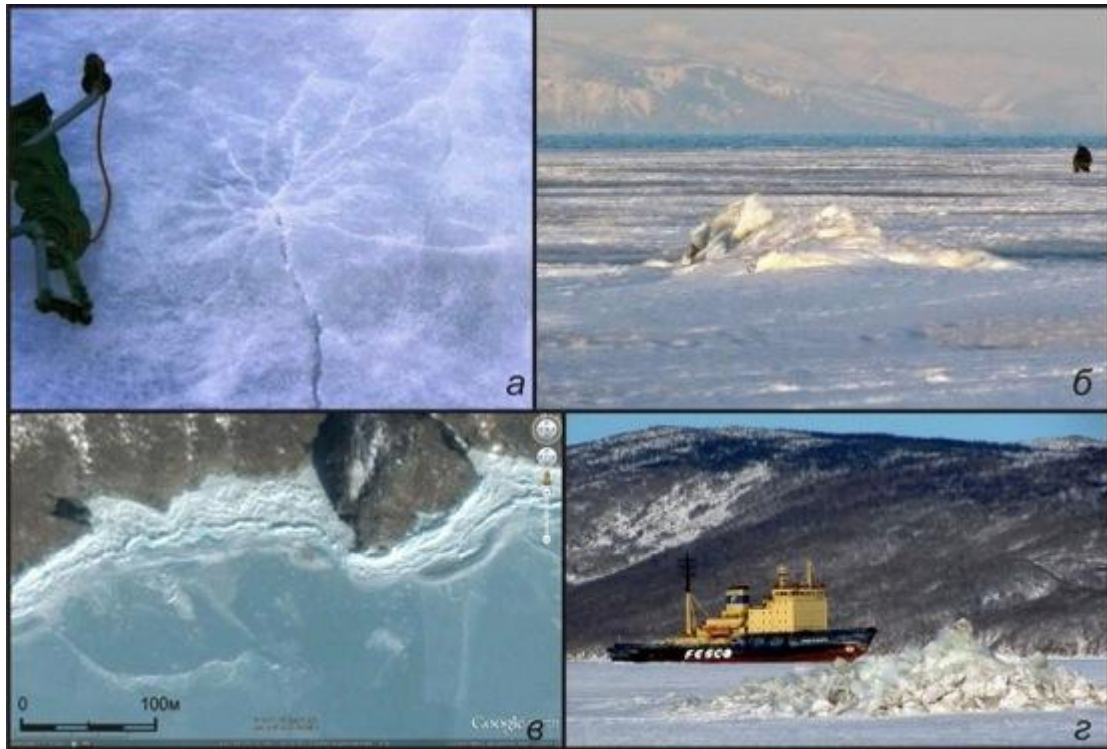


Pic. 3 Coastal torosses and coastal ice terrace in the Nagayev bay: 1 — low with slope in the eastern coast; 2 — higher in bold northern coast (March, 4, 2010)

Depth of coastal ice terrace is higher in bold coasts, as for example, at the slope of breakwater in the Nagayev bay (pic. 4 б), lower — in shelfy ones, as at the beach of its eastern coast (pic. 3, 4 а). Coastal terrace protects the beach from hummocking of dynamic ice cover, caused as a result of activity of tidal forces (pic. 3, 5 в) and takes to its surface all the slop fragmentary material from the coast, as it is seen at pic. 4 а.

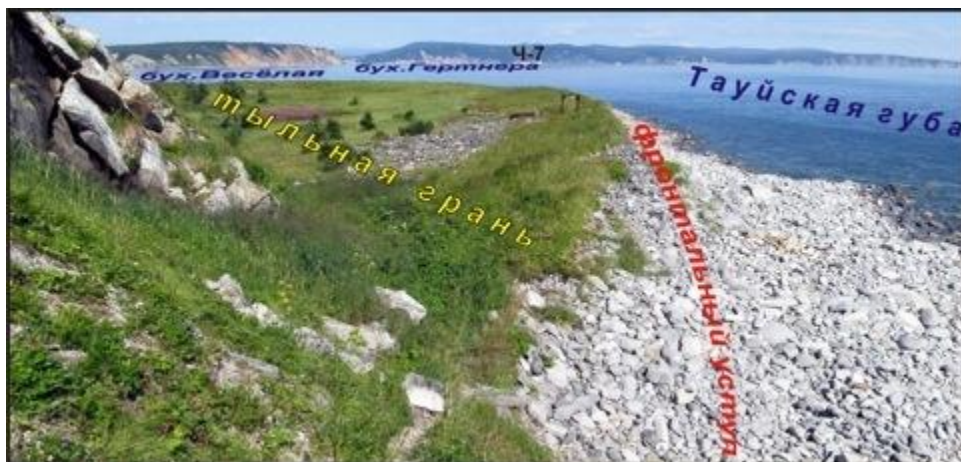


Pic. 4. Crumbled coastal ice terrace in spring: а — in the slope of the eastern coast (May, 11, 2008); б — at the slope of breakwater by the southern coast of the same bay (May, 13, 2007)



Pic. 5. One of various star cracks (**а**), which appear at the surface of fast ice in the littoral zone by its «fixing» during low tides to the exposed stones (December, 21, 2003); «star» hummock (**б**), which appeared from star crack form big stone by the end of winter's deep ice (April, 25, 2009); multiple star hummocks (small points), coastal hummocks and coastal ice terrace by enter to the Odyan bay at the beginning of winter (**в**); great star hummock (**з**), which appears at the exploded in 1947 and sunken in the Nagayev bay the ship «Viborg»

Ice hummocking mostly influence coast of open water areas, especially in mulls than in closed from the window bays. Result of hummocking by dynamic ice floes is well expressed in the high level of mammocks' rounding at the front bench of paleoseismological tearing away of Vostochny-0,3 (mull Vostochny, pic. 6).



Pic. 6. Rounded as a result of tidal activity and ice hummocking pigs at the front bench of paleoseismological tearing away of Vostochny-0,3 (aging more than 2 thousand years [9]), which is composed by sharp-

cornered benches and pit gravel. Ch-7 — paleoseismological tearing away Cherniy-7 at the northern coast of the Gertner bay

In spring during destruction of ice terrace appear mostly isometric formed «micro icebergs» with the high at the Magadan plot up to 5 meters. In many cases in May and June in the already cleaned from ice Magadan bays winds and streams take «alien» slough ice, which source is the north of the Sea of Okhotsk (pic. 7). There in Gizhinsk and Penzhinsk bays oscillatory tidal amplitude attains maximum value for the Pacific Ocean — 9,6-12,9 meters. Correspondingly to it the hight of Penzhinsk micro icebergs could be more than 12 meters.



Pic. 7. Very huge «micro icebergs» at the shoal of Nagayev bay — fragments of destroyed coastal ice terrace in spring, which was brought from the sea of Okhotsk (May, 12, 2013)

Ice «press»

By low tides the fast ice at the littoral lies down the hidden pitfalls and at their surface appear multipath stelar cracks, which according to the growth of ice depth (up to 1,3-1,5 meters) and its heaviness open, increase broadwise and lengthwise and change into rather well-defined in the relief of ice surface stelar torosses (pic. 5).

The strength of influence of the fast ice on the bed could demonstrate the example of fast (for three years) dip of sunken in 2006 and turn turtle large refrigerator trawler² «Professor Moiseev» (pic. 8) in bottom mud under its pressure of fast ice. Now back of a ship is unseen even by the lowest tides, but earlier it rose above for more than 2 meters. In the same way, apparently,

sink in the soft sediments of the littoral also chunks and gibbers.



Pic. 8. Sunken in the Nagayev bay LRT (large refrigerator trawler) «Professor Moiseev» (May, 18, 2006)

When the fast ice bottoms at the littoral during low tides, sand and pebbles freeze to its sole. With the growth of ice depth such sand-pebble lenticular interbeds appear to be at the surface by the end of winter. As a result of spring dissolution of ice at the top, by May they crop

² large refrigerator trawler

out the fast ice by its depth of about 1 meter. Because of sun warm-up of darker than the ice sand-pebbles interbeds basins of ice water appear with the depth of about 0,5 meters and size over 10 meters (pic. 9 *a*). At that they begin to melt then, when inter beds are still under the ice in the first decimeters.

Ice and other transpositions of fragmentary material

Process of ice transposition of fragmentary material is represented in the following way. In-going from abrupt coasts to ice fragmentary material comes to fast ice (pic. 4 *a*), after which destruction in spring zooms off from the beach scarp by ice and as far as it melts it sinks out. But in tidal Arctic seas other two and probably more effective mechanisms of ice transposition function.



Pic. 9. Ice transposition of fragmentary material as a result of its freezing to the lower surface of fast ice, which bottoms in the littoral zone of the Gartner bay by low tidal levels: *a* — exit of sand and small pebbles at the surface of fast ice because of spring melting at the top (May, 10, 2013); *b* — put to the littoral pebbles and boulder stones, which are discordant with typical for native scenery much smaller cave deposits of particle composition

Freezed at the bottom and cropping up in spring (pic. 9 *a*) fragmentary material after destruction of fast ice and coastal ice terrace zoomed off in blocks of ice over different distances, including southern parts of the sea of Okhotsk, where ice finally melts and dumps all the fragmentary materials at the bottom (pic. 9 *b*).

During the period of spring destruction of ice terrace its fragments, because of tidal oscillations, shake — alike crampons — and remove from the encroachment line freezed in ice huge (up to 1 meter and more) stones and spread them over foreshore mostly over short distances — meters and hundreds of meters, which are limited by huge weight of fragments (pic. 4 *b*). Topographic location of huge observable mammoths at the encroachment lines under such an ice influence changes over years of inspection.

Especially observable the result of alongshore ice transposition is in the Magadan bay Oksa (pic. 10), where the number and size of mammoths on the beach is gradually decreasing from

bases of rocks (with great huge rockslides) at the western and eastern shores to the top of the bay.

As the result of drifting of «micro icebergs» (pic. 7) from the north of the sea of Okhotsk its overrun through the whole sea of fragments of rocks, unusual for the region, is possible, for example, of Pre-Cambrian crystalline schists, aposandstones, limestones, pea pebbles, hidden in the basin of the sea of Okhotsk just at the Thaignonos peninsula. Their discovery somewhere in the south of the sea of Okhotsk could put at a stand researchers of lithology and marine deposits petrography.



Pic. 10. Directions (shown with pointers) of decrease of number and largeness of mammoths at the bench from bases of rocks to the top of the Oksa bay because of ice transposition

Biogenic transposition of fragmentary material is provided on a small scale by means of affixion of weeds, Laminaria (sea girdle) to small stones at the bottom in the littoral zone. With swift tidal waters stones with Laminaria are drawn on bottom mostly in direction of retreating sea (pic. 11 a).

An important role in moving of fine-grained soft sediments at the littoral play king worms (Nereis virens). Built by them multiple uliginous-sand pits under the entrances to their squats (pic. 11 б) are regularly washed away by the sea, by moving thorough littoral — because of tides — surf zone, and material, which they were built of is washed away to the lower hysographic level of sea bottom.



Pic. 11. Drill at the sand bottom in the littoral zone of the Gartner bay, which appeared as a result of transposition by tidal stream of pebble with affixion of Laminaria (a). «Hollows», created by king worms - Nereis vireos — over their squats (б)

Influence of processes of morpholithogenesis on the ecosystem

Influence of morpholithogenesis processes in the coastal zone of tidal Arctic seas on biogenous constituent of ecosystem is expressed ambiguously and differently directed. In such a way, ice transposition of huge blocks and boulders at the littoral forms more difficult relief of sea-shores, which is advantageous for bracing of weeds, mollusks rather than at the flat sand-pebble beach, subjected to intensive wave-cut processing. Sea calfs and sea birds like to relax on huge blocks, which drain low water. Less intensive, but over greater distances of bottom its relief's complicity is shown by ice transposition of sand, pebble and small blocks, which freeze to the lower part of fast ice.

At the same time, «ice press» produces back-to-back work, smotthing the relief of bottom in the drying zone. Regular ice «ploughing» of soft sediments of coastal zone by means of tidal fluctuations in sea level gives food to such fish as navaga (*Eleginus*) and eelpout (*Zoarces viviparus*) which mostly eat benthos at the littoral. In March under cracks between coastal ice terrace and movable fast ice on the stony fields in the phase of high tides lays eggs codfish [10]. Herring deposits eggs in the end of May — beginning of June mostly in vegetation of *Laminaria*, which grow at irregular places of littoral, formed also by means of coastal ice transposition of huge blocks and boulders. In such vegetations sea-urchin lives the whole summer, which at the beginning of summer eats herring's caviar. Wolffish (*Anarhichas*) also hides in summer in the same places, but eats mollusks and crabs. Great flounder (*Platichthys stellatus*) in the same period of time comes near to the coast, attracted by caviar of herring and capelin. The biggest eat capelin itself. Big flocks of smelt (*Osmerus eperlanus* L.), which live under hummocks within the littoral on the depth of 5—25 meters for the practically whole winter, at the end of winter — usually at the beginning of May — enter the drying zone together with navaga under the remained as a result of degradation of ice coverage sheet of ice with width of 1-2 kilometers. Crabs and finger-fishes (*Asteroidea*), avoiding the influence of «ice press», come to the coast just in deep parts of sea. Sea calfs with increase of ice depth migrate to the shore ice edge and to floating ice sheets, in spite of high concentration of candle fish and navaga in winter just under the coastal ice ledge. They come back to bays just after destruction of ice following flocks of spawning herring — independent whether drift ice is there or not.

Feedback effect of biogenous constituent of the eco-system on morpholithodynamic happens. It is expressed in noted processes of transposition of small stones with affixion of *Laminaria* to the lower hysographic level because of ebbstreams; as well as because of washaway and drif-

tage to the higher depth of hollows under the squats of clam worms, during their washaway surf zone, migrated under the influence of sea level tidal oscillation.

Conclusion

Specifics of morpholithogenesis in the coastal zone of the Northern part of the sea of Okhotsk is in common characteristic for all Arctic tidal seas. It is peculiar for it formation of coastal ice terrace, which limits influence of sea waves on the coast during only the summer period (for about half a year). Flattering of marine deposits at the littoral furthers pressure of fast ice with appearing on it of stellular cracks and torosses. With freezing of fragmentary material at the bottom of fast ice is provided mass scale spread of sediments through the whole sea of Okhotsk. More localized spread takes place mostly in the coastal zone because of freezing of huge blocks in the coastal ice terrace and its future destruction. An important role in morpholithogenesis at the littoral of northern seas plays, as it appeared to be, biogenies spread of precipitates. Influence of processes of morpholithogenesis in the coastal zone of Arctic tidal seas on the biogenies constituent of the ecosystem and feedback effect of biogenies constituent of the ecosystem on morpholithodynamic plays an important role.

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UDK 519.233.5

Modeling changes in climate indices of Arctic Regions (by the example of Arkhangelsk)



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Abstract. Changes in climate indices by the example of Arkhangelsk have been analyzed.

Keywords: *climate model, climate scenario, climate forecast, computer model, trend model, the adequacy of the model, regional climate models*

Introduction

As a result of materials investigation of meteorological observations in all the regions of the world it is established, that climate is not considered to be permanent, but it is put into changes. According to estimates of some authors, based on these investigations, from the beginning of the 20th century increase of average yearly temperature in a surface layer through the territory of Russia comprised from 0,9 to 1,1°C [1, p. 10].

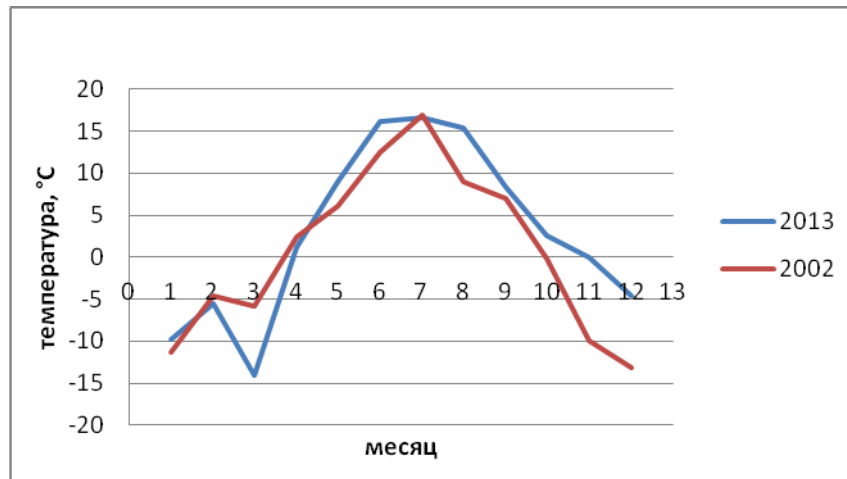
Climatic indexes of the region

For checking of this fact we have collected and analyzed data on changes of average yearly temperature, the basis for research was chosen Arkhangelsk. Researches are based on archival data from web-sites of Hydrometeorology and Environmental Monitoring Agency and meteorological center^{1 2}. For comparison were taken data on climate in 2002 and 2013.

¹ Weather in Russia and in the world // Meteorological center: [web-site]. [2013]. URL: <http://meteocenter.net/> (accessed 14.01. 2014).

² FSBI the Hydrometeorological Centre of Russia // Hydrometeorological Centre of Russia. About the weather firsthand: [web-site]. [2013]. URL: [http:// meteoinfo.ru/](http://meteoinfo.ru/) (accessed 14.01.2014).

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Pic. 1. Diagram of monthly average temperatures in Arkhangelsk

Changes of monthly average temperatures is given below (Table 1).

Table 1

Changes of monthly average temperatures in Arkhangelsk

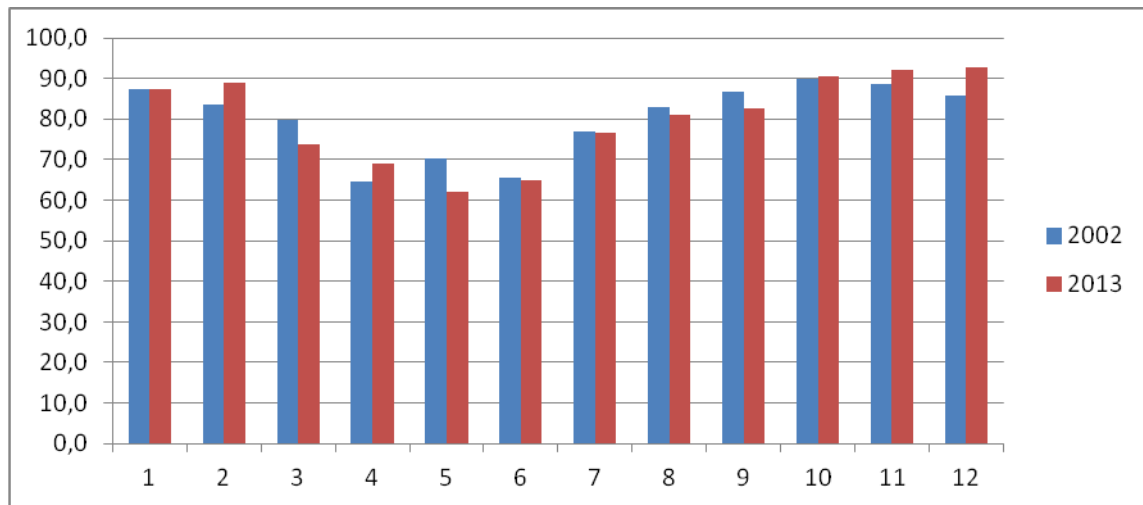
year	month											
	1	2	3	4	5	6	7	8	9	10	11	12
2002	-11,4	-4,6	-5,8	2,4	6,0	12,5	16,9	8,9	7,0	-0,2	-10,0	-13,2
2013	-9,7	-5,5	-14,0	1,2	8,9	16,2	16,6	15,3	8,4	2,5	0,0	-4,6
Δ	1,6	-0,9	-8,2	-1,2	2,9	3,7	-0,2	6,4	1,3	2,7	10,0	8,6

According to this data of temperature we can make a conclusion on climate warming, because increase of average annual temperature for more than 2,2°C took place. Analysis of curve of temperature diagrams for Arkhangelsk let us conclude that there is increase of average monthly temperature from 1,3°C to 10°C. By that way, maximum changes in temperature indexes is noticed in December.

According to the analysis of average monthly temperature it was conducted monthly ranging of years on temperature conditions. Temperature leaders appeared to be years mostly after 2005. Inside the top ten of the warmest years were years from the whole period of investigation. In the year 2010 we noticed the biggest number of temperature peaks: in April, May, July and December. The coldest years were mostly before 2006, but February 2011 as the coldest is on the first place.

Climate is much influenced by moisture gradient. Below we can see actual value of average relative degree of humidity for Arkhangelsk in years 2002 and 2013. The highest relative degree of

humidity is noticed in winter period and in late autumn (81-92%), the lowest in April—June (63-69%).

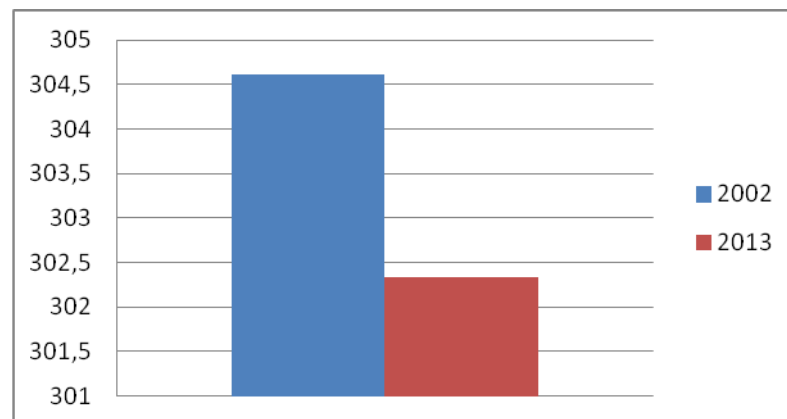


Pic. 2. Changes of relative degree of humidity, Arkhangelsk

By that, monthly analysis of data showed, that the lowest humidity was noticed in May, 2013 (62%), the highest (93%) — in November 2003 r.

Ranging of average monthly humidity estimated, that there are many years with above normal humidity: 10 years in January and October. With number of below normal humidity is 8 years in February and 7 in March, April and December.

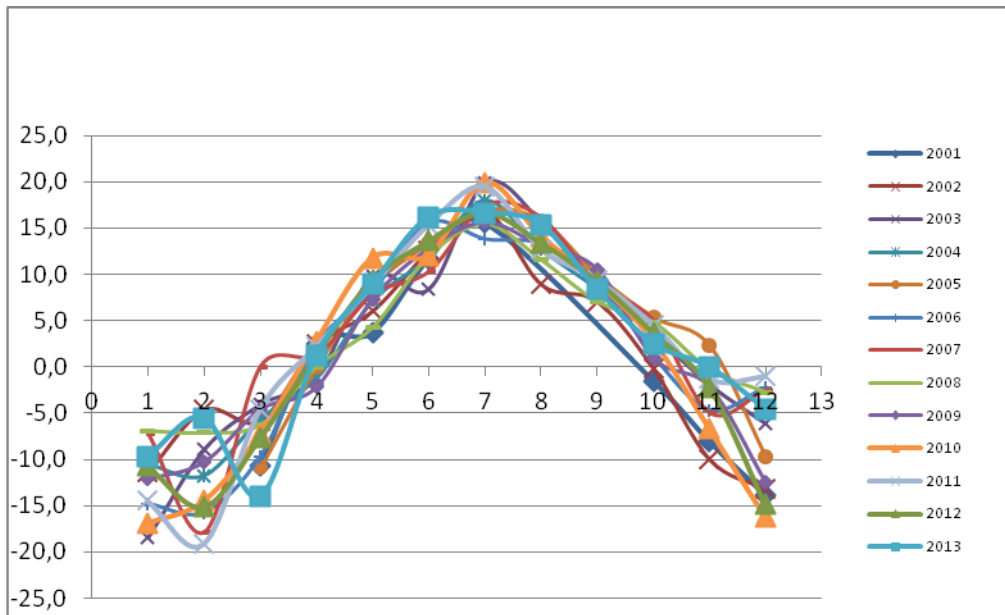
It was also investigated changes of oxygen content of atmospheric air (year average).



Pic. 3. Content of O₂ in the air, Arkhangelsk

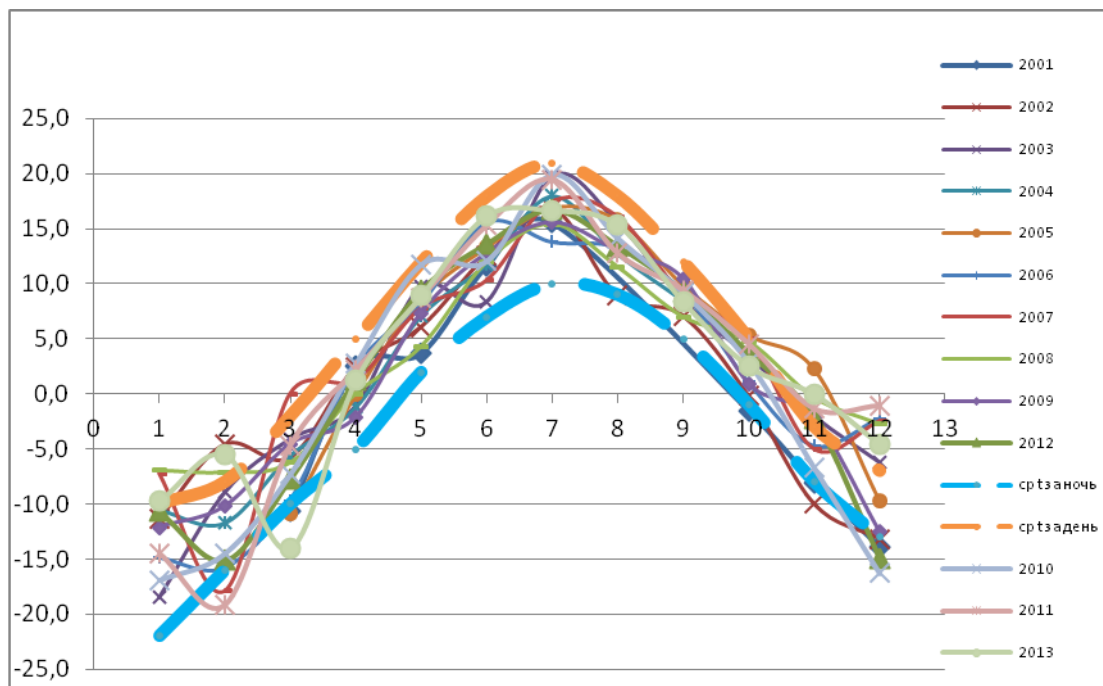
According to this estimates we can make a result on reduction of oxygen in the air in practically 0,7%. In such a way, tendency to warming and moisturization of climate is marked.

Based on experimental data of temperature changes in Arkhangelsk over the period since 2001 to 2013 there were calculated average temperatures monthly (pic.4).



Pic 4. Diagram of average monthly temperatures in Arkhangelsk

To explore changes of average monthly temperatures of Arkhangelsk, climatic data of monthly average night and daily temperatures taken from the web-site of Federal Service of Russia on Hydrometeorology and Monitoring of the Environment were applied to this diagram.

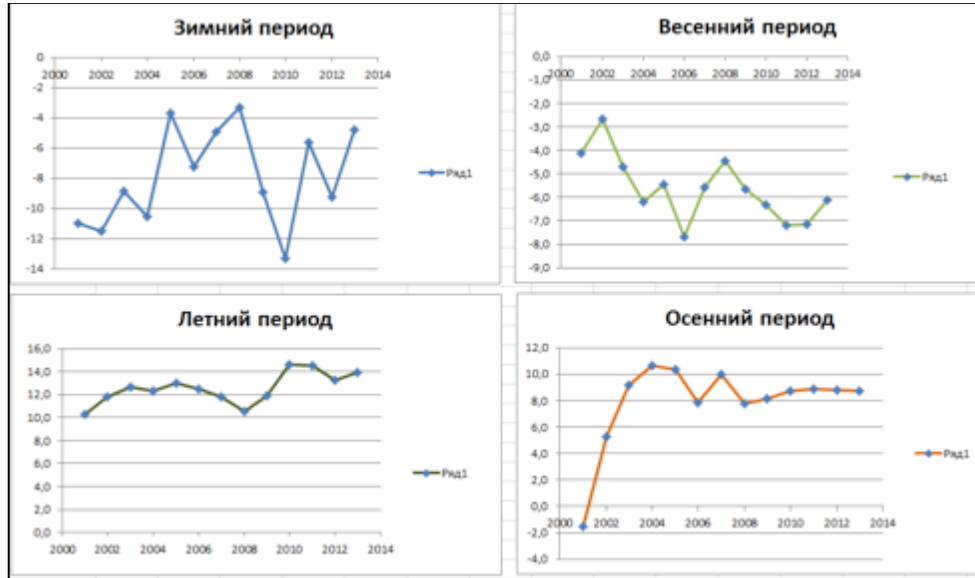


Pic 5. Derivations from the norm of monthly average temperatures

In such a way, we can see according to the picture 5, that during the period 2001 till 2013 the average monthly temperature in Arkhangelsk has been changing within the fixed climate value, which is characteristic for this city. Exceptions were anomalous values: January 2007, 2008; February 2002, 2011, 2013; March 2002, 2013; November 2002, 2005, 2013 and December 2010, 2011, 2013. The year 2013 featured all anomalies.

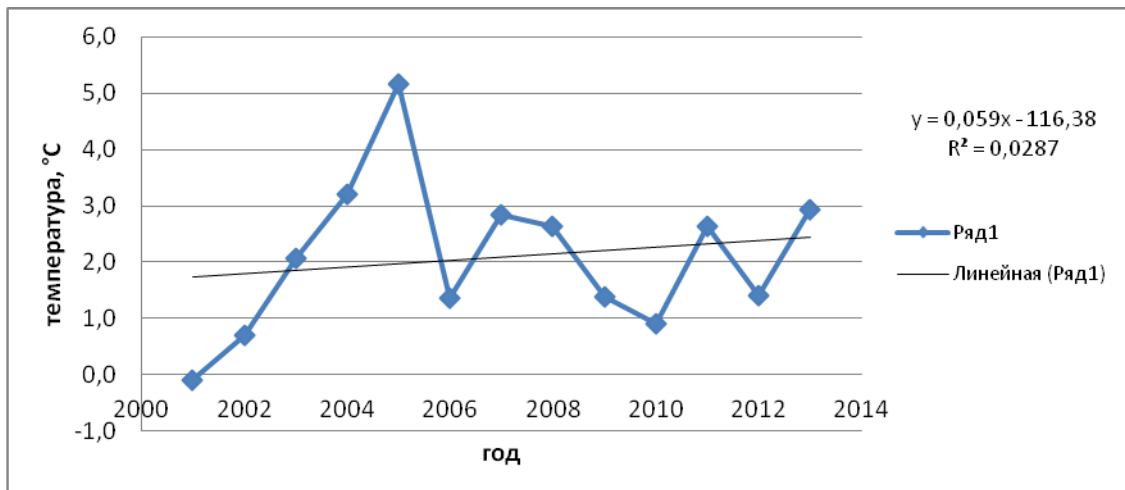
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In picture 6 we can see seasonal changes of average temperature.



Pic. 6. Seasonal changes of average temperatures

Summary table of data of average yearly changes of temperature for Arkhangelsk for the period 2001—2013 was discharged. Its results are introduced in picture 7.



Pic. 7. Changes of average yearly temperature in Arkhangelsk

Trend line gives evidence to rise of yearly average temperature.

Based on time series there was created a Brown model with adaptive parameter of adaptation:

$$\hat{y}(t) = A_0(t-1) + A_1(t-1) \cdot k$$

$$\varepsilon(t) = y(t) - \hat{y}(t)$$

$$A_0(t) = A_0(t-1) + A_1(t-1) + (1 - \beta^2) \cdot \varepsilon(t)$$

$$A_1(t) = A_1(t-1) + (1 - \beta)^2 \cdot \varepsilon(t)$$

$$\alpha_t = |K_t|$$

$$K_t = \frac{\hat{\varepsilon}_t}{\tilde{\varepsilon}_t}, \text{Если } K_t \rightarrow 0, \Rightarrow \text{система адекватна}$$

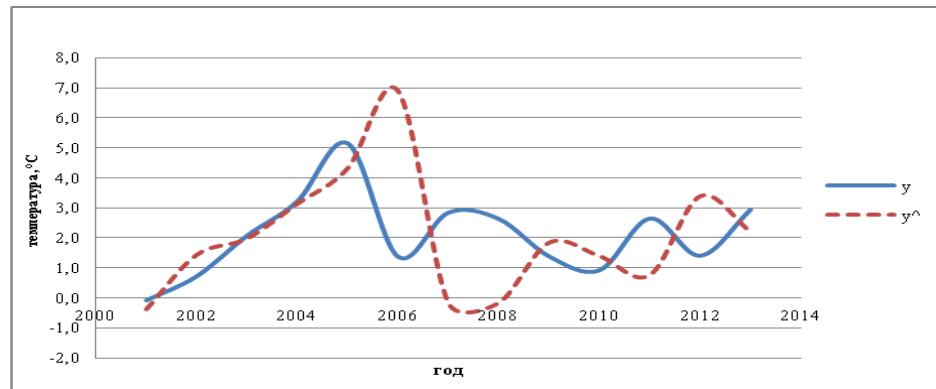
$$\hat{\varepsilon}_t = (1 - \gamma) \cdot \hat{\varepsilon}_{t-1} + \gamma \cdot \varepsilon_t$$

$$\tilde{\varepsilon}_t = (1 - \gamma) \cdot \tilde{\varepsilon}_{t-1} + \gamma \cdot |\varepsilon_t|$$

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Following parameter values were found: Model is considered to be exact and adequate:

$R=0,28$, $E=14,6$, $F=0,613$.



Pic. 8. Changes of average year-round temperature, Arkhangelsk

Brown model with adaptive parameters of adaptation

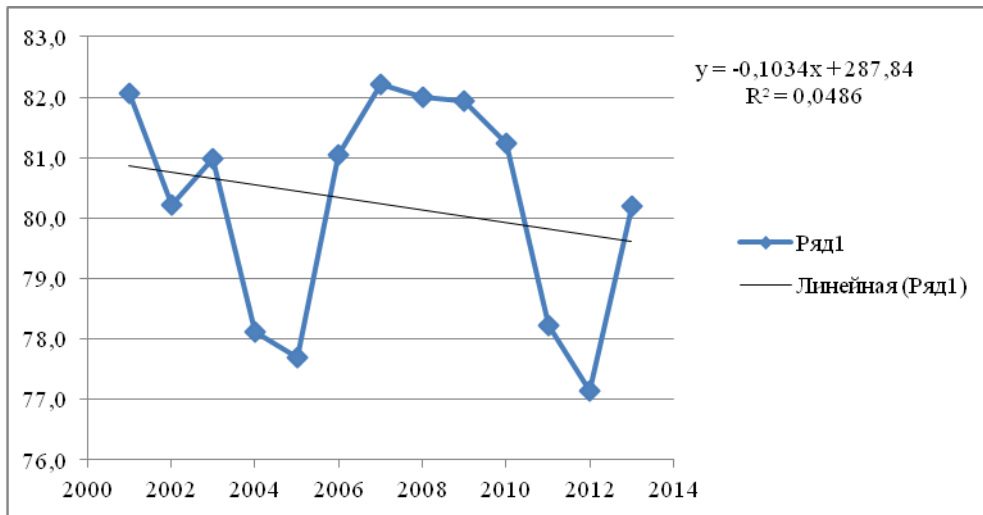
Based on this model an interval and point forecasts for 3 years in advance were formed.



Pic. 9. Point and interval forecasts of average year-round changes for Arkhangelsk

The result of analysis of average year-round changes of humidity for Arkhangelsk city for the period 2001—2013 is shown in picture 10.

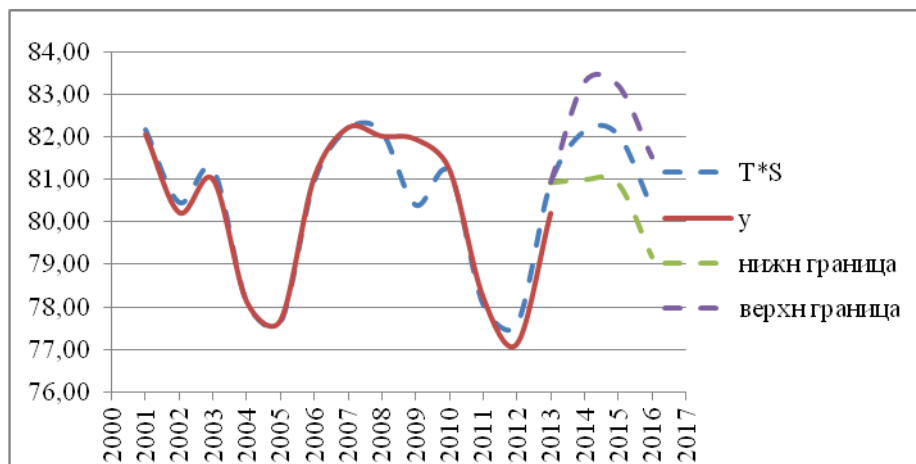
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Pic. 10. Changes of average year-round humidity, Arkhangelsk

Trend line speaks for lowering of average year-round changes of humidity for 0,9% during the overviewed period of time (12 years).

Based on methods of stochastic simulation a multiplicative model for given data was created, according to which it was also created a forecast of average year-round humidity changes for 3 years in advance:

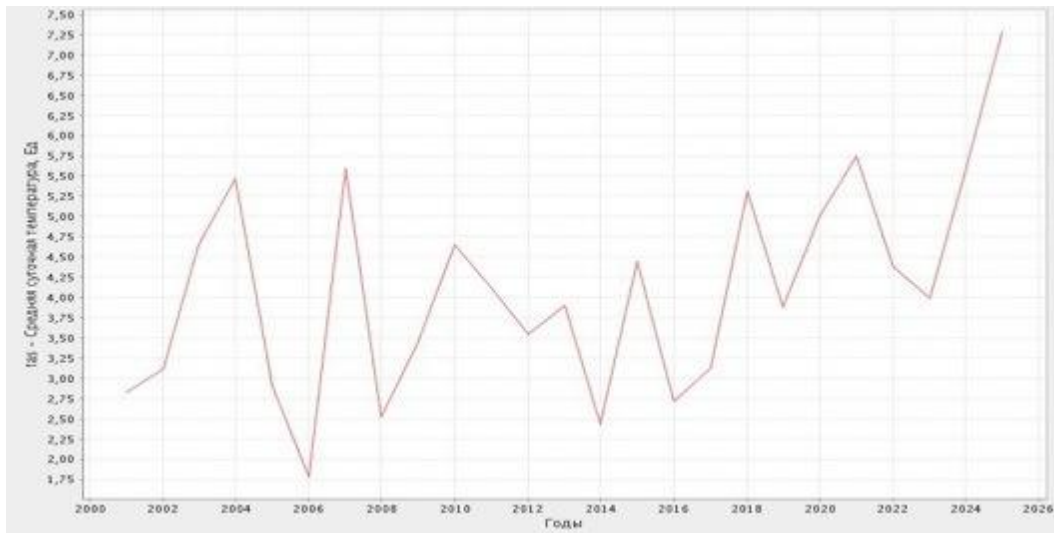


Picture 11. Point and interval forecasts of average year-round changes for Arkhangelsk

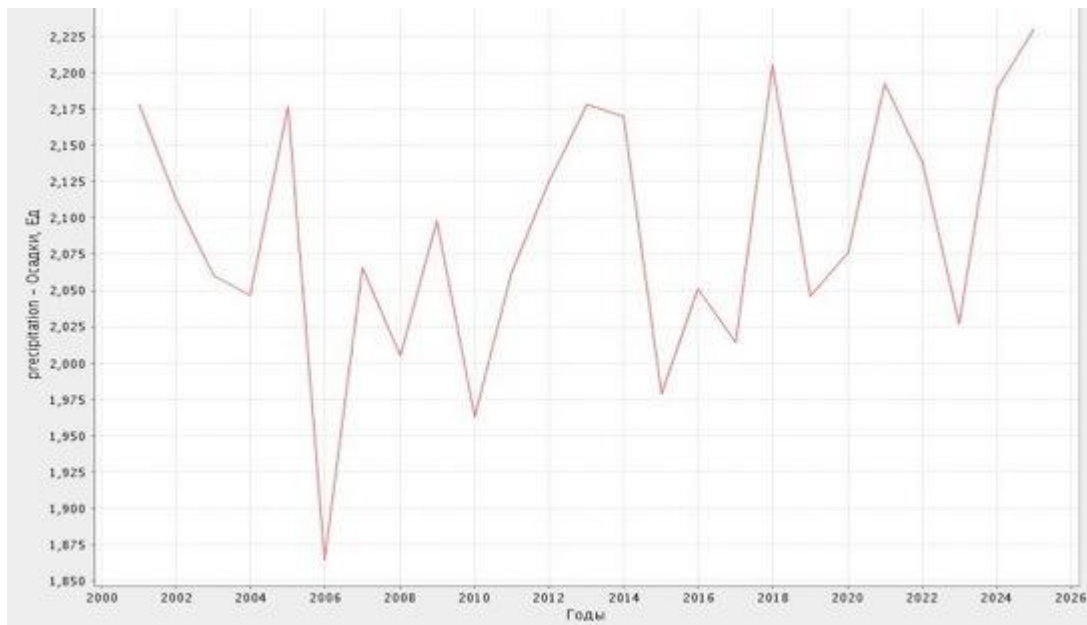
In such a way, to the year 2017 humidity for geographical space of Arkhangelsk will reduce for 2% in comparison with 2001.

To confirm conclusions reached on forecast climate changes with the help of service of web-site «FSBI Institute of global climate and ecology of Roshydromet (Hydrometeorology and Environmental Monitoring Agency) and the RAS (Russian academy of sciences) there was created a point forecast of climate data changes to the year 2025.

Results of program analysis can be seen in following pictures:



Pic. 12. Model: INM - IVM RAS, anthropomorphic scenario: commit, climate average daily temperature



Pic. 13. Model: INM - IVM RAS, anthropomorphic scenario: commit, climatic variable of precipitation

Conclusion

In such a way, created models of average temperature changes in this region and results of regional model of Institute of global climate and ecology of Roshydromet (Hydrometeorology and Environmental Monitoring Agency) and the RAS (Russian Academy of Sciences) let us make conclusions about the increase of average daily year-round temperature for 0,1 °C a year, about the increase of amount of precipitation for 0,002 mm and reduction of atmosphere pressure for 1,85 points.

Consequently, climate of the European North, in particular of Arkhangelsk region is changing, and it anyway will influence economic life of the region.

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Polar poppies on the cape Flora / Photo. © Oboimov A.P. 2014

UDK 612.11/127.2:312-053:331.108.42(1-17)

Influence of polar time record on the oxygen transportation function of blood of northerners of various age



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Abstract. The work shows the results of studying the oxygen transportation function of blood of northerners of working age. It shows the dynamics of hematological variables depending on the length of living in the North

(northern time record), which is important for human ecology.

Keywords: *Arctic, North, alien population, erythrocytes, hemoglobin, Nordic experience, age*

Introduction

According to the theory of functional systems [1; 2], functional system of breath, which unites external respiration, cardiovascular system and the oxygen transportation function, is a very labile structure. It redevelops fast in response to actions of organismic and exogenous factors, providing adequate for organism demands in oxygen balance. Climate and geographical factors of Arctic and North are recognized to be serious irritators of oxygen transportation function of blood, they influence ecology of man as well as management of people in harsh environmental conditions.

When investigating functional systems of a man it is important to take into account that stress shielding on the North are based on age-related changes, and it is difficult to imagine a priori how they correlate with each other during particular age period. Based earlier method of population cross-section when analyzing the function of external respiration and oxygen transportation function of blood [3] let analyze both age and lifetime on the North (Polar life), to emphasize periods of stress shielding, fledging period or interim period, period of relative stabilization and destabilization. The disadvantage of this method appeared to be that it doesn't answer following questions: Will these periods be developed by northerners, who came to the North when they were 20, 30 or more years old? When yes, will the length of periods be the same? Is it possible to speak about presenilation when reduction of reserved data relatively to temperate data? Some of these questions were answered during correlational study of polar life with respiratory function [4] and blood gas composition of men in different aging groups (20—29, 30—39, 40—49 and 50—

59 years) [5].

Ecological factors of the Arctic and North directly influence the make up of erythron system. Oxygen transportation function is sensitive to low temperatures and other stressors, it is prone to various changes during development of pathological situations. Being the part of functional system of O₂ transportation, changing of this function could reflect its adaptive opportunities for people of the Arctic regions. As an evidence of ecological factors influence are considered to be exertion of erythropoiesis with high activeness of erythropoetin [6], reduction of erythrocyte life expectancy [7; 8; 9]. By that the connection with latitude is evident: the farther to the North, the smaller life expectancy of erythrocytes was, and the intensity of daily erythropoiesis and the average volume of erythrocytes were increasing [8, p. 191; 9, p. 54]. But till today it is not stated whether there is a connection between polar experience and northerners' transportation function of blood and how it changes in people, who came to the North in different periods of time. The goal of research was to investigate special aspects of blood transportation function by comers of different age groups and polar experience.

Methods

For investigation of blood transportation function we surveyed on a voluntary basis men 20-59 years old in different districts of the Taimyr (Dolgano-Nenets) Autonomous District¹. 4 groups were formed according to age. The first group were men aged 20—29 years old (n=75), the second — 30—39 years old (n=90), the third — 40—49 years old (n=47) and the fourth — 50-59 years old (n=43). According to length of residence in the North (74° N.) we marked groups with different polar experience (from 1 year, from 1 to 2 years, from 2 to 5 years, from 5 to 10 years, 10 years and more).

Quantity determination of erythrocytes (Er) was conducted in hemoscope M-065. Hematocrit index (Ht) was directly measured in microcentrifuge (Radiometer, Denmark). Haemoglobin contents (Hb) in blood was measured by unified cyanmethemoglobin method with use of acetone cyanohydrin. As calibration solution, a standard fluid of hemiglobincyanide with concentration 59,75 mg% (Reanal, Hungary) was used, which is relevant to International standard solution of hemiglobincyanide. Mean cell haemoglobin concentration was measured in average concentration of this protide in erythrocyte.

¹ From the 1st of January 2007 — the Taimyr Dolgano-Nenets municipal area of the Krasnoyarsk Krai. — editorial comments of «Arctic and North» journal

Determination of erythrocytes' diameter was conducted by direct microscopical method with the help of spiral eyepiece micrometer. Blood for determination of erythrocytes' diameter was taken from median cubital vein into tube with heparine (10 cell/ml) according to recommendations of International Committee for Standardization in Hematology [10]. Indication of average diameter of erythrocytes and variation limits of cellules' diameter (minimum and maximum) was carried out. In dried blood smears we found the place, where erythrocytes were situated in one stratum and gauged the diameter of 500 cellules. Using the data of average diameter of erythrocytes (DE) we performed computation of average volume of erythrocytes (AvVE), index of sphericity (IS) and thickness of cellule (TC). Investigations were conducted under expedition conditions in spring-summer period.

As an experimental group we used results of investigations of 95 practically healthy men who live in Novosibirsk (55° N) at the age of 22—55 years old.

Statistical analysis of the results was conducted with the use of statistical package CSS. Numeric data were expressed during the work as mean±mean error ($M\pm m$). As boundary value of fidelity we used confidence level $p<0.05$.

Results of investigation

Oxygen transportation function of blood firstly depends on condition of Hb-erythrocytes carriers. Residents aged 20—29 years old who have Nordic experience less than 1 year, number of erythrocytes was higher in comparison with the same number in other experimental group (table 1). Further increase of Nordic experience didn't influence the number of erythrocytes and it ranged from 4,4 to $4,6 \times 10^{12}/l$. In the age group of 30-39 years old number of erythrocytes was higher during all the Nordic experience in comparison with other experimental group, which let us speak about erythrocytosis. In the age group 40—49 years old Nordic experience didn't influence the number of erythrocytes: it corresponded to age norm of mid latitude residents.

By northerners of the age group 20—29 years old who had Nordic experience less than 1 year number of Hb, as well as of erythrocytes, was higher in comparison with other experimental group which speaks about hyperhemoglobinemia (table 1). In the period of residence in the North for 2—10 years it is noted statistically that it is lowering in comparison with the index of the corresponding age group. In the group of the 30—39 years old concentration of Hb didn't depend on Nordic experience and was the same as the other experimental group. In the age group of 40—49 years old northerners with Nordic experience of 2—5 years concentration of Hb appeared to be mionectic (hypohemoglobinemia), with increase of Nordic experience a tendency to reduction during essential data scatter was determined.

Table 1

Number of erythrocytes and concentration of Hb by Northerners depending on age and Nordic experience

Age, years	Nordic experience, years (n)	Er $\times 10^{12}/l$	Hb, g/l
20—29	less than 1 year (19)	4,68 \pm 0,1 ¹	153,6 \pm 3,1 ³
	from 1 to 2 (33)	4,58 \pm 0,6	152,0 \pm 2,9
	from 2 to 5 (9)	4,43 \pm 1,2	136,0 \pm 2,4 ²
	from 5 to 10 (8)	4,61 \pm 0,4	125,1 \pm 1,8 ³
	10 and more (6)	4,55 \pm 0,8	155,1 \pm 3,6 ¹
	Experimental group (n=54)		4,41 \pm 0,07
30—39	less than 1 year (12)	5,12 \pm 0,3 ³	151,6 \pm 6,5
	from 1 to 2 (13)	4,57 \pm 0,09 ³	149,3 \pm 4,4
	from 2 to 5 (20)	5,16 \pm 0,4 ²	135,3 \pm 8,6
	from 5 to 10 (26)	5,27 \pm 0,3 ³	135,8 \pm 5,1
	10 and more (19)	5,06 \pm 0,4 ¹	136,4 \pm 5,6
	Experimental group (n=24)		4,09 \pm 0,07
40—49	less than 1 year (5)	4,32 \pm 0,5	153,7 \pm 1,8
	from 2 to 5 (6)	4,36 \pm 0,7	143,1 \pm 1,7 ²
	from 5 to 10 (12)	4,99 \pm 0,09	144,8 \pm 15,6
	10 and more (24)	4,92 \pm 0,07	143,2 \pm 8,9
	Experimental group (n=10)		4,39 \pm 1,2
50—59	from 2 to 5 (5)		144,1 \pm 3,7
	from 5 to 10 (24)	5,09 \pm 1,1	
	10 and more (14)	4,71 \pm 0,07 ³	
	Experimental group (n=7)	4,22 \pm 0,05	150,3 \pm 4,3

Note: ¹- $p < 0,05$, ²- $< 0,01$, ³- $< 0,001$ — according to current experimental group; within brackets there is a number of participants in the group; Er $\times 10^{12}/l$ is a number of erythrocytes; Hb — haemoglobin

Results which we got with the help of Hematology Analyzer showed that minimum percentage of Hb (138 g/l) is characteristic for Northerners who lived in the North for 3 years, and maximum (168 g/l) — for 8 years independent from the age group [11].

For indication of Ht-index we used finger-capillary blood (capillary Ht) and median cubital vein venous blood (venous Ht). In group of the 20—29 years old venous Ht was increased inde-

pendent from Nordic experience in comparison with data of other experimental group (table 2). Capillary Ht was also increased except those northerners with Nordic experience 2—5 years.

Table 2

Hematokrit blood index by Northerners

Age, years old	Nordic experience, years (n)	Ht, %	
		capillary	venous
20—29	less than 1 year	52,2 ± 0,8 ³	55,2 ± 0,9 ³ *
	from 1 to 2	52,1 ± 0,4 ³	54,6 ± 0,8 ³ *
	from 2 to 5	50,4 ± 1,7	55,0 ± 2,1 ¹
	from 5 to 10	53,2 ± 1,5 ³	54,8 ± 1,1 ²
	10 and more	52,8 ± 0,7 ³	55,6 ± 0,6 ³ *
30—39	less than 1 year	51,5 ± 2,0	48,8 ± 4,1
	from 1 to 2	49,2 ± 1,8	53,0 ± 2,3
	from 2 to 5	52,9 ± 1,2 ²	55,4 ± 1,4 ³
	from 5 to 10	51,2 ± 0,8 ²	55,7 ± 0,9 ³ *
	10 and more	52,5 ± 1,6 ²	55,8 ± 1,2 ³
40—49	less than 1 year	49,0 ± 0,3 ²	51,2 ± 1,2 ¹
	from 2 to 5	48,2 ± 2,2	53,2 ± 0,8 ³ *
	from 5 to 10	51,3 ± 1,6 ¹	54,7 ± 1,9
	10 and more	53,8 ± 1,8 ²	55,7 ± 1,9 ²
50—59	from 2 to 5	55,2 ± 1,2 ³	55,6 ± 1,6 ³
	from 5 to 10	52,6 ± 1,1 ³	56,0 ± 1,5 ³
	10 and more	53,9 ± 1,5 ³	57,0 ± 1,4 ³
Experimental group (n=95)		47,2 ± 0,5	48,1 ± 0,8

Note: ¹ - p<0,05, ² - <0,01, ³ - <0,001 — according to experimental group; Hb — hemoglobin; Ht — hematokrit index; * - p<0,05 between capillary and venous Ht;

In the age group of the 30—35 years old increase of index is noted by Northerners with Nordic experience from 2 to 5, from 5 to 10 and 10 and more years, as less than 2 years Nordic experience was the same as other experimental group. In the group 40—49 years old increase of capillary and venous Ht was noticed by Northerners with Nordic experience less than 1 year and 10 years and more. By people who live in the North 2—5 and 5—10 years we noticed increase of either venous or capillary Ht. In the group of the 50-59 years old index was increased independent from Nordic experience.

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As a rule, venous Ht-index does not differ from the capillary one [12, p. 275]. In the North in the number of cases venous Ht appeared to be higher, than capillary (table 2). It is noted in the group of Northerners aged 20—29 years old with Nordic experience 1-2 years and 10 years and more. In the group 30—39 years old differences was by Northerners with Nordic experience 5—10 years, in the group 40—49 years old — with Nordic experience 2-5 years.

Moderate increase of Ht-index could speak for development of symptomatic erythrocytosis, which accompany respiratory embarrassment, particular forms of hemoglobinopathies and hypoxic states. But increase of number of erythrocytes was noticed only in the group 30—39 years old, in group 20—29 years old by Northerners with Nordic experience less than 1 year and in group 50—59 years old with Nordic experience 10 and more years (table 1), while increase of Ht-index was noticed by practically all the groups. In such a way, changes of Ht-index could be connected with morphofunctional features of erythrocytes. The conducted morphometric assessment of erythrocytes of northern comers showed, that Ht index is increased not so much because of absolute increase of erythrocytes, as because of changes in their form and size (tables 3, 4).

Table 3

Physiological anisocytosis, average diameter and surge of erythrocytes' diameter of Northern comers depending on age and Nordic experient

Age, years	Nordic experience years, (n)	PA	ED, mkm		
			average	minimum	maximum
20-29	less than 1 year	2,82±0,06 ¹	7,47±0,03	6,05±0,14	8,89±0,11
	from 1 to 2	2,77±0,07	7,50±0,01	6,14±0,07	8,93±0,04
	from 2 to 5	2,67±0,16	7,58± 0,02	6,27±0,08	8,95±0,14
	from 5 to 10	2,68±0,17	7,53±0,09	6,32±0,11	9,0±0,17
	10 and more	2,92±0,22	7,52±0,02	6,20±0,23	9,12±0,09 ¹
30-39	less than 1 year	2,58±0,16	7,47±0,02	6,21±0,14	8,80±0,08
	from 1 to 2	2,57±0,15	7,49±0,02	6,27±0,15	8,85±0,05
	from 2 to 5	2,40±0,12	7,51±0,03	6,34±0,10	8,74±0,07
	from 5 to 10	2,54±0,07	7,49±0,02	6,23±0,08	8,82±0,04
	10 and more	2,78±0,18	7,43±0,03	6,10±0,12	8,89±0,11
40-49	less than 1 year	2,76±0,22	7,55±0,02	6,50±0,16	9,22±0,15 ¹
	from 1 to 2	2,25±0,15 ¹	7,55±0,05	6,60±0,15 ¹	8,85±0,15
	from 2 to 5	3,0±0,20	7,45±0,05	6,0±0,22	9,0 ±0,15
	from 5 to 10	2,63±0,12	7,49±0,02	6,33±0,09	8,96±0,13

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	10 and more	2,54±0,09	7,52±0,02	6,32±0,08	8,92±0,07
	from 2 to 5	3,35±0,35	7,49±0,05	5,67±0,17 ²	9,02±0,28
50-59	from 5 to 10	2,25±0,30	7,54±0,05	6,45±0,18	8,7±0,17
	10 and more	2,55±0,09	7,50±0,02	6,40±0,08	9,05±0,13
Experimental group (n=95)		2,61±0,07	7,51±0,07	6,20±0,06	8,80±0,06

Note: ¹-p<0,05, ²-<0,01, — according to experimental group. ФА — physiological anisocytosis; ДЭ — erythrocytes' diameter

Physiological anisocytosis is characterized with presence of erythrocytes of different size. In the group of Northerners with Polar experience less than 1 year and group of the 40—49 years old with Nordic experience of 1—2 years quantity of anisocytosis differed from the same index of experimental group: it was higher in the group of the 20-29 years old and lower in the group of the 40—49 years old (table 3). An average diameter of erythrocytes of Northerners corresponds to index of experimental group. In the group of the 20—29 years old of Northerners with Nordic experience 10 and more years old were noticed erythrocytes with maximum diameter, which increased this index by experimental group. Erythrocytes with maximum diameter were also noticed in the group of the 40—49 years old but only by Northerners with Polar experience less than 1 year. Differences in minimum diameter were noticed in group of the 40—49 years old by Northerners with Nordic experience 1—2 years (increase) and group of the 50—59 years old by Northerners with Nordic experience 2—5 years (reduction) according to index of experimental group. These data are in keeping with results of scanning electron microscope of Northerners' erythrocytes [13]. When by Moscovites bulk of erythrocytes is presented by discocytes-normocytes (68%), by Northerners except the population of normocytes (42%) number of microcytes was increased (from 14% in Moscow to 22% in Magadan) and macrocytes (from 18% in Moscow to 36% in Magadan).

Other characteristics of erythrocytes (TE, AvVE and TC) are put into more changes. In age group 20-29 years old with increase of Nordic experience was noticed a tendency to increase of AvVE (from 111,5±2,46 to 116,2±2,82 fl) (table 4). In group of the 30—39 years old AvVE was increased only by Northerners with Nordic experience of less than 1 year, from 1 to 2 and from 2 to 5 years; after 5 years of residence in the North the index corresponded to temperate norm. In age group 40—49 and 50—59 years old maximum indexes of AvVE were by Northerners with Nordic experience 10 years and more.

Table 4

Average volume, thickness and sphericity erythrocytes index by Northern comers

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depending on age and Nordic experience

Age, years	Nordic experience, years	AvVE, ϕ fl	TE, mkm	IS
20-29	less than 1 year	111,5±2,46 ³	2,56±0,07 ³	2,95±0,08 ³
	from 1 to 2	113,7±1,6 ³	2,56±0,04 ³	2,9±0,05 ³
	from 2 to 5	113,6±1,72 ³	2,52±0,04 ³	3,02±0,03 ³
	from 5 to 10	115,2 ±2,4 ³	2,50±0,19	3,03±0,11 ²
	10 and more	116,2±2,82 ²	2,54±0,07 ³	3,0±0,09 ³
30-39	less than 1 year	100,2±3,34 ¹	2,29±0,13	3,26±0,23
	from 1 to 2	107,5±3,53 ³	2,49±0,39	3,05±0,49
	from 2 to 5	102,3±3,34 ²	2,28±0,07	3,25±0,13
	from 5 to 10	97,2±2,96	2,35±0,08 ¹	3,45±0,13
	10 and more	103,7±8,9	2,37±0,24	3,29±0,35
40-49	less than 1 year	113,5±20,5	2,52±0,41	3,05±0,49
	from 5 to 10	102,8±6,0	2,28±0,14	3,3±0,20
	10 and more	109,2±5,0 ²	2,42±0,02 ²	3,1±0,04 ²
50-59	10 and more	114,5±11,1 ¹	2,59±0,03 ³	2,89± 0,18 ¹
Experiment group (n=95)		90,6±1,6	2,15±0,02	3,4±0,03

Note: ¹p<0,05, ²<0,01, ³<0,001 — according to experiment group; AvVE — average volume of erythrocytes; TE — thickness of erythrocytes; IS — sphericity index

Increase of average volume by unchanging average diameter of erythrocytes suppose re-configuration of cellules. It is confirmed with such indexes as TE and AvVE. In the group of the 20—29 years old TE is increased in comparison with this index in experiment group. Exceptions were Northerners with Nordic experience of 5—10 years, where it didn't differ because of vast data spread from the index of experimental group. In group of the 30—39 years old most of Northerners TE corresponded to data of experimental group. Differences are noticed in group of Northerners with Nordic experience of 5—10 years: their erythrocytes were thicker. In the group 20—29 years old AvVE is mionectic in comparison with experimental group (table 4). In the group of the 30—39 years old AvVE corresponded to analogous index of experimental group. In groups of the 40—49 and 50—59 years old it was lower among Northerners after 10 years of residence in the Arctic.

In such a way, results of investigation showed that oxygen transportation function of blood changes according to age of Northerners and length of their residence in these conditions. When in the group of the 20—29 years old by Northerners with Nordic experience of less than 1 year this function is realized by increase of number of erythrocytes and concentration of Hb, after 2 years it is broken because concentration of hemoglobin doesn't correspond to temperate concentration — it is lower. In the group of the 30—39 years old moderate erythrocytosis is noticed according to experimental group, by that concentration of Hb corresponds to temperate concentration. For the group of the 40—49 years old characteristic was reduction of Hb concentration among Northerners with Nordic experience of 2—5 years, for the group of the 50—59 years old — development of moderate erythrocytosis by Northerners with Nordic experience 10 and more years.

It is important to take into account that obtained results on number of erythrocytes and concentration of hemoglobin among Northerners don't differ from normal numbers of healthy men (without any connection with latitude residence). Exceptions were Northerners with Nordic experience of 5—10 years from the age group of the 20—29 years old, among whom concentration of Hb was $125,1 \pm 1,8$ g/l. This value is lower than permissible limits adopted for healthy men [12, p. 270]. Characteristic changes of erythrocytes among Northerners appeared to be increase of average volume of erythrocytes by unchangeable average diameter, which led to increase of erythrocytes' thickness and reduction of AvVE. Whereas, these changes could testify changes of membranes structure and cytoskeleton of erythrocytes.

It is well-known that respiratory surface of erythrocytes by its average volume by people is about 3—4 thousand m^2 [14]. Consequently, by increase of AVE we could expect accretion of erythrocytes' respiratory surface and in such a way — accretion of diffusion area for O_2 , which could essentially speed up diffusion rate per unit time. Apparently, among Northerners aged 30—39 years old increase of erythrocytes' number with moderate increase of AvVE could be over-viewed as a mechanism of adaptation for need for O_2 increase in Northern conditions. Probably, we could accept presence of this mechanism by healthy newborn child, by whom AvVE is higher than 106 fl, and later in the wake of child's rising, this index is decreasing.

Computation of such an index as average concentration of hemoglobin in erythrocyte, which reflects saturation efficiency of erythrocyte with hemoglobin, indicates its decrease in each erythrocyte. By that, with increase of Nordic experience in all age groups this reduction became more and more evident. In the group of the 20—29 years old from 29,5% of Northerners with Nordic experience of less than 1 year to 23,5% of Northerners with Nordic experience from 5 to

10 years. In the group of the 40—49 years old from 30,3% of Northerners with Nordic experience 1—2 years up to 25,9% of Northerners with Nordic experience more than 10 years. Men in experimental group this concentration was $30,4 \pm 0,72\%$.

Reduction of average concentration of hemoglobin in erythrocyte is noticed also among the residents of Magadan ($26 \pm 1\%$) and middle altitude ($30 \pm 1\%$) in comparison with the residents of Moscow ($33 \pm 1\%$) [15]. It is worth noticing that results of erythrocytes' morphometry of Northerners remind of experimental data, which were achieved by guinea pigs in conditions of oxygen deficiency ($pO_2 = 48$ mm Hg, 9000 m of height). Among these animals there were noticed number of reticulocyte, Ht, Hb, but by that average concentration of hemoglobin in erythrocyte declined, thickness of erythrocytes increased in already 72 hours of hypoxic stimulus influence [16]. Decline of average concentration of hemoglobin in erythrocyte speaks for hypochromasia and is overviewed as stigma of iron deficiency. Of wide extension of latent iron deficiency in Northerners' organism speaks data of bone marrow histochemical research by accidentally died Northerners [9, p. 56].

In such a way, found changes of morphometric characteristics of erythrocytes influence development of suppositions for intravascular derangements and tissue hypoxia. Increased in volume and thickness cellules are amenable for aggregation and damage of microhemorheology more. Increase of Ht index affects negatively on blood velocity, while leading it to decelerating; as a result comfortable conditions are provided for aggregation of erythrocytes in microcirculation vessels and mass conglutination of leucocytes at vascular walls and their further «occlusion», what in turn lead to breakdown of tela supply with oxygen [17]. These reasonings are supported by data achieved during estimate of microcirculation by the method of biological microscopy of bulbar conjunctiva [18]. 50,7% of survey comers there was noticed aggregation of erythrocytes in vessels of eye ground and retinal. More than 1/3 of population were noticed changes of blood velocity, and 46,6% were noticed aneurysms. The conducted by the author correlation analysis created connections of changes in blood velocity in retinal vessels and aggregation of erythrocytes with levels of plasma lipids and Nordic experience.

Break of intravascular microcirculation is also influenced by changes of red blood cell membrane structure. By researches of L.E.Lapin it is shown increase of lisoform concentration against the background of decrease of total phosphotide content, increase of ropiness of erythrocyte inter septum because of congestion of lipid peroxidation products. The last, according to the author's point of view, leads to possible appearance of protein-lipidic linkings, which leads to decrease of erythrocytes' deformability. We can suppose that mionectic erythrocytes' deformability

could be to some extent be compensated by decline of average concentration of hemoglobin in erythrocyte, because erythrocytes with high and moderate concentration of hemoglobin in them would have encounter more difficulties during microcirculation vessels circulation. In term, their obstruction through capillary tubes together with other factors create favorable conditions for development of tissue hypoxia.

Together with changes in intravascular microcirculation, connected with founded morpho-functional characteristics of erythrocytes, Northerners experience some stress also with vascular microcirculation. In the Arctic, in the North, capillary permeability is higher with all age groups [20]. But there is a dynamics according to this index, connected with Nordic experience. In the group of the 20—29 years old Northerners with Nordic experience from 5 to 10 years ductance for protein and filter liquid was mionectic, but after 10 years of residence it again increased. It was noticed earlier, that Northerners of this group have mionectic haemoglobin contents. Together with this, for this group is characteristic increase of lung ventilation [4, p. 19], which provided normal oxygen tension and satiation of capillary blood with oxygen, necessary level of histological metabolism, which speaks for increase of index of venous-capillary difference in oxygen tension with increase of Nordic experience [5, p. 80].

Among Northerners in the group of the 30—39 years old number of erythrocytes was increased, Hb concentration and IS of erythrocytes didn't stand out from the norm. In this age group capillary permeability for filter liquid and protein by Northerners with Nordic experience from 2 to 5 years was reduced, after 5 years of residence it was constantly increasing. Volume of lung ventilation by them corresponded to temperate norm, after 10 years of residence in the North it was supported by means of increase of breathing rhythm. In this group it was noticed connection with Nordic experience not only with venous-capillary difference in oxygen tension, but also capillary-venous difference in oxygen, what reflects connection of dynamics of tissular metabolism intensity with length of residence in the North. In the group of the 40—49 years morphometric characteristics of erythrocytes after 10 years of residence in the North were different from temperate latitude. Lung ventilation was supported by increase of breathing capacity, after 10 years of residence breath acceleration acceded to this mechanism. Tendency to increase of venous-capillary difference in oxygen tension and capillary-venous difference in oxygen was determined by the well-known phenomenon of shift of energetic metabolism from «carbohydrate» type into «fat».

Educed shift of pH aside to acid intoxication (metabolic or respiratory according to Nordic experience) [5, p. 79] supposes change of affinity of Hb to O₂. It could be increased by means of synthesis non relevant for adults of fetal Hb and increase of 2,3-diphosphoglycerate in erythrocytes. But increase of fetal Hb was noticed by Northerners with small Nordic experience or by in-

fluence of polar cold by unadapted to low temperatures people [21]. Contrary to the expectations concentration of 2,3-diphosphoglycerate in erythrocytes, measured among the residents of Magadan, didn't exceed the physiological norm [8, p. 212].

In such a way, achieved results speak of consolidation of role of oxygen transportation function of erythrocytes by Northerners in providing of transportation of oxygen as part of functional breath system. Tension of oxygen transportation function of blood is accompanied by displacement of function of external respiration, transcapillary and gas exchange. In each age group relations between particular compartments of functional breathing system is determined by Nordic experience of Northerners.

Conclusion

Thematic justification of oxygen transportation function of blood in the Arctic, in the North is connected with investigation of mechanisms of northern tissue hypoxia development. Realization of this function is provided by erythrocytes, which are considered to be hemoglobin carriers. In the turn, hemoglobin provides transportation of oxygen and carbon dioxide. Results of erythrocytes' morphofunctional characteristics analysis of Northerners of different ages depending on Nordic experience let us view different adaptive potential by young and middle-aged people. In the group of the 20—29 years old, Northerners with small Nordic experience increase oxygen capacity of blood by means of moderate erythrocytosis and hyperhemoglobinemia. After two years of residence in the North there is lack of erythrocytosis, haemoglobin contents lowers; after 5 years it is lower than the lower limit of physiological norm. But after 10 years of residence in the North hyperhemoglobinemia develops. In the group of the 30—39 years old among all Northerners, no matter how long they live in the North, erythrocytosis is noticed, haemoglobin contents corresponds to temperate norms. But with increase of Nordic experience a tendency to its decline is noticed. In the group of the 40—49 years old among Northerners after 2 years of residence in the North hyperhemoglobinemia is noticed according to temperate norm. Educated changes of oxygen transportation function of erythrocytes by Northerners depending on Nordic experience are compensated by alteration of external respiration, transcapillary and gas exchanges. Such an interaction between erythrocytes, respiratory system and vessels is considered to be an evidence of mobilization of functional respiratory system and their functioning on a new level, necessary for adequate providing of cells and tissues with oxygen in Arctic conditions. Insufficient interaction or disagreement between particular compartments of breathing functional system create conditions for development of the northern tissue hypoxia, which negatively influences the ecology of a man.

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Noospherogenesis of the Arctic: forming environmental world outlook of students



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Abstract. Social ecology is designed to equip future specialist with knowledge of the regularities of the system "society-nature" development and derived from these laws principles and technologies of optimization of relations between society and nature. Social ecology must be included in the curricula of the main university directions of NArFU. Social ecology must be taught in module, which should include: social and environmental problems of the Arctic (the North), social security, social medicine (hygiene). It is already necessary to start environmental education of society with focus on that common, which must contain all civilization of the 21st century right today.

Keywords: *Environmentalism, noosphere, pedagogical innovation, social ecology, ecological modernization, ecological education*

Education without outlook?

«Beauty will save the world — these popular words of
F.M.Dostoevsky has become the maxima.
But why even beauty will save the world?»
A.I.Subetto

More and more evident, though not always doubtless, is becoming the historic limitation of such mass types of a man as: economical man, partial member, liegeman and Homo Faber. When not always complete negation of ethic and outlook marks, but always their smearing impose students and young people upon «consumer society». Modern civilization, and it raises no doubts, is characterized with increase of direct and indirect dangers to life and health of a man. But in the era of global ecological crisis, correspondingly in the paradigm «noospheric phase of development» it is already developing the process of transformation of ideas of «humanism» and content of «ecology» [1]. These ideas must become, to the author's point of view, main directions of evolution (modernization) of Russian educational system. These circumstances are redoubled and actualized by uncomfortable and extreme conditions (challenges) of the Arctic and European North.

Sociologist A.M.Konov, pinpointing attention upon inefficiency of strategic management of the Russian Arctic (RFAZ) [2, pp. 27—28; 3], gives main factors, which, according to his point of view, influence negatively the creation of effectively working system of management. He particularly noted underestimation of the role of northern federal universities in science-educational providing of protection of Russian national interests in the Arctic. Comprehensive core of education obliges us to agree with the scientist and moreover to notice in it one of the main problems of Arkhangelsk region and the Arctic macroregion longstanding development gap — of the place, where science takes part in public life management so little. Local economists, engineers and managers of different branches are evidently strongly oriented on technocratic consciousness. Already created Northern (Arctic) Federal University (NArFU) is still in the process of establishing scientific schools. Special attention must be payed to lack of social mandates in some branches of scientific knowledge from number of alternating Arkhangelsk governors. Modern bureaucrats objectively are in need of complex scientific researches, which take into account specialities of the region. The state of regional healthcare service is a good example, it is not yet developed mostly in terms of healthcare.

Northern University (NArFU), to our point of view, must firstly develop scientific outlook of students, which will be necessary for them for their future active participation in effective strategic management of Arctic development. But anyway to bring this mission to life education processes and scientific researches must hold some validity.

In the context of our topic let's address the point of view of a clever theorist of general ecology N.F. Reimers. He objectively resumed transformation of scientific biological ecology into independent integrated science [4]. Reimers thought, and we think the same, that ecology «...has left native wall of biologically clear house, and pushed aside mother science — bioecology...». Philosopher R.S. Karpinskaya, admitting that ecological approach is considered to be result of biology, noticed that it has overgrew frames of biology [5]. Nowadays ecological approach included that social-formed goal. It means that in its content it is practically realizing connection between natural science and humanities knowledge. According to it we intent to understand *social ecology as a science and practice on formation of noosphere*. And only in such a way there will be no doubts practical challenges of ecology of a man, formulated by B.B. Prohorov: «creation on the whole territory of the country of ecologically clear, safe and socially comfortable environment of a man» [6]. As well as special attention which he payed during solution of a problem of demographic behavior and people's health conditions.

We see the problem of not always effective scientific close support of Russian Arctic exploitation in oblivion of noospheric approach in strategic management of special northern socio-natural environment. Nowadays integral approach in education process in NArFU is practically impossible. There is neither department nor even laboratory of noospheregenesis (social ecology), and orientation to scientific biological ecology is still going on. Social hygiene is substituted by chemistry of environment or the so-called technosphere safety, community medicine by the so-called healthy lifestyle and health promotion technologies; there is no place for political economy and social safety. Essentially students are prepared for life for Ministry for Civil Defense of the Russian Federation, Emergency Management and Natural Disasters Response (EMERCOM) charges, but not for sustainable development. And it is by that integrative approach (noospheric) to natural scientific and humanitarian knowledge on the basis of ecology let researchers enter out of institutional, philosophy interpretation of globalization processes in the RFAZ. Naturally nowadays in NArFU we can cheer that in Russia socio-ecological problems is excluded from lines of «sorokinskiye readings» and is absent in register of leading sociologist institutes. Even in International independent ecology-political university (IIEPI) there is no major «social ecology» [7]. Urgency of an issue also strengthens by the fact that traditional official philosophy appeared to be irresponsible to new development of Arctic and Russian European North. In NArFU, to our mind, still continues to rule the dominant oriented to direct rule of thumb.

Philosopher-noospherist A.I.Subetto also referred «universalism», regionalism, fundamentalism; the first, the second and the third priority development» to the number of common principles, which determine university education of the 21st century [8]. University education in NArFU, and it is true for the paradigm of glam-science, is in difficult times and obtains more and more narrow technocratic (practically oriented) character¹. We mark that this phenomenon wasn't specific for traditions of native (imperial and Soviet) classical universities. And in this terms the question of a student from NArFU to President V.V. Putin about necessity of history as a subject is impossible to consider private².

¹ Glam-science is characterized by dominating of simple and bright figures over real subjects and actions. In the branch of social sciences the growth of glam-science is shown in expansion of such disciplines as management and marketing, — as it was underlined by D.V.Ivanov, Doctor of Sociological Sciences, Professor of Saint-Petersburg university // *Sociology of science and technologies*, 2014, no.2, vol. 5 URL: <http://cyberleninka.ru/article/n/aktualnaya-sotsiologiya-i-glem-nauka> (accessed 26.11.2014). — editorial comment of journal «Arctic and North».

² Trofimova M. «Remembering my education before Master's program I would like to notice that during the first terms great attention is payed to common disciplines, for example to humanities. With all my respect to such a discipline as «Native history» and understanding of its importance I would like to get knowledges in introduction to the course, about history of development of science, some elements of business, rules of law. And together with it I have a question. Probably, in our universities it is worth paying more attention to practical education, but not to repetition

Properly speaking, the question is about quality of university education, and university to our mind is not mechanical reckoning of Bachelor's and Master's programs. From the other side, university form of higher education cannot still be the only one. Public needs ask to add the institutional setting of higher education with different forms of non-university higher education: engineer, pedagogic and economic institutes, drill and other schools as well as academies of applied sciences. Russian education demands for institutionalization. And speaking about it we share the opinion of director of Institute for education development (IED) of National Research University — Higher School of Economics I.V. Abankina. Scientist doesn't make «any sense» in experiment on applied Bachelor's program, which was started by Ministry of Education and Science of the Russian Federation in 2009. Bureaucrats meet the needs of rather wide Russian public wishes, who essentially don't accept any other education except higher education. And the Ministry has decided hastily and hotheadedly to create educational chimera. Mixture of higher and secondary-level education lies at the heart of this pedagogic chimera. Quality of secondary-level education in Russia surely doesn't increase, but of the higher education will be certainly become lower!

UNO conference on environment and development in 1992 declared as the first principle of sustainable development (SD) providing to be concern for people, who have rights for fruitful life. One of the main problems which stands before researchers at the current stage of social ecology formation is considered to be performance of consistent approach to understand of its subject. In his work on theory of people's behavior in urban environment in 1921 R. Park and E. Berdges used the term «social ecology» for the first time. With this term as synonym to definition «ecology of a man» Chicago sociologists underlined, that in this context we speak not about biological, but about social phenomenon, which has also biological characteristics. In 1970 at the World sociologist congress in Varna was created International Sociological Association Committee on social ecology. In Russia social ecology (theory of noosphere) still continues to be in the sidelines of its biological neighbor, which claims the status of scientific ecology. At the same time in our country appears the necessity to «hide» eco-social problematic into other disciplines [7].

Out of institutional philosophical conceptualization

We became rich in knowledge, but poor in wisdom.

K.G. Jung

A.I. Subetto rightly named the era of the 90s of the 20th century as «era of glut of innovation-pedagogical activity». Together with it, we would *firstly* remember that this «glut» was initiated by social, political and economic reforms. Neoliberalists conducted it under negotiation of traditionalism and grounds of Soviet educational system and contention of the so-called «deideologisation», «pluralism» and «liberalism». *Secondly*, we must take into account that any pedagogical system must have the status of anthropogenic system. *Thirdly*, special place in innovation process must be payed to proofing of national language, and Russian in the educational system still continues to be stood for English. And, *finally*, it is necessary to forbid those virtual pedagogic innovations, which destroy culture and a man. Logic of thoughts about the desired idea of modern education gives us a real answer that it is new anthropocentrism.

A.A. Seredkin agrees with common idea that chief approaches to modern concept of social ecology and environmentalism were formulated in three key for ecology development publications [9]. These are: «Bounds of growth», «Plan of survival» with foreword made by famous biologist Ehrlich and «Small is beautiful» by Fritz Schuhmacher. Even in 60s of the 20th century it became evident that problems of environmental safety and prevention of ecological crisis couldn't be cured by technological means. We need radical changes of basic institutions of urban society and transition to alternative social system. We got the development of theory which studies laws and forms of interaction between society and environment, variety of connections between social changes and changes in life-supporting economic conditions of social processes.

During last 50 years the world was proposed a complex of ideas, ideologies and programs of society rebuilding and changes in its management system. Up to the middle of 1980s these were concepts of eco-socialism and eco-anarchism. In 1990s they were changed into theory of modernity, concept of sustainable development, ideas of «green capitalism» and «ecological modernization». The concept «sustainable development» (SD) became the philosophy of ecological politics of developed Western countries. This concept gives the possibility for rather wide rendering of the definition of SD, but it connects environmental safety with economic growth and is considered to be main politics in countries, which are «the core of market». In Russia social ecology is understood as the study of noospheregenesis, where were developed the ideas of V.I. Vernadsky. By the end of the 20th century scientific knowledge allowed people to understand all the infinity of range of problems, which demanded for their interpretation. Integrative approach (noospheric) to scientific and humanities knowledge based on ecology let the researchers to enter the concept of Arctic globalization processes. But, from the other side, evidently, N.N. Moiseev's

point of view is fair, as he noticed that social studies appeared to be not ready to understand and accept deepened process of globalization and ecological crisis.

The phrase «everything is relative» nowadays is repeated practically at every step and by practically every scientist. There is firmness that it is impossible to know everything authentically or comprehensively, that the veracity is no longer than figment of the mind or imagination. This is the source of many our problems: controversies, created by the theory of the world culture multipolarity to discussions on modern condition of environment. But when «everything is relative» than probably the idea that «everything is relative» is not true?

And it's not surprising that most of people in the Post-Modernism period «despaired» to find some unique conditionalism to take it as a basis of their ideology as a universal principle. The Idea of «Post-Modernism» as the basic problem of modernity, characterized by confrontation of different thinking paradigms and life-forms, was firstly introduced at the end of 70s of the 20th century by philosopher Jean-François Lyotard ("La condition postmodern", 1979). Post-Modernism confirms impossibility of outer knowledge and proclaims the idea of fatuity of human being. The most important in modern scientific ideology is digestion of the new paradigm of world view. It is necessary to know, understand and adopt that most of object which cause our interest are considered to be open, unbalanced systems, controlled by non-linear laws (cosmical chaos) [10]. These are ecological, natural and socio-natural complexes, living organisms, cities, enterprises, economic structures, etc.

To our point of view, in the era of the first stage of global ecological crisis there happened no essential changes of economic and political power distribution. Confirmations about «death of classes» also seem to be evidently exaggerated and premature. In such a way, conceptualization on class antagonism and power of capital could be considered to be strict frames of noospheric futurology! Nowadays the challenge of ecological knowledge is to help young people understand what objective reality causes advantages and disadvantages of globalization. We anyway suggest the thesis on the role of universals, obtained by science. Without them people just have many individual ideas at the level of commonplace sense, traditions created by different peoples. Our position a priori provokes objections among mythologists who are defenders of the position «everything is relative».

Some scientists, for example, claim that each science supports the mark of cultural and national specialities, and that's why we can speak of «Indian», «Chinese» or about «western», «European» science. By that each of national sciences is thought to have its own methods and priorities, what doesn't exclude the veracity of these sciences. Author in particular knows suggestion on

veracity of «Russian epidemiology». In a dispute over the main the question is universals, whether they are objective, real or they are just names of things.

It is characteristic that Post-Modernism was presented as new, progressive alternative to traditional science, as new modern world perception. Post-Modernism world perception was firstly pointed as alternative to bourgeois styles in pictorial art (impressionism, cerebralism). Modern, constructivism in architecture. Improvisation as free art. Jazz in music. Then the chain: blues, rhythm-n-blues, rock-n-roll, rock. Then punk as anarchy, highest expression of freedom in music, pop music and pop culture. In historical science: concept of local civilizations of Spengler (realization of extremity of civilizations and culture), «ecumenism» of Toynbee. Then «new sciences» appeared, for example, valeology, pedagogical psychology, family studies, regional studies, gender studies, etc.

We protest against how heartily the radically gender world view is settled in our students' minds. It claims that traditional science is full of patriarchal (masculine) tone and masculine rowdy words, as well as of aggressive methods. Radicality of gender world view knows no bounds! Even battles in different countries' parliaments and armed conflicts the followers of gender science are trying to explain by «masculine politics». Gender view strongly demands to counter «masculine science» with more mild, calm «feminized» science. It is evident that the goal of «gender view», inoculated to us by «progressive human beings», is to prepare our youth to hyper-tolerance in relation to homosexual marriages? Legal equality of men and women is substituted for biological sexual equality! And the main, where in this philosophy is the place for scientific view on the processes of globalization so necessary to create sustainable development of the Arctic?

In belief emptiness of consumer society exception is done only to confirmation of private property and consumption inviolability. In people's minds we can notice displacement of care from progress to ideological fluctuation of civilization development. People try to find asylum in religious fundamentalism or in fascism, what externalizes in nationalism, Eurasianism, «Orange revolutions» in Arabian countries and in Ukraine. And it is evident that those scientists are right, who underline connections of future noospheric civilization not only with changes in economic basis of society, but with transformation of collective consciousness, world outlook and ideology [11].

At bottom, «Philosophy of postmodern» reflects common crisis of New world humanistic philosophy. Post-Modernism in philosophy appeared from radical doubt of possibility of the philosophy itself as some kind of belief-theoretical and genre unity. It didn't keep some pseudo-scientists from suggesting impossibility of objective knowledge on existence, and the idea of hu-

man being fatuity is proclaimed. Now the philosophy doesn't solve such problems as: what is good and just, how this world is arranged and what is the reason for being [12].

S.A. Stepanov wrote about «feeling of isolation of modern Russian philosophy, and its indifference to current underground processes of world reorganization» [13]. To his point of view, integrative approach based on ecology out of traditional official philosophy created such schools as «outinstitutional philosophy»: philosophy of ecology; philosophy of global studies; philosophy of sustainable development; philosophy of technics. Strictly speaking, these schools can't be parts of traditional philosophy, and we can speak only of studying common principles. As an example of «outinstitutional philosophy» in social ecology, to our mind, could be generalization of academician N.N. Moiseev. S.A. Stepanov considers «ecological imperative» of Moiseev to be the «basic category and foundation of new history-philosophical direction — philosophy of ecology», which is associated with imperative of Kant.

It is true that N.N. Moiseev tried to define the strategy (not worldview!) for mankind's survival in the 21st century. Global conscious human activity must become its basis. He thought that such an activity must limit itself by creation of «...rigid boundaries of development, necessity to coordinate its activity with development of the rest biosphere. These directives are so strict, that they could be called «an ecological imperative» [14]. Later a scientist-noospherist A.I. Subetto introduced into scientific use a related term «imperative of human being survival». To the scientists' point of view, this term «in the XXIst century means imperative of transition to new stability of socio-natural evolution». And scientist-ecologist A.G. Shmal noticed the idea of social ecology in regimentation, that means in consent restriction of human activity [15]. But now, in the context of political understanding of the term «sustainable development» (SD), adopted in RHS-92 summit, rich countries impose restriction of development for developing countries, including Russia. And this is with the assumption that level of consumption in Western countries even today is higher than rational.

Stepanov also thinks, that in the backbone of a theory of social ecology must be also included the «concept of universal evolutionism of N.N. Moiseev». His universal evolutionism of N.N. Moiseev is a configuration of world evolution progress expansion, which reflected in works of the academician. N.N. Moiseev defined co-evolution of nature and society as such a development of mankind, which doesn't destroy the stability of both biosphere and mankind. Actually, this is definition of the goal, which the planetary society must achieve. But whether this goal could be achieved?

We must point the position of ideological opponent of N.N. Moiseev, who was professor V.I. Danilov-Danilyan [16]. He proceeded from the assumption that «evolution of biota is realized through the process of speciation...». By that average life time of species adopted by him is about

3 mln. years. He concludes on wrongfulness of co-evolution of nature and man because of difference «in speeds of bio-evolution and technical evolution (five times!). Danilov-Danilyan considers also to be incorrect to equate terms «co-evolution» and «sustainable development» as N.N. Moiseev thought.

Critics of co-evolution theory adduce different arguments, which, to their point of view, speak for impossibility of such form of human being development and biosphere. But when making away with different misconceptions and variants, there is only one question is left: human control by biosphere is impossible as a matter of principle, because flow of information in all the computers of modern civilization is 1020 times less than flows of information in biota (all the living organisms, plants and animals, including people) of the Earth. Opponents of co-evolution theory hold that by such a great difference it is impossible to create an adequate model of biosphere, and consequently, to control its condition. Logic of such reasonings is mistaken inasmuch as it allow use in control processes of just such models, which are absolutely master copies of objects (in our instance copy of biosphere, which describe all its details up to behavior of particular organism). In reality behavior of systems, composed of great amount of elements, is described by statistical laws, and to control biosphere models with courtesy of individual organism are absolutely unnecessary.

Askar Ackaev points that academician N.N. Moiseev didn't delude himself about practical possibility to conduct co-evolution of a man and biosphere [17]. N.N. Moiseev came into his pessimistic position and thought, that «in modern world with its system of values it is considered to be hardly possible the opportunity to subject human activity to realization of circumstances, which provide co-evolution of society and nature demands». He supposed, that before it must be formulated common civilizational moral imperative, which will be equal to ecological imperative.

Governability of society of the era of noosphere, essentially, is considered to be the antithesis to spontaneity of the world capitalist market. And this antithesis is also part of N.N. Moiseev's theory, who thought, that «when this era will take place, it must anyway possess rational organization. Without it will be impossible to organize the regime of co-evolution!». But in the 20th century, in spite of great scientific success, who allowed to create new examples of technology and gradually to make over the whole peoples' lifestyles, concepts of rationalism began to receive different criticism.

First of all, from the Church! It couldn't be in another way. For slovenly in thought the truth is one forever, that mechanism of creation was once neglected by some Highest Force or Higher Reason. In one word, God has never fitted in the schemes of classical rationalism, or according to

the words of Laplace, to explain functioning of the Universe, a human being wasn't in need for a hypothesis for God's existence.

In the theory of noospherism we must anyway include the problem of production and division of value of «negative welfare». In the second half of the 20th century scientists-economists finally arrived at a decision that, because values of negative welfares (unwanted products, h.e. contaminates) are not considered to be the goods, the market is anyway not able to control them. Really, in market conditions each producer must either pollute or suffer from positions degradation in competitive struggle!

Moreover, industrialists' expenses, on which basis are produced traditional calculations of profitability, are objectively not appeared to be standards of real products' costs. This is also ecological imperative, which dispels a myth about social responsibility of business. In reality, this myth is not just a misbelief. This is legal camouflage of large-scale robbery, which overrides everything what was spoken about by earlier socialists-utopianists and even their followers Marxists, when they criticized exploitation of man by man, which was followed by new-born system of private enterprise. Western scientists-economists in this respect gave different points of view (according to their preferences). But most of them were solid in that it is essentially necessary state regulation of nature management.

In such a way, ecological crisis and perspective of ecological catastrophe are connected not by biology of a man, but by concrete form of human civilization (structure of society and predominated values). Such an approach, which could be called as socio-ecological, foresees the cause of ecological disasters in authoritarian industrial form of civilization, whereby concentration of energy in arms of slender and estranged from society elite is possible. Technocratic culture, culture of material consumption is becoming apparent force, which supports the structure of industrial society. Globality of the process demands for control from the side of world society.

Already since the 21st century it has become narrow in the frames of plane lineal determinism. And rationalism began to receive criticism not only by theologians, but already by scientists. Even physiologist I.M. Sechenov, about whom bio-ecologists often forget, underlined necessity of human being study in unity of its «body, soul and nature». The finishing stroke on starting worldview positions of classical rationalism was made by physics in the 19—20th centuries. And special attention must be paid to the fact that rigorous stroke to rational thought in Europe was delivered by the Einsteinian theory of relativity and the Niels Bohr quantum mechanics. Right quantum mechanics gave first demonstrative and incontestable evidence on involvement of a man as an active element in world evolution process. And in this context it is worth noticing the role of

Darwinism (concept of a man as being thinking animal), socio-Darwinism (shift of laws of wildlife with its «struggle for existence» to human society). Freud (libido) and Jung (archetype) played their roles. And surely two World and Cold wars, Holocaust, collapse of the Soviet Union and Socialist Federal Republic of Yugoslavia!

Self-organization is a characteristic of all nonlinear medium, when elements of the environment or their summation acquire the status of part of the whole. When characteristics of parts are determined by the characteristics of common, but not vice versa. In particular, everything happens around us we could consider as the process of self-organization, thus the process which is moved by means of internal stimulus, which doesn't ask for interference of exogenous factors, which doesn't pertain to system. From these positions, the global economic crisis and different forms of deviation are the result of interaction of internal components of system of the world capitalist market at a point of fabrication.

Speaking about the theory of systems, it is necessary to remember the reader on Russian scientist A.A. Malinovsky-Bogdanov, whom rightfully belongs superiority in development of main thesis of systematology theory. His work «Tectology. General organizational science» was significantly ahead of time, and as it is usual in such things, it appeared to be unclaimed for a long time. It was practically unknown for the West, where superiority in this sphere clearly belonged to L. von Bertalanffy, but just at the second attempt. We admire the breadth of A.A. Bogdanov's thoughts, of this politician, philosopher, sociologist, economist and book critic. As a revolutionist he didn't share the ideas of Plekhanov and Lenin on ground problems of socialism theory. He created «institute of struggle for viability», was its leader, and died when conducting a risk experiment on blood transfusion with himself.

As notionalist Bogdanov made a talk with conceptual baseline of tectology (from Greek. τέκτων — builder, creator and λόγος — word, study), common organizational science, which represented the idea to give expanded construction of common organizational theory and structure of systems [18]. According to Bogdanov, laws of system organization are single for all the objects, material and mental, because of which it is possible to study them in generalized form. As well as maths, tectology stands against specialisms, which study specific for each area laws and features. Definition of organized system is based on the principle in technology «the entire is more than the total of all its parts». Empiriomonism and tectology came in for knockdown criticism of Russian Marxists.

Methods of tectology are alike common methods of natural science. It is firstly different forms of induction. In the context of our topic it is worth underlining that the ideas of tectology are

inclined to modern problematic of current researches, in particular to number of problems, set up as a result of «general systems theory» by L. von Bertalanffy³. On this basis, tectology now must be overviewed as precursor of general scientific notion. Synergy, essentially, is becoming scientific system, «Science of all sciences». In particular, within a matter of synergy scientifically grounded decision genius foresights are found, which ongoing since the dawn of civilization, for example, such as rise of an order from chaos. The term «systemology» itself was suggested in 1965 by Russian philosopher I.B. Novikov.

V.I. Vernadsky eventually introduces new criterial dimension «humanity as a whole» in the analysis of system connections «man-nature» and transfers social analysis in global surface. In the center of the system of noospheric worldview is a Humanity with concrete system of essential material-economic needs and interests of survive of present and future generations.

The idea of systematic approach is rather easy: all elements of the system and all the operation inside must be overviewed just as a whole, just together, just in connection with each other. Poor experience of attempts to solve systematic problems ignoring this principle is rather well-studied: these are local decisions and consideration of deficient number of factors. Local optimization at the level of particular elements has practically led to ineffective as a whole and even sometimes to dangerous consequences. For example, construction of dike to increase the level of the Caspian sea, which fenced off the bay Kara Bogaz Gol, modernization of educational systems and public health system of Russia or projects of Northern rivers transference.

We agree with the point of view of S.A. Stepanov that «scientific and socio-humanities generalizations of N.N. Moiseev gave to philosophy of ecology prognostic functions...». They correspond to challenges of ecological education in NArFU reconstruction, and «philosophy of ecology of N.N. Moiseev» must be recognized as the theoretical basis and new paradigm of human culture and morality. Scientific heritage of V.V. Vernadsky and N.N. Moiseev, A.I. Subetto and other scientists-noospherists allow to interpret in a new integral paradigm processes of globalization and take them to basis of the theory of social ecology (noospherism). Myths are dangerous for formation of rational and moral worldview by young population. Relations between people, nature and society must be overviewed from the positions of synergy and universal evolutionism of N.N. Moiseev. But ecological philosophy of N.N. Moiseev stayed to be unacknowledged by Russian official philosophical community. According to it we can make a deplorable conclusion: in the 21st century in

³ Bertalanffy, Ludwig von (born 19.09.1901, Atsgersdorf, Austria), biologist, author of «common theory of systems». 1934—48 assistant professor, then professor of University of Vienna, 1949—61 worked in different universities in the USA and Canada, since 1961 professor of theoretical biology in Albert university (Canada).

Russia there is still historically formed model of opposition of institutional (state) university philosophical departments and free philosophers, who are not constrained by official academic frames of professional affiliation.

Alternative to northern technocratic education

*The Great Patriotic war was won by
«Soviet tenth-grader»
A.A. Zinoviyev*

We suppose that providing of high level of intellectual and moral development of a student and creation of conditions for acquirement of scientific style of mind experiences must be acknowledged to become chief goals of innovation education in NArFU. It is the direction, which our northern university must follow. NArFU is a young university and, evidently, could not understand the paradigm that «fundamentalism is the basis of «universalism». Professor Subetto clear and in an easy form explains the idea of the category «fundamentalization» of the university education. The main thing in fundamentalization of education is that it must be anyway include «philosophization» of university education, its direction to formation of the common scientific worldview by graduates, their orientation in geopolitics, global problems, in problems of sustainable development of population and Russia in the 21st century».

Biological ecology studies all connections in ecosystems of biosphere. Social ecology studies just specific connections in mega-system «society-environment». Subject of social ecology — is laws of the system «society-environment» development and resulted principles and methods of optimization of human relations with nature. Part of subject is represented by its gnoseological part and is connected with understanding of laws, which according to the level of community are lower than philosophical, but higher than the laws of special and complex sciences. Noospheric studies aimed to learn youth, that collective mind, but not nature must control future destiny of human world. It allows to unite in one humanistic «code of life» different principles, which were founded and successfully approved by different peoples, nationalists and religions. Moreover, such a methodology allows us to preserve anthropocentric position of our civilization.

Nowadays «ecological function of state» could mean only one - to protect right of a person to life. Narrow-scientific environment-oriented approach is fundamentally considered to be unethical, and such a state politics is an unfair game. Dominance of such definitions as «protection of environment» in the university education makes an illusion of simplicity. It creates a myth that biosphere is environment of modern man. Carried to the point of absurdity paradigm «environmental protection» dialectically and consistently passes into its opposition — priorities of administrative, economic and technological regulations.

Social ecology in its scientific meaning enters the cycle of the so-called anthroposophic knowledges — sciences of humanology. Its theoretical basis could and must become the new paradigm of innovational reconstruction of any education. In modern times system-structural approach appeared to be scientific method, and probable, such definition as «ecological» is acceptable only when we speak about purposeful activities, directly connected with optimization of specific ecological relations in the system «man-environment-society», which has the final goal to provide co-evolution of all constituents of this system [19].

A.I. Subetto assigns to education and family function of «reproduction of social intellect». Educational process in the broad sense of the word is overviewed by him as «unity of education - translation of knowledge, nurturing and education». Scientist uses new sociological category «educational society» for dialectic negation of informational society of the end of the 20th century. Educational society aims to remove negatives of informational societies, firstly, appeared during the XXth century by fall of quality of public intellect. Subetto pointed insufficient acquisition of «humanistic potential of national and world cultures», insufficiency of noospheric education, adoption and «taking into practice new paradigms in science and culture, what form «half-intelligence» among people with degree in Russian higher educational establishments.

As an axiom we see concept of the idea, that pedagogical educational innovations are not just demonstration of pedagogues work, but «they correspond to the moment of development» of system. Suggested by scientists educational innovations will be adopted only than, when concrete innovation will become the part of the last one, and is always appropriate to «order», «need» of pedagogical system evolution. Propensity of NArFU to «practically-oriented» education, contrary to theory of knowledge and higher education fundamentalization, surely, points to lack of progress in pedagogical evolution of this educational system. We thought good to come to this fact from the perspective of ethics of educational space.

Using the definition «innovational susceptibility» of educational systems, introduced by A.I. Subetto, we agree that different educational systems have correspondingly «particular types of innovational susceptibilities». In educational space innovational susceptibility is determined by science-technical, economic, social, pedagogical and organizational circumstances and has many levels in educational systems. Susceptibility of NArFU to innovations is characteristic not only for the level of concrete university. And to this fact there are many examples of various innovational susceptibility of education systems and higher hierarchy. It is not a secret, that Russian and Soviet education systems couldn't accept at the full extent Darwinian theory or concept of accident. In Russia, for example, biology (USSR) firstly adopted evolution of Marxist ideology and Lysenkoism

(The persecution of scientists who do not conform to the official governmental opinion on a scientific matter).

Technocratic education, fundamentally, dogmatically leads the society to going to impasse. We have to remind the reader one truth, that there is nothing more practical than the good theory! And it must become the basis for practical economic and engineer developments. Otherwise, we could again wait continuation of modern architecture of Arkhangelsk city and foremost project of «the Northern rivers lift off».

In different education guidances in social ecology there are made active attempts to create optimal model of the course taking into account specialities of one or another discipline. Discipline social ecology (beginning of noospheregenesis), to our point of view, could be represented with the wide worldview thematics. Among lecture topics the priority is given to the history of ecological study development, extremity of technocratic philosophy and biologism of traditional ecology; dualism in human sciences, worldview and world outlook, prognostic reports for Rome club. It is necessary to comply the reason for current global ecological crisis at the end of the 20th and beginning of the 21st centuries, American model of market society of consumption and production, evolution of biosphere into techno-sphere.

Special attention must be given to sociological approach in ecology, formation of ecological consciousness and formation of ecological ethics, main bio-indicator of ecological risk, consumer-related idea of current civilization, its objective influence on spirituality, morality and rectitude.

In detail must be overviewed the idea of such definition as «sustainable development» (SD): scientific and political content (RIA-92); «sustainable development» and powerful forces of market and globalization. With this topic will be connected problems of «green» and «red» criticism of global ecological crisis; custom of division of value of negative values through the whole society; pathogenesis (mechanism of development) «sicknesses of civilization» and factors of «new environment». With the result of the summit in Rio de Janeiro in 2012 (RIIO+20) the discipline should be finished.

Conclusion

We agree with points of view of scientists-noospherists, that not market priorities, but social ones will impart momentum to transformations of all our society and will lay the basis for management of its future development [20]. Oblivion of these principles and leads to loss of knowledge and brainwork values, what is considered to be one of the challenges for successful development of our country, by that threat to national security of Russia takes place.

In that connection, speaking about modernization of educational system, we must speak about the necessity of introduction of social ecology in curriculum of main university departments in Northern (Arctic) Federal University, which mission is to secure national interests of Russia. Environmentalization of the educational system marks level of infiltration of ideas, definitions, principles and approaches of ecology in other disciplines, and also preparation of ecologically trained specialists of the widest profile: engineers, doctors, economists, sociologists, etc.

Why did NArFU appear to be negatively sensitive to integral educational innovation? There are many reasons for that, but the first place is taken by bureaucratization of all the the system of education in Russia. Bureaucratization threatens to destroy Russian education and science, and here is no place to academic freedoms and artistic license. This fact is well understood and in the Russian academy of sciences (RAS), but the Academy itself appeared to be victim of political system and is not able to influence this process.

From our own reasons of NArFU irresponsiveness we would like to name fragments of Arkhangelsk technical and pedagogical institutes' (and later universities') traditions. They are far from university concept, but are always self-regenerated. Secondly, in the HEI (Higher education establishment) appears the idea of non-necessity of human sciences for Arctic development. Thirdly, here we can see admiration of western education systems with their marked functionalism. And this superiority either unrestricted or unintentionally is inculcated to our students! It is probably forgotten that special place in the ethic of pedagogical innovations is given to security of national language. Ethic shows us, that the greatest danger for us is constituted by «aggression of English-spoken words». And the main, that adepts of obsequiousness forget, that progressive and democratic Europe has mostly become history. Fourthly, in the northern university hasn't still appeared professorial self-regulated community. And, finally, beggarly remuneration of labour of professors and lecturers! Current remuneration of labour of higher-education teaching personnel is not adequate to the idea of this labour. And it doesn't facilitate progress of educational system.

Social ecology must be taught within the module, when must be included also socio-ecological problems of the Arctic (North), social security, social medicine (hygiene), etc. These disciplines specify and develop principles of out institutional philosophical conceptualization.

We share the idea of academician Moiseev about necessity even nowadays to start ecological public education with orientation to that common, what must contain all civilization of the XXIst century. In this context, probably, right was professor A.G. Busigin [21], who thinks, that even today we must realize two things: escape from total differentiation of knowledge, sciences

and educational disciplines; to reconsider priorities of human values (from HV «money — power — information» to HV «life — health»).

Basis of such programs must be composed from closure of humanitarian concept of ethics by A. Shweizer with natural scientific ecological concept by V.I. Vernadsky. Barrier on this way, we think, is considered to be ongoing differentiation of sciences, which terribly complicates opportunities of knowledge's synthesis and which is caused not by some particular reasons, but by all the evolution of modern civilization.

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Reviewer: Dregalo Aleksandr Alekseevich,
doctor of Philosophy, professor

Review

UDK 581.9 (1-924.14)

Botanical excursions on the Sørøya Island in Northern Norway



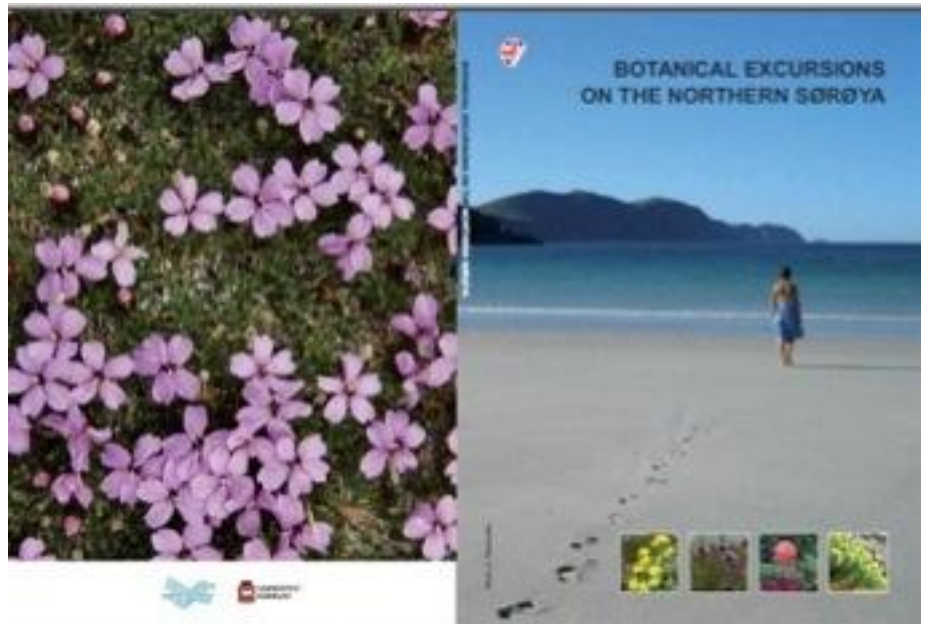
© **Koroleva** Natalia Evgenyevna, Candidate of Biological Sciences, senior researcher of Polar-Alpine Botanical Garden-Institute named after N.A. Avrorin of Kola Science Center of Russian Academy of Sciences. E-mail: flora012011@yandex.ru

Abstract. Bilingual guidebook “Botanical excursions on the northern Sørøya (Finnmark, Norway)” is presented in the article.

Keywords: *Norway, Sørøya, ecotourism, guidebook, nature of northern islands, mountain birch forest, tundra, seashore vegetation, meadows and grasslands, mires, plants on the rock, habitats of mosses and lichens*

More and more Russian tourists visit Scandinavian countries, i.e. Norway. Scientific, ecological and natural tourism represent one of popular trends of Russian–Norwegian international cooperation.

Norwegian publishing House Grafika AS has issued bilingual (Norwegian and Russian) guidebook «Botanical excursions on the northern Sørøya (Finnmark, Norway)» [1, 2013]. The Guidebook adds to better understanding of nature and plant life not only of the Sørøya Island, the largest of northern Norwegian isl-



ands, but also of the whole Northern Norway. The book is a result of cooperation project which was supported by Barents- Sekretariat in 2011—2013, and initiated by the ecologists of Hammerfest Kommune (Northern Norway) and scientists of Flora and Vegetation Department of Polar-Alpine Botanical Garden-Institute (Kirovsk, Russia).

Scandinavian people experienced in ecological and natural tourism have wide access to diverse guidebooks. Birdwatching guides and Sea mammals watching guidebooks are among most

popular [2, 2011], [3, 2008] etc. There are excellent and well-illustrated manuals about plant wildlife of Norway, incl. various handbooks of flowering plants ([4, 2007], [5, 2007], [6, 2012]), mosses and lichens ([7, 1995], [8, 2008]), types of habitats ([9, 1998], [10, 1997]), and numerous Internet-sites, but not so much pocket guidebooks [11, 1993]. The guidebook presents main types of habitats and plant communities of Sørøya Island, most typical and nice-looking plants and lichens. The guide contains more than 200 full-colored photographs, the plants are arranged according to their habitats. Habitat types are grouped accordingly with EUNIS Habitat Types Classification. Guidebook has following chapters: Features of Land and Climate, Plant Names and Vegetation Types, Mountain Birch Forest, Alpine (Tundra) Zone, Meadows and Grasslands, Mires, Seashore Vegetation, Plants on the Rock, Plants and Men). Bryophytes and Lichens are covered in their own chapters. Electronic Guidebook in English is available on the Laboratory of Flora and Vegetation page, www.kpabg.ru (in 'Publications').

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UDK 392 (470.21)

Contribution to the study of history of the Kola North

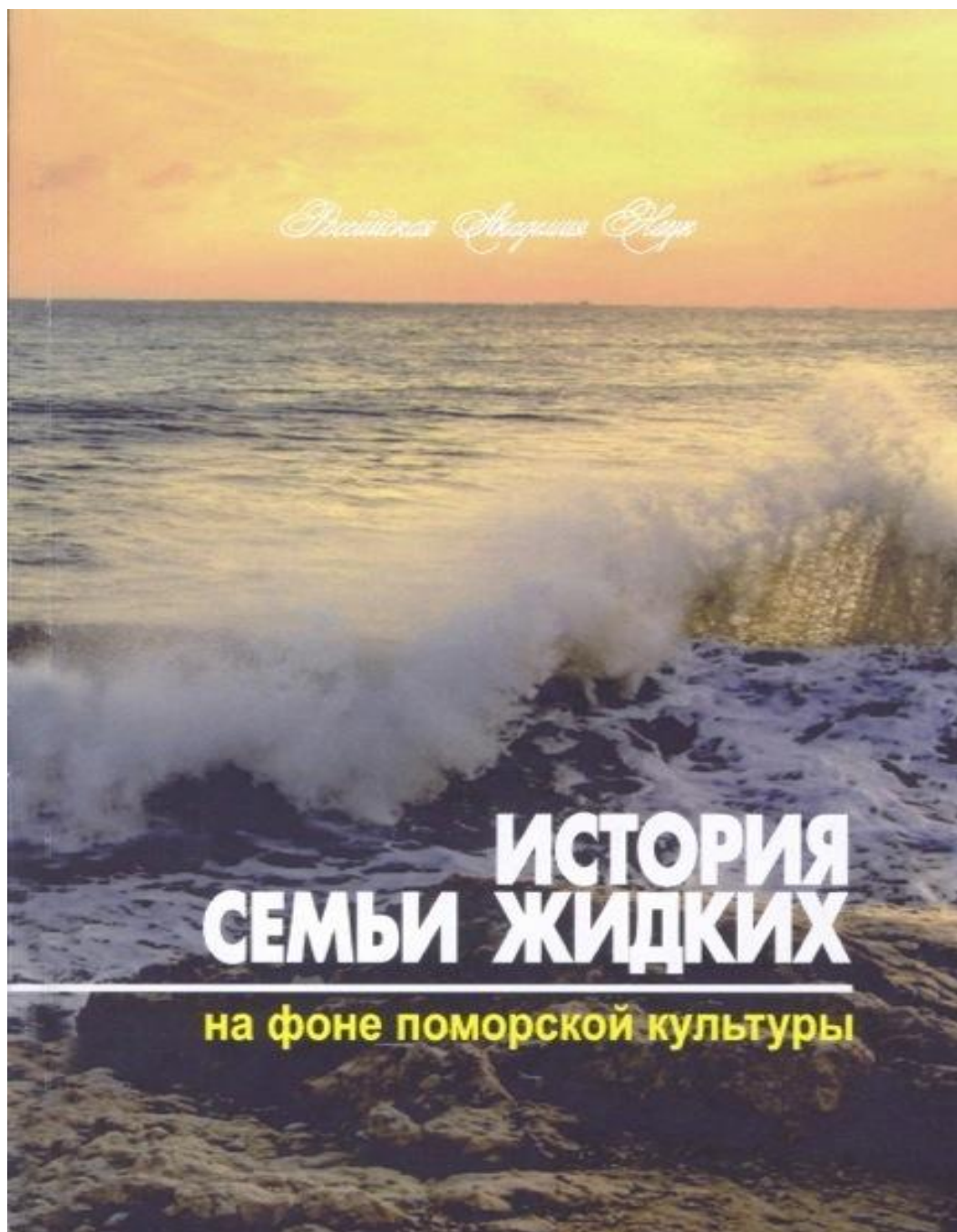
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Abstract. Scientific activity by Irina A. Razumova in the field of historical and social anthropology on the Kola North is analyzed. The book of documentary materials "The History of Family of Zhidkih on the Background of Pomor Culture" is estimated.

Keywords: *historical anthropology, social anthropology, folklore, regional studies, North, tradition, cultural landscape, cultural memory, family, oral history.*

Ten years has passed since on the Kola North appeared and began to develop successfully by direct participation of Doctor of Historical Sciences, chief research worker of Center of humanities of the Barents region of KSC (Krasnoyarsk Scientific Center) of RAS named after I.A. Razumova (Apatity) new scientific field — historic and social anthropology. This methodological area is considered to be interdisciplinary, and for working in it there were in need for Irina Alekseevna's knowledge as philologist, folklorist, ethnographer, cultural specialist and historian. Essentially, everything what was proposed by I.A. Razumova in different publications [2; 3; 4; 5; 6; 7; 8; 9; 10; 11; 12; 13] became the challenge of history-regional tradition, existing on the Kola North and attempt to move native humanitarian problematic in other forms of reading and understanding. With this goal to the native humanitarian ground were moved new approaches and methods, which are successfully applied by historians-anthropologists in Russia and in the whole world.

So, by I.A. Razumova and her followers for the first time in conditions of the Murmansk region methods of oral theory were used, there was collected and analyzed great content of data, which characterize socio-cultural situation in central and southern districts of the region, firstly, on the territories of the so-called small towns. These researches «captured» researchers in Murmansk, who, in their term, developed beginnings of scientists from Apatity over the regional center and northern part of the region [15]. Also Irina Alekseevna for the first time used definition of «cultural landscape» speaking about the Kola North [3], what itself became not only scientific contribution, but original intellectual provocation, which stirred other researchers into action in the same direction [14].



Historically anthropological direction of scientific researches of I.A. Razumova predetermined priority of social, «Human» problematic. Researcher is conscious about how experience and accept the history ordinary people — residents of the Kola North; how functions and develops the institution of the family in north of the Arctic Circle conditions; how happened and are happening processes of adaptation of migrants to territorial and ethnocultural specifics of the region; how local consciousness, way of life and cultural practices of region's residents are formed.

External distance from such usual for native historical consciousness concepts as «state», «power», «economy», etc. just at first sight excludes human discourse from «high dimensionality». Residents of the Kola North, whom the anthropologist is interested in, — is a labor resource,

which live in synergy with political and economic factors. And when current Russian government is puzzled with the question how to save and probably to creep the industrial (and wider geopolitical) potential of Russia on the territories of the Far North, anthropological researches could render great assistance in revelation of socio-cultural instruments when solving these challenges.

New result of scientific work of I.A. Razumova and her follower O.V. Zmeeva is published in Krasnoyarsk scientific center (KSC) of RAS scientific-documentary source book «History of family of Zhidkih on the background of the Pomor culture», which includes educed memorial records of a resident of Kandalaksha (Murmansk region) G.F. Beloshitskaya, folkloristic texts from her own private archive and also finding aid prepared by publishers [1].

The central place in publication is G.F. Beloshitskaya's essay «History of family of Zhidkih in the Pomor village Kandalaksha» and also adding it small memorial compositions of her, where we are able to see the practice of ordinary conceptualization of her family history, its traditions, important dates, living atmosphere (games, songs, etc.). Memorial compositions consist of independent texts full of different marks of Russian Pomor culture. They contain unique information on history and ethnography of the Pomor family in the Northern Belomorie (the whole coast of the White Sea and adjoining area) in conditions of intensive social transformations of the 20th century.

Sources really enrich the understanding of that specific situation, which took place in Kandalaksha (as well as other districts of Russian Pomorie (mainly used of shores of White Sea) during fracture of history. Constructed in 1915—1916, Murmansk railway which connected skirts and the center of the country was near the village of Kandalaksha. During industrialization works on construction of cascade of hydroelectric stations started on the river Neva and Kandalaksha aluminum plant. As a result near the village Kandalaksha began to grow the settlement, which in 1938 was reorganized into town. Village continued to live till in 1971 it wasn't assimilated by it.

Notes of G.F. Beloshtskaya is an evidence of a person who became the eyewitness of transformation of traditional landscape and keeper of its cultural heritage.

Publishers of this source fairly came to its analysis from positions of not only concrete-historical and private, but also structural and typical, what allowed them to interpret problems of family identity and cultural memory in the context of Russian Pomor culture. Publishers rightly consider, that memorial culture to wide extent determines viability of cultural traditions at the stages of «cultural acceleration» [1, p. 12]. Soviet transformation didn't lead to disappearance of the whole layer of pre-revolutionary culture because of conservation of its particular elements in «memorial landscape».

Such comments to texts of memories successfully provide their representativeness with accumulated in science bank of knowledge in history, culture and ethnography. Special attention was paid to language of memorial source. In a special table publishers located correlation of Pomor terms, founded in texts of G.F. Beloshitskaya, with famous vocabularies of Russian Pomor lexicon. Perception of texts is increased with the help of photos, archive documents and pictures from the family Zhidkih private archive.

Documentary collection from G.F. Beloshitskaya's private archive — is not the only one example of family memoirs in the Kola North. As researches of 2012—2013, undertaken by the expedition of Murmansk State humanitarian university showed, sources, published by I.A. Razumova and O.V. Zmeeva on the history of family of Zhidkih, have their analogues in the northern districts of Murmansk region, rather alike by its both structure and directivity of content. For example, with collected works of G.F. Beloshitskaya could be interrelated earlier published memorial compositions of the Kola residents E.M. Popova and V.S. Lopincev, and of the Murmansk resident T.S. Uvarova. And folklore materials, collected by G.F. Beloshitskaya, are aligned with collection of chastushkas (two-line or four-line rhymed poem or ditty on some topical or humorous theme) of the Kola resident M.I. Zherebtsova [15]. These parallels could speak for the fact, that contrary to ideas of lack of cultural layer on the Kola North, family culture is in their own way rich.

Study of family memory and private archives of the Northerners - is a current problem of humanitarian science in conditions of demographic challenges and threats, which face nowadays Russian society and Russian North in particular.

Collection of the history of family of Zhidkih is rightly considered to be the best evidence of the fact, that interdisciplinary approach, and particularly, historical and social anthropology, as an accepted direction of current science, has its perspectives in the Kola North.

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Five problems of Russian Arctic development

In recent years, Large circumpolar fields have begun to attract great attention of not only Arctic countries, but also states, situated far from high latitudes. In conditions of global climate changes a possibility of exploitation of these fields became possible. Here great deposits of hydrocarbon crude and mining materials are open. And the Northern Sea route promise to become the international transport corridor, where length of investigation is increasing. These problems were in the center of participants' attraction of regular meeting «Mercury club», which took place in October, the 8th, 2014.



Speaking in this meeting, **Evgeniy Primakov**, academician of RAS, president of the «Mercury club», touched 5 problems. The first problem legalization of external frontier of Russian continental shelf in the Arctic Ocean according to international right. The second problem. We must state some success in rebirth of the Northern sea route. But we had to do much more than already done. It is referred to increasing construction of atomic and diesel ice-breakers, as well as to perfection of navigation systems and contacts during the whole duration of the Northern sea route. The third problem is exploitation of resources, especially of energetic surely in the Arctic part of the Russian Federation, including exploitation on our continental shelf. The fourth problem is fortifying of military infrastructure in the Arctic region. Firstly, reconstruction of transpolar aerodromes and military base in the Novosibirsk islands. The fifth problem is real socio-economic development of the Russian Arctic zone. Set by the president to government challenge to provide full funding of the program starting from 2017 absolutely doesn't mean inactivity in socio-economic development of this region during these two years, especially in organizational-administrative level.



Arthur Chilingarov, special RF Presidential Envoy in international relationship in Arctic and Antarctic, RAS corresponding member, Hero of the Soviet Union and Russia announced: «I would like to say that there are different opinions on convention (UN Law of the Sea Convention, 1982), but the common opinion is that *we probably got ahead of ourselves with its ratification*. Only USA didn't ratify this convention. It turns out that in their politics they think of sectoral dividing. That's why we must rebuild our scientific potential in the Arctic: polar stations, geographic and hydrometeorological support — what we lost after the USSR collapse.



МОСКВА, 2014
«ТПП-ИНФОРМ»

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Igor Melamed, director general of CJSC «International center of regions development»

said: «there was an outstanding event this year: on the 21st of April a State program of the Rus-



sian Federation Arctic zone development was signed. On the 22nd of April Security Council was held, and in the beginning of May president signed a Decree on boundaries of the Russian Federation Arctic zone, which approved its land boundaries. As a leader of development group I would like to tell about this program. By all the sonority of words «State program of the Russian Federation Arctic zone» it is done not as much, as it was

planned». He noticed that it managed to allot areas, where business really participates in development of the Arctic zone. There are 12 areas. Mostly they are connected with extraction of commercial minerals in Chukotka, Murmansk region, Nenets and Yamalo-Nenets autonomous areas. «Mostly development of the Arctic is registered in 14 programs. We succeed to count that in the Arctic zone up to the year 2020 will be put up about 145 billion rubles. *But for the State program of the Arctic zone development no money is given nowadays.* At the meeting of Security Council the President said in his welcoming remarks: «To provide funding of this program, of this very program, since 2017». If you look at the list of realization following the results of the Security Council, this point was not included».

In meeting of the club also participated and spoke: **Andrei Klepach**, vice-chairman of State corporation «Vnesheconombank» (Bank for Development and Foreign Economic Affairs); **Vyacheslav Ruksha**, director general of federal state unitary enterprise «Atomflot»; **Evgeny Ambrosov**, first Deputy Director General of JSC «Sovkomflot»; **Valery Mit'ko**, president of Saint-Petersburg scientific public organization «Arctic civic academy of sciences»; **Leonid Kalashnikov**, first vice-chairman of the State Duma Committee on international affairs; **Lev Voronkov**, professor of the department of European integration, leader of north-european direction of the Center of north-european and baltic researches of MGIMO (Moscow State University of Foreign Affairs) scientific-coordination council on international researches; **Vladimir Barbin**, ambassador at the Ministry of Foreign Affairs of the Russian Federation; **Vyacheslav Zilanov**, chairman of Coordination Council of associations, unions and enterprises of Northern basin fishing industry, etc.

Speeches of participants are published in: «Problems and perspectives of effective exploitation and development of the Arctic zone and adjoining sea areas of Russia. Materials of the meeting of «Mercury club» October, 8, 2014». Moscow, TPP-Inform publ., 2014. Everyone who is interested in problems of Russian Arctic development have an opportunity directly to get acquainted with texts of speeches of the meeting's participants of «Mercury club» in «Arctic encyc-

lopedia» of journal «Arctic and North»: URL: [http://narfu.ru/upload/medialibrary /b6d/mercury-club-_oktyabr-2014_for_site.pdf](http://narfu.ru/upload/medialibrary/b6d/mercury-club-_oktyabr-2014_for_site.pdf)

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November 2014

Russian Arctic – Territory of Rights

In November 13–14, 2014 in Saint-Petersburg the second International Arctic Legal Forum «Preservation and sustainable development of Arctic: legal aspects» took place, and it was organized by the government of the Yamalo-Nenets autonomous area and Institute of legislation and comparative law affiliated to the RF government. Meeting of the forum took place in the President library named after Boris Nikolaevich Yeltsin.



There participated representatives of 8 international organizations, 7 foreign countries, deputies of the State Duma and senators of Federal Assembly of the Russian Federation, 10 ministries and other government authorities, 31 territorial entities of the RF, 11 medium-sized and big enterprises, 20 scientific and educational establishments of the country. The plenary meeting was opened by **V.A. Vasilyev**, vice chairman of the State Duma, general member of the RF Federal Assembly State Duma on Security and Anti-Corruption Enforcement, PhD in law. In his speech he underlined the impressive participants of Forum as a platform for communication between professionals and coordination of positions through all the variety of discussing problems of complex development and exploitation of the Russian Arctic. Vladimir Abdulievich read greeting of the State Duma Chairman **S.E. Narishkin**, chairman of the RF FA State Duma, doctor of economic sciences, chairman of supervisory board of the Institute of legislation and comparative law affiliated to the RF government, who couldn't personally attend this forum.

With information statement and photos of forum's plenary meeting you could get acquainted on the web-site of Institute of legislation and comparative law affiliated to the RF government: <http://www.izak.ru/news.html?id=707>



In speech on the plenary meeting of **A.Y. Kapustin**, doctor of laws, first vice-director of Institute of legislation and comparative law affiliated to the RF government and in introduction article of **T.Y. Habrieva**, vice-president of RAS, academician, honored jurist of the RF, director of the same institute in scientific almanac «Russian Arctic — territory of right» (Moscow, 2014. 280 p.), published to the beginning of forum, there was noticed importance of tradition of special legal

regulation in particular territories of the Russian Federation. Development of the Russian Federation Arctic zone (RFAZ) has different levels of legal regulations. Delimitation of matters of authority and power between federal, regional and local levels of public government is current nowadays. Complex comprehensive-legal investigation of the Arctic development is necessary. In the project of recommendations of participants of the 2nd International Arctic legal forum «Preservation and sustainable development of the Arctic: legal aspects» it was underlined, that federal legislation, chief legal acts of the RF territorial entities, which are included in the RFAZ «compose distinct legal and regulatory framework of sustainable development of the region. Global transformations in Russian legislation are not needed» (Recommendations..., p.3). On meetings of the forum it was noted, that it is not referred to Arctic law, as independent branch of Russian law. Special role is paid to legislation of the RF territorial entities. Speaking about federal legislation, there are two positions: to make current legislative changes (№132 — Federal law, July, 28 2012 on NSR) or to enact federal legislation (project of FL «On RFAZ»).

It is evident, that we had to pass a difficult and long way from declared readiness to real results of transformation of Arctic into the territory of rights. And an important first step was already done to understand situation in the Arctic at the interdisciplinary level, — from the position of economy, management, geopolitics, geography, regionology, landscape sciences, social sciences and other scientific disciplines, which representatives together with legalists took active part in discussion of the problems of the RFAZ effective development.

Such a discussion was within four workshops:

- I. Human Dimension of the Arctic: society and law.
- II. Cooperation of the state, business in sustainable development of Russian Arctic micro-region.
- III. Use of the Arctic resource potential: legal aspects, innovation approaches.
- IV. Arctic within the meaning of international law.

Without paying attention to the whole complex of discussed problems, it is now practically impossible here and to do it, that's why I would like to dwell on touched during discussion on the forum key problems of management — Arctic management.

What do we control? What is considered to be subject to management of Russia in the Arctic?

During speakings at the forum it appeared a problem of primary importance on the way to transform the RFAZ into the territory of right. In speeches of honorable **V.A. Vasilyev and A.Y. Kapustin** at the plenary meeting in beforehand prepared project of recommendations of the partici-

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pants of the second international Arctic legal forum nothing was said about the opportunity of adoption of primary federal law «On the Russian Federation Arctic zone». Question on currentness of adoption of such a law «On the RFAZ» was opened by **A.A. Klishas**, doctor of law, chairman of the Committee of the RF FA Federal Council on constitutional legislation and state construction. This problem was also multiple noticed in workshop meetings, concrete business suggestions on its content were made.

Nowadays there is practically no legal and regulatory framework of the RFAZ management system at the federal level. In neither Russian Empire, nor the USSR, nor in the Russian Federation was not adopted the primary law, which determined the status, structure and boundaries of the Russian Arctic. As a result this is the lack of both legitimate subject of management, but also a matter for scientific inquiries. Investigating some subject field of scientific knowledge each specialist by himself determines subject of the Russian Arctic, its boundaries, what ultimately affects preparation of practical recommendations for Arctic management. For example, in Arctic continental shelf the Sea of Okhotsk is included, which is not and has not been included in aquatic area of the Arctic Ocean (AO). Or the problem of usage of sectoral approach (1926) nowadays is over-viewed, which eventually should lead Russia to refuse the ratification of the UN convention on continental shelf, what do we struggle for in such a way?

What do we control, just land? Russian Federation Presidential Decree from May, 2 2014 no. 296 «On dry lands of the RFAZ» is not well-grounded geopolitically. In the meanwhile, we speak about thalassocratia — marine might of Russia. National interests of the RF are alike sacrificed to departmental bureaucratism represented by former Ministry of Regional Development (statistics was important for record in RFAZ, but it is not priority). Russia is a maritime power, it has a great might — thalassocratia, but it is moved down to the level of tellurocracy (power of dry land). The so called «black hole» is noticed — as though empty space of the Russian Arctic (here — water areas and islands in the Arctic Ocean), what could have irreversible destroying effect for geopolitics, economics and management in the nearest future. Russian permanent presence in the Arctic region as permanently or provisionally is in Russian national interests, s very important and necessary in modern changeable world, when different states lay claim to Arctic resources and communications.

Who rules the Russian Arctic?

The problem is now becoming ever more relevant by the fact that modernization of the Russian Arctic management is becoming dictates of the present time, especially after liquidation of the Ministry of Regional Development. Nowadays the RFAZ happens to be in the situation well

known for everyone in famous Russian proverb «too many cooks spoil the broth». When for the Arctic number of state structures at the federal level are responsible, management itself often appears to be out of their care, without reliable verification.

For decades discussions are conducted about creation of the RFAZ Federal authorities. Announcing on the 22nd of April 2014 at the meeting of Security Council on the problem of realization of state politics in Arctic **V.V. Putin** declared, that we must increase quality of state government and performance of decisions — for it to create single point of responsibility for realization of Arctic politics. «I would like to underline that we need not massive bureaucratic body, but flexible, swiftly working structure, which could help to coordinate ministries' and authorities' activities better, of regions of the Russian Federation and business»⁷⁷. Still practical decisions are not adopted, but nevertheless, discussions are still continue. At the forum there were raised questions on creation of Arctic Ministry on the model of the RF Ministry for Development of Russian Far East, the RF Ministry on North Caucasus affairs, Arctic corporation, multiagency commission. Also other variants are being discussed, but still everything is done privately, without public involvement. Meanwhile, the suggestion of **Herdísar Þorgeirsdóttur**, vice-chairman of European commission for democracy through law (Venice Commission) on right of citizens for getting the information what happens in the Arctic, was for reason.

On interdisciplinary researches in Russian Arctic

Interdisciplinary forum in Saint-Petersburg in November, 13—14 2014 showed strategic need in holding of such meetings of representatives of different branches of science, when it is really important to understand each other. For example, in Russian law such definitions as «macro-region» and «the Russian Federation Arctic zone» are practically not used. But it doesn't mean that they are not used in other branches of science. Arctic not for the first time is called macro-region, great economic and geopolitical area, it was suggested to create Arctic virtual federal district and Arctic union of Russian regions. In official documents of the USA such concept as «region» is employed for the whole Arctic.

In his report at the plenary meeting **S.N. Haryuchi**, doctor of legal sciences, chairman of Yamalo-Nenets Autonomous area Legislative Assembly paid attention to importance of taking into account climatic, geographical and other conditions of the RFAZ during the process of adoption of legal decisions, to the importance of assertion of citizens' social rights. On social problems of living

⁷⁷ Putin V.V. Announcing at the meeting of Security Council on the problem of realization of state politics in Arctic. April, 22 2014. URL: <http://news.kremlin.ru/transcripts/20845> (accessed 01.11.2014).

in Arctic knowledgeably with skill spoke **I.L. Shpector**, Chairman of the Commission on local government, Housing and Utilities infrastructure, President of Arctic Circle and the Far North cities union, who for ten years was government executive of Vorkuta. **V.B. Mit'ko**, president of the Arctic civil academy of sciences, chairman of the RAS Saint-Petersburg department of secession of geopolitics and security analyzed «Legal aspects of Russian geopolitics Arctic challenges».

Wide range of Arctic problematic was represented in workshop meetings of the forum: **A.K. Tulohonov**, corresponding member of the RAS, doctor of geographical sciences, Honored Scientist of the RF, committee member of the RF FA Federation Council: «Arctic in new geopolitical positions: object, principles of exploitation, law»; **V.A. Kryazhkov**, doctor of legal sciences, professor of the department of constitutional and municipal law of National Research University — Higher School of Economics, honoured legal worker of the RF: «Perfection of legislation on Northern peoples in the context of Russian politics in the Arctic»; **A.V. Shevchuk**, doctor of economic sciences, professor of Russian Presidential Academy of National Economy and Public Administration, vice-chairman of the Council for the Study of Production Forces on ecology and nature management: «Socio-economic and ecological aspects of exploitation of Arctic resource potential»; **S.V. Makar**, doctor of economic sciences, leading researcher of the Center of federative relations economics of Institute of regional researches and problems of spatial development of FSEE HVE «Financial university affiliated to the RF government»: «Vectors of spatial evolution of the Russian Arctic zone in the period of modernization». With specifics and business suggestions were distinguished speeches of business preventatives — **P.S. Kondukov**, **D.V. Mikhailov**, **S.V. Ribakov**, **V.V. Sayunov** and others. One more curiosity of this forum was in that together with doctors of sciences, professors in works of workshops participated young scientists, post-graduate student and students of universities.

In this article are noticed just some particular problems of transformation of the Arctic into the territory of right (terra — ground). And I would like to add to the word «territory» also Arctic «water area».

In conclusion I would like to express gratitude to **D.N. Kobilkin**, governor of the Yamalo-Nenets Autonomous area, to his team, and also to Institute of legislation and comparative legal sciences affiliated to the RF government for a great organization an successful conduction of the Arctic forum.

P. S. Adoption of primary federal law «On the Russian Federation Arctic zone» is still a current issue. What is Russian Arctic (RFAZ), its status, structure, boundaries, ground (territories) and water (water areas), procedure for the introduction of amendments, funding of different projects,

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maintenance of register of Arctic islands..., - these and other issues could be reflected in this law. I'm sure, that anyway we mustn't include in the FL on RFAZ rebates for population and preferences for business. This problem is solved by means of adoption of other laws on Northerners, because Russian Arctic (RFAZ) is considered to be part and parcel of territories of the Russian Federation Far North.

Variant of denouncement of ratified by the Russian Federation in 1997 Convention UN on the Law of the Sea (1982) is not excluded, but by that it is necessary to size up all the risks and consequences.

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Presentations of forum's participants P.V. Butakov, P.S. Kondukov, K.A. Laishev and V.A. Zabrodin, Y.F. Lukin, O.E. Medvedeva, V.B. Mit'ko, S.N. Haryuchi and A.V. Shevchuk can be found on the web-site of journal «Arctic and North»:

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ABSTRACTS. KEYWORDS

Аннотации. Ключевые слова

Социологические науки. Политология. Экономические науки
Social Sciences. Politology. Economics

© Бородин В.В., Васьков Н.Н., Калистратов Н.Я., Ларионов А.В., Никитин В.С., Попов В.М., Русанов А.В. О создании и развитии специализированной верфи «Арктика – шельф»

© Borodin V.V., Vas'kov N.N., Kalistratov N.Y., Larionov A.V., Nikitin V.S., Popov V.M., Rusanov A.V. On the creation and development of specialized shipyard "Arctic – Shelf"

Аннотация. Предлагается концепция бизнес-идеи проекта специализированной верфи, территориально рассредоточенной в границах Архангельской агломерации, которая призвана развивать производственную кооперацию, существующие компетенции и технологии при создании морской арктической техники и судов

Ключевые слова: Арктика, шельф, суда, морские платформы, верхние строения, модульные блоки, компетенции, специализированная верфь, технологии, кораблестроение

Abstract. The article proposes the concept of a specialized shipyard business project, geographically dispersed within the boundaries of the Arkhangelsk agglomeration, which aims to develop production cooperation, existing competencies and technologies in the creation of the Arctic marine equipment and vessels

Keywords: Arctic, shelf, vessels, sea platforms, topside facilities, modular units, expertise, special shipyard, technologies, shipbuilding

© Варфоломеев Ю.А. Особенности проектирования и строительства малоэтажных домов в Арктике

© Varfolomeev Y.A. Specifics of design and construction of low-rise buildings in the Arctic

Аннотация. В результате обследований малоэтажных домов в европейской части Арктической зоны России за 30-летний период выявлены особенности их проектирования, строительства и эксплуатации в условиях холодного климата. Отмечается несовершенство действующего федерального строительного законодательства. Проанализирована стоимость квадратного метра общей площади жилых помещений по субъектам Федерации на конец 2014 года. Разработаны предложения по совершенствованию федерального и регионального законодательства.

Ключевые слова: Арктика, инфраструктура, дома, малоэтажные, проектирование,

Abstract. As a result of low storey buildings reconnaissance in the European part of the Arctic zone of Russia for a period of about 30 years a number of peculiarities of their designing, construction and exploitation in conditions of frigid climate have been found out. The imperfection of currently in effect federal building law is marked. An average cost of square meter of living space in federation territorial entities by the end of 2014 has been analyzed. Suggestions for federal and regional legislation improvement have been developed.

Keywords: Arctic, infrastructure, buildings, low-rise, projection, construction, laws

строительство, законы



© **Зальевский Р.Н.** Угрозы терроризма в Российской Арктике

© **Zalyevskiy R.N.** The threat of terrorism in the Russian Arctic

Аннотация. В статье рассматриваются правовые, институциональные, социально-экономические и политические проблемы, способствующие развитию терроризма. На основе анализа фактов по современной истории терроризма в России, предлагаются меры борьбы с ним, правовые инструменты, антитеррористическая политика, в том числе в Российской Арктике.

Ключевые слова: *Российская Арктика, терроризм, экстремизм, социально-экономические факторы, молодёжь, коррупция, правовые инструменты, антитеррористическая политика*

Abstract. The article examines the legal, institutional, socio-economic and political issues that promote terrorism. Based on the analysis of the facts of the modern history of terrorism in Russia, proposes actions to deal with it, legal instruments, anti-terrorism policies, including in the Russian Arctic.

Keywords: *Russian Arctic, terrorism, extremism, socio-economic factors, young people, corruption, legal instruments, anti-terrorist policy*

© **Кондраль Д.П.** Культура, синергия и сбалансированность процессов стратегического управления Севером России

© **Kondral D.P.** Culture, synergy and balance of processes of the North Russia strategic management

Аннотация. В статье кратко обозначены актуальные проблемы культуры, синергии и сбалансированности процессов стратегического управления Севером России. Отмечается распространение подданнической культуры, необходимость демократизации на основе культуры участия и создания сбалансированной системы стратегического управления.

Ключевые слова: *Север России, стратегическое управление, подданническая культура, культура участия, синергия, сбалансированность процессов*

Abstract. The article briefly marks current problems of culture, synergy and balance of strategic management processes of Northern Russia. Spread of subservient culture, the need to democratize based on the culture of participation and the creation of a balanced system of strategic management is noticed.

Keywords: *Northern Russia, strategic management, subservient culture, the culture of participation, the synergy, balancing processes*

© **Тарасов П.И.** Развитие транспортных сетей Республики Саха (Якутия)

© **Tarasov P.I.** Development of transport networks of the Republic Sakha (Yakutia)

Аннотация. В современных условиях освоение Арктики невозможно без развития транспорта, внедрения новых технологий. Автор

Abstract. In modern conditions exploration of the Arctic is impossible without development of transport, introduction of new technolo-

предлагает создание сети транспортных коридоров в Республике Саха (Якутия) на основе существующих транспортных узлов, в частности порта Тикси, использование новых технологий

Ключевые слова: Арктика, транспорт, транспортный узел, порт Тикси, технологии, автопоезд, облегченная железная дорога

gies. The author proposes the creation of a net of transport corridors in the Republic of Sakha (Yakutia) on the basis of existing transport nodes, in particular the port of Tiksi, and the usage of new technologies.

Keywords: Arctic, transport, transport hub, port Tiksi, technology, trailer, lightweight railway

© Фёдорова Е.Н., Пономарёва Г.А. Восточная Якутия: демографические процессы в постсоветский период

© Fedorova E.N., Ponomareva G.A. Eastern Yakutia: demographic processes in the post-Soviet period

Аннотация. В статье отражён статистический анализ всех основных демографических показателей Восточной Якутии за постсоветский период (1989-2010 гг.), который показывает их ухудшение. Налицо депопуляция населения. Однако, несмотря на негативные процессы, имеются предпосылки восстановления демографического потенциала. Оптимизм связан с осуществлением мегапроекта, который может его возродить. В 2007 г. в республике принят для реализации инвестиционный проект «Комплексное развитие Томпонского горнопромышленного района».

Ключевые слова: Восточная Якутия, регион, демографические процессы, рождаемость, смертность, естественный прирост, мегапроект

Abstract. This article reflects the statistical analysis of all demographic indexes of East Yakutia for the post-Soviet period (1989-2010), which shows its deterioration. Also depopulation occurred. However, despite negative processes, there are prerequisites for recovery of demographic potential. Optimism is connected with megaproject implementation, which can revive it. 2007 the investment project "Complex Development of the Tomponsky Mining Region" was adopted for realization in the republic.

Keywords: East Yakutia, region, demographic processes, birth rate, mortality, natural increase, megaproject

© Ямилов Р.М. Позиционирование России в Арктике: проблемные аспекты

© Yamilov R.M. Positioning of Russia in the Arctic: problem aspects

Аннотация. Анализируются вопросы современной ситуации в Арктике, арктические вызовы и особенности развития экономики. Выявлены основы для разработки арктической модели экономики, необходимость организационных изменений для эффективного управления Арктической зоной Российской Федерации

Ключевые слова: Арктика, вызовы, экономика, экологически ответственная модель

Abstract. The issues of the present situation in the Arctic, Arctic challenges and features of the economic development are analyzed. Basis for the development of the Arctic economy model, the need for organizational changes effective management of the Russian Federation Arctic zone are identified.

Keywords: Arctic, challenges, economy, the environmentally responsible business model, Arctic

хозяйствования, Арктический федеральный округ, управление, принцип тщательности, принцип дублирования планирования

Исторические науки. Historical Sciences

© Лукин Ю.Ф. Двинская земля: в поисках идентичности

© Lukin Y.F. Dvina Land: in search of identity

Аннотация. Двинская земля как историко-географическое понятие локализуется археологами с X века, отождествляется с Заволочьем. Административно входила в состав Великого Новгорода (X-XVI вв.), княжества Московского и централизованного российского государства, трансформируясь в Двинской уезд (XVI-XVIII вв.) и Двинскую провинцию (1719-1785). Как мультидисциплинарный объект исследования определяется системно в нескольких измерениях: ландшафтно-природном, историко-географическом, административно-управленческом, культурном, социально-экономическом, мифическом.

Ключевые слова: Двинская земля, Заволочье, Великий Новгород, идентификация, история, карты, локализация, хронология, управление, ландшафт, артефакты

Abstract. As a historic-geographical term, Dvina Land is localized by archeologists since the Xth century and is identified with Zavolochye. Administratively it was a part of Velikiy Novgorod (X-XVIth centuries), Grand Duchy of Moscow and centralized Russian State, transforming into Dvina uyezd (XVI-XVIIIth centuries) and Dvina province (1719-1785). As a multidisciplinary research object, it is systematically defined in several dimensions: landscape and natural, historic-geographical, administrative and governmental, cultural, socio-economic, mythical.

Keywords: Dvina land, Zavolochye, Velikiy Novgorod, identification, history, maps, location, chronology, management, landscape, artifacts

© Шубин С.И. Сталинский неонэп как предтеча массовых репрессий 1937-38 годов на Европейском Севере

© Shubin S.I. Stalin's NeoNEP as the precursor of mass repressions of 1937-38s in the European North

Аннотация. В статье раскрывается авторская версия одной из причин массовых репрессий 1937-38 гг., вытекающих из феномена неонэпа 1934-1936 гг., сложившегося на короткое время в стране после отмены карточной системы и своеобразной передышки после «наступления по всему фронту» нового, по-большевистски возводимого социализма.

Abstract. The article reveals the author's version of one of the causes of mass repressions of 1937-38 period arising from the phenomenon of NeoNEP (New Economic Policy) of 1934-1936, which lasted for a short time in the country after the derationing and a kind of a respite after the overarching of the new Bolshevik-built socialism.

Ключевые слова: Неонэп, отмена кар- точной системы, результаты «великого» перелома, обвинения во вредительстве, массовые репрессии и их последствия
Keywords: NeoNEP, derationing, results of the "great" fracture, accusations of sabotage, mass repressions and their consequences

Экология. Environmental Science

© **Важенин Б.П.** Специфика формирования рельефа и рыхлых отложений в береговой зоне приливных ледовитых морей (на примере Северного Охотоморья)

© **Vazhenin B.P.** Specific character of relief and loose sediments forming in the coastal zone of tidal icy seas (in the context of the northern part of the Sea of Okhotsk) ecosystem

Аннотация. С использованием полевых и дистанционных методов исследований определены некоторые специфические черты процессов формирования рельефа и рыхлых отложений в экосистеме береговой зоны моря под совместным действием приливных сил и ледового покрова.

Ключевые слова: экосистемы, приливные моря, береговая зона, ледовый припай, ледовое торашение, ледовый разнос, Охотское море

Abstract. The results of field studies and remote sensing data are used to describe some peculiar features of forming land surface and loose rocks processes as due to a combined action of sea tides and ice cover in the sea coastal zone ecosystem.

Keywords: ecosystem, tidal seas, coastal zone, fast ice, ice hummocks, ice transposition, Sea of Okhotsk

© **Зеленина Л.И., Федькушова С.И.** Моделирование изменения климатических показателей арктических регионов (на примере г. Архангельска)

© **Zelenina L.I., Fedkushova S.I.** Modeling changes in climate indices of Arctic Regions (by the example of Arkhangelsk)

Аннотация. Проведён анализ изменения климатических показателей на примере г. Архангельска.

Ключевые слова: климатическая модель, климатический сценарий, прогноз климата, компьютерная модель, трендовая модель, адекватность модели, региональные климатические модели.

Abstract. Changes in climate indices by the example of Arkhangelsk have been analyzed.

Keywords: climate model, climate scenario, climate forecast, computer model, trend model, the adequacy of the model, regional climate models.

© **Ким Л.Б.** Влияние полярного стажа на кислородотранспортную функцию крови у северян различного возраста

© **Kim L.B.** Influence of polar time record on the oxygen transportation function of blood of Northerners of various age

Аннотация. Представлены результаты изуче-

Abstract. The work shows the results of study-

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ния кислородотранспортной функции крови северян работоспособного возраста. Показана динамика изменения гематологических показателей в зависимости от длительности проживания на Севере (северного стажа), что важно для экологии человека.

Ключевые слова: Арктика, пришлое население, эритроциты, гемоглобин, северный стаж, возраст

ing the oxygen transportation function of blood of northerners of working age. It shows the dynamics of hematological variables depending on the time length of living in the North (northern time record), which is important for human ecology

Keywords: Arctic, alien population, erythrocytes, hemoglobin, Nordic experience, age

© **Шрага М.Х.** Ноосферогенез Арктики: формирование экологического мировоззрения студентов

© **Shraga M.H.** Noospheregenesis of the Arctic: forming environmental world outlook of students

Аннотация. Социальная экология призвана вооружить будущего специалиста знаниями закономерностей развития системы «общество-природа» и вытекающими из этих закономерностей принципами и технологиями оптимизации отношений между обществом и природой. Социальная экология должна быть включена в учебные планы подготовки основных университетских направлений СА-ФУ. Она должна преподаваться в модуле, куда следует включить ещё: социально-экологические проблемы Арктики (Севера), социальную безопасность, социальную медицину (гигиену). Необходимо уже сегодня начать экологическое просвещение общества с ориентаций на то общее, что должна поддерживать вся цивилизация XXI века.

Ключевые слова: Инвайронментализм, ноосфера, педагогические инновации, социальная экология, экологическая модернизация, экологическое просвещение

Abstract. Social ecology is designed to equip future specialist with knowledge of the regularities of the system "society-nature" development and derived from these laws principles and technologies of optimization of relations between society and nature. Social ecology must be included in the curricula of the main university directions of NArFU. Social ecology must be taught in module, which should include: social and environmental problems of the Arctic (the North), social security, social medicine (hygiene).

It is already necessary to start environmental education of society with focus on that common, which must contain all civilization of the 21st century right today.

Keywords: Environmentalism, noosphere, pedagogical innovation, social ecology, ecological modernization, ecological education

Обзоры. Review. Conference Review

© **Королёва Н.Е.** Ботанические экскурсии по острову Сёррёйя в Северной Норвегии

© **Koroleva N. E.** Botanical excursions on the Sørøya island in Northern Norway

Аннотация. Статья представляет издание на двух языках, путеводитель ««Ботанические экскурсии по северному Сёррёйя (Финмарк,

Abstract. Bilingual guidebook "Botanical excursions on the northern Sørøya (Finnmark, Norway)" is presented in the article.

Норвегия)»

Ключевые слова: Норвегия, Сёрёйя, экологический туризм, путеводитель, природа северных островов, березовые криволеся, тундры, приморские сообщества, луга, болота, скальные сообщества и группировки, местообитания мхов и лишайников

Keywords: Norway, Sørøya, ecotourism, guidebook, nature of northern islands, mountain birch forest, tundra, seashore vegetation, meadows and grasslands, mires, plants on the rock, habitats of mosses and lichens



© **Фёдоров П.В.** Вклад в историческое познание Кольского Севера

© **Fedorov P.V.** Contribution to the study of history of the Kola North



Аннотация. Проанализирована научная деятельность И.А. Разумовой в области исторической и социальной антропологии на Кольском Севере. Дана оценка сборнику документальных материалов «История семьи Жидких на фоне поморской культуры».

Ключевые слова: историческая антропология, социальная антропология, фольклор, регионоведение, Север, традиция, культурный ландшафт, культурная память, семья, устная история

Abstract. Scientific activity by Irina A. Razumova in the field of historical and social anthropology on the Kola North is analyzed. The book of documentary materials "The History of Family of Zhidkih on the Background of Pomor Culture" is estimated.

Keywords: historical anthropology, social anthropology, folklore, regional studies, North, tradition, cultural landscape, cultural memory, family, oral history

Лукин Ю.Ф. Пять проблем развития Российской Арктики

Lukin Y.F. Five problems of Russian Arctic development

Аннотация. Дается обзор материалов заседания «Меркурий-клуба» 8 октября 2014 года: «Проблемы и перспективы эффективного освоения Арктической зоны и прилегающих регионов России»

Ключевые слова: Российская Арктика, шельф, право, Северный морской путь, ресурсы, военная инфраструктура, социально-экономическое развитие

Abstract. We give a review materials of "Mercury Club" meeting October 8, 2014: "Problems and prospects of effective development of the Arctic zone and the adjacent regions of Russia"

Keywords: Russian Arctic, shelf, right, the Northern Sea Route, resources, military infrastructure, socio-economic development

Лукин Ю.Ф. Российская Арктика – территория права

Lukin Y.F. Russian Arctic – territory of rights

Аннотация. Информация о проведении 13-14 ноября 2014 года второго Международного арктического правового форума «Сохранение и устойчивое развитие Арктики: правовые аспекты»

Ключевые слова: Арктика, правовое регулирование, регионы, междисциплинарные

Abstract. Information on the Second International Arctic legal Forum "The conservation and sustainable development of the Arctic: Legal Aspects" November 13-14, 2014

Keywords: Arctic, legal regulation, regions, interdisciplinary approaches, society and law, re-

подходы, общество и право, ресурсы, экология, объект управления России в Арктике *sources, ecology, object management of Russia in the Arctic*

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