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List of Scientific Publications Reflected in Georgian Abstracts Journal

1. A. Janelidze Institute of Geology, Proceedings	ISBN 978-9941-406-51-5
2. Accounting	ISSN 1512-0805
3. Aghmashenebeli	ISSN 1512-2581
4. Agrarian-Economic Science and Technologies	ISSN 1987-6335
5. Air Transport	ISSN 1512- 4916
6. Akhali Agraruli Sakartvelo (New Agrarian Georgia)	ISSN 1987-8729
7. Akhali Economisti (New Economist)	ISSN 1512-4649
8. Appendix to the Journal Newsletters of Education Sciences of Georgia	ISSN 1512-102X
9. Bacteriophages and Probiotics – Alternatives to Antibiotics – Intern. Conf. Abstr.	ISSN 0132-1447
10. Bee-keeping. /G. Madzgharashvili/. Monograph. - 2013	ISBN 978-9941-442-01-8
11. Biofarmer	ISSN 1987-9598
12. Building	ISSN 1512-3936
13. Bulletin of Abastumani Astrophysical Observatory	ISSN 0375-6644
14. Bulletin of Centre of Strategic Development of Georgia	ISSN 1512-0813
15. Bulletin of Georgian National Academy of Sciences	ISSN 0132-1447
16. Business Courier	ISSN 1987-6041
17. Business-Engineering	ISSN 1512-0538
18. Cardiology and Internal Medicine-XXI	ISSN 1512-1291
	EISSN 1512-1968
19. Caucasus International University Herald	ISSN 1987-863 X
20. Ceramics	ISSN 1512-0325
21. Collected Papers of Institute of Water Management	ISSN 1512-2344
22. Collected Scientific Works of I. Kutateladze Pharmacochemistry Institute	ISSN 1987-7277
23. Collection of Scientific Works of Sukhishvili University	ISSN 1987-5711
24. Collection of Scientific Works of Tbilisi State Medical University	ISSN1987-8990
25. Computer Sciences and Telecommunications	ISSN 1512-1232
26. Critical Care & Catastrophe Medicine	ISSN 1512-2689
27. Culture & Philosophy	ISSN 0132-1447
28. Economics	ISSN 1512- 1313
29. Economics and Business	ISSN 1987-5789
30. Economisti	ISSN 1987-6890
31. Energy	ISSN 1512-0120
32. Experimental & Clinical Medicine	ISSN 1512-0392
33. Food Safety and Quality. K. Laperashvili, G. Kuchukashvili. – 2011. 143 pp. Geo.	ISBN 978-9941-0-3995-9
34. G. Tavartkiladze Teaching University, Scientific Works	ISBN 978-9941-17-347-9
35. Gadasaxadebi (Taxes)	ISSN 1987-9156
36. Gaenatis Matsne (Gaenati Herald)	ISSN 1512-4096
37. Ganatleba (Education) – Scientific Journal	ISSN 1987-782X
38. GEN-Georgian Engineering News	ISSN 1512-0287
39. Georgian Chemical Journal	ISSN 1512-0686
40. Georgian Journal of Geography	ISSN 1512-1267
41. Georgian Journal of Radiology	ISSN 1512-0031
42. Georgian Medical News (GMN)	ISSN 1512-0112
43. Georgian Oil and Gas	ISSN 1512-0457
44. Georgian Pediatrician	ISSN 1512-1542
45. Georgian Scientific News (GSN)	ISSN 1987-7234
46. Herald of Sokhumi State University	ISSN 1987-572X

47. Hydro Engineering	ISSN 1512-410X
48. Institute of Hydrogeology and Engineering Geology, Proceedings	ISBN 978-9941-405-81-5
49. Journal of Georgian Geophysical Society	ISSN 1512-1127
a. Physics of Solid Earth	
b. Physics of Atmosphere, Ocean and Space Plasma	
50. Khandzta	ISSN 1512-3812
51. Law and Economics	ISSN 1987-8303
52. Mermisi – Collection of Scientific Works	ISSN 1512-4585
53. Metsniereba da Technologiebi (Science and Technologies)	ISSN 0130-7061
54. Metsniereba da Tskhovreba (Science and Life)	ISSN 1987-9377
55. Mining Journal	ISSN 1512-407X
56. Modern Problems of Architecture and Town Planning	ISSN 2233-3266
57. Multi-Level Innovation Policy and European Integration. TECHINFORMI. – 2010. 312 pp. Geo.	ISBN 978-9941-0-2452-8
58. Nano Studies	ISSN 1987-8826
59. Newsletter of Academy of Education Sciences of Georgia	ISSN 1512-195X
60. Novation	ISSN 1512-3715
61. Pediatric Cardiology	ISSN 1987-9857
62. Problems of Metallurgy, Welding and Material Science	ISSN 0512-1909
63. Proceedings of the Georgian Academy of Sciences, Biological Series B	ISSN 1512-2123
64. Proceedings of the Georgian National Academy of Sciences – Chemical Series	ISSN 0132-6074
65. Proceedings of the Georgian National Academy of Sciences, Biological Series A	ISSN 0321-1665
66. Proceedings of the Georgian National Academy of Sciences, Biomedical Series	ISSN 0321-1665
67. Respiratory Journal of Georgia	ISSN 1512-2778
68. Results of Study of Farm Loan and Farm Insurance. Elkana. - 2010	ISBN 978-9941-406-51-5
69. Scientific Works of Georgian-British Institute of International Law and Management	ISSN 1987-6866
70. Scientific Works of Tbilisi Balneological Resort	ISBN 99940-845-7-7
71. Social, Ecological and Clinical Pediatrics	ISSN 1987-9865
72. Subtropical Crops	ISSN 0207-9224
73. The Caucasus and the World	ISSN 1987-7293
74. The EU Eastern Partnership Programme and Prospects of Innovative Development of Georgia. Tbilisi – 2011. 238 pp.	ISBN 978-9941-0-3679-8
75. The Role of Social Capital in Rural Development of Georgia. M. Muskhelishvili, L. Mezvrishvili, B. Natsvlishvili, M. Elizbarashvili. Monograph. - 2012	ISBN 978-9941-17-879-5
76. Transactions of Technical University of Georgia	ISSN 1512-0996
77. Transactions of the Institute of Hydrometeorology	ISSN 1512-0902
78. Transactions of the International Science Conference of GT U – Basic Paradigms in Science and Technology Development for the 21 st Century. - 2012. v. I, v. II.	ISBN 978-9941-20-096-0 ISBN 978-9941-20-098-4
79. Transactions of V. Bagrationi Institute of Geography	ISSN 1512-1224 ISBN 99940-60-19-4
80. Transport and Machinebuilding	ISSN 1512-3537
81. Wood Bulletin	ISSN 1512-0546
82. Works of Georgian Academy of Economic Sciences	ISSN 2233-3207

List of Periodical Publications Reflected in the Present Issue:

1. Proceedings of the A. Eliashvili Institute of Control Systems. 2013. – #17
2. Agrarian-economic Science and Technologies. 2013. – #3, 4; 2014. – #1, 2
3. Pediatric Cardiology. 2013. – #7
4. Goni. 2014. – #1
5. The EU Eastern Partnership Programme and Prospects of Innovative Development of Georgia. 2014
6. Ekonomisti. 2013. – #1, 2, 3
7. Georgian Journal of Radiology. 2013. – # 1-2(40-41)
8. Caucasus University Collection of Scientific Works. 2013
9. Critical Care & Catastrophe Medicine. 2012. – #9-10
10. Science and Technologies. 2013. – #1(714)
11. Building. 2013. – #2(29)
12. Actual problems of pathology, therapy and medical rehabilitation. 2014
13. Professional's Voice. 2013. – #1; 2014. – #1.
14. Law and Economics. 2013. – #4
15. Mining Journal. 2013. – #1(30), #2(31)
16. Works of Georgian Academy of Economic Sciences. 2013. – v. 11.
17. Bulletin of the Georgian National Academy of Science. 2013. – v.7. – #1.; v.7. – #2
18. Georgian Medical News (GMN). 2014. – #1, 2, 3
19. Air Transport. 2013. – #1(8); 2014. – #1(9)
20. Social, Ecological & Clinical Pediatrics. 2013. – #15-10-9
21. Actual Topics on Women Health. 2013. – #2
22. Collected Papers of Institute of Water Management. 2013. – #68
23. Nano Studies. 2013. – #7, 8
24. GEN. 2013. – #3, 4

CONTENTS

A. SOCIAL SCIENCES

A1. State and Law. Jurisprudence

A2. Sociology. Demography

A3. Economy

A4. Education

A5. Informatics/Computer Science

A6. Other Social Sciences

B. NATURAL AND EXACT SCIENCES

B1. Mathematics. Mechanics. Physics. Cybernetics

B2. Chemistry. Biology

B3. Geology. Geodesy

B4. Geography. Cartography. Astronomy

B5. Other Natural and Exact Sciences 166

C. TECHNICAL AND APPLIED SCIENCES. SECTORS OF ECONOMY

C1. Power Industry

C2. Electrical Engineering. Electronics. Radio Engineering. Communications

C3. Automation & Telemetry. Computer Engineering

C4. Mining. Metallurgy. Chemical Industry

C5. Mechanical Engineering. Instrument-making

C6. Light Industry

C7. Food Industry

C8. Construction. Architecture

C9. Agriculture and Forestry. Fishery

C10. Water Industry. Melioration

C11. Foreign and Domestic Trade. Tourism

C12. Transport

C13. Medicine. Public Healthcare

D. INTERSECTORAL PROBLEMS

D1. Organization and Management

D2. Environmental Protection. Ecology

D3. Statistics

D4. Other Intersectoral Problems

A. SOCIAL SCIENCES

A1. State and Law. Jurisprudence

13.A1.1. Regional innovation policy of new EU-member states and applicant member states: Slovakia and Turkey. /O. Shatberashvili/. The EU Eastern Partnership Programme and Prospects of Innovative Development of Georgia. – 2014. – pp. 94-108. – geo.; abs.: geo., eng.

The regional innovation policy is one of the main components of the EU's multilevel innovation policy and a strong development tool. Accordingly, the elaboration and implementation of such policy for the countries participating in the European integration process is a serious challenge to be necessarily answered by them. This fully concerns Georgia too, where the talk on the regional innovation policy started already in 2010, although without taking practical steps. Hence, the experience of the EU Member-States of developing and implementing the regional innovation policy is of interest for Georgia. Of particular interest are the countries of the former Socialist bloc, who have become EU Member States, also the candidate countries. For this purpose, two countries have been selected – Slovakia (Member) and Turkey (Candidate). This selection is substantiated in the main part of the article. Their regional innovation strategies and current outcomes of implementation of these strategies are considered. The regional innovation policy is shown to be greatly dependent on the arrangement of a country's regions and administration/management tradition. Also shown is the role of local and central governments in the development and implementation of a regional innovation policy. This role is different in Slovakia and Turkey, because their management decentralization degree is different. This notwithstanding, the both countries have developed and are operating the tools of regional innovation that comply with the general experience and strategic documents of the European Union. Like in other Member States of the EU, the same actors are involved in the process, although differences also exist. For example, Turkey makes more active use of free zones and organized industrial zones, which are less applicable in the EU Member States. In Slovakia, in contrast to Turkey, self-government initiatives play much greater role. Georgia, as a non-member, non-candidate country, has comparatively more freedom of action and can, thus, resort to and use the experience of both countries to a greater extent. Moreover, at the current stage it can, with a definite caution, apply to the experience of other, non-European countries as well. As it seems, given that Georgia's regions greatly differ from one another, a different blend of the approved and tested tools may be used in their innovation strategy. Fig. 9, Ref. 12.

Auth.

13.A1.2. Comparative analysis of governmental administrations of the USA and France. /K. Pridonashvili/. Law and Economics. – 2013. – # 4. – pp. 4-13. – geo.; abs.: geo., eng., fr.

In this publication the author makes a comparison of federal and unitary systems based on examples of territorial organization in the USA and France. According to the view presented in this article, modern federal and unitary systems have many common features because developed self-government and generally distribution of powers are based on principles of vertical subsidiarity which enables modification of controlled unitary system and similarity with the federal system is obvious if we take into consideration legal principles. The author thinks that modern democratic process deprives of political basis the territorial organization of the state which falls within legal frameworks defined by democratic parameters. Ref. 8.

Auth.

13.A1.3. Principles of justice of electoral law. /K. Pridonashvili/. Law and Economics. – 2013. – # 4. – pp. 28-34. – geo.; abs.: geo., eng., fr.

In this publication the author reviews the peculiarities of functions of electoral systems. The author gives essential arguments and expresses his negative attitude towards the proportional electoral system, suggests to use the majority electoral system only for parliamentary elections and introduces an institution of primaries, which will enable and play an important part in balancing the parliamentary majority and will be an effort for the legislative body to fulfill effectively its functions and strengthen and establish parliamentarism as an institution and values in Georgia. Ref.10.

Auth.

13.A1.4. Some legal aspects of tax lien/mortgage and civil lien/mortgage. /I. Kharazi, T. Gardapkhadze/. Low and Economics. – 2013. – # 4. – pp. 35-46. – geo.; abs.: geo., eng.; fren.

The authors opine that the right of tax lien/mortgage and civil mortgage, in particular contractual mortgage, originates on the debtor's property, which the debtor had when the principal obligation originated. Other topical issues differentiating the tax lien/mortgage from the real mortgage are discussed. Ref.5.

Auth.

13.A1.5. Some considerations with regard to the territorial arrangement of Georgia. /K. Pridonashvili/. Low and Economics. – 2013. – # 4. – pp. 47-62. – geo.; abs.: geo., eng., fren.

The present article examines the territorial arrangement of Georgia according to the Constitution of Georgia, presents the so-called Boden document regarding the issue of territorial organization of Georgia and talks about comparative analysis of federal and unitary systems based on the examples of the USA and France. The work also deals with conceptions about division of sovereignty and national self-determination. The author expresses his positive attitude towards the idea of establishment of a unitary state in Georgia and is against political autonomies, because he thinks that the country's territorial arrangement according to ethnicity deepens a sense of diversity and promotes the conservation of separatist sentiments. Ref.15.

Auth.

13.A1.6. How to make a policy of non-recognition more effective. /V. Modebadze/. Law and Economics.–2013.– # 4. – pp. 63-69. – geo.; abs.: geo., eng., fren.

The article explains how to make the policy of non-recognition of Abkhazia's and South Ossetia's independence more effective. Effective implementation of the non-recognition policy depends on various factors: 1. Expansion of diplomatic ties. 2. Active cooperation with western countries and international organizations and their involvement in the implementation of the policy of non-recognition. 3. Along with the non-recognition policy the implementation of the policy of take-back recognition. Ref.11.

Auth.

13.A1.7. Constitutional court supervision of Georgia's international treaties. /J. Khetsuriani/. Bulletin of the Georgian National Academy of Sciences. – 2013. – Vol. 7. – # 1. – pp. 151-164. – eng.; abs: eng., geo.

The jurisdiction of the Constitutional Court of Georgia extends to all types of international treaties. The Constitutional Court of Georgia carries out supervision of international treaties both in advance (preventive) and subsequently (repressive). In the case of finding an international treaty unconstitutional, it is advisable to set a legal date after the expiry of which the international treaty, recognized as unconstitutional, will lose force. During this term state bodies will be enabled to carry out appropriate procedures towards denouncing the international treaty. Ref. 20.

Auth.

13.A1.8. The agent-oriented approach and the agent system theory. /O. Shonia, T. Kaishauri, I. Kartvelishvili, L. Kolbaia/. GEN. – 2013. – # 4. – pp. 19-25. – geo.; abs.: eng.

The article deals with the means of realization of the system of visualization and analysis of the interconnections between normative legal documents – the agent-oriented approach. The description of the technology of this system and relevant explanations are discussed. The review of agent architecture, classification, models and applications are given. Tab. 1, Fig. 2, Ref. 2.

Auth.

13.A1.9. Victimology aspects of crime in Georgia: state and prevention. /E. Beselia/. Caucasus University Collection of Scientific Works. – 2013. – pp. 70-78. – geo.; abs.: geo., eng.

This article is devoted to a crime and victimization analysis in contemporary Georgia. The study aims to: examine the development of victimology as a science in a historical perspective and give a description of its main goals and objectives; compare the basic definition of victimization as a social phenomenon and tools for the implementation of empirical research; describe fundamental victimization surveys carried out in the USA, European Union and Georgia; analyse results of

victimization surveys in Georgia from 1992 to 2012 and compare them with the number of prisoners; develop theoretical and practical measures to reduce the level of victimization in Georgia. This study is based on results of European crime victimization surveys conducted in European countries in 2004-2005 and Georgian crime victimization surveys conducted in 1992-1995 and 2010-2012 years. The Georgian surveys were conducted on the basis of techniques and used modified questionnaires of the European victimization survey carried out in 2004-2005. The data collected by the Georgia crime victimization survey show that the dynamics of victimization indicators for some crimes decreased in Georgia 5-10 times from 1992. At the same time, the number of inmates in Georgian prisons increased 4-5 times on average, which is critically high for any country. In the final part of the paper the author provides some findings and recommendation for reduction of the level of victimization: 1. Conceptual basis of victimology as a science should be improved; 2. The victims conditions and behavior should be scrutinized as central object of victimization; 3. New approaches related to analyse of interaction between the victim and the offender should be developed; 4. Techniques victimization studies (surveys) should be improved; 5. Methods of collecting and summarizing victimization information should be improved; 6. Conceptual provisions for decreasing victimization among population should be developed; 7. Special anti-victimization campaign should be organized for vulnerable groups of population. The paper is the first of its kind to examine in a comparative setting of different definitions, literature sources and approaches inherent for modern victimology and the author's conclusions that are new words for the Georgian legal science. Tab.2, Ref.31.

Auth.

13.A1.10. The specifics of dividing property between spouses. /D. Lobzhanidze/. Caucasus University Collection of Scientific Works. – 2013. – pp. 79-86. – geo.; abs.: geo., eng.

The article deals with the problems of judicial division of property between spouses in the case of divorce as well as the handling of problems arising in the course In claiming ownership. Ref. 3.

Auth.

13.A1.11. Force and power. /G. Loria/. Caucasus University Collection of Scientific Works. – 2013. – pp. 87-95. – geo.; abs.: geo., eng.

The presented research deals with legal aspects of the origin and realization of force and power. The rational, comparative, synthetic and analytical methods are used. Attention is focused on the opinions of well-known theorists and the author's view around the discussed problems expressed on the basis of their theories. The author expresses an opinion that the law retains the status of regulative force of public relations until it serves the purposes, aspirations and values of society. Their complete disregard leads to mistrust to the law and society uses the right of opposition. In such case it is no longer important whether the right of opposition is or is not constitution-based, because the norms, which may recognize this right, are no longer in effect. In such circumstances the force of law and government is restricted and replaced by the societal force until the people transfers the power to someone else. Ref. 6.

Auth.

A3. Economy

13.A3.1. Land cadastre and land management. /D. Egiashvili, A. Meskhishvili/. Agrarian-economic Science and Technologies. – 2014. – # 1. – pp. 40-50. – geo.; abs.: geo., eng.

The essence of a land cadastre and its difference from land registration are given. The major objectives of land reform are mentioned, such as: drafting new legislation to cover land and land management information; fixing actual facts in the cadastre; accurate identification of land and land ownership boundaries and a possibility of their planning under appropriate standards; ensuring a simple and cost-effective approach to the data available in the system; making public information concerning the system's functioning and its benefits, etc.

Auth.

13.A3.2. Regionalism and self-governance. /O. Keshelashvili, N. Michanashvili/. Agrarian-economic Science and Technologies. – 2013. – # 3. – pp. 6-12. – geo.; abs.: geo., eng.

The priorities of regionalism and self-governance are considered, such as: improvement of the territorial administration structure and activation of territorial systems; decentralization of powers and responsibilities; achievement and rooting of real self-governance in regions; promotion of natural, unrestricted economic development of regions (country); introduction of democratic principles of state administration at national level. The reform having initiated in Georgia should ensure transformation and approximation of the European self-governance model to the Georgian reality rather than its mechanical transfer and introduction.

Auth.

13.A3.3. The strategic program of integration and sustainable development of tea-growing and tea industry and economic mechanisms of its realization. /O. Keshelashvili/. Agrarian-economic Science and Technologies. – 2013. – # 3. – pp. 15-27. – geo.; abs.: geo., eng.

The main objective of the study is to develop as strategic program of tea-growing and tea industry integration and sustainable development, as well as an economic mechanism of its implementation, on the basis of creating community unions and their entrepreneurial capacity-building to result in an economic growth of the agrarian sector, food security an improvement of social conditions of the rural population.

Auth.

13.A3.4. Considerations and positions aimed at promoting sustainable development of agriculture. /O. Keshelashvili/. Agrarian-economic Science and Technologies. – 2013. – # 3. – pp. 28-34. – geo.; abs.: geo., eng.

Considerations on the setting up of an Analytical-Coordination and Advisory-Certification Centre at the Ministry of Agriculture are presented. Functions of the Centre and a work program in the direction of economic analysis, marketing strategy, development and coordination priorities are discussed. As regards an advisory activity of the Centre, proposals on the establishment of a Training and Advanced Training Centre of Farmers and Agriculturists in cooperation with the Academy of Agricultural Sciences, with the description of its purpose and functions are given.

Auth.

13.A3.5. Economic risk and its management (risk management). /O. Keshelashvili, N. Damenia/. Agrarian-economic Science and Technologies. – 2013. – # 4. – pp. 6-14. – geo.; abs.: geo., eng.

Risk reduction means either a possibility of mitigation of loss or reducing the undesired event probability. Irrespective of the probability nature, risk should be managed and in many cases it is successfully managed. Risk management requires: creation of a work program and methodology; risk assessment and analysis; setting out and implementation of reduction or elimination measures; establishment of risk management resources; risk prediction. The risk management (which is used to control the loss of income) is based on: risk avoidance, taking risk, risk insurance, risk transfer to a third person, and various methods of reducing losses. The most popular risk protection and reduction methods are insurance, self-insurance, diversification and limitation.

Auth.

13.A3.6. National Mountain Agriculture Development Program (economic-technological recommendations and management mechanism – research and applied project). /O. Keshelashvili/. Agrarian-economic Science and Technologies. 2013. – # 4. – pp. 15-22. – geo.; abs.: geo., eng.

The urgency, novelty, substantiation, and objectives of a National Mountain Agriculture Development Program, as well as a comprehensive plant of its development are presented. Program proposals and recommendations in terms of the economic and technological perfection and management mechanism improvement of mountain agriculture development are presented.

Auth.

13.A3.7. Issues concerning real estate/land value and evaluation. /D. Egiashvili, A. Meskhishvili/. Agrarian-economic Science and Technologies. – 2013 . – # 4. – pp. 23-29. - geo.; abs.: geo., eng.

Land is a huge resource without which there would be no life on earth. Land has a physical as well as an abstract concept. Land use and ownership rights are so tightly interlinked as the plant roots to the land. Prudent and cautious land use is necessary for current and future generations. In a market economy land and real estate represents an object of purchase and sale which has its value. Market price for land and real estate is determined by its area, location, characteristics of a building, size of occupied land, and zonal coefficient. Calculation of real estate market price is based on official information about market prices, executive government branches' database, and information provided by taxpayers to the tax services along with few other reliable sources. During valuation process valuers strictly distinguish the terminologies "sale price", "market price", "costs" and "value". It's important to introduce and endorse land/real estate valuation methodology in Georgia and support development of highly qualified competent real estate valuers.

Auth.

13.A3.8. Land administration and policy. /D. Egiashvili, A. Meskhishvili/. Agrarian-economic Science and Technologies. – 2013. – # 4. – pp. 30-41. – geo.; abs.: geo., eng.

We can discuss land and its usage from different angles. Land, as an object to which individuals or groups have the right to sell or buy, is subject to taxation and represents a foundation for economic activity. Land has a special meaning in a country's economy. Safety of the system of land administration must ensure order and stability. During implementation the land administration policy, land consolidation has a special meaning. Land management includes the nature of the investment in the land and the execution of land area related-fundamental political decisions.

Auth.

13.A3.9. Research of economic cycles and crises using MATLAB. /A. Bardavelidze, Kh. Bardavelidze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 42-46. – geo.; abs.: geo., eng., rus.

The research of cycles and crises in economics is presented by typical library blocks of Simulink without a mathematical model. Block-scheme options of production with designation of each block are developed. A model of economic cycles and crises is presented by plotting device blocks and full set of experimental windows. In studying the impact of system stability, term of working ability of devices on the dynamics of production and the initial deficit production stability, it was found that by increasing a delay, i.e. decelerating the response of production to demand, the economic system's indices – amplitude and oscillating period, as well as instability and a risk of crises tend to increase. It is established that the reason of cycles and crises during production in a closed economy is the existence of negative feedback in a control system. Fig. 5, Ref. 7.

Auth.

13.A3.10. Innovation policy in EU and Georgia: regional policy. /O. Shatberashvili/. The EU Eastern Partnership Programme and Prospects of Innovative Development of Georgia. – 2014. – pp. 12-27. - geo.; abs.: geo., eng.

The countries, which successfully developed in the 20th century, were those which had based public administration on scientific expertise and directed economic processes on the way of innovation. The innovation-directed development means the innovation policy elaboration and implementation at all levels of management/administration, both national and regional. This approach (tested by international practice, primarily European) should be widely shared in Georgia as well, and should not be a subject of controversy. Georgia's aspirations to European integration, reflected in the preparation and initialing of the association agreement, strengthen this position. At the same time, there must be a clear-cut perception of the innovation policy essence and its mechanisms. In this respect, more has been done in Georgia at the central government level than at the regional one. The article considers the essence and mechanisms of the innovation policy. The regional innovation policy is a necessary component and condition of the socio-economic development of regions. In Georgia, in spite of the adoption by the government of a regional innovation strategy in 2010, no progress towards development and implementation of an appropriate policy has been observed. The reason of it is also the circumstance that said strategy

was approved upon categorical request of donors. This is another evidence of the known and repeatedly confirmed fact: operative is only a strategy, which (1) has been ordered by the Georgian society and (2) the executors of which are also Georgian authors (who use international experience, including the involvement of foreign experts). Georgia's problems will be solved only subject to the involvement of the Georgian society and Georgian specialists. Similarly, the problems of development in regions, including the innovation policy issues, will not be handled without the involvement of local community and local government. There are many examples (first of all in the EU) showing that the regional government, under conditions of the involvement of interested institutions and society, manages to ensure competitiveness at a national and international level. The mobilization of local intellectual resources (universities, private business, and other interested actors) enables to select and develop from the internationally recognized instruments the ones that are most suitable and realizable under specific local conditions. The prerequisites for innovative development of regions and some practical instruments have already been created in Georgia in 2013-2014: the spending on R&D has increased, an Innovation and Technology Agency has been set up, the work on the innovation strategy is under way, preferential credits in the food sector are under operation, etc. Regions should spare no effort in order to make the best use of these opportunities. Fig. 3, Ref. 4.

Auth.

13.A3.11. Labor activity motivation of personnel as an important factor in achieving competitive superiority. /N. Kakauridze/. Professional's Voice. – 2013. – # 1. – pp. 24-28. – geo.; abs.: geo., eng., rus.

The most important factor of achieving competitive superiority – personnel motivation - is mentioned. Productivity of this resource does not have any limits and therefore the greatest reserve of industrial efficiency rests on it. The proposed factors of personnel motivation make a team united by interlinked general targets. At that the team work of an organization intimately includes motivation of individuals rather than excluding it. The art of management is exactly in the encouragement of individual performers with concurrent preservation of the working team. Ref. 4.

Auth.

13.A3.12. The impact of increased investment activity on production efficiency. /N. Kakauridze/. Professional's Voice. – 2014. – # 1(1). – pp. 21-26. – rus.; abs.: geo., eng., rus.

The research is presenting the results of the reforms implemented by the Georgian government to improve the investment environment. The strategic plan of priorities and priority projects are currently considered as a major step forward, for promoting which the country is ready to provide financial incentives. Budgetary funds are being used to develop business plans of investment projects; various economic activities are under way, a great number of employees are being trained in project financing which is, in the near future, to contribute to the implementation of numerous investment projects, attraction of investments, and creation of new workplaces and jobs. For investors, the attractive factor is the investment legal framework, covering the following main areas: the development of regional investment legislation and the regulatory framework in the field of business support, information transparency in regions, the creation of the highly-developed specialized market infrastructure for the investment processes to be supported, the restructuring of enterprises to increase their investment attractiveness and competitiveness. All these are to greatly increase attractiveness of the country for investments in all types of infrastructure. Ref. 6.

Auth.

13.A3.13. Optimal management of fund flows in a company. /M. Chumburidze, L. Janadze/. Professional's Voice. – 2014. – # 1(1). – pp. 32-37. – geo.; abs.: geo., eng., rus.

The paper deals with the problem of non-classical optimal control of variable accounting for discrete models of investment in a company. As an example, the problem of optimal management of financial flows to the company, where the control parameters are changed in each period of investments planning is given. The author proposes own mathematical model. The problem has been solved with the help of software applications, using-VBA and Search Solutions in Excel. Fig. 5, Ref. 3.

Auth.

13.A3.14. Stages of the world economic development and Georgia's economic policy. /R. Asatiani/. Works of Georgian Academy of Economic Sciences. – 2013. – v. 11. – pp. 116-136. – geo.; abs.: geo., eng.

Stage I started from the last third of the 18th century and continued up to the thirties of the 20th century (economic policy built on classical liberal theory); stage II started from the forties of the 20th century and continued up to the economic crisis in 1974-1975 (economic policy fitted to the Keynesian macroeconomic regulation); stage III started from the eighties of the 30th century and continued up to the second half of the 1990s (economic policy built on neoclassical synthesis); stage IV started in the second half of the 1990s and accomplished with the world crisis in 2008 ("The anti-Keynesian revolution" - economic policy built on monetary theory). In economic policy during Georgia's transition period none of the economic theories was used in its classical form, moreover Keynesian model. That is why the requirements put to economic policy are ignored in the country. The legal institutions are weak, standard of living is low, the Gini coefficient is high, the middle stratum is scanty, legal and social agreement appears to be unattainable. Ref. 5.

Auth.

13.A3.15. District level management of the agricultural sector. /O. Keshelashvili/. Agrarian-economic Science and Technologies. – 2014. – # 2. – pp. 6-16. - geo.; abs.: geo., eng.

The objective and subjective reasons associated with a district-level management of the agricultural sector are discussed. The lack of an organizational structure to orient the development of the sector at district level based on the changes taking place therein and to coordinate activities of agricultural production, processing and service industries, intra-sectoral cooperation and interests is mentioned. Accordingly, the scheme is divided into four segments: agriculture departments, agricultural enterprises; processing enterprises and service enterprises. The district-level management can be simply expressed as follows: rural development; rural population's responsible initiative; local resources and the State support.

Auth.

13.A3.16. Effective management of land resources - a prerequisite for poverty reduction. /P. Koguashvili, G. Zibzivadze/. Agrarian-economic Science and Technologies. 2014. – # 2. – pp. 34-42. – geo.; abs.: geo., eng.

The article analyzes poor condition of agricultural development and its major causes. The necessity of timely development of a comprehensive land cadastre to become an economic basis for evaluating and taxing agricultural land, their monitoring, and appraising their quantitative and qualitative changes is mentioned. Suggestions are made on the restoration of the State Land Management Service, which would enable the country to work out annual land balances according to the land categories and their beneficiaries, timely prevent the adverse consequences that accompany our country's land resources (desertification, secondary bogging, erosion processes, heavy metal contamination, etc.).

Auth.

13.A3.17. Problems of government regulation of budget rationing in the Republic of Armenia. /A. Gulyan/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 54-56. – rus.; abs.: geo., eng., rus

Problems of a government-regulated economy and particularly the budget rationing in the construction are studied. Areas of government regulation of construction adopted by legislation of the Republic of Armenia and the most significant problems of the sector requiring immediate actions are addressed. Among those is the ensuring compliance of national rationing and standardization systems with international standards. The article addresses the objective and visual factors impeding the establishment of a budget rationing system complying with current industrial relations. Based on the study of international experience, an exemplary pattern of budget rationing system in RA is proposed. Ref. 5.

Auth.

13.A3.18. The sources of deficient higher economic thinking. /R. Namicheishvili/. Goni. – 2014. – # 1. – pp. 16-20. – geo.; abs.: geo., eng.

The conditions created in Georgia following the collapse of the Soviet system, which made it

possible to open numerous higher educational institutions and economic specialties that lacked proper intellectual support are considered. As a result, a pseudoscientific caste and an army of certified economists of scientific criticism who fail to understand the challenges faced by the country and interfere with the development of a creative economic society have originated. Approaches, the implementation of which would improve the economic thinking in the county, are proposed. Ref. 5.

Auth.

13.A3.19. Cost assessment of failure of instruments of labor. /Sh. Ukleba, Z. Mikaberidze/. Goni. – 2014. – # 1. – pp. 29-30. – geo.; abs.: geo., eng.

The failure assessment of a technical system and a systems approach to estimating the failure cost are studied. The classification of failures according to many factors, including the catastrophic failure and accidental failure/fault is considered. The qualitative characteristics of the “failure price”, which enable to assess and characterize all the consequences of the specific failure more accurately are studied. Ref. 3.

Auth.

13.A3.20. The phenomenon of industry clustering. /N. Dumbadze, A. Davitadze, A. Noniadze/. Air Transport. – 2013. – # 1(8). – pp. 78-87. – rus.; abs.: geo., eng., rus.

The industrial cluster policies carried out in developed countries caused growth of GDP by 70-90%. For Georgian priority sectors, such as tourism, aviation and agriculture, the main principle of clustering is to increase the competitiveness and partner interrelationships of said industries. This will result in an increased number of tourists entering the country, passengers transported by air transport and agricultural products. The input-output analysis model developed by V. Leontiev allows us to calculate the exact amount of product produced by a particular industry sectors that will satisfy the market demand of the given products, as well as balance the market demand and supply of goods. Fig. 1, Ref. 8.

Auth.

13.A3.21. Evaluation of project realization strategy based on a stochastic approach. /V. Momotov, G. Tevzadze/. Air Transport. – 2014. – # 1(9). – pp. 54-61. – rus.; abs.: geo., eng., rus.

Evaluating a possible indicator of the project effectiveness according to the proposed methods will make it possible to choose an optimal strategy for an investment project and optimize its parameters. Ref. 6.

Auth.

13.A3.22. Equilibrium and optimal tax rates in the models of aggregate demand and aggregate Supply (Laffer-Keynesian Synthesis). /I. Ananiashvili, V.Papava/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 166-177. – eng.; abs: eng., geo.

In contemporary economic theories, the role of taxes is studied one-sidedly. Keynesianism mostly emphasizes the mechanisms by which taxes affect the economy through aggregate demand and almost does not take into account the mechanism of their effect on the aggregate supply-side. The problem of taxes is also seen one-sidedly by supply-side economics, in which the effect of the tax rate on aggregate supply is brought to the fore. The paper presents a macroeconomic equilibrium model in which aggregate demand and aggregate supply are considered not in relation to the price level, as is traditionally done, but in terms of functions dependent on the average tax rate. The concepts of optimal and equilibrium tax rates are introduced. Based on an analysis of the model, it is shown that when the government tries to maintain the equilibrium average tax rate at a fixed level, the optimal tax rate becomes dependent on the price level, and an appropriate change in aggregate demand may lead to approximation of the optimal rate to the equilibrium rate. It is also demonstrated that each given value of the equilibrium tax rate can be matched with a set of functions and curves of aggregate supply and the national budget's tax revenues. Ref. 9.

Auth.

13.A3.23. The behavioural model for estimating the Laffer fiscal points. /I. Ananiashvili, V. Papava/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 142-150. – eng.; abs: eng., geo.

The article examines the approach to estimating the effect of the tax burden on the amount of total output and budget revenues. This approach uses a behavioural model, with a specific version of an entropy function. In the context of production technology, to quantitatively estimate the dependence of output on the amount of the tax burden, the article reflects the expansions of the macroeconomic production function in which the role of the average tax rate is distinguished in some form. The suggested model makes it possible to determine the so-called fiscal points corresponding to the maximum production effect and the budget's maximum tax revenues. The conclusion is drawn that, these points correspond to the Laffer concept, since for the points of the behavioural model the amount of use of economic resources occurs endogenously. The results obtained are illustrated using existing data on the U.S. economy. When different versions of the calculations were carried out, the estimated model as a whole, as well as its parameters, maintained its stability and did not lose its statistical significance in a fairly broad range of changes in the "sample size." Even when the quality of the model deteriorated (the parameters being estimated became statistically insignificant) as a result of excessive reduction of the sample size, the estimates of the fiscal characteristics changed only slightly. This is not sufficient grounds for drawing final conclusions about the suitability of the suggested model for conducting specific applied calculations. Fig. 2, Tab. 1, Ref. 12.

Auth.

13.A3.24. Information and advisory service of small and medium enterprises. /K. Khmaladze, E. Gobejishvili, D. Kupatadze/. Mining Journal. – 2013. – # 1(30). – pp. 99-101. – geo.; abs.: rus., eng.

The article discusses the role of information and advisory services in the upgrading competitiveness of SMEs. The information and advisory support is very important for training entrepreneurs in the use of the results of new information and innovation products and activities. The article provides a list of business services classified by the general political document of the European Economic Commission of the UN. The impediments for development of SMEs are established and the principal requirements to institutions promoting entrepreneurship are identified at a micro level. Ref. 1.

Auth.

13.A3.25. Present situation and development trends of the world oil market. /G.Lobzhanidze/. Mining Journal. – 2013. – # 2(31). – pp. 47-53. – geo.; abs.: rus., eng.

The state of oil prices, given various factors of the current world market trends, is presented. In addition, studied and analyzed are the world's oil reserves, consumption, demand, the dynamics of world prices and the oil producing and oil consumer states' strategies, as well as the necessity and importance of small-tonnage petrochemical industry production, and other topical issues important for strengthening the economic development and independence of our country. Tab. 3, Ref. 18.

Auth.

13.A3.26. Methods for calculating economic effectiveness of pressure hydro transporting systems, in the case of their complete protection from hydraulic impacts. /L. Makharadze, V. Silagadze, M. Jangidze, S. Steriakova/. Mining Journal. – 2013. – # 2(31). – pp. 56-59. – rus.; abs.: geo., eng.

Methods for calculating economic effectiveness proposed by the authors is based on a specific invention, which provides for the use of modern equipment, patents and innovations in the national economy. Ref. 11.

Auth.

13.A3.27. Total revenue function and integrated demand model. /Sh. Demurashvili, T. Macharadze, A. Miinikov/. GEN. – 2013. – # 3. – pp. 23-27. – eng.; abs.: eng.

It is shown that the total revenue curve for a new nonlinear model of the demand-price relationship is piecewise differentiable, has no minimums, but only maximums. The total revenue curve in backup points x_i , being continuous, has no derivatives. The notion of Implicit and Explicit

Maximums of the Total Revenue Function were introduced and the criteria for determination whether the given maximum of Integrated Total Revenue is explicit or implicit were elaborated. Fig. 3, Ref.3.

Auth.

13.A3.28. Wellness industry development options and strategy in Georgia. /G. Erkomaishvili/. Ekonomisti. – 2013. – # 1. – pp. 26-33. – geo.; abs.: eng., geo., rus.

Today, the wellness industry, due to its highly prophylactic and health-improving medical/biological direction is becoming extremely popular all over the world. In the near future it is going to become a multi-billion industry. The concept of wellness generally means a healthy balance of the mind, body and spirit in an overall feeling of well-being by pleasant rather than forcible methods. Georgia has excellent natural resources for developing one of the most important directions of this industry - constructing a recreational center being implemented by an investment company "MedGroup Georgia". The modern center equipped center will provide its customers with wellness services, employ a large number of staff, employ the locally made products and services, increase profit and have a favorable effect on the national economy. Ref. 11.

Auth.

13.A3.29. The effect of global economic crisis on world economy, its reasons and overcoming mechanism. /D. Aslanishvili, K. Omadze/. Caucasus University Collection of Scientific Works. – 2013. – pp. 35-45. – geo.; abs.: geo., eng.

The article demonstrates the reasons of the recent economic crash, its developments and results for the world economy. Also, how arduous are the ongoing problems, the state bodies' reactions and their steps to prevent the crisis, TARP program, its volume and mission, differences between the ongoing crisis and the great depression time, also the predicted three scenarios of future economic developments. Tab 6, Ref. 3.

Auth.

13.A3.30. Crisis cycle theory and world economic crisis. /T. Akubardia/. Caucasus University Collection of Scientific Works. – 2013. – pp. 52-57. – geo.; abs.: geo., eng.

The article compares the economic model of crises developed by the authors with the Kondratiev's so-called semi-centennial cycles. According to the proposed model, one of the main components of an economic crisis is the financial crisis, which does not, in itself, condition the economic crisis. Concerning the reasons of a financial crisis, there is an essential difference between these models. According to Kondratyev's theory, each important innovation causes an ascending phase of a cycle whereas on our model, the reason of formation of financial crisis is the compelled policy pursued by the government, which essence consists in artificial increase of prices on goods and services. The compelled character of this policy is that the artificial increase in the prices gives a chance to avoid temporarily a crisis, but in the long-term period, because of the cumulative effect of these measures, creates preconditions for the crisis emergence. Ref. 6.

Auth.

13.A3.31. Timeline of economic policy of competition in Georgia. /Sh. Gogiashvili/. Ekonomisti. – 2013. – # 2. – pp. 17-29. – geo.; abs.: eng., geo., rus.

Due to the specifics of transition from the centrally planned to the market economy, along with the formation of private property relations in Georgia, the development of state competition policy has started. As early as in 1992, a decree and then, in 1996, a relevant law were passed. The 2005 reform performed within the context of liberalization of the economy substantially distanced the state competition laws from European standards. An analysis of statutory acts demonstrated the lack of a common and consistent competition state policy, as well as the declarative nature and, actually, the impossibility of enforcement of the norms and provisions. A retrospective review of the competition policy development indicates an obvious deficiency of acts of the public authority in this direction in 2004-2012. An amended law On Free Trade and Competition adopted In May 2012 is more adequate by its essence than that of 2005; regrettably, it is also does not comply with European standards. Nowadays, the Georgian authorities, which promised to regulate and approximate the competition field to the European standards, as a part of their election program,

works hard, together with non-governmental organizations and foreign experts, to perfect the competition laws and identify the optimal structure of relevant executive bodies. Ref. 6.

Auth.

13.A3.32. Infrastructural approach to service management. /E. Baratashvili, B. Gechbaia/. Ekonomisti. – 2013. – # 2. – pp. 30-39. – geo.; abs.: eng., geo., rus.

Service infrastructure is one of the most important parts of the common market infrastructure. No economy of any country or its separate administrative territories can function without service infrastructure. The work underlines two sides of market infrastructure – its material- substantial consistence, economic potential, creating the conditions for system functioning of markets and economical relations concerning the activities of market players, which are directed to the creation of the conditions for commodity and monetary circulation. The infrastructure is considered as a system providing the vital activities of individuals and the functioning of legal persons. It is also noted that the infrastructure of a number of organizations in Georgia needs to be improved for total perfection as a guarantee for the effective functioning. The work gives the essential regulations, which help the management of the infrastructure, including the formation of the management strategy.

Auth.

13.A3.33. Synergy in integration development of Ukrainian chemical industry enterprises. /A. Shevtsova, S. Gre-chanaya/. Ekonomisti. – 2013. – # 2. – pp. 45-51. – eng.; abs.: eng., geo., rus.

The article is devoted to issues of synergy organization and implementation during the integration process of Ukrainian chemical industry enterprises after the crisis. The overall state of the industry over the past five years is analyzed. Objective reasons for the initiation of integration process are identified and justified, their gist is determined. The practical experience of creating vertically integrated structures based on a group of chemical enterprises is generalized. Motivational and organizational approaches to integration development with the benefits of synergy are established. Tab. 1, Ref. 12.

Auth.

13.A3.34. Salary level and dynamic analysis in Georgia. /M. Vashakidze, N. Kakauridze/. Ekonomisti. – 2013. – # 2. – pp. 86-90. – geo.; abs.: eng., geo., rus.

The paper notes that the statistical analysis of salaries, as the main form of remuneration, allows revealing the salary costs of the workforce. An analytical study of the wage levels and dynamics is made based on wage indexes. Considered are the variable, fixed composition and structural shift indices. Using these indices, it is calculated how the level of average wages is changed and how it influences certain factors, which is reflected in the corresponding graphs. Based on a survey, it is concluded that despite the growth, wage income still has not regained its status of main income. It has practically lost its economic content and social-economic comparison function. Ref. 7.

Auth.

13.A3.35. Analysis of employment and unemployment in Georgia. /M. Vashakidze/. Ekonomisti. – 2013. – # 2. – pp. 91-96. – geo.; abs.: eng., geo., rus.

The paper discusses the problems of employment and unemployment in Georgian society, which takes the leading place in the list of country's social and economic issues. In terms of unemployment, we have the so-called untapped production potentialities costs, which are being lost because of the unused labor force. An analysis of the unemployment rate in Georgia based on the statistical information of 2005-2011 years is made and reflected in graphs. According to the statistics, the only category that shows a stable increase is self-employed category, while the number of hired employees decreases. Unemployment is a serious restriction for the country's economic development. Entrepreneurship as a source of employment is a driving force of the economy. Therefore the creation of favorable conditions for making business by the government is an efficient way to raise the level of employment. Fig. 5, Ref. 6.

Auth.

13.A3.36. The role of public diplomacy in the sphere of international economic relations. /D.

Kazbekova/. Ekonomisti. – 2013. – # 2. – pp. 102-107. – rus.; abs.: eng., geo., rus.

The article aims to analyze the importance and the role of public diplomacy in the context of international political economy. Considering the importance of modern trends, it is necessary to premeditate the degree and global scales of risks that are of priority importance at all levels of business relations in the efficient and quality management development strategy. Ref. 18.

Auth.

13.A3.37. Theoretical aspects of managing accounts receivables. /L. Gvenetadze/.

Ekonomisti. – 2013. – # 3. – pp. 10-16. – geo.; abs.: eng., geo., rus.

The methodological aspects of accounts receivables, such as credit policy, credit repayment policy, establishment of creditworthiness standards, recovery policy are discussed. The factors that have an impact on credit policies: variety of goods, value of money and credit repayment terms are analyzed. Tab. 1, Ref. 6.

Auth.

13.A3.38. Some aspects of the Georgian economy development concept. /E. Menabde-Jobadze/.

Ekonomisti. – 2013. – # 3. – pp. 25-29. – geo.; abs.: eng., geo., rus.

The article considers the critical role of the State in development of economy in the rather complex process of seeking for own market model. An adaptive model of development of Georgia is offered, which should take into consideration: the appropriate governance system oriented towards the use of novel technologies; the system should be adaptive, transformational, optimal and adequately dynamic. The government faces three objectives: ensuring effectiveness, adaptability and optimality. The system presents certain integrity, the elements of which function in an open economic system individually but serve to the achievement of common success. There arises the problem of relations between the center and peripheries, the solution of which is of key significance for the development of the country, in general. Fig. 1, Ref. 4.

Auth.

13.A3.39. Partnership of social sector of economy and private business. /M. Kapanadze, M. Kvantaliani/.

Ekonomisti. – 2013. – # 3. – pp. 30-34. – geo.; abs.: eng., geo., rus.

Under new economic conditions, the State acts as one of the subjects of the market, while in the social sector, private and mixed enterprises begin to operate together with the governmental organizations. Consequently, it is necessary that the regulatory role of the State is preserved with the concurrent ensuring of a balance between the volume of social demands and the capabilities of meeting them. The problem of keeping an optimal balance between the public and private sectors has always been of urgency in a society. The subject of partnership between the State and the private sector, which is more frequently used in many countries as a regulatory of economy, becomes of priority. In the West, the State and business have become rather mature partners, although the State still plays the leading roler. The naked faith in the "invisible hand of the market" and the State's inaction are certainly reasons of development of the global financial and environmental crises. Ref. 6.

Auth.

13.A3.40. Economic efficiency of foreign investment in Georgia. /N. Karkashadze, L. Kamladze/.

Ekonomisti. – 2013. – # 3. – pp. 56-63. – geo.; abs.: eng., geo., rus.

The article deals with the role and importance of foreign investment in Georgian economy. The dynamics of foreign investment by years as well as a percentage of large investor countries in the total investments of Georgia are described. A share of foreign investments according to the branches of economy and their dynamics per capita are shown. The economic efficiency is evaluated on the basis of the results obtained from investments, which is reflected in the increase in production in the relevant field. Finally, it is concluded that foreign investments actually contribute to the economic development of the country. Fig. 2, Tab. 4, Ref. 5.

Auth.

13.A3.41. Market principles of underwriting. /N. Benidze, J. Bitsadze, T. Gugeshashvili/. Ekonomisti. – 2013. – # 3. – pp. 64-70. – geo.; abs.: eng., geo., rus.

The essence of underwriting, where competition presents one of its commercial factors, is discussed. The insurer may not stay alone in the competitive insurance market. If the insurer sets a big insurance premium, he might lose the business (clients), while the setting of a small premium could imply losses for the insurance company. The process of underwriting aims to properly select risks, create a quality portfolio of insurance risks. There are no ready-made recipes in the process. An underwriter takes a decision based on the specific risk characteristics.

Auth.

13.A3.42. The main aspects of forecasting and issues of its indicators analysis. /M. Tsutskiridze/. Ekonomisti. – 2013. – # 3. – pp. 71-79. – geo.; abs.: eng., geo., rus.

The article deals with the main aspects of macroeconomic indicators' forecasting and issues of their analysis. The basis of determining a multifactorial model of forecasting economic indicators and its components is investigated. The main problems of economic and social factors analysis are described. The importance of a long-term economic growth, its systemic regulation and the impact of market factors on the expected change of principal indicators of the economic development are analyzed. Ref. 7.

Auth.

13.A3.43. The impact of non-tariff measures on foreign direct investments. /S. Jashi/. Ekonomisti. – 2013. – # 3. – pp. 102-109. – geo.; abs.: eng., geo., rus.

Foreign Direct Investments are important to overcome the social problems and economic development of Georgia. Unfortunately, there is no analytical service to determine the sectors of Georgia where investments are possible. Non-tariff measures have the significant role to restrict or attract the investments. The government should have a policy that would attract foreign direct investments and make the country more attractive for the investors. NTMs have both the direct and indirect effect on the investments. Both of them are very important for Georgia, especially the indirect one. If Georgia satisfies the international standards, Georgian entrepreneurs would be able to export products without any restrictions. The numerical growth of standards in various sections of Georgia will interest foreigners. Since Georgia is beneficiary of GSP+ and if it satisfies the EU standards, Georgian production will enter the EU market under a preferential regime. In addition, the signing of the DCFTA is to play an important role in attracting FDIs. Noteworthy is the fact that if the EU or international standards will be introduced in Georgia, the agricultural sector will have great potential to attract foreign investments. Fig. 1, Ref. 8.

Auth.

A4. Education

13.A4.1. Information support as a factor contributing to the development of science and education. /M. Kopaleishvili, I. Bedinashvili, E. Misabishvili, E. Pawlowicz/. Science and Technologies. – 2013. – # 1(714). – pp. 9-14. – geo., abs.: geo., eng., rus.

The role of scientific abstracts publications in the dissemination of the latest scientific achievements is outlined. Thematic analysis of the Georgian Abstracts Journal published by Techninformi, information support to individual branches of science, and the dynamics of highlighting the abstracts of published editions are given. The information collections available at Techninformi and designated for information support of science and education are listed. Tab. 2, Ref. 6.

Auth.

13.A4.2. Development prospects of the water education sector at the Technical University of Armenia. /S. Tokma-jyan/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 175-178. – eng.; abs.: geo., eng., rus.

The educational and research activities of the Water and Engineering Faculty of the Yerevan State University of Architecture and Construction in training bachelors and masters are described. The

university avails of respective chairs and laboratories for professional training of specialist. The construction of a hydraulics laboratory equipped with modern equipment is under way. Fig.2, Ref. 2.
Auth.

13.A4.3. Competence-oriented learning at a higher medical institution (review). /A. Nuftiyeva, G. Kausova/. Georgian Medical News. – 2014. – # 2(227). – pp. 57-62. – rus.; abs.: geo., eng., rus. The aim of the study was to analyze and assess interactive methods of training which are used at S.D. Asfendiyarov Kazakh National Medical University. The medical education program at the University has an innovative competency-based curriculum. Integrated curriculum and active methods, such as problem-based learning and practice-based learning, are used. The core of the curriculum in medicine is case study method - empirical inquiry that analyzes a medical fact in its "real-life context". The combined use of the method of case-study and training in small groups during practical classes are presented. Blended learning education program that mixes various activities (face-to-face classrooms, live e-learning, self-paced training), in which a student learns through delivery of content and instructions via online delivery with elements of student control, is also presented. Analytical and problem-solving skills are developed. It is concluded that blended learning promotes better assimilation of information and complies with the principles of competency-based education. Fig. 1, Tab. 1, Ref. 15.
Auth.

13.A4.4. Fundamentals of professionalism and international recommendations in architecture. /D. Abuladze/. Building. – 2013. – # 2(29). – pp. 159-162. – geo.; abs.: geo., eng. The article deals with the state of higher architectural education in Georgia, the development of common standards of education in Georgia, the necessity of its implementation and the role of international organization. Ref. 6.
Auth.

13.A4.5. Problems and solutions in vocational education and training in Georgia. /R.Nakashidze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 158-165. – eng.; abs: eng., geo. The world practice shows that the labor market is oriented to high qualification. Those who have prestigious professions and relevant qualification have greater chances for social self-realization. Under conditions of a market economy the price of such labor force is significantly increasing. Therefore, under conditions of a free competitive system the problem of vocational training, retraining and raising the level of qualification of the labor force is especially important. The educational system should be focused to prepare the young people for future challenges to cope and use them for social benefit. Under conditions of modern scientific and technical progress, the goal of lifelong learning is adaptation to dynamic life and professional mobility of a person. Ref. 6.
Auth.

13.A4.6. Ecological education sets the foundation for sustainable utilization of the environment. /M. Chkhartishvili/. Mining Journal. – 2013. – # 1(30). – pp. 121-122. – geo.; abs.: rus., eng. The importance of ecological education, which is a basis for sustainable use of the environment, is discussed in the work. It is a continuous process of teaching, upbringing, self-education and personality development, which is directed towards the formation of behavioral norms and social knowledge. The ecological education should define the right approach to the surroundings and promote thus the improvement of the quality of life, economic development and the ecological security of the. Ref.4
Auth.

13.A4.7. Some conceptual issues of teaching physics. /N. Kavtaradze, I. Lekvinadze, R. Chikovani/. GEN. – 2013.– # 4. – pp. 116-119. – geo.; abs.: eng. The article deals with the problems of teaching physics and the ways of their solution. An emphasis is made on the issues of arranging modern physics laboratories. To achieve this aim, students should be more active and more keen on the subject. Career guidance and strengthening of the Georgian physics school are required. Ref. 2.

Auth.

13.A4.8. The necessity of restoration of general economic theory teaching in universities of Georgia. /R. Asatiani/. Ekonomisti. – 2013. – # 1. – pp. 9-25. – geo.; abs.: eng., geo., rus.

The article considers the role of general economic theory as the source and methodological foundation of all economic sciences in the national economic policy, in social and economic development and in the expansion and refining of society outlook. In this connection analyzed are the classical-liberal, “Keynesian” (neo-Keynesian), neoclassical theories, “neoclassical synthesis” and monetary theory, served as a basis of the economic policy of leading capitalist countries of the world with different longevity and in different time periods. One is evident: the economic policy built on Keynesian macro-economic regulation caused qualitative transformation of “wild capitalism” into socially oriented market economy (“Keynesian revolution”), while economic policy of developed countries adjusted to M. Friedman monetary theory (“anti-Keynesian revolution”) caused economic crisis of the contemporary world. With the respective argumentation the article explains the processes which brought us to the following conclusion: the cause of Georgia’s lack of success should be searched for in improper economic policy. In economic policy of independent Georgia neither of governments had used the experience approved in the whole world. Today in new Georgia the escape from economic crisis is, in the first place, possible pursuing economic policy built on Keynesian theory. Imparting of social orientation to the economy will revive the market and give high multiplication effect, which is the basis of economic development of Georgia. As to teaching of general economic theory at universities, this is essentially indispensable not only at the faculties of economic profile, but generally at all faculties (short program). Equating of general economic theory with economics is not right as the subject of their research is different. That is why economics, as well as, general economic theory are taught at the universities of the leading countries of the world. This advanced experience tested in the world is to be considered in the educational system of Georgia as well. Ref. 29

Auth.

13.A4.9. Some issues of management of technical universities in the republic of Armenia in view of participation in the Bologna process. /S. Tokmajyan/. Ekonomisti. – 2013. – # 1. – pp. 34-40. – rus.; abs.: eng., geo.

The paper focuses on a number of issues related to higher educational institutions’ self-government. Peculiarities of financial stability of technical universities of the Republic of Armenia have been brought to light to meet competition from European institutions of higher education. An analysis of mechanisms designed for keeping young specialist at universities is presented. Fig. 3, Ref. 9.

Auth.

13.A4.10. Internationalization of education in the context of economic globalization. /K. Kondikerova/. Ekonomisti. – 2013. – # 1. – pp. 55-61. – rus.; abs.: eng., geo., rus.

The internationalization of the education system under globalization conditions is considered. Creation of a single world space will require review and consideration of a phased transition from one level to another in order to achieve the global level, i.e. the one global education. Since close cooperation and strategic partnership in the field of education, the creation of joint educational projects, the participation of international treaties such as the Lisbon Convention, the Bologna process will give new impetus to the new education in the existing international standards of education. Implementation and harmonization of these international instruments in the domestic legislation will make it easy to navigate in the future single educational space. Ref. 8.

Auth.

13.A4.11. The need of using a systems approach to complex development of university science, higher education and business in Georgia. /Sh. Machavariani/. Caucasus University Collection of Scientific Works. – 2013. – pp. 7-17. – geo.; abs.: geo., eng.

The present work analyzes the shortcomings characteristic of science, higher education and business in Georgia resulting from non-sufficient financial support for scientific activities at universities, loose coupling between scientific research and educational process, very low interest of businesses in scientific products and inexistence of active government programs. In order to

improve the situation on a qualitative level, it is recommended: to work out a cohesive strategy for the development of university education and science, to arrange well-planned networks, "business promoting structures" (innovation and competence centers, scientific and technological parks, innovation idea banks, various business incubators, etc.) that will interconnect the interests of science, university education and business interests, promote fund raising of important resources for arranging researches, growth of the country's innovation potential, rising business competitiveness, establishing research-oriented educational process at universities and training of high qualified personnel. Fig. 1, Tab. 11, Ref. 31.

Auth.

A5. Informatics/Computer Science

13.A5.1. On the approximation and scalarization of nonscalar optimization problems. /V. Maisuradze, M. Salukvadze, V.Gabisonia/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 13-26. – geo.; abs.: geo., eng., rus.

The concept of approximate effective point of given subset of criteria space is defined in the paper. The approximation issues of the set of effective points of reference set by the set of approximate effective points are studied. In addition, the methods of generation of the set of effective points on the basis of standard extreme problems solution are considered. The obtained theoretical results, which substantially rely on preceding investigations of the authors about separability of unnecessarily convex sets, are substantially applied to approximation and scalarization of the problems of nonscalar optimization. Ref. 7.

Auth.

13.A5.2. Model validation on identification of one class of non-stationary systems. /B. Shanshiashvili, M. Salukvadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 27-33. – eng.; abs.: geo., eng., rus.

The problem of model validation of linear non-stationary dynamic systems is considered by the example of the second-order system identification. The problem of parametric identification is stated as, in a certain sense, an inverse problem of Cauchy's problem for linear ordinary equations. It is shown that upon existence of the exact information on input and output variables of the system, the output signals of model coincide with output signals of system when the same signals are given on their inputs. Ref. 15.

Auth.

13.A5.3. On the non-interactive estimation of solutions in an iterative method of vector-valued optimization. /N. Kilasonia/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 39-41. – geo.; abs.: geo., eng., rus.

A new vector-valued optimization method is presented in the paper. Although the method is not interactive, it implies a step-by-step improvement of the compromise solution. The special coefficients are introduced in order to enable the algorithm, to estimate current solutions and take decision how to continue compromise solution searching process. The presented method is envisaged for the type of users who for some reasons are not ready to work with the algorithm interactively. Ref. 4.

Auth.

13.A5.4. Computation of a commercial firm's optimal plan by simplex method. /D. Sikharulidze, V. Maisuradze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 34-38. – geo.; abs.: geo., eng., rus.

The problem of a commercial firm's optimal type determination is turned to the problem of linear-fractional programming, which by certain transformations [2] is turned to the linear programming problem. The solution algorithm is illustrated by a simple example. Ref. 2.

Auth.

13.A5.5. A simple quantitative model for evaluation of the sustainable development index and its correlation with the knowledge society index (k-index). /Z. Buachidze, A. Gigineishvili, A. Chirakadze, N. Kavlashvili, I. Khomeriki, Z. Sigmashvili, M. Wireman/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 49-54. – eng.; abs.: geo., eng., rus.

The main determining factors of achieving sustainable development (SD) can be divided into three groups: economic, social and environmental. Numerous works were done to propose a model for achieving a composite numerical index of SD (I_{SD} index) to track incorporated information on social, economic and environmental dimensions of SD. Another approach is related to characterizing of the progress of societies and countries according to generation and use of new knowledge for ensuring their development. A quantitative characteristic of the development of society and basic conditions of its development is the index of K-society (I_K). A third approach is often utilized to evaluate the achieved progress by means of I_{SEC} which represents the security component of sustainable development norm, which is the aggregated degree of remoteness of the country from the totality of ten presented threats. It seems to be obvious that all three indices characterize the relative progress really achieved by countries and the prospects of future successful development. Thus, a good correlation of relative values of these indices can indicate and approve the reliability of all of them. This work is devoted to the testing of the simplest methods of the numerical (quantitative) calculation of the SD Index (I_{SD}) and its comparison with the published values of Sustainable Development Indexes and K-Society Indexes (I_K, I_{SEC}) for a control group of countries with different levels of scientific, economic and social development and environmental safety. The performed study showed that there is a proper coincidence between the calculated SD and published K-society indices which indicates the adequateness of both SD and K-society approaches for characterizing the achieved and relative progress of countries and societies in the modern world and the prospective of their future development. Tab. 2, Ref. 9.

Auth.

13.A5.6. Combined adaptive management system parameters of artificial climate. /L. Gvaramadze, O. Labadze, N. Kavlashvili, T. Saanishvili, G. Kiknadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 71-74. – geo.; abs.: geo., eng., rus.

The features of building management and control systems of artificial microclimate parameters for objects with irregular structure of the distribution parameters in space are considered in the paper. The possibility of using a combined method for a two-tier management of such facilities is shown in the work. The structure of an energy-efficient control and management system of artificial microclimate parameters enabling to reduce the costs necessary for the implementation of the governance process is given. Fig. 2, Ref. 7.

Auth.

13.A5.7. CES encoding standard system and a Georgian linguistic corpus. /N. Amirezashvili, L. Samsonadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 136-140. – geo.; abs.: geo., eng., rus.

Different kinds of linguistic corpora have been created to work on large amount of texts and take out the necessary information. For working unification with different kinds of corpora, and for the fact that the data of a corpus were not depended on the realization of a certain program and on the interface of working with the corpus, standards of annotation of textual corpora are being developed. In this article morphosyntactic features of CES standard are described. Our goal is to create a corresponding annotation system for Georgian linguistic corpus on the basis of encoding standard systems, which enables us to describe any electronic text, written in Georgian language by international standards. Ref. 3.

Auth.

13.A5.8. On an electronic state. /T. Bakhtadze, I. Margalitadze, M. Gegechkori/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 147-151. – geo.; abs.: geo., eng., rus.

The most important criteria of e-services that are necessary for e-states to exist are considered in the paper. The methods how to move away barriers that accompany the process of an e-state creation are given. Fig. 4, Ref. 6.

Auth.

13.A5.9. The role structure of a Georgian sentence. /G. Chikoidze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 111-117. – geo.; abs.: geo., eng., rus.

The paper presents some schemes of role structure for a Georgian simple sentence. The main components of this scheme are its core with its nucleus (verb) and the periphery, which includes such characteristics of situation, expressed by the utterance, as Instrument, yime, place, etc. The both main components have the “layered structure”, and the order of these layers is defined by the degree of “nearness” to the verb, that is to the nucleus of the core. The essential advantage of the role structure is its immediate relative unite the meaning of utterance differently from traditional and syntax, it defines the semantic functions of meaning components and unites there in one system. Fig. 5, Ref. 4.

Auth.

13.A5.10. Deixis of time in Georgian. /A. Chutkerashvili/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 131-135. – geo.; abs.: geo., eng., rus.

The relation between language and context in a language structure is most clearly represented by the phenomenon of deixis. The term (deixis) is of the Greek origin and means ‘indicating’, ‘denoting’. The traditional ones are personal, place and time categories of deixis. Deixis of time describes time moments or sections with respect to the time on which an expression is uttered. The time when the expression is created is called Coding Time (CT) that is different from Receiving Time. Deixis of time is generally expressed by adverbs of time. Ref. 4.

Auth.

13.A5.11. Perspective of developments of cloud computing in education. /M. Gegechkori, V. Bakhtadze, T. Lominadze, M. Archuadze, M. Odiladze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 145-147. – geo.; abs.: geo., eng., rus.

Perspective of development of cloud computing in the fields of education and sciences are considered in the work. Innovative potential of Cloud Computing are shown. Ref. 4.

Auth.

13.A5.12. International standard EAGLES for annotation of a Georgian text corpus. /L. Lortkipanidze, N. Javashvili/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 118-130. – geo.; abs.: geo., eng., rus.

The main purpose of text corpora is to provide scientific researches in vocabulary and grammar of language. As a result of corpora annotation, it is possible to get any analytical information about the text. There is a set of the international projects that develop standards and instructions for coding and development of language corpora. One of them is EAGLES standards (Expert Advisory Group on Language Engineering Standards), which is an initiative of the European commission within Linguistic Research and Engineering program. Its aim is to accelerate the provision of standards for very large-scale language resources (such as text corpora, computational lexicons and speech corpora). Morphosyntactic features of EAGLES standard are described in this article. According to the standard, the Georgian morphosyntactic features, which are necessary for annotation of a Georgian text corpus, are submitted. Ref. 7.

Auth.

13.A5.13. Knowledge acquisition method from evaluation texts on the basis of concepts. /M. Khachidze, M. Archuadze, G. Besiashvili/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 180-184. – geo.; abs.: geo., eng., rus.

The paper considers the method of knowledge acquisition from evaluating texts. The said method has been worked out by synthesizing two existing methods: Explicit Semantic Analysis (ESA) and analytical heuristics. The article examines a new and more convenient method for concept describing (its attributes) and calculating. This method describes concepts more compactly and semantically more precisely. The described method together with other methods can be used in formation process of knowledge basis. Tab. 2, Ref. 4.

Auth.

13.A5.14. Logical framework of medical information system for cancer diagnosis. /M. Khacidze, D. Khacidze, N. Khacidze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 185-190. – geo.; abs.: geo., eng., rus.

The logical structure of a medical information system is considered in the work. Software modules are built for each logical element. These modules provide: the collection of patient data (including the analysis that is the result of micro calorimetric analysis), analysis of the data of a patient with the purpose to diagnose cancer diseases. Diagnostic is basis on two methods - the new micro calorimetric method of diagnosing and analytical-heuristic method of knowledge representation. Fig. 3, Ref. 5.

Auth.

13.A5.15. Analysis of the matrix one-way function and two variants of its implementation. /R. Megrelishvili/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 198-202. – eng.; abs.: geo., eng., rus.

In this article we first announced about two versions of the new matrix one-way function (With respect to the issue of relevance, we repeat, that the main advantage of the matrix one-way function is high speed operation). The first variant is the result of the natural development of cryptography and it is associated with the use in the cryptography of new tropical arithmetic operations. The results of their applications may be named as "Tropical Cryptography." But at the same time, regardless of the general algebraic values "Tropical Cryptography", it is fact, that the construction of multiplicative groups, based on the our tropical operations, may be accepted as an integral part of the realization of the matrix one-way function. Therefore, its adoption and an implementation can be associated with its recognition. The second option, at this stage, is the result of repeated analysis of matrix one-way function and it is associated with the use of exponential one-way function within a certain time frame (Assuming the exponential one-way function, which Diffie-Hellman took from Number Theory). However, it is obvious that the use of the degree (exponential) one-way function, in a certain time interval is not associated with loss of speed for the matrix one-way function, therefore, and - for the corresponding key exchange algorithm via an open channel communication or to perform other actions. Ref. 9.

Auth.

13.A5.16. On the issue of a binarization of quantitative features for logical methods of recognition. /M. Mikeladze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 152-156. – geo.; abs.: geo., eng., rus.

The algorithm of a binarization of quantitative features for logical methods of recognition is considered in the paper. The heuristic criterion of informativeness, that allows to receive splitting of a set of quantitative feature values into informative intervals without the solving a complex optimization problem, is used in this algorithm. Fig. 2, Ref. 4.

Auth.

13.A5.17. Solution of informalized problem of medical diagnosis applied to the stomash gastritis klass of diseases. /V. Radzievski, M. Mikelaze, N. Jaliabova, D. Radzievski/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 157-162. – geo.; abs.: geo., eng., rus.

The problem of computer diagnosis of gastritis class stomach diseases, on the basis of knowledge about the disease is considered in the paper. This knowledge includes a description of possible alterations in the components of a sick organism, as well as information about the relations that exist between the symptoms and their causes. Applying this knowledge, casual analysis of alterations in a sick organism is performed on the basis of which a final diagnosis is given. Fig. 3, Ref. 7.

Auth.

13.A5.18. Generalized description of the situation classes and expanding of the set of the possible solutions in complex systems control. /V. Radzievski/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 163-168. – geo.; abs.: geo., eng., rus.

The problem of getting solutions for managing complex systems is considered in the paper. It is shown that the solution of such problems is not possible by traditional mathematical methods or

techniques busting. Production models of knowledge and recognition models are used in order to solve such problems. We also consider the relationship between the state set the control object and the set of possible solutions generated by the control system. It is shown that the relation between these sets should be brought into line with the law of requisite variety Ashby. The methods for solving this problem and recommendations are given in the paper. Tab. 1, Ref. 8.

Auth.

13.A5.19. Production model of knowledge in the problems of medical diagnosis and prognosis. /V. Radzievski, D. Radzievski/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 169-174. – rus.; abs.: geo., eng., rus.

It is shown in the paper that the models of the processes of diagnosis and prediction based on the principles of behavioral psychology are not effective enough. A model of the process of medical diagnosis and prognosis, based on the knowledge on the subject field is suggested. Models of deterministic, probabilistic and fuzzy productions are used to represent knowledge. Ref. 9.

Auth.

13.A5.20. On the molecular switches of nanoelectronics. /M. Surguladze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 141-144. – geo.; abs.: geo., eng., rus.

One experiment for creation of basic element of the future computing devices is described in the work. Problems of modeling of nanoelectronic circuits are presented. The factors needed for using supercomputers for modeling the elements of molecular electronics are considered in the paper. Fig. 1, Ref. 2.

Auth.

13.A5.21. Model analysis of computer network with multiple servers with limited queue length and limited waiting time. /T. Chumburidze, K. Odisharia, S. Khoshtaria, Ts. Khoshtaria/. Air Transport. – 2013. – # 1(8). – pp. 46-53. – rus.; abs.: geo., eng., rus.

The article proposed analysis model COP with multiple servers with limited queue length and limited time of waiting gives possibility to analyze how effectively existing COP can serve current requirements for the maintenance of a certain level of intensity, or for specified requirements of service, what should be the required server resources and the main characteristics of productivity and reliability design of the COP. Ref. 4.

Auth.

13.A5.22. Functioning of computer networks in separate request servicing mode. /T. Chumburidze, K. Odisharia, Ts. Khoshtaria/. Air Transport. – 2013. – # 1(8). – pp. 54-63. – rus.; abs.: geo., eng., rus.

The author introduces analytical models intended to appraise efficiency of main parameters of computer system functioning in different rates of service requirements. Ref. 4.

Auth.

13.A5.23. Management of information processes as a guarantee of economic security of a modern corporation. /G. Teplinsky, V. Novak/. Air Transport. – 2013. – # 1(8). – pp. 70-77. – eng.; abs.: geo., eng., rus.

In the article certain aspects of management of information processes of a corporation's economic security are analyzed, which relate to structuring of information environment on the basis of the balanced scorecard system, and the use of this methodology in the construction of the complex system of economic security of a modern corporation is considered. Ref. 5.

Auth.

13.A5.24. Towards mathematical modelling of mass service processes. /M. Akhobadze, E. Kurtskhalia/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 66-70. – eng.; abs: eng., geo.

Generally, each case at the Court is preceded by preparatory work. If the number of judges, court halls or budget amount is not sufficient, resulting waiting list will require certain time to be considered. On the other hand, according to the law, each particular case should be considered

within a certain period after its starting. Obviously, during the process of new court planning or existing court functioning, it is desirable to know in advance whether the time period for each case discussion is conformable to the terms defined by the law for the given number of judges, court halls or budget amount. A lot of mathematical modelling tasks for mass service as well as for the Courts are reduced to the solution of homogeneous equation with two variables, the precise solution of which is often impossible. The article considers the mathematical model of the Courts functioning as a three-phase system of mass service, where, the first phase (subsystem) reflects the specificity of the judge's activities, the second phase - budget amount and the third – Court halls completeness. This mathematical model represents systems of differential and integral equations. The paper considers the solution of a mathematical model (homogeneous equation with two variables) in the form of a row that enables identification between the real process and appropriate mathematical model, by the modern informatics technology and software achievements, thus providing the imitation of Courts normal functioning. Generally, a lot of mathematical modelling tasks are often reduced to the solution of homogeneous equation with two variables, the precise solution of which is often impossible. The article considers the solution of such equations in the form of a row that provides identification between the real process and appropriate mathematical model for each particular case and process by the modern informatics technology and software achievements. Ref. 4.

Auth.

13.A5.25. An optimal control problem for a nonlocal boundary value problem. /D.Devadze, M. Dumbadze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 71-74. – eng.; abs: eng., geo.

In the present paper the Bitsadze–Samarskii boundary value problem is considered for a quasi-linear differential equation of first order on the plane and the existence and uniqueness theorem for a generalized solution is proved; the necessary (in the linear case) and sufficient optimality conditions for optimal control problems are found. The optimal control problem is posed, where the behavior of control functions is described by elliptic-type equations with Bitsadze–Samarskii nonlocal boundary conditions. The necessary and sufficient optimality conditions are obtained in the form of Pontryagin's maximum principle and the solution existence and uniqueness theorem is proved for the conjugate problem. Ref. 13.

Auth.

13.A5.26. An algorithm of the solution of an optimal control problem for a nonlocal problem. /D. Devadze, V. Beridze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 44-48. – eng.; abs: eng., geo.

The paper deals with optimal control problems whose behavior is described by Helmholtz equations with Bitsadze-Samarski nonlocal boundary conditions. A theorem about a necessary and sufficient condition of optimality is given. A numerical algorithm of the solution of an optimal control problem by means of the Mathcad package is presented. Fig. 2, Ref. 16.

Auth.

13.A5.27. The unification of bibliometric indices to assess the level of scientific productivity at the micro- and meso-levels. /L. Chobanyan, N. Makhviladze, O. Shatberashvili, P. Tsotskolauri/. GEN. – 2013. – # 3. – pp. 28-30. – eng.; abs.: rus.

The notion of effective individual indices of citation has been introduced. A comparison of the effective indices with the traditional ones has been carried out. The appropriateness of using the effective indices in comparing research activities of different scientific directions has been substantiated. Tab. 1, Ref. 6.

Auth.

13.A5.28. Space-time coding in MIMO systems. /Sh. Kvirvelia, J. Beridze/. GEN. – 2013. – # 4. – pp. 26-29. – eng.; abs.: eng.

With the help of program MatLab, MIMO channels with STBC for the Wimax standard model by using of BPSK, QPSK, QAM16, 64, 128, 256 types of modulation are estimated. The characteristics of spectral efficiency and the error rate were obtained. It is shown that, at high SNR, the use of QAM modulation is the most efficient. Tab. 3, Fig. 2, Ref. 3.

Auth.

13.A5.29. Business process management with radio-frequency identification (RFID) and biometric technologies. /G. Datukishvili/. Caucasus University Collection of Scientific Works. – 2013. – pp. 96-100. – geo.; abs.: geo., eng.

Over the past years, advances in science such as information technology, have become equal to revolutionary explosions. The only weak link in this process is a man, who is the only hinder in the development of information technology. Radio-frequency identification technologies fully satisfy the automated control system where there is the need for recognition of the object and registering it in real time. Technology based on radio-frequency identification is called RFID technology. This issue describes the process in which the identification of human resources with the help of biometric technology is carried out in particular with the help of fingerprint scanner. In my opinion, in the organization, where the staff daily uses various objects or office equipment, between RFID and biometric identifier can be considered to be the best decision. Ref. 3.

Auth.

A6. Other Social Sciences

13.A6.1. For logical conditionality. /E. Ormotsadze/. Goni. – 2014. – # 1. – pp. 152-154. – geo.; abs.: geo., eng.

Logical conditionality is a kind of determination. It belongs to the abstract sphere; it is a logical process along which the result is determined on the basis of logical relations of thinking. Logical determination takes place in all forms and law of thinking. Logical necessity is the severest necessity to determine the way of internal refusal. Logical necessity is of categorical character. It does not have degrees, thus it is the absolute necessity. The real necessity is a relative necessity. Ref. 3.

Auth.

B. NATURAL AND EXACT SCIENCES

B1. Mathematics. Mechanics. Physics. Cybernetics

13.B1.1. About some issues of turbulent flow in boundary layer. /T. Magrakvelidze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 81-88. – geo.; abs.: geo., eng., rus.

Some problematic issues in the boundary layer of turbulent flow are considered in the paper. It is suggested that modified G. Gips distribution can be used to describe turbulent pulsations. Way pulsations in the turbulent flow are obtained on the basis of the formula for calculation side: $v' = u_\tau e^{-7.8/\eta}$, where u_τ is a dynamic velocity, η - dimensionless distance from the wall. Obtained formula is in a good agreement with J. Laufer experimental data. Velocity distribution unified formula is offered both for turbulent bulk and viscous/buffer layers. Fig. 3, Ref. 13.

Auth.

13.B1.2. The analysis of movable device vibrations and their utilization. /T. Trokashvili/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 20-21. – geo.; abs.: geo., eng., rus.

The paper presents frequency characteristic feature of the noise while engine processing. The scheme of the main signal of noise is shown in the work. Research is carried out by the example of the reduction engine. It is shown that it is possible to define the main frequency (number of rotations) f and the signal of errors Δf . The results can be utilized in diagnostics, in the engine and generator managing. Fig. 5, Ref. 3.

Auth.

13.B1.3. The active linear filters shifting into the resonance frequency. /T. Trokashvili, G. Urushadze, N. Shengelia/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 98-100. – geo.; abs.: geo., eng., rus.

The paper presents the analysis of the complex signal into constituents. The scheme that is constructed using the active linear filter is shown in the paper. It's possible to single out the main signal. The frequency of the main signal can be changed in a certain range. The scheme of filter shifting into resonance frequency is also shown in the work. Fig. 4, Ref. 3.

Auth.

13.B1.4. Characterization of a triangle of minimal perimeter inscribed into the given triangle. /G. Tsuleiskiri, L. Asatiani, L. Kisishvili/. Building. – 2013. – # 2(29). – pp. 27-31. – geo.; abs.: geo., eng.

The theorem of orthocentric triangle of the given triangle proven by the Hungarian mathematician Lipot Fejer (born 1880) is applied to solve the problems. Fig. 6, Ref. 4.

Auth.

13.B1.5. Rotation of a point around an arbitrary point on a plane. /B. Maspindzelashvili, G. Kirmelashvili/. Building. – 2013. – # 2(29). – pp. 65-71. – geo.; abs.: geo., eng.

The rotation of any point around an arbitrary point on a plane is considered. In particular, rotations are considered within both the point of origin and the core point different from it. The point coordinates for respective angles of rotations are determined. The proposed determination of point locations can have a definite application in construction, in the solving of geodesy, analytic and descriptive geometry and other practical problems. Fig. 5, Ref. 2.

Auth.

13.B1.6. Stressedly deformed state of a body stretched under action of load and compressed by lateral volume forces. /N. Berishvili, R. Giorgobiani, G. Javakhishvili/. Building. – 2013. – # 2(29). – pp. 129-132. – geo.; abs.: geo., eng.

The work deals with the determination of the stressedly deformed state of a deformable body. In contrast to the classical concept of similar problem, volume forces generated by load in transverse direction are taken into consideration. The respective solution of the problem under consideration fully complies with major equations of the theory of elasticity as well as the relevant boundary conditions of body attachment. Fig. 1. Ref. 3.

Auth.

13.B1.7. On some properties of periodic functions. /S. N. Bliadze, S. S. Bliadze/. Air Transport. – 2014. – # 1(9). – pp. 19-25. – rus.; abs.: geo., eng., rus.

Methods, the use of which enables a simple and comprehensive analysis of a function for its periodicity and period, are presented. Fig. 2, Ref. 3.

Auth.

13.B1.8. On the Wiener processes in a Banach space. /B. Mamporia/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 5-14. – eng.; abs: eng., geo.

The analysis of the definition of Wiener process in a Banach space is given. It considers the definitions of generalized Wiener process and Wiener process in a weak sense. The representations of them by the sums of identically distributed independent (weakly independent) Gaussian random elements are given. Ref. 6.

Auth.

13.B1.9. Equilibria of constrained point charges. /G. Khimshiashvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 15-20. – eng.; abs: eng., geo.

We discuss analogues of the famous Maxwell conjecture on the number of equilibria of point charges in certain situations where the positions of charges are subject to quadratic constraints. Two types of quadratic constraints are considered in some detail: point charges placed at the vertices of polygonal linkage, and point charges confined to a circle. We show that the Coulomb potential in both cases is a Morse function on the corresponding moduli space and present several results on the number and Morse indices of its critical points. Detailed results are obtained if the

number of charges does not exceed four. For quadrilateral linkage, we establish that the number of equilibria does not exceed eight. As a by-product, we show that any convex configuration of such a linkage is an equilibrium of Coulomb potential for some collection of charges at the vertices. For three charges on the circle, we give a geometric characterization of configurations which are equilibria of Coulomb potential for some collection of charges. Ref. 9.

Auth.

13.B1.10. On the convergence of the crank-nicolson semidiscrete scheme for an evolutionary equation in Banach space. /J. Rogava, D. Gulua/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 21-32. – eng.; abs: eng., geo.

The Crank-Nicolson semidiscrete scheme is considered for an evolutionary equation with a linear unbounded closed operator A in the Banach space. It is proved that if (a) the spectrum of the operator A is contained in a symmetrical open sector with an angle opening less than π , lying in the right-hand half-plane; (b) for any point z ($z \neq 0$) not belonging to this sector, the resolvent norm is not greater than $c/|z|$; (c) the second derivative of a solution satisfies the Lifshitz condition. Then the error of an approximate solution is not greater than $c(\varepsilon_0 \ln \tau^{-1} + \varepsilon_1 + \tau^2)$, where τ is a grid step, while ε_0 and ε_1 are the disturbance of the initial vector and the right-hand part, respectively. Ref. 16.

Auth.

13.B1.11. On hierarchical models of prismatic shells within the framework of the Chandrasekharaiah-Tzou nonclassical theory of thermoelasticity. /G.Avalishvili, M. Avalishvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 33-44. – eng.; abs: eng., geo.

In the present paper the Chandrasekharaiah-Tzou dynamical nonclassical model for thermoelastic prismatic shell is studied. The initial-boundary value problem corresponding to the dynamical three-dimensional model is investigated applying variational approach in suitable spaces of vector-valued distributions. A hierarchy of two-dimensional models is constructed for thermoelastic prismatic shell, when surface forces and the normal component of heat flux are given along the upper and the lower faces of the prismatic shell. The two-dimensional initial-boundary value problems corresponding to the models of the hierarchy are investigated in suitable function spaces. Moreover, the convergence of the sequence of approximate solutions of three space variables, constructed by means of the solutions of the reduced two-dimensional problems, to the exact solution of the original threedimensional problem is proved and under suitable regularity conditions the rate of convergence is estimated. Ref. 15.

Auth.

13.B1.12. Rigorous theoretical arguments for suppression of the Lamb shift. /A. Khelashvili, T. Khachidze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 45-49. – eng.; abs: eng., geo.

The main purpose is to elucidate the role of the hidden symmetry of the Dirac-Coulomb problem and to show algebraic possibilities for derivation of spectra. It is shown that the requirement of invariance of the Dirac Hamiltonian under some kind of Witten's superalgebra picks out the Coulomb potential only. It follows that the traditional view on the Coulomb potential is to be changed in the context of $N=2$ supersymmetry. Ref. 9.

Auth.

13.B1.13. Classical motion of a test particle in the Bonnor spacetime based on Lyra manifold. /M. Yavari/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2 – pp. 50-56. – eng.; abs: eng., geo.

The exact solutions of the vacuum field equations for the Bonnor spacetime in presence of a massless scalar field within the framework of the Lyra manifold are studied. Also, the classical motion of a test particle in this spacetime by using the Hamilton-Jacobi method is investigated. Ref. 13.

Auth.

13.B1.14. On Poncelet porism for biquadratic curves. /G. Khimshiashvili/. Bulletin of the Georgian National Academy of Science – 2013. – Vol. 7. – # 1. – pp. 5-10. – eng.; abs: eng, geo. Two seemingly unrelated topics having in fact a common feature that they naturally lead to consideration of certain involutive transformations of biquadratic curves are discussed. The first topic is concerned with the so-called Darboux transformation on the moduli space of planar quadrilateral linkage. We explain how this transformation can be related to involutions of an appropriate biquadratic curve and present a natural analog of Poncelet porism in this setting. The second topic is concerned with the uniqueness of solution to the Dirichlet problem for string equation in bounded domain. If the boundary is a convex biquadratic curve we show that an analog of Poncelet porism for the so-called John's mapping can be established in the same way as for Darboux transformation. Ref. 7.

Auth.

13.B1.15. Approximation by trigonometric polynomials in subspace of weighted grand Lebesgue spaces. /N. Danelia, V.Kokilashvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 11-15. – eng.; abs: eng, geo.

The paper presents the direct and inverse theorems of trigonometric approximation in closure of $L_w^p(1 < p < \infty)$ by the norm of weighted grand Lebesgue spaces. The rate of deviation by summation means of Fourier trigonometric series is derived. Ref. 7.

Auth.

13.B1.16. Lattice isomorphisms of free nilpotent Lie algebras. /A.Lashkhi/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 16-20. – eng.; abs: eng, geo. K denotes a commutative domain with unit. L denotes the Lie algebra over k ; $L(L)$ the lattice of all subalgebras L . Let M and M_1 be the linear algebras over the rings k and K_1 , respectively, and $\sigma: k \rightarrow k_1$ be an isomorphism. A bijection $\mu: M \rightarrow M_1$ will be called a σ – semilinear quasimorphism if for any $x_1, x_2 \in M$ and $\alpha, \beta \in K$ there exists $\lambda \in K_1$ such that $\mu(\alpha x_1 + \beta x_2) = \sigma(\alpha)\mu(x_1) + \sigma(\beta)\mu(x_2)$, $\mu(x_1 x_2) = \lambda \mu(x_1)\mu(x_2)$. Let $f: L(L) \rightarrow L(L_1)$ be a lattice isomorphism, where L and L_1 are torsion-free nilpotent Lie algebras of class 2 over the principal ideal domains k and K_1 , respectively. If $\dim L \neq 3$, then L and L_1 are semilinear isomorphic. Let $f: L(L) \rightarrow L(G)$ be a lattice isomorphism, L and G be Lie algebras over the principal ideal domains k and K_1 , respectively. If L is a free (nonabelian) polynilpotent or free Lie algebra and $\dim L \neq 3$, then $k \cong k_1$ and $L \cong G$. Ref. 13.

Auth.

13.B1.17. On the estimation of a maximum likelihood of truncated exponential distributions. /G. Lominashvili, M. Patsatsia/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 21-24. – eng.; abs: eng, geo.

The problem of estimation of parameters of truncated exponential distribution by the maximum likelihood method is studied. It is shown that maximum likelihood equation for truncated exponential distribution has a unique solution which gives an asymptotic effective estimator of the parameter. Ref. 4.

Auth.

13.B1.18. “Anomalous” heat capacity of the stoichiometric lanthanum dihydride. /N. Namoradze, I. Ratishvil/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 25-32. – eng.; abs: eng., geo.

Two models aimed to describe the experimentally registered difference between the heat capacity temperature dependences $C(T)$ of dihydrides LaH_2 and CeH_2 , denoted as $C(T)[\text{LaH}_2]$ and $C(T)[\text{CeH}_2]$ are compared. In both models the specific features of the $C(T)[\text{LaH}_2]$ are ascribed to the transfer of a number of hydrogen atoms from energetically favorable tetrahedral interstitial positions to the less-favorable octahedral interstitial positions. One of the models allows random transitions from tetra-positions into octa-positions of a number of separate H-particles, while the second model implies that in the fcc crystalline lattice of metal atoms linear hydrogen-metal atomic complexes - “H-M-H dumbbells” are formed. In the ground state they are oriented along [111]-type crystallographic directions and at temperature increasing they are reoriented along the [100]-type

crystallographic directions. Existing experimental results give preference to the first model. It is suggested that analogous tetra-octa transfers are not realized in cerium dihydride due to the specific details of the H-H interactions in the cerium lattice. Fig. 6, Ref. 7.

Auth.

13.B1.19. Calculation of the gravitoelectromagnetism force for the O’Hanlon-Tupper spacetime. /M.Yavari/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 33-37. – eng.; abs: eng, geo.

By using the threading splitting concepts for a time dependent spacetime, the time dependent quasi-Maxwell equations in terms of the gravitoelectromagnetism fields are discussed. The motion of a test particle in the O’Hanlon-Tupper spacetime by applying the Hamilton-Jacobi method and the quasi-Maxwell equations is studied. Also, the gravitoelectromagnetism force in this spacetime is calculated. Ref. 21.

Auth.

13.B1.20. Comparison of analytical and numerical methods for assessment of stress-strain state of the massif around the tunnel of noncircular cross-section. /L. Japaridze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 38-43. – eng.; abs: eng., geo.

In the recent years in the world practice of calculation of the underground structures numerical methods have almost displaced the analytical methods of continuum mechanics. While numerical methods are indispensable for some intricate problems of geomechanics, the analytical methods of the theory of elasticity for calculation of tunnels should be a subject of further use and development. Parallel solution of specific problems with the use of one of the commercial computer software and N.Muskhelishvili’s method of Theory of Elasticity was conducted. Using the example of tunnel of rectangular cross-section, it was shown that the analytical solution can be more accurate and comparatively easier over numeric especially using the well-known program “Mathlab”. Fig. 7, Tab. 1, Ref. 6.

Auth.

13.B1.21. Uncertainty of raw data in systems engineering. /A. Prangishvili, O. Namicheishvili, G. Zhghenti, L. Cholikidze/. GEN. – 2013. – # 3. – pp. 9-16. – geo.; abs.: eng.

The problem of choosing the law of probability distribution of the random variable by the criterion of maximum entropy of this quantity is examined as an isoperimetric problem of variational calculus. Ref. 6.

Auth.

13.B1.22. Formal neuron adaptation using the Widrow-Hoff algorithm. /A. Prangishvili, O. Namicheishvili, M. Gogiashvili/. GEN. – 2013. – # 3. – pp. 16-22. – geo.; abs.: eng.

The article deals with the study on the methods of adaptation of the formal neuron paper when this neuron is used as a storing device of the true value of the binary signal. It is understood that, to the formal neuron inputs different versions of the same binary signal are fed with varying reliability and the neuron should restore the true value of the start signal in these versions. The adaptation of the formal neuron becomes essential. The adaptation is interpreted as the process that changes the weights of formal neuron inputs for adjusting them in accordance with the error probability of input channels. The task of the control is to ensure the higher impact of more reliable inputs on the accepted decision (i.e. on the decoded signal) as compared to less reliable inputs. However, the adaptation can be implemented in different ways, by means of different algorithms. In this article, we consider the continuous adaptation. It is proved that, in the case of continuous adaptation without feedback in accordance with the Widrow-Hoff algorithm, the weights are formed in proportion to those which deliver the maximum of Mahalanobis distance. Ref. 6.

Auth.

13.B1.23. Linearization of the solution of Langevin’s equation in magnetic liquids. /K. Kotetishvili, G. Chikhladze/. Nano Studies. – 2013. – # 7. – pp. 225-228. – eng.

In the paper, the wide range of rotation frequencies is considered for B_e , including the typical f_0 for the ordinary MRI. Larmor’s frequency is 8.5MHz at about 0.2T and rises up to 14.9MHz at about

0.35T. The amplitude of B_e is located within 1–10% for B_0 , which is relatively wider, than the amplitude of the typical B_1 , although it is of the same order that is the magnetic field created by nano-particles. Interaction with transversal magnetization is reached by selection of the frequency of excitement for $B_{e(\omega)}$, being of the same order that is the inverse τ time of substance relaxation. For typical magnetic nano-particles in bio-medical works its value (approximately one microsecond) is given. Sick disturbances in the magnetic field signals along i_x and i_y were considered, gradually transferring into $\pi/2$ space (rotates) and creating the rotating field in transversal xOy plane. Change in rather big signals is considered along i_z ($h_z=0$). For the field of DC we got the enclosure (0.1–0.35T) in the results, where the nano-particles of 4nm radius of the magnetic nuclei (being the contrast agents of the ordinary MRI) are saturated up to 90%. At $B_0=0.35T$, $L(\alpha_0)=0.9$. Ref. 3.

Auth.

13.B1.24. Research on water-repellant nanofiber spun by electro bubble spinning method.

/M. Iwamoto, H. Ino, T. Kimura, Y. Kishimoto/. Nano Studies. – 2013. – # 8. – pp. 29-34. – eng.

Recently, water repellent materials have been attracted much attention in academic and industrial fields. In this research, the nanofiber nonwoven fabric that has water repellency was tried to spun by making fine structure surface. In order to make them, the nanofiber that contains a lot of fine particles on the surface of nanofiber is spun and treated with a fluorochemical water repellent agent. The electro-bubble spinning method that is carried out by the electrospinning from the bubbling polymer solution was selected for this research. This method has advantages that heterogeneous solution is continuously mixed by air bubbles and narrow nozzle, which sometimes get stick, is unneeded. The optimal conditions for producing uniform fine particles, and the relationship between the polymer solution composition and water-repellent properties were investigated. Fig. 7.

Auth.

13.B1.25. Mechanical properties of nanostructured copper coatings made by cold gas dynamic spray.

/R. Maev, V. Leshchynsky, E. Strumban, D. Dzhurinskiy, J. Kocimski, E. Maeva/. Nano Studies. – 2013. – # 8. – pp. 111-120. – eng.

Severe plastic deformation (SPD) involves very large strains, which are imposed on a specimen without introducing any significant changes in its dimensions. From this point of view, cold gas dynamic spray (CS) can be considered an SPD process, in which a very large plastic strain is imposed on the interface due to the impact of particles accelerated to supersonic velocities. While the CS coating deposition process is widely used, the influence of SPD taking place during the coating buildup process resulting in forming nano-structured alloys has not been defined yet. In this study, an attempt has been made to produce thick Cu coatings on a carbon steel substrate using the SPD processing conditions. The nano-structured interface of Cu coatings / carbon steel substrate exhibits very high adhesion strength and good mechanical properties, which makes the CS technology attractive for producing copper clad parts. Fig. 12, Ref. 10.

Auth.

13.B1.26. Study of ion beam mixing of TE/IN and SE/IN systems by cascade collisional mixing model.

/B. A. M. Ibrahim/. Nano Studies. – 2013. – # 8. – pp. 183-190. – eng.

Ion beam mixing at room temperature of Te/In and Se/In bilayer systems induced by 400keV Ar⁺ ions from Jordan van der Graaff accelerator with fluence ranging from $1.11 \cdot 10^{14}$ – $7 \cdot 10^{15}$ ion/cm² for TE/IN system and $1.35 \cdot 10^{14}$ – $2.3 \cdot 10^{16}$ ion/cm² for SE/IN system. The systems are studied by means of AC electrical resistivity measurement, which shows higher mixing efficiency of SE/IN system than TE/IN system, and by 2MeV He⁺ backscattering spectrometry, which shows the width of intermixed layers are 100 and 50nm for SE/IN and TE/IN, respectively. Ion beam mixing for these systems are studied theoretically by cascade collisional mixing Haff & Switkowski model, the nuclear stopping powers are calculated by TRIM computer code. The diffusion rate is calculated for the systems TE/IN and SE/IN, which showed that the diffusion rate and mixed layer for the system SE/IN is greater than that of TE/IN, which agrees with experimental results. The theoretical study is a tool and indication to determine the efficiency of mixing between upper and lower layers before preparation and irradiation of samples, which provide the effort and money. Fig. 11, Ref. 10.

Auth.

13.B1.27. Once more on effective electrical charge of atomic nuclei. /L. Chkhartishvili, T. Berberashvili/. Nano Studies. – 2013. – # 8. – pp. 267-272. – eng.

Concept of the effective electrical charge of atomic nucleus is introduced and its values are tabulated by equating the energies of atomic electron orbitals followed from their analytical expression for the corresponding “hydrogen-like” atom and *ab initio* calculations. Tab. 1, Ref. 8.

Auth.

13.B1.28. The theory of polaron low temperature mobility. /B. Kotia, D. Khutsishvili/. Nano Studies. – 2013. – # 8. – pp. 289-304. – eng.

New exact quantum evolutional equations for equilibrium double time correction functions (Green functions) of a small subsystem interacting with a thermostat (boson field) is derived with the help of Lowville superoperator formalism and by the projection operator method. The random phase approximation (RPA) is not used at the derivation of these equations. As an application, electron-phonon system and Froehlich polaron model is considered. On the basis of Kubo linear response theory consistent theory of electrical conductivity is developed. Analytical expressions for the conductivity tensor and mobility along the all range of the low temperature and frequencies of external electric field are obtained. In this models also obtained temperature corrections to electrical conductivity (mobility) conditioned by accounting initial correlations of electron with phonons. It is obtained correct low temperature mobility of Froehlich polaron analysis, of which by different methods led to different results. Ref. 14.

Auth.

13.B1.29. Investigation of optical transmission spectra of TiN thin films obtained by HF-reactive sputtering method. /A. Bibilashvili, Z. Jibuti, N. Dolidze/. Nano Studies. – 2013. – # 8. – pp. 311-314. – rus.

The work investigates the optical transmission of TiN thin films (50–200nm) obtained by HF-reactive sputtering method. It describes techniques of obtaining films and measuring of their parameters. It is shown that with increase in thickness of films the change of light transmission in all the measured wave-bands is observed together with a transmission sharp peak at the wavelengths of 293–330nm. For the assessment of stability of optical properties of TiN films it was investigated the influence of pulse photon, thermal and ultra-violet impact on transmission spectrum of samples. Results show that optical parameters of the obtained films are stable. From experimental data, the conclusion becomes that in case of TiN application as an optical cover it is possible to expect the high stability of parameters. Fig. 2, Ref. 6.

Auth.

13.B1.30. New mechanism for materials indentation at nanometer and submicron scales. /A. Gerasimov, G. Chiradze, T. Ratiani, M. Vepkhvadze/. Nano Studies. – 2013. – # 8. – pp. 327-332. – rus.

Proposed is a new idea of changing the location of atoms in condensed matter explaining, in contrast to molecular-kinetic theory, all the observed experimental facts. The experimental data confirming the correctness of the proposed concepts are presented. Fig. 5, Ref. 15.

Auth.

B2. Chemistry. Biology

13.B2.1. Effect of a fermentation technique on the physico-chemical and organoleptic properties of red wines. /N. Baghaturia, T. Nanitashvili, N. Begiashvili, T. Shilakadze, B. Baghaturia/. Agrarian-economic Science and Technologies. – 2014. – # 2. – pp. 43-49. – geo.; abs.: geo., eng.

The given article explores the effect of the grape pulp complex fermentation procedures on the chemical properties and quality of red wines. The above-outlined fermentation method resulted in improved production techniques and quality of red wines. Tab. 2.

Auth.

13.B2.2. The fatty acid composition of ordinary flax seed oil (*Linum usitatissimum* L.) cultivated in Georgia and its biological activity. /B. Kikalishvili, D. Zurabashvili, D. Turabelidze, L. Shanidze, G. Parulava/. Georgian Medical News. – 2014. – # 2(227). – pp. 86-88. – rus.; abs.: geo., eng., rus.

The aim of the study was individual quantitative and qualitative determination of fatty acids in ordinary flax seed oil (*Linum usitatissimum* L.) cultivated in Georgia. The neutral lipids extracts were fractionated and analyzed by high performance liquid chromatography (PTC-1, Waters) with refractory detector R-401. Analytical column (150.0x3.0 mm) was filled with reversphase Bondopak C₁₈). Software OASIS-740 is used. The correction retention times of each fatty acids is compared with conformity standard. The investigation showed that in flax seed oil linoleic (31.3±2.1 mg%) and linolenic (40.2±2.9 mg%) acids were predominant and together constitute principal basic of research composition. The flax seed oil contained also palmitic and stearic acids in less quantity. Tab.1, Ref. 14.

Auth.

13.B2.3. Study of high-temperature processes for obtaining antimony sulfide and metallic Sb. /J. Bagdavadze, R. Chagelishvili, T. Gagnidze, A. Kandelaki, R.Razmadze, Z. Tsikaridze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 75-80. – eng.; abs: eng., geo.

The paper deals with topical questions of the processes of obtaining antimony sulfide and metallic Sb from ores. Problems of both theoretical and applied character have been considered. Complete Thermodynamic Analysis (HTA) of the heating process of Sb and Sb₂S₃ in vacuum (P = 0.0001 atm) and that of the systems Sb-S, Sb-S-Fe, Sb-S-Al in different media at atmospheric pressure was made. In all the cases estimations were carried out at temperatures from 400 to 1500 K at the pressure of 1 atm. The results are shown in diagrams (temperature dependence of the content composition). Experiments were conducted to obtain antimony sulfide from gold-bearing antimony ores of Zopkhito (Georgia). The kinetics of evaporation of Sb₂S₃ for the ores of various fractions in a vacuum at temperatures of 500-700°C was studied and the optimal conditions for obtaining Sb₂S₃ were defined. Antimony of technical grade (95%) was obtained from antimony sulfide by iron reduction of antimony (in vacuum) followed by sublimation and condensation. By heating of technical grade antimony up to the temperatures of 400°C, 450°C and 500°C in vacuum (~10-5 MPa) and holding for 3 hours (with the aim of purification of As and S), antimony of high purity (~99.2%) was obtained. Fig. 4, Ref. 2.

Auth.

13.B2.4. Economical assessment of the production of efficient hard alloy materials by reprocessing tungsten-containing residues. /Z. Mirijanashvili, G. Tavadze, A. Kandelaki, V. Garibashvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 81-84. – eng.; abs: eng., geo.

The indispensable condition for further development of modern technologies is creation of economically justified powder materials with special properties. These materials enable improvement of the exploitation parameters of machines and mechanisms. Metal and ceramic properties should be efficiently combined in these powders, enabling the increase of the firmness along with acceptable resilience. Stages for the technology of obtaining hard materials imply injection of metal chlorides (WCl₆, NiFeCl₆) obtained via processing of armor-piercing missile cores and liquid hydrocarbon compound at the temperature range of 750-900°C; implementation of a simultaneous process of reduction and selective carbide formation. Consequently powder will be obtained, each particle of which will contain tungsten carbide (WC) and cementing metal (NiFe or Co). Optimal technological parameters developed will provide nanocrystal (<50 nm) structure of components and high degree of blending. The structure of powders affects the increase of the quality of manufactured items as compared to traditional materials and their items or products, where sizes of particles are 1-4 μm. Through compaction of such powders products with the following parameters are obtained: MRA>91; σ_{B1100°C}>400 MPa. Analysis of the business plan data for producing powders of metal-ceramics has shown that the technologies developed are characterized by high economical efficiency. Namely, in the case of production of 1 kg ready-made product from an abrasion-resistant powder. Its net price is by 20-25% less than of similar conventional products. This is due to the simplicity of technology and high outrun of products. Hard

alloys produced by means of nanotechnologies are characterized by homogeneous structures and significantly increased (by ~3 times) abrasion resistance. Fig. 1.

Auth.

13.B2.5. Increase of the efficiency of direct doping of steel by modelling of the process of carbothermal reduction of oxide systems $\text{Cr}_2\text{O}_3\text{-MnO-SiO}_2$. /I. Janelidze, G. Jandieri, E. Janelidze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 85-91. – eng.; abs: eng., geo.

The present study deals with the problem of raising the efficiency of direct doping of steel and intensification of processes of direct carbothermal reduction of doping elements. Solving of the task of concentration ratios of reacting elements and optimization of temperature limits of the reaction is considered as a rational way for the resolution of the problem. Thermodynamic modelling of kinetics of carbothermal reduction of metals is offered as a key to the problem solution. The problem is discussed on the example of thermodynamic computer modelling of kinetics of carbothermal liquid phase reduction reactions of the complex oxide system of chromium, manganese and silica $\text{Cr}_2\text{O}_3\text{-MnO-SiO}_2$. It has been substantiated as a result of the study that in the case of choosing and maintenance of rational temperatures of the reaction zone at direct doping of steel it is possible to increase by 10-15% the efficiency of reduction of chromium, manganese and silica and their uptake by the melt. It has been established that maximum possible efficiency of direct doping of steel in conditions of distribution at stoichiometric concentration is achieved at the following ratio of oxide components 20-25 wt% of Cr_2O_3 and 80-75wt% of $[\text{2MnO+SiO}_2]$ and maintenance of temperature within 1800-1950 K range in the liquid-phase transition layer of slag-metal. Fig. 3, Ref. 13.

Auth.

13.B2.6. On one stochastic model of a chemical reaction. /B. Dochviri, O. Purtukhia, G. Sokhadze, G. Tkemaladze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 92-96. – eng.; abs: eng., geo.

Nearly all natural reactions are of random character. In many spheres of science and applications essential use is made of probabilistic-statistical methods. Using these methods, probabilistic models were constructed and fundamental results were obtained in the investigation of the following issues of chemistry and biology: autocatalytic, unimolecular, bimolecular, monomolecular and chain reactions, population growth, mutation, epidemic theory, gene frequency theory, radiobiology, and so on. In this paper a chemical reaction of first order is considered when the reagent concentration is distributed by the binomial law. New expressions are obtained for the mathematical expectation and variance of the reagent concentration and product. A stochastic model of a first order reaction is constructed. Ref. 8.

Auth.

13.B2.7. Establishing taxonomy of pathogenic bacteria, causative agents of haricot bacteriosis spread in different regions of Georgia by 16S rDNA fragments. /D. Gaganidze, T. Sadunishvili, N. Amashukeli, N. Sturua, M. Gamkrelidze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 130-135. – eng.; abs: eng., geo.

The haricot crop is greatly damaged by bacterial diseases, two of which stand out in Georgia by their harmfulness and wide spread: brown spot and angular leaf spot of haricot caused by the pathogens *Xanthomonas phaseoli* and *Pseudomonas phaseolicola* respectively. In order to determine the taxonomy of pathogenic bacteria causing haricot bacterial disease - brown spot in different regions of Georgia DNA have been isolated and purified. To obtain 16S ribosomal DNA fragments polymerase chain reaction has been carried out with two preliminarily specific primers designed by us, constructed of 20 nucleotides: 5' TGG CGG ACG GGT GAG GAA TA 3' (forward) and 5' CGT CAT CCC CAC CTT CCT CC 3' (reverse). Selected 16S ribosomal DNA fragments were sequenced. Sequence of PCR fragments and their analysis, using computer program "BLASTA", allowed to identify two phytopathogenic strains 1466 and 1475 as *Xanthomonas axonopodis* pv. *Phaseoli*. A global alignment of 16S rDNA fragments between the strains 1466 and 1475 by means of computer program Lalign has shown 95.8% identity of the fragments. Fig. 1, Tab. 1, Ref. 11.

Auth.

13.B2.8. Novel biologically active dihydroxycinnamate-derived polyether from different species of family boraginaceae. /V. Barbakadze, L. Gogilashvili, L. Amiranashvili, M. Merlani, K. Mulkijanyan, A. Salgado, B. Chankvetadze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 136-142. – eng.; abs: eng., geo.

Plants belonging to Boraginaceae family such as *Symphytum asperum*, *S.caucasicum*, *S.officinale* and *Anchusa italica* have been widely used in folk medicine for centuries. Recent pharmacological studies of water-soluble high-molecular fractions from the roots of these species revealed pronounced anticomplementary, antioxidant, anti-inflammatory and wound healing activity. However, the active principle responsible for the observed effects of these fractions was not known. The present special communication summarizes the phytochemical data of the last decade on novel dihydroxycinnamate-derived polyether – the main constituent of the above-mentioned preparations in order to identify the active principles responsible for their biological activity. Structural analysis of constituents of highmolecular fractions was made, based upon IR, ¹³C, ¹H NMR, 2D heteronuclear ¹H/¹³C HSQC spectra, ¹D NOE and 2D DOSY experiments. The main chemical constituent of high-molecular water-soluble preparations from *S.asperum*, *S.caucasicum*, *S.officinale* and *A.italica* was found to be a novel dihydroxycinnamate-derived polyether, namely poly[oxy-1-carboxy-2-(3,4-dihydroxyphenyl)ethylene] or poly[3-(3,4-dihydroxyphenyl)glyceric acid]. In contrast to *Symphytum* polymer, most of the carboxylic groups of polymer from *A. italica* are methylated. Fig. 5, Tab. 1, Ref. 22.

Auth.

13.B2.9. Numerical simulation of soil salinity reduction caused by irrigation and introduction of sorbent. /A. Surmava/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 49-54. – eng.; abs: eng., geo.

The soil salinity change caused by the effort of the input of external sorbent and irrigation is numerically investigated using the nonlinear non-stationary equations of filtration and kinetic equations of chemical reaction between the carbonate sodium and calcium sulfate. The numerical integration of the system of equation is realized by means of the Crank-Nicolson implicit numerical scheme for 1 month interval of time and with 1 cm and 1 min spatial and temporary steps, respectively. A method widely used in practice is thus modeled, when gypsum is introduced in the upper 20 cm layer of soil followed by irrigation. It is shown that dissolution of sodium sulfate in water and the infiltration of the obtained solution in the soil is the main mechanism of reduction of sodium in the upper layer of the soil. The obtained liquid phase of sodium sulfate is transferred to the lower layer of soil and the increase of concentration takes place. During a month the content of the solid and liquid phases of sodium sulfate in the upper 1 m layer decreases about 2.5 times and rises 2 times at the levels $z > 1.7$ m. The calculation shows that the use of gypsum is an additional mechanism for the reduction of the content of salt in the soil. The process of the reduction of salt by means of this procedure intensifies by 10%. The content of sodium sulfate obtained by means of the chemical reaction and infiltration increases more significantly in the upper 20 cm layer than in the lower part of the soil. At the same time, the obtained concentration of sodium sulfate is low and it cannot cause a noticeable degradation of the soil properties. In the upper 20 cm layer in 30 days calcium carbonate with volumetric content exceeds 10 times by the content of sodium sulfate. Fig. 6, Tab. 1, Ref. 14.

Auth.

13.B2.10. The electrolytic dissociation of isomeric 4-Cyclohexene-1,2-Dicarboxylic acids. /E. Kvaratskhelia, R. Kvaratskhelia, R. Kurtanidze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1.– pp. 59-63. – eng.; abs: eng., geo.

Isomeric 4-cyclohexene-1,2-dicarboxylic acids (cis- and trans-isomers) are widely used in various photosensitive, curable and thermostable enzyme compositions. It should be noted that their useful properties are directly connected with the peculiarities of the electrolytic dissociation of these acids. In this work an analysis of the regularities of the electrolytic dissociation of the cis- and transisomers of 4-cyclohexene-1,2-dicarboxylic acid in their dilute (0.0001 – 0.01M) solutions were carried out with the aid of an original method of determination of the dissociation parameters of weak multibasic organic acids with “overlapping” equilibria previously described by the authors. Values of the usual and “partial” degrees of dissociation (the “partial” degree term was first suggested by the authors) for all dissociation steps, and the values of the concentrations of various

ionized and non-ionized forms of these acids, were calculated. With the aid of Debye-Huckel equation the activity coefficients of hydrogen ions and various anions were determined. The intervals of acid concentration in which various charged and uncharged products of dissociation (hydrogen ions, monoanions, dianions and undissociated acid molecules) prevail were also determined with the aid of an original method. We suggest also simple empirical equations for fast approximate calculation of the α_1 , α_2 , α_2' and pH values in the dilute (0.0001 – 0.01M) solutions of the cis- and trans isomers of 4-cyclohexene-1,2-dicarboxylic acids. Tab. 2, Ref. 6.

Auth.

13.B2.11. Alternative technology for production of pure metals and hard alloys. /O. Mikadze, A. Kandelaki, J. Bagdavadze, L. Rukhadze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 64-68. – eng.; abs: eng., geo.

An ecologically safe technology for the production of pure metals and hard alloys is based on the conversion of oxides in the atmosphere with ultra-low oxidation potential ($p_{O_2} = 10^{-21} \pm 10^{-28} \text{ atm}$) is considered in the paper. The formation of such a medium can be reached by means of oxygen pump. However simplicity and acceleration of the super deep rarefaction process in oxygen is done with initiation of chemical reaction of combustion of easy dissociated substances, such as alcohols, by their injection into closed contour of reactor. The drop of partial oxygen pressure (up to 10^{-28} atm) provides thermic dissociation of practically any oxide. An installation for conversion processes was constructed and methods for conducting the experiments were worked out. Complete thermodynamic analysis of typical reducing process of oxides with ethyl alcohol in the temperature range 300-1500 K was presented. Pure metals - Cu, Fe, Ni, Co, Carbides, Ti, Cr and hard solutions on the basis of tungsten carbide were obtained. The results of X-ray structure analysis are given. Fig. 5, Tab. 2, Ref. 3.

Auth.

13.B2.12. HPLC analysis of Poly[3-(3,4-Dihydroxyphenyl) glyceric acid] Preparations from *Symphytum asperum* and *Anchusa italica* (Boraginaceae) using different gel-filtration columns. /V. Barbakadze, L. Gogilashvili, L. Amiranashvili, M. Merlani, K. Mulkijanyan, S. Gokadze, Y. Wang, J. Hoang, I. Rustamov/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 83-88. – eng.; abs: eng., geo.

The main chemical constituent of high-molecular preparations from *Symphytum asperum* and *Anchusa italica*, poly[3-(3,4-dihydroxyphenyl)glyceric acid] (PDPGA), according to high-performance liquid chromatography (HPLC) gel-filtration chromatography (GFC) analysis is not covalently bound to residual polysaccharides. It is rather difficult to completely separate the polysaccharides from PDPGA by HPLC (GFC). This phenomenon can be explained as due to the presence of manifold hydrogen bonds between the polysaccharides and PDPGA. It will hold the residual polysaccharides together with the phenolic polymer during fractionation by HPLC (GFC). The PDPGA supposedly can be formed with polysaccharides a complex macromolecular architecture up to their supramolecular organization. Fig. 9, Ref. 15.

Auth.

13.B2.13. Effect of combined pesticide lambda-cyhalothrin on hydrobionts. /M. Nikolaishvili, G. Jikia, T. Mchedluri, T. Museliani, E. Petriashvili, S. Zenaishvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 89-92. – eng.; abs: eng., geo.

While monitoring waters of Alazani river, Eastern Georgia, it was found that some pesticide products used in the fields to protect agricultural crops and grapes from pests get into water. We studied the effect of the combined pesticide lambda-cyhalothrin on quantitative distribution of lipids in tissues, gills and liver of fish. The study was conducted on fish mursa (*Barbus mursa*) inhabiting Alazani river, which is characterized by slow zonal movement and is easy to fish. Biochemical processes occurring in fish due to water contamination with mineral fertilizers and pesticides were investigated. Some uncharacteristic processes in fish organism and changes in lipid concentration caused by pesticide effect were revealed. The level of changes in lipid components and fatty acids in the fish organs are determined. Fig. 2, Tab. 2, Ref. 7.

Auth.

13.B2.14. Morphological and biochemical investigation of the *Bothridium pithonis* Blainville, 1824 (Cestoda: Diphyllbothriidae). /L. Murvanidze, Ch. Lomidze, K. Nikolaishvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 100-104. – eng.; abs: eng., geo.

Cestodes are the most prevalent helminths in reptiles and particularly in pythons. In case of intensive invasion cestodes can cause death in pythons in the Zoological Parks. An African Rock Python (*Python sebae* Gmelin, 1788) was brought to Tbilisi Zoological Park from Tanzania in 2008. A month later the animal died. In a small intestine cestoda *Bothridium pithonis* Blainville, 1824 (one specimen) was detected. Based on the morphological investigation and its comparison with literature data its identity with *Bothridium pithonis* Blainville, 1824, was proved. The length of the python was 960 mm and the width at its broadest part was 15 mm. These measurements exceed the data given in the literature. The unarmed scolex was made of two spherical parts with a medial depression between them. Each part was surrounded with semicircular muscle ridges. The maximum width of the scolex was – 6 mm, height – 3 mm, the width of the neck in its narrow part – 1.5 mm. The tape-shaped strobila was clearly segmented with 13-14 units per 1 cm of the length. Minimal width of the segments was 9-10 mm, length – 0.5 mm. Maximal width of the segments was found in upper third of the body and equaled 15 mm and the length – to 0.9 mm. Two kinds of eggs were found: immature with 0.066 mm length and 0.044 mm width and mature – 0.13 mm in length and 0.09–0.11 mm in width. For the characteristic of the nervous system of *B. pithonis* the activity of enzyme cholinesterase in homogenates of the helminth was studied. In different parts of strobila the activity was different and fluctuated from 45.98 to 142.0 mkmol acetylcholine/mg protein/h. Improved quarantine period of the reptiles and intensive parasitological monitoring are required. Fig. 1, Ref. 13.

Auth.

13.B2.15. Influence of lanthanides and their compounds on the living organisms. /M. Kikalishvili, N. Khaburdzania, M. Kukhaleishvili/. GEN. – 2013. – # 3. – pp. 53-57. – geo.; abs.: eng.

The article deals with the analysis of the influence exerted by lanthanides and their compounds on living organisms, which, according to some researchers, is caused by their ability to substitute calcium ions in biological systems. Since lanthanides and calcium ions have the same range of ionic radii and are characterized by similar chemical properties, the competition is observed between them for seizing the active centers in biopolymers. The substitution of calcium ions with lanthanides ions may cause a dramatic change in the properties and molecular conformation in biopolymers, which in turn will have a great impact on their specific functions. Lanthanides and their compounds are used in agriculture. They are essential for normal development of some plants (radish, peas etc.). Besides, they are used in medicine for treatment of a number of diseases. Their compounds are classified as having low toxicity and being ecologically safe. Ref. 7.

Auth.

13.B2.16. Biological aspects of halogens. /M. Kikalishvili, N. Chkhartishvili/. GEN. – 2013. – # 3. – pp. 57-59. – rus.; abs.: eng.

The article deals with the biological role of halogens and their involvement in biochemical processes proceeding in the human body. Fluorine participates in the development of the bone tissue and the formation of tooth enamel. Fluorine deficiency causes dental caries, whereas the excessive exposure to high concentrations of fluorine may result in chronic poisoning called fluorosis. Chlorine participates in the formation of the blood buffering system, control of osmotic pressure and metabolic processes. Bromine facilitates the inhibition processes in the central nervous system. Iodine is important for the processes proceeding in the thyroid gland. Ref. 5.

Auth.

13.B2.17. Cell technology and tissue engineering: induced pluripotential stem cells. /Sh. Jinjolia/. GEN. – 2013. – # 3. – pp. 94-96. – rus.; abs.: eng.

The article deals with the issues of cell technology and tissue engineering. It is shown that reprogramming of induced pluripotential stem cells is a promising trend in tissue engineering. Ref. 7.

Auth.

13.B2.18. Cell technology: stem cells. Progress and prospects. /Sh. Jinjolia/. GEN. – 2013. – # 3. – pp. 97-99. – rus.; abs.: eng.

The article represents a brief overview of the progress in the field of development and introduction of the methods of production of stem cells in experimental biology, which opens up new vista for development of essentially new efficient biomedical technologies. The discovery of stem cells is the third most important achievement in biology after decoding of the DNA helix and the human genome program. Ref. 5.

Auth.

13.B2.19. The impact of the structure of basic components on the properties of sealing and screw lubricants. /V. Farzaliyev, S. Mamedov, F. Fatalizade, I. Guseinov, N. Ladokhina/. GEN. – 2013. – # 4. – pp. 58-62. – rus.; abs.: eng.

For development of highly efficient plastic lubricants insoluble in oil and gas, as disperse media the following vegetable oil was used: castor oil, soapstok, colophony and cotton oil. The cotton oil used for this purpose was produced by oxidation with hydrogen peroxide in the presence of oxygen. It was revealed that the acidity of the oxidized cotton oil hardly changed as the concentration of hydrogen peroxide increased. The viscosity of cotton oil increased when the amount of hydrogen peroxide increased up to 35%, whereas further increase in the amount of hydrogen peroxide hardly changed the oil viscosity. The IR spectra of oxidized cotton oil showed the presence of a hydroxyl group, which indicated that hydroxyl added to unsaturated bonds. The impact of the amount of the cotton oil oxidized with 20% hydrogen peroxide on the dropping point of the lubricant was studied. The quantity of 20% of hydrogen peroxide was considered to be optimal. It is inferred that the obtained lubricants can be used as sealing and screw ones. Tab. 3, Ref. 12.

Auth.

13.B2.20. Development of the technology of purification of galvanic waste waters from heavy metals and their concentration using the membrane method. /TS. Kurtskhalia, N. Enukidze, N. Chkheidze, Z. Simonia, M. Nadirashvili, G. Pavliashvili/. GEN. – 2013. – # 4. – pp. 99-107. – geo.; abs.: eng.

The article deals with the development of highly efficient membrane technology of purification of galvanic waste waters from heavy metals and their concentration. The aim of the investigation was also designing of the appropriate device. For achieving this aim, on of the membrane methods, electrodialysis with ion-exchange membranes was used. The experiments were performed by using the specially designed electrodialysis stand. The analytical instrumentation mounted on the stand provided the control of physicochemical and technological parameters of the process of electrodialysis. A special laboratory electrodialyzer-concentrator was designed for the abovementioned stand. The optimal parameters of the process were determined. Tab. 4, Fig. 1, Ref. 2.

Auth.

13.B2.21. Effects of synthesis conditions on the nanostructure of $Ce_xZr_{(1-x)}O_2$ mesoporous ceramics. /A. Bruno Costa, R. Bacani, M. Fantini, T. Martins, A. L. M. da Silva/. Nano Studies. – 2013. – # 7. – pp. 7-20. – eng.

Compounds $Ce_xZr_{(1-x)}O_2$ ($0.5 \leq x \leq 0.9$) were synthesized with Zr and Ce chloride precursors, using the triblock copolymer pluronic P123 and HCl (2mol/L). The pH adjustment was performed in two ways: synthesis A used 11.4mL of a NH_4OH solution added at once to the initial mixture, composed by metal precursors and template in HCl; synthesis B was done by dripping slowly until the change of pH value (between 3 and 6). In this work, $Ce_xZr_{(1-x)}O_2$ samples synthesized by these two processes are compared. The effects of pH values in materials characteristics were also evaluated. These samples were analyzed by X-Ray diffraction with Rietveld refinement, and nitrogen adsorption / desorption. In both processes, the studied materials presented two crystalline phases of $Ce_xZr_{(1-x)}O_2$ solid solution: cubic and tetragonal. The synthesis A also presented a tetragonal phase of ZrO_2 . The average crystallite size and the Brunauer–Emmett–Teller surface area are bigger in process A. Both processes produce samples with a mesoporous structure. Fig. 9, Tab. 13, Ref. 29.

Auth.

13.B2.22. Effect of propolis extract to morphology of electrospun polyurethane nanofibers. /R. Erdem, I. Usta, E. Sancak, D. Kocak, M. Akalin/. Nano Studies. – 2013. – # 7. – pp. 21-26. – eng.

Propolis-blended nanofibrous membranes were successfully fabricated by electrospinning technique with different composition ratios of polyurethane. Properties of the blended solutions were investigated in terms of viscosity, conductivity and pH values. The influences of propolis content in nanofibrous membranes morphology were observed by SEM analysis. It was found that uniform and bead free nanofibers were formed through the electrospinning process. Fig. 2, Tab. 1, Ref. 8.

Auth.

13.B2.23. Ge- and In-based one-dimensional nanostructures: Self-catalytic growth. /D. Jishiashvili, L. Chkhartishvili, L. Kiria, Z. Shiolashvili, N. Makhatadze, A. Jishiashvili, V. Gobronidze/. Nano Studies. – 2013. – # 7. – pp. 27-34. – eng.

The single crystal In_2O_3 and Ge_3N_4 nanowires were synthesized using the indium and germanium sources in new ambient comprising hydrazine decomposition products diluted with 3mol.% water. This ambient was simultaneously containing oxidizing, nitriding and reducing active precursors. In spite of this, only In_2O_3 nanowires were produced in case of In source, and only $\alpha\text{-Ge}_3\text{N}_4$ nanowires were formed when Ge source was used. These active precursors provided formation of volatile suboxides of source materials, their flow to the Si substrate while a part of them was reduced to In or Ge catalyst droplets and another part fed catalyst to grow the nanowires through the vapor–liquid–solid mechanism. The growth temperature for In_2O_3 nanowires was lowered down to 420°C , while the Ge_3N_4 nanowires were grown at 480°C which is by 370°C lower than the temperature indicated in the literature. The nanowires were characterized by a high crystallinity and the minimum thickness of 7nm. Fig. 4, Ref. 24.

Auth.

13.B2.24. Jet milling and thermal processing of argentum jarosite nanoparticles for silver recycling. /V. Leshchynsky, H. Weinert, J. Chojnacka, T. Wisniewski, C. Martinez Perez, Sh. Tilvaldyev/. Nano Studies. – 2013. – # 7. – pp. 35-40. – eng.

Mechanical activation of mining and metallurgical waste by means of fine and ultrafine milling is an effective process where an improvement in technological processes can be attained via a combination of effects influencing the properties of powder materials. The main advantages are decrease in the number of processing steps, improving of reaction efficiency, and the possibility of obtaining specific products which is difficult to obtain using traditional technological methods. Nanoparticles are often formed by approach, which adds value to the processed solids, and, in particular to silver jarosite. Presently, about 80% of zinc produced globally is extracted by roasting sphalerite concentrates followed by leaching the calcine in dilute sulphuric acid solution and eventually recovering zinc by electrowinning. Silver is part of the zinc refinery residue, flotation tailings and other. Mineralogical results showed that composite tailings are refractory in nature. The development of a concept of enhancing silver recovery from the tailings is the main aim of the paper. The efforts were focused on firstly decomposing the jarosite minerals by mechanical activation and thermal processing and then secondly leaching. These two steps ensured that silver found in the zinc refinery residue and in the jarosite minerals could be leached simultaneously. The composite tailings were milled to obtain the nano-micro particle mixture and then heated to decompose the silver-bearing mineral ($\text{Ag, PbFe}_3(\text{SO}_4)_2(\text{OH})_6$). The processing technology parameters of the first step were optimized and analyses of experimental results are presented. Fig. 4, Tab. 3, Ref. 5.

Auth.

13.B2.25. Mechanisms of nucleation and growth of metastable phases in Mg–Gd and Mg–Gd–Nd alloys. /S. Abd El Majid, M. Bamberger, A. Katsman/. Nano Studies. – 2013. – # 7. – pp. 41-48. – eng.

High supersaturation of Mg matrix by rare earth elements after quenching of solution treated Mg–Gd and Mg–Gd–Nd alloys provides sequential precipitation of different metastable phases. Precipitation of β'' , β' and β_1 phases during aging was observed. Homogeneous nucleation of fully

coherent metastable β'' (Mg_3RE , DO_{19}) phase during aging is followed by its diffusional growth, coarsening and transformation to the coherent β' (Mg_7RE , BCO) phase. This phase transformation involves additional Mg atoms from the adjacent Mg matrix resulting in nearly twice increase of precipitate volume. Following aging caused heterogeneous nucleation of semicoherent β_1 (Mg_3RE , FCC) phase on the β' -precipitates accompanied by reduction of precipitate volume for about 44.5% due to release of Mg atoms joined to Mg matrix. All precipitates grow in $\{01-10\}$ habit planes but their growth directions are different. The combination of HRTEM, TEM with SAED and JEMS simulation was carried out to characterize the nanometer-scale precipitates. Microhardness measurements were performed to reveal the effect of precipitation on the mechanical properties of the alloys. Mg–6Gd–3.7Nd based alloy reached a maximum value of microhardness after 16 days of aging; in Mg–Gd based alloy, microhardness increased more slowly and reached a maximum value after 64 days of aging. Fig. 8, Tab. 1, Ref. 12.

Auth.

13.B2.26. Room temperature synthesis of monodisperse gold nanoparticles and nano-shards with cyclic and linear diketones. /W. Peveler, I. Parkin/. Nano Studies. – 2013. – # 7. – pp. 49-56. – eng.

Gold nanostructures are currently an area of intense research in academia and industry, due to their applications in bio-labeling, nano-fabrication and detection. It has recently been established that a room-temperature mixture of chloroauric acid and cyclic ketones in water will spontaneously form a suspension of gold nanoparticles and nanoplates. In this work, it is presented the further finding that cyclic, 6-membered diketones, 1,4- and 1,3-cyclohexanedione, rapidly form gold nanostructures. 1,4-cyclohexanedione produces a deep purple suspension of $21 \pm 5\text{nm}$ spherical nanoparticles within 60s, with the reaction going to completion in 30min. 1,3-cyclohexanedione produced a grey solution, which under examination by TEM, proved to be comprised of polydisperse clusters of gold nano-shards. Linear equivalents to the cyclic ketones were also examined to probe the reaction mechanism and trends arising in a homologous series. This ketone based synthetic methodology provides a cheap, rapid and repeatable synthesis of gold nanostructures for application in SERS techniques or for further functionalization. Fig. 5, Tab. 2, Ref. 20.

Auth.

13.B2.27. Characterization of calcium silicate hydrate and calcium hydroxide in nanosilica binder composites. /I. Yakub, N. Sutan, C. Kiong/. Nano Studies. – 2013. – # 7. – pp. 57-62. – eng.

The aim of this study was to investigate the pozzolanic reaction of nanosilica binder composites (nSBC) through the characterization of the morphology of calcium silicate hydrate (C–S–H) and calcium hydroxide (C–H) using X-ray diffraction technique (XRD) and scanning electron microscopy (SEM). nSBC paste samples were prepared with water-binder ratio of 0.50, and 2, 3 and 5% by weight nanosilica with particle size 10–20nm were used as replacement of binder. Powdered and polished samples were tested at 28, 60 and 90 days of binder hydration. It was found that pozzolanic reaction exceeded hydration process in nSBC samples where SEM images showed high density of C–S–H structure compared to C–H. Besides, the peaks of C–H in XRD diffractograms for nSBC were seen to gradually disappear after 28 days. However, the patterns for C–S–H development in all samples were not consistent due to dynamic change in its amorphous structure. Fig. 4, Tab. 1, Ref. 14.

Auth.

13.B2.28. A study of the effect of carbon nanotubes dispersion on the properties of polymer composite nanofibers. /X. Barbosa, S. Rosa, V. Capel, F. Martinez, R. Quinones, W. Cuadrado, I. Ramos, Kh. Sotero–Esteve/. Nano Studies. – 2013. – # 7. – pp. 77-86. – eng.

Carbon nanotubes (CNTs), with their exceptional mechanical and electronic properties can be integrated into a variety of devices such as chemical and biological sensors, and electro-mechanical actuators. To be used effectively as reinforcement of polymer nanocomposites, a proper dispersion of the CNTs and adhesion to the polymer matrix are necessary. In this work, it is used a combination of computational and experimental techniques to study the influence of the CNTs-dispersion on the properties of the precursor solution and CNT/polymer nanofibers

fabricated using electrospinning. The dispersion was done using the ionic surfactants sodium dodecyl sulfate (SDS) and sodium dodecylbenzenesulfonate (SDBS) in chloroform (CHCl_3). The precursor solutions for electrospinning were prepared by adding the CNTs in their dispersion solutions to a polymeric solution of poly(methylmethacrylate) (PMMA) in CHCl_3 . The interactions between CNTs, surfactants, and polymers were simulated using the Wolffia graphical user interface to NAMD. In the experimental part, the properties of the solutions and fibers were analyzed using UV-visible spectroscopy and electrical characterization. Fig. 6, Ref. 23.

Auth.

13.B2.29. Broadening the concepts of efficient ligation and functionalization using azide-alkyne 1,3-dipolar cycloadditions for development of neoteric polymerized ionic liquids. /B. Mudraboyina, M. Obadia, R. Sood, I. Allaoua, P. Cassagnau, E. Espuche, A. Serghei, E. Drockenmuller/. Nano Studies. – 2013. – # 7. – pp. 107-112. – eng.

AB+AB step growth polymerization of α -azide- ω -alkyne monomers by copper-catalyzed 1,3-dipolar cycloaddition (CuAAC) generates high molar mass linear poly(1,2,3-triazole)s that are further quaternized to yield poly(1,2,3-triazolium) derivatives. We have extended this approach to a broad range of 1,2,3-triazolium-based polymerized ionic liquids (PILs) issued from chain growth and step growth polymerization methods. Furthermore the robustness of CuAAC has allowed developing PIL elastomers and functionalized PILs using unprecedented approaches. The physical properties of these materials are investigated by ^1H NMR, differential scanning calorimetry, thermogravimetric analysis, broadband dielectric spectroscopy, rheological and permeation studies. Tuning the synthetic as well as design strategies of poly(1,2,3-triazolium)-based materials with large variety of derivatives accessible by anion exchange, and macromolecular engineering opens new perspectives in the field of poly(ionic liquid)s and find applications in the fields of energy devices, catalysts and hydrogels for medical electrodes. Fig. 3, Ref. 34.

Auth.

13.B2.30. Effect of preparation conditions on the morphology and mechanical behavior of polyethylene vinyl acetate–clay nanocomposites. /A. Abdel Hafiz, A. Ramadan, A. Esawi/. Nano Studies. – 2013. – # 7. – pp. 113-122. – eng.

In this study, the investigation of the effect of different preparation processes, namely solution compounding, sonication and extrusion on the structure and morphology of the nanocomposite of polyethylene co-vinyl acetate (EVA) and 5wt.% non-modified Na^+ -montmorillonite clay was conducted. X-ray diffraction, transmission electron microscopy and tensile testing were used to characterize the morphology of samples obtained from the different processing steps and relate this to observed mechanical behavior. Results indicated that solution compounding, without clay pre-dispersion, led to poor clay dispersion in the nanocomposites. On the other hand, clay pre-dispersion followed by extrusion enhanced clay particle dispersion and layer delamination in the nanocomposites. Sonication was found to lead to degradation of the nanocomposites. It is believed that sonication promoted the intercalation of the solvent in the clay particles resulting in subsequent deterioration with heating during extrusion. Fig. 10, Ref. 17.

Auth.

13.B2.31. Studies on surface properties of organic polymer coatings modified with silicone–acrylic nanopowders. /I. Ofat, J. Kozakiewicz/. Nano Studies. – 2013. – # 7. – pp. 131-140. – eng.

Surface properties of epoxy-polyester and polyester powder coatings, both unmodified and modified with 3% of nanopowders containing silicone–acrylic core–shell nanoparticles (size ca. 100 nm) added as impact modifiers, were investigated using contact angle (CA) determinations, atomic force microscopy (AFM), optical microscopy (OM), scanning electron microscopy (SEM) equipped with EDS (energy dispersive spectroscopy) unit, and XPS (X-ray photoelectron spectroscopy). It was found that both CA and surface-free energy (SFE) changed significantly for modified coatings what could be explained by migration of silicone resin contained in nanopowder to the coating surface due to specific features of silicone polymer. The presence of silicone on the surface was confirmed by XPS and EDS, and AFM images of modified coatings showed structures on the surface which could be attributed to nanoparticles of silicone resin. It was also found that the

surface properties were very much affected by the chemical structure of silicone resin. Fig. 8, Tab. 4, Ref. 16.

Auth.

13.B2.32. Polymeric biocomposites with nanocellulose. /A. Masek, M. Zaborski/. Nano Studies. – 2013. – # 7. – pp. 141-144. – eng.

Presently, the most commonly used cross-linking agent for elastomers is sulfur, which is not an environmentally friendly additive. This study presents the use of amino acids as natural cross-linking agents for epoxidized natural rubber. We evaluated the cross-linking performance of the investigated agents on the basis of the cross-linking density and mechanical properties of natural rubber ENR(50) vulcanizates. We conclude that some amino acids may serve as cross-linking agents for natural rubber. Fig. 1, Tab. 2, Ref. 4.

Auth.

13.B2.33. Influence of R and R' alkyl groups ($-\text{CH}_3$ or $-\text{C}_2\text{H}_5$) on the properties of aerogels synthesized from $\text{RSi}(\text{OR}')_3$ precursors. /T. Matias, M. Ochoa, A. Portugal, L. Duraes/. Nano Studies. – 2013. – # 7. – pp. 145-160. – eng.

In this study, the influence of the R and R' groups (methyl, ethyl) of $\text{RSi}(\text{OR}')_3$ precursors on the sol-gel synthesis process and properties of organically modified silica aerogels is analyzed. Published works, in which the authors used methyltrimethoxysilane (MTMS), ethyltrimethoxysilane (ETMS), methyltriethoxysilane (MTES) and ethyltriethoxysilane (ETES) as precursors, were reviewed. The synthesis conditions and materials properties in the literature were compared to the authors' experimental results. R and R' groups affect the hydrolysis/condensation reaction rates hence the growth of the solid network. Although with identical chemical structures, the microstructure and relevant physical properties change substantially. Aerogels with unique insulation properties can be obtained from MTMS or MTES. They exhibit high porosities and contact angles, and very low densities and thermal conductivities. ETMS and ETES precursors only produce porous gels when combined with tetra-alkylorthosilicates (TMOS/TEOS) or MTMS, as the R size (ethyl) induces phase separation and growth of the solid network in preferential directions, giving more linear and compact structures. Fig. 4, Tab. 4, Ref. 28.

Auth.

13.B2.34. Press forming of chicken feather fiber (CFF) reinforced bio-composites: Effects of CFF volume on mechanical and thermal properties. /M. Ozen, M. Yuksek, M. Uzun, E. Sancak, I. Usta, O. Atak/. Nano Studies. – 2013. – # 7. – pp. 161-168. – eng.

In this study, the bulk moulding compound (BMC) has been employed to develop novel chicken feather fibres (CFF) reinforced composites. Glass fibres have been also used as fibre reinforcement. In BMC production, polyester resin, hardener, filling agents, glass fibres and CFF at different ratios were blended. The prepared BMC paste was pressed at 140°C temperature and then the paste was cured and converted to composite structures at 30s under 10bars press. The mechanical properties of developed composite specimens were tested and analysed. The main aim was to determine the effect of CFF reinforcement on the mechanical and thermal resistance properties of the thermoset composites. The incorporation of CFF, glass fibres, polyester resin and calcite into composite structures by BMC method has been attempted to produce for the first time and studied their properties. The results show that the CFF reinforcement have a critical importance for the tested composites in terms of tensile strength, Young modulus and Charpy impact properties. It has been demonstrated that thermal conductivity of composites changed notably due to the fibre reinforcements. Fig. 5, Tab. 6, Ref. 12.

Auth.

13.B2.35. Influence of hexagonal boron nitride nanocrystals on wear processes in brass. /L. Chkhartishvili, M. Darchiashvili, A. Gachechiladze, B. Margiev, L. Rukhadze, O. Tsagareishvili/. Nano Studies. – 2013. – # 7. – pp. 169-176. – eng.

There is investigated influence of the particulates of hexagonal boron nitride (h-BN) on wear processes in brass. The studies are performed on samples of brass-based composite material, in which chemically synthesized nanopowdered h-BN is used for antiwear modifier. Fixation of these particles in matrix is achieved by introducing the copper-plated h-BN nanopowder in brass-melt.

Structural studies show that h-BN particles are almost uniformly distributed within the brass-matrix. Wear processes are studied by determining weight losses at different loadings. It is shown that insertions of nano-crystalline h-BN (with Young's modulus much lower than that of brass) can change the wear mechanism and significantly reduce the intensity of wear in brass. Fig. 7, Tab. 1, Ref. 35.

Auth.

13.B2.36. Fluorescent nanoparticles of anthracene and Bis-MSB. /M. Kakuichi, K. Kasatani, Y. Morita, H. Okamoto, J. Kawamata/. Nano Studies. – 2013. – # 7. – pp. 177-184. – eng.

Fluorescence behavior of nanoparticles of two compounds, anthracene and 1,4-bis(2-methylstyryl)benzene (bis-MSB), was studied. Doped nanoparticles were also studied. Transparent organic nanoparticles dispersed in water were prepared by reprecipitation method. Poly(vinyl alcohol) was added into water to improve stability of organic nanoparticles. Fluorescence spectra and fluorescence quantum yields were measured by an absolute photoluminescence quantum yield measurement system. Fluorescence lifetimes were measured with a combination of a femtosecond Ti : sapphire laser and a streak camera. Fluorescence behavior of anthracene nanoparticles doped with perylene, anthracene nanoparticles doped with naphthacene, bis-MSB nanoparticles doped with perylene, and bis-MSB nanoparticles doped with naphthacene, was measured. When doping nanoparticles with a dopant, fluorescence of nanoparticles was quenched and strong fluorescence of dopant was observed. Fluorescence quantum yields of both anthracene nanoparticles doped with naphthacene and anthracene nanoparticles doped with perylene were as high as 0.75. Fig. 13, Tab. 4, Ref. 11.

Auth.

13.B2.37. Effect of chromate on DNA of *Arthrobacter globiformis*. /O. Rcheulishvili, N. Datukishvili, I. Gabriadze, T. Kutateladze, D. Pataraya, M. Gurielidze, N. Metreveli/. Nano Studies. – 2013. – # 7. – pp. 193-200. – eng.

Arthrobacter globiformis 151B – an aerobic, Gram-positive, Cr(VI)-reducing bacterium isolated from the polluted basalts from Georgia was screened for the presence of plasmid DNA. It was shown that the tested bacteria strain harbored a plasmid. The yield of plasmid DNA estimated by agarose gel electrophoresis did not change practically during the growth of bacteria (14, 24, 38, and 62 h), however it was missed completely after the exposure of bacterial cells to Cr(VI). Besides the dose-dependent decrease of the amount of the extracted chromosomal DNA was observed on the electrophoregrams, while the Cr(VI) concentration increased within the range of 0 to 200 mg/L. At the same time, the bacterial cells maintained the high survival at this concentration range of Cr(VI). Fig. 6, Ref. 18.

Auth.

13.B2.38. Porometry of zeolites with three-dimensional net of channels. /A. Kapanadze, G. Rtveliashvili, G. Tabatadze/. Nano Studies. – 2013. – # 7. – pp. 207-212. – rus.

It is shown that in zeolites NaX and NaA with three-dimensional net of channels with diameters of about 10Å, it is possible to introduce under the high pressure the melted metals, such as Hg, Ga, In, Bi, Pb, and Sn. It is also shown that the metal percolates by the hopping when reaching the critical pressure, which value is in good accordance with that from the porometric formula. Fig. 3, Tab. 1, Ref. 5.

Auth.

13.B2.39. Thermal conductivity of β -rhombohedral boron doped with metals in nano-sized interstitials. /L. Chkhartishvili, I. Murusidze/. Nano Studies. – 2013. – # 7. – pp. 221-224. – eng.

The frequencies of vibrations associated with metal impurities in nano-sized interstitials of β -rhombohedral boron lattice are theoretically determined to be above the intrinsic phonon bands – in spectral region from 1080 up to 4380cm⁽⁻¹⁾ – and, consequently, can be attributed to localized modes. At high levels of doping, these localized vibrations can be presumed to reduce the thermal conductivity significantly improving the thermoelectric figure-of-merit of the material. Tab. 2, Ref. 8.

Auth.

13.B2.40. Modification of the properties of lead selenide layers at their nanothickness. /A. Pashaev, O. Davarashvili, M. Erukashvili, Z. Akhvlediani, R. Gulyaev, L. Bychkova, V. Zlomanov/. Nano Studies. – 2013. – # 7. – pp. 233-240. – eng.

Paper deals with the peculiarities of creation of effective “negative” pressure and the increase in the forbidden gap width in PbSe nanolayers in connection with the formation of the quasi-dielectric state at their appropriate doping. During the formation of epitaxial layers, particular emphasis was placed on the impact of layers thickness as well as of growth temperature and rate on the attainment of high “negative” pressure. When determining the forbidden gap width, the optical transmission spectra were processed by a model of the Fabry–Perot interferometer. At high concentration of free current carriers, the absorption on them and their degeneracy were taken into consideration. Fig. 3, Tab. 1, Ref. 9.

Auth.

13.B2.41. Synthesis of gold nanoparticles by new strains of thermophilic actinomycetes. /T. Kalabegishvili, E. Kirkesali, E. Ginturi, A. Rcheulishvili, I. Murusidze, D. Pataraya, M. Gurielidze, N. Bagdavadze, N. Kuchava, D. Gvarjaladze, L. Lomidze/. Nano Studies. – 2013. – # 7. – pp. 255-260. – eng.

The synthesis of gold nanoparticles by two novel strains of thermophilic actinomycetes *Thermoactinomyces* spp. 44Th and *Thermomonospora* spp. 67Th isolated at the temperature 55°C from different soils in Georgia were studied. A complex of optical and analytical methods was applied for investigation of the experimental samples of actinomycetes with gold nanoparticles after exposure to chloroauric acid for different time intervals. The formation of gold nanoparticles was detected by presence of surface plasmon peaks at 530 nm in UV–Vis spectra and also visualized by TEM images. The results of the studies showed that after 1.5–2 days of reaction times the extracellular formation of nanoparticles with mainly spherical shape and sizes in the 5–60 nm range with an average in the 20–30 nm range takes place. AAS was applied for determining total gold concentrations in the bacterial biomass. The AAS results show that the total concentration of the gold accumulated by bacterial biomass increases rapidly at the beginning while after this rapid phase its change with time is insignificant. Fig. 5, Ref. 12.

Auth.

13.B2.42. Photochromic liquid-crystal multifunctional nanomaterials. /K. Japaridze, L. Devadze, J. Maisuradze, G. Petriashvili, Ts. Zurabishvili, I. Mzhavanadze, N. Sepashvili/. Nano Studies. – 2013. – # 7. – pp. 261-266. – eng.

The work describes a new method of creating polymer multifunctional smart nanomaterials based on composition consisting of nemato-chiral liquid-crystal doped with photochromic spiropyran. Choice as a dopant spiropyran with long alkyl chain at the nitrogen atom increases effective photosensitivity compared with the system containing spiropyran with a short chain. Merocyanine form photoinduced by ultraviolet light from spiropyran with long alkyl chain, which is an amphiphilic molecule with zwitterionic lyophilic head and lyophobic tail, is selforganized as micelles in the nematic-chiral liquid-crystal. Formation of micelles disturbs thermodynamic equilibrium. The new formed merocyanine molecules are added to already existing photoexposed molecules for restoration the equilibrium. It increases the absorbing centers ultimately. The phenomenon of increase effective photosensitivity was observed as in composition either in polymer films produced by the improved method of microcapsulation. Photochromic liquid-crystal polymer films with improved photosensitivity produced by us would be perspective multifunctional nanomaterials for the applications in various fields of nanotechnology. Fig. 5, Ref. 12.

Auth.

13.B2.43. Formation and investigation of thin oxide films for nanoelectronics. /A. Bibilashvili, Z. Jibuti, N. Dolidze, G. Skhiladze/. Nano Studies. – 2013. – # 7. – pp. 287-294. – rus.

The basic element of the majority of nanoelectronic devices is a high-quality superthin (5–50 nm) dielectric that cannot be formed using a standard technology due to high formation temperatures (about 1400 K). A possibility of formation of high-quality superthin oxide films on Si (SiO_2 , TiO_2 , Ta_2O_3 , and Al_2O_3) is studied using newly improved original method of catalytic plasma anodization

(CPA), which is a relatively low-temperature (<600K) technique. A thin layer of a rare-earth element (REE) is evaporated onto the surface. During the CPA process, thin layers REE and underlying material are rapidly oxidized. Oxidation rate increases by an order of magnitude, process efficiency – nearly by two orders, and electrophysical properties of the structure are improved. Then, REE oxide layer is removed chemically and oxide surface becomes almost pure, since REE protects material against ion bombardment. To improve further the structure of the obtained oxides, the samples were annealed in nitrogen atmosphere at 773K or by 1–3 pulses from incandescent lamp with durations of 1s. Thickness, growth rate, inner charge, boundary states density, breakdown field, dielectric constant, roughness, etc. of the obtained oxide films have been determined. The X-ray analysis showed that all of them had an amorphous structure. These results confirm the efficiency of the method for formation of high-quality super-thin oxides. Mechanism of the CPA based on free pulling of oxygen ions from plasma through a catalyst into the anodized material due to the difference of electronegativities of REE and oxidant material is proposed. Fig. 9, Tab. 1, Ref. 9.

Auth.

13.B2.44. New rotation-corrosion dispersation method for obtaining of iron–oxygen nanoparticles. /O. Lavrynenko, V. Kovalchuk, S. Netebea, Z. Ulberg/. Nano Studies. – 2013. – # 7. – pp. 295-22. – eng.

In the article we propose a new rotation-corrosion dispersing (RCD) method for obtaining of iron–oxygen nanoparticles. The process of the primary crystals formation applying the RCD method that based on the iron (steel) contacting with water dispersion medium and air oxygen is determined by simple electrochemical reactions on the metal surface. As a seed structure we found the following species: Fe(II)–Fe(III) layered double hydroxides (LDH) and ferrihydrite. While the LDH particles are present in the reaction area and on the steel surface, ferrihydrite is located in the near surface layer. Another product of the phase formation under such condition is weak concentrated sols. The optimum physicochemical condition for the formation of different iron–oxygen nanosized minerals was fixed in the present work. Fig. 26, Ref. 60.

Auth.

13.B2.45. Studies on thermal properties of silicone–acrylic nanopowders and of organic polymer coatings modified with such nanopowders. /J. Trzaskowska, J. Kozakiewicz/. Nano Studies. – 2013. – # 8. – pp. 7-16. – eng.

Thermal properties of nanopowders containing silicone–acrylic core–shell nanoparticles (size ca. 100nm) and of epoxy–polyester and polyester powder coatings, both unmodified and modified with 3% of such nanopowders added as impact modifiers, were investigated using differential scanning calorimetry (DSC) and thermogravimetric analysis (TGA). The nanopowders showed two glass transition temperatures (T_g) when examined by DSC: one below -100°C corresponding to relaxation of polysiloxane chains and another over $+100^\circ\text{C}$ corresponding to relaxation of poly (methyl methacrylate) chains. T_g of the core of core-shell nanoparticles contained in nanopowders depended on the chemical structure of silicone resin which constituted the core. It was also found that the coatings modified with nanopowders showed lower T_g than the unmodified coatings. TGA studies confirmed that the chemical structure of silicone resin affected thermal decomposition of nanopowders. TGA investigations of unmodified coatings and coatings modified with nanopowders revealed that thermal decomposition proceeded differently in both cases. Fig. 7, Tab. 5, Ref. 12.

Auth.

13.B2.46. Heterogeneous nano cerium chromate as a new and selective oxidant for selective conversion of alcohols to corresponding carbonyl compounds. /S. Oftadehgan, N. Goudarzian/. Nano Studies. – 2013. – # 8. – pp. 35-44. – eng.

The efficiency of highly branched polyethylenimine (PEI) as a support for nano cerium chromate and subsequent use as a heterogeneous oxidant for selective oxidation of alcohols has been investigated. These were synthesized using PEI to produce a polymer coordinated nano cerium, a new and straight forward method for screening high catalytically active nanoparticle polymer composites. The one-step systematic derivatization of the PEI scaffold led structural correlated to

the stabilization of cerium nanoparticles and catalysis. Analysis of this polymeric reagent identified a cerium chromate nanoparticle-composite that was able to efficiently oxidize several alcohols in dioxane under mild conditions due to the surface area of the nano cerium chromate per unit volume. The capacity of the reagent and fixation of nano cerium chromate confirmed by ICP and atomic absorption technique and morphology of this nano composite investigated by SEM and TEM. The reagent was found to be efficient and selective in the oxidation of benzylic and allylic alcohols to the corresponding carbonyl compounds in high yield. The reagent exhibit good chemo selectivity in oxidation reactions. Fig. 3, Tab. 1, Ref. 27.

Auth.

13.B2.47. Porous Si substrate: A high-quality and cheap substrate for advanced RF applications. /Y. Belaroussi, M. Belaroussi, G. Scheen, K. Ben Ali, J. Raskin/. Nano Studies. – 2013. – # 8. – pp. 45-52. – eng.

Nanostructured porous silicon is very promising for RF applications by overcoming the high-frequency losses originating from the bulk silicon substrate. A micro-porous silicon layer is formed by electrochemical anodization of Si at constant current density. The target thickness is 50µm with an average pore diameter of 5nm in order to reach an effective resistivity larger than 10kΩ·cm and an effective relative permittivity as low as 2.5. Porous Si layer before and after oxidation is characterized by XRD, SEM/EDS and FTIR. The results show a very good oxidation which is highlighted by vibrational modes. Moreover, SEM images of the porous silicon surface morphology indicate that micro-pores are obtained with size and density that depend on the current density, the anodization time and the resistivity of the starting silicon substrate. RF measurements of transmission lines demonstrate the successful reduction of the permittivity and conductivity of the Si substrate. Fig. 9, Ref. 16.

Auth.

13.B2.48. Nanocrystalline nickel cobalt ferrite ($\text{Ni}_{(1/2)}\text{Co}_{(1/2)}\text{Fe}_2\text{O}_4$) for electromagnetic interference (EMI) shielding applications. /D. Tiwari, A. Thakur, S. Borjas-Garcia, L. Villasenor Cendejas, N. Dasgupta-Schubert/. Nano Studies. – 2013. – # 8. – pp. 53-62. – eng.

The interest of EMI shielding is due to serious electromagnetic interferences caused by electronic products and devices. EMI shielding makes plastic enclosures able to protect equipment with EMI and safe transmission of data. Looking the design versatility, environmental reliability and good signal/noise ratio, we worked with nickel–cobalt ferrite ($\text{Ni}_{(1/2)}\text{Co}_{(1/2)}\text{Fe}_2\text{O}_4$) materials, which is easy to design with good signal/noise ratio. Nickel–cobalt ferrite powders have been studied in MHz frequency ranges and results are presented in this paper. We synthesized the nickel-cobalt ferrite via citrate route method at room temperature. The crystal structure was verified by the X-ray diffraction (XRD) pattern and dielectric behavior analyzed by using impedance analyzer with varying temperature up to 200°C. Transmission electron microscope (TEM) analysis showing the prepared powder is nanocrystalline is also confirmed by the particle size obtained from the Scherer's formula: 27.7nm. The results show that the prepared material has good proximity of dielectric constant and the calculated activation energy is 0.140 eV. Because of the conductivity and permeability of the prepared material at MHz frequency it is useful to EMI shielding application, which is about 20 to –15 dB at 100kHz to 100 MHz frequency ranges. Fig. 8, Tab. 2, Ref. 9.

Auth.

13.B2.49. Phase transition of nanoparticles of organic pigments. /M. Kakuichi, K. Kasatani, Y. Morita/. Nano Studies. – 2013. – # 8. – pp. 95-102. – eng.

Phase transition of nanoparticles of organic pigments was studied. Conditions under which phase transition of nanoparticles occurs were optimized. N-methylpyrrolidone solution of 3,6-diphenyl-2,5-dihydropyrrolo [3,4-c] pyrrole-1,4-dione (DPP), a derivative of diketopyrrolopyrrole, was diluted in vigorously stirred aqueous ethanol solution. Colloidal solution was then obtained. This solution was annealed at 60°C. UV/visible absorption spectra of DPP nanoparticles show that the wavelength of main absorption band shifted from 530 to 545nm after annealing, the absorbance of the band increased, and sharpening of the main band was also observed. From these results, it was suggested that the phase transition to J-like aggregates occurred by annealing. Phase transition of nanoparticles of violanthrone 79 was also observed. Fig. 9, Ref. 20.

Auth.

13.B2.50. Structural and dielectric studies of Cr⁽³⁺⁾ doped ZnFe₂O₄ nanoparticles. /R. Sebastian, K. Maniammal, Sh. Xavier, E. Mohammed/. Nano Studies. – 2013. – # 8. – pp. 121-130. – eng.

A series of chromium doped zinc ferrite nanoparticles, ZnCr_xFe_(2-x)O₄ (x = 0.0, 0.2, 0.4, 0.8) were prepared by using sol–gel technique. The formation of single phase FCC spinel structure was identified in all the compositions using XRD and FTIR. Rietveld refinement analysis has been used to analysis the XRD patterns. The lattice constant calculated from Rietveld refinement analysis was found to decrease with chromium ion concentration. The crystallite size of the sample was found to decrease with increase in chromium concentration. The TEM image reveals spherical morphology of the particles. Hall–Williamson analysis is used to evaluate the lattice stain induced in the samples. Detailed investigation of permittivity, dielectric loss, and AC conductivity was carried out in the frequency range 20Hz to 5MHz for all the doping concentrations. Frequency dependence of permittivity shows normal behavior and agrees with Koop's phenomenological theory of dielectric dispersion. AC conductivity is found to increase with frequency. The low value of dielectric loss makes them suitable for high frequency applications. Fig. 9, Tab. 2, Ref. 23.

Auth.

13.B2.51. Formation and evolution of nickel silicides in silicon nanowires. /A. Katsman, M. Beregovsky, Y. Yaish/. Nano Studies. – 2013. – # 8. – pp. 139-152. – eng.

Thermally activated axial intrusion of nickel silicides in silicon nanowires (NWs) is utilized to form nickel silicide / silicon contacts in silicon NW (SiNW) field effect transistors. The growth of different nickel silicides is often accompanied by local thickening and tapering of the NW, up to its full disintegration. In the present work this process was investigated in SiNWs of 30–60 nm in diameters with pre-patterned Ni electrodes after annealing at different temperatures of 300–440°C and times up to 120s. From the temperature dependence of the intrusion lengths activation energy of 1.45 eV for the surface diffusion of nickel was extracted. In several cases, periodic thickening of nickel-rich part is accompanied by tapering of monosilicide part up to its full dissolution. The kinetics of the nickel silicides growth was described by theoretical model. For a certain set of parameters tapering and dissolution of the monosilicide part of the intrusion were obtained. Fig. 9, Tab. 1, Ref. 26.

Auth.

13.B2.52. Separation of nanoparticles from nanoparticle enhanced phase change material. /M. Sheikh, M. Sharif, P. Rupa/. Nano Studies. – 2013. – # 8. – pp. 153-164. – eng.

Nanoparticle enhanced phase change material (NEPCM) is a colloidal solution of base fluid (alkane) and nanoparticles which have been developed to store thermal energy in the form of latent heat through phase change mechanism, i.e., melting and solidifying. Nanoparticles are primarily used to enhance thermal conductivity of the base fluid. After repeated phase change cycles, NEPCM should be replenished due to loss of efficiency. Since the disposal of the used NEPCM into the environment without any treatment, possess environmental and health hazards, it is necessary to develop technologies to separate the nanoparticles from the NEPCM before disposal. In this paper, several separation methods, such as: distillation, chemical destabilization, and centrifugation, yielding complete or partial separation, are evaluated and presented. The effectiveness of the separation methods have been analyzed using scanning electron microscopy (SEM) and UV–Vis spectrometry. Fig. 14, Tab. 4, Ref. 25.

Auth.

13.B2.53. Comparative studies of TiO₂ nanomaterial with its photo-catalytic applications. /Y. Ng, Y. Leung, M. Wong, A. Djuricic, F. Leung, W. Chan/. Nano Studies. – 2013. – # 8. – pp. 165-170. – eng.

Metal oxides are important materials that are being developed for use in research and health-related applications. In particular, TiO₂ nanomaterial for application in antibacterial coatings, pollutant purification, and photovoltaic devices has been extensively studied. However, there are few studies comparing pollutant purification and antibacterial behavior among different TiO₂ nanostructures. In addition, the photocatalytic performances are highly dependent on morphology and crystal structure. In this study, different nanostructures of TiO₂ with different morphology (nanoparticles and nanotubes) have been successfully synthesized by simple methods (anodization and solution method). SEM and TEM images have confirmed the morphology. The test of antibacterial activities under UV and ambient illumination has been demonstrated. Furthermore, the dye degradation test under UV illumination is also performed and obtained results dependence on the morphology and crystal structure is discussed. Fig. 4, Tab. 1, Ref. 6.

Auth.

13.B2.54. Nano-sphere of metal carbonates: Synthesis and characterization as energy storage materials. /Y. Sharma, A. Kumar, P. Chaturvedi/. Nano Studies. – 2013. – # 8. – pp. 171-182. – eng.

Lithium ion batteries (LIBs) are being developed to improve the energy / power density, longevity and safety to find their usage in high end applications. These features of LIBs extensively depend upon the Li-kinetics of electrode materials. Despite of invention of various materials in different shape and sizes, a suitable material is yet to be found which could fulfill all above requirements. In order to find suitable anode material, in the present work, nano-spheres of metal carbonates Cd_(1-x)Co_xCO₃ (x=0, 0.25, 0.50) are synthesized employing easy and cost effective co-precipitation method at ambient conditions. XRD patterns exhibit rhombohedral–hexagonal crystal structure with lattice parameters a=4.92(±0.01)Å and c=16.28(±0.01)Å. The Li-storage properties are examined by galvanostatic cycling and cyclic voltammetry. Based on the observed capacity values, CV results, ex-situ XRD and ex-situ TEM of charged electrode to 3V, the reaction mechanism is proposed and results are discussed. Tab. 1, Ref. 17.

Auth.

13.B2.55. Model of NMR spectroscopic analysis of azide containing organic molecules. /T. Chachibaia/. Nano Studies. – 2013. – # 8. – pp. 191-200. – eng.

Click chemistry provides powerful tool for modular synthesis strategies of polymers. Concept was introduced by Barry Sharpless and co-workers in 2001 and since then is widely used in many area of chemical synthesis, from materials production to drug design. The main concept is based on cycloaddition reaction between terminal azides and alkynes with triazole ring containing molecule production. Among known alkali metal azides is widely used sodium azide due its attractive chemical and physical properties. A concern of preexisting azidophobia overcomes thanks to development of methods for safe and secure use of azides in chemical reactions. Among state-of-the-art methods is NMR spectroscopy, which is powerful tool for analysis of chemical synthesis. Method of ¹H – NMR spectroscopy enables us to detect organic azide molecules products of azide alkyne cycloaddition click reaction. Fig. 3, Ref. 62.

Auth.

13.B2.56. Non-wetting of cavity walls of zeolites by metals. /A. Kapanadze, G. Rtveliashvili, G. Tabatadze/. Nano Studies. – 2013. – # 8. – pp. 201-202. – rus.

It is shown existence of the gap of nearly 1.5Å between the surface of a zeolite and a metal non-wetting it. Accounting this gap explains why the volume of cavities within the zeolite exceeds the volume of the metal introduced into it. Tab. 1, Ref. 2.

Auth.

13.B2.57. Properties of boron nitride synthesized under the effect of concentrated light radiation. /L. Sartinska, E. Voynich, A. Andreeva, A. Kasumov, I. Timofeeva, A. Yu. Koval, G. Frolov, T. Eren, E. Altay/. Nano Studies. – 2013. – # 8. – pp. 217-222. – rus.

Direct synthesis of boron nitride was carried out under the effect of concentrated light radiation with and without catalyst. In the presence of the catalyst it was obtained powders of nanodispersed and

fibrous structure. It was shown that the increase in the distance from the reaction zone results in an increase in the width of the band gap of BN structures from 3.6 to 5.1eV (at the maximum distance). The presence of oxides in powders near the reaction zone, identified by X-ray diffraction study, can explain the low value of the width of the band gap. Fig. 5, Ref. 12.

Auth.

13.B2.58. Investigation the influence of absorption of mercury on the structure and morphology of the gold thin films. /N. Khachidze, T. Khachidze/. Nano Studies. – 2013. – # 8. – pp. 223-226. – eng.

With the aim of optimization of the parameters, the mercury vapor sensor has been developed. The investigation of the mechanism of interaction of mercury with the control element (made of a thin gold film) of the sensor has been carried out. The results allow drawing the conclusion that optimum measurement time of a sensor is 20–25s. It is desirable that measurements be carried out at low temperatures (40–50°C). The minimal temperature necessary for restoration of the element is 400°C. Fig. 5, Ref. 3.

Auth.

13.B2.59. Attenuation of gamma-radiation concomitant neutron-absorption in boron-tungsten composite shields. /G. Nabakhtiani, L. Chkhartishvili, A. Gigineishvili, O. Tsagareishvili, D. Gabunia, Z. Rostomashvili, Sh. Dekanosidze/. Nano Studies. – 2013. – # 8. – pp. 259-266. – eng.

Water, plastic and other materials containing hydrogen provide protection against the relatively weak neutron radiation. But, in the case of high-density neutron fluxes only materials containing cadmium or boron serve as effective shields. We focused on boron-rich materials, because they successfully combine the set of attractive physical and technical characteristics with a very high neutron capture cross section of ^{10}B nucleus. The most of ^{10}B -n elementary acts are concomitant by the emission of a high-energy γ -quantum. For this reason, one of the major problems associated with the use of boron neutron shield is that the additional γ -radiation shielding is necessary. The preliminary analysis has shown that, layered composites of boron with heavy metals are promising materials for boron-containing neutron shields, which would allow the protection from the concomitant gamma-radiation as well. The work gives an assessment of these materials for shielding properties. The different dimensions of the shields are also considered. Calculations are done by using of computer code Micro Shield. Results proved that tungsten can be used together with ^{10}B -monoisotopic boron as an effective shielding for different neutron fluxes. Fig. 5, Ref. 18.

Auth.

13.B2.60. Composite ceramics based on boron carbide enriched in isotope ^{11}B as a promising radiation resistant structural material. /I. Bairamashvili, M. Galustashvili, J. Jobava, V. Kvatchadze, Z. Mestvirishvili/. Nano Studies. – 2013. – # 8. – pp. 305-319. – rus.

Fast neutron reactors, that over more than seventy years of operation have shown evident merits, failed to take up a worthy position in power engineering. One of the main reasons is deficiency of necessary materials. In fast neutron reactors heat and radiation loads are considerably higher than that in thermal reactors which leads to necessity to develop structural material with higher durability both for reactor vessel and for intra-reactor systems. In the present paper, one of the variants of such problem solution is shown as development of a new radiation-resistant structural material based on boron carbide enriched in stable isotope ^{11}B (>99.4at.%). In order to achieve specific plasticity of the material, design of creation technique of composite ceramics by boron matrix ($^{11}\text{B}_4\text{C}$) doping with zirconium (Zr^{11}B_2) is proposed. Analysis of those few data, that were obtained for such compounds and their comparison with results obtained for SiC already having status of the advanced radiation-resistant composite, make it possible to assume that $^{11}\text{B}_4\text{C}$ – Zr^{11}B_2 can become one of the most asked-for radiation-resistant structural materials of the future. Ref. 16.

Auth.

13.B2.61. Some issues of ultradispersive α -aluminum oxide powders of low temperature synthesis. /T. Kuchukhidze, T. Archuadze, V. Gabunia, M. Kadaria, O. Lekashvili, R. Chedia/. Nano Studies. – 2013. – # 8. – pp. 315-326. – geo.

By gradual heating of unstable intermediate phases of aluminum hydroxides and aluminum oxides above the temperature of 1200°C thermodynamically stable α -Al₂O₃ is obtained, which is widely applied in obtaining ceramics with different functional purposes. One of important moment is transformation at low temperature – preliminary inclusion of α -Al₂O₃-crystals during low temperature synthesis in conditions of decomposition of precursors (hydrolyze), drying-heating, and annealing for obtaining ultra-dispersive α -Al₂O₃-nanopowders. Modified polymer-precursor and self-developing reduction–oxidation reaction was used by us for obtaining α -alumina. Aluminum nitrates, aluminum lakesides, oxidants, and bi-functional compounds producing organic–inorganic gels (glycols, amino-alcohol, carboxyl acids, amino-acids, biopolymers and others) were used as initial precursors. Organic–inorganic gels were obtained by homogenization of aluminum and organic compounds at 80–200°C and by carbonization of the obtained mass at 300–800°C. By adding α -modification aluminum oxide in initial reactive mixture 3–5%, $\gamma \rightarrow \alpha$ phase transformation temperature (1200°C) decreases to the value of 1020–1080°C. It is established, that during interaction between aluminum nitrates and urea, adding of aluminum causes obtaining of amorphous aluminum oxide. By its annealing on the air at 800°C (2h) Al₂O₃ is obtained. Possibilities of obtaining nano-phase powders from aluminum at low temperatures (20–90°C) by subsequent annealing of obtained Al₂O₃ H₂O amorphous powder (1000–1100°C) the α - Al₂O₃ fibbers are obtained. It is established, from the X-ray diffraction method, that Al₂O₃ fibers contain particles with sizes of 10–30 nm. Microstructure of the powders and corundum products, obtained from them was studied by optical and electronic scanning microscopes (Nikon ECLIPSE LV 150, NMM–800TRF, Nanolab–7). Microhardness was determined on the device DUH–211S. Grain size of synthesized powder was established by Analysette 12 Dyna Sizer. Phase analysis of the specimens was conducted on the X-ray diffractometer DRON–3M. Thermal analysis (TG–DTG–DSC) was carried out on the device Setaram Tag. Fig. 6, Ref. 31.

Auth.

B3. Geology. Geodesy

13.B3.1. Duration of Cenozoic orogenies (by the example of Georgia). /F. Maisadze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 97-104. – eng.; abs: eng., geo.

On the basis of a litho-facial analysis of Cenozoic deposits that accumulated during the manifestation of orogenies (phases of folding), the processes of sedimentation accompanying these phases, as well as some paleogeographic and structural changes have been considered. Each orogenic phase was accompanied by accumulation of synorogenic regressive formations. They were a direct consequence and criterion of intensification of the tectonic movements. It turned out that in some cases there is no temporal coincidence between orogenic phase and regression, and the manifestation of the same orogenic phase in different tectonic zones is not strictly synchronous. During the Cenozoic time, the most important were the Pyrenean and Styrian orogenies, which, along with the Chegem orogeny, created the principal morphostructural units and mostly predetermined, in general, the character and appearance of presentday geological structure of the region. Taking into account the age of regressive deposits and geochronological data, for the first time the duration of each orogeny was determined for the territory of Georgia. Fig. 2, Ref. 15.

Auth.

13.B3.2. Stratigraphic spreading of *Mytiloceras* fauna in Lower and Middle Jurassic deposits of Georgia. /M. Topchishvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 105-112. – eng.; abs: eng., geo.

Mytiloceras fauna relicts gathered from Lower and Middle Jurassic sediments of different regions of Georgia gave the possibility to trace their alternation in sections. Along with them finds of index forms of ammonite fauna establishing exact age of the sediments allowed to ascertain stratigraphic boundaries of distribution of mytiloceras fauna. The most ancient species with age restricted to the Sinemurian stage are represented by *Mytiloceras pholadauriensis* (Sess.) and *M. depressus* (Münst.). The younger forms *M. dzirulensis minimus* (Kakh.) and *M. pseudoinconstans* (Kakh.) are da-

ted to the Toarcian and Aalenian stages respectively. The age of *M. nunuae* (Kakh.) is within the bounds of the Aalenian stage. The age of the younger species *M. djanelidze* (Kakh.) and *M. gurnensis* Kakh. is limited to the Bajocian stage. *M. quenstedti* (Pcel.), *M. falgeri* (Esch.) and *M. dubius* (Sow.) are distinguished for the widest vertical propagation, passing from the Sinemurian into the Toarcian while the first form uninterruptedly moves even into the Bajocian. *M. dzirulensis* (Kakh.) occurs in the Upper Pliensbachian and the Toarcian and *M. gryphoides* (Schloth.) in the Aalenian as well. *M. tshalensis* (Kakh.), *M. cinctus* Goldf. and *M. amygdaloides* (Goldf.) occur from the Toarcian to the Bajocian inclusive. Other representatives of Mytiloceras are mainly related to the Toarcian and Aalenian stages. Thus, some Mytiloceras species have wide stratigraphic spreading on the territory of Georgia and are useless for making precise stratigraphic inference. Fig. 1, Ref. 12.

Auth.

13.B3.3. Stratigraphical correlation of the Barremian-Aptian sedimentary sequences of the Okriba-Khreiti, Dzirula tectonic subzones (Georgia). /M. Kakabadze, I. Kakabadze, M. Sharikadze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 113-123. – eng.; abs: eng., geo.

The question of correlation of the Barremian-Aptian (Lower Cretaceous) sedimentary sequences, represented in the Okriba-Khreiti and its adjacent Dzirula tectonic subzones (Georgia), is studied. Selection of the considered territory as object for sequence stratigraphic correlation was conditioned by facial variety, existence of rich fossil composition and frequent alternation of sedimentation cycles during the Barremian-Aptian. On the basis of studying of unconformable surfaces, as well as of alternation of the comparatively deep and shallow sea facies of the Barremian-Aptian of the Dzirula subzone 5 sedimentary sequences (Br_1^1 - Br_1^3 , Br_2^1 - A_1^1 , A_1^2 - A_1^4 , A_2^1 - A_2^2 , A_3^1 - Al_1^1), corresponding to those established earlier in Okriba-Khreiti subzone, are revealed. Biostratigraphic frames of these sequences are specified, as well as their variable litho- and biofacial features in time and space are analysed. In most cases sequence boundaries are characterized by erosion surfaces, but in those sections where sequences represent comparatively deeper shelf setting facies, sequence boundaries are conformable. In all cases when boundaries between two sequences are represented by stratigraphical gap, beds of adjacent sequences are characterized by same dip azimuth and dip angle. Accordingly, each such boundary represents typical disconformity and the chronostratigraphic range of its degradation vacuity is variable in the considered region. Fig. 3, Ref. 25.

Auth.

13.B3.4. Shales of Georgia: shale gas mining context. /I. Shekrladze, N. Poporadze, U. Zviadadze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1.– pp. 69-78. – eng.; abs: eng., geo.

Far-reaching changes in global energy market, triggered by the so-called “shale revolution” and related worldwide activities push into the forefront the problem of investigation of shale resources of Georgia. In the paper a brief survey of shale deposits of Georgia is presented in the context of the prospects of shale gas (SG) mining. The primary tasks are set, aimed at improved understanding of the starting geological and environmental situation. Based on some initial conditions within the still unlicensed territory of the country, the Kazbegi-Omalo Region (KOR) with record concentration of shale-bearing rocks and advantageous geographical location is recommended as an area for primary research. It is shown that available geological data base is still insufficient for reliable evaluation of SG mining prospects. The investigation of the degrees of metamorphism of different sections and layers of existing huge shale mass remains the main problem. More detailed data on the total organic content (TOC) and some other characteristics of shale rock also are necessary. Given rigorous environmental standards set worldwide for SG mining, the necessity for additional hydrogeological studies is pointed out. Investigation of rock samples from extensive outcrops of the zone is defined as the way for outlining the territorial distribution of potentially gas-bearing rocks and identification prospective areas for SG mining. Further, based on experience of US Antrim and Sweden Alum Shale zones, preliminary stage of low-cost exploration drilling of upper layers of the identified areas (to the depths 500-800 m) can be performed using existing traditional technical means. The summarized data on geological studies and preliminary exploration drilling can be used through decision-making on high-cost exploration drilling using modern technologies. Fig. 3, Tab. 1, Ref. 32.

Auth.

13.B3.5. Garnets from the Dzama ore-bearing valley. /N. Poporadze, O. Seskuria/. Mining Journal. – 2013. – # 2(31). – pp. 4-6. – geo.; abs.: rus., eng.

The paper is on the variety of garnets from the Dzama ore-bearing valley. In the ore-bearing valley region, there are distinguished two districts of skarns: the Saterdze district and the Garti district. The garnet group minerals have been observed in both districts. As the researches carried out in this region show, the refractive index of garnets developed in the Dzama ore-bearing valley correspond to those of garnets of the ugrandite series and they are generally represented by grossular-andradite, andradite and grossular bearing varieties. The afore mentioned garnets are ineligible in jewelry. Fig. 2, Ref. 2.

Auth.

13.B3.6. Geological structure of the rhyolite extrusives of Gantiadi group and prospects of their application as raw materials for glass industry. /G. Nadareishvili, M. Tkemaladze/. Mining journal. – 2013. – # 2(31). – pp. 7-11. – geo.; abs.: rus., eng.

In the article, the questions of a geological structure, mineralogical-petrographical and petrochemical structure of composing rhyolite breeds of Gantiadi group of extrusive bodies and the containing volcanic-sedimentary suites located in the Dmanisi area (Kvemo Kartli) are considered. Besides, questions of petrochemical features of these breeds for the purpose of detection of their suitability as new, complex, nonconventional mineral raw materials for the glass industry are considered also. Fig.1, Tab. 1, Ref. 6.

Auth.

13.B3.7. Iodine in underground waters of Georgia. /N. Zautashvili/. Mining Journal. – 2013. – # 2(31). – pp. 12-14. – geo.; abs.: rus., eng.

A propagation of iodine underground waters in the territory of Georgia, which is distinguished with clear originality and which is conditioned by character of geotectonic zones is considered. In particular, in the hydrogeological area of the Georgian intermountain depression the accumulation of iodine is favored by the availability of salt and oil-gas deposits of the closed artesian pools and iodine rather high correlation connection to boron, sodium, chlorine and decomposition of organic substances is confirmed in these waters. Tab. 1, Ref. 5.

Auth.

13.B3.8. Connection of unique Georgian wines with tectonics. /V. Nadiradze/. Mining Journal. – 2013. – # 2(31). – pp. 40-41. – geo.; abs.: rus., eng.

The article looks at the relation between some unique zones of Georgian viticulture and geological processes. The zones which produce unique wines are associated with complex tectonic junctions originated from the intersection of collapsing structures of several connections. These junctions are often related to contrasting magmatism and intensive hydrothermal processes, which cause strata to become rich in chemical elements. This process affects the formation of soil and, further, nourishment of vine, which determines unique qualities of the vine and, consequently, the wine produced from it. Fig. 1.

Auth.

13.B3.9. On the Sazano pegmatitic field. /M. Gagnidze, A. Kvitsiani, A. Gomelauri, O. Kavtelashvili/. Mining Journal. – 2013. – # 2(31). – pp. 42-47. – geo.; abs.: rus., eng.

The paper discusses the structural style of the Sazano pegmatitic field: morphology and mode of occurrence of pegmatites, their mineral composition, the problems of genesis and quality characteristics. The research results allow classifying the object as pegmatites of non-differentiated, quartz-feldspar type, which are suitable for production of high potash spars. Fig. 9, Tab. 2, Ref. 5.

Auth.

B4. Geography. Cartography. Astronomy

13.B4.1. Results of surface-wave tomography of Earth's crust for Lesser Caucasus according to data of Rayleigh waves. /T. Gegechkori, N. Zhukova, E. Meparidze, A. Gventsadze, A. Sborshchikovi/. Nano Studies. – 2013. – # 7. – pp. 213-220. – rus.

There are presented the results of surface-wave tomography of Earth's crust for Lesser Caucasus according to data of Rayleigh waves. Fig. 9, Ref. 7.

Auth.

13.B4.2. Tomographical model of inhomogeneous structure of Earth crust for Georgia and nearest territories developed by data of surface seismic Rayleigh waves. /T. Gegechkori, V. Gotsiridze, N. Zhukova, A. Sborshchikovi, I. Shengelia/. Nano Studies. – 2013. – # 8. – pp. 227-230. – eng.

For the first time, Georgia and nearest territories has been studied tomographically using surface seismic Rayleigh waves method. There are utilized the 1960–1985 records of surface waves from seismic stations of Transcaucasia (21 stations). The tomographical models of the Earth crust's inhomogeneous structure have been analyzed for depth up to 40km and surface waves with periods from 10 up to 22s. Obtained results are interpreted from the geological point of view. Fig. 7, Ref. 4.

Auth.

B5. Other Natural and Exact Sciences

13.B5.1. Giant ostrich in Dmanisi fauna. /A.Vekua/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 143-148. – eng.; abs: eng., geo.

Dmanisi site and fauna of Upper Pliocene vertebrates is the widely known standard of late Neogene of the Caucasus. Materials on the rarest finds of skulls and mandibulae of the oldest (1,85 m) hominids in Eurasia in Dmanisi, as well of remains of multiform fauna of vertebrates have been repeatedly published in various scientific editions. Excavations of fauna of Upper Pliocene vertebrates of widely known Dmanisi site has been continued successfully. The list of fauna is enlarged with new elements yearly. Dmanisi faunistic complex contains representatives of about 40 species of six orders Mammalia: Lagomorpha, Rodentia, Carnivora, Proboscidea, Perissodactyla, rtiodactyla. There are also single finds of remains of Reptilia and Aves. The birds are most poorly presented in diverse fauna of Dmanisi. We have found only three bones of birds until recently. At the beginning of excavations of the site in 1983, a large femur of ostrich was discovered, then, in 2001 and 2006, the head of arm of Gallus and shin of Strix were found. And finally, in 2012, we succeeded in finding one more femur of ostrich, the description of which this article is dedicated to. Presence of remains of ostrich in old deposits unmistakably points to the predominance in the region of favorable conditions of climate. It is known that ostriches inhabit in open, snowless regions, preferring deserted, semi-deserted and steppe landscapes. Presence of remains of huge ostriches in the second half of the Pliocene on the territory of the South Caucasus is vivid evidence of the prevalence of continental arid stations in this region. Fig. 3, Tab. 1, Ref. 13.

Auth.

13.B5.2. Scaling features of ambient noise at different levels of local seismic activity. /T. Chelidze, T. Matcharashvili, N. Zhukova, A. Sborshchikovi/. Nano Studies. – 2013. – # 7. – pp. 201-206. – eng.

Investigation of dynamical features of ambient seismic noise is one of the important research challenges from the viewpoint of scientific and social interests. In this research, scaling features of the ambient seismic noise data recorded at Oni seismic station, Georgia, were investigated using detrended fluctuation analysis and multifractal detrended fluctuation analysis methods. Data sets were selected to include time periods with different level of local seismic activity. Scaling features of seismic noise datasets are noticeably different for seismically active and relatively quiet time periods. According to integral fluctuation features, at increased seismic activity Earth surface vibration is closer to persistent long range correlations, while at quiet periods we observe multitude of stochastic behaviors. Fig. 2, Ref. 15.

C. TECHNICAL AND APPLIED SCIENCES. SECTORS OF ECONOMY

C1. Power Industry

13.C1.1. Modern trends of power engineering development and the problems of optimal usage of Georgian energy resources. /T. Magrakvelidze, V. Chichinadze, Kh. Lomidze, N. Bantsadze, A. Mikashavidze, M. Janikashvili, I. Archuadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 75-80. – geo.; abs.: geo., eng., rus.

Modern trends of power engineering development worldwide are reviewed in the paper. The appropriate data is presented and analyzed. It is shown that power generation in Georgia should reach 40-50 billion kw. h within nearest decades for sustainable development of the economics. Taking into account resources of Georgia, the main priority should be done to the hydro power generation, both with or without reservoir power plants. It is obvious that so called alternative power resources should be developed as much as possible. However, these resources are not too much to be the base of power engineering development in Georgia. Fig. 1, Tab. 1, Ref. 6.

Auth.

13.C1.2. Prospects of using unconventional renewable energy resources of Georgia. /N. Mirianashvili, N. Gdzlishvili, V. Khatashvili/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 89-93. – geo.; abs.: geo., eng., rus.

The current state and prospects of sustainable and integrated use of nonconventional renewable energy resources of Georgia are analyzed in the paper. Tab. 2, Ref. 7.

Auth.

13.C1.3. The effectiveness of heat transfer devices with elastic walls. /M. Jikhvadze, E. Pantskhava/. Building. – 2013. – # 2(29). – pp. 117-120. – geo.; abs.: geo., eng.

The main objective of the work is to study specificities of movement of liquid in a nonstationary flexible channel with regard to use these specificities in technical devices. A specific study has been made in nonstationary flexible heat-exchange facilities and in the devices necessary for thermal treatment of flexible, plastic and elastic thin roll materials in order to substantiate the possible effective use of aerodynamic bearings. The aim of the work was also treatment of experimental stands used in researching process with regard to use them in heat-power training laboratories of the Higher Technical Institutes. Fig. 2, Ref. 3.

Auth.

13.C1.4. Export potential of the electrical energy generated in Georgia. /G. Gaganidze/. Caucasus University Collection of Scientific Works. – 2013. – pp. 46-51. – geo.; abs.: geo., eng.

This study aims to evaluate the export potential of the electrical energy produced in Georgia. The export potential of Georgia needs a dramatic growth, thus any new opportunity should be utilized in the best way. This study used a comparative analysis for identification of the possible markets for the new product. Electrical energy, as a specific product, could be supplied to the near neighbours. It was found that the potential of the electrical energy produced in Georgia should be considered in two main directions: first, the electrical energy as the product itself, and second, as the high consumed material to produce other high export potential products. Following the analysis the problems which should be considered as the major obstacles on the way of the development of the hydro power stations in Georgia were revealed. The major weakness of the research is the fact that under the electro energy development was considered only the hydro power development. Due to the fact that Georgia is rich in hydro energy such limitation seems logical, but for the sake of clarity should be mentioned that other energy sources also have potential to produce electro energy. The paper is trying to evaluate the export potential not only as the potential for the nearest land neighbours, but also to analyse the export potential for far away states. Also, export potential of the electro energy is considered in the broader way, such as the potential to produce other products which are high energy consuming by nature. Tab. 2, Ref. 2.

Auth.

13.C1.5. Emission materials for solar-to-electric energy converters. /M. Nishchenko, M. Shevchenko, E. Tsapko, G. Frolov, L. Sartinska. Nano Studies. – 2013. – #7. – pp. 249-254. – rus. Nanostructure emission materials for electrodes for solar-to-electric energy converters were developed and investigated. It was ascertained the relationships, mechanisms of electronic emission of nanostructure electrodes and process of gas ionization under the effect of solar radiation at the different intensities, temperatures and vacuum conditions. The thermoemission conversion of thermal energy into electric under the heating of cathodes by the solar radiation and optimum conditions of their using in the converter of energy and parameters of the last were investigated. It was developed the thermoemission nanostructured electrode materials. Fig. 4, Ref. 7.

Auth.

C2. Electrical Engineering. Electronics. Radio Engineering. Communications

13.C2.1. An investigation of electromagnetic shielding and mechanical properties of conductive fiber reinforced composites. /E. Sancak, Z. Yıldız, M. Yuksek, N. Demirel, E. Kocak/. Nano Studies. – 2013. – # 7. – pp. 63-70. – eng.

In recent years, the use of electrical and electronic devices has grown rapidly. These devices cause electromagnetic interferences, which could threaten human life. In order to solve this problem, intensive research to develop textile surfaces having electromagnetic shielding properties continues. The main objectives of this research work are to develop conductive fiber composite materials and to determine their electromagnetic shielding effectiveness. Thermoset polyester is the matrix phase and glass, stainless steel and carbon fibers are the reinforcement phase of the composite material. Carbon and stainless steel are incorporated as conductive fillers to provide the electromagnetic shielding properties of the composite material. Composites were investigated in terms of mechanical properties. Using a coaxial transmission line holder set-up, the electromagnetic shielding effectiveness of staple fiber reinforced composite structures was carried out in the frequency range from 15 to 3000MHz. Fig. 6, Tab. 3, Ref. 14.

Auth.

13.C2.2. Temperature dependence of the electrical transport properties of multilayer graphene. /E. Sadki, H. Okazaki, T. Watanabe, T. Yamaguchi, Y. Takano/. Nano Studies. – 2013. – # 7. – pp. 71-76. – eng.

Multilayer graphene thin films are deposited on silicon oxide substrates by mechanical exfoliation (or “scotch-tape method”) from Kish graphite. The thickness and number of layers are determined from both atomic force microscopy and Raman Spectroscopy. Electrical terminals are deposited on multilayer graphenes in a four-probe configuration by electron-beam lithography, gold/titanium thermal evaporation, and lift-off. The electrical resistance is measured from room temperature down to 2K. The electrical resistance of the multilayer graphenes shows an increase with decreasing temperature, and then decreases after reaching a maximum value. These results are compared with recent experimental and theoretical data from the literature. Fig. 3, Tab. 1, Ref. 17.

Auth.

13.C2.3. Conductive polymer/C-60 composite film. /M. Onoda/. Nano Studies. – 2013. – # 7. – pp. 123-130. – eng.

Nanostructured films of various conductive polymers can be obtained through electrophoretic deposition process. Unlike the conventional deposition techniques based on the solutions of conductive polymer, the methods employing colloidal suspensions like one proposed here make it to possible to separate the solidification of material from the film formation and drying steps. This unique feature provides nanostructure in the film deposited. A simple method, pouring a dilute solution of target material into an excess of non-solvent liquid, was used to obtain suspensions of conductive polymers. Since this method is similar to a step of purification of the polymers after polymerization and does not use any additives such as surfactant, the polymers in the suspension and therefore the films obtained through the electrophoretic deposition may keep at least the purity

of the original material. The unique morphology found in the electrophoretically deposited films opens up the new application of polymer light-emitting devices other than displays, the artificial finger print devices for anti-forging technology applicable to smartcards. Additionally, a unique process to obtain polymer–fullerene nanocomposite for photovoltaic application through the electrophoretic deposition is also proposed. Fig. 10, Ref. 11.

Auth.

13.C2.4. For theory of phase transformations in PrAlO₃Z. /B. Chachkhiani, L. Darchiashvili, E. Zeragia/. Nano Studies. – 2013. – # 7. – pp. 241-248. – rus.

An accurately solved model with thermodynamic potential of the eighth order on displacements of oxygen octahedron fully describing the character of change of all phases in PrAlO₃, as well as anomalies of measurable characteristics in case of the series of successive transitions is proposed. A complete model describing the effect of displacement of oxygen octahedron on splitting of basic (E_g) and excited ($T_{(2g)}$) terms of Pr₃⁺ ion is proposed. Analytical expressions for splitting of $T_{(2g)}$ term in orthorhombic and monoclinic phases are obtained through the values of parameter component. It is proved that electronic subsystem in PrAlO₃ cannot stabilize the phases of new symmetry as was assumed earlier. The structure of low-symmetry phases is discussed. Ref. 11.

Auth.

13.C2.5. Creation, research and subsequent usage of nanoparticles fluids for electronic components cooling. /J. Avaliani, I. Avaliani, T. Khachidze, S. Dolidze/. Nano Studies. – 2013. – # 7. – pp. 267-270. – eng.

The paper deals with the investigation of two-component liquids containing nanoparticles (nanoliquids) for their application to electronic element cooling. Based on the obtained results it is inferred that by mixing cooling agents with surface-active substances, it is possible to produce new cooling nanoliquids, which would be suitable for efficient cooling of electronic elements. Fig. 4, Ref. 5.

Auth.

13.C2.6. Electromagnetic shielding and mechanical properties of knitted fabric reinforced composites. /E. Sancak, M. Akalin, M. Yuksek, N. Demirel, I. Usta, E. Isgoren/. Nano Studies. – 2013. – # 8. – pp. 17-28. – eng.

Electrical and electronic devices, which intentionally or unintentionally radiate electromagnetic waves, are being used more as a necessity of modern life. As a result of the increase in the usage of electrical and electronic devices, we are being exposed to more electromagnetic environmental pollution with each passing day. One of the main methods used in protection from electromagnetic radiation is “shielding”. Shielding can be described as isolation to keep the electromagnetic radiation from external sources outside or to prevent unwanted emission of electromagnetic energy radiated by internal sources. In this study, yarns that are made of finest metal wires and cotton fibers were fabricated by using the ring spinning methods. Their knitted fabrics made from 7G flat knitting machine were developed successfully. Polyester composites containing made conducting knitted fabric with metal wire as electrical shielding materials were fabricated. Composites were investigated in terms of tensile strength, strain, elasticity modulus, flexural strength and impact strength properties. Using a coaxial transmission line holder set-up, the electromagnetic shielding effectiveness (EMSE) of various knitted fabric reinforced composite structures was carried out in the frequency range from 15 to 3000MHz. Fig. 8, Tab. 5, Ref. 14.

Auth.

13.C2.7. Characterization of AlN thin films annealed by CO₂ laser. /J.-Sh. Chen, J.-Y. Wang, Y.-J. Yao, Ch.-T. Chiang/. Nano Studies. – 2013. – # 8. – pp. 63-68. – eng.

Aluminum nitride (AlN) thin film is deposited by direct-current reactive sputtering system on sapphire (Al₂O₃) and Si(111) substrates. We anneal AlN thin film by CO₂ laser scanning its surface. The scan rates are 2.5 and 3mm/s with different laser power for different substrate samples. The key parameter is the different laser energy absorbed by substrates and thin films, and then the films will undergo different temperature and be annealed effectively. Comparing with tube

annealing furnace, the CO₂ laser annealing method can improve the issue of different thermal expansion coefficients and lattice mismatch between film and substrate. The crystallinity and surface roughness of AlN thin films are characterized by X-ray diffraction and atomic force microscope. The c-axis crystallinity quality of annealed AlN thin films is better than that of non-annealed samples. The surface roughness remains the same after laser annealing. Therefore, the CO₂ laser annealing process displays excellent effect for AlN thin films crystallinity and surface roughness. Fig. 11, Ref. 11.

Auth.

13.C2.8. Analysis of dielectric resonator antennas (DRA) based on complex perovskite CNBTOX – Ca(Nb_{1/2}Bi_{1/2})_xTi_(1-x)O₃. /A. Bruno Costa, R. Costa, F. de O. Amarante, A. Sombra/. Nano Studies. – 2013. – # 8. – pp. 69-76. – eng.

This work evaluates the numeric simulation of a probe-feed cylindrical DRA based on Ca(Nb_{1/2}Bi_{1/2})_xTi_(1-x)O₃, for x between 0 and 1. The electroceramics were prepared by the traditional solid state method. The dielectric permittivity and loss of the CNBTOX ceramics were analyzed in the region of 2 to 4GHz. The frequency response around the first mode (HEM_{11δ}) was determined by the HFSS (high frequency structure simulator) and these results were compared to the experimental setup. In this procedure, significant parameters of the DR, such as: return loss, input impedance, resonator bandwidth and air gap contributions were obtained during simulation. The results show experimental and theoretical characteristics of the resonator are in good agreement and the resonance frequencies increase with the bismuth amount. These measurements confirm the possible use of such material as small dielectric resonators. Fig. 4, Tab. 2, Ref. 23.

Auth.

13.C2.9. Apparent hall mobility of charge carriers in silicon with nano-sized “metallic” inclusions. /L. Chkhartishvili, T. Pagava/. Nano Studies. – 2013. – # 8. – pp. 85-94. – eng.

There is constructed a phenomenological theory of electron transport in a semiconductor with a nano-sized “metallic”, i.e. with higher than matrix conductivity, inclusions which can be screened by major carriers trapped on deep centers. In such heterogeneous samples, depending on the degree of screening the charge carrier effective Hall mobility can be either higher or lower than the Hall mobility in the semiconductor matrix itself. In the temperature region of lowered values, a minimum of the effective Hall mobility is expected. Based on the proposed theory, there are analyzed experimental temperature-dependences (from the nitrogen boiling point up to room temperature) of the dark- as well as photo- (under monochromatic IR illumination) effective Hall mobilities of electrons and holes in zone-melted n- and p-type silicon samples doped with phosphorus or boron, respectively, irradiated at room temperature with significant doses of high-energy protons (about 10¹¹–10¹³cm⁽⁻²⁾ and 25MeV) and/or electrons (about 10¹⁴–10¹⁵cm⁽⁻²⁾ and 2–8MeV). One comes to the conclusion that the screening of the irradiation-induced “metallic” inclusions in silicon should be related to vacancy complexes with background (oxygen) impurities and dopants. In n-Si, these are V+O (A-centers): E_c–0.17eV and V+P (E-centers): E_c–0.44eV, while in p-Si these are V+B complexes: E_v+0.45eV. Fig. 3, Ref. 10.

Auth.

13.C2.10. Investigation of the mechanical properties of polyamide 6/chitosan/hydroxyapatite based electrospun nanofibrous biocomposites. /R. Erdem, E. Sancak, S. Pazarlioglu, M. Akalin, O. Atak/. Nano Studies. – 2013. – # 8. – pp. 103-110. – eng.

Polyamide 6 (PA6)/chitosan (CS) based nanofibers containing different amount of hydroxyapatite (HAp) were electrospun successfully. Properties of the blended solutions were investigated in terms of viscosity, conductivity and pH values. Morphological and structural evaluations of nanofibers were conducted by SEM and EDS analysis. The results revealed that uniform nanofibers were obtained with the addition of a various amount of HAp. Tensile strength and elongational characteristics of the nanofibrous biocomposites were also studied. Fig. 7, Tab. 1, Ref. 16.

Auth.

13.C2.11. Compact low-pass filters using complementary rose curve resonators (CRCRs). /I.

Sassi, L. Talbi, K. Hettak/. Nano Studies. – 2013. – # 8. – pp. 131-138. – eng.

A novel low pass filter with controllable transmission zeros frequencies and wide stop-band bandwidth is presented. This filter is based on the use of the complementary metamaterial unit cell. The complementary rose curve resonators (CRCRs) are etched to the ground plane under a microstrip line. The design structure of the filter is controlled by tuning the geometric parameters of the proposed complementary resonators with a reduction of the circuit structure dimension. Using these complementary rose curve resonators, the proposed circuit structure is compact and wide stop-band tolerating the control of transmission zeros. Fig. 11, Ref. 10.

Auth.

13.C2.12. Modeling of the quasi-dielectric state in PbSnTe and PbSnSe nanolayers with high concentration of nonstoichiometric defects. /A. Pashaev, O. Davarashvili, M. Erukashvili, Z. Akhvlediani, L. Bychkova, V. Zlomanov/. Nano Studies. – 2013. – # 8. – pp. 253-258. – eng.

It is shown that under the conditions of mismatch between the layers of IV–VI semiconductors and the substrate when the conditions corresponding to effective “negative” pressure are realized, the forbidden gap width increases, and the stabilized Fermi level associated with the impurity shifts into the depth of the forbidden gap. An algorithm for computation of the energetic location of the impurity level in the strained semiconductor was developed. In this case, the concentration of current carriers decreases significantly as compared to that in the unstrained semiconductor. Fig. 1, Tab. 1, Ref. 9.

Auth.

C3. Automation & Telemetry. Computer Engineering

13.C3.1. Receptions of indemnification of parasitic making signals at construction interinductive of primary converters of type - 3D. /O. Labadze, M. Tsertsvadze, T. Labadze, P. Mandzhavidze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 55-57. – rus.; abs.: geo., eng., rus.

The paper presents the basic receptions of indemnification of parasitic signals influencing a target signal interinductive primary converters realization of which increases accuracy and reduces a transformation error. Ref. 5.

Auth.

13.C3.2. Principles of construction of inter-inductive primary converters. /O. Labadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 58-62. – eng.; abs.: geo., eng., rus.

The paper is dedicated to the methods of construction and applications high-precision inter-inductive primary converters intended as for control of mechanical parameters, and their using at creation system managements. Fig. 4. Ref. 10.

Auth.

13.C3.3. Principles of contactless definition of spatial coordinates of each joint and gripping devices of the single-row multiarticulate industrial manipulator. /O. Labadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 63-65. – geo.; abs.: geo., eng., rus.

Principles of contactless definition of spatial coordinates of each joint and gripping devices of the single-row multiarticulate industrial manipulator are shown in the paper. In places joints it is applied three coordinate without the inertialinter in the primary converter of type 3D which provides reliability and accuracy of definition of co-ordinates of each joint and gripping devices. Fig. 2, Ref. 2.

Auth.

13.C3.4. Features of the construction of contactless three-position dynamic object. /O. Labadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 66-70. – geo.; abs.: geo., eng., rus.

Ways of realization of control of contactless three position dynamic indicator based on the spent researches of various symmetric forms of magnets are considered in the paper. The originality of the found and installed features will provide not only the reliable operation of the control system, but it will also preserve the specific information of magnet system after removing the control pulse, reducing the consumption of energy used. Fig. 3, Ref. 4.

Auth.

13.C3.5. Modeling of dynamic systems based on computers. /D. Tsintsadze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 101-104. – geo.; abs.: geo., eng., rus.

The paper represents the issues of dynamic object simulation based on several computers and possibility of using the software interface. Fig. 2, Ref. 3.

Auth.

13.C3.6. Mobile robot control system./D. Purtskhvanidze/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 105-108. – geo.; abs.: geo., eng., rus.

The article considers advantages of use of an electric motor in the operation of the mobile wheel robot. The function chart of the mobile robot, the general scheme of a sensor subsystem is developed. The issues of design for informational-measuring and operational subsystems are discussed. Fig. 2, Ref. 2.

Auth.

C4. Mining. Metallurgy. Chemical Industry

13.C4.1. Referring to the issue of history of zinc in Georgia. /G. Tsirekidze, R. Chagunava/. Air Transport. – 2014. – # 1(9). – pp. 73-84. – rus.; abs.: geo., eng., rus.

Written sources and archeological data are considered, according to which zinc alloys have been used even before our era (B.C.). Aristotle's reference is given: "copper of mossinik's, most whitish and shiny that some kind of soil is mixed and dissolved in it». There is an opinion that the name of brass "messing" in many languages comes from the tribe name "mossinik" – the pioneers in obtaining this alloy. According to Georgian writing sources, zinc alloys and metal zinc have been already known in Georgia since the 11th-12th centuries. It is established that King Vakhtang VI introduced the Arabian-Persian term "tutia", which for 3 centuries have been used as a borrowed Georgian term to define metal zinc. Ref. 22.

Auth.

13.C4.2. On calculation of daily loads of stoping of mines of Tkibuli-Shaori coal deposit. /N. Kukuladze, T. Pirtskhalava, M. Basiladze/. Mining journal. – 2013. – # 1(30). – pp. 5-7. – geo.; abs.: rus., eng.

The frequency of joint fissures of large and medium amplitude throughout the Tkibuli-Shaori coalfield is found to be 2.5-times less than in other fields, where mechanized complexes are widely used. Given this circumstance, the employment of mechanized technologies in Tkibuli-Shaori coalfields is justified when the coal layers are worked according to the rise, with double faces, sloping layers with the transition to short faces in individual complex areas. The length of double faces is obtained: on the eastern flank of the basin - 200-250 m, the daily load - 3000-6000 tons; on the more frustrated west wing of the trough - 100-120 m, the daily loads - 1500-3000 tons. Fig. 2, ref. 3.

Auth.

13.C4.3. On the potential danger of sudden outburst of coal and gas at deep horizons of Tkibuli-Shaori coal field. /I. Tsintsadze, Z. Gordeziani/. Mining Journal. – 2013. – # 1(30). – pp. 8-14.– rus.; abs.: geo., eng.

For the purpose of regional prognosis of sudden outbursts of the coal and gas at the deep horizons of Tkibuli-Shaori coal field, the authors have analyzed the main outburst indicator: the depth of coal layer working, foulness of layers, gas pressure, thickness of coal layers and their structure, solidity of overburden rocks, coal microcracking and initial velocity of gassing from coals, volatility of

coals, ash content, moisture content, solidity and embrittlement. Every indicator has been evaluated and their interrelations and parameters of initiation of sudden outburst were established. It is concluded that the deep horizons of the field are liable to the risk of sudden gas outbursts. Fig. 5, Tab. 2, Ref. 15.

Auth.

13.C4.4. Analytical and numerical methods for solving problems of the stress-strain state of the massif around the tunnel. /L. Japaridze, T. Gobejishvili/. Mining Journal. – 2013. – # 1(30). – pp. 15-19. – geo.; abs.: rus., eng.

It is noted that lately in the world the practice of calculation of underground structures by numerical methods has almost driven out the analytical methods of continuous mechanics. While numerical methods are indispensable for some intricate problems of geomechanics, the analytical methods of the theory of elasticity for calculation of tunnels should be a subject of further study and development. A parallel solution of specific problems with the use of commercial computer software Phase 2. 7 of "Rockscience" and N.Muskhelishvili method of Theory of Elasticity was conducted. By the example of the tunnel of elliptical cross-section, it was shown that the analytical solution in some cases can be more accurate and comparatively easier as compared with the numeric one, especially when using the well-known program Matlab. Fig. 7, Ref.6.

Auth.

13.C4.5. Intensification of copper ore's flotation processes using the oil high temperature fractions. /A. Gigineishvili, D. Tevzadze/. Mining Journal. – 2013. – # 1(30). – pp. 21-22. – geo.; abs.: rus., eng.

The object of the research is the copper ore of Madneuli deposit with the content of copper 0.7%. A change in the electrode potential value as a result of influence of reagents on the surface of mineral in the flotation process has been shown. Based on the research data, the prospects of using high temperature fractions for dressing the poor copper ore of Madneuli deposit have been established. Tab. 1, Ref. 5.

Auth.

13.C4.6. The mixed and oxidated copper-pyrite ore-dressing technology of JSC "Madneuli". /B. Menabdishvili, A. Abshilava, N. Gugunishvili/. Mining Journal. – 2013. – # 1(30). – pp. 23-27. – geo.; abs.: rus., eng.

It is noted that lately, together with increasing the depth of mining the open-cast mines of JSC "Madneuli", the content of copper in ores has significantly decreased to very between 0.3–0.5%. All this caused the worsening of dressing's factory technological indices. Based on the results of laboratory research, an adjusted technological scheme is proposed, which envisages the grinding of flotation concentrates to 74 m (82–85%), 30-minute aeration and its further dressing in a separate cycle, as a result of which the concentrate's quality improved by 1.5–2.5%. At that, the extraction indices improve significantly. Fig. 5, Ref. 3.

Auth.

13.C4.7. On some questions of enrichment of Sazano pegmatites. /N. Gegia, D. Talakhadze, N. Shekrladze, T. Zuliashvili/. Mining Journal. – 2013. – # 1(30). – pp. 27-31. – geo.; abs.: rus., eng.

On the basis of mineralogical, chemical and grain-size analyses of technological samples of pegmatites of Sazano, the possibility of receiving a concentrate of potassium spar is established. The process flow diagram, including selective crushing and electromagnetic separation of the classified material, is developed. The received product satisfies the standard of the components of furnace charge necessary for production of china-ware, building ceramics, coating of welding electrodes, etc.. Tab. 1, Fig. 5, Ref. 6.

Auth.

13.C4.8. The method of flotation process control. /M. Gamtsemlidze, R. Enageli, A. Shekiladze/. Mining Journal. – 2013. – # 1(30). – pp. 32-34. – geo.; abs.: rus., eng.

The controlled and disturbing parameters of flotation process, which have the greatest effect on enrichment indices, are presented. The most widely used method of control, which regulates the

disturbing parameters, namely the consumption of reagents. To enhance the efficiency of control, a new method of systems control has been elaborated, which envisages regulation of the consumption of collecting and limiting reagents based on the variation of the ratio between the controlled disturbing parameters (pulp density, content of clay material in the pulp, the degree of foam mineralization). The solution of the mentioned system is presented in statics in the form of equations. The functional structure of automatic control of the flotation process is given and the principle of its operation is described. Fig.1, Ref. 3.

Auth.

13.C4.9. A crushing device given the control principle. /M. Gamtsemidze, R. Enageli, M. Tutberidze, G. Chkareuli/. Mining Journal. – 2013. – # 1(30). – pp. 35-38. – geo.; abs.: rus., eng. The process of crushing of hard-concentrated ores using an original crushing device is considered. The benefits of using such crusher are described. Fig. 4, Tab.1, Ref. 8.

Auth.

13.C4.10. Determination of arsenic content in the neighbouring area of Lukhumi arsenic field and recommendations about its reduction. /Z. Svanidze, G. Gunia, T. Tsertsvadze, L. Svanidze /. Mining Journal. – 2013. – # 1(30). – pp. 39-42. – geo.; abs.: rus., eng.

This work represents a test for determining the pollution degree of soil and water with toxic metals in Lukhumi arsenic field. The main objective of the research is to determine the quantitative content of arsenic in test objects. The Lukhumi arsenic field is one of the largest in Georgia and attracts attention in terms of economic and environmental protection aspects. Despite the fact that since 1992 the mining and processing of arsenic has been suspended there, the ecological situation is still grave, because of large amount of production waste left after closing of the chemical factory. The research results show that the content of arsenic in the test objects significantly exceeds the maximum permissible concentration. As for toxic metals, their content in the above region is less or approaches the maximum permissible concentration. Methods of soil cleaning are proposed in the form of recommendations. Tab. 2, Ref. 7.

Auth.

13.C4.11. On the explosive compacting of powders. /E. Chagelishvili, A. Peikrshvili, M. Tsiklauri, T. Pirtskhalava, B. Godibadze, A. Dgebuadze/. Mining Journal. – 2013. – # 1(30). – pp. 47-50. – geo.; abs.: rus., eng.

The investigation was carried out at Tsulukidze Mining Institute. Based on the principle of reconstruction of coal industry and the available experience of leading countries in this field, optimal technical solutions for exploitation of machine-operated systems for deposit conditions were developed. This implies a wide application of machines with cutting tools based on hard alloys obtained by powder metallurgy. A review of methods and possibilities of explosive treatment of porous materials is made. The set-up, furniture and correspondent mechanisms of shock wave loading as an integrated system and the ways of transfer the precursors in different thermodynamic level and structure/phase conditions are discussed too. Fig. 2, Ref. 6

Auth.

13.C4.12. Basic indicators of blast-hole drilling works on the construction of motor-car tunnel Mestia-Khaishi. /R. Mikhelson, S. Khomeriki/. Mining Journal. – 2013. – # 1(30). – pp. 51-56. – geo.; abs.: rus., eng.

The basic solutions about the blast-hole drilling works on tunneling the motor-car tunnel of Mestia-Khaishi in burrow rocks of 8th and 9th categories with transverse cross-sections of 98 square meters, carried out under the direction of the authors, are being presented. For the first time in domestic practice of tunnel construction, the technology of smooth explosion of charges with separation of transverse cross sections constructed on two independent stepwise stalls have been used in order to ensure the stability of exposed mountain rocks within the scope of the equipment, and maintaining natural structure of the mass during its explosive loading, also improving the circumstances of the installation of the roof bolting and lowering the expenses on the concrete during lining work process. The optimum values of blast-hole drilling work parameters, also data on total amount of the work expenses and special cost of the explosive materials are given and also the structure of the used

charges is considered. The technology is explained with the schemes of the borehole location in the stalls and the priority of the charges explosion. Fig. 5, Tab. 4, Ref. 6.

Auth.

13.C4.13. Methods for determining the velocity of detonation of industrial explosives. /Z. Kuchukhidze, A. Apriashvili, G. Bakhutashvili, G. Tkhelidze, D. Khomeriki/. Mining Journal. – 2013. – # 1(30). – pp. 57-59. – geo.; abs.: rus., eng.

The article describes the proven and globally accepted methods for determining the velocity of detonation of industrial explosives. The principles of both ionization and optical fibre systems are presented. The advantages and disadvantages of operating the above mentioned devices are given. The elaboration of a new type device for determining the velocity of detonation of industrial explosives is described. The operation of new device has been tested in field and laboratory conditions. The advantages of the developed device over its world analogues are grounded. Fig. 3, Ref. 4.

Auth.

13.C4.14. Generalized calculation algorithm of mechanical-pneumatic dampers for safe exploitation of pressure hydrotransport systems. /L. Makharadze, L. Gavasheli, S. Steryakova/. Mining Journal. – 2013. – # 1(30). – pp. 60-63. – geo.; abs.: rus., eng.

The generalized algorithm of mechanical-pneumatic dampers for safe exploitation of pressure hydro transport systems is discussed in the article. The working parts of them are made of flexible-plastic material with different shapes (spherical, torus, bellows-type, hose-type) and are the whole complex of hermetic flexible elements full with air. The algorithm completely foresees the parameters of all the elements, which are impacted by the sudden boost pressure during water hammer; like as: pipeline, liquid, which flows in it; damper body; adapter throttling pipe junction, by which damper is connected to pipeline; body working elements with air inside; flexible-plastic material, by which working elements of damper are made. Ref. 8.

Auth.

13.C4.15. Aerial tramway system for gripping and transportation of piece loads of different dimensions. /N. Iashvili/. Mining Journal. – 2013. – # 1(30). – pp. 63-65. – geo.; abs.: rus., eng.

An aerial tramway system for gripping and transportation of piece load of different dimensions: cases, barrels, sacks, boxes, rolls, bales etc. has been designed. The proposed design extends the capabilities of the system and eliminates the probability of load damage during gripping. Applications include cargo handling at railway stations, sea and river cargo ports, industrial construction sites, warehouses, in food and processing industry, etc. Fig. 1, Ref. 4.

Auth.

13.C4.16. On the specifics of the hydraulic calculation of storm water runoff from the underground premises. /V. Silagadze, M. Jangidze/. Mining Journal. – 2013. – # 1(30). – pp. 65-68. – geo.; abs.: rus., eng.

The article describes the scheme and how storm water runs off from the underground structures. Approaches to determine the choice of the estimated cost of drainage canals and pumping systems. Based on the analysis of long-term meteorological data for the region of showers Sagarejo found, that the integrated volume of run-off is often more with less intense rainfall. Therefore, for the final selection of the estimated volume of runoff should be analyzed for different rainfall intensities and duration of rain. Tab. 3, Ref. 3.

Auth.

13.C4.17. Concerning cutting inserts to reinforce tools of mining machines. /E. Chagelishvili, A. Peikrishvili, T. Pirskhalava, M. Tsiklauri/. Mining Journal. – 2013. – # 1(30). – pp. 68-72. – rus.; abs.: geo., eng.

The concept of technical development of Tkibuli-Shaori deposits (TShD) provides assembling of cleaning and tunneling complexes from conventional blocs according to individual projects that must be adapted with mining and geological condition of TShD. During the breaking of coal or breed range cover all power of cutting engines transmitted slaughtering through cutter that leads to their intensive wear. It's established, that in case of new annual design load capacity of TShD 3500K tone, only for execution of processes for cleaning the coal recess there is necessity in

125x10³pcs of standard cutting tools. The using of standard cutters in tunneling combine machines the period of operating time does not exceed 80-90 minute and share cost in depending of mining-geological conditions may be 37% and more depending on the cost of driving. There is given recommendation for projected mine of TShD to apply the strengthening technology of cutting tools developed by researchers of Tsulukidze Mining Institute based on hot explosive treatment diamond containing tools from WC and Co. The formation of transient zone between the cutting material and steel basis provides decreasing of stresses arising during the cutting process of rocks. From the other hand the diamond inclusions provides increasing of hardness and cutting characteristics of cutting tools too. Fig. 4, Ref. 13.

Auth.

13.C4.18. Vacuum drive as a belt bearing. /N. Molodini, R. Molodini/. Mining Journal. – 2013. – # 1(30). – pp. 73-75. – geo.; abs.: rus., eng.

The work process of a vacuum drum and belt bearing in the elastohydrodynamic regime is presented. Following the contact areas texture and analysis of results of the vacuum drive, the main calculation parameter here, as in the case of the belt bearing, is accepted the generalized Sommerfeld number (S_0); thereafter, according to a special special plot – “lubrication regimes of sluiding tribological situation” – the values of friction coefficient can be preliminarily estimated. Fig. 1, Ref. 6.

Auth.

13.C4.19. On the determination of the initial subsidence of loess soil pressure. /G. Chokhonelidze, Z. Kakulia, T. Iashvili/. Mining Journal. – 2013. – # 1(30). – pp. 75-77. – geo.; abs.: rus., eng.

The article discusses a new method of determining the value of the initial subsidence of loess soil P_s , which is based on the use of the limit equilibrium condition of the soil. Usually the value of the initial subsidence of soil P_s is determined by laboratory tests. Placed in compression device soil sample moistures and increases the vertical load on the ground. We measure the pressure, at which the deformation of the soil starts. We propose a definition of P_s by the test for shear resistance, i.e. subsidence P_s for this load corresponds the soil shear resistance S_p . Fig. 1, Ref. 3.

Auth.

13.C4.20. Evaluation of extreme events affecting the Caspian oil and gas pipelines in the Abul-Samsar volcanic Ridge (Georgia). /A. Okrostsvaridze, F. Pasquare, D. Tormey, D. Bluashvili, L. Vezzoli/. Mining Journal. – 2013. – # 1(30). – pp. 82-91.- eng.; abs.: rus., geo.

Identified and quantified are new seismic and volcanic hazards threatening the strategic Caspian oil and gas pipelines running through Georgia in the vicinity of the Abul-Samsari volcanic Ridge and evaluated arte the risk reduction and monitoring measures. As regards the seismic hazard, a major, NW-SE trending strike-slip fault is identified; based on an analysis of fault planes along this major transcurrent structure and about N-S trend of the maximum, the horizontal compressive stress (1) was determined, which is in good agreement with data instrumentally derived after the 1986, M 5.6 Paravani earthquake and its aftershock. Particularly notable is the strong alignment of volcanic vents along about N-S trend, that suggests a magma rising controlled by about N-S Directed 1. The result of our analysis is that the Baku-Tbilisi-Ceyhan (BTC) oil pipeline, as well the Baku-Tbilisi-Erzurum South Caucasian natural gas pipeline (SCP) were so designed as significantly reduce the risk posed by the newly-identified geohazards. However, since the consequences of long-term shut-down would be very damaging to the economies of Western Europe, we conclude, that the regionally significant BTC and SCP warrant greater protections, described in the final section of the work. The overall objective of our effort is to present the results in a matrix framework that allows the technical information to be used further in the decision-making process, with the goal of reducing the uncertainty in the final decision. Fig. 6, Ref. 30.

Auth.

13.C4.21. The method of measuring the form and size of a sample in testing stone materials for stretching. /N. Bochorishvili, N. Razmadze, N. Ratiani, I. Bochorishvili, M. Kitoshvili/. Mining Journal. – 2013. – # 1(30). – pp. 92-96. – geo.; abs.: rus., eng.

The work deals with the studies, which made it possible to establish the forms, sizes, accessories and other tools of samples necessary for studying the physical-mechanical features of construction materials. Based on systemic experimental studies, the work analyzes the resistance of hard materials on stretching, their dependence upon other affecting factors, scales of samples (size) and place of distribution of samples. Multiple experimental studies established rational use of natural use of natural construction and facing materials prolonging the life of building and improving their architectural design. Fig. 1, Tab. 3, Ref. 9.

Auth.

13.C4.22. Resistance of stone materials during pure start tension resistance. /N. Bochorishvili, N. Razmadze, I. Bochorishvili, N. Ratiani, M. Kitoshvili/. Mining Journal. – 2013. – # 1(30). – pp. 96-99. – geo.; abs.: rus., eng.

The work establishes a basic physical-mechanical feature of rocks – strength by rolling round profile axes. It should be noted that experiments on stone materials held by the same method may be used for getting interim resistance characteristics towards stretching. Especially it should be mentioned that the outcomes of lab experiments on stone materials do not give the absolute value of force impact resistivity, but rather the opportunity of conventional evaluation of the physical-mechanical characteristics of materials, which depends on testing sample type and methods of experiment. Ref. 12.

Auth.

13.C4.23. Once again on the precursors of earthquake. /L. Zuroshvili, R. Managadze, J. Zuroshvili/. Mining Journal. – 2013. – # 1(30). – pp. 101-104. – geo.; abs.: rus., eng.

The paper deals with the issues of earthquake prediction. In particular, it describes the effect of earthquakes on the atmosphere and the possibility of their prediction based on the disturbances in the layers of ionosphere. The paper is based on the results of studying the radiation of the layer F_2 of the ionosphere. The studies show a resemblance between the periods of vibration of several given parameters (such as, F_o the critical frequency) and the periods of seismic gravitation activities. Based on the example of the earthquake known as SAMACHABLO, which took place in 1991, an assumption is made that lengthy vibrations in the ionosphere are caused by seismic gravitational activities of the Earth. Fig. 5, Ref. 4.

Auth.

13.C4.24. Increase in cement mortar adhesion strength and improvement of cement stone adhesion with contact surfaces during well cementation. /G. Varshalomidze, V. Khitarishvili, G. Khetsuriani/. Mining Journal. – 2013. – # 1(30). – pp. 105-107. – geo.; abs.: rus., eng.

Increase in adhesive strength of cement stone with rocks containing borehole walls and with casting columns at the contact surface plays a key role in ensuring impermeability of annular space during well cementation. With this purpose we studied effect of special additives on the adhesion (agglutination) force of selected cement mortar and on the strength of adhesion of cement stone made from it with contact surface. It is determined that Concrepol addition into grouting mortar most of all increases strength of adhesion with contact surface. Its use in wells for carrying out of grouting works will significantly improve the quality of casting column cementation. Fig. 4, Tab. 1, Ref. 4.

Auth.

13.C4.25. Perlite use as cement active additive during well cementation. /G. Varshalomidze, V. Khitarishvili, G. Khetsuriani/. Mining Journal. – 2013. – # 1(30). – pp. 108-112. – geo.; abs.: rus., eng.

Grouting mixture manufacturing for well cementation is carried out taking into account the geological and technical conditions, in particular an addition of perlite rock as an active additive is recommended during cementation of fractured and absorptive intervals. Mixture of this composition is a light grouting mortar, from which is possible to receive strength cement stone. Fig. 3, Tab. 5, Ref. 3.

Auth.

13.C4.26. Requirements to technical safety upon receipt, delivery and storage of oil products at an petroleum storage depot. /A. Bezhanishvili, D. Dumbadze, J. Iosebidge, G. Mikadze, D. Vardoev/. Mining Journal. – 2013. – # 1(30). – pp. 115-118. – geo.; abs.: rus., eng.

Safety rules elaborated to ensure safe operation of petroleum storage depots are discussed. The operations subject to safety rules are enumerated. Ref. 2.

Auth.

13.C4.27. On the determination of the optimal length of lava under conditions of Tkibuli-Shaori coal deposit development. /T. Phirts Khalava/. Mining Journal. – 2013. – # 2(31). – pp. 15-17. – rus.; abs.: geo., eng.

It is shown that in the leading coal industry countries the a change in the lava length fromn 300 m up to 450 m has been common since the 1990s, which was one of the ways to improve the technical and economic indicators of underground coal mining. For specific geological conditions of the development of Tkibuli-Shaori field (TShM) a solution to the problem of finding the optimal length of lava $L_{l,opt}$ involved the development of an economic and mathematical model of the excavation site through subsequent differentiation of its implementation function. $L_{l,opt}$ value was determined by finding the minimum current cost C for 1 ton of coal in the first derivative of $f(L_l) = 0$. The calculation found that under conditions for TShM mining, a shuttle-like coal winning machine $L_{l,opt} \approx 120$ m, and from coal mining scheme with two harvesters $L_{l,opt} \approx 250$ m. Fig. 2, Tab. 1, Ref. 10.

Auth.

13.C4.28. Rock bump's forecast. /D. Kupatadze/. Mining Journal. – 2013. – # 2(31). – pp.18-21. – geo.; abs.: rus., eng.

The article considers one of the serious problems of control of rock bumps - their prediction, namely, determination of the time and place of origin of rock bumps in terms of their danger and degree on separate sites of layers. Several methods of prediction of possible rock bumps are considered, such as an analysis of mining and technical conditions, a complex method and a method of microseismic installations. Fig. 3. Ref. 4.

Auth.

13.C4.29. Static analysis of a single-span cut-and-cover tunnel. /L. Japaridze/. Mining journal. – 2013. – # 2(31). – pp. 21-25. – geo.; abs.: rus., eng.

An analytical apparatus for static analysis of a single-span frame of the cut-and-cover tunnel structures using the method of forces and displacements is considered. The work is stimulated by technical manual of the National Highway Institute of U.S. Department of Transportation (FHWA-NHI-10-034), where "the classical force and displacement methods to be used in the structural analysis of cut-and-cover tunnel structures" are recommended. Other numerical methods may be used, but will rarely yield results that vary significantly from those obtained with the classical methods. Fig. 3, Tab. 1, Ref. 5.

Auth.

13.C4.30. Application of the "slurry wall" technique in underground construction. /L. Japaridze, N. Kukuladze, T. Phirts Khalava/. Mining Journal. – 2013. – # 2(31). – pp. 25-29. – geo.; abs.: rus., eng.

The application of the slurry wall, or slurry trench technique in underground construction is considered as the most progressive method. The advantages of its application are enumerated. Fig. 3, Tab. 2, Ref. 11.

Auth.

13.C4.31. Modern surveying works in tunnel construction. /A. Kikabidze, I. Erkomaishvili/. Mining Journal. – 2013. – # 2(31). – pp. 30-33. – geo.; abs.: rus., eng.

The work deals with the problems that might arise during high-speed tunneling excavation and the ways of their solving. Considered is the applicable scope of a TBM combine for high-speed tunneling excavation, also a drilling-and-blasting way of tunneling; shown is the role of surveyor service for providing a high-speed tunneling excavation, also a monitoring system ZED-261, which provides high speed of excavation and monitoring accuracy. Fig. 3, Ref. 3.

Auth.

13.C4.32. Issues of selection of optimal technology for processing stored tailings of

Madneuli copper flotation mill. /N. Jikia, Ts. Dalakishvili, R. Sturua, D. Talakhadze, G. Gelovani, J. Sherazadishvili/. Mining Journal. – 2013. – # 2(31). – pp. 34-38. – geo.; abs.: rus., eng.

Processing of tailings stored during the operation period of Madneuli copper concentrating plant (since 1975) enables to produce an additional commercial product of copper and gold. The article presents a technology of preliminary concentration of valuable elements (copper and gold) from the stored tailings. The developed technology allows obtaining the copper-containing pyrite concentrate with 14.05% output; with copper content of 1.36 g/t, copper recovery 83,22%; with gold content of 3.78 g/t, with gold recovery 84.31. Fig. 1, Tab. 5, Ref. 4.

Auth.

13.C4.33. Technical requirements to the friction units of a vacuum drive. /N. Molodini, R. Molodini/. Mining Journal. – 2013. – # 2(31). – pp.38- 40. – geo.; abs.: rus., eng.

A list of friction units and designation of well-known vacuum-drive designs are given; the principal technical requirements to the elaboration and calculation of contact surfactes of vacuum drives are considered. Ref. 6.

Auth.

13.C4.34. Contemporary methods and guidelines for the protection against methane explosion in coal mines. /E. Mataradze, A. Bezhanishvili/. Mining Journal. – 2013. – # 2(31). – pp. 58-64. – geo.; abs.: rus., eng.

The paper overviews the standards applied in EU Member States as well as Georgian regulatory documents in the field of prevention and protection against explosions in coal mines and other hazardous industrial objects. An analysis shows the necessity of harmonizing the Georgian legislation and safety guidelines with the relevant EU standards. Fig. 2, Ref. 29.

Auth.

13.C4.35. Establishment of optimal conditions of fire extinguishing for extinguishing powders. /L. Gurchumelia, I. Gujabidze, F. Bejanov, V. Tkemaladze, L. Tkemaladze/. Mining Journal. – 2013. – # 2(31). – pp. 64-67. – geo.; abs.: rus., eng.

The work describes laboratory (experimental) methods developed taking into account the standard conditions of fires of different types that make it possible to determine the fire extinguishing time and the minimum consumption of extinguishing powders, also the dependence of the time of extinguishing on the intensity of powder supply. On the basis of such experimental researches, it is possible to establish the optimal conditions for extinguishing fires, implying the selection of optimal intensity of powder supply to the seat of fire, when the minimal specific consumption of the powder ensures extinguishing of the fires in the minimum time. Fig. 3, Tab. 1, Ref. 5.

Auth.

13.C4.36. Investigation of the process of plating with graphite copper. /G. Papava, V. Sherozia, N. Dokhturashvili, N. Maisuradze, M. Gurgenishvili. I. Chitrekashvili/. GEN. – 2013. – # 3. – pp. 48-52. – geo.; abs.: eng.

The article deals with the process of plating with graphite powder copper by using copper salt. The process is three-stage. The first stage consists in deposition of a copper dioxide layer on the graphite powder surface, the second – in its transformation into copper oxide, the third – in reduction of this oxide to crystalline copper. The results of investigation of the effect of the parameters of abovementioned processes on the plating quality are presented. Fig. 4, Ref. 9.

Auth.

13.C4.37. Development of high productivity mechanical cleavage technology of graphene-like nanoparticles manufacturing. /H. Weinert, V. Leshchynsky/. Nano Studies. – 2013. – # 7. – pp. 97-106. – eng.

Mechanical cleavage by scotch tape was the first method which was successfully applied by Geim and Novoselov to prepare free-standing graphene and has been proven to work on other layered materials, such as hBN₇ and MoS₂. During mechanical cleavage, the pulling force can easily break the weak van der Waals interaction between graphene layers and leave the strongly sp² bonded in plane structure intact. A shear stress can have a similar effect. Development and application of

shear-tension loading schemes to generate thin graphite platelets and MoS₂ sheets are the aim of this paper. The mechanically peeled 2D sheets have fewer defects than those produced by chemical methods. However, mechanical cleavage by Scotch tape has extremely low yield. If a mechanical process can be developed to treat tens of thousands of particles in one run and to peel each particle hundreds of times, a large number of high-quality nanosheets can be harvested for studies and practical applications. The novel ball and belt milling technology schemes and devices are applied for thickness reduction of layered materials and even for MoS₂ graphene-like nanoparticles production. The structure and properties of obtained materials are discussed. Fig. 9, Ref. 22.

Auth.

13.C4.38. Preparation Tm₃S₂ films by flash vacuum thermal evaporation. /M. Teteloshvili, Z. Jabua, A. Gigineishvili/. Nano Studies. – 2013. – # 7. – pp. 229-232. – rus.

A process is described for the growth of thin crystalline Tm₃S₂ films on different substrate (glass-ceramic, leukosapphire, single-crystalline silicon) by flash vacuum thermal evaporation from preliminary synthesized bulk crystal of Tm₃S₂. Thin films had Ti₂O₃-type cubic crystal structure with lattice parameter $a=12.47\text{\AA}$. Using the method of X-ray microanalysis, it was shown that obtained films contain 40.1at.%Tm and 59.9at.%S. According to the secondary X-rays image of the surface of prepared films, the components Tm and S are distributed on a surface homogeneously. Fig. 3, Ref. 12.

Auth.

C5. Mechanical Engineering. Instrument-making

13.C5.1. The determination of slide ratio of wheeled furrower. /T. Janelidze, V. Samkharadze/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 211-213. – geo.; abs.: geo., eng., rus.

A method of reducing the slide ratio of a wheeled furrower with the functioning surface of transitional radius is described. It was divided into three constituent with possibility of rotation independently of one another. The laboratory, field and industrial experiments of the wheeled furrower on Kolkheti Lowland showed that the above-mentioned working body can cut the temporary drainage furrows to ensure the admission and passage of surface waters. Fig. 1, Ref. 3.

Auth.

13.C5.2. A new type of flexible structure. /D. Pirkulashvili/. Building. – 2013. – # 2(29). – pp. 133-137. – geo.; abs.: geo., eng.

The article presents a new type of transformable structure, its description of the principle of operation. The structure consists of two parts, the opening is provided with the pneumatic cushions and the support brackets, and the folding is achieved by twisting a steel rope on the reels. A metal arched frame and pneumatic cushions are used as the bearing elements. Fig.7, Ref. 1.

Auth.

13.C5.3. Scanning tunneling microscope – a device to see atoms and molecules. /Ts. Ramishvili/. Nano Studies. – 2013. – # 7. – pp. 335-342. – geo.

The article is dedicated to the memory of the recently deceased Swiss physicist Heinrich Rohrer, Nobel laureate and one of the authors, creators of the scanning tunneling microscope, which made it possible for the first time to see the atoms on the surface of materials. Fig. 4, Tab. 1, Ref. 2.

Auth.

13.C5.4. Acoustic spectrometer. /D. Driaev, K. Kakhiani, F. Akopov, S. Tsakadze/. Nano Studies. – 2013. – # 8. – pp. 283-288. – rus.

A device for measurement of internal friction and the elasticity module in solids, in which losses on external friction are minimized by use as a sample vibrator of a tuning fork of new (three-reed) type is described. Fig. 2, Ref. 3.

Auth.

C6. Light Industry

13.C6.1. Deep purification of water-borne wastes of spinning and cotton manufacturing by ultrafiltration method. /A. Sarukhanyan, V. Shamyam/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 165-169. – rus.; abs.: geo., eng., rus.

Diaphragm technology more and more takes up the leading positions in the spheres of deep purification of residential water supply and especially of industrial waste waters, forcing out such traditional methods as water clarification, filtration, floatation, sedimentation, adsorption, ozonization. In industrial waste waters treatment the diaphragm technology for the most part is a supplement to these methods and is used as the final stage of deep purification. This paper for the first time suggests to purify sulfur dyeing waste waters from sulphides in thinlayer sedimentation reservoirs, reducing the portion of mineral coagulant bivalent iron sulphate from 3,0-3,5 g/l to 400-700mg/l and the final purification carry out by a ultra filtration equipment operating by a simplified procedure. Fig. 3, Tab. 1, Ref. 7.

Auth.

13.C6.2. Regulation of a range of products through the optimization of standard parameters. /M. Grdzeldze, M. Shalamberidze/. Goni. – 2014. – # 1. – pp. 48-56. – geo.; abs.: geo., eng.

The methods of regulating standard footwear sizes and forming new size ranges are discussed. Tab. 3, Fig. 1, Ref. 3.

Auth.

13.C6.3. The development of a principal concept of a dummy with the non-statistical surface. /M. Datuashvili, I. Charkviani/. GEN. – 2013. – # 3. – pp. 109-111. – rus.; abs.: eng.

The article deals with the problems of the use of dummies in the process of individual manufacture of garments. The process of fitting is a rather difficult and tedious process for both the manufacturer and the consumer. The task was to design a universal dummy with the non-statistical surface, through moving individual segments of which a figure identical to the required figure can be achieved to successfully replace the required object in the process of making customer-tailored clothes. Fig. 1, Ref. 3.

Auth.

C7. Food Industry

13.C7.1. New technology of production of antioxidant beverages from wild blueberries and blackberries. /N. Baghaturia, N. Begiashvili, E. Uturashvili, G. Grigorashvili, I. Kupatadze, A. Khotivari, V. Nakopia/. Agrarian-economic Science and Technologies. – 2014. – # 1. – pp. 57-61. – geo.; abs.: geo., eng.

The physical and chemical characteristics of the beverages made of blueberry and blackberry fruit were studied and their antioxidant activity was determined. On the basis of the conducted research, the beverages were found, besides containing useful substances, to be rich in antioxidants (polyphenols, vitamin C). Given their high antioxidant activity, they can be used by the general public for medical-preventive purposes to prevent and treat many dangerous diseases and their complications. Tab. 1, Ref. 3

Auth.

13.C7.2. Research in the technology of natural bread conditioners. /N. Baghaturia, N. Begiashvili, L. Kotorashvili, M. Ormotsadze, B. Baghaturia/. Agrarian-economic Science and Technologies. – 2014. – # 1. – pp. 62-69. – geo.; abs.: geo., eng.

Technology of producing natural bread conditioners developed in Georgia is considered. It is based on the extraction of hydropectine from the fruits of wild plants - hawthorn, dog rose, sea-buckthorn and jujube. The possible use of the obtained hydropectine in bakery production has been scientifically based and experimentally substantiated. Ref. 5.

Auth.

3.C7.3. Feijoa fruit quick freezing method to determine the optimal conditions for storage.

/E. Uturashvili, I. Kupatadze, M. Demeniuk, L. Kotorashvili, I. Moistsrafishvili, Z. Alania/. Agrarian-economic Science and Technologies. – 2014. – # 1. – pp. 70-75. – geo.; abs.: geo., eng.

The work presents the research results of quick freezing storage method of the unique plant feijoa that has useful and medicinal properties. The optimal conditions for the feijoa fruit freezing, storage, transportation and defrosting are studied and established. On the basis of the obtained results it is established that the feijoa fruits frozen with the quick freezing method can be stored for 10 months with minimal losses and maximal keeping of useful properties. Tab. 1, Ref. 3.

Auth.

13.C7.4. Hygroscopic properties of dried savory and marigold. /N. Alkhanashvili, L. Ejibia/.

Agrarian-economic Science and Technologies. – 2013. – # 3. – pp. 45-50. – geo.; abs.: geo., eng.

To establish the optimal conditions of dried and ground savory (*Satureja hortensis* L.) and marigold (*Tagetes patula* L.), their hygroscopic properties were studied in glass vessels specifically made for this purpose, which make it possible to observe moisture sorption kinetics of the product. In experiments, specific humidity of the ambient air varied within 20-90% at 18-20⁰ temperature. The experimental results were processed by building sorption isotherms, which reflect dependence of the product's equilibrium moisture on the relative humidity at the given temperature. When the product's humidity is known, the sorption isotherms make it possible to select such conditions of savory storage that exclude moisture sorption or desorption. According to an analysis of the sorption kinetics observation results, the speed of moisture sorption by the product during different relative humidity is different. During the high relative humidity the main portion of humidity will be absorbed by the product in 4-6 days from the beginning of the experiment. Long-term storage of savory and marigold in a storage where the relative air humidity is 75% at 18-20⁰ temperature is not recommended. Fig. 2, Tab. 1, Ref. 4.

Auth.

13.C7.5. Development of a cost-effective artificial savory drying technology. /N.

Alkhanashvili, M. Demeniuk/. Agrarian-economic Science and Technologies. – 2013. – # 3. – pp. 51-57. – geo.; abs.: geo., eng.

An artificial savory drying technology developed at the Research Institute of Food Industry, including the preparation of the raw material for drying, drying, dried savory inspection, milling and packing, is presented. The characteristics of savory, as an object of drying, were studied, the drying method and the dryer's design were selected and the optimal drying mode was established. Fig. 3, Tab. 1, Ref. 3.

Auth.

13.C7.6. Investigation of protective activity of wild plum pectin. /N. Baghaturia, I. Kupatadze,

Sh. Muladze/. Agrarian-economic Science and Technologies. – 2013. – # 3. – pp. 58-63. – geo.; abs.: geo., eng.

Experiments on laboratory animals (albino rats) the functional changes in the organism upon lead intoxication against the background of taking a pectin preparation obtained from wild plums (tkemali) have found that the pectin preparation interferes with the accumulation of lead in the organs and tissues of the laboratory animals and facilitates the detoxification process. Tab. 2, Ref.

4

Auth.

13.C7.7. Application of Georgian wines for medicinal purposes – essential component of a new trend – preventive medicine. /T. Tsivtsivadze, N. Chigogidze, R. Kldiashvili, E. Chigogidze,

R. Skhiladze, Zh. Gabrichidze, G. Sulakvelidze/. GEN. – 2013. – # 3. – pp. 63-66. – rus.; abs.: eng.

The article deals with a new trend – preventive medicine. Prevention of such serious and dangerous diseases as hypertension, atherosclerosis, heart attack, and apoplexy, which in 70% of cases are the cause of death, should be carried out as early as possible, even at a young age. During aging, blood vessels inevitably accumulate unhealthy symptoms. The concept of treatment without drugs on the basis of moderate consumption of aged Georgian wines made of unique endemic grape varieties was developed. The data on the chemical composition of Georgian wines and their unique bioactive components are considered. The prospects for therapeutic and prophylactic use of Georgian wines in preventive medicine, reducing the risk of serious diseases and their further development are discussed. As a result of our long-term and wide-ranging research, a universal complex non-alcoholic wine concentrate from Georgian red wines was elaborated. It is a source of natural antioxidants – bioflavonoids, polyphenolic compounds, stilbene, terpenoids, plant steroids, lactones, etc. Furthermore, it comprises fructosyl derivatives of amino acids and fructo-peptids that provide a stimulating effect on progenitor cells of the spinal cord, which is especially important in cancer radiotherapy. The concentrate is suitable for intensive children's nutrition as it contains no alcohol. The product is very useful for athletes during their physical training for a competition, because it is a natural stimulator and an energy tonic. The protective action on blood vessels is a distinctive peculiarity of natural red wines, which is expressed strongly by the Georgian varieties Saperavi, Dzvelshavi, Tavkveri, Ojaleshi, Akhasheni, Mukuzani, Teliani, Napareuli, etc. Ref. 9.

Auth.

13.C7.8. Nanosilver in the red winemaking technology and the inhibition of oxidation of phenol compounds. /N. Ebelashvili, L. Shubladze, Sh. Shatirishvili, N. Bibiluri, D. Okruashvili, M. Mdinaradze/. GEN. – 2013. – # 3. – pp. 67-80. – rus.; abs.: eng.

The content of catechines, flavanols, carboic acids and vanilic aldehyde was determined in red wine at different stages of the production process by high-performance liquid chromatography (HPLC). It was revealed that after lactic fermentation and removal of the wine from the residue, the treatment of the wine with 0.6 mg/dm³ nanosilver is very effective for inhibiting the oxidation of phenol compounds in the wine storage process. Fig. 10, Ref. 10.

Auth.

13.C7.9. Investigation of the impact of the application of nanostructured silver during the process of drawing over the white wine material on wine characteristics. /N. Ebelashvili, M. Melikishvili, G. Mikadze/. GEN. – 2013. – # 3. – pp. 81-84. – geo.; abs.: eng.

Cadifite and different doses of nanostructured silver were used during the process of drawing over the wine material produced from the Chinuri grape cultivar. Two months later the following parameters were determined in the wine material: basic conditional characteristics, total content of phenol compounds, and concentrations of tartaric, malic and lactic acids. It was found that in the course of drawing over the wine material, 50 mg/l cadifite (sulfur dioxide) and 0.6 mg/l had an identical effect on the characteristics of the wine material. Tab. 1, Ref. 12.

Auth.

13.C7.10. Selection of chromatographic columns and determination of the operational characteristics for detection of terpene compounds in grapes and wine. /M. Khositashvili, Z. Okropiridze, T. Kituashvili/. GEN. – 2013. – # 3. – pp. 84-86. – geo.; abs.: eng.

The article deals with the selection of gas-liquid chromatographic columns and the determination of the operational characteristics for quantitative and qualitative analyses of terpene compounds in grapes and wine. Ref. 4.

Auth.

13.C7.11. Identification of volatile components of grapes and wine and their quantitative calculation. /M. Khositashvili, Z. Okropiridze, T. Kituashvili/. GEN. – 2013. – # 3. – pp. 87-89. – geo.; abs.: eng.

The article deals with the identification of volatile substances in grapes and wine and their quantitative determination by gas-liquid chromatography. The Kovats index was determined for some of volatile aromatic components. Tab. 1, Ref. 4.

Auth.

13.C7.12. Bee products – source of biologically active substances. /D. Tavdidishvili, Ts. Khutsidze, M. Pkhakadze/. GEN. – 2013. – # 4. – pp. 134-137. – geo.; abs.: eng.

Nowadays it is topical to use natural, ecologically safe raw materials rich in essential nutrients in the production of food. Among such raw materials, bee products deserve a special attention. The article deals with the composition and the content of biologically active substances of traditional and insufficiently known bee-farming products, the spectrum of their physiological effects, their impact on the human organism and their applicability in food, pharmaceutical and other industries. Fig. 1, Ref. 6.

Auth.

13.C7.13. The prospects of small business development in food industry of Georgia. /M. Sanikidze/. Ekonomisti. – 2013. – # 1. – pp. 74-80. – geo.; abs.: eng., geo., rus.

SMEs are a substantial and integral part of a market economic system. Several factors, such as peculiarity of the sectoral structure of Georgia, terrain, climate conditions and population density, generate the need for the development of small and medium-sized enterprises. According to baseline surveys by Georgian municipalities, the majority of existing enterprises are small or medium. Most of them are engaged in food industry. In spite of the fact that SMEs are found in every region of Georgia, the share of their production level is relatively low in total output (5.4%). It should be noted that there is a good opportunity for Georgia to produce environmentally safe and competitive goods in the rural sector and a long-term perspective to actively participate on the world market. Ref. 6.

Auth.

C8. Construction. Architecture

13.C8.1. Permanent frameworks in monolithic house-building. /Z. Ezugbaia, I. Iremashvili, L. Chaladze, A. Ezugbaia/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 64-71. – geo.; abs.: geo., eng., rus.

The issues of application of highly effective permanent frameworks in monolithic house-building are discussed. The modern products of MANTO, FIRA, TISSEN, NOE, MEVA, VELOX and other companies are proposed, the application of which might significantly reduce the total cost, labor cost and terms of construction. Fig. 13, Ref. 4.

Auth.

13.C8.2. A complex of floating hydraulic engineering structures of a new type storm mitigation system and prospects of its application. /A. Prangishvili, Z. Tsikhelashvili, T. Gvelesiani, T. Batsikadze, N. Chkheidze, G. Dolidze/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 179-182. – geo.; abs.: geo., eng., rus.

A complex of engineering structures for effective sea storm waves damping is proposed. At first its location is planned in the sea shelf at some distance from the shore zone (Batumi Boulevard and Adlia Airport). The purpose of the complex is both the decrease of the sea shore (beach) washing out and the improvement of functioning of a rainfall sewerage system under storm conditions. Also, the construction of breakwaters in the Batumi and Poti port areas would be possible. Ref. 5.

Auth.

13.C8.3. On some problems of plasticity theory. /T. Batsikadze, V. Sokhadze/. Building. – 2013. – # 2(29). – pp. 6-12. – geo.; abs.: geo., eng.

The article considers the modern problems of plasticity theory that have arisen due to creation of a wide range of new composite materials characterized by anisotropic properties in construction practice on the one hand and modern technological processes on the other hand. Ref. 5.

Auth.

13.C8.4. The engineering solutions of building's walls. /Sh. Bakanidze, B. Surguladze, N. Mskhiladze, I. Chitadze/. Building. – 2013. – # 2(29) – pp. 13-19. – geo.; abs.: geo., eng.

The options of engineering solutions of load-bearing walls of a building are considered. The options of single-layer and double-layer walls made of different materials are compared in terms of technical and economic indices. The changes in material capacity and cost of the walls according

to the building's number of stories are analyzed. The favorable option of the engineering solution of the walls is found. Fig. 4, Tab. 5, Ref. 3.

Auth.

13.C8.5. A new engineering solution of a composed wood-metal triangular girder truss. /T. Khmelidze, G. Kavtaria, D. Jugashvili/. Building. – 2013. – # 2(29). – pp. 20-26. – geo.; abs.: geo., eng.

The nomenclature of wood-metal girders applied in construction, their positive and negative features are considered. A new option of a composed wood-metal triangular girder trusses is proposed. A comparison table of the economic indicators of different types of load-bearing structures of the 18m-spanned overhead cover is made. Fig. 4, Tab. 1, Ref. 6.

Auth.

13.C8.6. General characteristics of city-forming factors. /N. Tevzadze, B. Tatishvili/. Building. – 2013. – # 2(29). – pp. 32-35. – geo.; abs.: geo., eng.

The article reviews city-forming factors: relief, water resources, green plantations, and climate. Specific characteristics of these factors are identified and in each specific case the necessity of appropriate account of several or all of the factors is determined. The city-forming factors are presented as necessary prerequisites for creation and development as well as architectural and artistic expression of populated areas. Ref. 2.

Auth.

13.C8.7. Stability of a uniformly distributed in two directions load-pressed and contour-supported homogeneous plate. /A. Kvaratskhelia/. Building. – 2013. – # 2(29). – pp. 36-40. – geo.; abs.: geo., eng.

The article gives a solution of structural mechanics task of homogeneous plates. The precision degree of the obtained results is analyzed. A comparison of the obtained results with the exact solution has shown that for all the values characterizing the plate's stress-strain state the error of the proposed theory does not exceed 5% and is generally in the range of 0.5-3%. Ref. 5.

Auth.

13.C8.8. Stress of a uniformly loaded body given the originated volume forces. /N. Berishvili, R. Giorgobiani, G. Javakhishvili/. Building. – 2013. – # 2(29). – pp. 41-44. – eng.; abs.: geo., eng.

The work considers the state of stress of a prismatic body loaded by three-sided compressive, uniformly distributed, external load. The obtained solution indicates of the arising of tension stresses in definite parts of the body, i.e. unlike a similar classical task, the state of non-uniform stress is observable. Fig. 1, Ref. 3.

Auth.

13.C8.9. The load-carrying (strength) capacity of reinforced concrete structures at static and seismic impacts. /L. Avalishvili, D. Revazishvili, Kh. Gorjoladze/. Building. – 2013. – # 2(29). – pp. 45-50. – geo.; abs.: geo., eng.

The present work deals with a theoretical research of seismicity of reinforced concrete skeleton constructions; in particular, by computer computations within one-mass dynamic design diagram and by variation of geometric parameters of the reinforced concrete elements the seismic stresses for up to 8 or 9 magnitude seismic intensity loads were obtained. The result in the form of a table will significantly simplify the designer's efforts. In addition, the investigated skeleton structure's dynamic and static load-bearing capacity (strength) characteristics were computed and compared with similar results of an experimental study of identical reinforced concrete skeleton structure. The causes of the dynamic strength increase as compared with the static one are explained. Fig. 2, Tab. 3, Ref. 5.

Auth.

13.C8.10. Superplasticizers - effective means of new generation concrete making. /M. Turdzeldze, I. Loladze, Z. Karumidze/. Building. – 2013. – # 2(29). – pp. 51-54. – geo.; abs.: geo., eng.

The article considers the role of concrete mixture diluting, plasticizing additives in high-strength concrete fabrication; the classification according to compounds and the principal effect of the mechanism of action given; the mechanism of action of the new generation of superplasticizers (polycarboxylites and polyacrylates) and efficiency in hyper-dilution of mixtures are presented and explained. Fig. 1, Tab. 1, Ref. 11.

Auth.

13.C8.11. Realization and problems of urban planning projects of residential areas of the 1960s-1980s. /M. Bolkvadze/. Building. – 2013. – # 2(29). – pp. 55-57. – geo.; abs.: geo., eng.

The realization of urban planning projects of new housing development in Tbilisi in the 60s-80s and the follow-up construction problems are discussed. Such an analysis will facilitate the perspective development of these districts. Ref. 3.

Auth.

13.C8.12. Modern composite building materials. /L. Ugulava/. Building. – 2013. – # 2(29). – pp. 58-60. – geo.; abs.: geo., eng.

The history of composite materials, preconditions of their making, their components - the matrix and fillers are considered. Fig. 1, Ref. 2.

Auth.

13.C8.13. Effective self-hardening concrete used in construction. /A. Nadiradze/. Building. – 2013. – # 2(29). – pp. 61-64. – geo.; abs.: geo.

Research in self-hardening concrete and its wide application have begun since 1980, in 15 countries worldwide, including Georgia. For production of self-hardening concrete the well-known super plasticizers are used in addition with the new polymeric polycarboxylite. As a result, fluid of the concrete mix significantly increases, conditioning its self-hardening. The concrete is recommended to be used in the prefabricated reinforced concrete industry, as well as in the construction of monolithic structures, restoration and reinforcement of structures. Tab. 1, Ref. 4.

Auth.

13.C8.14. Determining minor elastic plastic deformations in an inclined cylindrical shell. /I. Kakutashvili, N. Javakhishvili, L. Korganashvili/. Building. – 2013. – # 2(29). – pp. 72-77. – geo.; abs.: geo., eng.

The calculation tasks of thin-walled structures, when non-elastic deformations are to be taken into account, are associated with considerable difficulties caused by the non-linear dependence between stresses and deformations. For solving such problems, most convenient in terms of a numerical realization is the A. Iliushin's minor elastic-plastic deformation theory. However, despite the relative simplicity, the computed stiffness is so important that the obtaining of actual numerical results in the case of strong physical non-linearity will be possible only in the case of definite types of boundary problems. Fig. 3, Ref. 3.

Auth.

13.C8.15. Technological solutions for replacing bearing walls. /I. Kvaraia/. Building. – 2013. – # 2(29). – pp. 82-85. – geo.; abs.: geo.

The paper discusses a technological process of replacing an old brick building and the overall load-bearing wall with a concrete wall. This became necessary after reconstruction of the existing building for proper connecting the old and new built parts. After that, along the entire length of reinforced concrete bearing wall long-span ribs merged the old and new spaces were arranged. Most important, it enabled the making of communication channels, which could not be done in the brick wall. Fig. 2, Ref. 2.

Auth.

13.C8.16. Concept of future concrete and its realization prospects. /M. Turdzeldze, L. Loladze/. Building. – 2013. – # 2(29). – pp. 98-102. – geo.; abs.: geo.

The article considers the key trends for realization of a new generation concrete concept. The main focus is made on concrete modification due high-tech, cost-effective and more comprehensive

materials. The prospects of the high-performance concrete production using local resources and industrial waste are shown. Ref. 5.

Auth.

13.C8.17. Basics of computation of wooden structures having toothed metal plates by application of the computer program APM WORD. /G. Kavtaria/. Building. – 2013. – # 2(29). – pp. 108-113. – eng.; abs.: geo., eng.

The article considers the succession of computation of the strength of wooden structures and the development of a geometric model of the structure by application of the APM WORD computer program. Fig. 12, Tab. 1, Ref. 3.

Auth.

13.C8.18. Review and classification of pneumatic structures. /D. Pirkulashvili/. Building. – 2013 – # 2(29). – pp. 114-116. – geo.; abs.: geo., eng.

This article provides an overview of pneumatic structures and classification of them. Described are all the common forms of these structures, the general characteristics and the application area. Tab. 1, ref. 2.

Auth.

13.C8.19. A simplified linear calculation method of a skeleton construction with seismic insulation. /L. Kakhiani, I. Saladze/. Building. – 2013. – # 2(29). – pp. 124-128. – geo.; abs.: geo., eng.

The article considers a seismic insulation system located in the foundation of a skeleton construction, its calculation methods and design. Fig. 2, ref. 5.

Auth.

13.C8.20. The dynamics of massive foundations. /T. Batsikadze, N. Murgulia, J. Nizharadze/. Building.–2013.– # 2(29). – pp. 146-150. – geo.; abs.: geo.

The work deals with oscillation of a massive foundation given the effect of inertness of the elastic support/foundation. The model of the base is chosen as a semicircle described by the approximate differential equation. The elastic constants of this differential equation were chosen in such mode that the results are as close as possible to the results of the obtained solution of the more exact equation. Fig. 3, ref. 3.

Auth.

13.C8.21. The effect of elastic inert foundation on the structure seismicity. /N. Murgulia, L. Sambakhidze, L. Kristesiashvili, E. Kristesiashvili/. Building. – 2013. – # 2(29). – pp. 151-154. – geo.; abs.: geo., eng.

The effect of combined inert soil foundation (Vlasov-Leontiev) on the dynamic characteristics of the frame structures is considered in the article. The calculation of seismicity is carried out by taking into account different categories and specified parameters of the soil. Ref. 4.

Auth.

13.C8.22. Influence of elastic inertial soil on the structure seismicity. /N. Murgulia, L. Sambakhidze, L. Kristesiashvili, E. Kristesiashvili/. Building. – 2013. – # 2(29). – pp. 155-158. – geo.; abs.: geo., eng.

Influence of combined inertial soil on the dynamic characteristics of the frame structures is considered in the article. Calculation of seismicity is carried out by taking into account different categories and specified parameters of the soil. Fig.3, Tab. 1, Ref. 5.

Auth.

13.C8.23. Analysis of building's operational conditions under limited development conditions. /K. Korkia/. Building. – 2013. – # 2(29). – pp. 163-167. – Geo.; Abs.: Geo., Eng.

The work considers the impacts of development of adjacent architectural heritage-listed buildings under limited urban development conditions that served as causes of deformations developed in the foundations and wall settings. Fig. 2, Ref. 5.

Auth.

13.C8.24. Architects professional ethics issues in Georgia. /D. Abuladze/. Building. – 2013. – # 2(29). – pp. 168-171. – geo.; abs.: geo., eng.

The article considers the issues of architects professional ethics and its importance in the independent architectural activity. The regulations of ethics and the necessity of their universal recognition and training in them at any stage of education are grounded. Ref. 6.

Auth.

13.C8.25. 35 Years of the Enguri arch dam. /G. Gabrichidze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 55-58. – eng.; abs: eng., geo.

The design of Enguri arch dam is recognized to be a striking example of engineering to date. The height of the dam is 271 m, the length of crest is 700 m. 1.1 billion tons of water is accumulated in the reservoir of the dam. For 35-years of service of Enguri hydrosystem, the programs of its rehabilitation were accomplished several times. Unfortunately, some problems planned in the program of rehabilitation were not studied at all. In particular, the assessment of the behaviour of the arch dam at strong seismic loading possible in the region was not made. The program of responding to the emergency situation created at possible break of the dam was not developed. These problems were considered to be very important and were discussed at the meetings held in 2004 within the above-mentioned program of renovation. Later they were emphasized in my reviewing paper. Some additional commentaries to the above-mentioned report are presented in the paper. Ref. 3.

Auth.

13.C8.26. Assessing the tunnel construction technical level. /R. Mzhavanadze/. Mining Journal. – 2013. – # 1(30). – pp. 19-21. – geo.; abs.: rus., eng.

A model to assess the technical level (TL) of the tunnel construction process is considered on the basis of an integral criterion taking into account the possible indices of this technology (labor-intensiveness of works, inputs of manual labor and time on a production unit) stipulated by using the appropriate technological decisions. On the basis of an analysis of the tunnel construction process flowsheet development, taking into account the available experience of building complex criteria, a coefficient of the technological level of preparatory mining operations has been elaborated. Fig. 1, Ref. 3.

Auth.

13.C8.27. Investigation of the possibilities for reinforcement of building structures with textiles from untwisted yarn. /T. Moseshvili, N. Meparishvili/. GEN. – 2013. – # 3. – pp. 103-105. – rus.; abs.: eng.

The article deals with the application of textile reinforcement of various types to concrete building structures. The advantages of the textile reinforcement in light and thin structures over the metallic one are demonstrated. The structure of knitted fabrics from untwisted yarn and the theoretical aspects of their use as reinforcement in concrete structures are discussed. Fig. 2, Ref. 3.

Auth.

C9. Agriculture and Forestry. Fishery

13.C9.1. Feasibility of obtaining non-traditional fodder for cattle-raising from mulberry leaf coarsened in autumn (sprouts and shoots) and its economic efficiency. /G. Nikoleishvili, A. Chagelishvili, T. Dalalishvili/. Agrarian-economic Science and Technologies. – 2014. – # 1. – pp. 51-56. – eng.; abs.: geo., eng.

Coarse autumn leaves (sprouts and shoots gathered in autumn) of the recommended mulberry varieties by their nutritive component composition have great advantage over other hardwood trees and are successfully used as fodder in cattle raising. Thoroughly dried mulberry leaf contains raw protein 15.72%, raw fat 7.41%, raw cellulose 15.4%, nitrogen-free compounds - 47.93% and ash - 13.80%. It should be stated that application of ferments capable to degrade cellulose enables us to

use sprouts and shoots as fodder for ruminant and non-ruminant animals. In Georgia, through perfection of the technologies of obtaining non-traditional fodder from coarse mulberry leaf gathered in late autumn will significantly speed up the restoration of nutritive base of sericulture and will maximally increase production of cheap non-traditional fodder. Ref. 3.

Auth.

13.C9.2. Georgian sericulture has no future without introduction of new technologies. /G. Nikoleishvili, E. Shapakidze/. Agrarian-economic Science and Technologies. – 2013. – # 4. – pp. 42-56. – geo.; abs.: geo., eng.

Technology and techniques of technological processes in silk production, through which it is possible to revive local sericulture, are discussed in this paper. Silkworm production sheets have been developed. A stationary installation for rearing silkworms simultaneously with the removal of litter outside the cocoonery has been designed; several modules of the design have been fabricated and introduced in farms of Terjola district. Fig. 10, Tab. 1, Ref. 5.

Auth.

13.C9.3. Some bio-ecological features of olive-tree under conditions of Kutaisi. /R. Kiladze, E. Gubeladze/. Goni. – 2014. – # 1. – pp. 6-7. – eng.; abs.: geo., eng.

The prospects of planting olive-trees in Georgia, in particular in Kutaisi, given their bio-ecological properties, are discussed. It is mentioned that under Kutaisi conditions the olive tree buds intensively grow in spring, slowing down in summer. Strong winds and abundant precipitation interfere with the pollination and reproduction process. Therefore, the olive-trees are recommended to generally cultivate for decorative purposes in parks at any time of the year. Ref. 2.

Auth.

13.C9.4. Problems and prospects of the tea production development. /V. Modebadze/. Law and Economics. – 2013. – # 4. – pp. 83 – 89. – geo.; abs.: geo., eng., fren.

This article analyzes problems and perspectives of the development of tea production in Georgia. The crisis in the field of tea industry is caused by a great number of specific factors, the analysis of which is vital for our country. Tea production is the field that can solve a great number of social problems and play a decisive role in reducing economic crisis. Fig. 2, Tab. 4, Ref. 7.

Auth.

13.C9.5. Peculiarities of inheritance of traits in hybrids of the second generation obtained by crossing Georgian endemic species and aboriginal varieties of wheat. /P. Naskidashvili, I. Naskidashvili, M. Naskidashvili, T. Loladze, Q. Mchedlishvili, N. Merabishvili, N. Gakharia/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 93-99. – eng.; abs: eng., geo.

The present paper shows that in plants surviving from lethal genetic phenomena (effect of lethal genes) the inheritance of dominant morphological traits of paternal plants is of monogenic nature (single gene inheritance) and the obtained segregation corresponds to theoretically expected one at the following ratio 3(dominant):1(recessive). It was established that early heading (early ear formation) time dominates in the second generation, while in hybrids obtained with participation of endemic species heading time characteristic of endemic species dominates. Resistance to yellow and brown rust dominates in plants of the second generation obtained with participation of endemic species. It is also shown that inheritance of plant height in plants segregated in the second generation is controlled by two genes – tallness is a dominant trait and the obtained segregation corresponds to theoretically expected one: 13(tall-stemmed):3(short-stemmed) or 15(tall-stemmed):1(short-stemmed). Diversity of biotypes is segregated in hybrid populations of the second generation and the peculiarities of inheritance of ear spike length, number of spikelets developed on the spike, number of grains in the spike, weight of a single spike and 1000 grains have been established in these plants. Tab. 2, Ref. 10.

Auth.

13.C9.6. Distribution of different varieties of vine with account of global warming on the territory of Georgia. /G. Meladze, M. Meladze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 105-109. – eng.; abs: eng., geo.

Climate change is one of the most important global problems. Atmosphere's self-cleaning capacity cannot maintain ecological balance of the climatic system due to strong anthropogenic loadings. Analysis of the global temperature regime confirmed that the climate changes sharply and tends to global warming. Tendency of global warming was observed on the territory of Georgia as well. Increase of the temperature in Eastern and Western Georgia is 0.4 and 0.2°C, respectively. It is possible that it will reach 1-2°C by 2030-2050. At the increase of temperature by 2 and 1°C active temperature sums (above 10°C) increase by 440-480°C and 220-250°C in Eastern and Western Georgia. An agro-climatic map is compiled for vertical zonal distribution of different kinds of vine based on the above-mentioned data. Three agroecological zones are marked out in the map. Sums of increase and decrease (in %) of atmospheric precipitation (mm) are taken into consideration according to vine distribution areas. By the scenario worked out at the increase of temperature by 1°C the duration of the vegetation period (day) increases and amounts to 12 days on average, and at the temperature increase by 2°C the duration amounts to 20 days. An extended vegetation period has positive effect on changes of terms of agrotechnical measures. Provision by temperature sums needed for complete ripening of grapes in the vegetation period is specified according to distribution zones of late vine varieties. By the database in Akhmeta (Eastern Georgia), the temperature sum is provided 8 times per 10 years, in Keda (Western Georgia) – 9 times per 10 years. According to the scenario it is supplied at the increase by 2 and 1°C each year. Tab. 1, Ref. 10.

Auth.

13.C9.7. Land recording issues. /N. Turabelidze, L. Darchiashvili/. Mining Journal. – 2013. – # 1(30). – pp. 113-115. – geo.; abs.: rus., eng.

The article deals with the history of land recording development in Georgia, starting from 1930s to these days. Considered are the land recording techniques and methods, as well as the institutional measures to be taken for improving the situation in this area. Ref. 3.

Auth.

13.C9.8. Ways of improving the agriculture land utilization efficiency. /L. Darchiashvili/. Mining Journal. – 2013. – # 2(31). – pp. 54-55. – geo.; abs.: rus., eng.

The article deals with agricultural land-related problems conditioned by the improper conduct of agricultural reform, as a result of which the functioning of the mechanisms regulating rural community relations and comprehensive land control failed. The emphasis is made on the establishment of an insurance system implying the protection of incomes of those engaged in farming from the negative effects of natural, biological and economic factors. The promising techniques and methods of improvement lands resources at national and regional level are proposed and main directions of further development of agriculture are identified; also considered are the institutional measures to be taken and the role of the State in achieving the above goals. Ref. 3.

Auth.

13.C9.9. Study of some properties of blue-green alga *Spirulina platensis*. /N. Kuchava/. Nano Studies. – 2013. – # 7. – pp. 185-192. – geo.

Some properties of one of the interesting blue-green algae in modern biotechnology, *Spirulina platensis*, in particular, the ability of accumulation of some biogenic and toxic chemical elements from the nutrient medium in the process of cellular growth, as well as the content of copper, manganese, zinc, magnesium, sodium in lyophilized *Spirulina platensis* biomass have been studied. The ability of *Spirulina platensis* to form silver and gold nanoparticles has been shortly considered as well. Tab. 4, Ref. 18.

Auth.

13.C9.10. Interaction of carbon nanotubes with mineral nutrients for the promotion of growth of tomato seedlings. /D. Tiwari, N. Dasgupta–Schubert, L. Villasenor, Dh. Tripathi, J. Villegas/. Nano Studies. – 2013. – # 7. – pp. 87-96. – eng.

The study of the effects of nanoparticles, specifically carbon nanotubes (CNTs), in plant science is a newly emerging area of research. Compared to plant cell walls and membranes, the penetration of CNTs into seeds is expected to be difficult due to the significantly thick seed coat. This study

shows the effect of pristine multi-walled CNTs (MWCNT) and ultrasonically dispersed (de-aggregated) MWCNT (dMWCNT) on the germination and growth of tomato (*Solanum lycopersicum*) seeds cultivated in 1MS agar gel media treated with different concentrations of MWCNT (0–60µg/ml) and dMWCNT (0–10µg/ml) and observed for periods of growth spanning 7 to 27 days. Growth indices at all stages of growth were improved by the CNT. The dMWCNT showed a greater effect than the MWCNT indicating that the degree of de-aggregation of the CNTs is an important factor in the effectiveness of the CNT–plant interaction. The concentrations of the elemental macro and micro nutrients in the seedlings were analyzed by polarized EDXRF spectrometry (pEDXRF). In the range of concentrations used, the lower concentrations for the MWCNTs, and the higher concentrations for the dMWCNTs, generally appeared to benefit the acquisition of mineral nutrients by the seedling indicating the dual effects of aggregation and possible toxicity at higher MWCNT concentrations. FTIR spectrometry of the seedling did not seem to indicate a significant presence of the CNT within the plant tissue. Fig. 5, Tab. 2, Ref. 14.

Auth.

13.C9.11. Accumulation of cadmium by basil (*Ocimum basilicum*), coriander (*Coriandrum sativum*) and saffron (*Crocus sativus* L) from cadmium-enriched soil. /A. Rcheulishvili, O. Rcheulishvili, N. Rcheulishvili, E. Ginturi, L. Tugushi, E. Gelagutashvili/. *Nano Studies*. – 2013. – # 8. – pp. 2013-216. – geo.

Effect of cadmium on basil, coriander and saffron and their components in the process of growth were studied, when soil was enriched by cadmium. In general, accumulation of cadmium was observed in roots of these agricultures. Fig. 1, Ref. 11.

Auth.

C10. Water Industry. Melioration

13.C10.1. The uranium isotope evaluation method of radiological conditions and water balance corroborative features of the river Chu basin. /M. Burkitbaev, D. Mamatkanov, T. Tuzova, B. Uralbekov/. *Collected Papers of Institute of Water Management*. – 2013. – # 68. – pp. 19 -23. – rus.; abs.: geo., eng., rus.

Flow-in balance components of the Chu River basin are specified by the even uranium isotope Ratio in waters. $^{234}\text{U}/^{238}\text{U}$ ratio shows stability over time (1964-2011 years) in the parts with no noticeable inflow. The possibility of using of the isotope dilution method to access surface and underground flows in different parts of the river basin is shown. An increase of the total uranium content in waters along the river downstream is found, which is associated with uranium-enriched underground waters in the areas with uranium anomaly occurrences. Fig. 1, Tab. 1, Ref. 11.

Auth.

13.C10.2. The main characteristics of the river. /I. Gabrichidze, Z. Gedenidze/. *Collected Papers of Institute of Water Management*. – 2013. – # 68. – pp. 24-26. – geo.; abs.: geo., eng., rus.

The works proposes using of a multi-trace scale built in a water gauge to calculate the main river characteristics (depth, velocity, flow), obtainable as a result of a theoretical and experimental study. Also, a new design of a hydrometrical rotator having definite advantages over the existing device is recommended. Fig.3, Ref. 3.

Auth.

13.C10.3. Some comments on the project of Shuakhevi HPP construction and operation at the Ajaristskali River. /T. Gvelesiani/. *Collected Papers of Institute of Water Management*. – 2013. – # 68. – pp. 41-47. – geo.; abs.: geo., eng., rus.

The brief characteristics of the project (report of the environmental impact assessment) relative to construction and operation of Shuakhevi HPP in Ajara (Georgia) at the Ajaristskali river developed by the "Ajaristskali Georgia" Ltd and the Norwegian Company "Clean Energy Invest" are presented. The planned hydraulic power system capacity is 400 Mw. At the start stage two concrete dams (Didajara and Skhaltva dams) having the height 39 m and 22 m will be constructed. The author of the article as an independent expert of the Ministry of Environment Protection of Georgia in his

comments deals with the issue of the environmental impact assessment relative to the risk of dams break. Fig. 2, Ref. 4.

Auth.

13.C10.4. Specification of a free outlet of Lake Sevan depending on its level, the forecast and vulnerability assessment under the influence of climate changes. /L. Vardanyan/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 72-77. – rus.; abs.: geo., eng., rus.

Researches show that the size of a free outlet of Lake Sevan depends on its level and is significantly varies from year to year. The article also presents the methods of determining the actual free outlet of the lake and assessing its level. The specified sizes of underground runoff that depend on the level are given. A diagram of the dependence of the underground water discharge on the water level and the evaluation data of the free outlet, which also depend on the water level, are presented. Fig. 4, Tab. 3, Ref. 13.

Auth.

13.C10.5. Performance standards of the mechanic part and electrical machines of reclamation systems. /M. Vartanov/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 78-83. – geo.; abs.: geo., eng., rus.

The article is devoted to the improvement of market relations in the field of land reclamation and water management. The problem of planning the operational costs of maintaining drainage systems, including costs associated with the operation of mechanical and electrical parts. Are normal scheduled maintenance, as well as the value of the turnaround time of reclamation funds that have a large enough physical deterioration. Discusses some rules whose application in practice, corporate planning operating costs, allow sufficient to accurately determine the size and timing of repair work and, ultimately, to ensure the normal content of the most important elements of water management systems, such as pumping stations, panels, electrical equipment. Tab. 3, Ref. 4.

Auth.

13.C10.6. Determination of the coefficients of horizontal exchange in Baku Bay on the basis of semi-empirical theory of turbulence. /T. Tatarayev, N. Hasanova, B. Agarzayeva, A. Veliyev, S. Askerova/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 84-88. – rus.; abs.: geo., eng., rus.

This article is dedicated to an analysis of the processes of turbulent exchange in the Baku Bay on the basis of long-term observations of currents. To evaluate the characteristics of exchange, the basics of semi-empirical turbulence theory were used. The evaluated coefficients of turbulent exchange and their dependences on the averaging period were determined. Also, "ellipses sharing" and their variability on the scale of the phenomenon, as well as the dependence of the mesoturbulent energy on the averaged period of turbulent fluctuations were determined. Fig. 3, Tab. 3, Ref. 6.

Auth.

13.C10.7. Research of Garasu (Darayurd) watershed water balance with the help of GIS. /F. Imanov, H. Aranchi/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 94-102. – eng.; abs.: geo., eng., rus

The main water balance parameters: precipitation, evaporation and river flow were analyzed. The runoff depth was calculated by a rational method that is widely used in western countries. The GIS technique was used in mapping the water balance elements of the given water body. Fig. 11, Tab. 3, Ref. 10.

Auth.

13.C10.8. Vulnerability assessment of a water reservoir system. /I. Iordanishvili, K. Iordanishvili, E. Khosroshvil/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 103-107. – geo.; abs.: geo., eng., rus.

The article discusses the issues on the intensity and risk assessment of water reservoir systems. The actual normal (invulnerable) functional period of water reservoirs with the consideration of load

magnitude reliability, jeopardy and phosphorus is determined. The necessity of water protective measures conducting is substantiated. Tab. 3, Ref. 7.

Auth.

13.C10.9. The highest molecular water capacity as an important physical constant of the grounds. /L. Itriashvili, E. Khosroshvili, M. Shavlakadze, L. Maisaia, Kh. Kiknadze/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 114-118. – rus.; abs.: geo., eng., rus.

The joining quality of water in the grounds with the consideration of energy is discussed. The highest molecular water capacity as a critical feature of changes in soil properties is determined. Fig. 2, Tab. 7, Ref. 5.

Auth.

13.C10.10. The water cycle and extreme events. /L. Itriashvili, Q. Dadiani, N. Nibladze/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 119-121. – rus.; abs.: geo., eng., rus.

This paper shows that use of standard processing of hydrological time series of distributions from the exponential family presupposes uniform stability of the hydrological system over the entire range of its parameters, without taking into account the specificity of hydro-physical processes in the catchment area, which in definite conditions may lead to extreme phenomena. It is concluded that descriptions of multiyear fluctuations of river runoff by linear equations cannot be satisfactory from the physical point of view, as even small non-linear ties in a dynamic system substantially alter the tails of distributions, and hence the assessment of the probability of catastrophes. Ref. 8.

Auth.

13.C10.11. Computer simulation of processes and optimal management capabilities. /R. Kiladze, V. Shurghaia, L. Kekelishvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 122-125. – geo.; abs.: geo., eng., rus.

The article discusses the optimal management capabilities of surface gravity irrigation systems through mathematical modeling and computer simulating of irrigation. Ref. 6.

Auth.

13.C10.12. Forecasting the conditions of movement of adhesive mudflow on the carrying-out cone. /E. Kukhalashvili, K. Bziava, I. Inashvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 126-127. – geo.; abs.: geo., eng., rus.

The mudflows, along with typical processes at natural disasters, have the features of destructive influences that are often accompanied by considerable loss of property, and also loss of human life. Assessment of the conditions of movement of adhesive mudflow on the carrying-out cone gets special importance, because in general, the settlements and considerable part of national economy are located within this area. According to this, the carrying-out cones is the place for attentive studying, where it is especially the subject of destructive influences by mudflow. In the given article the calculated dependences are received by means of which, forecasting the movement of the adhesive mudflow on the carrying-out cones, and also selection of the optimum options of construction schemes is possible. Ref. 4.

Auth.

13.C10.13. Some problems of water resources supply and demand. /A. Markosyan, T. Martirosyan/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 138-144. – rus.; abs.: geo., eng., rus.

The article deals with the general content of the problem of water resources supply and demand management. Also examined is the necessity of conducting a complex research of the quantitative and qualitative features of water. It is concluded that the current problems of the inefficient water resources management practices in Armenia result from the inefficient tariff system. Fig. 7, Ref. 4.

Auth.

13.C10.14. Problems of revaluation and inventory of incomplete non-current material assets and fixed assets of the organization providing services in the water supply and water

disposal sphere. /M. Mkrtumyan, G. Grigoryan/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 145-149. – rus.; abs.: geo., eng., rus

The article states that the financial improvement and effective management of the sphere of water management requires restructuring of debts and discharge of past burdens. Mentioned are the amendments and addenda made in the Armenian legislation concerning tax privileges and the Armenian government's regulations in the water management sphere. Tab. 4, Ref. 7.

Auth.

13.C10.15. Sediment-loaded mudflow uneven traffic flow with variable numerical of the flow. /O. Natishvili, V. Tevzadze, Z. Charbadze, N. Nibladze/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 153-156. – rus.; abs.: geo., eng., rus.

The reference image of the free surface curve for hyper concentrated debris-flow is proposed, in which the sustainability of mudflow toward erosion hub as well as its motion and dynamics in water plumbing are taken into consideration. Ref. 3.

Auth.

13.C10.16. Viscous liquid's constant motion in the open cylindrical beds. /A. Sarukhanyan, H. Tokmajyan, K. Ohanyan/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 160-164. – eng.; abs.: geo., eng., rus.

Steady-state flow of a viscous fluid in open canals is laminar, when a velocity of the flow is low or when viscosity is high. In case of a steady-state flow in cylindrical canals, particles of fluid travel only longitudinally causing unidirectional flow of the fluid. In open canals the fluid is under influence of the gravity force of which the component directed along the motion becomes the reason of the flow. Navier-Stokes equations were set up and for their integration boundary conditions were formulated according to which the flow rate at the fixed wall and the rate gradient on the free surface in direction perpendicular to the flow is equal to zero. The viscous fluid flow regularities in the following two cases of cylindrical canals are studied. Steady-state flow of the viscous fluid in open canals of semicircular cross-section is examined. A boundary problem has been defined, of which integration resulted in the velocity distribution function, maximum velocity, flow through effective cross-section, average velocity, distribution function of shearing stresses. The latter developed on the fixed wall enable to determine design formula for calculation of energy losses and an equation of uniform flow in an open canal has been derived. Steady-state flow of the viscous fluid in open canals of semielliptical cross-section is examined. A boundary problem has been formulated of which boundary conditions have been set up. Integration of the boundary problem was performed, velocity and shearing stresses distribution functions was obtained, average velocity at effective cross-section and the flow passing through it have been determined. The shear stress on the fixed wall was determined which enabled to determine design formula for calculation of energy losses according to which equation of uniform flow in an open elliptic canal has been derived. The obtained solutions enable to determine circular and elliptic open canals dimensions in case of the fluid steady-state flow. Fig. 7, Ref. 4.

Auth.

13.C10.17. The hydrotechnical classification of Georgian rivers according to their beds characteristics. /P. Sichinava, Z. Lobjanidze, Sh. Kupreishvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 170-174. – geo.; abs.: geo., eng., rus.

The classification of Georgian rivers according to the main types of processes taking place in river beds, forms of river drifts, and the hydraulic and stability characteristics is made. The state of the areas adjoining the river beds is described. Tab. 1, Ref. 6.

Auth.

13.C10.18. Selection of filtering drift for wetland grounds of Kolkheti Lowland. /V. Shurghaia, I. Zaqaizde, L. Kekelishvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 194-199. – geo.; abs.: geo., eng., rus.

The article considers the issues of selection of a system of drainage given the mechanical composition of the soils in the Kolkheti Lowland wetlands. Fig. 3, Tab. 1, Ref. 4.

Auth.

13.C10.19. A generalized method of assessing discharge for Newtonian and Non-Newtonian fluids upon uniform motion of the flow. /O. Natishvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 124-129. – eng.; abs.: eng., geo.

To characterize a uniform free-flow motion for the laminar flow conditions, a generalized method of assessing the fluid flow for both the Newtonian and non-Newtonian fluids is proposed. Fig. 2, Ref. 5.

Auth.

13.C10.20. On the qualitative indices of water-supply of Georgia's settlements. /N. Kitiashvili/. Mining Journal.–2013.– # 1(30). – pp. 78-81. – geo.; abs.: rus., eng.

The results of a long-term monitoring of the quality of water supplied to different populated settlements in Georgia by means of water intake facilities are considered; the negative factors observable as a result of water pollution by organic and nonorganic toxicants of ground waters used in water-supply are given; the maps of quantitative indices of distribution of separate toxicants in ground waters are compiled and the indices are comprised with the Maximum Admissible Concentration (MAC), fixed by standards. Fig. 3, Ref. 7.

Auth.

13.C10.21. The overall ecological status of the water quality of the Mashavera, the Khrami and the Debeda Rivers. /E. Bakradze, G. Kuchava, M. Arabidze, N. Buachidze, I. Kordzaia, L. Papachashvili/. GEN. – 2013. – # 3. – pp. 38-40. – geo.; abs.: eng.

The article deals with the hydrobiological assessment of the Mashavera, Khrami and Debeda Rivers. The ecological status was assessed by EQR-mean. Depending on the hydrobiological assessment, the following statuses were assigned: the Mashavera-Kianeti point- “not satisfactory», the Mashavera-Khidiskuri and the Debeda-Sadakhlo points -“bad”, and the Khrami-Khramhesi and the Mashavera-Didi Dmanisi points - “good”. Tab. 2, Ref. 3.

Auth.

C11. Foreign and Domestic Trade. Tourism

13.C11.1. Restoration of the Argonauts' route given the riverbed stabilization on the River Rioni. /G. Gavardashvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 27-32. – eng.; abs.: geo., eng., rus.

The two legends about Georgia associated with the Prometheus (Tskaltubo) Cavern and Argonauts are still alive in the world. In order to develop tourism in Georgia, the paper proposes a practical implementation of the above legends. The mentioned proposal is to be implemented with the stabilization of River Rioni bed, which will concurrently increase the reliability of protection of local population and the region's landscape from natural disasters. The project foresees the restoration of tourist routes and river transports on the Rioni, which includes a complex of measures; its realization will also contribute to the proper operation of the Poti Port, to the development and protection of the City of Poti and its coast line in the Black Sea waters, to the implementation of the freight and passenger shipping on the Kutaisi-Poti area of the River Rioni, and to the effective and reliable protection of agricultural lands and settlements from floods. Fig. 3, Ref. 3.

Auth.

13.C11.2. The role of air transport in the development of tourist industry. /Y. Sukhitashvili, M. Sukhitashvili, A. Mamedov/. Air Transport. – 2013. – # 1(8). – pp. 88-99. – rus.; abs.: geo., eng., rus.

The subject of research in the article is to determine the part of air transport in the development of tourist industry, the reasons of popularity of air transportation in the organization of tourist travels. Based on an analysis of the tourism environment, the main trends in the world tourism and its relationship with transport are given. Ref. 6.

Auth.

13.C11.3. Human resource planning for tourism. /N. Grdzlishvili/. Law and Economics. – 2013. – # 4. – pp.70 – 76. – geo.; abs.: geo., eng., fren.

This work notes that for the Development of the tourism sector and its effective management it is extremely important to train tourism sector employees. Human resource planning is a systematic process for the employment of personnel in the appropriate areas. Of particular importance for the development of quality tourism is the employment of qualified personnel in service sector. During human resource planning it is necessary to consider all the specialty varieties of tourism. This article analyses stages in human resources planning. It is stated that Professional development of personnel is not possible without professional training. Professional development has a positive effect on the employees. A specialist acquires new knowledge and skills through professional training which makes him more competitive in the labor market. It is stated that, if tourism will be planned, developed and will be managed on the principles of social responsibility, then it can bring different socio-cultural benefits. It is mentioned that if tourism is properly planned in the future and tourism management is based on the principles of social responsibility, it will certainly bring forth different socio-cultural benefits. Fig. 1, Tab. 1, Ref. 8.

Auth.

13.C11.4. Investments - the basis for tourism revival in Georgia. /N. Grdzlishvili/. Law and Economics.–2013.– # 4. – pp.77-82. – geo.; abs.: geo., eng., fren.

The importance of creating a favorable investment climate for accelerated development of tourism in Georgia is outlined. The application of a selective approach to the attraction of foreign investments is regarded as a necessary precondition. Also mentioned is the necessity of interesting Georgian businessmen living abroad for the purpose. Fig 3, Ref. 6.

Auth.

13.C11.5. Religious tourism - major factor contributing to the integration processes. /N. Grdzlishvili/. Law and Economics. – 2013. – # 4. – pp. 90-99. – geo.; abs.: geo., eng., fren.

This work notes that under present conditions, tourism has become the world's most powerful tool of economic development, which has a major influence on the political, economic, social and cultural ties among countries. It is said that nowadays religious tourism, in tourist activities, is one of the most actively developing directions. A strong interest towards religious tourism makes it an important factor contributing to social and political stability. According to the estimates of the World Tourism Organization (UNWTO) religious (General) tourism occupies the first place among the most promising directions of tourism. Experts assess religious tourism as the most promising direction for 21st century. This work discusses the development of religious tourism in Georgia. It describes different types of religious tourism, which can become the basis of cooperation between Georgia and Russia and between Georgian and Abkhazian people. Tourism development requires investment, key to the attraction of investment is the characteristics of region's political climate, in particular, a healthy macroeconomic policies, well-defined property rights and the efficient functioning of the financial and banking sectors. Regional integration can contribute to an increase in the volume of investments, if it substantially enhances credibility towards politics and expands markets, but this process should be congruent with the general policy. This work notes that the development of tourism in Georgia is one of an essential factors for regional stability. Ref. 8.

Auth.

13.C11.6. Concerning the estimation of tourism competitiveness (a case of Tbilisi city). /A. Sharashenidze/. Ekonomisti. – 2013. – # 1. – pp. 68-73. – geo.; abs.: eng., geo., rus.

Competitiveness indicators are analyzed; Tbilisi tourism potential is revealed based on data analysis; the factors influencing the tourism potential are characterized and the ways of its utilization are offered; the potential competitive innovations are analyzed according to the types of products and their role in diversifying the city tourism potential is assessed. Fig. 1, Tab. 1.

Auth.

13.C11.7. Reducing fluctuations in tourism center development on the basis of balanced cycles. /P. Chaganava/. Ekonomisti. – 2013. – # 2. – pp. 52-80. – geo.; abs.: eng., geo., rus.

The article gives a life cycle analysis of a tourist center, which covers the dynamics and interdependence of private investments and governmental expenditure in tourism. As research results indicate, the coincidence of touristic, private investment and government expenditure cycles leads to sharp fluctuations in the economic development of a tourism center. The article suggests a

mechanism of reducing the fluctuation of economic development on the basis of balancing the touristic and private investment expenditure cycles by government expenditure cycle and describes a number of instruments for this purpose. Fig. 9, Ref. 25.

Auth.

13.C11.8. Tourist product perception. /N. Jerenashvili/. Ekonomisti. – 2013. – # 2. – pp. 108-111. – geo.; abs.: eng., geo., rus.

A tourist product is created based on the customer-requested tourist services, which is a combination of different elements. The tourism product can be perceived differently, depending on the position it holds on the travel market. Scientists name perception as a "writing down" process, which is conditioned by the previous human experience. Ref. 4.

Auth.

13.C11.9. The characteristics of the external environment of the tourist business of Georgia. /N. Ghvedashvili/. Ekonomisti. – 2013. – # 3. – pp. 50-55. – eng.; abs.: eng., geo., rus.

The main fields of activities of tourist companies and their external environment are interconnected and dependent on each other. External environment is a combination of external factors and subjects of the company that has actual influence on the condition, efficiency and perspectives of its activities. The role of competition in the development of tourism is outlined. The insufficient competition among Georgian tourist companies is mentioned, especially in the so-called exotic tourism. The level of competition is much higher in recreation tourism. The market of this service in Georgia has been actually divided and access of new company in it is very difficult. Ref. 3.

Auth.

C12. Transport

13.C12.1. Historical review of Georgian transport network formation. /T. Makharashvili/. Building.–2013.– # 2(29). – pp. 86-89. – geo.; abs.: geo., eng.

It is noted that the town-building and transport system of Georgia has developed under the effect of political, economic, natural and climatic factors since the ancient times. Its axis long since went through lowland areas of the country from east to west, branching up to mountain region and along the Black Sea shore. The main settlements were built along these routes to make a unified urbanistic system. Ref. 2.

Auth.

13.C12.2. Definition of freight train weight standards on Marabda-Akhalkalaki railway line. /A. Kakabadze/. Building. – 2013. – # 2(29). – pp. 103-107. – geo.; abs.: geo., eng.

The Marabda-Akhalkalaki-Kartsakh railway line passes through complex topographic, geological and climatic conditions. In this area are steep slopes and small radius curves (300 m). The train weight, in addition to the locomotive power, is limited by reduction of traction coefficient between the wheel and rail in small radius curves. The work defines the freight train weight standard related to the traction coefficient. It is mentioned that under severe winter conditions the traction coefficient between the wheel and rails sharply decreases. Therefore, the authors consider it advisable to establish the freight train standard depending on the seasons (summer and winter). Ref. 1.

Auth.

13.C12.3. Air temperature influence at the barometric altimeter readings. /A. Apkhaidze/. Air Transport.–2013.–# 1(8). – pp. 8-13. – rus.; abs.: geo., eng., rus.

The mutability of barometric altimeter methodological error of the air temperature is considered. The study was made for Tbilisi airport area, depending on season and flight altitude. Tab. 2, Ref. 3.

Auth.

13.C12.4. Multifuel rotary piston engines “Wankel AG”. /K. Broladze/. Air Transport. – 2013. – # 1(8). – pp. 14-34. – rus.; abs.: geo., eng., rus.

Rotary piston engines applied in aircraft manufactured by Wankel AG are described. These engines can operate on the so-called "heavy fuel" – kerosene and diesel oil. The engine models LOCR-407SD – one-rotor, LOCR-814 TD – two-rotor, and AR-208 DT – two-rotor with turbo charge are described. VLDE-407SDT engine is the most interesting for aviation. In principle it is a power unit including RPE, all peripheral systems and is ready for application at drones and remotely piloted vehicle. Fig. 8, Tab. 1, Ref. 4.

Auth.

13.C12.5. BOEING 737 engine CFM-56 oil system upgrade. /K. Broladze, G. Saakadze/. Air Transport. – 2013. – # 1(8). – pp. 35-41. – rus.; abs.: geo., eng., rus.

The work aimed at improving the engine lubrication system of Boeing 737 aircraft. The problems of the engine oil filler cap and the ways of their handling are described. Fig. 2, Ref. 8.

Auth.

13.C12.6. Decision-making description model. /S. Khoshtaria, K. Bareladze, T. Khoshtaria/. Air Transport.–2013.– # 1(8). – pp. 42-45. – eng.; abs.: geo., eng., rus.

The work analyzes a decision-making model in ergative systems. In elaborating such models, the parameterization requirements providing sufficient information for decision-making should be taken into account. Ref. 4.

Auth.

13.C12.7. One of approaches to ensuring optimal dynamics of an aircraft control system. /T. Kapanadze, J. Ebanoidze, D. Brelidze/. Air Transport. – 2013. – # 1(8). – pp. 64-69. – rus.; abs.: geo., eng., rus.

Matrix criteria of an aircraft control system's sustainability are developed; the sustainability condition is obtained according to the matrix standards. As a result, an algorithm ensuring the optimal and dynamic properties of a cohesive management system is built. Fig. 1, Ref. 4.

Auth.

13.C12.8. Electrization of clouds causes by aircraft flight. /A. Apkhaidze, M. Mamsirashvili/. Air Transport. – 2014. – # 1(9). – pp. 8-13. – rus.; abs.: geo., eng., rus.

The article considers an aircraft as a cloud generator by electric discharges. The produced discharge is characterized of the time of relaxation that is commensurable with the existence of the cloud itself. Based on an analysis of a number of assumptions associated with the discharge of atmospheric electricity in stratus clouds, certain intervals between flying of aircrafts in clouds are proposed. Fig. 2, Ref. 6.

Auth.

13.C12.9. Raining efficiency of ergative systems. /S. Khoshtaria, K. Bareladze, T. Khoshtaria/. Air Transport. – 2014. – # 1(9). – pp. 14-18. – rus.; abs.: geo., eng., rus.

The article describes analytical approaches to typical ergative operations and formulas that determine the probability of error-free solution of the entire operation and algorithm, as well as the significance of availability. Ref. 2.

Auth.

13.C12.10. Paradigm of sustainable development of air companies in global competitive environment. /L. Litvinenko, V. Novak/. Air Transport. – 2014. – # 1(9). – pp. 34-41. – eng.; abs.: geo., eng., rus.

The existing trends on the world air market and urgent problems of air companies are analyzed and the effective measures for their sustainable development are identified. Fig. 6, Ref. 7.

Auth.

13.C12.11. Macro and micro factors influencing the competitiveness of air carriers. /Y. Sukhitashvili, N. Dumbadze, M. Sukhitashvili, B. Davitadze/. Air Transport. – 2014. – # 1(9). – pp. 42-53. – rus.; abs.: geo., eng., rus.

Under conditions of the global economic crisis and acute competition, air carriers are trying to reduce expenses and improve service quality for their customers. It is very important nowadays for

air companies to take into account an optimal ratio “tariff-quality” in order to increase their competitiveness on the air market. Ref. 6.

Auth.

13.C12.12. Elaboration of a logistic model for determination of thermophysical parameters for operation of the evaporator-homogenizer. /J. Iosebidge, A. Chkheidze, O. Gelashvili, O. Kiguradze, G. Khutsishvili, G. Abramishvili, L. Zurabishvili/. GEN. – 2013. – # 4. – pp. 40-44. – geo.; abs.: eng.

The article deals with the elaboration of a logistic model, which enable the theoretical determination of the values of characteristic parameters (heat transmission coefficient, heat capacity etc.) of thermophysical processes taking place in the course of operation of the evaporator-homogenizer. Tab. 2, Fig. 2, Ref. 5.

Auth.

13.C12.13. Improvement in the durability of motor car tribounits by vibrostimulation of tribo synthesis of graphite-diamond surface structures. /J. Iosebidge, A. Chkheidze, D. Kupatadze, E. Kutelia, G. Abramishvili, Kh. Mgebrishvili/. GEN. – 2013.– # 4. – pp. 45-47. – eng.; abs.: eng.

It is shown at the conceptual and experimental levels that in case of application of the oil containing amorphous nano-dispersed carbon (inside the particles of which are located the clusters of ferromagnetic iron), vibrostimulation could play the role of a creative factor, promoting the tribosynthesis of tribologically high-efficient secondary surface structures, including diamond nanoparticles. This will reduce the damage to tribounits caused by pitting and other kinds of wear. Fig. 2, Ref. 4.

Auth.

13.C12.14. Study on the opportunity of improvement of the durability of transmission units by adding the new-type additive to automobile oils. /J. Iosebidge, I. Padgurskas, D. Kupatadze, T. Apakidze, G. Abramishvili, L. Zurabishvili, M. Khvedelidze/. GEN. – 2013. – # 4. – pp. 48-51. – rus.; abs.: eng.

The article deals with the investigation results on the effect of new-type additives based on amorphous nanodispersion carbon on the parameters of oil that determine the durability of automobile transmission units. According to the obtained data, the additive of the given type provides significant improvements in wear-resistant, anti-scuffing and anti-pitting properties of the oil. Hence, the obtained oil surpasses well-known commercial transmission oil sorts. Tab. 6, Ref. 4.

Auth.

13.C12.15. Elaboration of the model of the logistic system: “ecological compatibility of the automobile gas diesel-properties of natural pressurized gas”. /J. Iosebidge, J. Julien, D. Aladashvili, O. Gelashvili, G. Abramishvili, L. Zurabishvili/. GEN. – 2013. – # 4. – pp. 52-57. – geo.; abs.: eng.

Conceptual relations between the ecological indices of the automobile gas diesel and the characteristics of natural pressurized gas were determined. On their basis, a logistic system was elaborated, which allows us to develop the optimal ways for enhancement of ecological compatibility of the gas diesel. Tab. 2, Fig. 2, Ref. 5.

Auth.

C13. Medicine. Healthcare

13.C13.1. The elemental composition of teeth hard tissues depending on the state of the environment. /N. Suladze, T. Shishniashvili, V. Margvelashvili, K. Kobakhidze/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 7-11. – rus.; res.: geo., eng., rus.

At present, great attention is paid to the origin of man-made micro elemental anomalies. To monitor the state of the environment and its effects on the human body, of great importance is the determination of the amount and distribution of various chemical elements in the dentin and enamel of the teeth. To determine the essential (Ca, Zn, Mn, Ni), conditionally essential (Rb, Ni, Sr) and toxic (Pb, Hg) trace elements in the mineralized tissues of the teeth and to identify the

relationship between the elemental composition of the tooth structure and the state of the general and dental health depending on the state of the environment, we have examined 29 children aged 3-4 years who have carried out analysis of hard tissue of teeth (teeth used for remote medical reasons) for the maintenance of nine chemical elements. Children living in a relatively environmentally favorable conditions essential value and conditionally essential elements in the mineralized tissues of the teeth were within normal limits, and toxic elements slightly increased limits that differ from those of children living in environmentally disadvantaged areas. In particular, these essential elements were significantly reduced (except for zinc), as indicators of toxic elements - mercury and lead, increased by 12.5% and 44.5%, respectively, which is clearly reflected on the state of dental health because noted decompensated form of tooth decay. Thus, deviations in a state of general and dental health of children associated with an imbalance of macro-and microelements in the mineralized tissues of the teeth. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.2. Clinical manifestation and management of intravenous mercury injection: a case report. /T. Kobidze, O. Urushadze, I. Afandiyev, G. Nemsadze, D. Loladze/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 11-16. – eng.; res.: geo., eng., rus.

Intentional self-injection of metallic mercury case report is presented. A 22 year old man with a past medical history of ethylene glycol suicidal poisoning was admitted to an Acad. N. Kipshidze Central University Clinic in Tbilisi, four months after deliberate intravenous injection of an unknown quantity of metallic mercury from several thermometers into his antecubital vein. After 2 months of asymptomatic period, the patient began to complain of pain and tremor in limbs, fatigue and skin rash. CT scan of the thorax and the abdomen confirmed multiple small opacities of metallic density in both lungs, liver and right kidney. After the procedure the patient was transferred to the toxicology center in Baku, Azerbaijan for chelation therapy. On arrival no biochemical abnormalities in hepatic or renal function or clinical pulmonary malfunction were detected, despite presence of slight symptoms of erethism, tremor mercurialis, knee joints arthralgia and lower extremities weakness. Chelation therapy with intramuscular injection of Unithiol (DMPS) was started in dose of 20 mg/ kg/ day. After one month of chelation therapy, mercury blood concentration slowly decreased from initially 134 microgram/L to 105 microgram/L. This case report demonstrates mild acute toxicity following intravenous administration of unknown amounts of elemental mercury. Because of chelation therapy can remove approximately 1 mg of mercury per day the patient was recommended further long-term DMPS treatments under the control blood mercury levels. It is concluded that clinical manifestations of intravenous elemental mercury intoxication may be delayed despite significant increase in blood mercury level. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.3. J point elevation as a predictor of premature ventricular beats. /Z. Matoshvili, Sh. Petriashvili, A. Archvadze, I. Azaladze/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 7-11. – eng.; res.: geo., eng., rus.

Early repolarization pattern (ERP) is a common ECG variant, characterized by J point elevation manifested either as terminal QRS slurring (the transition from the QRS segment to the ST segment) or notching (a positive deflection inscribed on terminal QRS complex) associated with concave upward ST-segment elevation and prominent T waves in at least two contiguous leads. 36 patients were included in this observation. There are 36 patients (19-68 years old) with early repolarization ECG patterns. All this 36 patients were divided into two groups according to their level of J point elevation. First group consisted of 12 patients with J point elevation $\geq 0,15$ mV; second group – of 24 patients with J point elevation $< 0,15$ mV. We make 24 h ECG holter monitoring all this patients to evaluate absolute number of premature ventricular beat during 24 h. Before and during this monitoring patients don't take any antiarrhythmic drugs. In the first group (J point elevation $\geq 0,15$ mV) sum of premature ventricular beats were 27432, in the second group (J point elevation $< 0,15$ mV) sum of premature ventricular beats were 31 896. The results of this observational study shows that there is 1,72 fold higher number of premature ventricular beats in first group. So, J point elevation equal or more then 0,15mV, is more arrhythmogenic and induces premature ventricular beats. This is principally new and very important result. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.4. Relationship between emotional stress and cardiovascular events. /Mahavir Senan, A. Petrosyan/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 7-11. – eng.; res.: geo., eng., rus.

During last years the relationship has been found in between sudden cardiac death and autonomic disbalance of nervous system, which effect on baroreflexor regulation of heart rhythm. The importance of heart rate in cardiovascular prognosis can be explained by its relationship with major pathophysiological determinants. We considered this fact as an actual problem and we performed our own study among 346 native Indians (260 males and 86 females), aged 41–54 years and employed by the Civil Service. They were consecutively examined between 1997 and 2004. Our large and long prospective study has disclosed a higher risk for sudden death for those apparently healthy individuals whose heart rate responses are exaggerated under mild emotional stress and below normal during peak exercise. This implies novel and simple ways for the early identification of subjects at increased future risk for sudden cardiac death. As well as we find out that autonomic disbalance is related with high risk of development of arrhythmias which is possible to find out exercise stress test. Individuals showing a high heart rate increase with mild emotional stress must be considered for additional investigations and for tailored preventive strategies aimed in first place to reduce the probability of ischemic heart disease. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.5. Correction of dyslipidemia in patients with chronic hepatitis c, combined with diabetes type 2. /M. Derbak, P. Boldizhar/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 25-31. – rus.; res.: geo., eng., rus.

The article shows the results of treatment of 118 patients with chronic hepatitis C (CHC) which is associated with type 2 diabetes mellitus (DM). When planning therapeutic interventions in chronic hepatitis C in patients with diabetes, it is considered the presence of visceral obesity, dyslipidemia, and hepatic steatosis. The efficacy of different treatment regimens was studied. Found that the usage of ursodeoxycholic acid and ademetonin in HCV patients with diabetes type 2 receiving standard antiviral therapy (SAVT), significantly make a positive effect on the level of dyslipidemia. The normalization of lipid profile allows for a full course of SAVT, which reduces the frequency of relapse. It is also noted that the simultaneous use of ademetonin and ursodeoxycholic acid in treatment of chronic hepatitis C leads to a reduction of side effects of SAVT. Metabolic therapy may be recommended for patients with chronic hepatitis C in combination with type 2 diabetes in case of SAVT, and at its contraindications or intolerance. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.6. Exercise tolerance in patients with coronary artery disease after coronary artery stenting. /V. Tseluyko, K. Kreyndel, Z. Vashakidze/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 31-36. – rus.; res.: geo., eng., rus.

The aim of the research is to investigate the impact of coronary stenting on exercise tolerance after 4-8 week and after 12-15 months. The study involved total 90 patients with coronary artery disease, who underwent coronary stenting. All patients underwent clinical examination, including an assessment of their condition, the frequency of angina attacks, echocardiography, resting ECG was recorded in all the patients in the standard 12 -lead veloergometry. Statistical processing was performed using Statistical 6.0 for Windows, the method of Wald–Wolfowitz. Data are presented as arithmetic means and error average $M \pm m$. We used a statistical method of calculation - the median ranks (with the median calculated by the usual rules of statistics - the arithmetic mean of the central members of the ordered series). Significant differences were assessed by t-test. The level of significance was considered significant when $p < 0,05$. According to the monitoring data of patients have a significant increase in exercise tolerance: threshold power increased by 63% and in 12-15 months by 58% compared with the original. The duration of the test conducted after stenting increased by almost 2-fold. In addition, significantly reduced the proportion of patients whose test results were evaluated as positive. Stenting of the coronary arteries after 4-8 weeks promotes the significant increase in exercise tolerance that persists after 12-15 months. The factors of associated with insufficient increase in exercise tolerance after stenting according veloergometry are: female gender, diabetes,

smoking cessation further contributes to the increase in the threshold of physical activity. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.7. Occurrence of occult HCV infection among HIV infected patients in Georgia. /L. Gatserelia, L. Sharvadze, M. Karchava, E. Dolmazashvili, T. Tsertsvadze/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 37-41. – eng.; res.: geo., eng., rus.

Occult hepatitis C (OCI) infection has been known as detectable HCV-RNA in the liver or peripheral blood mononuclear cells (PBMCs) in the absence of detectable serum or plasma HCV-RNA. OCI has been detected among different patients groups worldwide, it has been found not only in chronic hepatitis patients of unknown origin, but also among several groups at risk for HCV infection (hemodialysis patients or family members of patients with occult HCV). This occult infection has been reported also in healthy populations without evidence of liver disease. Prevalence of occult Hepatitis C virus has not been investigated in Georgian population, where a rate of HCV infection is highest (6.7%) among Eastern European Countries. The aim of this study was to investigate the occurrence of occult HCV infection among HIV infected individuals in Georgia. As a pilot study, we have selected three groups of HIV infected patients for analyses: Group 1 - HIV infected patients without evidence of liver disease (n=98), group 2 - HIV infected patients with cryptogenic liver disease (n=34) and group 3 - HIV/HBV co infected patients (n=29). HCV RNA was tested in PBMCs samples by real-time polymerase chain reaction. HCV genotyping was performed by Line-probe assay based on reverse-hybridization technology. Liver fibrosis was evaluated by transient elastography (FibroScan). HCV-RNA was detected in PBMCs specimens among 2 (2%) subjects from group 1, 4 (12%) subjects from group 2, and 9 (31%) subjects from group 3. HCV genotypes were determined for 14 of 15 OCI subjects resulting following genotype distribution: 6 (46%) - 1b, 3 (23%) - 2a/2c and 5 (38%) - 3a. One samples failed to be genotyped due to extremely low HCV viral load. Our data revealed the occurrence of occult HCV infection in HIV infected patients. No single HCV genotype was predominant in the present study. Liver fibrosis was found more frequently and the fibrosis score was significantly higher in OCI patients versus negative ones, suggesting that undiagnosed OCI might impact on the liver damage. The study demonstrated that testing only for HCV antibody fails to identify the true prevalence of HCV co-infection among HIV infected patients. We propose that in the absence of liver biopsy specimens, analysis of PBMC sample for HCV-RNA would be informative for detection of occult HCV. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.8. Comparative analysis of structural changes in thrombocytes during Alzheimer's and Parkinson's diseases. /V. Simonidze O. Samushia/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 41-46. – rus.; res.: geo., eng., rus.

The paper deals with the study of the changes in the formed elements of blood during the Alzheimer's and Parkinson's diseases. While studying the structure of thrombocytes, a number of identical structural changes were identified in case of both diseases. The study has revealed various shapes of thrombocytes, the production of pseudopodia on their surface, high level of body outline, specific distribution of glycogen granules and their concentration on the periphery, glycogen eruption, dissociation of Alpha-granules towards the edge, and effective outline and density of the granules. There are frequent cases of the granule eruption from the body (exocytosis), the existence of vacuoles on the matrix, the rise in the number of gigantic thrombocytes and, consequently, considerable enhancement of the ability of absorption. Besides, there is a rise in the number of degenerated cells. The shape of thrombocytes is often changed and stretched on one side. The produced pseudopodia make the impression of participation in phagocytosis. As for the difference between changes, during Parkinson disease the amount of thrombocytes is low, more gigantic and distorted shape, less invagination of plasma membrane, low amount of granules and less intensity of alpha-granule eruption from the body. The changes revealed by the research show the activity of thrombocytes, which should be connected to their participation in protective functions of the body towards existing agent. And the diseases – although with similar but with different pathogenic mechanisms – are being developed with participation of non-specific agents. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.9. Efficiency of recombinant erythropoietin administration in hemoglobinopathy H. /M. Hasanova, CH. Asadov, Z. Alimirzoyeva, T. Mammadova, A. Shirinova/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 46-49. – eng.; res.: geo., eng., rus.

Alpha-thalassemia is widely spread in human population and one of the most common types of α -thalassemia is hemoglobinopathy H which develops with mild microcytic hypochromic anemia, hepatosplenomegaly and jaundice. The basic method of anemia correction is blood transfusion. However this method has crucial deficiencies. As it is known recombinant erythropoietin (rEPO) contributes to erythroid proliferation and could be used for anemia treatment. The aim of the study was to qualify efficiency of administration rEPO in complex therapy of hemoglobinopathy H. Study involved irregularly transfused 14 patients with hemoglobinopathy H (2 males and 12 females). Control group included 30 healthy persons. Recombinant erythropoietin (Eprex) administrated hypodermically 10,000 units 3 times a week during 6 months. Average hemoglobin level before treatment was 62 g/l. Responses to the rEPO treatment varied from 9 to 70 g/l, 9 (64%) of patients had a good response, showed an increase in hemoglobin level more than 20 g/l. In 4 patients (29%) had a moderate response (10-20 g/l), but only in 1 (7%) patient occurred poor response. Changing the parameters of erythrocyte indices, hemoglobin fractions, serum iron and serum ferritin level are not statistically significant. It can be concluded that the use of rEPO in complex therapy of hemoglobinopathy H, leads to increased levels of hemoglobin and consequently reducing the need for blood transfusions. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.10. Tattoos: the relationship of diagnostic and semantic meaning. /A. Romaniuk, N. Tatsenko, V. Smeyanov, D. Movchan, R. Moskalenko/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 50-54. – eng.; res.: geo., eng., rus.

This article investigates a tattoo as a component of non-verbal semiotics of medical discourse in pathological anatomy. The purpose is to estimate the diagnostic value of tattoos on the body of patients as semiotic and symbolic aspect of medical communication. Tattoos are classified into three types: image tattoos, feature tattoos, and conventional tattoos (symbolic tattoos). Conventional tattoos are the most informative component of medical discourse symbolics because of their diagnostic value. During the investigation it has been found out that criminal tattoos have the greatest value because of their structuring, clear connection with certain diseases (tuberculosis, liver cirrhosis), and also valuable are tattoos related to drug and alcohol addiction, which are characteristic for patients with viral hepatitis, osteomyelitis. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.11. Activity of white rat antioxidant system under chronic stress. /Z. Kuchukashvili, M. Chipashvili, L. Lekiasvili, M. Mikadze/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 54-59. – rus.; res.: geo., eng., rus.

The aim of the research was to study the influence of long-term stress conditions on the rate of lipids' peroxidation (LPO), activity of antioxidant system and energy metabolism in brain, cardiac muscle and lymphocytes under 30-days isolation and diurnal cycle violation. Obtained results prove about the increasing of intensity of LPO in studied tissues under long-term stress conditions. According to the data, in lymphocytes, brain and cardiac muscle it was observed quantitative rising in nitric oxide (NO) concentrations. In junction with this it was changed the intensity of LPO, proved by the increase in quantities of products of this process. In contrast with this it was shown decrease in activity of enzymes of antioxidant system: Superoxiddismutase, Catalase, Glutathionreductase and Glutathionperoxidase, also we've studied activities of mitochondrial enzymes, such as, Succinatdehydrogenase, Creatine Kinase and Aconitase. It was shown that isolation and diurnal cycle disorders represent factors that induce remarkable down regulation of energy metabolism and increasing of oxidative stress pathways. Supposedly influence of stress factors could induce nonreversible processes that could stimulate various neurological, cardiovascular and immune system pathologies. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.12. Epidermal growth factor receptor expression and epidermal growth factor blood plasma content in simple and complex endometrial hyperplasia. /N. Dzelashvili, D.

Kasradze, A. Tavartkiladze, A. Mariamidze/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 59-65. – rus.; res.: geo., eng., rus.

The goal of our study was to concurrently determine the prognostic significance of Epidermal Growth Factor Receptor (EGFR) expression in endometrium and Epidermal Growth Factor (EGF) blood content in simple and complex hyperplasia. In order to detect EGFR expression, immunohistochemical examination of endometrial scarp from 35 patients was done along with HPLC (High performance liquid chromatography) method, for measuring EGF blood plasma content. The numerical data obtained were processed statistically using computer program SPSS-12. According to the results: 1. A significant/marked increase in EGF blood plasma level together with pronounced EGFR expression in simple endometrial hyperplasia (without atypia) suggests that simple hyperplasia is likely to transform into complex form, while unchanged level of EGF against the background of mild EGFR expression is probably indicative of not very bad prognosis. 2. Normal indices of EGF blood plasma level in simple endometrial hyperplasia (without atypia), accompanied by mild EGFR expression is suggestive of good prognosis. 3. A sharp or extremely sharp increase in EGF blood plasma level with pronounced EGFR expression in complex endometrial hyperplasia (without atypia) is likely to indicate poor prognosis that may lead to the transformation into atypical form. However, unchanged EGF blood plasma level against the background of mild EGFR expression in complex endometrial hyperplasia (without atypia) is likely to point to not very bad prognosis. 4. A marked increase in EGF blood plasma level with a pronounced EGFR expression in complex endometrial hyperplasia (without atypia) is likely to indicate poor prognosis that may lead to the transformation into atypical form. Because it is evident that drastic increase in EGF blood plasma level is not necessary, other factor should be suspected to play the major role, i.e. the substance that will (or will not) withstand neoplasia. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.13. The experimental application of chitosan membrane for treating chemical burns of the skin. /M. Pogorielov, O. Kalinkevich, E. Gortinskaya, R. Moskalenko, Yu. Tkachenko/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 65-70. – rus.; res.: geo., eng., rus.

The basic method for skin damage treatment, including chemical wounds, is a topical application of different agents. Their objective is to repair structure of the skin and its functions. All dressings for treating wounds are classified as biological, artificial and composites containing both synthetic and natural materials. There are many studies concerning application of chitosan, which is a derivate of natural polymer chitin, as a basis for topical materials to treat burns. However, data are rather limited about application of chitosan for treating acid burns. Thus, the aim of research is to study the morphological futures of skin regeneration after the chemical burn applying chitosan membranes. We performed the experiment on 60 young rats (3 months old) with the chemical burns of third-degree (IIIA degree) to study the morphofunctional features of skin regeneration. Later we applied the chitosan membranes on the burns. We carried out a histologic investigation on the biopsy specimens of wound to determine the morphological features of wound regeneration. The results confirmed that earlier granulation and epithelialization of the skin surface happened as the chitosan membrane was applied on the acid effected surface. The final result of the application of chitosan film is to achieve full epithelialization, preserve the structure of tissues beneath the burn and prevent getting scars. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.14. The redox potentials and morphological features of the pancreas, small intestines and liver under early enteral nutrition via micro-jejunostomy in modeling of acute pancreatitis. /G. Khatchapuridze, V. Leonov/. Georgian Medical News (GMN). – 2014. – # 1(226). – pp. 71-75. – rus.; res.: geo., eng., rus.

The article investigates morphological changes in pancreas, liver, and small intestine after early enteral nutrition in Vistar rats after modeling of acute pancreatitis and creation of jejunostomy. Morphological changes and redox potential measurements show that early enteral nutrition via micro-jejunostomy slows down the development of pathological processes in Vistar rats. Fig. 5, Tab. 2, Ref. 5.

Auth.

13.C13.15. Reproductive health in Georgia /A. Khomasuridze/. Actual Topics on Women Health. – 2012. – # 2. – pp. 7-10. – eng.; abs.:geo., eng.

Now it is well-known that Georgia has pioneered in the World to make reproductive health an independent medical discipline officially in 1997, separating it from obstetrics and gynecology. Since Georgia belongs to the group of developed European countries, as for typical for them, the birth rate decreased and the population was aged. It is also necessary to note that the infrastructure of infertility in Georgia equals to the World data. So, in the field of reproductive health in Georgia, we have some problems and for the successful solution of representing problems, we made the following activities. Thanks to our efforts and the help of the Ministry of Labor, Health and Social Affairs together with many International Organizations, we've managed to bring the number of artificial abortions below 30000 by 2002 (country population 4.5 million and the number of births - about 50000) and illegal abortions were practically eliminated but, the annual number of artificial abortions around 20000-30000 is too high for the small country. Approximately 25 years ago the prevalence of contraception in Georgia equaled to the zero and artificial abortion was the only "method of fertility regulation". The prevalence of modern contraception in Georgia has reached 55% which is the quickest jump in the history of contraception. The Zhordania Institute managed to introduce all traditional and high technology methods from the functional tests to the first successful use of IVF procedure in 2000. More than 2000 children are already born after IV F and the "oldest" is 12 years old. Fig. 8, Tab. 3, Ref. 6.

Auth.

13.C13.16. Gender medicine education system in Germany. /B. Pfliederer, D.Burghaus, K. Kannes, A. Bauland, J. Becker, A. Kindler-Röhrborn, M. Heue/. Actual Topics on Women Health. – 2012. – # 2. – pp. 19-27. – eng.; abs.:geo., eng.

Gender Medicine is one of the most important fields in medicine of 21st century. There is a greater difference between male and female as well as on micromolecular, and at the level organs and systems of human body. The difference depends on the genetics, biological factors (Sex, Hormones, signal pathways in cells, metabolism), and the environment and social factors. Accordingly, severity of disease, therapy outcome, prevalence and then intervention methods also related to the environment, biological and social factors. Gender is related to how we are perceived and expected to think and act as women and men because of the way society is organized, not because of our biological differences. Introduction to gender and health is to learn the difference between sex and gender and understanding gender as a determinant of health. In the article described the German research group gender-specific teaching modules in medicine – a collaborative project between the medical faculties of Muenster and Duisburg-Essen. Head of the project is prof. Bettina Pfliederer. Great importance is an adequate awareness of this problem. It is important the existence of the educated command of Medical Experts for carrying out of different researches in the field of Gender Medicine. For resolving this problem it is necessary to begin all with the high quality training program and well-formed schools. Medical Expert must be the professional, communicator, collaborator, manager, health advocate and scholar. The graduating students (medical experts) have to know the difference between sex and gender and be able to apply a gender lens for approaching any medical problem, from a gender perspective. Key competency of scholars is that the graduating students will be able to recognize and analyze gender bias in research design, implementation and analysis. Fig. 7, Ref. 6.

Auth.

13.C13.17. Use of Fareston in postmenopausal women with breast cancer. /M. Zaridze, G.Tevzadze/. Actual Topics on Women Health. – 2012. – # 2. – pp. 28-36. – rus.; abs.: geo., eng.

The aim of the research was to study effectiveness of Fareston treatment in women with menopause in III-IV stage breast cancer. We studied 195 patients aged 60-80, who were receiving treatment in chemotherapeutic department of National Oncologic Center of Georgia in 2003-2011y.y. Patients were divided into 2 groups: I – 97 patients, who were receiving hormone therapy with Tamoxifene; II – 98 patients, who were receiving hormone therapy with Fareston; 50 out of the 98 patients in the second group were in III stage of the disease, 17 were receiving hormone therapy with Fareston in the neo-adjuvant setting, 33 – in adjuvant setting. 19 patients with disseminated form of the breast cancer after developing resistance towards Tamoxifene were receiving Fareston. 29 patients were treated with Fareston due to metastatic bone damage.

Therapeutic dose of Fareston was 60-120 mg a day. Assessment of the treatment results showed that, in case of using Fareston in adjuvant regime in patients with III A-B stage disease, on the IV-VII month of the treatment 11% had disease progression, while this figure was 16% in I group. By using complex neo adjuvant (poly chemo-hormone therapy) treatment regime, full or partial regression of the disease was achieved in primary site as well as in regional metastatic lymph nodes. Afterwards these patients underwent an operation and adjuvant chemotherapy. 5 patients who had III A-B stage disease, on the III-IV month of the follow up developed bone metastasis, 3 in visceral organs. 29 patients with fourth stage of the disease, who had metastatic bone damage, underwent palliative chemo-hormone therapy + bisphosphonates + radiation therapy. Stabilization was achieved. Side effects characteristic of Tamoxifene were not revealed during the treatment with Fareston. Thus, using Fareston in neo adjuvant, adjuvant and palliative regimes is totally justified. Tab. 4, Ref. 15.

Auth.

13.C13.18. The role of mr spectroscopy in the diagnosis of breast cancer. /N. Meladze/. Actual Topics on Women Health. – 2012. – # 2. – pp. 37-42. – eng.; abs.:geo., eng.

The breast cancer (BC) takes the first place in the structure of oncological diseases of female population all over the world. Currently, one of the most important problems of mammology is the differential diagnostics of good-quality and malignant formations of mammary glands. It is known that MR mammography is a sensitive, however, not always specific method for diagnostics of diseases of mammary glands. In this connection, we have found actual to our study carrying out the research, purpose of which was to explore the possibilities of application of magnetic resonance spectroscopy in the differential diagnosis of formations of breast. MR spectroscopy was conducted to 73 women with the breast formations. The breast cancer was revealed in 52 patients (71.3%), fibroadenoma – in 19 (26%), lypoma – in 2 (2.7%). Single Voxel proton MR spectroscopy was carried out using the sequence of RESS before and after the introduction of contrast preparation. Voxel size was 1-3 mm. The increase of concentration of choline in the malignant formations has been revealed in the study without the contrast substance in the 7 observations, and in the study without introduction of contrast substance - in 9 ones. In all other observations, the identification of the choline peak in malignant formations was not possible, which we connected with a greater Voxel size, exceeding the size of formation. In addition, the increase of a choline level was determined in 2 (10.5%) observations of fibroadenoma both on up to, and on postcontrast researches. In connection with the inhomogeneity breast tissue, the availability of plenty lipids and water also arise difficulties due to signals from the data of metabolites. Thereof, it is necessary to use various methods for the reduction of signal intensity from the specified substances which was not always able to be suppressed effectively. Considering a close arrangement of peaks in the spectrum, it was not always possible reliably to judge about the presence or absence of choline. MR spectroscopy showed the best results after the introduction of contrast preparation that is associated with a more accurate voxel positioning. But there are diagnostic limitations of the MR spectroscopy, for example, when voxel size exceeds the size of a tumour, the distribution is determined by a very low-power signal from choline or lack absence of it and it does not allow to diagnose the breast cancer. Ref. 9.

Auth.

13.C13.19. Melatonin receptor (MT1A), universal nitric oxide synthase (uNOS), and breast cancer. /D. Kasradze, A. Tavartkiladze/. Actual Topics on Women Health. – 2012. – # 2. – pp. 43-47. – eng.; abs.:geo., eng.

The experimental research confirmed that melatonin plays an important role both as an oncopreventive agent and onco-therapeutic medication. We have studied 30 patients (28-53 years old) with breast cancer – with clinical/morphological diagnosis: ductal adenocarcinoma at the IV stage. The expression of melatonin receptor (MT1A) in cellular cultures of mammary gland tumors was studied using immune histochemical method and reagent MEL-1A-R antibody (GeneTex, Catalog Number GTX108221). The data of histochemical test on melatonin receptor (MT1A) expression in healthy patients breast biopate were used as control. In parallel, we have studied expression of enzyme universal nitric oxide synthase (u-NOS) in cellular cultures mammary ductal adenocarcinoma (30 cases) using Western Blot Method (reagent u-NOS antibody Catalog Number GTX73127. Gene Tex). The findings were compared to the data of u-NOS expression in healthy

patients' breast biopate. The obtained results were studied statistically using computer program SPSS, version 12. The results of study demonstrated that the expression of MT1A receptors are decreased in case of mammary ductal adenocarcinoma by 37.3 times, compared to control ($p < 0.01$). It should also be mentioned that the more anaplastic the cancer cell is - the more is decreased melatonin MT1A receptors expression. The expression of universal nitric oxide synthase (u-NOS) is decreased in case of mammary ductal adenocarcinoma by 25.5 times, compared to control ($p < 0.01$). It should also be mentioned that the more anaplastic the cancer cell is - the more is decreased u-NOS expression. Note that decrease in u-NOS expression directly correlates with decrease of melatonin receptor protein MT1A expression level. Ref. 5.

Auth.

13.C13.20. Immunological treatment of unbearing pregnancy with lymphoimmunological method. /N. Rusakova/. Actual Topics on Women Health. – 2012. – # 2. – pp. 48-53. – rus.; abs.:geo., eng.

For the restoration of immunological status of the pregnant woman's organism and blocking factor of autoserum additional stimulation, the immunization with father's antigens is needed. Lymphoimmunotherapy has lots of advantages in comparison with the method of transplantation of skin shred. It's technically easily to fulfill and any complications are excluded. The method of immunization by means of purified lymphocytes has been used since 1988 at E. Pipia Railway hospital in Tbilisi, and from 2008 at J. Zhordania Institute of Human Reproduction. For 25 years of treatment the effectiveness of this method amounts to 92%. In order to study the therapeutic effect of lymphoimmunotherapy in women with a familiar immune unbearing pregnancy. Total of 627 women in the age of 18-40 years were under supervision during 25 years. On the basis of the obtained results, it is possible to come to the conclusion that in cases of unbearing pregnancy, when with smaller or with greater probability it is possible to assume availability of immunological reasons, the method applied by us yields positive results. It is necessary to continue researches for the definition of criteria of selection of patients, time of vaccination, re-vaccination both before and after pregnancy. It is preferably to use lymphoimmunotherapy together with alternative methods of reproductology with objective of enhancing their effectiveness. Ref. 10.

Auth.

13.C13.21. Eating disorders. /M. Shakarashvili, N. Zhvania/. Actual Topics on Women Health. – 2012. – # 2. – pp. 54-65. – rus.; abs.:geo., eng.

Eating Disorders (ED) are the complex of symptoms, connected with abnormal eating habits which may involve either insufficient or excessive food intake to the harm of an individual's physical and mental health. The main forms of ED are: Anorexia Nervosa (AN) and Bulimia Nervosa (BN). One of the causes of rising interest of society to ED is the possible tragic outcome of this pathological condition. Unfortunately, the frequency of ED increases. The ED most often affects women. As usually psychological signs and/or habits of women with ED are: low self-confidences, lack of their real life control, personality conflicts, fairs, solitude and the difficulties with expression of fillings and emotions. The signs of AN are: total refusal, or immoderate food restriction and irrational fear of gaining weight. BN is characterized by recurrent binge eating followed by a compensatory purging: self-induced vomiting, excessive use of laxatives/diuretics, or excessive exercise. The reasons of AN and BN are not entirely understood. There are the following causes of eating disorders: biological (genetic predisposition), psychological (family influence and intrapersonal conflicts) and social (the influence of the environment). Treatment of ED is quite difficult and needs a high quality professional help. The treatment considers: gain of normal weight and treatment of psychological causes of ED - correction of thoughts and behavioral habits. The prevention of progress of Ed in future is also very important. Tab. 1, Ref. 40.

Auth.

13.C13.22. Chest pain in women: influence of imaging modalities on the management. /T. Vakhtangadze/. Actual Topics on Women Health. – 2012. – # 2. – pp. 66-73. – eng.; abs.:geo., eng.

Coronary syndrome is one of the most common causes of cardiovascular disease in both pre and postmenopausal women. However, The Euro Heart Survey of Stable Angina shows that women with angina are both under-investigated and under-treated. In the last decade, the role of modern imaging technologies in the diagnosis and development of the treatment strategies of ischemic heart disease has risen, but the information on their ability to diagnose women with coronary syndrome is still small. Myocardial SPECT provides an information on perfusion pattern, whereas CT angiography shows coronary anatomy, evaluates atherosclerotic plaques, distinguish soft and calcified lesions. The case presented in this article shows the possibilities of different techniques in evaluation of a woman with chest pain. We evaluated the woman with chest pain and normal coronary arteries. Our data indicate that there is an evident response to dipyridamole in women, which is expressed in pain and/or ECG changes; however, this does not correlate with perfusion pattern. Fig. 1, Tab. 1, Ref. 8.

Auth.

13.C13.23. Inappropriate sinus tachycardia. /Sh. Avaliani, M. Balavadze, D. Chiabrishvili/. Actual Topics on Women Health. – 2012. – # 2. – pp. 74-79. – rus.; abs.:geo., eng.

Inappropriate Sinus Tachycardia (IST) is a rare type of cardiac arrhythmia within the category of supraventricular tachycardia. IST is characterized by resistant symptomatic increase of frequency of sinus rhythm, more than 100 beats/min as in the resting state, so in the condition of wakefulness or with the minimal physical activity and with very little deceleration of sinus rhythm during sleep. IST may be caused by abnormal structure or function of the sinus node, or it may be part of the problem called dysautonomia, a disturbance and/or failure of the autonomic nervous system. The mechanism and primary etiology of IST has not been fully elucidated. An autoimmune mechanism has been suggested because several studies have detected autoantibodies that activate beta adrenoreceptors in a part of patients. The mechanism of the arrhythmia primarily involves the sinus node and peri-nodal tissue and does not require the AV node for maintenance. The symptoms reported by patients vary in frequency and severity. The treatment of IST is possible by the use of pharmacological and invasive methods, with varying degrees of success. Some types of medication tried by cardiologists and other physicians include: beta blockers, selective sinus node IF channel inhibitors (ivabradine), calcium channel blockers. Invasive treatments include several forms of catheter ablation such as sinus node modification (selective ablation of the sinus node), complete sinus node ablation (with associated implantation of a permanent artificial pacemaker). Ref. 9.

Auth.

13.C13.24. The specificity of multiple sclerosis clinical course in females. /M. Beridze, M. Alpaidze, S. Sopromadze/. Actual Topics on Women Health. – 2012. – #2. – pp. 88-95. – eng.; abs.:geo., eng.

Multiple sclerosis (MS) is an autoimmune disease causing inflammatory demyelination of the central nervous system (CNS). MS usually causes a relapsing-remitting course and later turns into a chronic progressive disease. Several immune modulation therapeutic approaches are approved by US Food and Drug Administration to treat MS. All these medications as well as other novel therapeutics showed the various side effects and their effectiveness in treating of MS is not sufficient. Scientists still search for most effective and safe treatment for MS population. Gender-related issues in multiple sclerosis include the important and widely accepted clinical observations that men are less susceptible to the disease than women and also that disease activity in multiple sclerosis is decreased during late pregnancy. This gender preponderance is also observed in other autoimmune diseases but the underlying mechanism behind this female prevalence is not very well understood. Specifically, the protective role of testosterone in young men and the protective role of the pregnancy hormone estriol in pregnant women are discussed. The involvement of vitamin D in MS pathogenesis and its connection to sexual hormones are also discussed. The rationale for novel therapies in multiple sclerosis based on the protective roles of these sex hormones is presented. Ref. 19.

Auth.

13.C13.25. Changes in the state of parodontium tissues under the influence of extreme factors. /I. Sakvarelidze/. Actual Topics on Women Health. – 2012. – # 2. – pp. 96-99. – rus.; abs.:geo., eng.

The oral cavity very sensitively reflects the general state of organism reactivity during the changes in the environment. We should consider the damaging effect of emotional stress and complexity of interaction between different systems responsible for the trophism of paradontium. Stress causes acute damage of paradontium tissue. The researches showed that stress can provoke haemomicrocirculatory disorders, disrupt trophism and metabolic processes in the alveolar tissues. Under the influence of extreme factors (hyperbarism, space flight, hypokinesia) on functional, clinical, microbiological, immunologic and cytological indicators of paradontium its vascular tone and blood flow are violated. The violation of vascular tone and blood flow is accompanied by a change in microbiocenosis, which is expressed by an increase in the number of bacteria capable of keeping the inflammation in the tissues of the mouth, and by the emergence of paradontopathogenic microorganisms. Ref. 13.

Auth.

13.C13.26. ST and T wave changes in children of different ages. /G. Chakhunashvili, N. Jobava/. Pediatric Cardiology. – 2013 – # 7. – pp. 11-18. – geo; abs.: geo., eng.

We think that ST and T wave changes in children of different ages must be discussed. We analyzed over 5000 child of different ages from 1981-2013. Despite the age, children appeared to have depressed T wave: - I standard lead – besides first age group; - II standard lead – in all age group; - AVF – in two age groups; - V4 – in last two age groups; - V5-V6 – in all age groups these leads shows as short-lived and also timely born children diagnostic criteria. This is important for disease treatment and also for estimation-prediction of dynamics, for prevention of cardiovascular diseases during rehabilitation in adults. 8 types of ST and T wave morphological changes is the leading estimation criteria during disease progression, as in short-lived, also in timely born children, also for all age groups of children and adult. This is important for disease treatment and also for estimation-prediction of dynamics, for prevention of cardiovascular diseases during rehabilitation in adults. Tab. 3, Fig. 31, Ref. 6.

Auth.

13.C13.27. Estimation of sportsmen physical and functional Condition under the treatment of apipulmo and apicori. /G. Chakhunashvili, N. Badriashvili, N. Topuridze, N. Jobava, Z. Shaqarashvili, Z. Pkhaladze, K. Chakhunashvili/. Pediatric Cardiology. – 2013 – # 7. – pp. 19-22. – geo; abs.: geo., eng.

Apipulmo is a mix of two biologically active components - bee and coniferous extract products, which are full of essential substances. It regulates metabolism of vitamins, amino acids and micro elements, rust and restoration reactions, improves utilization of tissues with oxygen, and increases physical and mental capacity of work, improves reproductive system functions, increases the ability of adaptation to stress reactions and defensive mechanisms. It has immune stimulating, immune modulating and anti-microbe effects. Apipulmo Amino acids are easy to assimilate, which assists to preserve nitrogen balance and organism growth. Estimation of basketballers physical and functional condition under the treatment of Apipulmo and Apicori. Stuff and methods: This work was based on 50 sportsmen (12-18 years old) physical development index and adaptation to load while getting Apipulmo and Apicori (three tablets once a day over a month). Results of research and their discussion: On the first step of research studied sportsmen anthropometric, physical and functional features before using Apipulmo/Apicori and after 3 months of using these products. Conclusion: Usage of Apicori and Apipulmo increases capacity of work, widens training and competition adaptation mechanisms conditions, fastens restoration processes after intensive physical load. Tab. 2, Ref. 10.

Auth.

13.C13.28. EKG parameters (St and T wave) and capillaroscopic parameters during diabetes mellitus type I in children. /G. Chakhunashvili, N. Jobava, K. Chakhunashvili, D. Chakhunashvili/. Pediatric Cardiology. – 2013 – # 7. – pp. 20-24. – eng; abs.: geo., eng.

Diabetes is associated with high risk of cardiovascular diseases. The disease increases the chance of developing cardiovascular pathologies by 2-4 times, compared to healthy population. Aim of the research: Evaluate EKG parameters during diabetic cardiomyopathies; Detecting changes in Capillaroscopic parameters. Methods: Cases of 32 children(6-15 years old, 17 boys,15 girls) diseased with diabetes type I was studied, who were hospitalized In TSMU pediatric clinic's

endocrine department. 13 of them were diagnosed and their cases were studied at once, 10 of them had been diagnosed 2-5 years before, 9 of them – 5-10 years before. We did capillaroscopic examinations. we determined capillaroscopic background (pink, pale, cyanosis), transparency (transparent, dimmed), number of capillaries (6-7 in sight, more or less), diameter of capillaries (dilated, contracted), shape of capillaries (hair like, anastomosis, loop like), Order/Disposition of capillaries (shows some order, does not show any order), blood flow type (homogenous, fast, slow), capillaries (homogenous, non-homogenous). 8 types of ST and T wave changes were determined (G. Chakhunashvili, N. Jobava 2005-2012). conclusions: 1. In group I EKG is less informative. 2. Hypertrophies of left ventricle and atrium and disorders of repolarizations were mainly found in group II. 3. In 64% of cases EKG showed rhythm and conduction disorders, which were more often in group II. 4. To achieve early diagnosis of cardiomyopathy and start early therapy, EKG must be recorded in every diabetes type I. 5. Determining types of changes in ST and T wave is important in children with type I diabetes. 6. Capillaroscopic data are quite important to get the right prognosis of disease progression. Nowadays there are several medications for treating cardiomyopathy, which can improve the quality of life. Tab. 5, Ref. 9.

Auth.

13.C13.29. EKG parameters (ST and T wave) during diabetes mellitus type I in children during some inflammatory and non-inflammatory diseases. /G. Chakhunashvili, N. Jobava, K. Chakhunashvili, D. Chakhunashvili/. *Pediatric Cardiology*. – 2013 – # 7. – pp. 26-32. – geo; abs.: geo., eng.

The frequency and description of ECG changes of ventricle complex terminal part in children is one of the important things. ECG parameters during (ST and T wave) Diabetes Mellitus type 1 is described in details during some inflammatory and non-inflammatory diseases. Conclusion: ECG parameters during (ST and T wave) Diabetes Mellitus type 1 is described in details during some inflammatory and non-inflammatory diseases has some changes during childhood, which determines the strategy of treatment. The frequency and description of ECG changes of ventricle complex terminal part in children is one of the important things in disease progression, diagnosis and rehabilitation in child age. Also for the involvement of cardiovascular system in pathological process. Timely estimation of ST and T wave changes conditions prognosis of the cardiovascular damage during Diabetes Mellitus Type I, some inflammatory and non-inflammatory diseases in child age. Tab. 2, Fig. 2, Ref. 21.

Auth.

13.C13.30. The frequency of mitral valve prolapse, etiology and pathology, determination of pathological process involvement degree and discussion in context with arrhythmia. /G. Chakhunashvili, N. Jobava, K. Chakhunashvili, M. Shvangiradze, M. Inasaridze, D. Chakhunashvili/. *Pediatric Cardiology*. – 2013 – # 7. – pp. 32-37. – geo; abs.: geo., eng.

They first talked about mitral valve prolapse in 60's of XX Century. Many famous scientist works were dedicated to its etiology and diagnosis (White, 1931; Reid, 1961; Barloid, 1963; Hancock, Co-hu, 1966; Jeresaty, 1979 and others). Aim of research: The aim of research was to show the diagnostic meaning of mitral valve prolapse and arrhythmia in children and adults. Methods and stuff of the research: 1500 children (0-15 age) and 250 children (max age 18) from sport schools were examined and analyzed. All of them were examined with clinical-laboratory and instrumental methods. Conclusion: 1. In 56% of children who had mitral valve prolapse had arrhythmia. 2. Their physical activities must be under strictest control just in case new rhythm disorders cannot damage their health. Ref. 19.

Auth.

13.C13.31. Clinical value of ST segment and T wave, during ventricle repolarization, early discharge partial syndrome and narrowed P-Q interval in children and adolescents. /N. Jobava, G. Chakhunashvili, K. Chakhunashvili, D. Chakhunashvili/. *Pediatric Cardiology*. – 2013 – # 7. – pp. 38-41. – geo; abs.: geo., eng.

Nowadays it is known that, cardiovascular system can be involved in pathological process during either diseases or not right training. Coronary blood flow is also damaged during some congenital or acquired non-inflammatory diseases. That is why we think it would be right to detect all above said changes, analyze them during disease or in healthy contingent (sportsmen). Meaning of ST

segment and T wave during repolarization syndrome (Prolonged Q-T interval), ventricle repolarization syndrome, Narrowed P-Q interval (0,12) and early discharge of ventricle in children and adolescents. 4500 children of age 0-15 were examined with different diagnosis (Grp I) and 350 sportsmen of age under 18 from different sports schools. All of them were examined with clinical-laboratory and instrumental methods. The numeric index was evaluated with student criteria (t), qualitative criteria 2, comparing between groups by Pearson. Difference was trustworthy if $t > 1,96$ $p < 0,05$ and $2 > 3,84$, $p < 0,05$. Diagnosing syndromes, as variety of normal EKG, must take a lot of caution and is justified if we have corresponding data of changing during clinical examination and EKG changes in dynamic. The further study also must be done about clinical syndrome, as we must be aware that if syndromes are symptoms of pathology and they stay after curing the pathology, we might think that the changes in EKG is individual for the healthy organism. The research done by us proves that ST segment and T wave changes in children demand individual discussion, which must stay as a clinical information from childhood throughout the life. Ref. 13.

Auth.

13.C13.32. Once again about acute rheumatic fever. /G. Chakhunashvili, R. Svanadze, N. Jobava/. Pediatric Cardiology. – 2013 – #7. – pp. 57-64. – geo; abs.: geo., eng.

Once again attention should be paid that last few years rheumatic fever number has decreased in economically developed countries and embraces 5 occasions in every 100000 citizens. In less developed countries disease index is 26-116 in every 100000 citizens. Mostly it's adults and children from 5-15 who get ill, but newborns and old people can also fall ill. Manifest is three times frequent in north Caucasus than in south. Correlation of sex – women : men=3:1. Today's evolution of rheumatic fever peculiarities: The tendency of increased number of disease in elder ages (20-30), increased number of latent course, decreased number of symptoms and mono organic damage, decreased frequency of heart valves damage. Fig. 4, Ref. 6.

Auth.

13.C13.33. In pediatric cardiology - possible usage of immune therapeutic medicine "GA-40" in treatment during infectious pathology. /G. Chakhunashvili, N. Jobava, K. Chakhunashvili, D. Chakhunashvili/. Pediatric Cardiology. – 2013 – # 7. – pp. 77-78. – geo; abs.: geo., eng.

Aim of work: Determination of usage of "GA-40" usage in treatment. The reason of the research was to investigate how "GA-40" effects on G.S.S. in experiments, where instrumental index and morphological data will be analyzed. Conclusion: "GA-40" effect was positive on cardiovascular system, cardiomyocytes, capillary endothelium (experiments on rabbits). This medicine should be used in pediatric cardiology during infectious diseases. Tab. 1, Fig. 8, Ref. 6.

Auth.

13.C13.34. The prospects of sporting valeology. /I. Dolidze, G.Chakhunashvili/. Pediatric Cardiology. – 2013 – # 7. – pp. 79-81. – geo; abs.: geo., eng.

Sports Valeology is a science on the and means of formation, preservation and strengthening of humans health. Valeology, as integrative science, gained its place in scientific world and is solving the problems of motivated health. Valeologist should synthesize in himself basic knowledge, typical for medical-prophylactic specialists, teachers and psychologists. The sporting Valeology, alongside with its theoretical and practical trends, should be considered a basis of General Valeology, It is obligatory to outline the plan of its perspective development. Ref. 14.

Auth.

13.C13.35. Hearing function in industrial workers: occupational noise influence. /M. Tushishvili, N. Sharashenidze, A. Tushishvili, Z. Kevanishvili/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 191-197. – geo.; abs.: geo., eng., rus.

Hearing function has been estimated in workers engaged in construction of trans-Caucasian pipeline over Georgia and subjected therefore to regular environmental noise exposures. The control group was represented by the employees of local humanitarian institutions. Auditory thresholds were measured within 0.125-12-kHz frequency band. Perception of 4-12-kHz frequencies was found to be selectively disturbed in workers group. Hearing deterioration particularly concerned 12- and 10-kHz frequencies. Younger individuals, 20-29, 30-39, and 40-49 years of age, demonstrated higher sensitivity to the job-related noise. In older subjects, 50-59 and 60-69 years of age, due to

age-linked threshold increments primarily in a high-frequency hearing band the noise effects became lesser in degree and narrower in spectral width. The testing of 12- and 10-kHz perception qualities is considered to be essential for revealing even of initial hints of hearing disorders under the noise exposures and for an in-time start then of respective prevention and/or rehabilitation services. Fig. 2, Tab. 1, Ref. 7.

Auth.

13.C13.36. Immune system and euthyroid goiter. /G. Chakhunashvili, N. Topuridze, N. Badriashvili, K. Chakhunashvili, S. Ghlonti/. Social, Ecological & Clinical Pediatrics. – 2013. – # 15-10-9. – pp. 49-51. – geo; abs.: geo., eng.

The aim of the study was to investigate function of thyroid glands as well as cellular and humoral immune system in patients with Euthyroid goiter. The investigation was carried out on 60 patients with Euthyroid goiter who underwent Ultrasonography of the thyroid glands, who also were studied on T- lymphocytes and its subpopulations CD3, CD4, CD8, the percentage levels of B lymphocytes, Ig G, Ig A, Ig M, testimonies in serum of blood, concentration of thyroid hormones T4 and T3. The results show that, the cell's immune system damages more heavier than hummor immune status during Euthyroid goiter. There was detected dramatic decrease of CD3 and CD8 lymphocytes, and increase of levels of B lymphocytes, Ig G, Ig A, Ig M. Changes in Immune system are accompanied by decrease of thyroid hormones T4 and T3 level in serum of blood. Based on our study we can conclude that studding Immune system is important in patients with thyroid gland pathology, as well as studying thyroid gland hormones T4 and T3 in the patients with autoimmune diseases. Tab. 1, Ref. 11.

Auth.

13.C13.37. New steps in critical care medicine - the plasma eradiation. /Z. Kheladze, S. Jaiani, B. Tsutskiridze, N. Kvitsiani, G. Chakhunashvili, D. Chakhunashvili/. Social, Ecological & Clinical Pediatrics. – 2013. – #15-10-9. – pp. 70-74. – geo; abs.: geo., eng.

The new prognostic-analogue scale of rating the bedsores of the critically ill patients was elaborated by authors. 6 most important prognostic criterions were used, by which the patients with the bed sore wounds were evaluated. The new scale aids in defining the general picture of the bed sore and rate the bedsores not only by its' stages, but also with determining localization, character, depth, area and the additional factors that favor the development of the bedsores. The above mentioned gives the possibility to determine the preparation criterions for the surgical operations, to ascertain the exact localization of the bed sore. The achieved results give the opportunity to recommend using of this scale to determine the necessity and readiness of the surgical treatment of the bed sore wound, for timely correction and prognosis of the treatment course. In this article, the authors, based on the treating experience of the critically ill 103 patients with bed sore wounds, offer the new method of treatment, which is based on using the plasma eradiation. The complex treatment of the above mentioned category of patients includes treating and irradiating the surface of the wound with the plasma flow, which significantly improves the results of treatment, lowers the numbers of complications and shortens the general dates of treatment. Achieved results, give us the possibility to widely recommend this method for treating the patients with bed sore complications. Ref. 11.

Auth.

13.C13.38. Treating surgical sepsis. /S. Jaiani, B. Tsutskiridze, D. Chakhunashvili, G. Chakhunashvili, N. Kvitsiani/. Social, Ecological & Clinical Pediatrics. – 2013. – # 15-10-9. – pp. 78-82. – geo; abs.: geo., eng.

The treatment and diagnostics of purulent-septic diseases is one of the most unsolved and tough problems of surgery. Its' actuality is related to the spreading of the purulent complications, which caused the numbers of the surgeries and the antibioticoresistent microflora to increase, as well as the dysfunctions of the patients' imunobiological reactions. The authors offer using the plasma-surgical device, which gives the opportunity to hasten the cicatrization dates of the wound using its' positive effects such as thermal effect of the plasma flow and the ultraviole and ozone components. The proposed plasma method of surgery makes it possible to improve the treating effect of the patients with purulent infection and the positive results were achieved even at the early stages

of using this method. The achieved results gives us the possibility to recommend using this method for treating the patients with the above mentioned complications. Tab. 2, Ref. 5.

Auth.

13.C13.39. Immunological testimonies among the children with Bronchopneumonia diseases associated with thymomegalia disease treated with apihepati. /G. Chakhunashvili, N. Topuridze, N. Badriashvili, K. Chakhunashvili/. Social, Ecological & Clinical Pediatrics. – 2013.– # 15-10-9. – pp. 84-86. – geo; abs.: geo., eng.

The aim of our trail research the immune system among the children of early age with bronchopneumonia. We studied T- lymphocytes and its subpopulations CD3, CD4, CD8, antibodies. The percentage levels of B lymphocytes, The Ig G, Ig A, Ig M, testimonies in serum of blood. The aim of our theme is the study the cell and hummoral immune system among the children of early age. Given results show us that cell immune system is more damaged during bronchopneumonia. We used immune modulating – apihepati. The results showed that Apihepati combined with basic treatment significantly enhances cellular as well as hummoral Immune status of the patients with bronchopneumonia diseases. Tab. 1, Ref. 9.

Auth.

13.C13.40. Some peculiarities of different traits in monozygotic twins. /D. Tskhomelidze, M. Abisonashvili, B. Rukhadze, D. Chakhunashvili, V. Ozashvili/. Social, Ecological & Clinical Pediatrics. – 2013. – # 15-10-9. – pp. 89-90. – geo; abs.: geo., eng.

The aim of our research was to find the differences between single monozygotic twins by different signs, for example weight at birth, height, form of head, nose, ear, length of face, color of skin, developing birth mark on the body and so on. At the same time we established one strange rule for monozygotic twins: The first one (who was born first) more often begins walking earlier compared to the second one and the same process was going on with first teeth appearing. To consider problems of epigenetics and genomic imprinting in future we have to find some interesting exceptions: 1) The single monozygotic twin(girl) with an undeveloped lachrymal gland was located in the epigastric area of the body and it was inherited to daughter from father. 2) We established that some single twins are different from each other by length of face(maximum in our case was- 6 mm) and the mother of these twins can distinguish between them by this sign. But at the same time she is unable to catch the difference between the other monozygotic twins. Fig. 2, Ref. 5.

Auth.

13.C13.41. Use of plastic materials in surgical repair of anal fistulae. /T. Abuladze, D. Mzhavanadze, K. Shapatava/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 14-20. – geo.; abs.: geo., eng., rus.

Surgical treatment of complex anal fistulae should be primarily directed at preventing postoperative fecal incontinence. We have introduced the fourth variant of plastic surgery, which utilizes autotransplantation (fascia lata femoris), explantation (synthetic polymeric plates), or medical glues. The procedure was performed on 258 subjects. The plastic repair of anal fistulae was directed at hermetization of the perineally resected fistula stump and transanal repair of the internal channel with the full preservation of the sphincter function. The results of the treatment were compared with the control group of 281 subjects. The rate of recurrence in the experimental group, when compared to the control group, was decreased from $9.3\pm 1.7\%$ to $5.4\pm 1.4\%$. No anal insufficiency was observed in the experimental group, while its rate in the control group was $9.6\pm 1.8\%$. Ref. 5

Auth.

13.C13.42. Substantiation of the treatment expediency of patients with chronic nonspecific pulmonary diseases in conditions of micro-climate of karst cave. /I. Tarkhan-Mouravi/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 21-26. – geo.; abs.: geo., eng., rus.

It has been found that the course of speleotherapy in the conditions of karst cave causes the activation of metabolism in hypothalamic cells and the increase of secretory activity of the pituitary cells both in patients and animals with chronic nonspecific bronchopulmonary inflammatory process, which, in its turn, leads to the increase of cortisol production in fascicular zone of adrenal

cortex. This was manifested in the increase of cortisol content in blood plasma and involved the attenuation (up to the disappearance) of bronchopulmonary inflammatory process and sensibilization of the organism, the improvement of respiration, as well as immunological and clinical parameters. Ref. 4.

Auth.

13.C13.43. Experimental investigation of the influence of Borjomi district village Akhaldaba borehole mineral water baths on the microstructure of skin and some organs. /I. Tarkhan-Mouravi, N. Gordadze, N. Didebulidze, L. Metreveli, I. Sikharulidze, M. Kakabadze, M. Kordzaia/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 27-33. – geo.; abs.: geo., eng., rus.

The investigation of the influence of Borjomi district village Akhaldaba borehole mineral water baths on the organism was conducted on male white rats in order to evaluate the influence of weakly mineralized (M-0.64) silica-acid, boric, carbonate-sulphate-sodium mineral water on the histological structure of skin, esophagus, stomach, duodenum, liver and the kidney. The experiments were conducted on 20 male white mongrel rats. 10 experimental rats were taking the mineral baths ($T=40\pm 3^{\circ}\text{C}$) for 60 minutes every day during three weeks; at the same time 10 animals of control group were taking the baths of tap water. All animals were attempted to breed after experiment; specimen analysis and taking of microphotographs was performed in microscope Ergeval-MF. The data obtained revealed that three-week application of mineral water baths doesn't lead to a change in macro- and microstructure of esophagus, stomach, duodenum, liver and the kidney of rats; and in the skin causes the intensification of natural current processes (epidermis keratinization, desquamation, glands maturation) and promotes the renovation of skin. So, the data obtained allow us to make the conclusion that this mineral water baths have no effect on the internal organs and can be used in practice. Ref. 3.

Auth.

13.C13.44. Use of tea in medicine (review of literature). /N. Kakulia/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 34-39. – geo.; abs.: geo., eng., rus. Peroral drinking of green tea has a normalizing influence on atherosclerosis, some forms of cancer, inflammatory diseases of intestines, diabetes mellitus and liver pathologies; intake of tea lowers cholesterol content in blood and promotes the weight loss in humans. Ref. 4.

Auth.

13.C13.45. Influence of medical rehabilitation using karipazim electrophoresis on patients with post-discectomy syndrome. /N. Saakashvili, Z. Kemoklidze, I. Tarkhan-Mouravi, N. Kakulia, M. Tabidze, I. Kvinikadze, N. Kvinikadze, N. Gurgenidze/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 40-53. – geo.; abs.: geo., eng., rus.

Thirty-two patients with post-discectomy syndrome were examined. All patients developed post-discectomy syndrome after surgical intervention on the disc between III and IV lumbar vertebrae. It was found that medical rehabilitation using karipazim causes weakening (up to even disappearance) of inflammatory process in the operated focus in patients with post-discectomy syndrome. The weakening of the inflammatory process in the operated intervertebral disc of patients with post-discectomy syndrome caused normalization or tendency to normalization of clinical and neurological condition, reduction in pain index and in severity of depression and anxiety; it significantly improved the quality of life. It was found that medical rehabilitation using karipazim electrophoresis is an effective method for the rehabilitation of patients with post-discectomy syndrome. Tab. 6, Ref. 18.

Auth.

13.C13.46. Algorithm of physical rehabilitation in patients with shoulder impingement syndrome. /I. Jankarashvili, M. Rukhadze/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 54-63. – geo.; abs.: geo., eng., rus.

The aim of this work was to establish the effectiveness of algorithm of methods of complex physical rehabilitation in patients with shoulder impingement syndrome. Total of 16 patients of both genders in age of 59-71 years were under the observation. Clinical examinations and diagnostic ultrasonography of shoulder joint before and after rehabilitation and X-Ray investigation were held.

The following algorithm of physical methods of rehabilitation was applied: electrophoresis with proteolytic enzyme karipazim - 20-25 procedures; from the 7-8 procedures of electrophoresis - phonophoresis with voltaren and chondroxide -10-15 procedures; from the 7-8 procedures of phonophoresis special exercises for shoulder muscles were added. After carrying out the specified rehabilitation complex a positive rehabilitation effect after first course was obtained in 13 patients. In two cases it was necessary to carry out the second course of rehabilitation. In one case slightly positive effect of rehabilitation was reached. Thus, on the basis of carried out research high therapeutic effect of algorithm of physical rehabilitation developed by us was established. Algorithm is based on the complex impact of physical methods. It includes consecutive application of resorptional, anti-inflammatory, chondral protecting and shoulder muscles enhancing impacts. Tab. 2, Ref. 13.

Auth.

13.C13.47. Health state of refugee children from Abkhazia. /G. Chakhunashvili, N. Manjavidze, I. Manjavidze, G. Chitaia, M. Tsiklauri/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 64-68. – geo.; abs.: geo., eng., rus.

There was held an investigation of the health status of 6-15 years old 800 refugee children from Abkhazia. This investigation suggested that 43.5% of the children had somatic and psycho-emotional dysfunctions. Those having psycho-emotional dysfunctions mostly manifested psycho-neurological dysfunctions, too. Fig. 2, Ref. 6.

Auth.

13.C13.48. Content of light aeroions in some health resort And tourist zones in Borjomi and Tbilisi. /A. Amiranashvil, V. Amiranashvil, T. Bliadze, I. Tarkhan-Mouravi, V. Chikhladze/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 69-74. – rus.; abs.: geo., eng., rus.

The results of investigation of light aeroions concentration in some health resort and tourism zones in Borjomi and Tbilisi, carried out in 2012, are presented in this paper. In particular, the data about the summary concentration of the ions in Borjomi park and of the territories adjacent to it, including the gorge of Borjomula river are cited. It is shown that near the river it is possible to find sufficiently places, suitable for the ionotherapy. Analogous situation are for other places of Borjomi Health Resort - the forest near to Mtsvane monastery; the bank of river Mtkvari, etc. In Tbilisi, in spite of the high air pollution, besides the territory of State Botanical Garden, it is also possible to find places, suitable for leisure about the rehabilitation - Mamkoda park, Tbilisi sea, Tortoise lake, etc. It is proposed subsequently to conduct the more detailed analyses of the content of ions in air of these zones, which will make it possible to increase the effectiveness of the health resort-tourist potential of Georgia. Tab. 2, Ref. 7.

Auth.

13.C13.49. Interconnection between aggression and pain (experimental study on rats). /G. Bekaia/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 75-79. – rus.; abs.: geo., eng., rus.

On the white naturally aggressive and nonaggressive rats, differentiated in accordance with Karli method, the tests on passive avoidance conditional reactions were performed in conditions of chronic experiments. It was confirmed that the pain threshold in naturally aggressive rats is significantly higher (by 33%) in comparison with naturally nonaggressive rats. It has been also established that emotional reaction of fear in naturally aggressive animals is maintained significantly longer (45 ± 6.5 days) as compared to nonaggressive ones (24 ± 5.2 days). According to the literature data the decrease of serotonin level in the brain of rats is observed at the development of aggression and at the same time the decrease of serotonin concentration in the brain is related to the improvement of memory (learning). Ref. 9.

Auth.

13.C13.50. Complex rehabilitative therapy of inflammatory processes in periodontium with the use of low-intensity laser and imudon. /T. Bostanjan, I. Kechin, R. Irzaev, A. Chebykin/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 80-87. – rus.; abs.: geo., eng., rus.

The use of complex rehabilitation therapy with low-intensity laser irradiation and imudon significantly increases the effectiveness of treatment of inflammatory processes in the periodontium, which develops after dental implantation surgery. Fig. 1, Tab. 2, Ref. 15.

Auth.

13.C13.51. Studies of the bioclimatic resources of Georgia in the joint operations of the institute of geophysics and Scientific and practical centre of health resort managing, physiotherapy, rehabilitation and medical tourism. /N. Ghlonti, N. Saakashvili, I. Tarkhan-Mouravi/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 88-93. – rus.; abs.: geo., eng., rus.

The analysis of the joint operations of the Institute of Geophysics and Scientific and Practical Centre of Health Resort Managing, Physiotherapy, Rehabilitation and Medical Tourism in the field of research of the bioclimatic resources of Georgia in the last five years is represented. The important results, obtained during studies of air equivalent-effective temperature in Kutaisi and Tskaltubo, the content of light aeroions in different health resort and tourist zones of Georgia, including in Tbilisi are noted; a question about the organization of ionotherapy at the health resorts of the Georgia is examined; the need for travelling papers of the health resort-tourist potential of Georgia in the correspondence with the contemporary requirements is indicated. It is intended to continue the indicated joint studies, and also to combine efforts for the solution of the new problems of scientific and applied value (development of recommendations regarding the adaptation to expected climate changes, creation of the bioclimatic passport of the health resort and tourist zones of Georgia, etc.). Ref. 9.

Auth.

13.C13.52. Diagnostic issues of vestibular neuritis. /S. Japaridze, T. Khechinashvili; R. Talishinski, M. Lomaia; N. Nakudashvili, E. Kharkheli/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 94-100. – rus.; abs.: geo., eng., rus.

Growing industry and various social-economic factors have led to global climate change and rise of different infections, affecting organs and parts of the human organism, including disability. In this respect a special attention is focused on inner ear disorders, particularly vestibular neuritis, the diagnosis of which is often impeded leading to delayed initiation of treatment. Hence the present study aims at specification of some indices obtained by means of vestibulometric method. Total of 23 consecutive patients, aged 18-50 (12 males and 10 females) have been evaluated. All of them complained of systemic dizziness, spinning sensation of themselves and surrounding objects in a single direction, remaining for the whole period of illness, besides they suffered from unsteady pacing, sudden blackouts, nausea and vomiting. Spinning direction commonly concurred with the direction of slow phase of spontaneous nystagmus. The onset of the disease in the majority of cases was associated with the recent episodes of viral grippe and in fewer instances with other infections or stressful states. Only in 2 occurrences it was not related to any other factors. The assessment of the following parameters, like rate, amplitude and speed of slow phase (SW) of spontaneous, caloric and optokinetic nystagmus was performed employing computed electronystagmography (Toennics Electronystagmography Computer System (2002). Labyrinth colorization was carried out using J. Clausen (1982) method applying certain amount of water varying in temperature regimes (30°C-44°C). As a result of the conducted study, it appeared that the incidence rate of the disease was significantly higher in transitional seasons (autumn, spring) ($P < 0.05$). In all the instances a vestibular neuronitis was marked with lesion of a single labyrinth. Rate and speed value of the SW of spontaneous nystagmus in case of closed eyes was marked with increase of the first parameter and decrease of the other one. Spontaneous nystagmus was revealed in nearly all the cases observed and only in one it was not identified at all. Comparing the rate, amplitude and speed of the SW of optokinetic nystagmus, in healthy and diseased labyrinths, it appeared that in the latter case those parameters were characterized by significant variability, appropriate to peripheral lesion of the vestibular apparatus ($P < 0.05$, $P < 0.01$ and $P < 0.05$). The investigation of the reflector nystagmus demonstrated diminished vestibular irritability or its complete absence in the affected labyrinth compared to the healthy one ($P < 0.05$). In conclusion, it should be noted that the findings, obtained as a result of the conducted subjective and objective investigation, vividly indicate the presence of vestibular nystagmus. Regarding the

elicited data, it enables the medical doctors to reach differential diagnosis, to distinguish the VN from other vestibulopathies in order to initiate appropriate and prompt treatment. Ref. 4.

Auth.

13.C13.53. The influence of splenectomy on young rat's growth. /N. Didebulidze, I. Tarkhan-Mouravi, N. Gordadze, M. Kordzaia, L. Metreveli, I. Sikharulidze, M. Kakabadze/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 101-107. – rus.; abs.: geo., eng., rus.

The experiments were conducted on 80 male white mongrel rats with 80-100 g body mass. 4 groups of animals were created. In the first basic group (n=20) splenectomy was held, in two control groups - 1/3 liver resection (second group, n=20); in the third - false operation (n=20); and the fourth group (n=20) - consisted of intact animals. The main goal of this investigation was the evaluation of correlation between changes in adenohipophysis somatotropocits and young rats growth speed after splenectomy. All animals were weighted every day, and slaughtered with Ether narcosis by decapitation after 1, 3, 7, 14, 30, 60, 182 days. The pronounced changes in haemolympatic nodes were observed on the II month after splenectomy. The nodes were bean-shaped, with size 6.5 ± 1.1 mm. On the specimens revealed realizes compensatory function. Maximal growth speed of splenectomized rats was revealed on the sixth week after operation ($C=0.03$), and in control groups - on the second, or third week ($C=0.02$). At the end of the experiment the growth of splenectomized rats mass (282.2 g), and accelerated growth of femoral bones were revealed. Femoral bones of splenectomized rats were 3.0 ± 0.49 mm longer than in II and IV control groups and 2.8 ± 0.38 mm. Longer as compared to false operated rats. The concentration of STH in blood serum of splenectomized rats correlated with their growth speed. STH concentration reduction over postoperation eighth week up to control indices was accompanied by the decrease of growth speed. Ref. 4.

Auth.

13.C13.54. Complex therapy of inflammatory processes in periodontium with the use of low-intensity laser and imudon. /I. Kechin, R. Irzaev, A. Chebykin, T. Bostanjan/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 108-110. – rus.; abs.: geo., eng., rus. Combined therapy with the use of low-intensity laser irradiation and imudon significantly accelerates the improvement of various indices in patients with gingivitis and periodontitis. Ref. 3.

Auth.

13.C13.55. About the mechanism of impact of electromagnetic weather on human health. /E. Sakvarelidze, Z. Sharadze/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 111-118. – rus.; abs.: geo., eng., rus.

The problem of the influence of electromagnetic weather on human health is considered in this work. Sun-Earth connection is most noticeably seen in the days of the solar activity, when the explosions on the Sun are accompanied by magnetic storms during which biotropic effects are manifested that adversely affect the human body. Numerous data confirm the negative effect of solar activity, particularly on the cardiovascular and nervous systems of humans. However, to date, the main problems are biotropic factors of solar activity and the establishment of the mechanism of their impact on biological objects. The article describes the mechanism of the impact of perturbations of the magnetic field on the human body. This impact can be through an information mechanism when disturbed synchronous communication between exogenous "leading" natural rhythms and endogenous biorhythms, causing the desynchronization of endogenous biological rhythms, and, as a consequence, the deterioration of health. Matching the main harmonic frequencies of infralow electromagnetic fields generated by separate systems of the human body with the values of the resonant frequencies of the natural resonators of Schumann and Alven and short-periodic magnetic disturbances was the basis to explain the negative effects of magnetic storms on health information influence of infralow-frequency weak natural fields. Ref. 7.

Auth.

13.C13.56. Urgent medical rehabilitation of victims of traffic emergency situations. /A. Ter-Ovakimian/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 119-122. – rus.; abs.: geo., eng., rus.

Increasing efficiency and quality of rendering emergency medical care to victims of traffic accidents and crashes requires to solve such issues, as: a) Ensuring interaction of territorial accident medical service with emergency services of the Ministry of Transport and relevant departments involved in eliminating the consequences of emergency situations; b) Solving issues related to the provision of information, preparation of medical and diagnostic standards for emergency medical assistance to victims with polytrauma; c) Providing emergency prehospital medical care to victims with polytrauma, including conducting medical sorting with evacuation and transport provision; d) Allocating a number of city public health hospitals and ensuring they are prepared to provide qualified and specialized care according to the type and nature of injuries received; e) Carrying out complex assessment of the severity of traumatic injuries, and determining the place of traffic injuries in the structure of crisis and emergency situations on transport; f) Studying the structure of traffic injuries and their medical consequences with the process analysis of emergency medical support in traffic accidents; g) Development and implementation of medical and diagnostic algorithms in providing medical care with rehabilitation of patients with polytrauma in the prehospital and hospital stages. Ref. 6.

Auth.

13.C13.57. Importance of mechanism of respiratory tract influence at the rehabilitation stage in patients diseased with pulmonary heart. /G. Eliava, A. Isakadze, T. Tsintsadze, M. Tabidze, T. Buachidze, L. Topuria/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 123-125. – rus.; abs.: geo., eng., rus.

Basic pathogenetic factors of evolution of pulmonary heart are elevated pressure in the system of pulmonary artery and hypoxemia. Alveolar hypoxia arises during hypoventilation of central, bronchopulmonary or thoraco-diaphragmal origin. At the rehabilitation stage it is necessary to eliminate inadequate nasal breathing or its full absence since it promotes alveolar hypoventilation, heart hyperfunction that ultimately can become the risk-factor of pulmonary heart evolution. Ref. 3.

Auth.

13.C13.58. The role of reflectory influences in the activity of sino-atrial node. /N. Saakashvili, G. Eliava, T. Tsintsadze, M. Tabidze, L. Topuria, T. Buachidze/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 125-129. – rus.; abs.: geo., eng., rus.

The method of mathematical analysis of heart rhythm has been used for assessment of the condition of body regulatory systems, which gives us an opportunity to estimate the ratio between activity of sympathetic and parasympathetic parts of vegetative nervous system, condition of humoral channel of regulation and of subcortical centres, while sino-atrial node is considered to be the indicator of humoral neural influences. The experimental study carried out showed that mouth breathing, in comparison with nasal breathing, caused an acute respiratory sinus arrhythmia in the experimental animals. The dynamics of statistical factors of heart rhythm points at the dominance of parasympathetic nervous system's activity that is explained by the modification in proportion of afferent signaling from different reflexogenic zones of respiratory passages. Ref. 6.

Auth.

13.C13.59. Interhemispheric asymmetry: psychophysiological aspects. /I. Sekoyan/. Actual Problems of Pathology, Therapy and Medical Rehabilitation. – 2014. – pp. 130-142. – rus.; abs.: geo., eng., rus.

The aim of research is to study the association of latent left-handedness signs and emotional-personal sphere characteristics with analysis of their transformation in age and gender aspects. 408 respondents have participated in project: 157 men (38.5%) and 251 women (61.5%) distributed in three groups according to age: I - 234 respondents, average age ($M \pm SD$) 22.7 ± 2.8 years, II - 81 respondents (38.7 ± 6.2), III - 93 respondents (57.4 ± 4.4). Psychometric examination has been carried out by standardized tests. The signs of latent left-handedness are revealed in 82.4% of respondents. The number of persons having one sign makes 26.0 %, with two signs - 30.4%, three signs - 14.0%, four signs - 12.0%. In community sample and gender aspect there is revealed the tendency of progressing with the years increase in number of persons both without signs of latent left-handedness and with a single sign. Progressing reduction in number of respondents with two and more signs of latent left-handedness is marked. In community sample 78.6 % of respondents have overcome test for sincerity according to Eysenck Personality Inventory test

(EPI₁) scale, the rest 87 persons have been excluded from the further examination. According to testing results (EPI₂ scale) there has been marked with the years an increase in number of intraverts and reduction in number of extraverts, meanwhile parameter of emotional stability (EPI₃ scale) in age and gender aspect does not practically change. With increase in age there occurs reduction in number of choleric, increase in number of phlegmatics and melancholics, thus, the number of sanguinics among men with the years does not change, but it is progressively reduced among women. The obtained results of respondents by Rotter I-E testify about an increase with the years in number of persons with external personal type and reduction in number of persons with internal personal type. Associated triad: alexithymia (on Toronto □ Alexithymia Scale) anxiety (on Staite-Trait Anxiety Inventory) □ depression (on Beck Depression Inventory), in the greater percent of cases is revealed in intraverts and externals. With the help of plural linear regress model, Spearman and Kendall nonparametric criteria, as well as with cluster and factorial analysis there has been revealed that the positive correlation connection and character of association between investigated psychometric parameters in respondents are exposed with the years to the certain modifications. Thus, it is established that in age dynamics alongside with increase of motor interhemispheric asymmetry there occurs an original transformation of respondents' emotional-personal characteristics, which can be consider to be one of the parameters of left-hand brain lateralization. Fig. 1, Ref. 6.

Auth.

13.C13.60. Interconnection between assisted reproductive technologies, pregnancy complications and risk of birth defects. /V. Grabar/. Georgian Medical News. – 2014. – # 2(227). – pp. 7-14. – rus.; abs.: geo., eng., rus.

The aim of the article was to investigate the relationship between pregnancy complications, infertility and assisted reproductive technologies (ART). The study was conducted on 1331 couples with complicated reproductive history. It is found that miscarriage and other complications of pregnancy depend rather on the etiopathogenesis of infertility than on the technique of ART. The highest frequency of complications of pregnancy was diagnosed in women with endocrine disorders. In case of congenital malformations in the fetus the frequency of birth defects was 3.6% after in vitro fertilization (IVF) and 1.8% in case of spontaneous pregnancy. It was found an increased risk of birth defects in singleton boys conceived by IVF. Tab. 2, Ref. 15.

Auth.

13.C13.61. The influence of C-aurine antioxidant complex on biochemical blood parameters in the process of treatment of patients with diabetes mellitus of type II with nonproliferative diabetic retinopathy. /S. Lekishvili/. Georgian Medical News. – 2014. – # 2(227). – pp. 14-20. – rus.; abs.: geo., eng., rus.

The purpose of this investigation is to study the effect of C-aurine complex of antioxidants on blood biochemical parameters in the process of treatment of patients with diabetes mellitus of type II with NPDR. 68 patients (136 eyes) were enrolled in the study. The monitoring of the patient lasted for 3 months. The character of changes of the basic visual functions has been examined. The patients were divided into 2 groups (main and control). Treatment of patients with main group conducted antioxidant complex Taurine + Vitamin C for 42 days. namely. Thus, we have revealed antioxidant activity of the combination of taurine and vitamin C with positive effect on the indexes of carbohydrate, lipid metabolism and hepatoprotective characteristics in patients with diabetes mellitus type II with NPDR. Taking into consideration the peculiarities of correlation relationships between functional, clinical and biochemical parameters and the results of experimental studies on animal it is acceptable to use Taurine complex + Vitamin C as part of conservative treatment of patients with diabetes mellitus type II with NPDR. Tab. 8, Ref. 6.

Auth.

13.C13.62. The results of the surgical treatment for total talus dislocation. /G. Gabunia/. Georgian Medical News.–2014.– # 2(227). – pp. 20-23. – rus.; abs.: geo., eng., rus.

The purpose of the research was to study the results of surgical treatment for rare and severe injury, such as the total talus dislocation and determine the causes of complications. The study

was based on findings from dynamic observations of 15 patients with this type of musculoskeletal pathology, who underwent surgical treatment in three multi-profile medical facilities of Kutaisi during 2005-2013 years. Statistical results were as follows: men - 12, women - 3. Patients age range 29-51 years. Trauma was mainly caused by motor vehicle accidents and falls. Three patients had a sports injury. There were 6 cases of an open dislocation of the talus. Complex surgical treatment strategy has been discussed. The author has studied the early and late complications of the surgical reduction of total talus dislocation during treatment and rehabilitation periods. Based on the observations and the data obtained from the reviewed literature we have concluded that outcomes of the surgical treatment of total talus dislocation in most cases are not satisfactory and often become the cause of limb dysfunction and repeated reconstructive surgery due to the later developed aseptic necrosis and arthrosis. Given the anatomical specificity of the talus, satisfactory results of the treatment are directly depended on a timely surgical intervention after the trauma as well as on a comprehensive postoperative rehabilitation. Ref. 9.

Auth.

13.C13.63. Early primary osteosynthesis in polytrauma of the locomotor apparatus. /G. Gabunia/. Georgian Medical News. – 2014. – # 2(227). – pp. 24-28. – rus.; abs.: geo., eng., rus.

The goal of the research was to study the local and general complications of the osteosynthesis of long tubular bones on different stages of the traumatic disease in patients affected by polytrauma as well as to determine the priority of early and delayed osteosynthesis. The research was based on the data obtained from dynamic follow-up of 187 patients with polytrauma, including several deceased, who had been treated in three large clinics of Kutaisi during the period 2003-2013. 283 fractures of long tubular bones were reported. The patients were divided into 2 groups according to the timing of osteosynthesis. General and local complications on different stages of traumatic disease have been identified in each of the groups. The study of long-term outcome of the treatment included 51 patients. The general and local complications of polytrauma were mainly caused by incorrect selection of methods for osteosynthesis and immobilization. The period within 1-5 days after the trauma should be taken as an optimal timing for the osteosynthesis of tubular bones under general anesthesia and resuscitation support; aggressive traumatology should be considered as a strong anti-shock measure and as a reasonable intervention for preventing hypo-dynamic and hypostatic complications. Such an approach has proven to be a key in achieving desirable long-term results. Tab. 1, Ref. 11.

Auth.

13.C13.64. Morphological peculiarities of esophageal mucosa in patients with gastroesophageal reflux disease and type II diabetes mellitus. /G. Fadeenko, E. Frolova-Romaniuk, V. Galchinskaya/. Georgian Medical News. – 2014. – # 2(227). – pp. 28-31. – rus.; abs.: geo., eng., rus.

The aim of the article was to study morphological features of esophageal mucosa in patients with type II diabetes mellitus and gastroesophageal reflux disease (GERD). The research was conducted on 67 patients with type II diabetes mellitus and GERD and 50 non-diabetic patients with GERD. The histological study of the mucous membrane of the distal esophagus in patients with combined pathology detected parakeratosis and acanthosis, outflows edema and bundles epithelium, surfacial hyperplasia, infiltration of neutrophils and vascular ectasia. The obtained results demonstrate that type II diabetes causes change in symptoms, endoscopic and histologic manifestations of GERD. It is concluded about the importance to develop and improve diagnostic tools for the detection of GERD with type II diabetes by means of invasive and non-invasive diagnostic techniques. Tab. 1, Ref. 8.

Auth.

13.C13.65. Effect of vitamin D correction on insulin resistance in patients with coronary heart disease and metabolic syndrome. /M. Hordina, V. Orlovsky/. Georgian Medical News. – 2014. – # 2(227). – pp. 32-36. – rus.; abs.: geo., eng., rus.

The aim of the article was to study vitamin D level, carbohydrate metabolism and insulin resistance in 135 patients with ischemic heart disease, stable angina FC II-III. The investigation detected hypovitaminosis D among 91.9 % of patients. All patients have been receiving 2000 IU of cholecalciferol per day for 6 months orally in addition to basic therapy. It was found that the correction of hypovitaminosis D positively affects on patients with coronary artery diseases. It is

concluded that individuals with co-morbid course of coronary heart disease and metabolic syndrome require treatment of hypovitaminosis D for an extended period of time. Tab. 3, Ref. 13.

Auth.

13.C13.66. Predictors of cardiac arrhythmias in patients with arterial hypertension during exercise stress testing. /M. Kolesnik, M. Sokolova/. Georgian Medical News. – 2014. – # 2(227). – pp. 37-42. – rus.; abs.: geo., eng., rus.

Arterial hypertension is an important risk factor for atrial and ventricular arrhythmias. 203 male patients were examined in order to identify predictors of cardiac arrhythmias in patients with arterial hypertension during exercise stress testing. All participants were studied by 24-hour ambulatory blood pressure monitoring, transthoracic echocardiography, an ultrasound scan of the carotid arteries and treadmill test. 47,3% of patients presented cardiac arrhythmias during exercise stress testing. The left ventricular mass, diastolic function and carotid intima-media thickness were found to be independent predictors of exercise-induced arrhythmias. The use of the exercise stress testing may be reasonable for additional risk stratification in hypertensive patients. Tab. 3, Ref. 17.

Auth.

13.C13.67. The relationship between socio-economic status and cardiovascular events. /Mahavir Senan, A. Petrosyan/. Georgian Medical News. – 2014. – # 2(227). – pp. 42-47. – eng.; abs.: geo., eng., rus.

The aim of the article was to study the relation between socioeconomic factors and mortality from CVS diseases. The study was performed among 346 native Indians (260 males and 86 females), aged 41-54 years and employed by the Civil Service. The study was carried out during 7 years. At 24 months of follow-up, 281 of 346 subjects (81.2%) had blood pressure progression. Subjects in the highest category of education or income had a 16 and 11% lower risk of cardiovascular events when compared with those in the lowest education or income category, respectively. The study demonstrates that socioeconomic status is a powerful and independent predictor of blood pressure progression and cardiovascular event in initially healthy persons. In this population, education was a more robust indicator of incident hypertension than income. It was found that obese persons with primary education did not have a higher risk of blood pressure progression or cardiovascular event than their counterparts with high school education. Finally, our findings indicate that even in this well-educated cohort, socioeconomic status as measured by education and income remains an important determinant of hypertension. Tab. 2, Ref. 23.

Auth.

13.C13.68. Assessing the need for a protected living environment among severely mentally ill adults in the Republic of Georgia. /N. Zavrashvili, N. Makhashvili, M. Eliashvili, K. Zurlo, E. Chkonia/. Georgian Medical News. – 2014. – # 2(227). – pp. 48-51. – eng.; abs.: geo., eng., rus.

The purpose of this study is to assess the need for a new mental health service called a Protected Living Environment (PLE) in the republic of Georgia. PLE intends to provide residential care for the severely mentally ill (SMI) in the community. Patients and staff members from all six long-term psychiatric hospitals (Tbilisi, Batumi, Rustavi, Khoni, Surami, Bediani) in Georgia have participated in the study. The study includes a quantitative (a structured survey) and a qualitative component (in-depth interviews), which together provide a more comprehensive data. The questionnaire and the questioning route for focus group interviews were self-designed according the recommendations of World Health organization and based on a health facility assessment tool SARA - The Service Availability and Readiness Assessment. The study revealed that consumers and mental health professionals have positive attitudes towards the development of protected residential institutions, which could be an important alternative for residential care and would promote deinstitutionalization and reintegration into society. Fig. 1, Ref. 10.

Auth.

13.C13.69. Adipocytes and macrophages functional morphology in obese humans: correlation with plasma leptins level. /E. Giorgadze, L. Gogiashvili, Z. Tsagareli, E. Nikobadze/. Georgian Medical News. – 2014. – # 2(227). – pp. 52-57. – rus.; abs.: geo., eng., rus.

White adipose tissue macrophages and both in peripheral blood simples obtained in biopsies from male (n=14) and female (n=11) gluteal depots, were observes by light and electron microscopic

methods, in obese in patients with BMI ($35,2\pm 7,9$ and $31,3\pm 8,5$) in female and men, consequently. The data indicates on the positive correlation between adipocytes death, macrophages local activation and leptins level in obese individuals. Recent evidence indicates the correlation between increased leptin production level and adipocytes necrotic foci in WAT, which is trigger lipid tissue persists necrotic foci and formation chronic inflammation response in obese individuals. Tab. 5, Ref. 15.

Auth.

13.C13.70. System and anthropological analysis of psychology of loneliness of the people enduring social isolation (on the example of prisoners in the prisons of east Kazakhstan).

/A. Gizatullina/. Georgian Medical News. – 2014. – # 2(227). – pp. 67-75. – rus.; abs.: geo., eng., rus.

This article contains the material reflecting the results of the author's theoretical analysis of the loneliness phenomenon and an empirical study of its features in a particular social group - the prisoners. The analysis focused from the point of system-anthropological approach, actively developed by a group of Siberian scientists, considering the whole loneliness and loneliness of people who are hold at forced social isolation as a kind of integrity loss. The study accounted for age and gender differences in this population group. The research was conducted in the East Kazakhstan region of the Republic of Kazakhstan during 2007-2012. There was used a range of experimental psychological research methods in this study. Empirical research has shown that our hypothetical assumptions about the senses experience of loneliness in terms of system-anthropological psychology is justified. Identified indicators of the social isolation degree between prisoners in both gender groups were significantly higher in comparison with representative comparison groups. Manifestations of imbalance personal qualities male and female prisoners was confirmed the results obtained by the method of APDP, demonstrated a significant excess severity scales for pessimism, emotional lability, impulsivity, and anxiety. Most respondents in both gender groups of prisoners compared to general population showed a pronounced tendency to increased anxiety and depression, that indicates the negative effects of loneliness on the patients psychological status. This is confirmed by a statistically significant excess of the anxiety level and depression in both gender groups of prisoners. Fig. 3, Tab. 5, Ref. 13.

Auth.

13.C13.71. Progesterone – regulator of T-lymphocytes cytotoxicity. /A. Gokhelashvili, N. Gogebashvili, I. Datunashvili, M. Machavariani, M. Enukidze, T. Sanikidze/. Georgian Medical News. – 2014. – # 2(227). – pp. 81-85. – rus.; abs.: geo., eng., rus.

Progesterone plays important the role in the regulation of the immune system during pregnancy. We examined the effect of progesterone on the cytotoxic activity of T-lymphocytes in a model system Jurkat cells. Jurkat cells were stimulated with 50 µg/ml of phytohemagglutinin A (PHA) at 37°C for 5 minutes. Then, PHA was removed by centrifugation, the cells were washed and cultured for 24 hours alone or with progesterone (added to the incubation medium of Jurkat cells at a concentration of 0.07 and 0.7 µl. Determined value of The parameters of mitochondrial membrane potential (by flow cytometry) and parameters of mitochondrial oxidative metabolism (the rate of generation of superoxide and peroxide radicals and activity of mitochondrial superoxide dismutase, catalase, glutatinperoxidase, the degree of nitrosylation of mitochondrial electron-transport proteins (by method of electron paramagnetic resonance and spectrophotometry) were determined. It was identified the lowering effect of high dose of progesterone (0.7µl) on the value of mitochondrial membrane potential (balancing percentage of cells with high and low values of mitochondrial potential and decreased intensity of oxidative stress in mitogen - activated Jurkat cells, which supports inhibition of their proliferation and differentiation activity. Fig. 2, Tab. 2, Ref. 15.

Auth.

13.C13.72. Restoration of jaw bone tissue defect using osteoplastic material. /T. Grdzeldze, A. Machavariani, G. Menabde, N. Gvelesiani, I. Amiranashvili/. Georgian Medical News. – 2014. – # 2(227). – pp. 89-92. – eng.; abs.: geo., eng., rus.

The aim of the study was to repair mandibular bone defect using BIO-OSS artificial bone implantation. The experiment was conducted on 30 white laboratory rats. Defect in the bone of

lower jaw was created surgically. Animals were divided into 2 groups. 15 animals were allocated in control group. Another 15 animals were allocated in the BIO-OSS treatment group. Control group: analysis revealed bone defect in 6-month after modeling of bone defect. There was no pronounced proliferation of connective tissue visible in the defect area. Treatment group: In the samples of treated group, BIO-OSS bone mass formed basophilic fiber-like structures. It was surrounded with the thin proliferative connective and granulation tissues. Conclusions: proposed technique of bone defect reconstruction is an effective and sustainable method and can be recommended for wider use in clinical practice. Fig. 3, Ref. 10.

Auth.

13.C13.73. Impact of inherited thrombophilia on the risk of recurrent venous thromboembolism onset in Georgian population. /N. Pirtskhelani, N. Kochiashvili, L. Makhaldiani, N. Pargalava, E. Gaprindashvili, K. Kartvelishvili/. Georgian Medical News. – 2014. – # 2(227). – pp. 93-97. – rus.; abs.: geo., eng.

Inherited thrombophilia means a predisposition of an individual to thrombosis caused by genetic disorders of homeostasis system. Purpose of the conducted study was to establish the role of point mutations of prothrombin (PGM) - 20210G/A; Factor V Leiden (FVL) - 1691G/A and methylenetetrahydrofolate reductase (MTHFR) - 677C/T genes, i.e. inherited thrombophilia in the pathogenesis of primary and recurrent venous thromboembolism in patients of the Georgian population. The above mentioned mutations were detected by PCR and single nucleotide primer extension reaction, followed by Enzyme Linked Immuno-Sorbent Assay (ELISA) in 93 patients with venous thromboembolism, out of which: 56 patients were diagnosed with unprovoked, primary thromboembolism confirmed by objective studies and 37 patients were diagnosed with recurrent thromboembolism. According to statistical analysis of the results, incidence of FVL mutation in the group of patients with recurrent thrombosis was significantly higher compared to patients with primary thrombosis - respectively 0.21 and 0.44 ($p=0.0164<0.05$). It should also be mentioned that homozygous carriage of FVL mutation was confirmed only with patients having recurrent thrombosis. Similar tendency was observed during study of prothrombin gene; however the difference was not statistically significant. Similar tendencies were not observed in case of homozygous carriage of MTHFR gene C677T mutation. Double and triple heterozygous / homozygous carriage of studied mutations (total of 20 cases) was observed in patients of both groups. Distribution of these genotypes in the recurrent thrombosis group was higher compared to patients with primary thrombosis - respectively 27% and 17.9%. Herewith, it should be mentioned that the patients with primary thrombosis were much younger than those with recurrent thrombosis and their age did not exceed 50 years. According to the results obtained by us, it is possible to consider Leiden mutation, especially its homozygous form and double/triple heterozygous/homozygous carriage of the studied mutations as an independent risk factor of development of recurrent thrombosis in the Georgian population and prolong anticoagulation therapy in patients of similar genotype as much as possible to prevent recurrent thrombosis and related complications. Tab.2, Ref. 13.

Auth.

13.C13.74. The role of point mutations in the genes, predisposing inherited thrombophilia in the pathogenesis of proximal and distal deep vein thrombosis in Georgian population. /N. Pirtskhelani, N. Kochiashvili, L. Makhaldiani, N. Pargalava, E. Gaprindashvili, K. Kartvelishvili/. Georgian Medical News. – 2014. – # 2(227). – pp. 98-102. – eng.; abs.: geo., eng., rus

Duration of treatment of venous thromboembolism (VTE) and prevention of its recurrence represent significant problems of contemporary medicine, as the basic method of treatment – anticoagulation is frequently complicated by hemorrhage. Therefore, its duration is strictly defined and depends on existence of risk factors related to recurrence of thrombosis. Purpose of the conducted study was to establish the role of point mutations of prothrombin (PHG) - 20210G/A; Factor V Leiden (FVL) - 1691G/A and methylenetetrahydrofolate reductase (MTHFR) - 677C/T genes, i.e. inherited thrombophilia in the pathogenesis of proximal and distal lower extremity deep vein thrombosis in patients of the Georgian population, as in case of proximal thrombosis there is a higher risk of recurrent thrombosis. The above mutations were detected by PCR and single nucleotide primer extension reaction, followed by Enzyme Linked Immuno-Sorbent Assay (ELISA) in 61 patients with venous thromboembolism of various localizations, out of which: 49 patients

were diagnosed with unprovoked proximal thromboembolism confirmed by objective studies and 12 patients were diagnosed with distal thromboembolism. The difference between the groups was evaluated by F (Fisher) precise criterion. According to statistical analysis of the results, incidence of FVL mutation in the group of patients with proximal thrombosis was significantly higher compared to patients with distal thrombosis 0.43 and 0.08 ($p=0.0256$), respectively. Similar tendencies were observed in case of carriage of prothrombin gene and MTHFR gene mutations, as their presence was higher in the group of patients having proximal thrombosis than in patients with distal thrombosis, however, this difference was not found to be statistically significant. It should be particularly mentioned that double or triple heterozygous or homozygous carriage of studied mutations with various options was confirmed in 15 of 61 patients and the above genotypes were observed only in the group of patients having proximal thrombosis. According to the results obtained from this investigation, it is possible to consider inherited thrombophilia, especially Leiden mutation and double or triple heterozygous and homozygous carriage of studied mutations in the Georgian population as an independent risk factor of development of proximal thrombosis, which on its part, represents one of the risk factors of development of recurrent thrombosis and conduct proper long-standing anticoagulation therapy and take secondary preventive measures in patients of similar genotype to reduce the risk of recurrent thrombosis. Tab. 2, Ref. 13.

Auth.

13.C13.75. Development and substantiation of complex approach to determination of individual intolerance and hypersensitivity to dental materials. /D. Grizodub/. Georgian Medical News. – 2014. – # 3 (228). – pp. 7-13. – rus.; abs.: geo., eng., rus.

The aim of research was to define the most simple, objective and affordable test for determination of individual compatibility for dental materials before placement of prostheses in the oral cavity. After series of provocative and laboratory tests it was found that the most convenient is the mucogingival test. Also found that absolutely all materials, including ceramics, can cause individual intolerance with more or less severe clinical symptoms. Tab. 5, Fig. 2, Ref. 11.

Auth.

13.C13.76. Effect of benign testicular mass on fertility: an epidermoid cyst case. /A. Ürkmez, Ö. Yüksel, A. Somay, A. Verit/. Georgian Medical News. – 2014. – # 3 (228). – pp. 14-17. – eng.; abs.: geo., eng., rus.

The article discusses the problem of epidermoid cysts - extremely rare but the most common benign intratesticular tumors. The majority of non-palpable testicular lesions, discovered by ultrasonography in a population of infertile men, are benign tumors. The case of a young man who had incidentally diagnosed, during his infertility evaluation, a right testicular mass which was pathologically reported as epidermoid cyst after partial orchiectomy is presented. It was suggested that benign testicular cysts may effect the normal parenchyma of testis even if the normal histopathology. Thus, the excision of these benign lesions especially in infertile population is recommended. Fig. 3, Ref. 11.

Auth.

13.C13.77. A rare entity of benign bladder neoplasm: female lipoma. /S. Akan, Ö. Yüksel, N. Özbay, F. Uruç, A. Verit/. Georgian Medical News. – 2014. – # 3 (228). – pp. 17-20. – eng.; abs.: geo., eng., rus.

Although benign bladder neoplasms constitute less than 5% of all bladder neoplasms, they should be taken into consideration because they can be symptomatic, and have the risk of confusing with other malignant neoplasms. Herein, we reported a 59-year-old female patient consulted to our outpatient clinic with the incidents of hematuria. During cystoscopic examination, a yellow-coloured mass lesion with smooth contours on the right posterolateral wall of the bladder was observed. Histopathological examination of the specimen demonstrated mature adipose tissue contained within submucosal layer without bladder wall invasion. Bladder lipomas are rarely seen pure benign masses which almost all reported ones were men. We think that female cases should also be taken into consideration for differential diagnosis presenting with hematuria. Fig. 3, Ref. 10.

Auth.

13.C13.78. Application of sonography for evaluation of posterior circulation disorders. /M. Alpaidze, M. Janelidze/. Georgian Medical News. – 2014. – # 3 (228). – pp. 20-28. – eng.; abs.: geo., eng., rus.

Posterior circulation disorders (PCD) include a) vertebrobasilar insufficiency (VBI), which has a wide clinical manifestation such as vestibulocerebellar syndrome, cephalgia, cochlear syndrome, vegetovascular dystonia, visual disturbances, “syndrome of vertebral artery compression” etc, b) vertebrobasilar TIA and c) stroke. All of them are caused by blood flow disturbances in vertebral (VA), basilar (BAS) and posterior cerebral arteries (PCA). Aim - evaluation of role of extracranial duplex-sonography (EDS), transcranial color-coded duplex-sonography (TCCD) and rotational functional tests (RFT) in PCD. 88 patients (age range 18-62y) with PCD and 20 healthy controls with relevant age range were examined using EDS, TCCD and RFT with measurement of vertebral arteries (VA) diameter, mean flow velocities (MFV) and pulsatility index (PI) in VA, basilar artery (BAS) and posterior cerebral arteries (PCA). For statistical analysis SPSS software (Version 11.5) was used. In 48 (54,5%) patients revealed unilateral narrowing (less than 2.5 mm in diameter) and deformation of vertebral artery associated with osteochondrosis or primary hypoplasia. In 11 (12,5%) patients revealed bilateral narrowing (less than 2.8 mm in diameter) and deformation of vertebral arteries. Ultrasound investigation showed a decrease of MFV (23 ± 1.4 cm/sec) in the intracranial length of vertebral artery and an increase of PI ($3,2 \pm 0,3$ $p=0,002$) in the extracranial segments (V1- V3). In 52 cases (59%) revealed decrease of MFV in BAS by $32.6 \pm 4.7\%$ and in 41 cases (46.5%) decrease of MFV in both PCA by $24.8 \pm 5.2\%$ ($P < 0.002$). In 21 cases (23.8%) revealed concurrent development of vertebrogenic reflex vasoconstriction. In 18 patients (20.4%) exposed only deformation of vertebral arteries with local increase of MFV and normal values in intracranial segments. Rotational tests were positive in 42 (47.7%) patients and manifested high correlation with clinical data. EDS and TCCD are important tools for estimation of high hemodynamic risk in patients with PCD. Rotation induced vertebrobasilar ischemia with temporary impairment of cerebral blood flow to the brainstem, thalamus, and occipital lobes predicts possible posterior circulation TIA or stroke and helps with proper selection of further treatment strategy. Fig. 3, Ref. 31.

Auth.

13.C13.79. Reversible cerebral vasoconstriction syndrome and migraine: sonography study. /M. Alpaidze, M. Beridze/. Georgian Medical News. – 2014. – # 3 (228). – pp. 28-36. – eng.; abs.: geo., eng., rus.

RCVS is characterized by severe headaches with or without focal neurologic deficits and segmental constriction of cerebral arteries that resolves within 3 months. The primary clinical manifestation is recurrent sudden-onset and thunderclap headache. Diagnosis requires cerebral or magnetic resonance angiography (MRA) confirmation and ultrasound monitoring. Our purpose is to discover the difference of ultrasound data between RCVS and migraine. 61 patients (age range 17-60y., 41-female, 20-male) underwent sonography examination using Transcranial Dopplerography (TCD) and Transcranial Color-Coded Duplex Sonography (TCCD) methods. In 29 patients MRA examinations were performed. Group I- 27 patients with RCVS with typical acute-onset of severe headaches. Group II-34 patients- migraine in anamnesis, with 1-2 attacks monthly, control group - 15 healthy persons. Ultrasound examinations were performed during 2 months with time intervals of 1-20, 21-40, and 41-60 days. Markedly in migraine group examinations were performed in interictal periods also. Group I-the mean maximum (MM) V(CS)- $77,8 \pm 14,7$ cm/sec, V(MCA) - $127,5 \pm 22,8$ cm/sec, V(ACA) - $115,7 \pm 18,4$, V(BA)- $74,7 \pm 20,1$. Lindegaard Index (LI) - $3,1 \pm 0,5$. MRA revealed segmental cerebral artery vasoconstriction. The MCA was involved in 62.9%, the ACA- in 51.8%, the PCA- in 37% and the BAS- in 40.7% of patients. Group II- the MM V (CS)- $72,8 \pm 12,5$ cm/sec, V (MCA)- $118,4 \pm 26,7$ cm/sec, V(ACA) - $105,8 \pm 17,6$, V(BA)- $74,5 \pm 18,1$, averaged LI - $2,9 \pm 0,7$. In the majority (61.7%) of this group revealed increased MM V in several cerebral arteries with different combination of involving vessels. No correlation was found between incidence side of pain and /or pain intensity. Both groups exceeded of controls – V (MCA) ($63,2 \pm 9,5$ cm/sec), LI ($2,1 \pm 0,2$), $p < 0.001$) and revealed vasospasm. All data were calculated by nonparametric Binomial test. Obtained data showed no significant difference regarding the vasospasm degree between typical RCVS and migraine, whereas revealed that vasospasm in migraine is more determined to posterior circulation but in RCVS vasospasm has the more diffuse character. Despite the extensive knowledge concerning RCVS and migraine, many uncertainties

still exist and further randomized controlled trials are needed for understanding the underlying pathophysiology factors. Tab.2, Fig. 9, Ref. 34.

Auth.

13.C13.80. Mechanisms of formation and progression of non-alcoholic fatty liver disease in type 2 diabetics. /N. Kravchun, E. Dorosh/. Georgian Medical News. – 2014. – # 3 (228). – pp. 37-45. – rus.; abs.: geo., eng., rus.

Currently, study of the mechanisms of formation and progression of non-alcoholic fatty liver disease (NAFLD) in the patients with type 2 diabetes mellitus (DM) is a topical problem in endocrinology. Prognosis for the disease depends on NAFLD stage and it determines the necessity to study the origin and mostly the progression in NAFLD course. It will favour the enhancement of efficacy of the treatment for this cohort of patients. The object of this work was to study the mechanisms of formation of NAFLD phasic course in type 2 diabetics via determining the levels of lipid peroxidation (LPO), 8-isoprostaglandin as components of oxidative stress. LPO indices and liver functional activity parameters (general cholesterol, high-density lipoproteids cholesterol, triglycerides, β -lipoproteids, very-low-density lipoproteids cholesterol, atherogenicity coefficient, thymol test, alanine aminotransferase, aspartate aminotransferase) were determined in the examined individuals. The carried research allowed, that changes in biochemical parameters levels is connected with increasing of diene conjugates (DC) activity and the carried correlation analysis of the studied values proved this relevance. The subgroup of the patients with DC levels of 200-400 nmol/l has no inflammatory alterations (cytolysis syndrome) that gives evidence of steatosis phase. The group of patients with DC levels of 400-600 nmol/l demonstrated the stage of non-alcoholic steatohepatitis with the most expressed shifts in functional liver condition. The greatest lipid, carbohydrate metabolic changes were found in the subgroup of the patients with DC level of 600 nmol/l and more that gives evidence of fibrotic processes. Tab. 3, Ref. 13.

Auth.

13.C13.81. Structural and functional changes of heart and vessels in patients with essential hypertension and type 2 diabetes. /A. Belovol, A. Shalimova, M. Kochueva/. Georgian Medical News. – 2014. – # 3 (228). – pp. 45-51. – rus.; abs.: geo., eng., rus.

Comorbidity of essential hypertension and type 2 diabetes is a serious problem connected with early affection of target organs and further cardiovascular complications. Pathogenetic mechanisms, determining the progress of essential hypertension, insulin resistance and type 2 diabetes, mostly have mutual symptoms and lead to the progression of disease. Many investigators consider cardiovascular pathology to be disease which has free radical nature. Activation of free radical oxidative process and endothelial dysfunction are recognized one of the most important pathogenetic mechanisms of cardiovascular diseases. To investigate structural and functional changes of heart and vessels, state of the pro- and antioxidant status, levels of proinflammatory cytokines in patients with essential hypertension and type 2 diabetes we have examined 102 patients with essential hypertension stage II and type 2 diabetes in a moderate condition. After the investigation it was discovered that changes of cardiohemodynamics in patients with essential hypertension and type 2 diabetes are characterized by the following aspects: systolic function of left ventricle is conserved, concentric hypertrophy of left ventricle predominates and also there is diastolic dysfunction similar to disordered relaxation. Changes of blood vessel walls in the examined patients are shown by growing intima-media thickness and pulse wave velocity in carotid artery and aorta and also by dropping endothelium dependent vasodilation. The mentioned structural and functional changes in heart and magistral vessels go together with growing levels of cytokines, activation of pro-oxidant system with suppression of antioxidant system, what is shown by correlation connections of different intention and direction. Tab. 2, Ref. 19.

Auth.

13.C13.82. Angioprotectors in the treatment of rosacea. /N.V. Tsiskarishvili, A. Katsitadze, Ts. Tsiskarishvili, L. Tchitanava, N.I. Tsiskarishvili/. Georgian Medical News. – 2014. – # 3 (228). – pp. 51-54. – rus.; abs.: geo., eng., rus.

Rosacea - a common chronic inflammatory dermatosis (3-10% of all dermatoses) primarily affecting the skin of face. Numerous methods for the treatment of rosacea are defined by the diversity of etiologic and pathogenic factors of dermatosis, its stage and clinical form. But a

significant role in its development, most researchers relate to vascular disturbances. It is suggested that vascular changes in this disease are the product of two interrelated pathological processes: the disturbances in integrity and tone of the vascular wall and disorganization of perivascular connective tissue. The results of these processes are formation of a stable dilatation of skin blood vessels clinically manifested by erythema and telangiectasia. Based on foregoing, The aim of this study was evaluation of therapeutic efficacy of Rutin Forte in complex treatment and prevention of rosacea. 30 patients with an erythematous stage of rosacea were under observation (20 women and 10 men) aged 25 to 50 years. The first group (15 patients) was treated by the standard procedure (Antibiotics, systemic metronidazole, antihistamines, traditional external therapy). Patients of the second group (15 people) additionally received a Rutin Forte containing long-acting vitamin C, zinc and selenium. The drug was administered at a dose of 2 capsule per day. Duration of treatment - 2 to 3 months. Observation period after treatment were 12 months. During this period we revealed a significant reduction of erythema, recurrence of disease in the second group of patients was not observed, but in the group of comparison recurrences were detected on 3rd month of follow up and the degree of erythema reduction was significantly less. Thus, the study revealed that Rutin Forte is an effective means for the treatment and prevention of the torpid relapsing forms of rosacea on erythematous stage of dermatosis. Fig. 2, Ref. 11.

Auth.

13.C13.83. Analysis of spreading the sexually transmitted disorders in Georgia. /Sh. Chiokadze, G. Galdava, O. Kvlividze, G. Durglishvili/. Georgian Medical News. – 2014. – # 3 (228). – pp. 55-59. – rus.; abs.: geo., eng., rus.

According statistical data in Georgia sexually transmitted disorders represent one of the most important medical and social problems. Main causes of this are hard social and economic condition of the country, changing sexual-behavioral stereotypes, drugs and alcohol abuse, political perturbation, as well as unprecedented decrease in financing prevention programs of STD by government. The purpose of given research is statistical analysis of spread of sexually transmitted disorders in Georgia, in particular, among the people included in risk group; finding trends and in accordance with this, working out recommendations for improvement of situation in given field of medicine. Essays showed that through 2000-2012 years among STD revealed in the group of increased risk chlamidiosis was the most common. There is an objective trend of increasing the level of morbidity with chlamidiosis and trichomoniasis, however the speed of increasing morbidity with trichomoniasis probably does not correspond the reality. In the same time morbidity with gonorrhea and syphilis is decreasing, however in the result of significant decrease in STD prevention program scale data validity concerning syphilis might be doubtful. Coming out of this in the field of health care related to STD optimization of laboratory diagnostics management is essential; perfection of methods of epidemiologic control; increasing the scales of prevention programs as well as initiation of researches related to antimicrobial resistance of gonococci. Authors consider essential taking steps for optimization of management of laboratory diagnostics and perfection of methods of epidemiologic control and increasing scales of preventive programs. Ref. 10.

Auth.

13.C13.84. Contribution of leptin in the development of insulin resistance in pregnant women with obesity. /K. Tarasenko/. Georgian Medical News. – 2014. – # 3 (228). – pp. 59-63. – rus.; abs.: geo., eng., rus.

The aim of the present study was to investigate contribution of leptin in the development of insulin resistance in obese pregnant women depending on the obesity class as well as its effect on the progression of pregnancy. 36 pregnant women of I and II obesity classes and 21 pregnant women with normal body mass participated in the study. Concentrations of insulin, leptin and C-reactive protein in blood serum were measured with immunoenzymatic assays. Insulin resistance (IR) was determined with the Caro index. Contribution of leptin to development of IR was assessed with the ratio "leptin/Caro index". An increase of leptin concentration in blood serum was found in pregnant women with obesity compared to healthy controls. Moreover, the ratio "leptin/Caro index" increased with IR progression and reached maximum in the group with obesity class II, where it was 5.8 times higher than in the control group. An increased frequency of gestoses and placentary dysfunction were manifestations of weakening of adaptive mechanisms of the organism associated

with the IR progression and increased role of leptin in its development. Therefore, activation of adipocyte function through the increased leptin secretion and increased ratio “leptin/Caro index” reflects the important role of leptin in pathogenesis of IR in pregnant women with obesity. Tab.1, Ref. 30.

Auth.

13.C13.85. Leptospirosis in Georgia. /N. Mamuchishvili, T. Kuchuloria, I. Mchedlishvili, P. Imnadze/. Georgian Medical News. – 2014. – # 3 (228). – pp. 63-66. – rus.; abs.: geo., eng., rus.

The aim of the article was to study epidemiological patterns of leptospirosis in Georgia from 2001 to 2011. The investigation revealed that formal registration of the infection began in 1950s. Single cases were reported annually in the country with the exception of 1986, when water-borne outbreak broke out in Sukhumi with 21 detected cases. Low morbidity level of disease was reported during 2001-2005. Since 2006 significant increase of leptospirosis has been observed. The highest incidence was reported in 2011–1.81 per 100000 population. The increase is likely to be mainly attributed to the improvements in diagnostics of the infection. Young and middle-age persons are more frequently vulnerable to leptospirosis in Georgia, 54.8% of the cases are reported among age group of 30-59. Incidence of the infection is the highest in males – 60-65% of the detected cases. In addition, leptospirosis is characterized by high case-fatality rate - $8.7 \pm 3.6\%$ (95% CI= 5.7-11.7). Case fatality is especially high in persons over 60 and over reaching $24.3 \pm 8.1\%$. Only single cases are observed in children under 14. In 21st century etiological structure of leptospirosis has being changed somehow. By contrast, in the earlier period the disease was mainly caused by *L. icterohaemorrhagiae* and *L. grippotyphosa*, nowadays we encounter such causative agents which were not observed in 20th century – *L. autunnalis*, *L. mankarso*, *L. wolffii* and others. Water is mainly implicated as a risk factor in the infection transmission. Finally, to study of epidemiological characteristics of leptospirosis in Georgia, identified that, the infection is widely distributed in the country, has an increasing tendency and duration of the disease frequently is a severe. Ref. 8.

Auth.

13.C13.86. Mechanisms of development and clinical endoscopic characteristics of HP-negative gastropathy in patients with chronic heart failure. /O. Boiko/. Georgian Medical News. – 2014. – # 3 (228). – pp. 67-71. – rus.; abs.: geo., eng., rus.

Hp-negative gastropathies in chronic heart failure (CHF) are characterized with polyethiologic polymorphic changes of gastric mucosa (GM). At the same time the mechanisms of their development and peculiarities of clinical-endoscopic and morphological manifestations are understudied. The linkages of clinical and morphological changes of gastric mucosa with various factors, and, above all, the factors involved in the development and progression of heart failure, are needed to be studied fundamentally. Some of these factors are oxidative stress and lipid peroxidation, the enzyme activity of the antioxidant defense, immuno-inflammatory and vasoactive endothelial factors. The dependences between the mechanisms of development of Hp-negative gastropathies and CHF are understudied. Possible dependences between mechanisms of development of Hp-negative gastropathies and pathogenesis of main disease (hypertension), complicated by heart failure, are understudied also. It was revealed that the development of gastropathy in patients with hypertension of 2 degree and CHF was associated with depression disorders of lipid metabolism, activation of lipid peroxidation and decreased activity of enzymes of antioxidant protection. The predictors of macroscopic inflammatory changes of gastric mucosa in hypertensive patients with CHF and HP-negative gastropathies are atherogenic ratio, blood levels of diene conjugates, malondialdehyde and catalase. Tab.1, Fig. 1, Ref. 18.

Auth.

13.C13.87. Prognosis of rotavirus infection in children. /Y. Kharchenko, S. Lavrukova, I. Yurchenko, N. Movlyanova, S. Eremenko/. Georgian Medical News. – 2014. – # 3 (228). – pp. 72-75. – rus.; abs.: geo., eng., rus.

The aim of the research was to develop the method for predicting the course of rotavirus gastroenteritis in children. Under the supervision were 3607 children aged from 9 days to 5 years with the diagnosis of “Acute gastroenteritis” and “Acute gastroenterocolitis”. The diagnosis of rotavirus infection was on the basis of a set of clinical, epidemiological data and the results of paraclinical and bacteriological studies and data of detection of rotavirus antigen strain. Genotyping of

rotavirus group A was performed by PCR 269 faecal samples. For rotavirus infection is characterized by the following clinical symptoms: intestinal disorders, symptoms of intoxication, signs of dehydration. Clinical manifestation of rotavirus infection is closely correlated with indicators of leukogram, erythrocyte sedimentation rate and the degree of metabolic acidosis. The presence of concomitant bacterial infection burden for rotavirus, but the presence of conditionally pathogenic flora practically did not influence on the clinical manifestation of the disease. The longest duration of diarrhea was observed in patients with rotavirus gastroenteritis was caused by a strain with genotype PCR they often occurred in children older than 2 years ($t=3,4$; $p<0.01$). Special scheme has been developed for predicting the course of rotavirus gastroenteritis, including the availability of mix infection, to determine the severity of the pathological process a specially designed scale. Tab. 2, Ref. 6.

Auth.

13.C13.88. Expression pattern of DNA-methyltransferases and its health implication (short review). /E. Kvaratskhelia, T. Tkemaladze, E. Abzianidze/. Georgian Medical News. – 2014. – # 3 (228). – pp. 76-81. – eng.; abs.: geo., eng., rus.

Epigenetics is heritable and reversible alterations of gene expression without direct alteration of DNA sequences. One example of epigenetic factors is DNA methylation, which prevents certain genes from being expressed. Another example is histone modifications. In addition, miRNAs can silence genes at transcriptional and posttranscriptional level. DNA methylation is regulated by DNA methyltransferases (DNMT1, DNMT3a, and DNMT3b). Aberrant DNMTs expression is the dominant mechanism for the genome instability which associates with a wide range of diseases such as a cancer, autoimmune diseases, mental disorders. In this article we reviewed the major mechanisms of changes of DNA methylation regulated by DNMTs and the role of this changes in pathogenesis of various diseases. In addition we briefly reviewed epigenetic agents, such as inhibitors of DNA methyltransferases or HDAC (histone deacetylase) targeting oncology, hematology, immunology, and neurologic disease indications, and which are in various phases of study or have been clinically tested and approved by FDA (Food and Drug Administration). Tab.1, Ref. 53.

Auth.

13.C13.89. Features of CD44+/CD24^{-Low} phenotypic cell distribution in relation to predictive markers and molecular subtypes of invasive ductal carcinoma of the breast. /M. Gudadze, Q. Kankava, A. Mariamidze, G. Burkadze/. Georgian Medical News. – 2014. – # 3 (228). – pp. 81-87. – eng.; abs.: geo., eng., rus.

Breast cancer is the most widespread pathology among women. Despite the current progresses in research and treatment of metastatic breast cancer, mortality caused by this disease is still high, because above mentioned therapy is limited due to existence of cells resistant to therapy. Cancer stem cells are the only cells with ability of unlimited proliferative activity and cancerous potential, thus, they participate in the growth, progression and dissemination of cancer. Cancer stem cells are resistant to various forms of therapy, including chemotherapy and radiotherapy. Results of examination showed that 50% of all cases are positive on so called markers of stem cells, thus 45% of cases are negative. CD44+/CD24^{-Low} cases (cases that reveal stem cell-phenotype) in the group of invasive ductal carcinoma of Luminal A molecular subtype are almost as many as CD44+/CD24⁺ and CD44⁻/CD24⁺ phenotype cancers. In this group non-stem phenotype cases are 65%, so 5 times more than stem cell phenotype cancers. 1324 postoperative breast materials studied through 2008-2012 at the laboratory of "Pathgeo-Union of Pathologists" LTD and Academician N. Kipshidze Central University Clinic were used as test materials and specimens from 393 patients with invasive ductal carcinoma were selected. CD44/CD24 markers' expression in phenotypically different cancers and clinic-pathologic parameters as well as various biological features was conducted by the Pearson's correlation analysis and using X² test. Statistical analysis of obtained numeral data was held using SPSS V.19.0 program. Confidence interval of 95% was considered statistically significant. Stem cell phenotype positive cases are with the highest percentage represented in Luminal B and basal-like molecular subgroup that to our minds is associated with their aggressive behavior and resistance to chemotherapy. Relatively good prognosis and response to chemotherapy of Luminal A molecular subtype cancers are to be stipulated by lower percentage of cases with stem cells phenotype. With regard to the dimension of

cancer the analysis of stem cell phenotype cancers showed that frequency of stem cell phenotype (CD44+/CD24^{-low}) dramatically increases from T1 to T4 cancers. High density of stem cell phenotype cancers in cancers with metastatic lymphatic nodes proves that presence of mentioned phenotype plays a role in progression and dissemination. On the one hand, little amount of stem cells phenotype cancers (CD44+/CD24^{-low}), on the other hand absence of negative cases for markers of stem cell in Her2 subtype makes us consider that come phenotype, close to stem-cell phenotype, plays the leading role in Her2 positive cases. Fig. 8, Ref. 23.

Auth.

13.C13.90. Parodontitis pathogenetic factors, their interaction and effects. /Nana V. Kipiani, M. Iverieli, N. Mosemgvdlishvili, Nino V. Kipiani, S. Japaridze/. Georgian Medical News. – 2014. – # 3 (228). – pp. 88-91. – eng.; abs.: geo., eng., rus.

Induced by microbial intervention oxidative stress causes electronic transport disorder in gingival cells mitochondrias as well as decrease of energogenesis and increase of lipoperoxidation. In oral cavity local immunity is decreased in parodontitis, that is related with immunoglobulin A deficiency and lysozyme activity decrease. Against this background, microbial factors damaging effect on periodont is intensified. In parodontitis the free nitric oxide (NO) content decrease in gingival tissues and its appearance in saliva are related with transformation of NO into toxic peroxinitrite, that on its turn enhances oxidation, parodontal injury, cell degradation and necrosis. Nitrooxide deficiency in gingival mucosal cells is characterized by decreased protein P-53 expression and terminal differentiation disorder of the cells. Mitochondria related energogenesis disorder in gums causes inhibition of their cell regeneration, which together with apoptotic changes is characterized with parodontal tissue destruction and depletion. Tab.2, Ref. 7.

Auth.

13.C13.91. Bacterial phagelysates and malignant tumor growth. /K. Gambashidze, N. Bejtitashvili, T. Azaladze, M. Pkhaladze, A. Azaladze/. Georgian Medical News. – 2014. – # 3 (228). – pp. 92-95. – rus.; abs.: geo., eng., rus.

Anti-tumor preventive efficacy of E.coli phagelysate has been studied. Investigations were conducted on 2-3 months 48 male mice. Regimen of preventive vaccinations were: single - 0,25 ml phagelysate intraperitoneal injection, 3 days before Ehrlich carcinoma inoculation (1×10^6 tumor cells); 3 times vaccinations (0,25 ml, with 3 day intervals) 3, 6, and 9 days before inoculation of carcinoma; and 10 times (during 10 days, before inoculation of carcinoma). Treatment efficacy was evaluated according to the indices of cancer growth (development of cancer tissue, cancer growth inhibition percent, lifespan and survival percent). Experiments have shown that single and 3 times preventive vaccinations inhibited tumor development and delayed malignant growth, while, 10 times permanent vaccinations had no effects on cancer growth. Cancer growth inhibition percent in single and 3 times vaccinated animals were 58% on the average. Maximal lifespan in control group mice consisted 59 days. By the 125th day of cancer growth, at single vaccination 17% of mice were alive, while in 3 times vaccinated mice the survival percent was 25%. Anti-tumor potential of E.coli pagelysate supposedly could be explained by immunoregulatory properties of the preparation. Fig. 2, Ref. 8.

Auth.

13.C13.92. Ct-perfusion technique in evaluation of cerebral hemodynamics in patients with carotid artery lesions. /F. Todua, M. Beraia, D. Miminoshvili, K. Lomidze/. Georgian Journal of Radiology. – 2013. – # 1-2 (40-41). – pp. 8-17. – geo.; abs.: eng.

Our research shows that computer tomography study allows us to simultaneously make a timely diagnosis of various pathologies of blood vessels feeding the brain, as well as to determine their hemodynamic significance and to carry out monitoring of the course of processes caused in the brain substance by these pathologies. All this is extremely important for prevention of ischemic processes or determination of treatment tactic. Tab. 1, Fig. 13, Ref. 19.

Auth.

13.C13.93. The complex diagnosis of soft tissue malignant tumours. /F. Todua, S. Kakhadze, D. Gachechiladze/. Georgian Journal of Radiology. – 2013. – # 1-2 (40-41). – pp. 49-56. – geo.; abs.: eng.

The data revealed that the ultrasound study with color power doppler and MR tomography are highly informative research methods in soft tissue tumors diagnostics. Ultrasound study with color power doppler is an effective screening method, while MR tomography is quite pathognomonic in the diagnosis of soft tissue tumors and reflects their morphogenesis, with high-precision sets tumor localization, size, structure and local distribution. By complex application of ultrasound and magnetic resonance tomography and angiography it is possible to estimate the degree of tumor malignancy, vascularization of neoplasms, its interrelation with blood vessels and bone structures, which is an important criterion for determining treatment tactic. Fig. 4, Ref. 12.

Auth.

13.C13.94. Endoscopic ultrasound in the diagnosis of vater papilla tumors. /F. Todua, M. Gurgenidze, T. Ioseliani, T. Changelia/. Georgian Journal of Radiology. – 2013. – # 1-2 (40-41). – pp. 67-71. – geo.; abs.: eng.

Significance of endoscopic ultrasound in the diagnosis of vater papilla tumors is discussed in the article. Endosonography is highly informative method and is characterized by high precision, which allows us to determine the possibility of endoscopic resection and form of extended operation in late cases. Fig. 5, Ref. 6.

Auth.

13.C13.95. Incidence rates of the primary brain tumours in Georgia – a prospective population-based study. /D. Gigineishvili, S. Rohrmann, A. Tsiskaridze, R. Shakarishvili/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 149-157. – eng.; abs: eng., geo.

To determine the incidence rate and evaluate other basic epidemiologic data of primary brain tumours in Georgia a population-based cohort study was performed between March 2009 and March 2011. Active case ascertainment was used to identify brain tumour cases by searching neuroradiology scan reports and medical records from all participating medical institutions, covering almost 100% of the neurooncology patients in the country. A total of 980 new cases were identified during the two-year period. For a population of almost 4.5 million, the overall annual incidence rate was 10.62 per 100,000 person-years, age-standardized to the year 2000 US population (ASR). Non-malignant tumours constituted about 65.5% of all tumours. Males accounted for 44% and females for 56% of the cases. Among classified tumours age-standardized incidence rates by histology were highest for meningiomas (2.65/100,000), pituitary adenoma (1.23/100,000) and glioblastomas (0.51/100,000). ASR were higher among females than males for all primary brain tumours (10.35 vs. 9.48/100,000) as well as for main histology groups except for neuroepithelial, lymphomas and germ cell tumours. The annual incidence rate of all primary brain tumours in Georgia, though comparable with some European registry data, is low in comparison with 2004-2005 Central Brain Tumor Registry of the United States (CBTRUS) database, which may reflect variations in reporting and methodology. The higher percentage of unclassified tumours (37.8%) probably affects the discrepancies between our and CBTRUS findings. However, the most frequently reported tumour was meningioma with a significant predominance in females, which is consistent with CBTRUS data. Fig. 2, Tab. 2, Ref. 16.

Auth.

13.C13.96. Metabolism Peculiarities in Postmenopause Period after Hypolipidemic Therapy. /M. Akhvlediani, M. Balavadze, D. Gachechiladze, M. Emukhvari, M. Martiashvili, N. Beckaia/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 114-118. – eng.; abs: eng., geo.

The aim of our work was to show some metabolism peculiarities in menopause under 6 month hypolipidemic treatment. 156 women (average age 58.4±5.3) in postmenopause were included in our tests. Their total cholesterol exceeded 6.2 mmol/l. The patients were divided into 2 groups. Group I consisted of 80 women with subclinical hypothyrosis where TSH was more than 4.0 mkiU/ml), group II consisted of 76 women with clinical hypothyrosis, TSH was less than 4.0 mkiU/ml. Both groups were divided into subgroups. Hypolipidemic treatment with 20 mg Atorvastatin was carried out in the I and III subgroup women, while in the II and IV subgroups no specific hypolipidemic treatment was done. The patients were given the general diet recommendations. Besides, all the patients were treated with L-Thyroxine(the average dose 12.5-

100.0 mg) for hypothyrosis. Research has shown that the dynamics of blood lipid spectrum changes at different stages of hypothyrosis in postmenopause women points at the influence of thyroid hormone deficiency. In thyroid dysfunction, atherogenic processes in carotid arteries, namely, intima media - thickness (IMT) are proved to be interparallel processes. 6-month hypolipidemic therapy with Atorvastatin in hypothyrosis appeared to be much more effective than diet. Taking into consideration the findings, we may conclude that hypothyrosis in postmenopause accelerates atherogenic processes in carotid arteries, hypercholesterolemia, increases atherogenic lipoproteins and apolipoproteins along with the decrease of antiatherogenic lipoprotein and corresponding apolipoproteins. Therefore, this may be considered as the factor that helps to develop cardiovascular pathologies. Carotid arteries IMT may be a particular risk factor for developing cardiovascular complications in women with postmenopause. Tab. 2, Ref. 11.

Auth.

13.C13.97. On the prophylactic and economic efficiency of the antihypodynamic massager. /G. Purtskhvanidze, R. Chabukiani, A. Kharatishvili/. GEN. – 2013. – # 3. – pp. 106-108. – geo.; abs.: eng.

The effect of massage on the human organism is discussed. Massage is a complex physiological process, involving many systems and organs, the nervous system playing the primary role. The offered antihypodynamic massager is a visual object, which the driver's conscious perceives. By mental interpretation and the energy generated by the subconscious, the recovery of the diseased organ takes place. Just this is the manifestation of the medical-prophylactic and economic efficiency of the massager proposed. Fig. 1, Ref. 4.

Auth.

13.C13.98. In two thousand years after Christ the process of dying seems pleasant with it being predetermined by the death code embedded in the genome. /Z. Kheladze, Zv. Kheladze/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 19-33. - eng.; abs.: eng., geo.

The article provides data on diversity of lives and deaths. It provides the classification of life and death. The study confirmed emanation of β -endorphins in big quantities in the body of a dying person. The clinical picture of this is evidenced by encephalopathy. The existence of the "death code" and its transfer through the genome was confirmed. 14kd molecules of polypeptide with characteristics similar to endorphins were separated from the blood of the patients. These molecules are emanated by immunocompetent T-lymphocytes through the "death code" before death. Its role in the process of dying was confirmed. Fig. 8, Tab. 18, Ref. 11.

Auth.

13.C13.99. Therapy for acute exacerbation of interstitial pneumonia. /Ch. Mitaka, M. Yamamoto, T. Toyofuku, M. Jibiki, G. Haraguchi/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 34-49. – eng.; abs.: eng., geo.

The treatment of patients with acute exacerbation of interstitial pneumonia was assessed retrospectively. Prognosis of acute exacerbation of interstitial pneumonia was very poor with the mortality rate of 68%. PMX therapy in early phases proved to be affective. Non-inhalation method transiently improved oxygenation.

Auth.

13.C13.100. Georgia presents Georgia-1 and Georgia-2 generation devices providing medical care during space-navigation. /Zv. Kheladze, Z. Kheladze, I. Strelnikovi/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 50-53. – eng.; abs.: eng., geo.

During space flight the body of the cosmonauts are stressed simultaneously with multiple adverse factors radiation, high speed of the flight, gravity force, psychical and physical overstraining and other. There is no doubt that these factors leave fingerprint on the cosmonaut's organism and have effect on achieving mission goals perfectly, negative factor are more sharply outlined when the space flight have tight prolonged schedule. Fig. 2, Tab. 2, Ref. 5.

Auth.

13.C13.101. Life science nanotechnology in development of a new generation delivery system (NuCell Direct™ Delivery System). /M. Danielov/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 54-61. – eng.; abs.: eng., geo.

The article provides description of new generation delivery system in nanotechnology. Their affectivity versus the previous generations is evidenced. Their successful usage in practical medicine is suggested. Fig. 5, Tab. 1.

Auth.

13.C13.102. Critical patients have better clairvoyance ability than their care personnel. /Z. Kheladze, Zv. Kheladze, N. Kajaia, Ts. Kharashvili/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 72-76. – eng.; abs.: eng., geo.

The study covers patients in critical condition and the personnel of the Critical Care Medicine. All patients were conscious. The conclusion is drawn that critical patients have better capability of clairvoyance of different phenomena than the personnel. This difference was statistically reliable. Fig. 4, Ref. 2.

Auth.

13.C13.103. Bilio-vascular architecture of main magistral portal tracts. /I. Chanukvadze, V. Archvadze, M. Soreli, G. Gujbidze/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 77-81. – eng.; abs.: eng., geo.

The aim of the study was the identification of anatomical characteristics of lympho-biliary interactions and their presumed connections in the intrahepatic portal tracts. Morphological investigation of vascular-fibrous structures in the intrahepatic portal tracts of 75 adults liver samples was performed. It was described that the single segments of the intrahepatic structures and their fibrous tunics constitute of three vascular-fibrous sheathes orbicularly surrounding each other. The extramural biliary mucous glands provide the connections between the lymphatic and intrahepatic biliary systems. Ref. 14.

Auth.

13.C13.104. Diabetic foot infections – Clinical characteristics and antibacterial therapy. /A. Kistauri, G. Devidze, M. Jibladze, A. Kistauri-Cervantes/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 86-90. – eng.; abs.: eng., geo.

84 patients with diabetic foot syndrome were studied. The study presents the peculiarities of their treatment that are conditioned by pathogenic mechanisms. Tab. 6, Ref. 8.

Auth.

13.C13.105. Controlled hypotension in intra-cerebral hematoma treatment. /T. Kerdzevadze, G. Gegia, Z. Tvauri, K. Kerdzevadze/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 104-108. – eng.; abs.: eng., geo.

The study is done on critical patients with intra-cerebral hematoma. The mechanisms of intra-cerebral hematoma formation are researched. The necessity of hypotension treatment for stopping the bleeding or preventing its exacerbation is confirmed. Fig. 4, Ref. 6.

Auth.

13.C13.106. Usage of sedation in critical patients. /Z. Kheladze, Zv. Kheladze, M. Tkemaladze/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 109-113. – eng.; abs.: eng., geo.

The study focused on management of sedation in critical patients. For sedation were used Midazolam, Diazepam and Natrium-thiopental. According to therapeutic impact Midazolam was preferred. The necessity of its usage in critical conditions was advised. Fig. 8, Ref. 7.

Auth.

13.C13.107. Diagnostic value of “Catephsine – S” and “Alveomucyne” in critical patients. /N. Barnabishvili, Z. Kheladze, Zv. Kheladze, E. Ivanidze/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 114-117. – eng.; abs.: eng., geo.

The concentration of Catephsine-S and Alveomucyne in critical patients was studied. The former was found in increased concentration in all types of critical condition, especially in diseased patients. The increase of Alveomucyne concentration was observed in patients on artificial

ventilation. It was more acute in patients with different complications: bronchitis, pneumonia, etc. Tab. 3, Ref. 5.

Auth.

13.C13.108. Diagnostic-analogous scale for critical care medicine clinics with limited resources. /Z. Kheladze, K. Mumladze, Zv. Kheladze, T. Samkharadze/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 118-120. – eng.; abs.: eng., geo.

The article describes new diagnostic-analogous scale for critical care medicine clinics with limited resources. The characteristic features are simplicity and cheapness compared to APACHE II scale. Tab. 2, Ref. 2.

Auth.

13.C13.109. Comparative evaluation of hemostasis in patients with myocardial infarction in thrombolytic therapy. /A. Kistauri, A. Korotkov, A. Korotkova, M. Jibladze, A. Kistauri-Cervantes/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 121-126. – eng.; abs.: eng., geo.

The relationship between the changes of the hemostatic and kallikrein-kinin systems of blood from bleeding complications in patients with myocardial infarction in the thrombolytic therapy is considered. Disturbances of the hemostatic system and abnormal activation of the kallikrein-kinin system, both in terms of the traditional conservative and the dynamics and the early and late thrombolysis are identified. The pathogenetic significance of interaction kinin system and induced thrombolysis increasing fibrinolytic activity in the development of reperfusion syndrome are discussed. Analysis of the dynamics of parameters of the hemostatic function shows the advantages of comparative clinical safety of early thrombolysis, compared with the late one. The prospects of early thrombolysis during treatment with inhibitors of the activation of the kallikrein-kinin system are outlined. Tab. 3, Ref. 7.

Auth.

13.C13.110. Usage of endoscopy in diagnostics and treatment of critical patients. /B. Tsutskiridze, S. Jaiani, D. Chakhunashvili, G. Chakhunashvili, N. Kvitsiani/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp.134-140. – eng.; abs.: eng., geo.

The article describes the usage of endoscopy methods for diagnosis and treatment. The information on complications linked to such interventions is provided. The conclusion suggests more frequent use of endoscopic methods in Critical Care Medicine. Ref. 16.

Auth.

13.C13.111. Critical care long-term management - would it be a useful experience in space medicine? /Z. Kheladze, Zv. Kheladze, N. Ramishvili/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 141-144. – eng.; abs.: eng., geo.

The treatment of 26 patients in critical condition of 30-100 days duration is analyzed. This experience might be useful in space medicine, since the astronauts are similarly exposed to non-adaptable conditions. Tab. 3, Ref. 5.

Auth.

13.C13.112. Results of bone marrow immunocompetent function in critical patients. /Z. Kheladze, Zv. Kheladze, A. Palavandishvili, N. Barnabishvili/. Critical Care & Catastrophe Medicine. – 2012. – # 9-10. – pp. 145-149. – eng.; abs.: eng., geo.

In a body in critical state, the puncture morphology of bone cerebral is studied and the consistence of nitric oxide and peroxide-radicals is defined. It is established that during the critical condition of body, in bone cerebrals with morphology changes the presence takes place appearance of nitric oxide and peroxide radicals is observed. Tab. 3.

Auth.

13.C13.113. Nanomedicine and photons. /M. Dolidze, N. Dolidze, N. Chamiashvili, Z. Jibuti, L. Jibuti/. Nano Studies. – 2013. – # 7. – pp. 271-286. – geo.

The paper reports on the influence of the light photons on the living organism, also the history and types of phototherapy. One of the purposes of nanomedicine is a drug delivery directly to the damaged cells without damaging the healthy ones. Since the objects causing biological diseases

are of nanosizes the struggle against them must be conducted by a commensurate impact. Light photons – electromagnetic waves with length of nano-and microsized have just this selective property. And it turned out that disease-causing objects are characterized by the selective absorption of photons – they absorb only the color (wavelength) corresponding to its maximum ionization without damaging the healthy cells. Fig. 12, Tab. 1, Ref. 7.

Auth.

D. INTERSECTORAL PROBLEMS

D1. Organization and Management

13.D1.1. Some issues of organization of successful marketing. /G. Gurgendze/. Agrarian-economic Science and Technologies. – 2014. – # 1. – pp. 6-13. – geo.; abs.: geo., eng.

It is noted that at the stages of the marketing development and improvement strategy the following levers should be consistently used: brand name and its life cycle definition; specific location of successful marketing and its peculiarities; the level of starting sale price of the brand; numerical indicator of competitors and its analysis; the brand presentation necessity and efficient conduct of the work related thereto. The effective and successful marketing is the image of a specific entrepreneur, therefore it would be more correct to specify and term it as “personal marketing”, especially in the case of external marketing. Ref. 3.

Auth.

13.D1.2. State-level management of the agricultural sector. /O. Keshelashvili/. Agrarian-economic Science and Technologies. – 2014. – # 1. – pp. 14-39. – geo.; abs.: geo., eng.

The following organizational, regulatory and management spheres of the Ministry of Agriculture are presented as state-level management: raising soil fertility, plant protection, animal breeding activities, agroengineering, veterinary, breeding activity; a perspective model of the organizational-management structure and the tasks of the Ministry of Agriculture are given; the principal priorities and the measures to be taken in terms of improvement of management are set. Ref. 3.

Auth.

13.D1.3. Consequences of corporate management deficiencies. /G. Teplinsky/. Air Transport. – 2014. – # 1(9). – pp. 26-33. – eng.; abs.: geo., eng., rus.

The article considers the state of corporate relations in the country and consequences of corporate management deficiencies, which have a negative impact on both the position of individual corporations and the *national* economy as a whole. Ref. 5.

Auth.

13.D1.4. Technologization of state government in Ukraine: modern aspects. /T. Rinkovoi/. Caucasus University Collection of Scientific Works. – 2013. – pp. 101-106. – rus.; abs.: geo., eng.

The article analyzes the major trends of political and social technologies and actions of governmental institutions. Ref. 10.

Auth.

D2. Environmental Protection. Ecology

13.D2.1. A system of causal analysis of the observable object by the example of environmental information analysis. /D. Radzievski/. Proceedings of the A. Eliashvili Institute of Control Systems. – 2013. – # 17. – pp. 175-179. – geo.; abs.: geo., eng., rus.

The description of an information processing system built on the basis of causal analysis is considered. A detailed description of each software module is provided. The principle of construction and operation of the program is explained by the example environmental information analysis. Fig. 3, Tab. 2, Ref. 4.

Auth.

13.D2.2. Modern problems in connection with decrease of the River Chorokhi drift at the Black Sea seashore in Ajara. /M. Alaverdashvili, D. Kiknadze, N. Kokaia, N. Khupenia, N. Tsintsadze/. Collected Papers of Institute of Water Management. – 2012. – # 68. – pp. 16-18. – geo.; abs.: geo., eng., rus.

The problem of the dereliction at the Ajara Black Sea seashore as a result of a dramatic reduction of river drift is outlined. The statistical data according to years and the measures to be taken for handling the problem are given. Ref. 3.

Auth.

13.D2.3. The research of natural disasters formed in the riverbed of the River Mletis Khevi in Dusheti district and their consideration in the development of environmental schemes. /N. Gavardashvili, A. Gavardashvili/. Collected Papers of Institute of Water Management. – 2013. – # 67. – pp. 33-40. – geo.; abs.: geo., eng., rus.

The erosion-debris flow processes taking place in the water catchment basin of the River Mletis Khevi in Dusheti district in 2012-2013 are discussed. On the basis of a conducted field research, the new schemes to overcome the accumulated problems are proposed. Fig. 6, Tab. 2, Ref. 5.

Auth.

13.D2.4. Evaluation of the risks of floods and in the Rivers Chorokhi and Ajaristskali against the background of the climate change. /G. Grigolia, D. Kereselidze, V. Trapaidze/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 48-53. – geo.; abs.: geo., eng., rus. The risk-periods (months) of floods and flashfloods were fixed by using the observed data of the Rivers Chorokhi and Ajaristskali and the average monthly, immediate and daily water peak discharges as well as the number of occurrences of water peak discharges in individual months of the observed period were assessed. The measures to be taken for regulation of the rivers and the negative consequences of their implementation are considered. Tab. 8, Ref. 3.

Auth.

13.D2.5. The ecological problems of Tbilisi Sea and measures of their prevention. /R. Diakonidze, G. Chakhaia, L. Tsulukidze, Z. Varazashvili, Sh. Kupreishvili, T. Supatashvili, N. Mtiulishvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 57-63. – geo.; abs.: geo., eng., rus.

The article considers the ecological problems of Tbilisi Sea. The assessment of the current water quality and measures to prevent its deterioration are given. Fig. 7, Ref. 4.

Auth.

13.D2.6. The geotechnical aspects of erosion-protection phytogenic measures. /T. Tevzadze, M. Shavlakadze, G. Omsarashvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 89-93. – geo.; abs.: geo., eng., rus.

The results of the impact of local plants root systems on the soil strength characteristics of the burnt area in the village of Tsagveri (Borjomi district) are given. Recommendations on the erosion-protection phytogenic measures are provided. Tab. 1, Ref. 3.

Auth.

13.D2.7. Reconstruction of the climate of Azerbaijan in the Early and Middle Pleistocene. /N. Ismayilova/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 108-113. – rus.; abs.: geo., eng., rus.

The article speaks of the importance of a study of the vegetation cover of the Early and Middle Pleistocene in Azerbaijan in order to reconstruct the country's climate. The reasons of the climate changes taking place during these periods are analyzed. Ref. 4.

Auth.

13.D2.8. The effect of heavy metals on the environmental status of small rivers of the Oki River basin. /I. Majaiski, T. Guseva/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 132-137. – rus.; abs.: geo., eng., rus.

The article deals with the complex studies carried out on small rivers - the most important landscape component of the River Oki, which evidence a serious man-made load resulting from agricultural activities there and being evidenced by the accumulation of heavy metals in the surface and ground waters. Fig. 1, Tab. 5, Ref. 5.

Auth.

13.D2.9. Oil absorbents. /G. Hovsepyan, M. Kalantaryan/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 157-159. – rus.; abs.: geo., eng., rus.

The absorption capacity of different fractions of floated obsidian (2,5÷5,0; 5,0÷10,0; 10,0÷20,0 mm) of kerosene, transformer oil and motor-car oil mixture has been studied. The prospects of its use for treating the oil-polluted water are discussed. Fig. 4, Ref. 5.

Auth.

13.D2.10. The implementation of adaptation measures against the climate change in vulnerable regions. /L. Purtseladze/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 183-187. – geo.; abs.: geo., eng., rus.

The definition of climate and its principal types is cited. The short-term and long-term objectives for studying climate changes, water and wind erosion and the erosion level calculation formulas are given. Ref. 5.

Auth.

13.D2.11. The evaluation of draught-type flood-control constructions. /G. Chakhaia, L. Tsulukidze, Z. Varazashvili, R. Diakonidze, I. Khubulava, T. Supatashvili, G. Omsarashvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 200-203. – geo.; abs.: geo., eng., rus.

The work presents a new scheme of a draught-type flood-control construction, containing cylinder-shaped elements. The peculiarities of its design and the prospects of its application in preventing floods are considered. Fig. 4, Tab. 1, Ref. 1.

Auth.

13.D2.12. Geological conditions of mudflow formation in Kakheti and their management technology. /E. Tsereteli, M. Gongadze, N. Bolashvili, G. Lominadze, M. Gaprindashvili G. Gaprindashvili, T. Nanobashvili/. Collected Papers of Institute of Water Management. – 2013. – # 68. – pp. 204-210. – eng.; abs.: geo., eng., rus.

Kakheti Region, which covers 17.5% of Georgia's territory, occupies one of the leading places in the country's economic development, especially in the field of agriculture according to its natural landscape conditions. At the same time, the region is the most complicated area by the development scales of mudflow phenomena, recurrence rate, economic prejudice and risk of danger. More than a half of the territory is under the threat of the highest and high risk category. According to historical reports in the Kakheti region even in the past the mudflow processes were extensively developed and created certain problems to settlements (including cities of Telavi, Lagodekhi, Sagarejo and Kvareli), due to which sometimes there were human victims. If we rely on the expected trend of climate change for the period of 2020-2050, which has been developed by the Caucasus Environmental NGO (CENN) on the basis of the data of Sagarejo and Dedoplistskaro meteorological stations, the precipitation index indicates that for the next 30 years both the daily maximum amount of precipitation and the sum of 90-day precipitation will be increased. The number of the days per year will be increased as well, when the sum of daily precipitation is more than 10, 20 and 25. Correspondingly, the annual sum of precipitation, among them more than 200 mm, is increased, which will help to provoke the landslide processes and therefore, will increase the risk of danger of extreme mudflows transformation. Thus, we should assume that according to the long-range forecast of landslide-mudflow processes a high risk of danger remains again in the region of Kakheti. Fig. 9, Ref. 6.

Auth.

13.D2.13. A modelling study of meso-scale air flow over the mountainous relief with variable-in-time large-scale background flow. /D. Demetrashvili, T. Davitashvili/. Bulletin of the

Georgian National Academy of Science. – 2013. – Vol. 7. – # 2. – pp. 57-65. – eng.; abs: eng., geo.

The paper presents the numerical investigation of some orographic effects in the troposphere taking place in conditions of nonstationarity of large-scale undisturbed background air flow. With this purpose a 3-D hydrostatic nonstationary model of meso-scale atmospheric processes is used. The upper boundary of the calculated domain is simulated by the free surface and on the lower boundary the condition of slipping of air particles has been used along the relief. The problem is solved numerically by the two-step Lax-Wendroff method. Performed numerical experiments in case of both model and real relief of Georgia have promoted some regularities of orographic effects caused by the non-stationary character of the background flow. Fig. 4, Ref. 7.

Auth.

13.D2.14. Bioecological peculiarities of introduced exotic species of Japanese laurel (*Aucuba japonica thunb*) at the Black Sea Coast of Ajara, Georgia. /N. Lomtadze, N. Alasania, E. Machutadze/. Bulletin of the Georgian National Academy of Science. – 2013. – Vol. 7. – # 1. – pp. 110-113. – eng.; abs: eng., geo.

As a result of intensive influence of anthropogenic factors, the soil structure changes, the amount of plant populations diminishes and some of them disappear. Therefore, it is necessary to create cultural phytocenosis and preserve plant biodiversity. Many species of the flora of eastern Asia are introduced at the Black Sea coast of Ajara. Multi-year introduction of plants showed that different varieties and forms of ornamental shrubs of Asian origin adapt well to the local soil- and climatic conditions of Ajara. Subtropical climate conditions increase of plant resource potential and biodiversity. Most of the introduced shrubs at the Ajara Black Sea coast give self-seed crops or rootlets, bloom, yield fruits as they usually do in their countries of origin, but some of them change their regime. The study of the bioecological peculiarities of Eastern Asian plants was conducted on the species of Japanese Laurel (*Aucuba japonica Thunb*). Degree of their acclimation and introduction was determined and analysed. Climatic conditions at Ajara Black Sea coast are unstable, especially in winter and early spring sharp change of temperature is noted. Increase of temperature in this period provokes early budding. Hence, frost resistance of plants is one of the essential factors which determine the cultivation of introduced plants. Tab. 2, Ref. 3.

Auth.

13.D2.15. The content of toxic metals in vegetables and fruits of some regions of Georgia and observance of ecological safety. /Z. Svanidze, G. Gunia, L. Svanidze, T. Tsertsvadze/. Mining Journal. – 2013. – # 1(30). – pp. 43-46. – geo.; abs.: rus., eng.

In the work, the results of studying the content of heavy toxic metals in fruits and vegetables of various regions of Georgia are presented. The content of the metals getting to the soil and water as a result of artificial fertilizer of agricultural sites by inorganic fertilizers are investigated. In addition, soil is polluted by preparations used against various agricultural pests, containing heavy toxic metals, a considerable part of which accumulates in soils. A comparison of the content of heavy metals in the vegetables in the regions that intensively use inorganic fertilizers and in regions using only organic fertilizers is made. Tab. 2, Ref. 7.

Auth.

13.D2.16. Ecological conditions of mountain forests in Georgia. /M. Chkhartishvili/. Mining Journal.–2013.– # 1(30). – pp. 119-120. – geo.; abs.: rus., eng.

Ecological conditions of Georgian mountain forests are analyzed in the work. Development of science and technology has altered the existing balance between the nature and the human, which is caused by the unreasonable activities of the latter. Because of this, plant covering is catastrophically reduced, some animal species have either become extinct or are on the brink of extinction, erosion has destroyed arable land and air and water have been polluted. The author has explored general conditions of the forests in Georgia and concluded that joint harmonic development of nature and society is the only solution to the problem. Ref. 4

Auth.

13.D2.17. Development of the treatment technology for waste waters polluted with heavy metals using the membrane method. /N. Chkhubianishvili, M. Kavtaradze, G. Mchedlishvili, Ts. Kurtskhalia/. GEN. – 2013. – # 3. – pp. 41-44. – geo.; abs.: eng.

The article deals with the technology of treatment of acid pit water by electro dialysis. The optimal conditions of waste water treatment were established. The technology is recommended to be used in projecting the pilot production. Tab. 2, Fig. 1, Ref. 3.

Auth.

13.D2.18. Environmental monitoring by means of bio-indication and bio-testing. /T. Pavliashvili, T. Kalabegishvili/. Nano Studies. – 2013. – # 8. – pp. 273-282. – geo.

The paper deals with the biological methods of environmental monitoring such as bioindication and biotesting. A brief historical Review of these methods is given. Basic requirement imposed on bioindicators are defined. Major bioindicators and their applications to air, water and soil indication are discussed. The role of biotesting in the determination of the quality just as of natural water bodies and flowing water, so of potable water, is emphasized. The issue of pollution of the environment with nanoparticles and nanomaterials is examined, and the related peculiarities of biotesting are considered. Ref. 12.

Auth.

D3. Statistics

13.D3.1. Gender statistics in Georgia: needs and development. /L. Charekishvili/. Ekonomisti. – 2013. – # 3. – pp. 35-43. – eng.; abs.: eng., geo., rus.

Gender statistics represent the statistics about the status of women and men in all spheres of public and economic activity. Gender statistics is aimed to ensure objective data through comparison and evaluation with regard to the status of women and men and of the gender equality. Improvement in collection and coverage of statistical data on the ground of gender is very important for people working on the gender issues, as well as for the representatives of legislative bodies, government bodies and civil organizations. CEDAW – The Convention on the Elimination of All Forms of Discrimination against Women – is a landmark international agreement that affirms principles of fundamental human rights and equality for women around the world. Countries that have ratified or acceded to the Convention are legally bound to put its provisions into practice. They are also committed to submit national reports (at least once every four years) on measures they have taken to comply with their treaty obligations. Close and continuous cooperation between users and producers is crucial to successfully produce and improve gender statistics in Georgia. There are about 8 steps formed for developing gender statistics.

Auth.

13.D3.2. Statistical analysis of demand for human resources and incomes of the employed in Georgia. /D. Chakhvashvili/. Ekonomisti. – 2013. – # 3. – pp. 44-49. – geo.; abs.: eng., geo., rus.

Maintenance of request of the process of industry with necessary qualification resources stipulates business successful strategy. Maintenance of request of the process of industry with necessary qualified resources stipulates the business successful strategy. After establishing goals and problems of a company, the question of providing it with material and labour resources will naturally arise. In the labor market of Georgia there is non-correspondence between needs of the employer and skills offered by potential employees. As a result, the main factor interfering with successful business in Georgia is the lack of skilled manpower. Lately, specific adjustments have been made in the employment policy of private business. The dynamics of payment of employees has changed in the industrial or non-industrial sectors. In the private sector, the level of average wages is significantly higher than in the public sector. It is true that in the country increasing of salary is fixed but it's expressed according to nominal salary only. If we correct nominal level of salary through price index the situation will be significantly changes. Fig. 3, Ref. 9.

Auth.

D4. Other Intersectoral Problems

13.D4.1. On the implementation of a unified military medical electronic information network in the Republic of Armenia. /R. Khachatryan/. Georgian Medical News. – 2014. – # 3 (228). – pp. 95-100. – rus.; abs.: geo., eng., rus.

The article is based on literature reviews and personal observations on the medical service practice in the armed forces of the Republic of Armenia. It is stated that the military medical service in Armenia is an adequately functioning system, which guarantees medical safety of the military service and could provide quality medical services to servicemen and other people equaled to thereto. However, the analysis showed that the means of uniform information database and automatic control system are not actively used for patient's diagnosis and treatment; there is no uniform informational database between medical service and the management of the armed forces. Thus, there is clearly a need to implement new information technologies to improve the management in unified military medical system. Ref. 14.

Auth.

13.D4.2. The scattering curve and its derivative in the process of competition study. /G. Lezhava, B. Lezhava/. Caucasus University Collection of Scientific Works. – 2013. – pp. 18-34. – geo.; abs.: geo., eng.

The opportunity of using the scattering curve and its derivative in the process of competition study has been discussed. This implies first of all the tight struggle among economic subjects for the paymass available in the society which may be used for satisfaction the needs of its members and for purchase of appropriate products and services. The definitions of concepts of the so called differential and integral competitive envy (stimulus) (DCE and ICE) using the mathematical apparatus of the scattering curve have been provided. For example, the economic growth coefficient for the Pareto's distribution of revenues has been calculated on which DCE directly depends, and the appropriate charts are provided. ICE has been also considered based on two models of society, the so called two-group and dual models, with appropriate calculations and charts attached. In the conclusive section the application of DCE and ICE concepts for commensurable economic subjects at the example of scattering curves of distribution of info telecommunication and economic resources among the world community countries is provided. Fig. 5, Tab. 1, Ref. 8.

Auth.

13.D4.3. Boreholes water level and earthquake's daily monitoring. /A. Sborshchikov, G. Kobzev, S. Mavrodiev, G. Melikadze/. Nano Studies. – 2013. – # 8. – pp. 203-212. – eng.

Studies of precursors and events that occur before an earthquake is one of the most important problem in today's seismology. Earthquake prediction has become an urgent issue that helps forecast destructive earthquakes. The paper discusses the daily monitoring of water level in several boreholes located in different parts of Georgia for this purpose. Fig. 6, Tab. 1, Ref. 15.

Auth.