GEORGIAN ABSTRACTS JOURNAL

The present issue compiled according to **Organization for Economic Cooperation and Development (OECD)** Scientific Research Classifier**.**

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List of Publications
Reflected in the Present Issue

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2. Agrarian-Economic Science and Technologies – 2015. – #4; 2016. – #1
3. Air Transport – 2015. – #2(10)
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21. Science and Technologies – 2015. – #1(718)
22. Translational and Clinical Medicine - Georgian Medical Journal – 2016. – v. 1. – #1
23. Transport and Machinebuilding – 2015. – #2-3(33-34).

b1. NATURAL SCIENCES

b1.1 Mathematics

b16.1.1.1. On pareto-guaranteed equilibrium in the Cournot problem. /M. Salukvadze, V. Zhukovskiy/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 7-13. – geo.; abs.: eng., rus.
The Paper is on the economic duopoly problem of the French scholar A. Cournot taking into account the conditions of uncertainty. Namely, the competition of two firms has been studied under the additional uncertainty factors. We have got the formulas showing the conditions of Pareto-guaranteed balance taking into consideration the possible existence of import, for such situations formulas have been computed showing the corresponding profit of the players. With this aim mathematical model of the problem has been formulated, the algorithm of building the condition of Pareto-guaranteed balance is presented, the conditions of the inner minimum of Pareto have been found, a kind of Nesh balance situation has been built. We have received the gains of the players as well as their guaranteed profits. Ref. 4.

<div align="right">Auth.</div>

b16.1.1.2. Model validation at identification of linear dynamic systems with variable parameters. /B. Shanshiashvili, M. Salukvadze, N. Dadiani, V. Gabısonıa/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 14-20. – eng.; abs.: geo., rus.
The problem of model validation of linear dynamic systems with variable parameters after the example of the second order system identification is considered. It is supposed that direct observation of the state vector of system is not possible and elements of the output matrix are variables. The problem of parameter identification is stated as, in a certain sense, an inverse problem of Cauchy's problem for linear ordinary equations. It is shown that at the 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.

<div align="right">Auth.</div>

b16.1.1.3. The problem of choosing targets for two opposing teams of shooters. /V. Khutsishvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 21-25. – rus.; abs.: eng., geo.
The fight to destroy the enemy between two teams of shooters is considered. The fight consists of rounds, where in each the shooters at the same time make one shot. The teams may be different both in number of shooters and in the individual probabilities of hitting the target. The problem is choosing the optimal schemes of aiming for both teams in the sense to maximize the difference between the probabilities of victory and defeat. The formulated problem is solved for two special cases. It is a few shooters against one and two against two. In the latter case, the classical results of the theory of zero-sum games may be applied. The calculation results showed that regardless of the individual skills of shooters corresponding payment matrix always has a saddle point. Tab. 3, Ref. 1.

<div align="right">Auth.</div>

b16.1.1.4. Cargoes optimization adjusted for fees. /D. Sikharulidze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 26-30. – geo.; abs.: eng., rus.
The task originates from the problem of marine transportation, when due to bounded capacity of the ship it is necessary to determine the best combination of cargoes to get maximum profit taking into account different constraints. This is the problem of linear-fractional programming which can be reduced to the problem of linear programming by certain transformations. In fact the delivery of some cargoes is delayed; moreover, some cargoes pass laboratory control necessarily after loading (e.g. wheat, which needs the time about three days). Therefore the delivery of the cargoes to the destination is delayed; it causes serious fees of the transport company. We take into account this circumstance by adding the surplus item to the functional, representing positive part of function. So, that the functional does not represent a linear-fractional function any more. In the article the method of solving this problem is suggested. Ref. 2.

<div align="right">Auth.</div>

b16.1.1.5. Determination of the parameters defining Georgia's national identity and modeling ethno cultural evolution. /A. Prangishvili, T. Obgadze/. Automated Control Systems. – 2015. – #2(20). – pp. 9-15. – geo.; abs.: geo., eng., rus.
The lines of the Georgian character that define the national originality are studied. The basic elements of the Caucasian character and those additional parameters that create the Georgian character are distinguished. The concept of an index of originality is entered. The basic system of the aggregated parameters defining dynamics of an index of national originality is constructed. Influence of globalization on nature of growth of an index of identity of national cultures is studied. After the example of Georgia the corresponding mathematical model for dynamics of the index of originality is constructed 1990-2015. Fig. 6, Ref. 3.

<div align="right">Auth.</div>

b16.1.1.6. Mathematical modelling of company value dynamics. /T. Obgadze, R. Gogoladze, N. Bichenov/. Automated Control Systems. – 2015. – #2(20). – pp. b16-30. – rus.; abs.: rus., eng., geo.
In work, for studying the company value dynamics, a mathematical model is constructed; specific cases of the constructed model which show the width of coverage of processes of various complexities are studied. On the basis of the regression analysis, functions for the defining model parameters are constructed; dynamics of the time series of the given hypothetical values is studied. Tab. 3, Fig. 13, Ref. 11.

<div align="right">Auth.</div>

b16.1.1.7. Mathematical modeling of distribution of carbon and sulfur in the slug in the process of continuous casting. /B. Gogichashvili, T. Tsertsvadze, A. Papiashvili A/. Mining Journal. – 2015. – #1(34). – pp. 93- 96. – geo.; abs.; geo., rus., eng.

Steel casting with continuous caster of melted steel is becoming mainstream in modern metal practice. There are several basic types of continuous casters: vertical, removal of vertical ingot, radial, with curved radial crystallizer tank, horizontal, etc. Modeling was carried out in full compliance with the theory of similarity and modeling. Each curve created through modeling was processed mathematically, which revealed optimal parameters of technological process of continuous casting of melted steel. Introduction of these parameters in production technology will lead to the enhancement of the production technology as a whole and improvement of the quality of produced goods. Fig. 4, Ref. 7.

<div align="right">Auth.</div>

b16.1.1.8. The analysis of a mathematical model of the copper flotation process. /R. Enageli, A. Shekiladze/. – Mining Journal. – 2015. – #2(35). – pp. 25-28. – geo.; abs: geo., rus., eng.

The article presents an analysis of the mathematical model of copper flotation process at the Madneuli processing plant. The model is built on the basis of the existing statistical data concerning plant technological process. The criterion for optimization of the flotation process, which provides for a maximum quantity of commercial product is established. The acceptable limits of variation of control actions (reagent consumption) have been identified. Based on the obtained results the process can be optimized. Fig. 7, Ref. 2.

<div align="right">Auth.</div>

b16.1.1.9. A solution of an integral form of a capillary equation by power series. /N. Enukidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 153-159. – rus.; abs.: geo., eng.

The solution of the integral form of the capillary equation by power series has been found. Recurrence formulas for calculating series coefficients have been obtained. It has been shown that the series coefficients are n degree polynomials of β Bond numbers. The first five polynomial coefficients have been calculated. The general formulas of the first and second members (e_{n1}, e_{n2}) of the polynomial coefficients have been calculated. On the basis of solutions obtained the formulas for a solution of the capillary equation at a first and second approximation have been derived. Using the tables obtained by numerical solution of capillary equation approximation error has been estimated. It has been shown, that when calculating the maximum diameter of Pendent drop by the formula of the first approximation the error for small values of Bond number ($\beta{\leq}0.6$) is no more than 1%. Tab. 7, Fig. 2, Ref. 9.

<div align="right">Auth.</div>

b16.1.1.10. Mathematical-chemical investigation of alkanes within the scope of quasi-ANB-matrices method. /N. Kupatadze, G. Otinashvili, M. Gverdtsiteli/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 187-188. – geo.; abs.: geo., eng., rus.

Within the scope of quasi-ANB-matrices method, three correlation equations were constructed and investigated for alkanes. Correlations are satisfactory. Tab. 1, Ref. 5.

<div align="right">Auth.</div>

b16.1.1.11. Mathematical-chemical investigation of redox reactions [Co(NH₃)₅Hal]²⁺+V²⁺ within the scope of block-matrices method. /K. Kupatadze, M. Gverdtsiteli/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 189-190. – geo.; abs.: geo., eng., rus.

Within the scope of Block-matrices method for redox reactions were investigated. The correlation equation was constructed. Calculations show that correlation is satisfactory. Tab. 1, Ref. 7

<div align="right">Auth.</div>

b16.1.1.12. The inverse inequalities of trigonometric approximation in weighted variable exponent lebesgue spaces with different space norms. /V. Kokilashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 1-11. – eng.; abs: eng., geo.

The inverse type inequalities of trigonometric approximations are established in weighted variable exponent Lebesgue spaces with different space norms. Ref. 9

<div align="right">Auth.</div>

b16.1.1.13. On some properties of sets of uniqueness of functional series. /Sh. Tetunashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 12-15. – eng.; abs: eng., geo.

The structure and some properties of uniqueness sets of functional series are presented. Ref. 14.

<div align="right">Auth.</div>

b16.1.1.14. Smirnov classes of analytic functions with variable exponent in multiply connected domains. /V. Paatashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. b16-23. – eng.; abs: eng., geo.

Let G be multiply connected domain with boundary, $\Gamma = \bigcup_{k=0}^{m}\Gamma_k$, where Γ_k, $k = \overline{0,m}$ are simple closed rectifiable curves such that $\Gamma_1 \dots \Gamma_m$ lie outside each other, but all of them lie inside of Γ_0. The paper introduces the Smirnov classes $E^{p(.)}(G)$ with variable exponent $\vec{p}(t) = (p_0(t), p_1(t), \dots, p_m(t))$, where $p_m(t))\overline{0,m}$ are given positive measurable functions on Γ_k. The properties of functions from these classes are established, in particular: an expansion theorem, representability by a Cauchy integral, generalizations of Smirnov's and Tumarkin's theorems, related to simply connected

domains for multiply connected domains. Also, the question of belonging of Cauchy type integrals with a density from $L^{p(\cdot)}(\Gamma)$ to the class $E^{p(\cdot)}(G)$ is investigated. Ref. 15.

Auth.

b16.1.1.15. On one singular integral equation arising from the radioactive transfer theory. /D. Gulua, M.Bibiluri, D. Shulai/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 24-30. – eng.; abs: eng., geo.
In the class of Hölder functions we give the necessary and sufficient condition for solvability of the two-dimensional integral equation having singularity with respect to one variable. Such equations often arise from the radioactive transfer theory. Finding a solution is reduced to solving a one dimensional Fredholm integral equation of the second kind. Ref. 6.

Auth.

b16.1.1.16. On topologically finite spaces. /G. Vardosanidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 31-37. – eng.; abs: eng., geo.
The notion of topologically finite space was introduced in 2012. In the present paper the question whether the union of finite number of topologically finite spaces is topologically finite is studied. More precisely, it is shown that the union of two topologically finite spaces (even in the realm of separable, metrizable and connected spaces) may not be topologically finite. Ref. 2.

Auth.

b16.1.1.17. Solution of minimal set partition and set covering problems. /N. Ananiashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 38-43. – eng.; abs: eng., geo.
The article considers solution of minimal set partition and set covering problems. As is known, the problems of minimal set partition and set covering belong to the class of complex NP problems. The efficient algorithm for precise solution of such problems does not exist nowadays (except in private cases). Solution time depends on a scale of the problem and it may significantly increase with it. A tree algorithm of simplified search is used. It became possible to decrease volume of occupied memory approximately 32·M-times with non-essential elaboration of programming techniques and computational time decreased approximately 32·M-times, where M is a number of covering subsets. For this purpose, partition matrix was compactly written and then basic operations were performed on columns of the matrix with logical operators. A complex of programs was developed in algorithmic language C++ and realized in Dev-C++ environment to solve these problems and check them on tests taken from ORLibrary and real combinative problems that are known from the literature. The results are satisfactory and given in reasonable amount of time. The proposed complex of programs may be used for solution of the other problems of graph theory that can be deduced to problems of minimal set partition or set covering, or they are the sub-problems of such problems (for instance, problem of searching of dominant set of graph nodes). Tab. 2., Ref. 13.

Auth.

b16.1.1.18. Numerical simulation of distribution of contaminants discharged to Kura River. /A. Surmava, L. Intskirveli, N. Buachidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 78-84. – eng.; abs: eng., geo.
Numerical simulation of distribution of contaminants discharged to Kura river is elaborated using nonstationary linear three-dimensional equation of transition-diffusion of substances in continuous medium. Model is meant for study of distribution of polluting agents in Kura river in the first approximation. Kura river is divided in 10 conventionally uniform linear sections and annual average values of hydrological parameters specific for the river are used for each section. Distribution of passive polluting agents thrown to Kura river near Georgian-Turkish state border is modeled using numerical experiment in case of stationary source. The time, which is necessary for polluting agent to reach the points located along the river, to pass various sections of river, to reach Georgian-Azerbaijan border and Mingachevir Reservoirs is determined. Distribution pattern of polluting agent concentration in the river bed, as well as concentration change, when passing from one section to another are determined, and relative change of concentration in 10 conventional river sections is estimated. Distribution of passive contaminant thrown to Kura river by salvo for 6 hours near Georgian-Turkish state border is studied. Pattern of gradual shift of the contamination plume in Georgian section of Kura river and gradual concentration change are shown. Ammonium ions (NH_4^+) distribution discharged from cities situated at Kura river is modeled. Distribution pattern for ammonium ions concentration in Kura river is received using numerical experiment. It is shown that values of concentration received via mathematical modeling with permissible accuracy coincide with the data of field observations. Fig. 4., Tab. 2., Ref. 9.

Auth.

b16.1.1.19. Solvability conditions of nonlocal problems for singular in phase variables higher order differential equations. /I. Kiguradze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 7-12. – eng.; abs: eng., geo.
The unimprovable in a certain sense conditions guaranteeing the solvability of nonlocal problems for singular in phase variables higher order differential equations are established. Ref. 10.

Auth.

b16.1.1.20. Boundary value problems on an infinite interval for singular in phase variables two-dimensional differential systems. /N. Partsvania/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 13-18. – eng.; abs: eng., geo.
For singular in phase variables two-dimensional differential systems, optimal in a certain sense conditions guaranteeing the existence of positive solutions of boundary value problems on an infinite interval are found. Ref. 11.

Auth.

b16.1.1.21. Algebraic function fields and non-standard analysis. /A. Klimiashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 27–32. – eng.; abs: eng., geo.
Non-standard analysis was developed in 1960-1970 as an application of logical methods to such topic as abstract algebra, analysis field theory. The present work considers applications of non-standard analysis to modern algebra. It is based on A. Robinson's work – Algebraic Function Fields and Non-Standard Arithmetics. A possibility of generalizing Robinson's argument is considered. Some other applications of non-standard analysis to algebra include, for example, applications of non-standard methods, computational group theory and the theory of rewrite rules. Ref. 8.

<div align="right">Auth.</div>

b16.1.1.22. On estimation of unknown parameters of exponential-logarithmic distribution by censored data. /A. Pijyan/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 33-38. – eng.; abs: eng., geo.
The problem of estimation of parameters of Exponential-Logarithmic distribution in the case of censored data is considered. We used pseudo maximum likelihood method and constructed a procedure to solve this problem. Theorem of consistency is proved. Simulation is used to study the properties of estimators derived. Tab. 1, Ref. 4.

<div align="right">Auth.</div>

b16.1.1.23. Approximation by trigonometric polynomials of fractional derivatives of periodic functions and the properties of conjugate functions in $L^{p(x)}$ spaces when $\min p(x) = 1$. /N. Danelia, V. Kokilashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 7-11. – eng.; abs: eng., geo.
The present paper studies the problem of approximation of 2π periodic functions and the properties of conjugate functions in the spaces $L^{p(x)}$, when $\min p(x) = 1$. The Bernstein-Zygmund type inequality for fractional derivatives of trigonometric polynomials is established and relying on this inequality, the direct and inverse inequalities for fractional derivatives are obtained. The condition ensuring belonging of conjugate functions to the space $L^{p(x)}$, $\min p(x) = 1$ is explored. The Zygmund type inequality for generalized moduli of smoothness of conjugate functions is presented and a subclass, invariant with respect to the conjugate operator, is determined. Ref. 8.

<div align="right">Auth.</div>

b16.1.1.24. The Riemann-Hilbert boundary value problem for Carleman-Vekua equation with polar singularities. /G. Makatsaria, N. Manjavidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 12-19. – eng.; abs: eng., geo.
The paper deals with the Riemann-Hilbert boundary value problem for the Carleman-Vekua equation with polar singularities. Index formula and criteria of solvability are obtained. Ref. 5.

<div align="right">Auth.</div>

b16.1.1.25. On locally cyclic and distributive modules and algebras. /A. Lashkhi/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 20-25. – eng.; abs: eng., geo.
In the theory of abelian groups the following two results are fundamental: on the representation of finitely generated abelian groups in the form of a direct sum of cyclic subgroups and the classification of locally cyclic groups. The generalization of the first of them for the case of modules over the principal ideal domains is classical. However, there are no published works for locally cyclic modules over the principal ideal domains. The aim of this paper is to fill this gap, namely, classification of cyclic modules over the principal ideal domains is given locally. Fig. 4, Ref. 9.

<div align="right">Auth.</div>

b16.1.1.26. Solving linear partial differential equations by moving least squares method. /H. Mafikandi, M. Amirfakhrian/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 26-36. – eng.; abs: eng., geo.
In this work we consider a method for solving linear partial differential equations, specially heat and waves equations that describe behavior of temperature distribution and wave propagation in one or multidimensional environments by moving least squares procedure. We present some illustrative examples and compare our proposed method with other methods to show the efficiency of this method. Tab. 6, Fig. 3, Ref. 22.

<div align="right">Auth.</div>

b16.1.1.27. On a nonlocal problem for an abstract ultraparabolic equation. /G. Avalishvili, M. Avalishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 37-42. – eng.; abs: eng., geo.
In this paper ultraparabolic equation with nonlocal initial condition is considered in abstract Hilbert spaces. The existence and uniqueness result for the nonlocal problem is proved in suitable spaces of vector-valued distributions with values in Hilbert spaces. An iteration algorithm of approximation of solution of the nonlocal problem by a sequence of solutions of corresponding classical problems is constructed and investigated. Applying general result obtained for nonclassical problem in abstract Hilbert spaces, nonlocal in time initial-boundary value problem for ultraparabolic equation is studied in Sobolev spaces. Ref. 12.

<div align="right">Auth.</div>

b16.1.1.28. The Mohr's integral calculation method. /D. Kipiani, S. Bliadze, N. Bliadze/. Air Transport. – 2015. – #2(10). – pp. 115-121. – eng.; abs.: eng., rus., geo.

Numerical methods of the Mohr's intergral calculation are considered, in particular using the Vereschagin method and the equation of parabola. On the basis of a comparative analysis advantages of the equation of parabola are shown. Fig. 4, Ref. 3.

Auth.

b16.1.1.29. Adaptive entropic coding of main coefficient arrays of discrete cosine transformation. /J. Khuntzaria, M. Gogberashvili, L. Khuntzaria, V. Abuladze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 67-76. – geo.; abs.: geo., eng., rus.
Justification of effectiveness of adaptive entropic coding of the arrays of differences of main coefficients of discrete cosine transformation of the brightness and contrast components of the images recommended by JPEG (Joint Picture Expert Group) and MPEG (Motion Picture Expert Group) standards of effective coding of immobile and mobile images, as well as relevant algorithm are provided. There is established, that the adaptive approach to entropic coding ensures not only better compression, compared with non-adaptive coding, but also better approach to the relevant entropy. Data of effectiveness of adaptive entropic coding are provided for the test images of various classes. Tab. 6, Fig. 9, Ref. 9.

Auth.

b16.1.1.30. Construction of Ono triplet structure in any logos. /A. Klimiashvili/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 85-93. – geo.; abs.: geo., eng., rus.
The logic of monad heighting in any logos is studied. The connection of this logic to the triplet Ono is shown. The fundamental properties of joint functions and natural transformations are used. Possible applications include the class of any mathematical models containing modalities, including the weater-related models. Ref. 8.

Auth.

b16.1.1.31. A mixed problem for an equation describing processes taking place in a magnetohydraulic pusher. /S. Bitsadze, R. Bitsadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 243-247. – geo.; abs.: geo., eng., rus.
A mixed problem for nonlinear hyperbolic equation, which is received by mathematical modeling of processes taking place in a magnetohydraulic pusher of special design, is studied. The uniqueness of solution, written in an explicit form, is shown and the domain of definitions for solution is established. The problem is solved with the use of method of characteristics and Riemann's invariant method. Ref. 5.

Auth.

b16.1.1.32. Problem of circles' tangency. /S. Bitsadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 248-252. – geo.; abs.: geo., eng., rus.
The work examines the case, when construction of circle tangent to three circles by Gergonne method is impossible. This obstacle is overcome by representation of the solution in the form, where properties entering into it do not change in case of any inversion. All notions and provisions necessary for solution are given. The advantages of the considered method are shown against the Gergonne method. Fig. 1, Ref. 5.

Auth.

b16.1.1.33. Construction of some quadric surfaces by the Staude method. /S. Bitsadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 253-257. – rus.; abs.: geo., eng., rus.
The article examines the Staude method for construction of ellipsoid and confocal quadric surfaces with the use of fibre. The rigid structure, consisting of ellipse and hyperbole, is taken as the basis of this construction, at that hyperbole plane is perpendicular to ellipse plane and contains major axis of the latter. It is shown that one ellipsoid, one-field and two-field hyperboloids are passing through each space point. Fig. 5, Ref. 2.

Auth.

b16.1.1.34. Solving metric problems using inversion. /N. Javakhishvili, T. Baramashvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 127-132. – geo.; abs.: geo., eng., rus.
The article offers an original way of solving geometric problems. Specific methods of problem solving is given as well as variety of cases in which one could use inversion. Using inversion considerably simplifies the process of problem solving. Inversive geometry is a unique way of loversing points on a plane. It is very practical, given that, using this method, one could turn problem including circles into simpler ones, reading straight lines. Fig. 3, Ref. 3.

Auth.

b16.1.1.35. Solution of some positional tasks using high level elevation method. /N. Nozadze, T. Beridze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 133-140. – geo.; abs.: geo., eng., rus.
The work considers solution of some positional problems of descriptive geometry using the method of high level elevations, developed by prof. A. Shavgulidze. The method is based on a possible scheme of projective realization of a-5 type model, which is part of independent model systems by prof. I. Japaridze. Particularly, constructive apparatus of projections is used in particular case, when we have hyperbolical linear congruency is orthogonal. In the same time one directrix of congruency d_2 belongs to Π_2 and is perpendicular to Π_1, the other directrix d_1 represents a line at infinity of a plane Π_1. This model is placed with Cartesian rectangular coordinate system in such a way that d_2 is coincided with z axes. The result accepted complex drawing is a drawing of orthogonal projection of a space R_3 supplemented with elevations on $z=d_2$ axes. Fig. 9, Ref. 3.

Auth.

b16.1.1.36. Solution of mining-geological engineering practical tasks by using high-level elevation method. /N. Nozadze, T. Beridze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 141-146. – geo.; abs.: geo., eng., rus.

The present work four mining-geological engineering practical tasks are solved by using the method of high level elevations. The advantage of this method lies in the fact that the some auxiliary constructions are taken out of the plan and thus reached the drawing visualizations, measurements simplicity and dynamism. During solution of positional and metric tasks by the method of high level elevations basic terms and explanations of method of elevations are used. Fig. 9, Ref. 3.

<div align="right">Auth.</div>

b1.2 Computer and information sciences

b16.1.2.1. The role structure of noun fraze (NP). /G. Chikoidze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 87-90. – geo.; abs.: eng., rus.
The role structure and the syntactic constituent of the noun phrase (NP) are considered in the article. The main components of structure are the central structure (core) and the periphery, which is divided into the "layers" at the same time. The sequence reflects corresponding semantic relation, i.e. their proximity to a verb - the core of the structure. Establishment of semantic roles of the sentence members is meant under the role structure. Functions (role) which are carried out in a situation, in process or in state are represented by the members of the sentence. The role structure more closely than syntactic structure is connected to the contents and that's what is considered as its main value. Ref. 1.

<div align="right">Auth.</div>

b16.1.2.2. The role representation of the causal relations in the meaning of an expression. /G. Chikoidze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 91-97. – geo.; abs.: eng., rus.
The approach described in the article represents the meaning of an expression as a role structure. Its elements - sentential primitives, i.e. simple sentences which have an "inner" role structure as well. At the same time, within the general structure of the expression to "sentential primitives" certain appropriate semantic roles are given, in particular, the conjunctions expressing logical relations, which are important for representation of the meaning. The causal relations between members of the expression are considered in this work. Ref. 5.

<div align="right">Auth.</div>

b16.1.2.3. Lexical functions as an important component of combinatorial dictionary. /G. Chikoidze, N. Amirezashvili, L. Lortkipanidze, L. Samsonadze, A. Chutkerashvili, N. Javashvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 98-104. – geo.; abs.: eng., rus.
The value and importance of the explanatory-combinatorial dictionary for the Georgian language is presented in the article. Lexical functions are general meaning of the word. The combinatorial dictionary includes: the meaning of a lexical unit, grammatical characteristics and its usage (lexical relations between words and word combinations) natural area suitable for the word; this helps to avoid mistakes. The lexical functions take important place in the dictionary. To create such area of the word is possible by means of lexical functions. The list of lexical functions selected for the Georgian language and samples of two words described by lexical functions are presented in the article. Ref. b16.

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b16.1.2.4. The lexical unit *klde* (cliff) in the explanatory-combinatorial dictionary. /N. Javashvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 109-114. – geo.; abs.: eng., rus.
The lexical unit *klde* (cliff) is considered in the paper according to the zones of the Combinatorial-Explanatory Dictionary. The full definition, its synonyms, metaphoric or figural meanings, composites and the relations to the other words are given in the paper. Lexical functions are used to define a word. This enables to characterize the lexical unit entirely in the word-building point of view too. The words defined in such way are important and necessary part of the combinatorial dictionary. The dictionary assists with the semantic learning of lexical fund of the language and it is used in automatic systems of the language.Ref. 7.

<div align="right">Auth.</div>

b16.1.2.5. Text conversion during the compilation speech synthesis. /A. Tushishvili, M. Tushishvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 115-118. – geo.; abs.: eng., rus.
The present work shows that the transformation of the Georgian orthographic text into phonetic is rather time-consuming operation. However, compared to the English and the Russian languages, it is relatively easy to achieve, based on the characteristics of the Georgian phonetics. It is shown that the characteristics of the Georgian phonemes are more expressive and stable. Stress and co articulations practically do not change their timbre therefore their characteristics are independent of a position and the neighborhood, so the number of varieties of the Georgian sound units is relatively small. Ref. 5.

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b16.1.2.6. SOAP and REST web services. /M. Tsintsadze, M. Khachidze, M. Archuadze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 119-125. – eng.; abs.: geo., rus.
In the provided work the common definition of Web services according to modern approach is presented. After the brief history of WS, WS benefits and challenges associated with their implementation is discussed. The work addresses the issues of Web Services architecture along with their Development Lifecycle. Two main standards SOAP and REST are discussed and Web Services Description Language introduction is given. The paper is organized as follows: after common definition of Web services the brief history of WS is provided. Chapter 2 address WS benefits and challenges associated with their implementation, the issues of Web Services architecture along with their development lifecycle is given in chapter 3. Two main standards SOAP and REST are discussed in chapter 4 and the example of WSDL is provided in Chapter 5. The paper concludes appropriate bibliography. Fig. 2, Ref. 8.

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b16.1.2.7. Vector space model and Georgian language text processing. /L. Lortkipanidze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp.105-108. – geo.; abs.: eng., rus.
The work is dedicated to the development of a method of automatic word grouping by their values. The method can be used for problems of information retrieval and auto-referencing tests, it is also relevant in the design of WordNet dictionary, for automatic cataloging of documents and other problems associated with processing large amounts of text. The paper discusses the theoretical basis of the problem and offers a modern method of computational linguistics – Vector representation of words based on their semantic. The article describes the main stages of the formation of semantic vectors, considers a method of forming a multi-dimensional vector reflecting the semantic proximity of words, and provides an overview of the generalized vector space model, forms general scheme of algorithms and software for processing the vector model of textual information. Ref. 10.

Auth.

b16.1.2.8. Safety of cloudy computing. /P. Karchava, T. Bakhtadze, M. Gegechkori, M. Archuadze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 126-129. – geo.; abs.: eng., rus.
In the offered article cloudy technologies is considered. Safety issues and the main methods of their decisions for these technologies which are possible for introducing in cloud computing are analyzed. Recommendations which should be provided for safety increase are presented. Ref. 6.

Auth.

b16.1.2.9. Use of Google apps for education services in the learning process. /M. Gegechkori, V. Bakhtadze, N. Narimanidze, T. Kaishauri/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 130-133. – geo.; abs.: eng., rus.
Preferences of use of services of Google environment in an education are shown. The possibilities of use of the professional package Google Apps for Education in the learning process are considered. Some popular services and applications of the Google Apps for Education which simplify learning process and increase its dynamism and efficiency are described. Fig. 2, Ref. 3.

Auth.

b16.1.2.10. Production models of knowledge in the diagnosis of primary headaches. /V. Radzieski, M. Mikeladze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 134-140. – geo.; abs.: eng., rus.
The problem of medical diagnostics for diseases of the class of primary headaches which along with quantitative data has a large amount of qualitative data (linguistic and unclear data) is considered. The method for solving these problems by using the knowledge, presented in the form of products, as well as by using a conceptual approach, based on constructing Boolean functions by means of examples is offered. The used data has been reduced due to the allocation of essential characteristics, allowing extrapolation, i.e., recognition of the conditions of this class not included in the training sample. Tab. 1, Fig. 1, Ref. 7.

Auth.

b16.1.2.11. Parallel and consecutive classification in the problems of pattern recognition and diagnostics. /V. Radzievski/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 141-145. – geo.; abs.: eng., rus.
Parallel and consecutive methods of object classification are considered. Analysis and comparison of these methods according to different criteria is carried out. The features and benefits of each method are revealed. Parallel - serial procedure of diseases classification with use of the key statements is offered. The decision tree is built through which the testing of the patient and partition of diseases into classes and subclasses according to symptoms is carried out. Such partition proceeds until the terminal top is received. It indicates production by means of which the diagnosis is made. In the paper the problem of diagnostics on the example of acute respiratory diseases is considered. Fig. 1, Ref. 4.

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b16.1.2.12. Formation of the knowledge base for medical systems. /N. Jaliabova, G. Besiashvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 146-152. – rus.; abs.: geo., rus.
The article presents the characteristics of the building of medical knowledge bases, it shows an example of rule building and implementation of a logical conclusion in medical information systems. Stages of creation of the medical knowledge base, sequence of actions of the expert are reflected while working with the medical knowledge base. The described method allows forming the initial state of the knowledge base as a set of systems of rules with the identified values of parameters. The formal representation of medical knowledge bases obtained by means of this algorithm allows using them in expert systems of medical diagnostics. The proposed approaches can be adapted to different subject areas. Tab. 2, Fig. 1, Ref. 5.

Auth.

b16.1.2.13. Data entry program in expert diagnostic system of primary headaches. /D. Radzievski/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 153-158. – rus.; abs.: eng., geo.
Expert diagnostic system of primary headaches is a program that can diagnose diseases such as migraine, tension headache and cluster headache. Primary headaches are called headaches that are not associated with other pathologies causing them. The program consists of two parts - training and diagnostic systems. The paper describes the educational part of the program data input in a local database system. The functions of the data input for the hierarchical tree features in C++ are considered. The features of data input for the triplet indication by using standard Windows resources are described. Fig. 8, Ref. 2.

Auth.

b16.1.2.14. The software structure of higher mathematics teaching. /L. Gachechiladze, M. Kiknadze/. Institute of Control Systems of Georgian Technical University Proceedings. 2015. – #19. – pp. 159-b163. – geo.; abs.: eng., rus.
The paper proposes a software framework designed to improve the learning process of higher mathematics in higher education schools. It consists of a control unit and a database. The database consists of several tables in which tasks are placed by topics that are ordered by difficulty. The database also contains decisions of all tasks. The control unit on the bases of the study subjects, choose the appropriate table and tasks of an appropriate level of complexity. This approach allows the student at every level of the program learning maximally identify their intellectual abilities, change the parameters of any problem and solve it again, etc. Using the simulator significantly improves the quality of teaching the higher mathematics and facilitates student mastery of any topic of the discipline. Tab. 4, Fig. 1, Ref. 2.

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b16.1.2.15. Hypervisors and safety of information. /N. Narimanidze, T. Burchuladze, M. Odiladze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. b164-b166. – geo.; abs.: eng., rus.
The hypervisor is basis of virtualization, ensuring safety of information and operates the virtual computer. The problems connected with safety of virtualization in cloud computing demand the analysis and the relevant decisions. In the paper influence of technical characteristics of a hypervisor on safety of information is considered. Characteristics of types of a hypervisor with different parameters providing their efficiency are presented. Recommendations are provided. Tab. 1, Ref. 2.

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b16.1.2.16. Input information generation in machine learning clasification algorithms. /Z. Bosikashvili, D. Chokhonelidze/. Automated Control Systems. – 2015. – #2(20). – pp. 31-35. – geo.; abs.: geo., eng., rus.
One of the main purposes of machine learning is observing the system. There exist many kinds of system: Mathematical, Biological, Informational system and etc. One kind of such system is intelligence system. These systems are used in many industries. Machine learning is one of the main parts of intelligence system which includes such questions: Input and output information, main processes of system. Such systems' machine learning defines much kind of algorithms. Such systems' machine learning defines much kind of algorithms. One kind of algorithm of this system is classification. It's important to know how to generate input information for that kind of algorithms. Current article discusses how to generate input information of classification algorithms. Fig. 3, Ref. 1.

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b16.1.2.17. Output information generation in machine learning clustering algorithms. /Z. Bosikashvili, D. Chokhonelidze/. Automated Control Systems. – 2015. – #2(20). – pp. 36-41. – geo.; abs.: geo., eng., rus.
One of the main purpose of machine learning is observing the system. There exist many kinds of system: Mathematical, Biological, Informational system and etc. One kind of this system is intelligence system. Many industries use these systems. Machine learning is one of the main parts of intelligence system which includes such questions: Input and output information, main processes of system. Such systems' machine learning defines many kinds of algorithms. One kind of algorithm of this system is clustering. It's important to know how to generate output information for that kind of algorithms. Current article discusses how to generate output information of clustering algorithms. Fig. 1, Ref. 2.

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b16.1.2.18. Method for multi-agent learning in computer games. /G. Abelashvili, Z. Bosikashvili/. Automated Control Systems. – 2015. – #2(20). – pp. 52-57. – geo.; abs.: geo., eng., rus.
Multiple-agent technology has always been widely used in computer games. It combines game theories, compound systems, applied sociologies and artificial intelligence. There are systems which are hard to create. One of the cases in such system is to make agent learn something and afterwards to give this kind of knowledge to another agent - making agents share the knowledge. In this article, we will review the method of making agents share their knowledge - problem of knowledge marking. Problem of knowledge marking will be shown as an example of Ants Colony. Fig. 3, Ref. 2.

<div align="right">Auth.</div>

b16.1.2.19. Using of argumentation mechanism of artificial intelligence in video games. /G. Abelashvili, Z. Bosikashvili/. Automated Control Systems. – 2015. – #2(20). – pp. 58-65. – geo.; abs.: geo., eng., rus.
There are many problems in video games. Groups of agents have the main roles. They take a group and individual decisions. Group decisions are depended on individuals. Agents don't always think the same way, they wish to reach consensus, which will be their group's final decision. One of the known ways to reach consensus is the augmented mechanism. In this article, we will discuss argumented mechanism as an example of Ants problem. Tab. 3, Fig. 1, Ref. 4.

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b16.1.2.20. Database query optimization: new approach to genetic programming. /L. Tsitashvili, B. Meparishvili, G. Janelidze/. Automated Control Systems. – 2015. – #2(20). – pp. 90-95. – eng.; abs.: eng., geo., rus.
This paper discusses one of the actual problem of database management which is called Query Optimization. In the process of implementation every possible plan of binary tree makes the so-called situation space that is determined by dimension appropriate to n! Factorial in case of n number of table. Contemporary database management systems, for instance SQL Server may be consisted of about 32 tables in one query. In this case the variation if the query are equal of about 2.6 *1035 plans and selecting the optimal one causes time problem, even with superfast computers. The major function of the Query Optimizer existing in the database management system is searching the best plan that is a quit difficult task proceeded from the above-mentioned dimension. Thus, the needed to develop new and more effective methods for the Query optimization becomes evident. The paper discusses one modified algorithm of Genetic

Programming, which carries out the selection of a combination of Relational Algebra operations and finds the optimal solutions very fast. Fig. 4, Ref. 5.

<div align="right">Auth.</div>

b16.1.2.21. Construction of multimodal freight forwarding MIS using CASE design and hybrid programming technologies. /G. Gogichaishvili, G. Surguladze, N. Topuria, L. Petriashvili, G. Surguladze/. Automated Control Systems. – 2015. – #2(20). – pp. 96-107. – geo.; abs.: geo., eng., rus.
The present article discusses database design for Multimodal Freight Forwarding MIS system, development of software and user interfaces using CASE design and hybrid programming technologies. In particular, the article proposes conceptual schemes for multimodal freight forwarding (ship, rail, motor and air transport modes) problem areas with tables of Customer (owner of cargo), cargo (transportation object) and supplier – freight forwarder, with Object-Role and Entity Relationship modeling (ORM/ERM) instruments, developed using Ms SQL Server package. The article also discusses realization of interface for functional problem of database administrator within environment of hybrid programming (WPF, C#, XAML). Tab. 2, Fig. 10, Ref. 9.

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b16.1.2.22. Infrastructure and simulation model of business process management for multimodal freight forwarding. /G. Surguladze/. Automated Control Systems. – 2015. – #2(20). – pp. 108-123. – geo.; abs.: geo., rus., eng.
The present article discusses problems of managing business processes of multimodal freight transportation, international level of development of the abovementioned field and broadening of its use in Georgia. The article presents an analysis of types of multimodal shipments with emphasis on modeling and improving automation of business processes of a freight forwarding business based on modern information technologies. BPMN diagram of freight forwarding has been developed based on process oriented approach. Structure of management information system of the problem area has been designed with database, monitoring and decision making blocks. For the purpose of research to be done on dynamic processes of cargo transportation developing a simulation model based on graphoanalytical tool of Colored Petri Nets (CPN) is proposed. Fig. 8, Ref. 12.

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b16.1.2.23. Modern approuches and planing tools of information systems. /E. Turkia, M. Giutashvili, S. Stomadova, Z. Katsitadze/. Automated Control Systems. – 2015. – #2(20). – pp.124-129. – geo.; abs.: geo., eng., rus.
The article reviews development of complex information systems and modern approaches of management of these systems. Attention is paid to methods of practical implementation of information systems' international standards recommendations. Importance of program - modeling engineering technology and process-oriented approach is reviewed. The article describes modeling of business processes and main principles of CASE technology, which is productive for legacy and complex IT system management. For development, analysis, and service of programming systems, UML language diagrams, methods of business-process management modeling, automatic generation of UML diagrams based on scenarios are presented in practical examples. Fig. 3, Ref. 3.

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b16.1.2.24. Discussion and comparison of single page application JAVASCRIPT platforms ANGULARJS and EMBERJS. /G. Kentchoshvili/. Automated Control Systems. – 2015. – #2(20). – pp. 130-135. – geo.; abs.: geo., eng., rus.
The article considers SPA-platforms AngularJs and EmberJs. A comparative analysis of these two platforms is made and their advantages and implementation complexities are identified when building web applications. As an illustrative example, simple SPA-application implementation is carried out using the both AngularJs and EmberJs platforms. Fig. 2, Ref. 3.

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b16.1.2.25. Methods for assessing the use of graphical visualization software packages. /E. Kamkamidze, M. Janelidze, T. Apkhadze/. Automated Control Systems. – 2015. – #2(20). – pp. 136-141. – geo.; abs.: geo., eng., rus.
The new directions of application of the computer graphics software packages at the current stage of students' teaching are examined. Computer graphics are used in almost all scientific and engineering disciplines for perceiving, displaying and processing of the transmitted information. Currently quite powerful hardware and software are used for a variety of graphics, beginning from a simple drawing to creating realistic images of complex objects. The evaluation of the advantages and disadvantages of raster, vector, and fractal graphics is performed. There are presented tables showing the characteristics and capabilities of the popular graphics programs. Suitable methods of graphical visualization, transformation, and scaling, coding graphical information are described. Tab. 2, Ref. 6.

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b16.1.2.26. Access control system for distributed networks. /G. Iashvili/. Automated Control Systems. – 2015. – #2(20). – pp. 142-147. – eng.; abs.: eng., geo., rus.
Access control models for electronic information flow control have existed for decades and have been developed over time to support a range of applications and uses. In this work we are summarizing the existing literature on access control models and proposing a new combination of rules and methods that are best suited to the changing security threats introduced by the move to mobile collaborative working and de-perimeterization. Fig. 3, Ref. 7.

<div align="right">Auth.</div>

b16.1.2.27. Some features of development and use of the intelligent concentrator for computer network systems. /O. Natroshvili, N. Gabashvili, T. Gabashvili/. Automated Control Systems. – 2015. – #2(20). – pp. 148-152. – geo.; abs.: geo., eng., rus.

Features of development and use of intelligent concentrators for computer network systems are formulated. He are explained positive sides of intellectualization of devices which are focused on data transmission with various speeds in systems, which increases the flexibility of application in comparison with other devices currently in operation, increasing productivity of systems in general. Ref. 4.

Auth.

b16.1.2.28. Possible applications of cloud technology in manufacturing. /O. Gabedava, N. Gabedava, G. Sebiskveradze/. Automated Control Systems. – 2015. – #2(20). – pp. 153-156. – geo.; abs.: geo., eng., rus.
The article examines the possibility of using cloud technologies in the production and advantages of its application. We assess the current situation of the IT-market in the production. Analyzed is the objective and subjective related scheme using cloud technology. On the basis of analysis, conclusions about the need for cloud technology in the workplace can be drawn. Fig. 2, Ref. 5.

Auth.

b16.1.2.29. The control problems of sound sensors. /I. Mosashvili, N. Mchedlishvili, I. Davitashvili/. Automated Control Systems. – 2015. – #2(20). – pp. 157-b161. – geo.; abs.: geo., eng., rus.
Control of modern technical systems is exercised by sensors and actuators. The article considers the problems of control of sound sensors, specifically, the sound controller, which can be used to determine the noise level. There is used the special algorithm for data processing immediately; to data processing, which are received from the sensor we use the Arduino software. The specific tasks are implemented on the electronic platform board Arduino Mega 2560. Fig. 7, Ref. 4.

Auth.

b16.1.2.30. The automated installation of the scheme of electrochemical analyzers. /N. Eremeishvili, I. Garsevanishvili, E. Kunelashvili/. Automated Control Systems. – 2015. – #2(20). – pp. b162-b166. – geo.; abs.: geo., eng., rus.
During the last time purposeful job on creation of means of metrological maintenance of electrochemical analyzers of structure was spent. By present time are developed and serially many types of complete sets of the state standard samples of structure of water solutions are issued. There was a necessity of creation of the testing scheme for analyzers of structure of liquid environments, also workings out of installation of the higher accuracy for reproduction of unit of painting concentration of solutions. High metrological characteristics and serial release, completely satisfies requirements of creation of the elementary type of the testing scheme of electrochemical analyzers of structure of liquid environments. Fig. 2, Ref. 4.

Auth.

b16.1.2.31. Kerio Control – network firewall and administrator's complex tools. /K. Revazishvili/. Automated Control Systems. – 2015. – #2(20). – pp. b167-172. – geo.; abs.: geo., eng., rus.
The structure of modern corporative network is more loaded and complicated system. Need a number of manageable devices, which can moderate our LAN and WAN. In First, we need to manage our network, need to get software and hardware what we need in our topology. One of Solution to manage out LAN is Kerio Control. It is new name of Kerio WinRoute Firewall. This software provides lot of network tasks. The main task of Kerio control is to replace expensive network hardware, such as routers, firewalls and etc. Fig. 4, Ref. 4.

Auth.

b16.1.2.32. Development of a computer control system of the considered cases for a Beziskovy type of civil law. /T. Sukhiashvili, B. Khvedelidze, I. Shurgaia/. Automated Control Systems. – 2015. – #2(20). – pp. 173-179. – geo.; abs.: geo., eng., rus.
Automation of decision-making processes at the present stage sets a task of creation of the computer systems intended for management of multi-purpose difficult objects. Transferring of the center of gravity of researches on this problem is caused by development of the traditional principles of management, languages of modeling of the operated objects and methods of search of decisions by means of models. Despite it, at the solution of the specified problem there are difficulties connected with creation of adequate model of object of management. Special difficulty is presented by organizational systems what the judicial system is. Correct production of lawsuits considerable guarantee of organizational actions, protection of a legal procedure, and timely consideration of lawsuits. In article process of development of computer system of civil office-work, a problem and means of their decision on the basis of the rational unified process (RUP) is considered. Fig. 1, Ref. 4.

Auth.

b16.1.2.33. Applying of the systems of artificial intelligence in the banking sphere. /M. Chkhaidze, M. Tabatadze/. Automated Control Systems. – 2015. – #2(20). – pp. 180-185. – geo.; abs.: geo., eng., rus.
The work treats the applying of an artificial intelligence, i.e. artificial intellectual systems in the financial sector, more exactly, in banks. The world's leading banks realize the efficiency of artificial intellect, so that the demand is increasing. Nevertheless, there are certain circles that are not aware even of existence of such methods, let alone their usefulness in the banking. The work considers the tasks that are already approved and are being used in banking. Their advantage comparing to the standard methods is analyzed. Ref. 4.

Auth.

b16.1.2.34. Exchange rate forecasting problem for Georgian currency GEL. /A. Gabelaia, L. Gabelaia/. Automated Control Systems. – 2015. – #2(20). – pp. 186-193. – geo.; abs.: geo., eng., rus.

The problem of forecasting an exchange rate which, taking into account its complexity, often is considered unreal, is analyzing. In particular, the correlation analysis of this indicator and related directly factors is carried out. Econometric models of forecasting of exchange rate (factorial and ARIMA type) are constructed and forecast estimations of national currency on the basis of these models are found. All calculations are made on the basis of a known Eviews package. The analysis of the known warning indicators of currency crisis is given. Tab. 1, Fig. 10, Ref. 5.

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b16.1.2.35. Building charts using IMSL Chart Library. /L. Iashvili, M. Ninua, M. Turmanidze/. Automated Control Systems. – 2015. – #2(20). – pp. 194-199. – geo.; abs.: geo., eng., rus.
In the era of computer technologies, software packages are regularly refined and developed and new software libraries are made. They are designated to solve different engineering and scientific problems in a more simplified way. Using the programming language C# and a variety of two-dimensional graphs and under conditions of any framework version different two-dimensional graphs can be constructed in the Microsoft Visual Studio environment, with the possibility of constructing a similar dimensional graph in the same environment more simply, using the IMSL Chart library. Fig. 1, Ref. 2.

<div align="right">Auth.</div>

b16.1.2.36. Wind tunnel simulation using the COMSOL MULTIPHYSICS package. /L. Iashvili/. Automated Control Systems. – 2015. – #2(20). – pp. 200-204. – geo.; abs.: geo., eng., rus.
COMSOL Multiphysics is a software package that provides easy simulation of mathematical and physical models of different dimensions; the program package contains all the mathematical formula being important for a variety of scientific research. The program is intended for physicists, engineers, mathematicians; it can solve different types of tasks solved and set up their new models. It enables the solution of both wind loads and other engineering and simulation tasks in a different dimension. Fig. 5, Ref. 3.

<div align="right">Auth.</div>

b16.1.2.37. Testing and electronic testing means. /I. Okropiridze/. Automated Control Systems. – 2015. – #2(20). – pp. 205-211. – geo.; abs.: geo., eng., rus.
The test compilation principles, check of validity and reliability, testing methods, their positive and negative aspects, test compilation recommendations and testing process software by the MOODLE system are considered. Fig. 8, Ref. 2.

<div align="right">Auth.</div>

b16.1.2.38. Software development life cycle in the latest versions of Visual Studio.NET Framework package. /G. Surguladze, T. Kaishauri, G. Nareshelashvili, G. Maisuradze/. Automated Control Systems. – 2015. – #2(20). – pp. 212-222. – geo.; abs.: geo., eng., rus.
The article discusses process automation issues for basic phases of software development life cycle (modeling, design, implementation, refactoring, testing and support) in versions of Visual Studio.NET 2013/15 package. In particular, implementing new possibilities of the unified modeling language are given within this integrated environment. Respective UML diagrams have been developed using Visual Studio.NET. The process of generating C# code from class association diagram has been investigated based on an experimental task and new possibilities of reverse programming have been analyzed. Fig. b16, Ref. 8.

<div align="right">Auth.</div>

b16.1.2.39. On a method of multiple correction of databases in pattern recognition objectives. /N. Tkemaladze, V. Jikhvashvili, M. Kuridze, G. Mamulashvili/. GEN. – 2015. – #3.– pp. 5-8. – rus.; abs: eng.
A new method of multiple corrections of databases on the basis of object recognition results is suggested. The correction of databases is one of important objectives of the system of pattern recognition with learning (SPRL) elaborated by us. Therefore,a brief information on the SPRL is given. The object recognition results were significantly improved after including the above-mentioned method in the SPRL. Ref. 8.

<div align="right">Auth.</div>

b16.1.2.40. Search of objects in the area. /M. Nachkebia/. GEN. – 2015. – #3.– pp. 9-14. – rus.; abs: eng.
The paper deals with the problems of search in the area in different situations of search depending on the character of information about locations of the object of search, the structure and location of search means, technical parameters of both search forces, and the required object. In the specific case, the model can be applied to the problems of search of naval underwater objects. Ref. 7.

<div align="right">Auth.</div>

b16.1.2.41. A possibility of constructing a new symmetric tweakable block cipher and a method of calculation of Pearson's Correlation Coefficient. /L. Julakidze, Z. Kochladze, T. Kaishauri/. GEN. – 2015. – #4. – pp. 39-45. – geo.; abs.: eng.
The paper deals with a new symmetric tweakable block cipher using the modified Hill algorithm. A possibility of constructing such a cipher and a method of calculation of the Pearson's correlation coefficient between the text and the ciphertext are discussed. Ref. 11.

<div align="right">Auth.</div>

b16.1.2.42. Dynamic models of laminated systems. /S. Bliadze, U. Dzodzuashvili/. Air Transport. – 2015. – #2(10). – pp. 122-133. – rus.; abs.: rus., eng., geo.
The accuracy of proposed methods is evaluated after the example of dynamic calculations of three-layer cantilever plates and pinched cylindrical shells. Calculation errors of six lower natural frequencies did not exceed 8%, and

calculation errors of amplitudes of excitation oscillations account for 2%. With this the time to solve the problem was reduced more than twice. Tab. 3, Ref. 12.

<div align="right">Auth.</div>

b16.1.2.43. A solution of Malfat problem by AutoCAD. /N. Javakhishvili, T. Baramashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 148-155. – geo.; abs.: geo., eng., rus.
The article considers the solution of such problem as a Malfat problem by currently most urgent CAD program AutoCAD; it ensures simplifying of the problem. AutoCAD develops spatial perception, creative thinking and promotes the development of designer skills. Proposed is the solution known as Malfat of the circles problem that is based on the drawing and descriptive geometry methods. The CAD program AutoCAD allows simplify the problem solution that was almost impossible. Fig. 5, Ref. 2.

<div align="right">Auth.</div>

b16.1.2.44. On the numerical realization of similar tasks on a computer. /T. Zarkua, D. Mamporia/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 258-263. – geo.; abs.: geo., eng., rus.
The article is devoted to the question of numerical computer realization of the optimal control algorithm. The program is made up in the language C++, It enables realization of the effective control in a similar system under conditions of resources deficiency. Ref. 2.

<div align="right">Auth.</div>

b1.3 Physical sciences

b16.1.3.1. The system of compensation and simulation of perturbed geomagnetic field variations. /N. Inviya, N. Kavlashvili, E. Kubaneishvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 39-43. – eng.; abs.: geo., rus.
The system of active screening is offered. It can work in the mode of compensation of magnetic storms, as well as in the mode of their modeling. Using such system will allow the researchers who are studying questions of impact of weak magnetic fields onto live organisms to intensify works while carrying out scientific experiments. Static characteristic of a control device, block diagrams of systems of compensation and modeling of magnetic storms are offered. Fig. 8, Ref. 3.

<div align="right">Auth.</div>

b16.1.3.2. Influence of wall roughness on power necessary for liquid mixing in the cylindrical vessel. /T. Magrakvelidze, A. Mikashavidze, N. Bantsadze, Kh. Lomidze, Ts. Shengelia, I. Mantidze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 49-54. – geo.; abs.: eng., rus.
Description of experimental methodic and test unit for investigation of power necessary to mix liquid in the stirred tank with smooth and rough side walls are presented. Experimentally was established that power needed to mix liquid in the vessel with rough side walls is twice more than power necessary in case of smooth walls. It is shown that results obtained for smooth surface are in good coincidence with references. Based on investigations was made conclusion that for intensification of heat transfer in stirred tanks using artificial roughness is more efficient than reflective spacers. Fig. 4, Ref. 10.

<div align="right">Auth.</div>

b16.1.3.3. Configuration and use of the active band-pass filters. /T. Trokashvili, G. Urushadze, N. Shengelia/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 55-58. – geo.; abs.: eng., rus.
The complex baseband signal is considered. The signal frequency changes within a large range. The scheme of filter for allocation of frequency of the main signal as well as the scheme of automatic adjustment of the filter for the resonant frequency is shown. As the filter the active baseband filter of the second order is used. Fig. 5, Ref. 4.

<div align="right">Auth.</div>

b16.1.3.4. Ways of a search for new energy sources. /D. Purtskvanidze, N. Gdzelishvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 68-71. – geo.; abs.: eng., rus.
As you know, oil, coal, and gas reserves will not last for long. Moreover, burning of oil and coal worsens ecological environment. Uranium and Thorium reserves are large, but the problem of radioactive waste still exists. People are afraid of Chernobyl recurrence. Therefore, the issue of the managed thermonuclear synthesis, that would provide us with inexhaustible energy reserves, is so important. Nuclear fusion provides energy from water with harmless waste of hydrogen and helium. In this work, the new type of equipment for nuclear fusion is reviewed. The principles of operation and advantages over other existing equipments is provided. Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.1.3.5. Model of three-dimensional space–time. /D. Purtskvanidze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 73-75. – geo.; abs.: eng., rus.
Four-dimensional space (marked as: "4D", R4) - in mathematics is an abstract concept, produced by generalizing rules of three-dimensional space. In modern physics, space and time are merged into a single four-dimensional continuum, which is called Minkowski space. Its metric considers the time dimension differently than spatial dimensions. In the offered four-dimensional space model, we have three axes of material points OX, OY, OZ. The fourth coordinate t (time) is read on the time OT axis. Reading takes place regarding to the starting point of the coordinate system. OT axis is symmetrically located relative to the axes OX, OY, OZ and is inclined at an angle of 450 to each of them. Fig. 3, Ref. 1.

b16.1.3.6. The aerodynamic characteristics of the aircraft. /D. Tsintsadze, K. Omiadze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 76-79. – geo.; abs.: eng., rus.
The article substantiates the need for introduction of aerodynamic coefficients. To receive them in the process of modeling, the function values are entered in the computer in the form of a table. This is accomplished by software executed in the programming language QBASIC. Ref. 4.

b16.1.3.7. Solution of a heat exchange nonlinear mixed problem in the disperse environment considering light emission (dynamic processes). /T. Modebadze/. Novation. – 2015. – #b16. – pp. 9-14. – geo.; abs.: geo., rus., eng.
In the work the operational method of solving the systems of differential equations corresponding to the heat exchange for Neiman's problem is considered. Influence of light radiation on drying process is provided. Respectively, the discretion of light radiation changes the right side of the system of equations that causes a change in the class of decision functions. Existence of the solution is proved and it is shown to which class of function this solution belongs. The given problem and the method of solution can be used also in case of the liquid heat carriers. Ref. 6.

b16.1.3.8. The method of explosive materials efficiency determination by stress wave parameters. /S. Khomeriki, R. Mikhelson, G. Shatberashvili/. Mining Journal. – 2015. – #1(34). – pp. 64-65. – geo.; abs.; geo., rus., eng.
The article indicates determination of explosive materials' efficiency, according to which the working capacity of the materials are the impulses obtained by the stress wave energy made by the processing of oscillograph chart. It should be noted that this method has the same insufficiencies as the methods of measurement of cavities made in the rock after the explosion, or a great data spread caused by physical-chemical different features of the explosive materials as well as by the explosion of different parts of the same rock. Notwithstanding this, the method is still widely used, which is conditioned by a relatively higher reliability of the instrumentally acquired results. Ref. 3.

b16.1.3.9. Calculation of slope stability circular cylindrical sliding surface. /T. Pirtskhalava/. – Mining Journal. – 2015. – #2(35). – pp. 22-25. – geo; abs: geo., rus., eng.
It is shown that the current calculation method of slope stability recesses circular cylindrical sliding surface is widespread in the global building practice and used by a variety of techniques. The method consists in finding the graph-analytical method point position O_{min} - the center of rotation for the most dangerous sliding surface sliding wedge, which corresponds to the minimum value of the coefficient of slope stability. In this case, consider the plane problem of soil mechanics, i. e. the thickness calculated slope in the direction of its length is taken 1m. An algorithm graph-analytical method Janbu, by which solved the problem of finding a specific point position O_{min} - the center of rotation, for the most dangerous sliding surface of array soil cut slope. Fig. 3, Ref. 8.

b16.1.3.10. Lattice constant as an indicator of technology and properties of $A^{IV}B^{VI}$ semiconductors. /A. Pashaev, O. Davarashvili, M. Enukashvili, L. Bychkova, R. Gulyaev, M. Dzagania, V. Zlomanov/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 180-186. – rus.; abs.: rus., geo., eng.
Our investigations show that lattice constant of IV-VI semiconductors maybe as an indicator of the influences: composition, pressure and temperature such as forbidden gap width. This fact is stimulated also by high absorption of X-ray by IV-VI semiconductors. By research of the lattice constants of epitaxial layers $PbS_{1-x}Se_x$ and $Pb_{1-x}Sn_xTe$ were determined their compositions and technological stability, additionally confirmed by narrow halfwidth of X-ray lines. Data on lattice constants were used also at layers' thickness analysis, when at the beginning was necessary the knowledge of the density of the concrete layer. In the paper are presented also steps of the calculation of layers' thickness by using experimental and literature data. The object of the discussion is an expediency of the determination of lattice constants at the research of the deformations in the layers obtained on the different substrates. Tab. 4, Fig. 5, Ref. 9.

b16.1.3.11. On the estimators for some frequency distributions arising in bioinformatics. /D. Farbod/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v.9. – #1. – pp. 44-50. – eng.; abs: eng., geo.
We consider two well-known frequency distributions which can be used for modeling phenomena arising in bioinformatics. These are: the two-parameter waring frequency distribution and the two-parameter Pareto-like frequency distribution, both introduced by V. A. Kuznetsov. We propose the system of finding the maximum likelihood estimators (MLE) for the unknown parameters of such frequency distributions. The proposed MLE are coincided with some moment estimators. Moreover, a method of approximate computation of the MLE for the models parameters is obtained. Simulation studies are given to support the theoretical results. Tab. 1., Ref. 8.

b16.1.3.12. Search for the right-handed WR boson and a heavy neutrino at the LHC. /N. Krasnikov, V. Matveev/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v.9. – #1. – pp. 51-55. – eng.; abs: eng., geo.
We give a brief review of the SU_c (3) $\otimes$ SU_L (2) $\otimes$ SU_R (2) $\otimes$ U(1) left-right symmetric gauge model and discuss a possibility to detect the right-handed WR -boson and a heavy neutrino in pp collisions at the LHC. We present bounds on the masses of the WR -boson and heavy neutrino, obtained at the ATLAS and CMS detectors with a total energy of colliding protons 7–8 *TeV.* Fig. 2., Ref. 10.

b16.1.3.13. Study of the collective flows of protons and pions in p(C,Ta) and He(Li, C) collisions at momenta of (4.2, 4.5 and 10 AGeV/c. /L. Chkhaidze, G.Chlachidze, T.Jobava, A. Durglishvili, L. Kharkhelauri/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v.9. – #1. – pp. 56-64. – eng.; abs: eng., geo.

Collective flow of protons and pions was studied at the momenta of 4.2, 4.5 and 10 AGeV/c for different projectile-target combinations, specifically, p(C, Ta) and He(Li, C). The data were obtained from the SKM-200-GIBS streamer chamber and from Propane Bubble Chamber systems utilized at JINR (PBC-500). The method of Danielewicz and Odyniec has been employed in determining the directed transverse flow of particles. The collective effects are studied with respect to the reaction plane, which is defined by the impact parameter vector and the beam direction. The values of the transverse flow parameter $F = d < P_x > d(y)$ and the strength a_2 of the anisotropic emission were defined for each interacting nuclear pair. The directed flow of protons and pions changes with increase of the energy and the mass numbers of colliding nucleus pairs. The elliptic proton flow points out of the reaction plane and also strengthens as system mass increases. The pion flow is in the reaction plane, as the proton one for the lighter (pC, He(Li, C)) systems, and in the opposite direction for the heavier (pTa) system. The pC system is the lightest studied one, and the pTa is extremely asymmetrical system in which collective flow effects (directed and elliptic) have ever been detected (for protons and pions). The information about them in interactions of light and medium projectile nuclei with various target nuclei is very limited and the results obtained in this paper will bring a new light on the nature of the flows. The obtained results provide very important information on the mechanism of nucleus-nucleus interactions at high energies, as well as on characteristics of the produced nuclear matter. Fig. 4, Tab. 2., Ref. 18.

<div align="right">Auth.</div>

b16.1.3.14. Study of DNA structures for the free energy model $F = \sqrt{Ak^2 + B}$. /M.Yavari/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v.9. – #1. – pp. 65-71. – eng.; abs: eng., geo.

In this paper, we are going to generalize the results of the Feoli's formalism for DNA structures. This formalism is formulated for the free energy F = F(k), which depends on the curvature k. Firstly, the general equilibrium shape equations are presented. The exact solutions of these equations for the free energy model $F = \sqrt{Ak^2 + B}$ are investigated in Feoli's formalism. Ref. b16.

<div align="right">Auth.</div>

b16.1.3.15. Effective potentials in the reduced Alt-grassbergersandhas-Khelashvili (AGSK) equations and the multi-channel problem. /A. Khelashvili,T. Nadareishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v.9. – #1. – pp. 72-77. – eng.; abs: eng., geo.

There is such a formulation of integral equations for 3-body problem when scattering operators obey 3-dimensional equations (instead of 6-dimensional), and effective potentials are to be found from the Faddeev-like equations. In this formulation various approximate methods are developed, which have many advantages for studying the relevant problems. This approach is dominant for the last 50 years. The main problem consists in choosing the separable part of 2-body amplitudes in the kernels of 3-body equations. In the article we use the spectral representations for Green functions and show that all positive technical properties of AGSK equations remain and at the same time effective potentials should be simplified. We considered the effective potential in reduced 3-body problem. Potentials do not contain 2-particle bound state singularities in the 3-body space. Hence, wave functions have the same phases as scattering amplitudes. It follows that after performing angular decomposition in the final equations, 2-particle phases cancel each other and the effective potentials become real functions of arguments. Non-triviality of the obtained result consists in the following: the kernels of the equation for effective potentials do not depend on energy parameter, moreover one of the momenta rests on the energy-shell. Therefore, from 3-particle problem we need only 2-particle bound state wave functions and semi energy-shell amplitudes. This fact is somehow unexpected and may become an important thing for further advance in many particle dynamics. Ref. 5.

<div align="right">Auth.</div>

b16.1.3.16. Equilibria of point charges in convex domains. /G. Giorgadze, G. Khimshiashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 19–26. – eng.; abs: eng., geo.

We discuss equilibrium configurations of Coulomb potential of point charges in convex domains of the plane and three-dimensional Euclidean space. For a triple of points, we give an analytic criterion of the existence of point charges for which the given triple is an equilibrium configuration. Using this criterion, rather comprehensive results are obtained for three charges in the circle and ellipse. Several related problems and possible generalizations are also indicated. Ref. 9.

<div align="right">Auth.</div>

b16.1.3.17. One general approach to the investigation of different nature complex nonequilibrium processes. /G. Gabrichidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 39-44. – eng.; abs: eng., geo.

Any processes can be mechanical, physical, chemical, biological, psychological, spiritual, social. All of them are forms of movement. They are interrelated. The more simple ones enter the more complex and can form qualitatively new form of the processes. The processes can be complex, nonlinear, nonequilibrium but stable. Stability can be considered as a definite qualitative threshold at stepping over of which the process becomes uncontrolled, unpredictable. We suggest a general approach to the study of complex processes formulated in terms of mechanics for the first time. For characterization of the process we use the notion of the momentum vector applied to the center of the mass of the system of points. To expand the field of application of the relations obtained beyond the frameworks of mechanics we suggest to give new meaning to the notions and symbols applied. For example, the mass is defined as inertness to change any property, and the center of mass as the center of inertness of the system of points to the change of

properties. The mystic idea of vector multiplication is emphasized indicating the determining role of the choice of the solution for development of the process and difficulty of such choice in unstable process. Fig. 4, Ref. 2.

Auth.

b16.1.3.18. Equilibria of point charges on nested circles. /G. Giorgadze, G. Khimshiashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 43-49. – eng.; abs: eng., geo.
We discuss a natural problem concerned with equilibrium configurations of Coulomb potential of three positive point charges constrained to a system of nested circles in the plane. After describing our approach in general setting, several concrete problems of such type are studied in detail. First, we consider a system of three concentric circles each of which contains exactly one charge, and give a complete description of configurations, which can serve as equilibria of three positive charges. Next, we give explicit formulae for the sought charges and obtain a geometric characterization of those configurations, which can serve as stable equilibria of three positive charges. Moreover, we obtain similar results in the case of three nested circles, which are not necessarily concentric and describe the topology of the set of equilibrium configurations. Several related problems and conjectures are also presented. Ref. 10.

Auth.

b16.1.3.19. Approximate solution of anti-plane problem of elasticity theory for composite bodies weakened by cracks by integral equation method. /A. Papukashvili, T. Davitashvili, Z. Vashakidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 50-57. – eng.; abs: eng., geo.
In the present article an anti-plane problem of the elasticity theory for a composite (piece-wise homogeneous) orthotropic body weakened by cracks intersecting the interface or reaching it in a right angle is studied. The studied problem is reduced to the singular integral equation (when crack reaches the interface) and system (pair) of singular integral equations (when crack intersects the interface) containing an immovable singularity with respect to the unknown characteristic function of the crack disclosure. Behavior of solutions in the neighbourhood of the crack endpoints is studied by the method of discrete singularity with uniform division of an interval by knots. In both cases (crack intersects or reaches the interface) the question of behavior of approximate solutions are investigated. The corresponding algorithms are composed and realized. The results of numerical investigations are presented. Tab. 2, Ref. 13.

Auth.

b16.1.3.20. On the existence of additional (hydrino) states in the dirac equation. /A. Khelashvili, T. Nadareishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 58-63. – eng.; abs: eng., geo.
In case of spinless particles there appear additional (singular) solutions in the framework of relativistic Klein-Gordon equation for Coulomb potential. These solutions obey to all requirements of quantum mechanical general principles. Observation of such states ("hydrino, small hydrogen") should be important for manifestation of various physical phenomena. In this article the same problem is considered for spin-1/2 particle (electron) in the Dirac equation. It is shown that such kind of solutions really occurs, but the rate of singularity is more higher than in spinless case. By this reason we have no time- independence of total probability (norm). Moreover the orthogonality property is also failed, while the total probability is finite in the certain area of the model-parameters. Therefore, we are inclined to conclude that this additional solution in the Dirac equation must be ignored and restrict ourselves only by normal (standard) solutions. Ref. b16.

Auth.

b16.1.3.21. Behaviour of superfluid ^{3}He polar and ABM phases in presence of globally stretched aerogel. /G. Baramidze, G. Kharadze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 64-68. – eng.; abs: eng., geo.
The superfluid ^{3}He phases in the presence of uniaxially deformed aerogel are under an active investigation. The most valuable information on the properties of superfluid phases of ^{3}He is contained in the time-averaged and rapidly time-oscillating contributions to the dipole-dipole potential. In globally stretched aerogel the behavior of the Polar and ABMU(1)LIM models of superfluid ^{3}He are compared. In the time-averaged approximation these states look similar and apparently cannot be easily discriminated in the experiments exploring the pulsed NMR spin dynamics. On the other hand, our theoretical analysis of the spectrum of high-frequency spin oscillations superimposed on the time-averaged spin dynamics shows the pronounced difference between the behavior of the Polar and ABMU(1)LIM states. Ref. 4.

Auth.

b16.1.3.22. Helical solutions of the free energy model $F=Ak^2+B\tau^2$. /M. Yavari/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 69-78. – eng.; abs: eng., geo.
In this paper, we are going to use a geometrical approach for studying the biopolymer structures. The exact solutions of the general equilibrium shape equations for the free energy model $F=Ak^2+B\tau^2$ (k and τ are the principal curvatures and A, B ϵ Z) are investigated by using the Feoli's formalism [A. Feoli et al., Nucl. Phys. B 705 (2005) 577]. Using the properties of the principal curvatures, we show that the particular solutions of this model can be matched with the family of protein structures. Fig. 4, Ref. 32.

Auth.

b16.1.3.23. Effective technology for high temperature superconductors oxygenation. /G. Dgebuadze, B. Bendeliani, I. Metskhvarishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 79-82. – eng.; abs: eng., geo.
Good oxygenation of superconductors is a necessary condition in order to achieve a pure high-temperature phase in them. The synthesis under the oxygen pressure can provide homogeneity of multiphase precursor and avoid the carbon wastes in it that is so important for attaining a Hg-based pure high-temperature phase. Oxidation process requires regular delivery of oxygen to the samples of superconductors within a certain temperature range (400-1300K). The

temperature is controlled according to the selected algorithm. Present article is dedicated to the effective technology of oxygenation of high-temperature superconductor materials (HTS). Some original solutions for construction of the mobile system of HTS oxygenation OS-1000DMB, the functions of its elements and the technological processes are considered in detail and the results obtained are provided. Fig. 3, Ref. 13.

Auth.

b16.1.3.24. Determination of the temperature of magnetic phase transitions of systems $Y_{1-t}Gd_t(Co_{1-x}Al_x)_2$. /Z. Gamishidze/. GEN. – 2015. – #4. – pp. 87-89. – eng.; abs.: rus.
The paper deals with the effect of the f - d exchange interaction on the ground state of zonal magnetics $Y(Co_{1-x}Al_x)_2$ and $Lu(Co_{1-x}Al_x)_2$ and the determination of the temperature of their magnetic phase transitions. The investigation showed that, at low temperature, the magnetic properties of the systems under study depended on the content of aluminum. Specifically, it was determined that the temperature of magnetic phase transitions increased with the increasing content of gadolinium. At the same time, the higher was the content of aluminum, the faster increased the temperature. At high concentrations of aluminum (x=0.07, 0.085 and 0.105), transitions from a weak ferrimagnetic state to a paramagnetic one took place at low concentrations of gadolinium t, while, at high concentrations of gadolinium t, there occurred transitions from a strong ferrimagnetic state to a paramagnetic one. At low concentrations of aluminum (x=0.00 and x=0.05), transitions to the spin glass state took place as the temperature decreased, while, with the increasing concentration of gadolinium, transitions to the strong ferrimagnetic state occurred. Fig. 1 Ref. 7.

Auth.

b16.1.3.25. On similar problems for a non-newtonian conducting fluid with consideration for heat transfer. /M. Kekenadze, Z. Tsitskishvili/. GEN. – 2015. – #4. – pp. 19-22. – geo.; abs.: eng.
The paper deals with the movement of a nonconducting plate in the power-law non-Newtonian fluid in the absence of an electrical field. Similar solutions for the given problem with consideration for the heat transfer and blowing in the plate were found. Fig. 1, Ref. 8.

Auth.

b16.1.3.26. Unsteady simultaneous rotation problem of the infinite porous plate and surrounding fluid with account of magnetic field and heat transfer in case of variable electric conductivity and injection velocity. /L. Jikidze, V. Tsutskiridze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 195-202. – eng.; abs.: eng., geo., rus.
By using the method of successive approximation there has been studied the unsteady simultaneous rotation problem of the infinite porous plate and surrounding conducting fluid with account of magnetic field and heat transfer with variable electric conductivity $\sigma = \sigma_0\left(1-\dfrac{T}{T_\infty}\right)$ and injection velocity $\upsilon_w = \upsilon_0\left(1-\dfrac{T}{T_\infty}\right)$. For determination the thickness of the dynamic and thermal boundary layers, there are obtained differential equations and written their exact solutions for the particular cases when the injection velocity varies according to different laws and between the thicknesses of a functional dependence of the form $\delta_T(t) = \gamma\delta(t)$. Calculated are all the physical characteristics of the flow. Ref. 4.

Auth.

b16.1.3.27. Non-Newtonian weakly conductive liquid flow at the boundary layer by heat transfer. /J. Sharikadze, Z. Tsitskishvili, M. Kekenadze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 203-209. – geo.; abs.: geo., eng., rus.
The article considers some special cases of determining the thickness of the dynamic boundary layer when the convection is non-free and is caused by the displacement of a plane vertical infinite plate in weakly conductive viscous ordinal liquid. Proceeding from the condition of continuous transition into each other of dynamic and boundary layer the formulas for estimating the movement of heat flow and friction force in the plate are obtained, for different values of liquid leakage speed in immeasurable values. Ref. 5.

Auth.

b16.1.3.28. The radiation annealing of the defects of growth in n-Si crystals obtained by the zone melting. /T. Paghava, M. Beridze, D. Khocholava, N. Esiava/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 210-2b16. – rus.; abs.: rus., geo., eng.
The **n**-type silicon crystals of electrons with concentration of $5 \cdot 10^{13}$ sm^{-3} obtained by the zone melting with concentration of $5 \cdot 10^{13}$ sm^{-3} have been investigated. The crystals of the sizes 1x3x10 mm of rectangular parallelepiped form have been irradiated by the protons with the energy of 25 MGW at room temperature. Growth of electron concentration by the protons of crystals during the irradiation within the interval of $1,8 \cdot 10^{11}$–$9 \cdot 10^{11}$ sm^{-2} is connected with the radiation annealing of crystal growth defects and liberation of phosphorus atoms blocked inside the defects. During irradiation of crystals by great dozes ($\Phi > 9 \cdot 10$ sm^{-2}) the concentration of the secondary radiation defects of acceptor type exceeds the concentration of growth defects and relatively that of phosphorus atoms released during their annealing. As a consequence the concentration of electrons during the growth of radiation doze is decreased. Decrease of Hall mobility of electrons during increase of radiation doze within the interval of $1,8 \cdot 10^{11}$–9.10^{11} sm^{-2} is connected with creation of di-vacancies during the radiation annealing of crystal growth defects. The free vacancies create the non-transparent shell for negatively charged electrons around the "metal" inserts formed during radiation by the protons. As a result, in crystals are originated the dielectric inserts causing the decrease of electron mobility. Concentration of dielectric inserts are limited by concentration of growth defects, which equals nearly to $N_{def} \approx 10^{13}$ sm^{-3}, and the concentration of "metal" inserts $N_{met.}$ is increased directly depending on the radiation doze. The μ_{eff} is the growth function of $N_{met} - N_{def}$ difference. Fig. 3, Ref. 8.

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b16.1.3.29. Investigations of some γ-transition of ice spectrum of ^{151}Eu. /M. Metskhvarishvili, T. Razmadze, I. Kalandadze, M. Beridze, N. Jokhadze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 217-223. – geo.; abs.: geo., eng., rus.

Investigation of the internal conversion process of the radio-active nuclei γ-rays is the one of the effective method for determination of the multipole of the γ-transition and quantum characteristics of the fundamental and excited levels. Studying of the internal conversion electron (ICE) spectrum gives important information about decay schemes of radio-active nuclei. Scientifically there is interesting comparison of the high precision (1-2%) measured relative and absolute internal conversion coefficients (ICC) to their theoretical significants. Such measurements gives possibility from one side to verify the precision of theoretical ICC and on the another hand determine amount of admixture in the case of mixed γ-transition. On the double focusing magnetic sector type beta-spectrometer there was investigated ICE spectrum of two gamma-transitions in ^{151}Eu. It was determined $M1 + (14 \pm 1)\% E2$ multipolar compounds of 153.6 kev Gamma-transition. It was observed unknown gamma-transition with 153.3 keV energy between the 349.8 and 196.5 keV energy states. It is shown that this is mixed type $M2 + (5 \pm 0.8)\% E3$ transition. It is determined that spin of 196.5 kev energy state is 5/2$^+$. Fig. 3, Ref. 10.

Auth.

b16.1.3.30. Effect of water vapor temperature and pressure on surface quality of the cutting, during water vapor plasma cutting. /Z. Sabashvili, T. Loladze, N. Kenchiashvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 182-188. – rus.; abs.: rus., geo., eng.

The quality of the cutting surface is an important indicator of the effectiveness of plasma cutting. Many of the defining characteristics of the cutting quality are: cutting width, the deviation from perpendicularity of the cutting surface and the sizes of burr. Investigations have shown that these parameters influence temperature and water vapor pressure at the inlet of the plasmotron. With high temperature and pressure the cutting width and the deviation from perpendicularity are decreased. The value of the burr size is minimal and does not exceed permissible minimum size. Fig. 5, Ref. 6.

Auth.

b16.1.3.31. Analysis of real thermodynamic cycle of thermal powered membrane pump. /I. Shekriladze, M. Meparishvili, E. Machavariani, G. Gigineishvili/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 52-60. – geo.; abs.: geo., eng., rus.

The article analyzes the real thermodynamic cycle of thermal powered membrane pump. The design equation for defining the pump efficiency is received. A numerical model of the cycle is developed allowing determining parameters of the cycle for different initial conditions. The results of modeling are given. Fig. 4, Ref. 7.

Auth.

b16.1.3.32. Creation of an experimental model of thermal powered membrane pump and investigation of thermo-hydrodynamic processes. /I. Shekriladze, M. Meparishvili, E. Machavariani, G. Gigineishvili, J. Rusishvili, D. Shekriladze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 61-69. – geo.; abs.: geo., eng., rus.

An experimental model of the new modification of thermal powered membrane pump was designed. The amplitudes of the heating surface temperature pulsation and liquid piston replacement and correlation between them are investigated. The interrelation between efficiency and useful head is also studied. The ways of further sophistication of the pump are outlined. Fig. 5, Ref. 8.

Auth.

b1.4 Chemical sciences

b16.1.4.1. Modeling of the process of obtaining technical silicon using locally manufactured raw materials. /J. Mosia, G. Nikolaishvili, M. Chumbadze, A. Julukhidze/. Science and Technologies. – 2015. – #1(718). – pp. 18-22. – geo.; abs.: geo., eng., rus.

The results of study of physico-chemical bases of quartz carbothermic reduction using deposits of raw materials in Georgia are given. Laboratory research of quartz included such parameters as density, water absorption, electrophysical properties and warm-up behavior. Also given are the results of thermodynamic modeling of silicon carbothermic obtaining. Fig. 2, Ref. 6.

Auth.

b16.1.4.2. Investigation of low-grade copper ores of the Madneuli deposit on ore-dressing. /D. Talakhadze, M. Gamtsemlidze, D. Tevzadze, M. Tutberidze, N. Ghughunishvili/. Science and Technologies. – 2015. – #1(718). – pp. 23-26. – geo.; abs.: geo., eng., rus.

The possibility of re-concentration of low-grade copper ore of the Madneuli deposit, which is based on the results of the heavy liquid separation of ores (fractional analysis), is discussed. On the basis of the conducted experiments, it is established that as a result of processing, the initial ore (coarse fraction) of density 2.75 g/cm3 in a heavy suspension a light fraction - tails (having a copper content of not more than 0.1 %) and a heavy fraction with a copper content over 50%, than in the concentrating material are obtained. Tab. 2, Ref. 3.

Auth.

b16.1.4.3. The influence of the main factors having an effect on the process of fine crushing in crushing device for refractory manganese ore and coal. /G. Javakhishvili, M. Gamtsemlidze, Z. Arabidze, T. Rukhadze, M. Tutberidze, N. Samkharadze/. Science and Technologies. – 2015. – #1(718). – pp. 27-37. – geo.; abs.: geo., eng., rus.

The principle of simultaneous work of the original crushing devices required for crushing fragments of refractory manganese ore and coal to the smallest sizes, hood and cyclone are discussed. The originality of crushing is that the crushing of fragments to the smallest size is carried out in the crusher by a spirally arranged toothed disk (cutting principle), while the flow of air created by rotation of the disc, wears out the fragments at the inner wall of the crusher (grinding principle). As a result of research for these materials, it is established that minerals in fragments are fastened within the sizes of 3 ¼ 1 mm. In case of crushing within these sizes, obtaining of the maximum output of 3 ¼ 1 mm class fraction in the crashed product would be more efficient if it is further processed by the gravitation method. The paper, based on the experimental data, gives the dependences between the main factors involved in the process of crushing (controlling variables: the number of disk rotations, rpm; productivity, g; diameter of crusher outlet, mm) and output (%) of 3 ¼ 1 mm class fraction by correlation analysis. Also, by the method of dispersive analysis the advantage of the impact of the major factors in the value of the fraction of the desired class output is demonstrated. Tab. 4, Fig. 7, Ref. 4.

Auth.

b16.1.4.4. Bis(2,4-bis(trichloromethyl)-1,3,5-triazapentadienato)-M(II) (M = Cu and Ni) complexes as a useful synthons for the construction of supramolecular architectures. /N. Shixaliyev/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 191-197. – eng.; abs.: eng., geo., rus.

1,3,5-triazapentadienato complexes [M{NH=C(CCl₃) NC (CCl₃)=NH}₂].(Solvent)₂ [M=Cu, solvent = (CH₃)₂NCHO (**1**); M = Ni, solvent = (CH₃)₂NCHO (**2**); M = Ni, solvent = (CH₃)₂SO (**3**); M = Ni, no solvent (**4**)] were prepared by reaction of CCl₃CN with ammonia in the presence of CuCl₂ or Ni(CH₃COO)₂. The complexes were characterized by ESI-MS, IR spectroscopy, elemental and single-crystal X-ray diffraction analyses. Their molecules are interconnected by means of N–H⋯O hydrogen and N⋯Cl or Cl⋯Cl halogen bonds between the solvent molecules and the NH of **1**–**3**, and –CCl₃ groups of **1**–**4**. The non-covalent bonding motifs are identical in all the four inclusion compounds showing the robustness and directionality of this perspective synthon for crystal design and supramolecular chemistry. Accordingly, the overall arrangements in **1**–**4** are related; the mutual orientation of the host molecules provides identical helical catemers by means of strong N–H⋯O and N⋯Cl or Cl⋯Cl intermolecular hydrogen and halogen bonds. Tab. 2, Fig. 2, Ref. 35.

Auth.

b16.1.4.5. Quantitative estimation of volatile N-Nitrosamines in tobacco smoke using validated GC-MS Method and its uncertainty evaluation, illustrated by determination of N-Nitrosomethylethylamine. /I. Rubashvili, V. Tsitsishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 85-92. – eng.; abs: eng., geo.

The present work describes an efficient, sensitive and rapid GC-MS method for quantitative estimation of nine volatile N-nitrosamines diluted in methanol as a sample solution, which can be used to determine the above-mentioned compounds in tobacco smoke or in sample solutions obtained from solid/liquid material using extraction. The concentration of sample solution should not be less than 0.5 µg mL- 1 (Limit of quantitation of this method) for each N-nitrosamine. The uncertainty of this method is estimated based on validation data, which is illustrated by determination of N-nitrosomethylethylamine in tobacco smoke of the commercial best-selling local cigarette brand. The uncertainty value was used as the acceptance criteria for evaluation of the method precision. The determined quantity of N nitrosomethylethylamine varying from 108 to 124ng per cigarette is very high, which can be caused by high nitrate and tar content in local tobacco. Fig.1, Tab. 3, Ref. b16.

Auth.

b16.1.4.6. The kinetics of tri-isobutylarsenite transesterification in presence of decane. /G. Bezarashvili, K. Sulaberidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v.9. – #1. – pp. 93-96. – eng.; abs: eng., geo.

Choosing the direction of a kinetic experiment, the reaction between tri-isobutylarsenite and ethylene glycol has been studied under nonisothermal conditions. The reaction mixture contained ethylene glycol in excess and decane was used as a diluent. The observation of process development was accomplished by volumetric method, distilling the by-product (isobutyl alcohol). The values of reaction rate were determined by means of graphical differentiation of kinetic curve. Statistical analysis of experimental results has shown that the most likely value for the activation energy of reaction under mentioned conditions is 10800 J•mol⁻¹. The kinetic equation used describes the experimental results with satisfactory precision on the initial stages of reaction when, essentially, a partial transesterification of arsenite by dialcohol takes place. Fig. 4, Ref. 13.

Auth.

b16.1.4.7. The quantum-chemical modeling of synthesis of some phenylgycidates. /A. Chikovani, Z. Pachulia, M. Merlan, V. Barbakadze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v.9. – #1. – pp. 97-101. – eng.; abs: eng., geo.

In the present paper we present geometrical and electronic characters of the intermediate products of the synthesis reaction of some phenylgycidates, such as heat of formation (ΔHf), the ionization potential (I), the dipole momentum (μ), the net atomic charge (qi) and the bond order (Pij), using quantumchemical non-empirical density functional theory (DFT) and quantum-chemical semi-empirical AM1 methods. Epoxides are regarded as important synthons due to their versatile functionalities into the fine organic synthesis. For the production of safe drugs it is required such objects to be prepared from the particular enantiomers. Epoxides synthesis can be realized by the Darzen's reaction mechanism – the interaction of Ketones or Aldehydes with the α-halogen esters yielding the α, β-epoxy esters. The 3,4- dibenzyloxyphenyl and tert-butyl-2-chloracetate were chosen as an initial materials for tert-butyl-3-(3,4- dibenzyloxyphenyl)-oxirane-2-carboxylate synthesis. We calculated geometrical, energetic and electronic characteristics of the starting, intermediate and final states of the tert-butyl-3-(3,4-dibenzyloxyphenyl)- oxirane-2-carboxylate synthesis reaction using the density functional theory (DFT). Interaction of the 3,4-dimethoxybenzaldehyde and the methyl-2-chloracetate is one of the

possibilities of the methyl-(3,4- dimethoxyphenyl)-oxirane-2-carboxylate synthesis. Geometrical, energetic and electronic characteristics of the starting, intermediate and the final states of methyl 3-(3,4- dimethoxyphenyl)-oxirane-2-carboxylate were calculated using the semi-empirical quantum-chemical (AM1) method. The quantum-chemical calculations revealed that tert-butyl-3-(3,4-dibenzyloxyphenyl)-oxirane-2-carboxylate synthesis reaction is exothermic while the 3-(3,4-dimethoxyphenyl)-oxirane-2-carboxylate synthesis reaction is endothermic. The activation energy is high in both cases. However, in convenient environment (temperature, pressure, pH) tert-butyl-3-(3,4-dibenzyloxyphenyl)-oxirane-2-carboxylate and 3-(3,4-dimethoxyphenyl)-oxirane-2- carboxylate synthesis reaction can be realized according to the considered scheme. Fig. 7, Ref. 4.

Auth.

b16.1.4.8. Thermogravimetric study of triphenylmethylarsonium tetrabromo-copper (II). /M. Kikalishvili/. GEN. – 2015. – #3.– pp. 80-82. – rus.; abs: eng.
The process of decomposition of arsenic-containing compound $[(C_6H_5)_3AsCH_3]_2[CuBr_4]$ was studied by the-rmogravimetric analysis. It was revealed that first an organic part separated. The final product of the thermolysis was copper bromide. Fig. 1, Ref. 6.

Auth.

b16.1.4.9. Determination of the occurring forms of chemical elements in aqueous solutions. /I. Berdzenishvili, K. Kamkamidze, D. Kiknadze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 47-51. – rus.; abs.: geo., eng., rus.
The paper is devoted to the numerical modeling of the behavior of elements in aqueous solutions. The algorithms for solving this problem are presented. It is shown, that in aqueous solutions as a result of hydrolysis reactions pH values have been changed. The occurring forms of aluminum in different environments are calculated. The dominant forms of calcium depending on pH values of solution are revealed. Tab. 1, Fig. 2, Ref. 13.

Auth.

b1.5 Earth and related environmental sciences

b16.1.5.1. Fresh data on of the late variscan garnet-bearing granites of the khrami crystalline massif. /G. Beridze/. Science and Technologies. – 2015. – #1(718). – pp. 43-49. – geo.; abs.: geo., eng., rus.
Garnet-bearing granites outcrop over the area of ≈1-1.5 km^2. Garnet content amounts 5-10% of the granite. The garnet is spread in the form of tetragon-trioctahedral crystals. Their size ranges within the limits of 2–10 mm. Microprobe analysis of garnet crystals revealed its zonal character: from the core to the periphery Mg content decreases and Mn content increases, respectively decreases amount of pyrope (magnesium-alumium garnet) and increases number of spessartine minal. The garnet core formed at the magmatic stage in the paragenesis Bt+Pl+Ort+Grt+Qrt and its periphery at the postmagmatic stage of granitic magma cooling in the paragenesis Ab+Mikr+Grt+Qrt±Ms. Change of garnet composition during the process of crystallization was conditioned by temperature decrease and not by the assimilation events, as previously was believed. Tab. 4, Fig. 5, Ref. 8.

Auth.

b16.1.5.2. Bioenforcement methods of the Black Sea shelf coastal water slopes. /T. Tevzadze, G. Omsarashvili/. Science and Technologies. – 2015. – #1(718). – pp. 50-58. – geo.; abs.: geo., eng., rus.
The methods of protection against negative effects of erosive and abrasive-erosive processes are presented. The methods of protection against erosive occurrences on the surface of the earth have been used by a human being since ancient times. A lot of tools of protective tools have been elaborated. For example, planting trees and bushes and plant rows as a windbreak to protect against wind erosion; planting perennial trees on erosive slopes; aerial inspection of gorges with high slopes, etc. The method of protecting ground from erosion has been recently elaborated in Water Management Institute – Geokhalicha (Geocarpet) "NESGEO". All the above mentioned methods, excluding aerial inspection, present a biophytogenic protective tool. Not only the territories of land relief and natural-technogenic objects, but also the slopes of the bottom of water territory of the shelf undergo erosion. Abrasive-erosive processes exert especially great damage on coastal stripe of shelf slopes. In the bottom part of the water territory of shelf slopes the stone-gravel sediments are moved by the falling of stormy waves and the south-north flow existing along coastal stripe. It is accompanied by migration of bottom (fine sandy, sandy, argillous, gravel-stony) grounds towards great depths of continental slopes following by removal of important areas from urban territories. Protection against negative abrasive-erosive occurrences and harmonization of negative engineering-geological processes taking place in a shelf slope is possible by means of carrying out biozoogenic or biozoogenic-phytogenic measures together with other traditional methods. It can be carried out by artificial reproduction of coral polyps, which form cays and create lagunes. A cay-forming process is one of the most successful measures to protect abrasive-erosive occurrences. Cay-forming corral vivifying ability and reproduction is related to a lot of factors of environmental conditions and it should be studied in details. Fig. 4, Ref. 3.

Auth.

b16.1.5.3. Noosphere, processes of noogenesis and aspects of its harmonization. /T. Tevzadze, G. Omsarashvili/. Science and Technologies. – 2015. – #1(718). – pp. 59-65. – geo.; abs.: geo., eng., rus.
The opinions of French scientists P. Teiar De Charden, E. Lerua and Academician V. Vernadsky of the 20s-40s of the last century are presented. According to these opinions, the impact of a human being on natural environment is becoming stronger and stronger. This opinion says that noosphere should be presented not as a simple society which exists in the certain environment - a simple environment which has been impacted greatly by mankind, but as a totally integrated one, in which developed society and variable environment are united. The term "Noogenesis" was first applied by us in 1999, in the Collection of Anniversary Works of the Institute of Water Management and Engineering Ecology

dedicated to the 70th anniversary of foundation of the institute and in the same year, in the collection of works "International Theoretical Problems of Engineering Geology", Moscow. The processes of noogenesis taking place in the noosphere are discussed as the processes initiated in relation with creation of natural technogeneous complexes and the rocks generated due to the mentioned processes (noogenesis rocks, new noogenesis horizon of underground waters generated, as a result of flooding the territory by a water reservoir, relief forms created by slope processes related to construction of technogeneous structures for various uses, etc.). The impact of society on natural environment, especially the one initiating geological processes, presents hydromelioration and hydroenergetic technogeneous complexes. Such natural-technogeneous complexes (NTC) stipulate the formation of processes of noogenesis. Rocks of noogenesis origin different from natural environment, relied forms, hydrogeological conditions, mciroclimate, seismic conditions, etc, which are created by influence of a human being's powerful mind. Harmonization of processes of noogenesis and safety of natural-technogenous processes are based on their high professional designing, high quality construction and strict application of the terms of operation. Ref. 6.

<div align="right">Auth.</div>

b16.1.5.4. Dynamics of lead accumulation in woody plants. /N. Kiladze/. Novation. – 2015. #b16. – pp. 42-45. – geo.; abs.: geo., rus., eng.
Dynamics of heavy metal accumulation have been studied in poplar trees and in the needles of pines. The research takes place seasonally . Large amount of lead accumulates in the needle of pines during June and august. More lead accumulates in the pine trees then in polar trees. The more is the lead in the plants the lesser is the sprout length. Pine's as the active absorber of lead can be used as the indicator of environmental pollution. Tab. 1, Ref. 11.

<div align="right">Auth.</div>

b16.1.5.5. Analysis of toxic metals content in vegetables cultivated on adjoining to highway land. /N. Gachechiladze/. Mining Journal. – 2015. – #1(34). – pp. 91-93. – geo.; abs.; geo., rus., eng.
The present article considers the ecologic - chemical condition of vegetable cultivated adjacent to highway land and remote from auto roads land from the point of view of heavy toxics metals content. The critical analysis is made on the oasis of study of Georgian reality actual material and regularities of toxic metals distribution are reviewed as well. Tab. 3, Ref. 4.

<div align="right">Auth.</div>

b16.1.5.6. The results of the monitoring of the ecological state of natural environments of a number of mining regions of Georgia. /Z. Svanidze, G. Gunia, L. Svanidze/. Mining Journal. – 2015. – #1(34). – pp. 96- 100. – geo.; abs.; geo., rus., eng.
The paper presents the results of studies the distribution of metallic impurities in natural environments, in areas of intensive anthropogenic impact in Georgia. Shows that the studied environment significantly contaminated by impurities, the main sources of which are mining enterprises in these areas. For purification of harmful impurity, at a certain stage of technology development, the most effective are modified and activated natural sorbents in which Georgia is rich enough. The work will be of interest to readers, employed theoretical and practical issues of ecology in mining industry. Tab. 2, Ref. 3.

<div align="right">Auth.</div>

b16.1.5.7. Near Tbilisi region fractured systems of the upper cretaceous sediments. /M. Sharikadze, R. Paatashvili, Z. Suramelashvili, A. Adamyan/. – Mining Journal. – 2015. – #2(35). – pp. 4-9. – geo; abs: geo., rus., eng.
The aim of the named work is to create an understanding of the fractures of the Upper Cretaceous rocks in order to create probable model for the fractured systems generated in them. We have studied the surface outcrops of the Adjara-Trialeti folded area and Artvin-Bolnisi belt with the purpose of creating a possible model of the fracture systems developed in the named area. The micro-fractures of the volcanic-sedimentary and carbonaceous layers of the Upper Cretaceous were observed through the field studies concentrating on their frequency, distribution, penetration, morphology, connection of the main fracture parameters with the lithology of the rocks, structure (grain size), layer thickness, diastrophism properties and quality. Microscopic analysis of the series of cuttings from the Upper Cretaceous sediments of Manavi and West Rustavi (Manavi wells M11 and M12 and Kumisi well no.1) were also incorporated in the study. Conclusions were made in the final report on the pattern of fractures in the Upper Cretaceous formations of the near-Tbilisi area. Fig. 4, Ref. 6.

<div align="right">Auth.</div>

b16.1.5.8. The role of transverse lineaments in metalogeny of Georgia. /V. Nadiradze/.– Mining Journal. – 2015. – #2(35). – pp. 10-15. – geo; abs: geo., rus., eng.
The global scale promotion of the so called Schatski meridian on the territory of Georgia is expressed by a range of structures of this system. Long-term recurrent relocations have been recorded on them. It has been asserted that transverse, including meridian, structures play an important role in magmatic, hydrothermal and seismic processes. Dispersion of mineral deposits, including oil and gas, is determined by tectonic knots which are formed by transecting of Caucasian and transverse structures. The mechanism of originating of barite-polymetallic and copper-colchedan ores is discussed. Fig. 4, Ref. 8.

<div align="right">Auth.</div>

b16.1.5.9. Factors of productive barite mineralization of Okriba raise. /Sh. Gegia/. – Mining Journal. – 2015. – #2(35). – pp. 15-18. – geo; abs: geo., rus., eng.
In the article the geological structure and perspectives of Okriba barite bearing ore unit are considered covering Gvedi-Lachepita, Khvamli, Mekvena, Joneti, Kirov, Zubi, Tkhmori-Vatetra ore fields. The questions of detached within ore unit

rupturing failure and folded structures spatial orientation, their origin and development, connected with these structures productive barite mineralization localization are considered also. Tab. 1, Fig. 1, Ref. 4.

<div align="right">Auth.</div>

b16.1.5.10. The mining industry as a basis for energy development. /D. Chomakhidze, M. Basiladze, L. Bibilashvili/. – Mining Journal. – 2015. – #2(35). – pp. 19-22. – geo; abs: geo., rus., eng.
The article, based on the reality of Georgia, substantiates the role of mining industry in energy development. The levels and dynamics of energy extraction are defined. On option has been expressed to refer hydropower to mining industry. The suggestions for the promotion of the mining industry in energy development have been formed. From this point of view, it's spoken to increase production potential of coal, oil, natural gas, thermal waters, as well as economical and rational use of energy resources. Tab. 2, Ref. 4.

<div align="right">Auth.</div>

b16.1.5.11. Modeling of ozone content distribution in lower troposphere over the territory of Georgia using the data of satellite and ground observations. /S. Stankevich, O. Titarenko, A. Amiranashvili, Kh. Chargazia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 54-58. – eng.; abs: eng., geo.
The data of ozone content in the atmosphere are required for studying the climate change, ecological appraisals, etc. Frequently, the information of ozone content in troposphere above the large regions or continents is necessary. At present there are several satellite systems in the world for operational global checking the atmospheric parameters including ozone. Relatively low accuracy of satellite measurements can be considerably improved correcting them by using the data of ground-based measurements. Some results of modeling the average ozone content distribution in the 2.5- km layer of the atmosphere over the territory of Georgia according to the data of satellite and ground-based measurements in Tbilisi are given in the work. Fig. 2, Ref. 14.

<div align="right">Auth.</div>

b16.1.5.12. Temporal and spatial variations of scaling behavior of seismic process in Caucasus. /T. Chelidze, T. Matcharashvili, Z. Javakhishvili, N. Zhukova, N. Jorjiashvili, I. Shengelia, E. Mepharidze, Z. Chelidze, A. Sborshchikovi/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 59-64. – eng; abs: eng., geo.
In the present research we investigate variation of scaling features of earthquakes' temporal and spatial distribution in Caucasus from 1960 to 2014. Data sets of waiting times and interearthquakes distances were obtained from the original and declustered Caucasus catalogues. For the assessment of long-range time-correlations of used data sets the method of Detrended Fluctuation Analysis (DFA) was used. We analyzed dynamical features of seismicity in Caucasus by assessing scalin characteristics of earthquakes' time and space distribution for shorter time periods and calculated DFA slopes for different sliding windows. Exactly, calculations were carried out for sliding windows of 500 data length. DFA scaling exponents variations of waiting time sequences obtained from the original and declustered catalogues were assessed by different order of polynomial fitting. In addition to fixed length data sets, the scaling exponents were separately calculated for 5 years long sliding windows. The data of surrogate waiting times obtained by shuffling of original series were processed also by DFA method. It was found that scaling exponents calculated for different windows vary in a wide range indicating variable temporal behavior from anti-persistent to persistent type. Different DFA scaling regimes are observed. Close to 0.5 and antipersistent scaling exponents were obtained for the time periods when the strongest regional earthquakes occurred. In the present work, we studied dependence of scaling properties of waiting time series and distances between consecutive earthquakes in the catalogue of Caucasus in different released energy range. We tested our results for scaling exponents calculated for different length of sliding windows. Fig. 6, Ref. 15.

<div align="right">Auth.</div>

b16.1.5.13. New types of halogen-free, eco-safe fire extinguishing composite powders and evaluation of their efficiency. /L. Gurchumelia, Z. Khutsishvili, L. Nadareishvili, S. Tkemaladze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 65-70. – eng.; abs: eng., geo.
Elaboration of new types of halogen-free, eco-safe, inexpensive, highly effective fire-extinguishing composite powders and evaluation of their efficiency are discussed in the article. Such powders will be made by mechanical blending of local mineral raw materials, which do not require modification with expensive, halogen-containing hydrofobizative additives. The optimal dispersity were selected so, that caking capacity to be minimal and homogeneous action of combustion products on the flame as well as a heterogeneous inhibition of combustion process to take place. Powder efficiency was evaluated with consideration of both effects. The technology for the production of obtained fire-extinguishing powders differs from the serial production technology. Such powders, will be made by mechanical blending of local mineral raw materials: zeolites, perlites and clay shales, which does not require additional chemical processing and modification with expensive, halogen-containing hydrofobizative additives, what makes the extinguishing materials far cheaper than imported analogues. Received fire-extinguishing powders are characterized with high operating characteristics as well as high fire-extinguishing capacity and values of recombination coefficients of atomic oxygen. Thus, they are non-halogen, eco-safe, inexpensive, highly effective and universal. Tab. 2, Fig. 2, Ref. 6.

<div align="right">Auth.</div>

b16.1.5.14. Climate of Imereti in 2010 against a background of global warming. /D. Mikautadze, M. Kvabziridze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 92-95. – eng.; abs: eng., geo.
Research carried out over the last two decades revealed that since 1990s the response of the Kutaisi climate to global warming has a well manifested tendency to temperature rising. Deviation of mean temperature from the norm makes 0.7-1.2^0C. In 2010, when monthly deviation of temperature increased from 0.2^0C to 5.7^0C, it was the hottest weather since 1966. According to the data of WMO the mentioned year along with 2005 and 1998 years holds a position of the hottest year at a global scale. Such anomalous pattern was connected with the synoptic situation, when the heat wave

dominating in Europe and Russia, reached Georgia. The situation was aggravated by the strong foehnic circulation dominating in the gorge of river Rioni. Tab. 1, Fig. 1, Ref. 7.

<div align="right">Auth.</div>

b16.1.5.15. Pressure drop distribution at high power perturbation over the mountainous territory. /I. Samkharadze, Z. Khvedelidze, T. Davitashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 83-90. – eng.; abs: eng., geo.
Study of the spatial-temporal propagation of the air flow generated by the action of high-power phenomenon has great theoretical and practical value, especially for the mountainous territories because even the low hills slow down the velocity of flow motion and change its direction, sometimes even to the opposite direction. In the present paper the air flow generated by high-power pulse and its spatial-temporal propagation in the atmosphere above the uniform and non-uniform terrains are investigated. Some results of theoretical and numerical investigations are given. Received results can be useful in military and mining operations, especially in the process of open career works in populated places or near to them. Tab. 2, Fig. 2, Ref. 17.

<div align="right">Auth.</div>

b16.1.5.16. Determination of atmospheric aerosol optical depth over territory of Georgia during different regimes of cloudiness using the satellite and ground-based measurements data. /S. Stankevich, O. Titarenko, A. Amiranashvili, Kh. Chargazia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 91-95. – eng.; abs: eng., geo.
The aerosol optical depth (AOD) of the atmosphere is one of the important parameters, which is characteristic for general aerosol pollution of the atmosphere. The present work shows some results of modeling of AOD distribution over the territory of Georgia with different cloudiness according to the methodology of the combined analysis of satellite and ground-based measurements of AOD in Tbilisi proposed earlier. In particular, the AOD values are followed by the total cloud cover values. Above the territories which are characterized by increased cloudiness, the AOD is also increased. Despite the fact that strong aerosol pollution of the atmosphere is observed in Tbilisi, the value of AOD during increased cloudness is a bit less than in other cities (Kutaisi, Batumi). During the cloudless days the AOD decreases with the increase of the distance from the basic air pollution source - Tbilisi city. Fig. 3, Ref. 18.

<div align="right">Auth.</div>

b16.1.5.17. Determination of the reservoir eutrophication. /L. Ghogheliani, E. khatiashvili, Z. Askurava/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 6-9. – geo.; abs.: geo., eng., rus.
The article discusses the reservoir eutrophication processes and a mathematical model of their development. The nutrient inflow from the catchment area, caused by both the ongoing natural processes (precipitation, soil erosion, etc.) as well as a result of human activities is considered. The transformation of the nutrients concentration in the water reservoir is studied. Based on the values of the nutrients concentration, the degree of eutrophication is determined and forecasted. Ref. 3.

<div align="right">Auth.</div>

b16.1.5.18. Integral form of a hydraulic equation of a stratified-density flow, when the lower flow is the collapsed rock mass intruding into the water reservoir under the action of seismic forces. /L. Ghogheliani/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 10-18. – eng.; abs.: geo., eng., rus.
In the published fundamental works about hydrodynamic theory of mud streams, avalanches and landslides, the calculation of their characteristics, seismic forces have not been taken into consideration. That is why we additionally introduce the seismic force into the dynamic equation since the crumbling slope is potentially dangerous, because it may be set in motion under the action of a seismic shock of certain intensity and direction. Fig. 1, Ref. 5.

<div align="right">Auth.</div>

b16.1.5.19. Regularities of transit traffic flow in rivers. /L. Klimiashvili, D. Gubeladze, D. Gurgenidze, M. Natsvlishvili/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 25-30. – geo.; abs.: geo., eng., rus.
The issue of underground streaming movement in ground is discussed. The induced streaming dependence on streaming hydraulic opposition is revealed. The dependence of bed capacity integral characters is revealed to be calculated. Ref. 5.

<div align="right">Auth.</div>

b16.1.5.20. Characteristics of river-bed processes. /L. Klimiashvili, D.Gubeladze. I. Kruashvili, D. Gurgenidze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 31-35. – geo.; abs.: geo., eng., rus.
During the research of water erosive process, one of the most important issue is the learning of the hydrodynamic structure of streaming, at the bottom and the nearby layer, because it causes deformation of the bed, transformation of velocity field and the intensity of turbulent mixing. Tab. 1, Ref. 5.

<div align="right">Auth.</div>

b16.1.5.21. Improvement of water regulation technology on drainage soils by the drainage-modular systems with multigrade adjusting drains. /R. Tkachuk, N. Tkachuk, A. Rokochinsky/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 36-46. – rus.; abs.: geo., eng., rus.
An improved construction of drainage-modular systems with multigrade drains, with water regulation technology of drainage soils is considered. Dependences between the cumulative runoff from traditional drains (stacked on the same depth) and drainage modulus from multigrade connection of adjusting drains, also the method of calculation parameters of drainage-modular systems are obtained. Tab. 2, Fig. 4, Ref. 13.

<div align="right">Auth.</div>

b16.1.5.22. Determination of characteristics of wavelike debris flows in the debris flow channels. /E. Kukhalashvili, I. Inashvili, K. Bziava, I. Kruashvili, D. Lortkipanidze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 70-74. – geo.; abs.: geo., eng., rus.

The break-through of the dam in mountainous terrain leads to the formation of destructive waves with increasing erosive energy, which quickly is transformed into the debris flow. In this paper there is an attempt to solve the calculation problem of one direction's long waves in debris flow. Using the obtained calculation dependences are possible to determine of flows height take into account waves height and rheological parameters. Ref. 4.

<div align="right">Auth.</div>

b16.1.5.23. Regarding the formation of defects in the systems of water supply under mechanical impact. /L. Klimiashvili, M. Natsvlishvili/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 75-79. – geo.; abs.: geo., eng., rus.

The process of formation of point defects in metal pipes used in the systems of water-supply under mechanical impact is considered. A dislocation mechanism of the stability loss of metal elements is analyzed, the mobility of which in two intersecting planes of slip may lead to the formation of cracks. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.1.5.24. Determination of head loss of hydrotransport with the thickened pulp tails for ore dressing. /V. Aleksandrov, S. Avksentyev/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 9-15. – rus.; abs.: geo., eng., rus.

Analytical determination of head loss in hydrotransport thickened pulp is a task more difficult in comparison with a similar task for the mixtures with the mass concentration of particulate matter less than 30%. Over the past 25-30 years, along with the development of empirical methods of calculation, it had accumulated a substantial body of information on the actual pressure drop. This allowed the experts to summarize the known methods and to develop a universal calculation method to determine the main parameters of hydraulic transport of mixtures with a relatively low solids content in volume pumped mixtures. Tab. 1, Fig. 2, Ref. 2.

<div align="right">Auth.</div>

b16.1.5.25. Measures to recover of small rivers ecosystems in the Azerbaijan. /I. Agaev, B. Akhmedov, T. Zeynalov, A. Muslumov/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. b16-20. – rus.; abs.: geo., eng., rus.

The present article is dvoted to the existning ecological conditions of small rivers and near by territories; the reasons of deleterions effect on them are determined; measures taken for the restoration of ecological conditions are presented in the article. Ref. 3.

<div align="right">Auth.</div>

b16.1.5.26. Assessment and analysis of natural hazards in the riverbed of River Vere on 13-14 June 2015 and efficient measures of hazards control. /G. Gavardashvili, R. Diakonidze, G. Chakhaia, L. Tsulukidze, E. Kukhalashvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 30-44. – geo.; abs.: geo., eng., rus.

Reasons causing generation of natural hazards in the riverbed of the River Vere that took place on 13-14 June 2015 are reviewed, assessed and analyzed. In order to provide assessment of the hazard, field investigation data obtained on 14-20 June 2014 from the River Jokhoniskhevi are introduced. After processing and analyzing of the conducted field and scientific research, the main engineering and ecological measures for regulation of the catchment basin of the River Vere are outlined. Among the abovementioned measures, in order to efficiently protect the capital Tbilisi against mudflows, resources saving modern constructions for regulation hazards are reviewed and recommended. In order to efficiently protect the capital Tbilisi against hazards, for regulation of river bed of the River Vere, the necessity of laboratory modeling of debris flow control three-step lattice type barrage is justified for illustration. The Informative quality of the results obtained from there conducted field investigation is highlighted for demonstration of its actuality for the public. Tab. 1, Fig. 25, Ref. 10.

<div align="right">Auth.</div>

b16.1.5.27. Assessment of dynamics (trend) of variability of annual and monthly maximum water discharges at Vere River. /G. Grigolia, D. Kereselidze, M. Alaverdashvili, V. Trapaidze, G. Bregvadze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 45-49. – geo.; abs.: geo., eng., rus.

The freshet, which took place on June 13-14, 2015 at Vere river became the reason of human losses (21 people were killed) and inflicted significant damage to urban infrastructure. Identification and assessment of regularities of variability of maximum water discharge in river flow is very topical due to global warming. Correlation coefficients for trends of separate months between maximum water discharge and its order number for uninterrupted periods of 1963-1990, 1991-2014 and 1963-2014, as well as coefficients of freshet activity were assessed for establishment of flood and freshet dynamics. As calculations show, trend in actual fact is not recorded, there are observed trends only in 5th months of 1991-2014 and in annual discharges, while in other cases the variability is of random character. Tab. 3, Fig. 9, Ref. 3.

<div align="right">Auth.</div>

b16.1.5.28. Protection of Tbilisi City from predictable natural disasters after the example of the River Vere. /R. Diakonidze, J. Panchulidze, Z. Charbadze, Z. Laoshvili, B. Diakonidze, S. Kvizhinadze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 50-55. – geo.; abs.: geo., eng., rus.

The article deals with the natural disaster, taking place on the River Vere on 13 June 2015 and causing significant ecological and economic losses, damage of Tbilisi City and the death of 21 people. The correctness of the determination of maximum predictable discharge during design of tunnels at the existing disaster zone has been estimated. A detailed

hydrological report of the River Vere, including hydrographical maps and predictable value of maximal discharges are presented. Tab. 1, Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.1.5.29. Methods to improve the efficiency of water use irrigated agriculture of Georgia. /M. Vartanov, E. Kechhoshvili, L. Kekelishvili, F. Lortkipanidze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 61-67. – geo.; abs.: geo., eng., rus.
This article discusses issues related to improving the efficiency of water use in irrigated agriculture of Georgia. Established is the ineffectiveness of the current system of payment for crop irrigation. An analysis of the existing systems in the world pricing of irrigation water is given. Particular attention is paid to the operation of irrigation systems under modern conditions. The necessity of the functioning of farmers' associations is stressed. Tab. 4, Ref. 4.

<div align="right">Auth.</div>

b16.1.5.30. Structural analysis of the annual vertical runoff of the Ganjachay River basin. /F. Imanov, I. Aliyeva, A. Guliyeva/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 68-71. – rus.; abs.: geo., eng., rus.
The article analyzes the annual vertical river runoff after the example of the Ganjachay River basin. By dismembering hydrographs, it is established that for the period covering 1928-1963 the average value of surface runoff was 55.6% and groundwater runoff was 44.4%, while for the period of 2003-2010 it was 30.5% and 69.5% accordingly. A comparison of these figures shows that the ratio of surface and groundwater flow had changed dramatically: the proportion of surface runoff decreased by 25.1%, while the proportion of groundwater runoff, on the contrary, increased. Tab. 2, Fig. 2, Ref. 5.

<div align="right">Auth.</div>

b16.1.5.31. Reclamation of rivers floodplain places. /Sh. Kupreishvili, P. Sichinava, K. Dadiani/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 96-98. – geo.; abs.: geo., eng., rus.
The scheme and distance between dams which have to be made in order to prevent flood on a river are proposed; water discharge for trapezoidal crossing after arrangement of the dams is calculated; river side slopes and the crest width parameters are established. Fig. 2, Ref. 6.

<div align="right">Auth.</div>

b16.1.5.32. The current state of the ecosystem of Masazir Lake of the Absheron peninsula of the Republic of Azerbaijan. /V. Mamedov, A. Salamov, Kh. Khalilova/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 118-124. – rus.; abs.: geo., eng., rus.
The paper discusses the direction and types of disturbance in ecological state of Masazir Lake for the period more than 100 years. It has been established that the increase in oil and gas production in the region decreased geodynamic formation pressure, resulting in reduced flow rate and the quantity of highly mineralized spring waters that feed the lake. With the increase of anthropogenic effluents in water and bottom sediments of the lake found alien to this environment chemical elements and compounds. Fig. 4, Ref. 8.

<div align="right">Auth.</div>

b16.1.5.33. Field studies of water control structures with impervious elements made of polymeric materials. /M. Nesterov, I. Nesterova/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 148-150. – rus.; abs.: geo., eng., rus.
The results of full-scale experiments of water regulating constructions on the canals of melioration systems are given. Polyethylene filmy screens have been used instead of sheet pilings in these constructions. The arrangement of impervious film screens showed a significant advantage against traditional sheet piles on the level controls used in land reclamation. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.1.5.34. Determination of the irrigation potential of the River Tedzami based on the forecasting the crop water requirements. /T. Odilavadze, K. Bziava/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 151-155. – geo.; abs.: geo., eng., rus.
Sustainability of agriculture of the Kaspi municipality greatly depends on the provision of irrigated agriculture with the water resources and efficient use of irrigation water. The exclusive source of water for the given municipality is the river Tedzami, which is used to provide water to eight irrigation canals. Implemented analysis of the calculation of crop water requirements, taking into account the recommendations of the Food and Agriculture Organization (UN FAO) indicates that the water conductivity of irrigation systems extremely low, requires rehabilitation and recovery. However, in a case of rehabilitation, river flow of river Tedzami during the growing season (July, August, and September) will provide irrigation water just to one irrigation channel, which subsequently reduces crop yields. In order to improve the efficiency of irrigated agriculture of Kaspi Municipality, it is necessary to regulate river flow of the river Tedzami, rehabilitate irrigation canals and introduce the modern irrigation technologies. Tab. 2, Fig. 1, Ref. 1.

<div align="right">Auth.</div>

b16.1.5.35. Management of quality of river waters of the Aral Sea Basin. /E. Chembarisov/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 197-200. – eng.; abs.: geo., eng., rus.
The problems of the Aral Sea desiccation and the considerable deterioration of the ecology in the Aral Sea basin and in other regions of Central Asia have now acquired global importance. An estimation of ecological condition of the Aral Sea basin has been made by using the methods of system analysis, budget, statistics, and cartography. Based on the volume of surface water and its quality in different regions of Aral Sea basin, the optimum options of their use within irrigation systems have been proposed. Methods have been developed for decreasing the extent of river water pollution, reducing

the number of collector drainage water discharges into rivers and principles of hydroecological zoning of territories /1/. Tab. 1, Ref. 3.

Auth.

b16.1.5.36. Analysis of the study of riverbed processes of the River Don. /E. Khetsuriani, L. Fesenko, T. Khetsuriani/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 221-227. – rus.; abs.: geo., eng., rus.
The article is devoted to the results of a morphological study of the River Don in the area of water intake facilities in the City of Rostov-on-Don. The studies of ice phenomena, water-level modes are conducted and hydrographs constructed. Tab. 3, Fig. 2, Ref. 11.

Auth.

b16.1.5.37. Sioni earthfill dam's suffusion and filtration processes assessment. /I. Iordanishvili, K. Iordanishvili, G. Natroshvili, D. Potskhveria, N. Kandelaki, L. Bilanishvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 72-76. – geo.; abs.: geo., eng., rus.
The results of a chemical analysis taken from the water of the earthfill dam of Sioni piezometers in 2013-2015 are given. According to the data obtained from chemical analyses taken from piezometers at the body of dam, the sharp rise of dry residue is noticed on the left wing of the dam. Scales of losses of seepage waters are defined. Tab. 1, Fig. 4, Ref. 3.

Auth.

b16.1.5.38. Raising depressions with colmatage and rephulation of drainage area. /Sh. Kupreishvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 99-101. – geo.; abs.: geo., eng., rus.
A running scheme of colmatage is proposed; the positive and negative properties of colmatage and rephulation are defined; the advantage of the rephulation against the colmatage running with acceleration of the surface raising process is established. Tab. 1, Ref. 5.

Auth.

b16.1.5.39. The forecast of rapture of regime stability of hyperconcentrated flow movement. /E. Kukhalashvili, Z. Lobzhanidze, T. Kereselidze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 102-108. – geo.; abs.: geo., eng., rus.
The violation of flow movement regime and its conversion into wave form movement cause changes both in the riverbed processes, also in the evaluation of its stability. A high dense flow moveable in the wave form significantly differs from the ordinary running flow; its hydrological and hydraulic parameters are changed. The problem is further complicated in the case of engineering problems of such flows' regulation are considered. The calculation dependence is obtained on the basis of equal and wave movement of linked debris flow, in particular the law of motion between the average and wave speed; A graphical dependence of the relative rate of the average and wave speed of the flow in association with the rheological characteristics is obtained. Fig. 3, Ref. 4.

Auth.

b16.1.5.40. Quality control and homogeneity of temperature and precipitation data in Georgia. /L. Megrelidze, L. Kartvelishvili, N. Dekanozishvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 125-129. – eng.; abs.: geo., eng., rus.
Long-term temperature and precipitation data series obtained from Georgia hydrometeorological network were studied to detect and correct nonclimatic homogeneity breaks. A detailed description of the procedure results is provided and the impact of adjustments on trend estimation is discussed. The two-phased regression model based on the penalized maximal t and F tests and the transPMFred algorithm (for non-zero daily precipitation series) will be used for this reason. The homogeneity tests showed strong inhomogeneity of the original data series, which could have both internal climatic and non-climatic origins. Breaks that were identified by the mentioned homogeneity tests were compared with available metadata containing data such as instrument changes, changes in station location and environment, observation procedures, etc. Significant breaks (significance 95% or more) that coincided with known dates of instrumental changes were corrected using quantile-matching or mean-adjustments. It should also be noted that some significant breaks, which could not be connected to known dates of any changes in the park of instruments or stations location and environment as well the spatial distribution of outliers indicates that they are due to climate variability rather than measurement errors. Corrected series are now available for future studies on detection of climate variability and change. Tab. 1, Fig. 4, Ref. 6.

Auth.

b16.1.5.41. The existing problems of geological spontaneous disaster in Georgia and methodological actions of first row adaptation-prevention measures for elimination them. /E. Tsereteli, M. Gaprindashvili, Z. Kvaratskhelia, G. Gaprindashvili, O. Kurtsikidze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 201-208. – geo.; abs.: geo., eng., rus.
In Georgia, the temple of sustainable development is significantly delayed by Synergy of country's economic, social and environmental component, which is a direct reflection of the intense activation of natural geological phenomena and large-scale development. Reasons of process development-reactivation is multi-spectral, including the side-profiled phase deterministic factors, take a crucial place variety of climatic and meteorological parameters in time and space, extremely high press of human engineering activities and earthquakes. In Georgia there is no place except high mountainous areas where the occurrence of negative Geological events is not linked with human activities. Geological disaster risk reduction potential is complicated by public low awareness about natural geological disaster. For Disaster risk assessment and creation of effective Early Warning system for national, regional and municipal level, it is necessary to know where, what type and scale geological process formation and activation and what kind of danger is expected to the population and the infrastructure. The risk management measures should be based on the situation of geological

hazard evaluation criteria such as the quality of the natural disasters affected species and the reasons for their emergence and reactivation determination, also assessment of element at risk. For realization of these problems it is necessary to have permanent regional geo-monitoring researches for whole country; 2.The geological disaster evaluation criteria for individual regions and municipalities and the threat of natural disaster risk assessment and special maps, scale: 1:50 000-1:100 000; 3. The second and third level stationary polygons particularly relevant and strategically important area. 4. Processing of historical-statistical data of Geological disaster processes development tendency for individual regions and municipalities 5. Processing of Landslide-Gravitational Hazard Map in digital format, 1: 200 000 scales. Fig. 2, Ref. 8.

<div align="right">Auth.</div>

b16.1.5.42. Computing characteristics of the head part of mudflow front movement. /O. Natishvili, G. Gavardashvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 138-143. – rus.; abs.: geo., eng., rus.
A brief description of characteristics of the mudflow front has been offered. Schemes computing the movement of the head part of mudflow in the case of simple and complex deformations are given. Taking into consideration the distribution curves of velocities and shear stress in the unconfined uniform flow of the Newtonian fluid, the equation for calculation of the form of head part of mudflow front, for both cases, has been obtained. It is determined, that maximum height of the head part at the convex shape, according to the observation, varies within the ranges $H_8 = (1{,}5 \div 1{,}8)H$. Fig. 3, Ref. 5.

<div align="right">Auth.</div>

b16.1.5.43. The snow avalanche study and modern avalanche control measures in Georgia. /N. Sukhishvili, O. Okriashvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 174-179. – geo.; abs.: geo., eng., rus.
The article presents the problems caused by snow avalanches in mountainous regions. The article deals with the backlash. Therefore, a new type of avalanche-protection structures generally designated for reducing the speed and the spread of avalanche zones in narrow and deep ravines has been designed and developed. Tab. 1, Fig. 9, Ref. 6.

<div align="right">Auth.</div>

b16.1.5.44. Debris flow traffic termination defining features. /N. Undilashvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 180-182. –geo.; abs.: geo., eng., rus.
Based on the study of the mudflow movement conditions and solution of the second order differential equations of the flow movement, the predictable equation of the flow movement termination regularity is obtained. Fig. 2, Ref. 8.

<div align="right">Auth.</div>

b16.1.5.45. Establishment of the solid fractions' volume by taking into account the configuration of solid blurb transported by debris flow formed in the River Nagvareviskhevi existing with village Daba in Borjomi district. /L. Tsulukidze, L. Maisaia, K. Kiknadze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 209-214. – geo.; abs.: geo., eng., rus.
The article analysis the dynamic of erosion-debris flow processes running in the catchment basin of the River Naghvarevis Khevi near the village of Daba in Borjomi district. As a result of chamber treatment of field-recognatation data, the amount, volume, transport distance and the speed of stones of various shape and diameter transported by debris flow mass are established. The independence between various shape stone characteristic (E) and friction coefficient (f) I found. Tab. 2, Fig. 8, Ref. 2.

<div align="right">Auth.</div>

b1.6 Biological sciences

b16.1.6.1. New bio-mat against erosion. /L. Itriashvili, I. Iremashvili, E. Khosroshvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 77-78. – rus.; abs.: geo., eng., rus.
The article shows the composition of a new bio-mat against erosion, the qualitative and quantitative indicators of its components. It describes the work of bio-mat's mechanism, features and efficiency. The article shows the production technology and use efficiency. Ref. 2.

<div align="right">Auth.</div>

b16.1.6.2. Paulownia - tree for the future. /N. Kipiani/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 81-83. – geo.; abs.: geo., eng., rus.
The importance of involving in Georgian woods species immigrated or introduced ifrom different flora genetic centers in order to make together with local (endemic) species a new nat ural resource. The article deals with the possibilities of spreading Paulownia, one of the important cultural varieties in West Georgia. Due to its many-sided utilization, it can be named as the Tree for the Future. Ref. 3.

<div align="right">Auth.</div>

b16.1.6.3. Dendrochronology at the service of the national economy. /M. Tughushi, A. Zedgenidze, N. Ala-verdashvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 87-89. – geo.; abs.: geo., eng., rus.
The article deals in details with dendrochronology (or tree-ring dating) as the indicator of timber plant thickness and age of the apical growth age; it role in the country's budget forming at the expense of timber tax payments is analyzed. Ref. 3.

<div align="right">Auth.</div>

b16.1.6.4. General review of fauna and population density of scoops (LEPIDOPTERA: NOCTUIDAE) of the Caucasus. /E. Didmanidze, N. Mandaria/. Novation. – 2015. – #b16. – pp. 15-22. – geo.; abs.: geo., rus., eng.

Since 1971 until 2000, the Georgian National Museum of Zoology Department was conducting planned faunistic expeditions in the Caucasus. The aim of this expedition was to carry a complex study of the Caucasus region's fauna and to enrich the funds. Together with many other tasks, a special attention was given to revealing the fauna' structure and characteristic features. One of these features is the determination of population productivity settlement density, which is of a great theoretical and practical importance. We studied the following issues of the Caucasus fauna (Lepidoptera, Noctuidae): 1. Frequency of certain species of each biome. 2. Background making neutral and rare species 3.The density of the settlement. Analysis of all these issues males it possible to speak about the state of species in the biological chain, wild nature agrobiocenosis in general, as well as under the influence of anthropogenic factors, to determine in advance the intensity of the expected harmfulness, based on the abundance of population of harmful species, correctly determine the limiting factors and make a reliable prediction of effective control measures. Tab. 1, Ref. 23.

Auth.

b16.1.6.5. Changes in the vital processes of infected plants. /N. Ghvinianidze, N. Chkhartishvili/. Novation. – 2015. – #b16. – pp. 95-98. – geo.; abs.: geo., rus., eng.

As a result of disease, together with other vital processes ongoing in the palnt, its photosyntheisis is also prone to change. The intensity of photosyntheisis significantly decreases, which is conditioned bya decrease in the amount of pigment chlorophyll in the infected plant's leaves. The changes are undergone by the pigments of carotene group. The changes in the pigments have a negative influence on photosynthesis. The usual pace of light and darkness is broken. The change also influences the exchange of nitrogen. It is known that the changes in the amount of nitrogen compound in infected plants are caused by proteolite ferments which are produced by pathogenic organisms in the plants. The disease has a negative influence on breathing – there is a change in the intensiveness of breathing in an infected plant, which is connected with ferment system. Ref. 8.

Auth.

b16.1.6.6. Study of certain vegetative organs of *Tribulus terrestris*. /V. Nebieridze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 198-201. – geo.; abs.: geo., eng., rus.

Mass portion (%) of vegetative parts of whole plant *Tribulus terrestris* is the following: leaves 36,6; fruits 26,3; stems 31,5; roots 2,6. The content of furostanol glycosides in leaves 3,9%, fruits 1,35%, stems 0,33%, roots 1,0%. Steroidal glycosides composition: of leaves, fruits and stems is similar, but significantly differs in the roots. Chemical study of certain organs of *Tribulus terrestris* is in progress. Tab. 1, Fig. 1, Ref. 5.

Auth.

b16.1.6.7. Preliminary investigation on the content of biologicaly active compounds of some plants growing in Georgia. /K. Shalashvili, M. Sutiashvili, T. Sagareishvili, N. Kavtaradze, J. Aneli, M. Churadze, M. Alania/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 202-207. – rus.; abs.: geo., eng.

Preliminary phytochemical investigastion has been carried out on the contained of flavonoids, cycloartans, amino acids, cyanogenic glycosides and γ-aminobutyric acid 37 objects of 35 plants growing in Georgia. Some perspective plants rich by biologically active compounds were revealed. Some of these are proposed for the deep chemical investigation. There were isolated and identified 4 flavonoids: quercetin, populin, formononetin and biochanin A-7-0-β-D-glucopyranoside from *Trifolium pretense*. The structure of this compounds was determined on the study of physical-chemical properties, transformation products and spectral (UV, UR, ^{1}H and ^{13}C NMR) date. Tab. 1, Ref. 13.

Auth.

b16.1.6.8. Pollution of agricultural plants with radionuclides in Samtskhe-Javakheti Region. /K. Chkhaidze, R. Zedgenidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 337-338. – rus.; abs.: geo., eng.

Within the framework of project it has been studied the agricultural plants polluted by radioluclides in the the region of Samtskhe-Javakheti. In particular it wos estimated, that potatoes and other agricultural crops (in soil - 20 sm. lier) are not poluted with stroncium-90 in mountainous areas. The common radioactivity is determined in 500 vegetatia samples (fruits, grains, vegetables, food greens) which are taken from the different soil and climat conditions. It was cleared that woody perinnial and deciduous plants contain stroncium-90 5-times more, than softwood plants. The pollution with stroncium-90 was inceased in food-grass in highlands of Trialeti - Javakheti, where it was 3 - 8 times more then in lowlands. Ref. 3.

Auth.

b16.1.6.9. Ex situ conservation base of global status woody species protected by International Union for Conservation of Nature (IUCN) "Red List" and Georgian "Red List" at Batumi Botanical Garden. /J. Jakeli, M. Metreveli/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp 128-133. – eng.; abs: eng., geo.

The article deals with some bioecological peculiarities of 46 species of 28 genera and 13 families of global status woody plants protected by IUCN "Red List" and Georgian "Red List" that grow at Batumi Botanical Garden: potential and possibilities of their growing, reproductive restoration and development in the humid subtropics soil-climatic conditions along the Georgian Black Sea littoral. It highlights the significance of these factors for creation of a conservation base for the species with protected status in new environmental conditions and analyzes the present outcomes: most species under study can be included for the perfection of the conservation base at the Batumi Botanical Garden. According to the worldwide protection status in the orangery conditions the following planting materials were received: 4 samples of 2

Critically Endangered (CR) species, 186 samples of 5 Endangered (EN) species, 26 samples of 6 Vulnerable (VU) species, 65 samples of 6 Near Threatened (NT) species and 296 samples of 28 Least Concern (LC) species. Total planting and reserve gene-pool comprise 577 samples of 47 species, including 30 seed samples of local reproduction and 17 – delivered through the seed exchange programs between the botanical gardens worldwide. Tab. 2, Ref. 7.

Auth.

b16.1.6.10. New data on some rare species of flora of Georgia. /N. Lachashvili, N. Eradze, M. Khachidze, L. Khetsuriani/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 134-138. – eng.; abs: eng., geo.
There is a number of rare and endangered species in the flora of Georgia. Protection and survival of these plants require to specify plant areas and reveal new populations. The floristic and geobotanical studies, carried out in 2012-2014 revealed several new places of distribution of some rare species of Georgian flora. They are as follows: 1. Astragalus tanae Sosn. (family Leguminosae), 2. Chrysopogon gryllus (L.) Trin. (family Gramineae), 3. Sternbergia colchiciflora Waldst. & Kit. (family Amaryllidaceae), 4. Halimodendron halodendron (Pall.) Voss. (family Leguminosae), 5. Bongardia chrysogonum (L.) Spach. (family Berberidaceae), 6. Matthiola odoratissima (Pall. ex Bieb.) R. BR. (family Cruciferae). Among these plants Halimodendron halodendron and Astragalus tanae are listed in the Red List of Georgia and Bongardia chrysogonum was included in the Red Book of Georgia. Astragalus tanae, Chrysopogon gryllus and Sternbergia colchiciflora are listed in the Red List of Caucasian Endemic Plants. Astragalus tanae Sosn. is a Georgian endemic plant. The above mentioned species grow in the arid and semi-arid ecosystems. They were found in such climatic conditions and dry ecotopes that are characteristic of them. Halimodendron halodendron and Bongardia chrysogonum were registered to be growing in the environs of Gareji monastery on Iori Plateau, Astragalus tanae nearby the village of Mskhaldidi, in the environs of Tbilisi, Sternbergia colchiciflora and Matthiola odoratissima on the different part of Kvernaki range, within the environs of Kaspi, and Chrysopogon gryllus – on the eastern slopes of Shavimta in the extreme eastern part of Iori Plateau. In the new area a single population of Astragalus tanae, Bongardia chrysogonum and Chrysopogon gryllus, two populations of Halimodendron halodendron and three populations of Sternbergia colchiciflora were registered. Matthiola odoratissima in the form of individual units is sporadically spread in the new area. While pointing out the coordinates and habitats the article gives the new sites of distribution of these species and represents labels of the new herbarium material (TBI). Based on the literature data the article covers the information on their old areals. The article is attached by some photos of the plants. Fig. 4, Ref. 17.

Auth.

b16.1.6.11. On peculiarities of insect functionally distinguished flight muscles structure. /G. Papidze, N. Gachechiladze, O. Akhmetelashvili, T. Eristavi/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 155-b162. – eng.; abs: eng., geo.
In this paper the ultrastructure, morphometry, histochemistry of locust (Locusta migratoria migratorioides R.F.) functionally different monofunctional (MOF) and bifunctional (BIF) flight muscles are discussed. Electron-microscopic, histochemical and morphometric investigations have revealed ultrastructure and metabolic peculiarities of monofunctional (muscle-113) and bifunctional (muscles-119,120) muscles. The structure of sarcomeres, their sizes, the number of acting filaments on orbit of myosin filaments, mitochondrial number and their layout, the high activity of succinatedehydrogenaze confirm the homogeneity and phase nature of muscle-113. The fibers of muscles-119, 120 involved in flight and extremities movement differ in size of sarcomeres and variability of number of actin filaments around myosin filaments. The results of morphological investigations allow conclude that bifunctional muscles may be composed of heterogeneous fibers that functionally are divided into phase and tonic fibers. Thus, the existence of different parameters characteristic for mono- and bifunctional flight muscles are due to their functional specialization. Fig. 6, Tab. 1, Ref. 27.

Auth.

b16.1.6.12. Nematodes associated with bark beetle Ips typographus in Borjomi Gorge. /M. Burjanadze, M. Lortkipanidze, A. Supatashvili, G. Kajaia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. b163-b167. – eng.; abs: eng., geo.
The spruce bark beetle Ips typographus L. (Coleoptera: Scolitidae) causes considerable damage in stands of oriental spruce trees (Picea orientalis Link) and is very common throughout Borjomi gorge forests in Georgia. Investigation of bark beetle populations were carried out with focus on the natural occurrence of insect pathogenic and parasitic nematodes. During the survey carried out in 2009-2011 in different sites of forests of Borjomi gorge the following nematodes were isolated from Ips typographus, Contortylenchus typograpi, Contortylenchus sp., Bursatylenchus sp,. Parasitorhabditis sp. Tab. 2, Fig. 8, Ref. 10.

Auth.

b16.1.6.13. Study of structural peculiarities of generative sphere and *ex-situ* conservation of Georgian endemic plant *campanula kemulariae* fomin included in the Red List of the Caucasus. /L. Gabedava/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 96-104. – eng.; abs: eng., geo.
Structural peculiarities of generative sphere of the local Georgian endemic *Campanula kemulariae* Fomin (VU), included in the Red List of the Caucasus, were studied at different stages of development. Capacity for seed production was evaluated, germination capacity and seed viability determined. Course of formation of generative sphere of *C. kemulariae* proceeds mainly within the norm. Anther develops by centrifugal (efferent) type. The wall of anther consists of epidermis, endothecium, 2 intermediate layers and tapetum. Insignificant deviations (1-2%) occurring at early stage of meiosis do not affect its normal course. Tetrads are formed by simultaneous mode. Pollen grain is triporous. Fertility of pollen attains 90%. Conditions and terms optimum for seed germination were established under controlled temperature and illumination. Early stages of ontogenesis – latent and pregenerative were studied. *Ex-situ* conservation works were carried out at the Department of Plant Conservation of the National Botanical Garden of Georgia. Fig. 15, Ref. 21.

b16.1.6.14. Formation of phenolic compounds in callus culture from *Rhododendron Caucasicum* Pall. and influence of hormonal effectors on the process. /D. Bagratishvili, R. Jikia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 105-109. – eng.; abs: eng., geo.
Effect of various concentrations of 2,4-D, Kinetin and NAA on the growth and formation of phenolic compounds in stem callus culture from *Rhododendron Caucasicum* Pall. was studied. 5mg/l and 10mg/l 2,4-D favorably effected on the growth of tissue culture and formation of summary phenolic compounds and flavans (catechins+ proanthocyanidines). Kinetin 1mg/l and 5mg/l suppressed the growth of *Rhododendron* culture and formation of polyphenols (summary phenolics and flavans). 5mg/l and 10mg/l NAA stimulated the synthesis of summary phenolic compounds and summary flavans. The best result was shown by 10mg/l NAA. At the same time both concentrations of NAA visually did not change the growth of callus culture. Our data confirm that the growth of *Rhododendron* tissue culture and the formation of phenolic compounds in it are under hormonal control. The components of nutrient medium that increase the yield of biomass (2,4-D and NAA) also increase the formation of summary phenolic compounds and flavans, and vice versa. Kinetin, suppressing callus growth, reduces the amount of phenolic compounds. Fig. 3, Ref. 11.

Auth.

b16.1.6.15. Diversity of subspontaneous ferns of Ajara floristic region. /T. Vasadze, N. Memiadze, K. Dolidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 112-1b16. – eng.; abs: eng., geo.
In the paper, subspontaneous ferns propagated in Ajara floristic region are described. Systematic and geographical analyses of ferns are made. Biological peculiarities are studied of subspontaneous non-native ferns of 4 families, 6 genus, 7 species. The ways of invasion and peculiarities of propagation of these ferns in Ajara floristic region are considered. Two new species of subspontaneous ferns for Ajara floristic region (*Pteris serrulata Forssk., Neprolepis exaltata (L.) Schott.*) are described. Tab. 1, Fig. 4, Ref. 11.

Auth.

b16.1.6.16. Antimicrobial activity of Greater Celandine (*Chelidonium majus* L.) Plant Seed Lectin. /M. Khurtsidze, N. Aleksidze, G. Aleksidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 122-130. – eng.; abs: eng., geo.
Content of lectin (CBL-1) in seeds of the Greater Celandine (*Chelidonium mays* L.) was studied. It is demonstrated that in contrast to the total protein, content of CBL-1 is not dependent on the physiological state of seeds (stage of seed maturation and the state of seed dormancy) and it does not change. Content of CBL-1 in the Greater Celandine seeds and the surrounding area within 25 days of germination is of reciprocal character indicating secretion of CBL-1 into surrounding environment since the 20th day of germination. Experiments, conducted in vitro show that CBL-1 causes agglutination and suppression of propagation capacity of the following phytopathogenic microorganisms: *Pectobacterium aroidae*, *Xanthomonas campestris*, the human pathogenic bacteria *Staphylococcus aureus*, *Agrobacterium tumefaciens* and the pathogenic fungus *Trichoderma viride*. Tab. 4, Fig. 3, Ref. 14.

Auth.

b16.1.6.17. Relation between percentage composition of biologically active substances and the age of plants *Magnolia Obovata, Magnolia Grandiflora* and *Cocculus Lauripolius*. /M. Sturua, D. Tsakadze, Sh. Samsonia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 131-137. – eng.; abs: eng., geo.
Two species of Magnolia: Magnolia Obovata, Magnolia Grandiflora and a plant Cocculus Lauripolius were studied on the content of biologically active organic compounds. Total preparations were isolated from the mentioned plants and phenolic compounds, alkaloids and essential oils were obtained using modern methods of chromatography. On the basis of the spectral analysis individual alkaloids were identified. Changes in the contents of aglycone quartzetine and alkaloid liriodenine were detected in magnolia leaves. From the above mentioned two species of Magnolia the following alkaloids were separated: anonaine, remerine, liriodenine, lanuginozine, isolaurelin-N-oxide, remerine-N-oxide and dehydroremerine. *Cocculus Lauripolius* contains the following alkaloids: kokulin, kokulidin, koklaphyn, koklaurin, Izoboldin, Norizoboldin, Kokulidin-N-oxide. Phenolic compound such as izopheric acid was detected in large amount in the leaves of Magnolia Obovata. Separation and identification of biologically active substances were carried out by the use of modern chromatographic methods of analysis. Chemical compositions of leaves, shoots and flowers of evergreen Magnolia Grandiflora and deciduous Magnolia Obovata were thoroughly studied and compared. Different chemical processes important for living organisms were observed. Qualitative and quantitative changes in alkaloids, phenolic compounds and essential oils in different vegetation organs of all three plants were determined in different vegetation periods. Character of th dependence of the percent content of some important alkaloids on the age of plants was established. Tab. 1, Ref. 5.

Auth.

b16.1.6.18. The effect of microelements on the activities of peroxidase and polyphenol oxidase in tomato leaves and fruit. /N. Mangaladze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 138-142. – eng.; abs: eng., geo.
The influence of microelements (B, Zn, Cu, Co, Mn) on the peroxidase and polyphenol oxidase activity in tomato leaves and fruit was studied. Activity of the enzymes under study varies in different phases of plant vegetation. It can be explained by the fact that the tomato plant bears the technically, physiologically mature and crude fruit as well as buds and blossoms together. In both control and in the microelement group with the increase of the peroxidase activity the polyphenol oxidase activity decreases. Compared to the control group the polyphenol oxidase activity increased the most in the phase of vegetation of 4-5 leaves, after treatment with boron and then with cobalt. Boron and zinc have similar action on the enzyme activity. Under the action of boron the polyphenol oxidase activity especially increases in the phase of vegetation of 4-5 leaves and in the later phase decreases. The peroxidase activity changes accordingly. After

presowing treatment of tomato seeds with zinc the peroxidase activity decreases in leaves (in their early phase of vegetation) and fruit. It reaches its maximum in leaves in the fruit bearing period. Under the influence of copper and cobalt the peroxidase activity in fruit increases. In leaves it increases in the late phase of vegetation. The manganum influence on the the activity of polyphenol oxidase is less in the early phase of vegetation than in the late phase. In tomatoes with the increase of polyphenol oxidase activity the peroxidase activity decreases. Tab. 2, Ref. 7.

<div align="right">Auth.</div>

b16.1.6.19. The endparasites (Pentastomida, Nematoda) of African rock python *(Python sebae* Gmelin, 1788) in Tbilisi Zoological Park. /L. Murvanidze, Ts. Lomidze, K. Nikolaishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 143-149. – eng.; abs: eng., geo.
The paper presents the data on the helminthological investigation conducted in 2010 and 2013 on two African rock pythons (*Python sebae* Gmelin, 1788) from Tansania preserved in Tbilisi Zoological Park. The material was supplied by the staff of the veterinary service of the Tbilisi Zoological Park. Three species of endoparasites were revealed in internal organs of the python, which died in 2010: the pentastome *Armillifer armillatus* (Wyman, 1848) - in the lung, and two species of ascaridoid nematodes were revealed in digestive system: *Ophidascaris filaria* (Dujardin, 1845) - in gastric mucous layer and *Polydelphis attenuata* (Molin, 1858) Baylis,1921, in the intestine. The 13 individuals of *P. attenuata* (Molin, 1858) Baylis, 1921 were withdrawn from other python organism in 2013 as a result of dehelminthization. Description of parasites was made on the basis of morphological and morphometric data, obtained from both living material and fixed preparations. It is advisable to undertake special safety precautions to the captured animals in order to avoid lethal outcomes, caused by helminths in pythons living in isolation in zoological parks. Animals, newly introduced to zoological parks, should necessarily be subjected to dehelminthization and further parasitological monitoring. As there is a threat of disease with pentastomiasis the staff nurses, working in the terrarium, people under the risk should necessarily follow the safety precautions. Fig. 2, Ref. 28.

<div align="right">Auth.</div>

b16.1.6.20. Permeability of air-blood lung barrier for surfactant protein d (sp-d) in healthy dogs and those suffering from dirofilariasis. /A. Ermakov, A. Lysenkova, I. Kolodiy, P. Aksenova/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 150-154. – eng.; abs: eng., geo.
The goal of this study was to evaluate the permeability of the air-blood lung barrier for the SP-D protein in healthy dogs and those suffering from dirofilariasis. We have found that in 31.1% of dogs suffering from dirofilariasis there are air-blood barrier disorders for the surfactant protein D of lungs. Also, we have found that in case of invasion and chronic stage of dirofilariasis, protein concentration in the blood plasma of dogs up to 2 years old far exceeds similar indicators of healthy dogs, and after 2 years of age, the level of protein is considerably reduced compared with a population of healthy dogs. Tab. 1, Ref. 10.

<div align="right">Auth.</div>

b16.1.6.21. Paralysis of vine and struggle against it. /Sh. Kanchaveli, Z. Khidesheli/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 73-75. – geo.; abs.: geo., eng.
Paralysis of vine is a fungal s disease - tracheomicosis caused by the fungus *Stereum hirsitum* (wild) Fr. Researchers determined that the disease is spread both in East and West Georgia. Different sorts of vine according to their steadiness towards the disease differ from each other. The disease has chronic character and the plant dries in 4-5 years after getting it. The 20-30 year old vine gets the disease more often which is rarely observed in young (5-15 year old) vineyard. It is also determined that in infertile, sandy and lime soils the disease develops slowly, but in moist, heavy soil vine, on the contrary, dies quickly. Measures to control the disease are g enerally of prophylactic character, meaning correct vine pruning and planting of well healed seedlings; one of the measures is trimming of vine on the stem should be held in the early spring on 20-25 sm. height above the land surface; the place of trimming should be covered with garden ointment or painting and the trimming should be carried away from the plot and burnt. Fig. 2, Ref. 5.

<div align="right">Auth.</div>

b16.1.6.22. Principal diseases of coniferous species /pinus, picea, abies/ in Borjomi-Bakuriani region. /B. Tavadze, A. Supatashvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 76-79. – geo.; abs.: geo., eng.
The article discusses principal diseases of coniferous species spread in forests of Borjomi-Bakuriani region. Ref. 5.

<div align="right">Auth.</div>

b16.1.6.23. The microbiont associated with genus Juglans in Adjara. /O. Shainidze, A. Murvanidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 80-84. – geo.; abs.: geo., eng.
The walnut species found in Adjara are given. It is ascertained that out of 30 found microbionts, the most spread and rather harmful are 8 s pecies, namely: *Marssonina juglandis (Lib.) Magn., Phomopsis juglandis Grov., Melancnium juglandium Kunze., Microstroma juglandis (Beer) Sacc., Allternaria tenuis Nees**.,** Trichotecium roseum Link**.,** Mucor juglandis Link.* Fig. 7, Ref. 6.

<div align="right">Auth.</div>

b16.1.6.24. Determination of the markers of tolerance against mulberry phytoplasma diseases in tolerant varieties. /N. Stepanishvili, L. Tsigriashvili, Z. Gagoshidze, I. Chargeishvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 85-88. – geo.; abs.: geo., eng.
Mulberry *(Morus alba.* Lin) is a subtropical zone plant and still presents the only and indispensable feeding source for silk cocoons. Like other timber plants, it is prone to different infectious and non-infectious diseases, the prevalance and malignancy of which of which are not uniform and depend on both the plant's immune properties and biological characteristics of the parasite. Fig. 2, Ref. 11.

<div align="right">Auth.</div>

b16.1.6.25. The model makes available optimization of water use system on the irrigation system. /T. Turmanidze, G.Tetradze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 127-129. – geo.; abs.: geo., eng.

The model makes available the assessment of components of water balance components in agroecosystem: evapotranspiration (Emm), runoff (Rmm), potencial evapotranspiration (E_0), deficite of evapotranspiration (E_0-E) - being at the same time the irrigation norms -, sufficiency index (E_0/E) and soil moisture in agroecosystem. Tab. 2, Ref. 4.

<div align="right">Auth.</div>

b16.1.6.26. Monitoring of radioactive nuclides and heavy metal under conditions of alluvial soils of Lentekhi District territory and fertility management of mentioned soils type. /G. Danelia, Z. Chankseliani, T. Palavandishvili, T. Gogishvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 130-132. – geo.; abs.: geo., eng.

The share of radioactive nuclides and heavy metals in alluvial soils of the territory of Kvemo Svaneti accumulated in a layer at the edge of the River Tskhenis Tskali is much lower of the maximally permissible concentration. They are also poor in the nutrients to be assimilated by plants and are in need of immediate chemicalixation for the purpose of improving productivity of agricultural crops. Ref. 4.

<div align="right">Auth.</div>

b16.1.6.27. The protected areas of Georgia. /T. Patarkalashvili/. Annals of Agrarian Science. – 2015. – v. 13. – #3. – pp. 70-76. – eng.; abs: eng., rus.

Protected areas are a key to our present and future biodiversity. They provide hope for a protected planet. Wellmanaged protected areas not only conserve nature but provide wealth of essential ecosystem services that benefit communities and provide solutions to global challenges such as water provision, foot security, human health and well-fare, disaster risk reduction and climatic change. Georgia is notable for its biodiversity. About 400 trees and bushes of different species grow there. Among them such relicts and endemic species as: Pinus pithyusa, Pinus eldarica, Buxus colchica, Rhamnus imeretina, Quercus pontica, Staphylea colchica, Rhododendron ponticum, etc. Until 2005 there were 15 nature reserves, five hunting farms and one national park in Georgia. Now there are 14 nature reserves, 11 national parks, 19 state sanctuaries, 41 natural monuments and 2 protected landscapes with total territory of 600 597 hectare. It is 8.6% of the country's territory. For last 20 years the reserved areas of Georgia increased three times. 75% of them are covered with forests. The reserved areas are located in all characteristic climatic parts of the country-in west and east, in plains and highlands, is subtropical and subalpine zones. In reserved areas, along with different representatives of fl ora, many species of fauna are preserved. For the last period population of most species of animals and birds increased. For example, from animals: brown bear, wild cat, common marten, Eurasian badger, grey wolf, red fox, nutria, Asiatic jackal, European lynx, Caucasian squirrel, Eurasian otter, east and west Caucasian tur(goat). From birds: hillock eagle, tawny owl, rock partridge, hawk, griffon vulture, Caucasian blackcock, turkey vulture, Eurasian woodcock, wood pigeon, goshawk, white stork, crow, Eurasian jay, pheasant. The number of some animals and birds remained at the same level and some decreased. In general the situation now is stable. Tab. 3, Ref. 10.

<div align="right">Auth.</div>

b16.1.6.28. Study of phenotypic properties of Georgian isolates of *Ralstonia Solanacearum*. /M. Muradashvili, G. Metreveli, M. Tediashvili, Z. Sikharulidze/. Annals of Agrarian Science. – 2015. – v. 13. – #3. – pp. 20-25. – eng.; abs: eng., rus.

Ralstonia solanacearum is a serious destructive quarantine pathogen for *Solanaceae* plants worldwide, including Georgia. Diverse populations of this pathogen are usually represented by races, sub-races, biovars and biotypes. Biochemical profiling with biovar determination of R.solanacearum strains collected from various host plants in different regions of Georgia was done. It was shown that Georgian isolates can be divided into three groups: I group, biovar 3, II group - biovar 2, and III group – biovar1. The strains of most important biovar 2 of R. solancearum, which typically correlates with the race 3, were revealed in Akhaltsikhe, the potato industrial region of Georgia. These strains have considerably low growth temperature (20-25°C) and are characterized by good adaptation to Georgian climate. Tab. 3, Fig. 1, Ref. b16.

<div align="right">Auth.</div>

b16.1.6.29. Mathematic modeling of biosystems and usage of the integrated protection of citrus trees. /G. Aleksidze, L. Nozadze/. Annals of Agrarian Science. – 2015. – v. 13. – #3. – pp. 26-36. – eng.; abs: eng., rus.

The mathematical model of „predator-prey" and „pest-parasite" was studied. In that case the components of the system continuously change. The system is presented with two differential equations being solved by numerical integration and linear equation rules. For forecasting purposes the method based on the dynamic rows is used that can be determined by its state for a future period from current chain of changes. Design parameters for reliability usage and distribution and the Hoset's (Stiudent's) criteria made calculations for a long interval. Materials accepted on the basis of graphical analysis allow making of fairly accurate predictions in order to identify the trend and correct solution. The greatest advantage of this method lies in the simplicity of the construction schedule and convenience to read it. Fig. 13, Ref. 12.

<div align="right">Auth.</div>

b16.1.6.30. Antigenic specificity of animal dermatophytosis. /M. Kobakhidze, G. Dvali, G. Kaishauri, N. Lomtadze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. b167-172. – geo.; abs.: geo., eng., rus.

The antigenic structure of dermatophytes belonging to the species *T. verrucosum, T. mentagrophutes, T. equinum, T. sarkisovii, T.rubrum, T.ajelloi, M.canis, M. equinum, M. gypseum* was studied in agar gel by the immunodiffusion reaction. The antigenic complex of each species of dermatophytes was revealed and the amount of antigenic determinants in cross-reactions was established. Tab. 1, Ref. 4.

<div align="right">Auth.</div>

b16.1.6.31. Spatial memory impairment and hippocampal cell loss induced by Okadaic Acid (experimental study). /M. Chighladze, M. Dashniani, G. Beselia, L. Kruashvili, T. Naneishvili/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 83-87. – eng.; abs.: geo., eng., rus.

In the present study, we evaluated and compared effect of intracerebroventricular (ICV) and intrahippocampal bilateral microinjection of okadaic acid (OA) on spatial memory function assessed in one day water maze paradigm and hippocampal structure in rats. Rats were divided in following groups: Control (icv) - rats injected with ICV and aCSF; Control (hipp) - rats injected intrahippocampally with aCSF; OAicv - rats injected with ICV and OA; OAhipp - rats injected intrahippocampally with OA. Nissl staining of hippocampal sections showed that the pyramidal cell loss in OAhipp group is significantly higher than that in the OAicv. The results of behavioral experiments showed that ICV or intrahippocampal bilateral microinjection of OA did not affect learning process and short-term spatial memory but induced impairment in spatial long-term memory assessed in probe test performance 24 h after training. OA-induced spatial memory impairment may be attributed to the hippocampal cell death. Based on these results OA induced memory deficit and hippocampal cell loss in rat may be considered as a potential animal model for preclinical evaluation of antidementic drug activity. Fig. 3, Ref. 19.

Auth.

b16.1.6.32. Green roofs as an ecologically clean and energy-efficient technology in the construction. /Z. Ezugbaia, I. Iremashvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 56-60. – rus.; abs.: geo., eng., rus.

Problems related to the arrangement of ecologically promising, aesthetically highly qualified and energy-efficient green roofs for buildings and constructions have been considered. Recommendations regarding the usage of different plantings on such covers are provided. Fig. 9, Ref. 4.

Auth.

b16.1.6.33. Analysis of the sewage sludge disposal methods. /N. Serpokrylov, V. Borisova, N. Kondakova/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. b161-b164. – rus.; abs.: geo., eng., rus.

Waste is collected in the process of sewage treatment carried out by waste treatment facilities. One of the major sources of waste is sewage sludge that could serve as a recoverable resource under the correct approach. Valuable constituent content (organics) allows sewage sludge to be used as a fertilizer in the agricultural sector. Also studies have shown that activated sludge contains a considerable amount of vitamin B12. It is a source of essential amino acids (required for animal nutrition), with the exception of methionine. Along with that, activated sludge is characterized by considerably high total nitrogen content within protein. And since a certain group of plastic products is made of proteins, this type of waste can be used as a cheap raw material. Thus, improvement of existing solutions and development of new ones, aimed to reduce negative environmental effects, are becoming more and more topical issues due to the toughening of the environmental standards for sewage sludge utilization. Ref. 5.

Auth.

b2. ENGINEERING AND TECHNOLOGY

b2.1 Civil engineering

b16.2.1.1. Designing schemes of experimental areas of the proving ground of military vehicles on passability. /P. Dolidze, R. Kenkishvili, Z. Maisuradze, B. Mazanishvili, G. Burduli/. Science and Technologies. – 2015. – #1(718). – pp. 97-104. – geo.; abs.: geo., eng., rus.

The design data of structures assessing the passability of military vehicles for checking the parameters, which are accepted as obligatory within the North Atlantic Treaty Organization are given. The design data are selected from the proving grounds of military vehicles and the relevant documents of the USA and the Russian Federation. Tab. 2, Fig. 12, Ref. 11.

Auth.

b16.2.1.2. Improving the hydraulic circuit for cleaning from solid residues the sump area adjacent to the dressing plant JSC "Madneuli". /V. Silagadze, M. Jangidze, S. Steriakova/. – Mining Journal. – 2015. – #2(35). – pp. 31-35. – geo.; abs: geo., eng., rus.

The paper analyzed the existing layout of the equipment for washing-off and pumping solid residues from the territory adjacent to the drainage sump concentrator. The causes of its unsatisfactory performance and ways to improve it are given. The places for location of the rerlevant equipment are selected and the optimal size of the nozzle is calculated. A device for the resuspension of sediments deposited in drainage sumps is developed and the desired water flow for resuspension is determined. Fig. 3, Ref. 8.

Auth.

b16.2.1.3. On the optimal distribution of trucks for the transportation of ore. /N. Iashvili/. – Mining Journal. – 2015. – #2(35). – pp. 52-54. – geo.; abs: geo., rus., eng.

In mining and processing industries an optimal distribution of vehicles in mines and quarries is important. In ore transportation an optimal distribution of tipper trucks is the main topic. Often motor road freight transport is the main and

sometimes the only form of transportation from the extraction to the processing place or to the customers. Usually technological motor transport is gathered in a sub-unit of the factory, which purpose is to ensure stable and rhythmic work of transport, to reduce the cost of transportation and help mines, quarries and concentrating mills with transportation service. Fig. 1, Ref. 4.

Auth.

b16.2.1.4. Device determining the mass of cargo trolley cableway. /N. Iashvili/. – Mining Journal. – 2015. – #2(35). – pp. 54-56. – geo.; abs: geo., rus., eng.
The article deals with a new device making possible to determine the weight of cargo in cableway cars. In order to prevent the the influence of the cables' weight, a special platform, which will lift the trucks while weighing the cargo, is proposed. Fig. 4, Ref. 4.

Auth.

b16.2.1.5. Analysis of the continious regime use in the enteprises of mining industry. /N. Molodini, G. Machaidze, R. Molodini/. – Mining Journal. – 2015. – #2(35). – pp. 57-59. – geo.; abs: geo., rus., eng.
The article deals with the development of a method of determining the preferential transport means given the main parameters of transport machines of the continuous and cyclic regime. Its is established that in any case a belt conveyor shud be used for transporting loose and lump cargo, which is highly productive and can ensure high level of automation. Ref. 4.

Auth.

b16.2.1.6. Technical safety requirements to transport and electrotechnical installations of concentrating, sorting and sintering plants of ore and non-metallic mineral resources. /A. Bezhanishvili, D. Talakhadze, A. Abshilava/. – Mining Journal. – 2015. – #2(35). – pp. 81-84. – geo.; abs: geo., rus., eng.
Technical safety requirements to railway and automobile transport, ropeways, receiving, charging and unloading equipment, hoppers, as well as conveyers and other types of continuous transport of concentrating, sorting and sintering plants of ore and non-metallic mineral resources are given. General safety requirements upon exploitation of electrotechnical installations with voltage of 1000 and over 1000 volt are considered. Supplementary measures of safety for use of electric lighting, mobile electric devices, electric furnaces, means of communication, signaling and automation are described. Ref. 1.

Auth.

b16.2.1.7. Analysis of fatal fires in short road tunnels and their prevention measures. /O. Lanchava, G. Nozadze, N. Arudashvili/. – Mining Journal. – 2015. – #2(35). – pp. 85-89. – geo.; abs: geo., eng., rus.
The work reviews examples of accidents during fire in short worldwide tunnels. The danger of fire in short tunnels, where the installation of mechanical ventilation is not necessary, is oulined. After the example of developed countries, the necessity of arrangement of emergency ventilation in short tunnels is justified; offered are the measures of fire prevention in short tunnels, among which the following should be noted: modernization of infrastructure of tunnels; its equipment with emergency ventilation and with instrumentation; training of staff training and rescuers; conduct of training for improving actions during emergencies, etc. Fig. 2, Ref. b16.

Auth.

b16.2.1.8. A new fuzzy model of the vehicle routing problem for extreme conditions. /G. Sirbiladze, B. Ghvaberidze, B. Matsaberidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 45-53. – eng; abs: eng., geo.
Under extreme and uncertainty conditions the difficulty of vehicle movement between different customers cause the imprecision of time of movement and the uncertainty of feasibility of movement. In this paper this uncertainty is presented by a possibility distribution. A new multiple criteria fuzzy optimization approach for the solution of the vehicle routing problem is constructed. A new subjective criterion – maximization of feasibility of movement on closed routes is constructed. The problem is reduced on the min-max type bicriteria fuzzy partitioning problem for the so called promising routes. For the numerical solution of the scaling model Christofides exact algorithm is realized. To illustrate the results of the constructed new fuzzy approach, a numerical example is presented. Tab. 4, Fig. 1, Ref. 15.

Auth.

b16.2.1.9. The possibility of work of unreinforced masonry on eccentric compression. /Sh. Bakanidze, L. Zambakhidze/. GEN. – 2015. – #4. – pp. 71-75. – geo.; abs.: eng.
A possibility of the work of unreinforced walls of stone-work buildings on the load of crossbar constructions of the ceiling is considered. It was established that at small load and span it is possible to use unreinforced masonry by choosing the appropriate geometric design of the ceiling. Fig. 5, Ref. 2,

Auth.

b16.2.1.10. Dynamic comfortability of buildings under the wind effect. /I. Urushadze/. GEN. – 2015. – #4. – pp. 76-79. – geo.; abs.: eng.
The paper deals with the dynamic comfortability of a building under the wind effect. It is established that the wond load modeling is necessary for any type of building in order to check it for the II limit state. It is recommended to take into consideration the requirements of ISO 10137 and SNIP (Building Regulations) 2.01.07-85. Fig. 6, Ref. 6.

Auth.

b16.2.1.11. Building explanatory dictionary as paradigmic model of development of construction field. /T. Khmelidze, G. Gureshidze, K. Khmelidze, T. Vanishvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 114-122. – geo.; abs.: geo., eng., rus.

The value and significance of the building explanatory dictionary for Georgian population, inparticlar for buiders are outlined. The interest of the country's population in the relevant normative, reference and educational literature is underlined. The paradigm model, contents and structure of the explanatory dictionary compiled by the building faculty staff is presented. Ref. 3.

<div align="right">Auth.</div>

b16.2.1.12. Constructive solution of antilandslide retaining wall with ground anchors. /Sh. Bakanidze, N. Mskhiladze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 21-29. – geo.; abs.: geo., eng., rus.

The following constructive solution of an antilandslide monolithic reinforced retaining wall with ground anchors is proposed; groundanchors are arranged in two tiers – both at the upper side of the wall and at the place of its fixation to the foundation. Ground anchors are perceived as an overturning moment, as well as shearing force, originated from the pressure of ground on the wall. Two options of the above mentioned constructive solutions are performed: without pilasters (columns) and with the pilasters. Based on the technical and economic computation, the favorable constructive solution is identified. Tab. 5, Fig. 7, Ref. 5.

<div align="right">Auth.</div>

b16.2.1.13. Justification of the use of soil reinforced protective structures upon construction of modile diversion micro powerstation in the North Caucasus. /D. Kasharin/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 81-86. – rus.; abs.: geo., eng., rus.

The article considers the problems of justification of the use of a diversion micro-HPP for reserve water supply and standby power service of harbor installations in North Caucasus region. Calculation methods for reinforced ground structures used as water retaining structures and facilities engineering protection are considered. The experimental results of facial skins of the retaining structures are given. Fig. 4, Ref. 5.

<div align="right">Auth.</div>

b16.2.1.14. Defects in masonry of load-bearing walls upon construction of modern high-rise skeleton-type buildings. /V. Subbotin, I. Subbotin/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. b165-b168. – rus.; abs.: geo., eng., rus.

The article presents the results of an analysis of the causes that condition defects o masonry in the exterior load-bearing walls of high-rise structural steelwork apartment houses. Fig. 5, Ref. 9.

<div align="right">Auth.</div>

b16.2.1.15. Risk management in building complexes. /A. Subbotin, S. Chutchenko/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. b169-173. – rus.; abs.: geo., eng., rus.

The work introduces the concept of geotechnical monitoring of construction, reconstruction and existing buildings and structures, which managed all the risks and ensured their safety and safe operation. Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.2.1.16. Problems of development of floating wave energy mitigation hydrological structures and their placement in the sea for protecting the Georgian section of the Black Sea coastline. /A. Prangishvili, Z. Tsikhelashvili, N. Chkheidze, P. Giorgadze, Yu. Kadaria/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 183-190. – geo.; abs.: geo., eng., rus.

A new type of floating wave energy mitigation hydrotechnical facilities and the results of its testing under laboratory conditions are presented. Given are the preliminary data concerning the placement of wave energy mitigation facility units in the littoral area, which make possible to protect the coastal area from the storm waves and washing off. Fig. 6, Ref. 6.

<div align="right">Auth.</div>

b16.2.1.17. Analysis of modern concept of cleaning surface water in the waterworks. /E. Khetsuriani, L. Fesenko/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 218-220. – rus.; abs.: geo., eng., rus.

The article is devoted to the reliability of operation of water intake facilities that affect the assurance level and the flow characteristics in the watercourse in the sites of water intakes that may be established by calculation or by construction of regulating structures. Ref. 3.

<div align="right">Auth.</div>

b2.2 Electrical engineering, electronic engineering, information engineering

b16.2.2.1. Realization of the digital unit of the delay on discrete elements in the calibrator of the large dc. /L. Gvaramadze, O. Labadze, N. Kavlashvili, P. Stavrianidi, T. Saanishvili, G.Kiknadze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 59-63. – geo.; abs.: eng., rus

The typical structure of a laboratory source (calibrator) of a large direct current with high metrological characteristics is described. Negative sides of realization of the main unit of a delay are shown by analog methods. In particular, the element ordering the delay (variable resistance) doesn't give an opportunity to register its meaning by positioning of the handle of a potentiometer precisely. The amount of a delay not linearly depends on change of resistance of a potentiometer; the RC parameters of a chain giving the amount of the delay depend on a number of external factors like temperature, aging, etc. An option of realization of the digital block of a delay on discrete digital elements which is free

from the listed shortages is offered. The electric scheme of the device and time charts for an illustration of the block functioning principles is provided. Fig. 3, Ref. 2.

Auth.

b16.2.2.2. The formation and optimization of a joint trajectory for the industrial polyarticulated robot. /D. Purtskvanidze, O. Labadze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 64-67. – geo.; abs.: eng., rus.
Optimal control of industrial robots is a challenging task because of the physical restrictions. An alternative solution of the problem is its division into two parts: the selection of the optimal trajectory before the movement and regulation of the movement along the selected trajectory during operation of the manipulator. The trajectory can be obtained by taking already existing solutions. Planning of an optimal trajectory is achieved at the level of joints. Fig. 1, Ref. 2.

Auth.

b16.2.2.3. Determining parameters of a generalized model of the automated management system of a techno-dynamic complex of Georgian wine production. /T. Kapanadze, N. Lomidze, N. Chalidze, L. Gurbeleishvili/. Automated Control Systems. – 2015. – #2(20). – pp. 73-78. – geo.; abs.: geo., eng., rus.
The task of technologies is to identify and establish different regularities during the processes of transition of the utilized resources from one type to another. Given the above, technological processes represent a complex system. As it is known, simulation/modeling of complex systems is associated with a number of problems, such as a multilevel hierarchic structure, large dimensions of the parameters of realizable models, etc. The work, based on the technology theory, the principle of decomposition is considered, which consists in the following: the complex system is being artificially divided into subsystems, with preserving the autonomy of individual systems, simulation of these autonomous subsystems (elements) and establishment of a connection between them. The methodology of finding parameters of the above-mentioned connections on the basis of the identification and system simulation theory is discussed.Fig. 2, Ref. 7.

Auth.

b16.2.2.4. On implementation of some methods of the symmetric cryptography system. /V. Kekelia, G. Kotri-kadze/. Automated Control Systems. – 2015. – #2(20). – pp. 79-84. – geo.; abs.: geo., eng., rus.
The article deals with some of the methods for the realization of practical issues in cryptography. In particular, it is dedicated to the well-known symmetric methods (Cezar, Vijiner and Vernam) algorithms selling model in the form of an abstract idea and the realization of their hardware. Proposed is the mathematical apparatus, which is based on the concept of computer algebra system – operator algebra and conditional algebra, in the terms of which different algorithmic processes can be described. Fig. 2, Ref. 3.

Auth.

b16.2.2.5. Data clustering using particle swarm method. /P. Petashvili/. Automated Control Systems. – 2015. – #2(20). – pp. 85-89. – geo.; abs.: geo., eng., rus.
Clustering aims at representing large datasets by a fewer number of prototypes or clusters. It brings simplicity in modeling data and thus plays a central role in the process of knowledge discovery and data mining. Data mining tasks, in these days, require fast and accurate partitioning of huge datasets, which may come with a variety of attributes or features. This, in turn, imposes severe computational requirements on the relevant clustering techniques. A family of bio-inspired algorithms, well-known as Swarm Intelligence (SI) has recently emerged that meets these requirements and has successfully been applied to a number of real world clustering problems. This paper explores the role of SI in clustering different kinds of datasets. It finally describes a new SI technique for partitioning any dataset into an optimal number of groups through one run of optimization. Computer simulations undertaken in this research have also been provided to demonstrate the effectiveness of the proposed algorithm. Fig. 4, Ref. 5.

Auth.

b16.2.2.6. Proper design of the links on the site. /N. Lomidze/. Novation. – 2015. – #b16. – pp. 72-75. – geo.; abs.: geo., rus., eng.
The purpose of the article is to show the user the possible options of links' design and their selection advantage. Properly designed link is a guarantee that the visitor intuitively understands what will happen when you click or hover over a particular link. Every site owner draws links differently, be it dots, dash lines or firm lines. The different signal system at different sites leads to unpredictable results, i.e, nobody knows what will happen when you click on a particular link. Based on the article, such non-essential point as reference design can significantly simplify the lives of your potential customer. He will be pleased to find that all links on your site are predictable and pressing or referring to them yields the desired result. Ref. 1.

Auth.

b16.2.2.7. Effective elements of business communication by e-mail. /N. Shakaia/. Novation. – 2015. – #b16. – pp. 76-79. – geo.; abs.: geo., rus., eng.
The aim of the article is to familiarize the reader with the best elements of business communication by e-mail, write a non-verbal communication through letters correctly and properly. The article details how to ensure proper business communication, which requires the use of the following elements: address, subject, text files and e-mail. Ref. 3.

Auth.

b16.2.2.8. Analysis of the international practice for the solution of electric power quality problems in electric supply systems. /G. Mtvarelishvili/. GEN. – 2015. – #4. – pp. 67-70. – geo.; abs.: eng.
The analysis of the international practice for the solution of electric power quality problems in electric supple systems shows that electric power quality problems in the EU are solved by the EU legislative measures. In European electric

supply systems the owner of the electricity network has the right to fix the permissible limits of harmonics in the electricity supply system for each powerful electric customer based on *Distribution Network Code*. The customer is obliged to take the organizational-technical measures for limitation of harmonics in in the electricity supply system. Ref. 8.

Auth.

b16.2.2.9. Production and research of cable trenches from fibro-concrete. /D. Nozadze, P. Ejibia, S. Mebonia, D. Demetradze, G. Gogoladze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 129-135. – geo.; abs.: geo., eng., rus.

The manufacturing techniques of cable trenches from fibro-concrete are considered. The technique of determination of their sizes is offered. Calculation of operating loadings is executed after the example of a trench of concrete sizes. It is established that the products produced by these technology can be used in road construction. Fig. 3, Ref. 3.

Auth.

b16.2.2.10. Technological model of automation of technical maintenance and technical diagnostic processes "according to the state". /N. Mukhigulashvili, V. Kupradze, G. Benashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 156-b163. – geo.; abs.: geo., eng., rus.

The main direction of development of the maintenance system is the automation of many maintenance operations that is based on the application of automation means of technical diagnostics. The continuous automatic control systems of technical diagnostics and monitoring of railway automation and telemechanics' devices would be created by integration of continuous technical diagnostics and channel creating systems (for example, dispatch control systems). Thanks to human participation in the process of diagnosing, outlined are manual, automated and automatic diagnostic systems. The system is more perfect as lower is the human factor in the outcome of diagnosis. Therefore, the development of technological model for automation of technical maintenance and technical diagnosis "according to state" is very relevant. Tab. 1, Ref. 6.

Auth.

b16.2.2.11. Research of elements with the highest failure probability of railway automatics and robots. /N. Mukhigulashvili, V. Kupradze, G. Benashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. b164-171. – geo.; abs.: geo., eng., rus.

The track circuits carry out not only railway spans control for freeness and continuity, but also provide the proper operation of the other facilities of railway. Thus, the transportation process is highly dependent on reliable operation of them. For evaluating the functioning quality of track circuit's elements it is necessary to research and determine the quantitative indicators of reliability on the failures statistical data base. For more detailed analysis of faults of insulating joints by means of the statistical and emperical data of the failures of the railway automation and robots during 5 years, failure curves were built for the case of distribution of failures of the insulating joints according to months. It was investigated and found that the functional dependency of independent variables by months of the year and the dependent variable of insulating joints failures has the value of a regression function. Fig. 4, Ref. 6.

Auth.

b16.2.2.12. On the issue of development of a transport automatic control system. /M. Elizbarashvili, P. Elizbarashvili, K. Mchedlishvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 195-199. – geo.; abs.: geo., eng., rus.

The article considers the features of establishments of an automated control system of transport as a large (cyber) that is particularly likely to occur during the operation of a motor vehicle with sharp fluctuations of the "environment". In terms of improvement of the operational conditions, the necessity of functioning of a service (subsystem) for obtaining by drivers of additional information about electronic and radio (radiolocation) signals caused by bad weather or restricted visibility on road elements is substantiated. These measures should lead to a safe traffic and reduction of road construction and operating costs. Ref. 5.

Auth.

b16.2.2.13. Static converters on IGBT transistors for feeding field coils of dc electric locomotive traction motors in the recuperation mode. /C. Karipidis, G. Sanikidze, Yi. Skhirtladze, G. Margvelashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 230-242. – rus.; abs.: geo., eng., rus.

The article describes major shortcomings of existing recovery schemes of dc electric VL10 and VL11 locomotives where the field coils of traction motors are fed by a rotary transducer. Described are the schemes of static converters using ordinary thyristors and some schemes using IGBT transistors. It is noted that the replacement of rotary converters with static ones greatly simplifies the transition of electric locomotives motors in the regenerative mode. The paper proposes a scheme of high-speed static converter that also replaces the rotating transducer and that by all its basic parameters is superior to all existing converters. Fig. 6, Ref. 3.

Auth.

b16.2.2.14. Comparative calculation of key indicators of the real curves of phase voltages of asynchronous motors powered by a three-phase voltage inverter. /S. Karipidis, J. Sanikidze, I. Skhirtladze, G. Margvelashvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 25-32. – rus.; abs.: geo., eng., rus.

The article considers the processes taking place in the real three-phase power supply system of an asynchronous traction motor supplied by the three-phase voltage inverter. A comparative calculation of key indicators, such as the amplitude of the first harmonic, total harmonic distortion, etc. for real curve of phase voltage and the proposed two-stage optimal curve is carried out. Also indicated are shortcomings of the real curve of three-phase three-pulse phase voltage. As a result of calculation, the low value of the first harmonic amplitude $0,4718E_d$ against $0,5621E_d$, on the large value of harmonic ratio $K_r=0,6987$ against 0.2202. is indicated. Fig. 2, Ref. 4.

Auth.

b16.2.2.15. Characteristics of traction asynchronous motor powered by the voltage inverter. /S. Karipidis, J. Sanikidze, Yi. Skhirtladze, G. Margvelashvili, A. Khachidze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 33-44. – rus.; abs.: geo., eng., rus.

The article presents comparative calculations of the characteristics of asynchronous traction motor that is supplied by the inverter voltage. Calculations were carried out for three cases of power supply: a) for a pure sinusoidal voltage. b) in order to form voltage pulses in PWM, and c) for two-stage voltage optimum shape. Dependencies between the torque and active capacity from sliding and rpm are calculated for the above-mentioned three cases of voltage. Tab. 5, Fig. 3, Ref. 5.

<div align="right">Auth.</div>

b16.2.2.16. Mobile special-purpose robotic complexes. /R. Partskhaladze, V. Margvelashvili, S. Sharashenidze, I. Zakutashvili, N. Bashaleishvili/. Science and Technologies. – 2015. – #1(718). – pp. 74-85. – geo.; abs.: geo., eng., rus.

The article is concerned with the robotic sphere. Robots are used to perform various types of repair, recovery and rescue operations under emergencies on the ground, as well as in cases of accidents, natural disasters and their consequences. In recent years, robots have been used in almost all areas of human activity. The robots are designed to replace the person in cases, where the task is beyond human capabilities, or subject to excessive threat to health and life. Mobile robots are universal and therefore can be used in various fields. With regard to the use of robots for military purposes and in emergency situations, the robots are given priority for technical capabilities, suitability for use in difficult and extreme conditions and have the ability to ensure the protection of staff. At present time, a large number of mobile robots have been created. The article considers different options of mobile robotic systems manufactured in different countries. The design of such robot constructed in Georgia is also described. Tab. 1, Fig. 6, Ref. 5.

<div align="right">Auth.</div>

b2.3 Mechanical engineering

b16.2.3.1. Walking machines – off-roader transport. /V. Margvelashvili, M. Ghlonti, S. Sharashenidze, I. Zakutashvili, R. Partskhaladze/. Science and Technologies. – 2015. – #1(718). – pp. 66-73. – geo.; abs.: geo., eng., rus.

The problems of development of cross-country mobile machinery, in particular the walking machines are considered. A short history and the current condition of such machinery are given. Fig. 9, Ref. 5.

<div align="right">Auth.</div>

b16.2.3.2. Development of optimal brake leverage transmission of four-axle rail-cars. /S. Sharashenidze, V. Margvelashvili, R. Partskhaladze, I. Zakutashvili/. Science and Technologies. – 2015. – #1(718). – pp. 86-90. – geo.; abs.: geo., eng., rus.

Modern rail-cars, including a four-axle freight rail-car, are equipped with complex braking linkage transmissions and many joint connections. As a result, the losses of power from the brake cylinder to overcome the frictional forces in these connections increase and the full braking effect deteriorates. The paper develops an optimum variant of this transmission with less number of rods and joint connections. The corresponding analytical expressions are obtained taking into account the external forces. Fig. 2, Ref. 7.

<div align="right">Auth.</div>

b16.2.3.3. Classification of cars and determination of the motion degree of freedom according to the motion of bogie's elements. /S. Sharashenidze, M. Ghlonti, V. Margvelashvili, R. Partskhaladze, I. Zakutashvili/. Science and Technologies. – 2015. – #1(718). – pp. 91-96. – geo.; abs.: geo., eng., rus.

According to classification of cars and mobility of bogies in three dimensional spaces the motion freedom of cars that is necessary in calculating the output parameters is determined. The basic geometric indicators of cars are given, according to which the motion freedom in the "car-railway" system is determined. Such approach gives the possibility to create a special algorithm with subprograms to detect irregularities on the rolling surface of wheel and rail head. The scheme for determining the degree of free movement for four-axle rail-cars by box spring sets is developed. Tab. 3, Fig. 1, Ref. 7.

<div align="right">Auth.</div>

b16.2.3.4. Analysis of forming of vacuum in annular slot of contact surfaces of belt convoyers drives. /N. Molodini/. Mining Journal. – 2015. – #1(34). – pp. 54-57. – geo.; abs.; geo., rus., eng.

The paper reviews the conclusions and aims of further investigations received by the analysis of vacuum creation process in annular slot of contact surfaces of known belt conveyers' vacuum-drums. It is accepted that the most favorable condition for vacuum making represents the adiabatic or hyper adiabatic expansion closed in recipients (dripping) liquid during of which the optimum value of vacuum is $P=(0.9 – 0.95) 10^5$ Pascal. Ref. 10.

<div align="right">Auth.</div>

b16.2.3.5. Increase of the locomotive tractive capacity with the use of the friction modifier in the contact zone of the wheel-rail. /I. Tumanishvili, V. Zviadauri, M. Tsotskhalashvili/. Mining Journal. – 2015. – #1(34). – pp. 57-59. – geo.; abs.; geo., rus., eng.

The problems of realization of the freightage from deep pits by freight locomotives are considered in the paper. Increase of the locomotive traction force is limited by the cohesion force between the wheel and rail. Values of the friction coefficient between a wheel and rail vary in the wide range. Therefore for obtaining a sufficient traction force they load a locomotive with the additional ballast and pour the sand on the rolling surface of the rail. As a result of this, running gear of the locomotive as well as power sub-stations and contact networks are overloaded at movement on the upgrades. Besides, pouring the sand on the rail causes abrasive wear. An alternative method of increasing and stabilizing the

cohesion force between a wheel and rail, which envisages modification of the wheel-set rolling surfaces, is proposed. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.6. Adjusted mechanical indicator of an asynchronous motor with squirrel-cage rotor. /M. Tsereteli, N. Makharashvili, M. Oniani/. – Mining Journal. – 2015. – #2(35). – pp. 28-31. – geo; abs: geo., rus., eng.
This manuscript discusses the pros and cons of the Kloss equation of mechanical oscillation of an asynchronous motor with squirrel-cage rotor. It points out that main disadvantage of the equation is a significant discrepancy between the value calculated from the formula and the value measured directly from the parameters provided by the catalog. The manuscript provides a simple empirical formula, which allows the calculations of the starting torque of the motor. Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.7. Investigation and development of modern technologies for gradient throat plates. /A. Tutberidze, T. Namicheishvili, Z. Melashvili, K. Papava, D. Macharadze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 96-102. – eng.; abs: eng., geo.
The topical problem of research and development of modern technological processes for production of gradient materials, in particular, gradient throat plates are considered in the paper. The goal of the work is to produce a two-layer armour plate consisting of high quality plates (HRC 62, KCU 0.5; 48-50 HRC KCU 0.9) with special physical and chemical properties. Such armour plates can resist the ballistic effect or any other impact. Two kinds of technologies developed for production of the two-layered armour plates with the above-said properties are described in the paper: production of armor plates by means of ultrahigh impulse pressure and by pack rolling. To this end, a complete technological cycle of production was developed including the steel smelting, casting and treatment under pressure and thermally. The two-layer plates was produced by means of ultrahigh pressure (explosion) in a classical way: the angle of explosion - 2.6^0-3.5^0; the explosive – ammonite (6ЖВ); the charge height - 35mm; detonation velocity 4.2 km/sec. The working surfaces were treated by inductive method in order to give them hardness reaching HRC 62 and HRC 48, respectively. The other way of production of the layered plates developed recently is the pack rolling. However, the pack rolling is also connected to some difficulties. In pack rolling a special metal powder is applied between the pretreated layers for better adhesion; then, the layers are packed and after heating up to 1150^0C are rolled according to the preliminary defined technology of pressing. As a result, a two-layer throat plate of HRC 62 and HRC 48 is obtained. One of the significant properties of the layer production is the adhesion strength. According to the recommendation 10885-85 of the State Standards the admissible adhesion strength should be above 147 mgpa-15 kgp/mm^2. The adhesion strength of the layers produced by the above described technology of pack rolling was 170 mgpa (17 kgp/mm^2); the adhesion strength of the layers produced by the above described technology of explosion also satisfied necessary requirements. Tab. 4, Fig. 3, Ref. 9.

<div align="right">Auth.</div>

b16.2.3.8. Formation of spherical and aspherical surfaces given the cutter's profile. /D. Shalamberidze, D. Zardiashvili, L. Avaliani/. GEN. – 2015. – #3. – pp. 51-54. – geo.; abs: eng.
The article deals with a mathematical model of shaping complex surfaces on CNC machines. In this model the cutter trajectory is calculated taking into account the profile of the optical part and the cutter profile of any complexity. This can significantly increase the accuracy of shaping of the part surfaces. Fig. 2, Ref. 2.

<div align="right">Auth.</div>

b16.2.3.9. Concerning the flying safety motivation formation of commercial pilots. /S. Tepnadze, A. Betaneli/. Air Transport. – 2015. – #2(10). – pp. 13-23. – rus.; abs.:rus., eng., geo.
The psychological motivation of the commercial pilot flying safety is being formed. For perfecting the motivation, individual work of the pilot using the autogenic training (auto-training) methods needs to be conducted This method Is based on muscular relaxation, self-inspiration and self-education. Ref. 16.

<div align="right">Auth.</div>

b16.2.3.10. The colour contrast system of presenting the radio meteorological data according to the flight safety criteria. /A. Apkhaidze, M. Mamsirashvili/. Air Transport. – 2015. – #2(10). – pp. 24-28. – rus.; abs.:rus., eng., geo.
The results of the research of the outcomes of presenting the automated weather radiolocation data are given. The criteria of the possibilities of development of convective clouds according to the radiolocation reflectiveness for Tbilisi Airport area are proposed. Ref. 7.

<div align="right">Auth.</div>

b16.2.3.11. On metal fatigue. /G.Tsirekidze, S. Bliadze, U. Dzodzuashvili, A. Gogolidze/. Air Transport. – 2015. – #2(10). – pp. 29-41. – rus.; abs.: rus., eng., geo.
The article discusses types of external loads, the action of which gives rise to the phenomena of fatigue; the methods to assess the fatigue resistance given the multi-axial effect of the load cycle's asymmetry and tension character are presented. The methods allowing in the case of isotropic materials to construct EN and SN fatigue curves and to establish the structure's life are given. Tab. 1, Fig. 10, Ref. 6.

<div align="right">Auth.</div>

b16.2.3.12. Dependence of the energy-gap width on the concentration of shallow impurities in semiconductors with tetrahedral symmetry. /K. Davitadze, Z. Gogua, G. Kantidze, T. Minashvili/. Air Transport. – 2015. – #2(10). – pp. 42-49. – eng.; abs.: eng., geo., rus.

According to the common model of the impurity center, the dependence between the energy-gap width and concentration of impurity is calculated in this paper. The individual role of impurities in decreasing the energy-gap width is shown. There is a good correspondence with the experimental results. Fig. 2, Ref. 14.

<div align="right">Auth.</div>

b16.2.3.13. Improvement of the system utilizing the heat of exhaust gases of the Mi-8 helicopter turbo-shaft engine. /A. Maisuradze, L.Robakidze, N. Kanchaveli/. Air Transport. – 2015. – #2(10). – pp. 50-62. – rus.; abs.: rus., eng., geo.
The possibility of using the system utilizing the heat of exhaust gas of the Mi-8 helicopter turbo-shaft engine for the needs of the existing heating, anti-freezing and conditioning systems is considered. Tab. 1, Fig. 7, Ref. 4.

<div align="right">Auth.</div>

b16.2.3.14. Combustion chambers of a gas turbine engine with low emission of harmful substances. /K. Broladze, Z. Jangulashvili**/.** Air Transport. – 2015. – #2(10). – pp. 63-74. – rus.; abs.: rus., eng., geo.
The development of the combustion chambers of gas turbine engines with low emission of harmful substances for the last 35-40 years is considered. Tab. 2, Fig. 9, Ref. 5.

<div align="right">Auth.</div>

b16.2.3.15. Automated (computer) support and decision-making system of flight control. /T. Kapanadze, L. Badenashvili/. Air Transport. – 2015. – #2(10). – pp. 75-82. – rus.; abs.: rus., eng., geo.
The paper views service of dispatch management and Service of Information Support (SOIS). In general, the SOIS dispatcher is the airplane's crew member "on land". The structure of an automated (computer) support and decision-making system (SDMS) is proposed. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.16. Some issues of investigating the validity of an operator in management ergative systems. /S. Khoshtaria, K. Bareladze**/.** Air Transport. – 2015. – #2(10). – pp. 83-89. – rus.; abs.: rus., eng., geo.
The article deals with the investigation of validity of an operator's action in management ergative systems. The ways to enhance the effectiveness of ergative processes, including aviation are proposed. Ref. 4.

<div align="right">Auth.</div>

b16.2.3.17. The enhancement of ergative system's reliability. /S. Khoshtaria, Ts. Khoshtaria, K. Bareladze/. Air Transport. – 2015. – #2(10). – pp. 90-96. – rus.; abs.: rus., eng., geo.
The article deals with the issues of enhancing the aviation ergative system's reliability. The improvement of the ergative system management using training techniques is proposed. Fig. 3, Ref. 4.

<div align="right">Auth.</div>

b16.2.3.18. An approach to solve the problem of vortex wake and flight safety. /T. Kapanadze, I. Paitchadze/. Air Transport. – 2015. – #2(10). – pp. 97-106. – rus.; abs.: rus., eng., geo.
The work surveys the promising directions of research and development in the field of air traffic management. Much attention is paid to the questions of use of mathematical models for planning, optimization and adjustment of flight, warnings and prevention of conflict situations on the ground and in the air, including a system for solving the problem of vortex wake and flight safety. Tab. 1, Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.19. Scientific rationale of approaches to risk asessment of the interaction of airlines with financial institutions. /V. Lototskyy/. Air Transport. – 2015. – #2(10). – pp. 107-114. – eng.; abs.: eng., geo.
The article considers typical risks arising in the process of interaction of modern airlines with financial institutions; the basic categories of such risks are proposed. The methodical approach to the risk management and ways to minimize risks in the banking system are discussed. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.20. Improving the aircraft servicing quality. /N. Dumbadze, G. Imedashvili, A. Noniadze/. Air Transport. – 2015. – #2(10). – pp. 134-140. – rus.; abs.: rus., eng., geo.
The aircraft servicing quality Improvement indicators are one of the key elements in the development of air transport. An analysis of aviation accident causes showed the following factors influencing the flight security: aircraft's design; personnel training and qualification level; quality of servicing. Improvement of the aircraft servicing quality substantially conditions the efficiency of the use of fixed assets in civil aviation. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.21. A.B. Shiukov (Shiukashvili) – the author of the unique German-Russian Aviation and Aeronautics Dictionary. /A. Betaneli/. Air Transport. – 2015. – #2(10). – pp. 157-b162. – rus.; abs.: rus., eng., geo.
One of the first aviators of Georgia created the unique illustrated German-Russian aviation and aeronautics dictionary published in 1937. The dictionary gave opportunity to receive the important information on the achievements of the Nazi Germany in the field of aviation. The creative development of this information gave opportunity to establish more combat-ready Soviet military aviation. Ref. 9.

<div align="right">Auth.</div>

b16.2.3.22. Theoretical bases for calculation and increase of the reliability of modern agricultural technology, using resource-saving technologies for restoring worn parts. /J. Katsitadze, Sh. Chalaganidze, G. Kutelia, J. Abuladze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 148-153. – geo.; abs.: geo., eng.

The theoretical bases for the calculation of individual and complex indicators of reliability of agricultural machinery are given, using modern mathematical methods. Agricultural machinery is considered as a repairable object of study and the main directions of improving its reliability are indicated by using the resource-saving technologies of worn-out parts. Fig. 5, Ref. 6.

<div align="right">Auth.</div>

b16.2.3.23. Selection of a standard tractor and calculation of the conversion factor in order to determine the total scope of mechanized agricultural works. /E. Shapakidze, G. Mosashvili, G. Chitaia, R. Japaridze, K. Bodzashvili, A. Giorgadze, M. Mosashvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 154-157 – geo.; abs.: geo., eng.

For the evaluation of mechanized works in contemporary agricultural production, the system of standard hectares is taken and on the basis of the relevant calculation a standard reference tractor ARES-577 manufactured by CLAAS Company is selected. Given the above, the conversion factors for converting modern physical tractors into the standard ones are calculated and presented as a table. Using these factors, you can determine the number of standard hectares for the individual operations, which sum represents the total volume of all mechanized works, which makes it possible to define the number and nomenclature of desired machinery. Tab. 2, Ref. 5.

<div align="right">Auth.</div>

b16.2.3.24. Device for peeling silk cocoons and analysis of its work. /E. Shapakidze, V. Miruashvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 158-b163. – geo.; abs.: geo., eng.

The paper reviews the silk cocoon peeling devices and their designs. An analysis of their operation made, shortcomings are identified and a new schematic diagram of a facility for eliminating these shortcomings is proposed, which can be used both for large amounts of cocoons as well as under conditions of a small household farm. Fig. 6, Ref. 6.

<div align="right">Auth.</div>

b16.2.3.25. Definition of ergonomic properties of mountain self-propelled chassis and derivation of its frame vibration equations. /I. Lagvilava, R. Khazhomia, B. Basilashvili, L. Gvalia/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. b164-b169. – geo.; abs.: geo., eng.

The article deals with generalized ergonomic indicators of a mountain self-propelled chassis. The dependence of the general arrangement of the chassis on its individual design features is given. A relationship between partial and angular vibrations and their calculation equations are identified. Also defined is that vibrations of the front and rear axes are interconnected, and the frequency of these vibrations is equal to the frequency of free vibrations. Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.26. Interaction of the undercarriage of a mountain self-propelled chassis with the soil based on the rheological models. /R. Makharoblidze, I. Lagvilava, R. Khazhomia, B. Basilashvili/. Annals of Agrarian Science. – 2015. – v. 13. – #3. – pp. 61-69. – eng.; abs: eng., rus.

The work gives a mathematical model of interaction of the undercarriage of mountain tandem-wheeled self-propelled chassis with the soil. A rheological model of Voigt and principal law of linear deformation are used as the deformation law of soils. A calculation formula for the soil deformation by considering the relative location of the front steering and rear driving tandems wheels is deduced. The soil deformation by ordinary biaxial and experimental undercarriages is compared. Ref. 4.

<div align="right">Auth.</div>

b16.2.3.27. Optimal design of a frame. /B. Gvasalia, D. Jankarashvili, T. Kvachadze, I. Mekvabishvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 93-101. – geo.; abs.: geo., eng., rus.

The design of a frame consisting of rectangular hollow beams is considered. The design is subject to the forces applied to discrete points along each rod. The method of optimal design parameters of the frame is worked out as an element of spatial construction. It uses the finite element method and the method of searching for the global extremum of objective unction. The composed matrix of individual elements and the system as a whole are used. As the objective function, the volume of the frame is used. The task is to find the size of the cross section of each frame member, which minimizes the volume while meeting the equilibrium limitation, as to the voltage and the variables of designing. Fig. 2, Ref. 4.

<div align="right">Auth.</div>

b16.2.3.28. Method of increasing the efficiency of a solar power sorption refrigerating plant. /T. Megrelidze, T. Isakadze, G. Gugulashvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 102-108. – geo.; abs.: geo., eng., rus.

An increase in the efficiency of a sorption cyclic refrigerating system working on the solar energy is discussed. A scheme of an experimental refrigerating unit is given; the reactions of ammine formations and physical and chemical model of the processes of dry absorption-desorption are described. A comparative characteristic of different operating pairs-sorbent and refrigerant used in the units is presented. The use of flat mirror concentrators focusing solar energy on the triangular reactors of generator-absorber in the solar receiving parts of the unit is examined. Fig. 4, Ref. 6.

<div align="right">Auth.</div>

b16.2.3.29. An innovation method for reducing energy consumption of frost-free refrigerators. /T. Megrelidze, T. Isakadze, G. Gugulashvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 109-113. – geo.; abs.: geo., eng., rus.

The article deals with the topical problem increasing economic performance of household refrigerators through modernizing their condenser design. In particular, the matter concerns transformation of usual condensers into an evaporation type condenser, which can serve as a basis for reducing the refrigerator's metal weight in parallel with improving its power characteristics. Fig. 3, Ref. 5.

<div align="right">Auth.</div>

b16.2.3.30. Issues of design, installation and operation of attractions/side-shows in terms of their safety. /A. Bezhanishvili, M. Shilakadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 95-104. – geo.; abs.: geo., eng., rus.
The requirements to the materials used for welding the steelwork structures for attractions and their units are considered. The measures necessary for safe operation, maintenance, repair, diagnostics and testing of attractions, parameters of evacuation passages, balconies, stages, galleries and stairs of buildings and constructions are given. Problems of lighting, heating and ventilation of tents–pavilions are considered together with the general requirements to putting into operation and technical examination of attractions. Ref. 2.

<div align="right">Auth.</div>

b16.2.3.31. Calculation of errors of the position, velocity and acceleration of the links of a spherical mechanism with clearances. /A. Talakvadze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 159-b164. – geo.; abs.: geo., eng., rus.
The article analyzes the position, velocity and acceleration of application of links of spherical mechanism with clearances by the linear theory of errors. The calculation of errors is carried out following the calculation of additional motions of the mechanism by differential equation. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.3.32. Issues of increasing the resource of heavily loaded cageless friction bearings' resource. /T. Chkhaidze, G. Japaridze, L. Gogoladze, D. Gongladze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 91-99. – rus.; abs.: geo., eng., rus.
The possibilities of increasing the resource capacity of cageless bearings are considered; a survey of the tower portal crane under service conditions is made. The possible arrangement of rollers that causes extreme conditions is computer-simulated. The impact of clearance between the rollers in the needle and roller bearings on the depreciation degree of contact surfaces is considered. The technological suggestions for improvement of their capability and reliability are offered. Fig. 4, Ref. 7.

<div align="right">Auth.</div>

b16.2.3.33. Compilation of tractor skidding coefficient regression equation by specific traction force. /R. Tskhvaradze, G. Archvadze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 69-73. – geo.; abs.: geo., eng., rus.
Using the probability statistical method, in particular compilation of a mathematical model of the tractor skidding coefficient by the regression equation in relation to the specific traction force is given. Introduction of the traction specific force makes it possible to is possible to express dependence of the skidding coefficient of specific tractor type (wheel, caterpillar) in the analytical form for specific soil layer. Tab. 3, Fig. 1, Ref. 2.

<div align="right">Auth.</div>

b16.2.3.34. Issues of the application of individual resource of the freight-cat truck/bogie stile edges and bolsters. /D. Kbilashvili, T. Grigorashvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 114-120. – eng.; abs.: geo., eng., rus.
Freight cars are equipped with 18-100 model bogies, having standard service life. Upon expiry of said service life, the lateral and truck bolsters need to be removed from service which in turn impedes the effective use of the car fleet. Hence study of individual resources of the lateral supports and bolsters of the freight-car truck becomes rather urgent. Tab. 1, Fig. 1, Ref. 8.

<div align="right">Auth.</div>

b16.2.3.35. Necessary conditions for improving the reliability of carriages' axle-boxes. /Z. Paturashvili, T. Grigorashvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 121-126. – eng.; abs.: geo., eng., rus.
Technical serviceability and reliability of carriages greatly influences the safe traffic of trains. Axle-boxes are the constituent parts of carriages, through which the loads from the car body are transferred to the wheel pair journal neck and then to the rail. The axle-boxes will ensure normal running of the wheel pair journal neck under service conditions. The axle-boxes accommodate bearings, the selection and adjustment of which is carried out by various tools, during which the human factor plays a rather significant role. To improve the reliability of axle-boxes, the necessary condition is the selection of parameters of the journal neck and inner ring of the bearing by means of modern electronic equipment, excluding the human factor. Tab. 1, Ref. 11.

<div align="right">Auth.</div>

b16.2.3.36. Determining performance exploitation of longitudinal digging excavator's working body. /D. Natroshvili, Z. Lobzhanidze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 144-147. – geo.; abs.: geo., eng., rus.
It is established that by using the presented methods methodic and taking into account concrete soil and relief conditions, the basic performance of an active workable pipe trenching car can be determined. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b2.4 Chemical engineering

b16.2.4.1. Investigation of the process and conditions of manganese carbonate ore leaching by the nitric acid method. /T. Rokva , T. Chakhunashvili , D. Dzanashvili, N. Butliashvili, M. Dadunashvili, L. Rokva/. Mining Journal. – 2015. – #1(34). – pp. 32-36. – geo.; abs.; geo., rus., eng.

The process of manganese carbonate ore leaching by the nitric acid method is studied. The effect of temperature, process duration, acid concentration and stirring intensity on the leaching process, as well as manganese recovery degree are established. By selection of leaching conditions (granulometry of crushed ore, pH of leaching, acidity, temperature of solution, stirring conditions) is reached the high degree of manganese recovery in the solution. Tab. 2, Ref. 6.

Auth.

b16.2.4.2. Some questions of cyanide leaching process of gold containing sulphide ores by Albion process technology. /N. Jikia ,N. Dolidze, D. Talakhadze, A. Abshilava,Z. Arabidze, D. Tevzadze, G. Gelovani/. Mining Journal. – 2015. – #1(34). – pp. 36-38. – geo.; abs.; geo., rus., eng.

The paper considers chemical mechanism of gold cyanide leaching process from sulphide ores by the Albion process technology. Gold leaching from these ores is possible only after decomposition of emulsion gold containing sulphides. The Albion technology does not need high pressures (works at normal pressure). Ref. 2.

Auth.

b16.2.4.3. Development of technology for enrichment of pegmatites of Sazano. /N. Gegia, N. Shekriladze, D. Talakhadze/. Mining Journal. – 2015. – #1(34). – pp. 38-41. – geo.; abs.; geo., rus., eng.

The article indicates the final results of experiments on flotation and electroseparation enrichment of Sazano pegmatites. The fieldspars concentrates received by flotation scheme are of the first and second degree and by electroseparation scheme - of the second degree. The first degree meets the fine ceramics production standard,whilethesecond degree can be used for building and household ceramics. Tab. 2, Fig. 1, Ref. 4.

Auth.

b16.2.4.4. On the presence of rare metals (tantalum and niobium) in pegmatites of the Sazano Field. /O. Kavtelashvili, N. Gegia, N. Shekriladze/. Mining Journal. – 2015. – #1(34). – pp. 42-43. – geo.; abs.; geo., rus., eng.

The paper gives results of the studies carried out in order to establish the presence of rare metals – tantalum and niobium - in pegmatites of the Sazano field. An original scheme of their preparation for chemical analysis was developed, which implies gravity concentration of ground and classified sample of large mass of pegmatite (10 kg) on the concentrating table, re-washing heavy fraction in heavy media and chemical analysis of tantalum and niobium in the obtained material. The presence of both metals in pegmatites of the Sazano field was cionfirmed. Tab. 1, Fig. 1, Ref. 6.

Auth.

b16.2.4.5. Explosive fabrication of antifriction composites from copper-graphite precursors. /E. Chagelishvili, A. Peikrishvili, B. Godibadze, N. Jalabadze, M. Tsiklauri, A. Dgebuadze/. Mining Journal. – 2015. – #1(34). – pp. 60-63. – geo.; abs.; geo., rus., eng.

The possibility of fabrication antifriction composites based on copper-graphite precursors using explosive consolidation technology at room temperatures is studied. The application of explosive consolidation technology provides the obtaining of highly dense billets near to the theoretical density, without cracks and porous. The structure of fabricated billets depending on parameters of detonation front is investigated. The investigation showed the preliminary density of precursors to be one of the important parameters in the proposed technology. In case of low density under the shock wave front container geometry is disturbed and obtaining of high dense billets becomes impossible. Fig. 9, Ref. 26.

Auth.

b16.2.4.6. Investigation of phase and chemical composition of manganese carbonate ore. /T. Rokva, T. Chakhunashvili, D. Dzanashvili, N. Butliashvili, T. Machaladze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 117-120. – geo.; abs.: geo., eng., rus.

The mineral composition of carbonate ore of Chiatura manganese mine is studied by the methods of X-ray, thermogravimetric, spectrophotometric and chemical analysis for its chemical-technological treatment. The main components of ore have been established. Tab. 4, Fig. 1, Ref. 5.

Auth.

b16.2.4.7. Quantitative analysis of iodine in the soft drug forms. /P. Iavich, N. Abuladze, M. Javakhia, L. Churadze, E. Khurtsidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 121-126. – eng.; abs.: eng., geo., rus.

The paper dwells on the review of the modern methods of iodine quantitative analysis in the soft drug forms. Iodine is a vital microelement. Its deficiency causes serious disorders in the organism. Making good the iodine deficiency is possibly by various foods and pharmaceutical products. At first, iodine, potassium iodide, potassium iodate, povidone-iodine and other substance should be separated from the base, and then their amounts must be determined. Isolation from the fatty base mainly occurs by means of ethyl ether, as a result of which there is chosen a particular method. Titrimetric determination is quite useful method, although at present there are more widely used the instrumental methods of analysis, such as photometry, chromatography, electrochemical methods, mass-spectrometry, etc. Studies of literary sources have shown that there exist many methods of iodine quantitative analysis, but following from its acting and auxiliary substances, each drug form requires individual approach to analysis. Ref. 45.

Auth.

b16.2.4.8. Corrosion testing of carbon materials in aggressive media. /Ts. Gagnidze, Zh. Kebadze, J. Aneli, L. Kakuria, K. Ugrelidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 130-133. – rus.; abs.: geo., eng.

The influence of various factors on the corrosion rate of carbon materials in aggressive media and the nature of the rate control process has been investigated. The effect on the properties of these materials, the possibility of their use as electrodes for electrochemical processes intensification was studied. Tab. 4, Fig. 2, Ref. 7.

Auth.

b16.2.4.9. N-glycosylation of aminobenzoic acids by some carbohydrates. /R. Kublashvili, V. Ugrekhelidze, N. Karkashadze, K. Ebralidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 134-139. – eng.; abs.: eng., geo., rus.

The N-glycosylation of o-, m- and p-aminobenzoic acids by G-galactose and L-rhamnose is described. The composition of the synthesized products is established by microchemical analysis, and their IR and ^{13}C NMR spectra are investigated. As a result of the N-glycosylation of isomeric aminobenzoic acids, an anomeric effect is observed: N-o-carboxyphenyl-D-galactosylamine and N-p-carboxyphenyl-L-rhamnosylamine appear only as β-anomers, and the other N-carboxyphenyl-D-galactosylamines and N-carboxyphenyl-L-rhamnosylamines appear as a mixture of α- and β-anomers. The transformation of synthesized N-glycosides into melanoidins is also investigated.Tab. 3, Fig. 2, Ref. b16.

Auth.

b16.2.4.10. Furfurol production by dehydration of D-xylose in the presence of H-clinoptilolite. /N. Kalabegashvili, D. Ioseliani, G. Balarjishvili, L. Samkharadze, T. Korkia, O. Mkheidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 140-143. – geo.; abs.: geo., eng., rus.

D-xylose dehydration on hydrogen form of clinoptilolite has been carried out at 110-180°C for furfurol production both at atmospheric (110°C) and at relatively high pressures (≤5 Bar). Reaction time was 4 hours. Dependencies of furfurol outcome from water-toluene ratio and temperature during reaction of D-xylose dehydration have been studied. It has been established that outcome of furfurol under the following conditions: temperature 170°C, pressure 4,5 Bar, water-toluene ratio 170:10 and in the presence of 1 g of catalyst is equal to 35.6%. Analysis of research results has been conducted at Infrared Spectrometer Varian 660FT-IR. Tab. 1, Ref. 17.

Auth.

b16.2.4.11. Selection of various protectors for stabilization of some organic dyes for their protection against ozone action. /R. Tushurashvili, M. Panchvidze, Ts. Basiladze, G. Khidesheli, G. Shanidze, M. Mamardashvili, N. Kvirkvelia/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 144-148. – geo.; abs.: geo., eng., rus.

The effect of various protectors on the process of stabilization of some dyes – direct red – 2C, bromopyrogallol red, methyl orange, direct black and rezorcin has been studied at their ozonization. It was established that among used additives thiourea causes the most efficient stabilization. Fig. 6, Ref. 2.

Auth.

b16.2.4.12. Thermodynamic analysis of interactions in the system BCl_3 - CH_4. /D. Eristavi, A. Sarukhanishvili, A. Gogoshvili, M. Gugeshidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. b160-b164. – rus.; abs.: rus., geo., eng.

The present study at continuing a cycle if works in the sphere of investigation of complex heterogeneous systems by active inclusion of thermodynamic processes computer modeling methods. System "B-Cl-C-H" is used for 500-2500K and the ratios of initial components H_2/BCl_3 from 1 to 192. Obtained results enable us to conclude that increase of hydrogen content in the increase of carbide boron yield and that this effect significantly increases with simultaneous increase in temperature. Acceptable results are obtained at 1500K and 101 kPa for the ratio $H_2/BCl_3 > 24$, and for 2500K, 10-12-fold excess of hydrogen in enough at the same gas phase pressure. As for condensed boron should be noted that when we adopted the condition of the experiment selection was not observed. Fig. 5, Ref. 6.

Auth.

b16.2.4.13. Solid solutions of $A^{IV}B^{VI}$ semiconductors with substitution in the anion sublattice. /A. Pashaev, O. Davarashvili, M. Enukashvili, Z. Akhvlediani, R. Gulyaev, L. Bychkova, M. Dzagania, V. Zlomanov/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. b165-171. – rus.; abs.: rus., geo., eng.

The uniform monocrystalline layers of solid solutions $PbS_{1-x}Se_x$ on the $BaF_2(III)$ substrate were obtained by the method of molecular epitaxy with "a hot wall". It was revealed that the growth rate of layers could be controlled by varying the mutual arrangement of the open tip of the quartz ampoule with the epitaxy source and the substrate on a stainless mask. At the same time the composition of the solid solution $PbS_{1-x}Se_x$ hardly changes with the changing temperature of the selenium source. It was revealed that the$PbS_{1-x}Se_x$ layers tend to crystallize in the orientation other than (III) – the orientation of substrate BaF_2. When the sulfur atoms replace the selenium ones (or vice versa), the lattice constant and the forbidden gap width change in concord. The values of the forbidden gap width determined by the models of Fabry-Perot interferometer and multiple internal reflection coincide at slight corrections of transmission. For IR photodetectors and lasers by optical excitation by the same composition of the active area of strained $PbS_{1-x}Se_x$ nanolayer it is possible to cover the spectral region of 3-4μm at T=300K by varying only the layer thickness. Tab. 3, Fig. 4, Ref. 10.

Auth.

b16.2.4.14. The change in free energy at the transition fatty acids between two different solvents. /I. Berdzenishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 172-173. – rus.; abs.: rus., geo., eng.

The relation to the standard free energy change at the transition 1 mol of fatty acid from the aqueous solution to liquid heptane is obtained. It is shown that the lower fatty acids predominate hydrophilic properties. With increasing length of the hydrocarbon chain the interaction of acids with water compare to n-heptane is changed to 3.45 kJ per group CH_2. Fig. 1, Ref. 5.

<div align="right">Auth.</div>

b16.2.4.15. Separating ability of the organic derivatives bentonite clays. /K. Khachaturian, N. Gegia/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 174-179. – rus.; abs.: geo., eng.
Chromatographic investigations of the initial and organic derivatives forms of askangels and askankols carried out. It has been established that they in its initial forms shows higher selectivity relative to molecules of non-saturated hydrocarbons, in comparisen with n-paraffin hydrocarbons of the same quality of carbon atoms. It has been shown that modification with malachite green results in the considerable decresion of holding capacity of askangels and askankols conserning components of separational mixtures. The malachite green treated askankols might be used for the analysis of the mixtures containing C_6-C_{10} n-paraffins and C_6-C_7 aromatic hydrocarbons. Tab. 2, Fig. 5, Ref. 6.

<div align="right">Auth.</div>

b16.2.4.16. Studies of possibilities of the use iodine as a remedy for iodine deficiency treatment and radioactive protection. /N. Abuladze, P. Iavich, M. Javakhia, L. Churadze, E. Khurtsidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 208-213. – eng.; abs.: eng., geo., rus.
In the modern world, the scale of large incidents and disasters create seriously threaten life and health of world population. Increasing general radiation background and other reasons have caused iodine deficiency progression. *Iodine prophylaxis* and treatment with iodine-containing preparationsare of crucial importance for avoiding thyroid gland pathology. In the conditions of increased radiation pollution, use of iodine as a *radioprotector* is of essential importance. Introducing of stable-isotope potassium iodide before penetration of radioactive iodineinto the organism protects thyroid gland from radioactive isotopes. The proposed review is aimed at formulation of theoretical foundations for developing iodine-containing alternative preparations, which will certainly help the world population to cope with iodine deficiency problem and to exhibit radioprotective properties. As such type of preparation, we consider the transdermal transport iodine-containing soft drug forms in kind of cosmetic, skin and mouth cavity care preparations, the unique high-absorptive base of which would serve transdermal transport of iodine for its further general action. Ref. 40.

<div align="right">Auth.</div>

b16.2.4.17. Chemical current source of the air(oxygen)-zinc system of new structure. /Zh. Kebadze, Ts. Gagnidze, T. Chakhunashvili, K. Ugrelidze, L. Kakuria/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 259-263. – geo.; abs.: geo., eng., rus.
The problems of functioning of the chemical current source of the air (O_2)-Zn sustem of new structure are considered. The catalytic activity of the carbon fiber material in relation to the electrochemical reduction reaction of oxygen has been established. Conducted experiments have shown, that the electrolytic manganese dioxide, deposited on a carbon fiber-based air electrode, is an efficient catalyst for the catode reaction. Tab. 2, Fig. 2, Ref. 13.

<div align="right">Auth.</div>

b16.2.4.18. Antibacterial zeolite sorbent. /N. Dolaberidze, V. Tsitsishvili, M. Alelishvili, M. Nijaradze, N. Mirdzveli, N. Klardjeishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 268-270. – geo.; abs.: geo., eng., rus.
The optimal conditions of obtaining bactericidal composition using an antibacterial agent ($AgNO_3$) and natural zeolite phillipsite have been considered. Preparation of such sorbent was intended to unite the sorption-detoxication properties of zeolite and antibacterial-somatic anti-toxic properties of silver. Dynamics of the accumulation of silver cations within zeolite crystal structure has been studied. The resulting material is qualitatively described by results of the chemical analysis and X-ray diffraction control as well as measurements od adsorption of water vapor. The silver containing nanozeolite material prepared by described method can be recommended for medical and biological applications. Tab. 2, Ref. 4.

<div align="right">Auth.</div>

b16.2.4.19. The possibility of volatile N-nitrozamines removing using local natural zeolites. /I. Rubashvili, V. Tsitsishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 271-277. – geo.; abs.: geo., eng., rus.
The present research has been shown the possibility of volatile N-nitrosamines removing using local natural zeolites – mordenite and clinoptilolite modified H-forms. It was prepared specially constructed laboratory instrument for the control of N-nitrosamines quantities removed from tobbaco mainstream smoke using zeolites H-forms. The quantitative determination of N-nitrosamines was carried out by validated GC-MS method. Analytical data has been shown that studied mordenite modified H-form's adsorptive capability is better than clinoptilolite H-form, more precisely; mordenite H-form decreases the content of volatile N-nitrosamines in tobacco smoke to 74% and clinoptilolite H-form decreases to 63%. Tab. 1, Fig. 3, Ref. 18.

<div align="right">Auth.</div>

b16.2.4.20. Peculiarities of the absorption spectra of epitaxiallead telluride layers. /A. Pashaev, O. Davarashvili, M. Enukashvili, Z. Akhvlediani, L. Bychkova, M. Dzagania, V. Zlomanov/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 278-284. – rus.; abs.: rus., geo., eng.
The spectra of the optical absorption of epitaxial lead telluride layers were investigated at room temperature. They are created by the analysis of the spectra of transmission and successive determination of index of refraction, reflection and

absorption coefficients. By straightening of the squares of absorption coefficients the forbidden gap width E_g was determined and was showed the coincidence of the data of two types of straightening. Over the absorption edge an additional absorption was revealed together with the absorption on free current carriers. By the modeling of the transmission spectra at zero additional absorption was established that the value of E_g was not changed although the real spectra seriously deformed. This analysis was showed –unstraight band-band transitions produced only the part of the additional absorption, and the most of it may be were virtual transitions between different valleys in the allowed bands. Tab. 2, Fig. 5, Ref. 8.

<div align="right">Auth.</div>

b16.2.4.21. Additional absorption in the optical spectra of the lead selenide epitaxial layers. /A. Pashaev, O. Davarashvili, M. Enukashvili, Z. Akhvlediani, L. Bychkova, M. Dzagania, V. Zlomanov/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 285-292. – rus.; abs.: rus., geo., eng.
In the article were discussed criterions for the identification of interference maximums in the optical transmission spectrum of the lead selenide epitaxial layer and for the construction of the absorption spectra by taking into account degeneracy at high concentration of current carriers. As influence of refractive index, coefficients of reflection and absorption on the character of absorption spectra, so possible changes of transmission in the optical measurements and Fermi level in the permitted zones also were studied. The values of the forbidden gap width determined by two types of straightening concided and were equal to 0,280 – 0,288eV at T=300K. On the little section of the optical spectrum between edge of absorption and absorption on free carriers was revealed additional absorption and was proposed to use it in IR modulators for broadening of the their spectral diapason. Tab. 4, Fig. 6, Ref. 11.

<div align="right">Auth.</div>

b16.2.4.22. Mathematical-chemical investigation of some halogen-derivatives of sulphur within the scope of quasi-anb-matrices method. /N. Kupatadze, M. Bedinashvili, M. Gverdtsiteli/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 293-294. – geo.; abs.: geo., eng., rus.
Within the scope of quasi-ANB-matrices method two correlation equation of "structure-property" type was constructed and investigated for some halogen-derivatives of sulphur. Correlationsare "excellent". Tab. 1, Ref. 6.

<div align="right">Auth.</div>

b16.2.4.23. Device for receipt of colloidal silver concentrate. /D. Eristavi, N. Bibiluri, Sh. Andguladze, L. Gverdtsiteli, I. Bazgadze, A. Gogishvili, E. Matsaberidze, M. Gugeshidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 339-341. – rus.; abs.: eng., geo.
Designing and manufacturing of colloidal silver device with the use of nanotechnologies is considered in this work, by means of which water solution of colloidal silver with various concentrations will be received and used for necessary purposes. Fig. 3, Ref. 7.

<div align="right">Auth.</div>

b16.2.4.24. X-ray structural research of chemical content of silicon pulled from metallurgical silicon melt. /E. Khutsishvili, N. Khutsishvili, I. Kupreishvili, L. Gabrichidze, N. Kobulashvili, N. Gonjilashvili, G. Urushadze, N. Kekelidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 342-345. – geo.; abs.: geo., eng., rus.
The possibility of X-ray structural analysis for determination of chemical composition of metallurgical Si and silicon pulled from its melt has been estabished. Tab. 2, Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.4.25. Detrimental impurities effective distribution coefficientin si at pulling from MG-Si melt. /N. Khutsishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 346-350. – geo.; abs.: geo., eng., rus.
Effective distribution coefficient of detrimental impurities in Si at the crystal pulling from MG-Si has been studied in the presented paper. The content of contaminating impurities in Si before and after the directional crystallization have been established by X-ray diffraction method, micro X-ray spectral analysis andemissive spectral analysis. Electrical properties and microstructure analysis of Si experimental samples have been implemented too. n-MG-Si goes into p-type Si. Tab. 1, Fig. 2, Ref. 7.

<div align="right">Auth.</div>

b16.2.4.26. Research of properties of refined silicon by the method of pulling from metallurgical silicon melt. /L. Gabrichidze, E. Khutsishvili, N. Kobulashvili, N. Khutsishvili, N. Gonjilashvili, G. Urushadze, I. Kupreishvili, N. Kekelidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 351-353. – geo.; abs.: geo., eng., rus.
Properties of silicon crystals obtained by pulling from melt of 98% metallurgical silicon have been studied. X-ray spectral microanalyzer, emissive spectral analysis, electric properties measurements, and microstructura investigations have been applied. The dependence of investigated properties on the velocity of crystal pulling has been established. Tab. 1, Fig. 1, Ref. 9.

<div align="right">Auth.</div>

b16.2.4.27. Corrosion resistance of the welded armour steel construction in the humid subtropical atmosphere of Batumi. /D. Ramazashvili, L. Akhvlediani, R. Bagrationi, G. Dadianidze, N. Luarsabishvili, M. Mikaberidze, V. Tsintsadze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 354-357. – geo.; abs.: geo., eng., rus.

The reasons of breakdown of engineering design collected by manual arc welding from armour steel of type 30ХНМА in the humid subtropical atmosphere of Batumi are investigated. It is established that for welding was used the electrode applicative for high-alloyed steels. As a result of the main metal, a zone of thermal influence, a weld and the weld metal are different on a chemical composition, structure and mechanical properties. Distinction of electrode potentials in sea water and the atmosphere promoted formation of galvanic couples and destruction of the engineering design along a welded joint. Besides the welding condition had been violated contributing to make for micro both macro cracks and the development of crevice corrosion . By laboratory research it is established that for welding of the steel grade 30ХНМА it is necessary to use a standard electrode of the type НИАT-3М. Ref. 3.

Auth.

b16.2.4.28. Synthesis of indole fragment-containing peptides via Ugi reaction. /Sh. Samsonia, U. Kazmaier, E. Katsadze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 107-111. – eng; abs: eng., geo.
The Ugi reaction was applied in the synthesis of indole fragment-containing peptides. Effect of solvent and temperature on the duration of the reaction, yield and stereoselectivity of the products were studied. L-amino acids as an acid component, (S)-p-methoxyphenylethylamine, indole-3-carbaldehyde and methyl-2-isocyanacetate were used as initial components. Influence of solvent and temperature on reaction yield and diastereomeric ratio was studied as well. Tab. 1, Ref. 18.

Auth.

b16.2.4.29. Development of a new continuous method of production of the novolac oligomer and the study on its kinetics. /Z. Molodinashvili/. GEN. – 2015. – #3.– pp. 85-89. – geo.; abs: eng.
A new continuous method of production of novolac-type oligomers by interaction of phenol with paraform in the melt in the presence of an acid catalyst was developed. To establish the optimal conditions of the reaction, some kinetic regularities of the process were investigated. It is shown that the reaction is of the second order. The optimal conditions for formation of the oligomer are the following: temperature – $100\text{-}120^0C$; duration of the reaction – 10 min; phenolic component: formaldehyde molar ratio – 1.15:10; amount of the catalyst – 1% in relation to the phenolic component. Tab.3, Fig. 3, Ref. 5.

Auth.

b16.2.4.30. Polycondensation of phenol and card-type bisphenols with paraform in the melt. /Z. Molodinashvili/. GEN. – 2015. – #3. – pp. 83-84. – eng.; abs: rus.
 A new continuous method of production of novolac-type oligomers by interaction of phenol and Card-Type bisphenols with paraform in the melt in the presence of an acid catalyst was developed. To enhance the heat resistance of the polymers, complex polymers with statistical arrangement of monomers in the macromolecule were synthesized by simultaneous condensation of phenol and Card-Type bisphenols. The softening temperature of co-oligomers increased from 70^0C to $90\text{-}180^0C$. Tab. 1, Ref. 5.

Auth.

b16.2.4.31. Test data on the process of separation of various salt solutions having the same concentration by electrodialysis. /Sh. Rukhadze, A. Aptsiauri, M. Apridonidze, A. Shotadze/. GEN. – 2015. – #4. – pp. 107-111. – geo.; abs.: eng.
The paper dwells on the results of experimental studies of the electrodialysis processes under conditions of simultaneous action of gravitational and forced convection in a desalination chamber of the water purification electro-membrane system. The experiments were carried out with $CaCl_2$, $MgSO_4$and Na_2SO_4 aqueous solutions for a wide range of parameters such as an initial concentration, electric current density and a jump in the electrical potential in the separation channel. Also, the seawater desalination and tap water purification processes were studied. Based on the test data obtained, we can conclude that, after desalination by electrodialysis, the seawater can be used for both industrial (technical) and domestic purposes. If only one type of salt is dissolved in the water, the electrodialysis process proceeds more slowly than in the cases with different salts. Tab.5, Fig. 2, Ref. 4.

Auth.

b16.2.4.32. The results of experimental studies on electrodialysis processes. /Sh. Rukhadze, A. Aptsiauri, M. Apridonidze, A. Shotadze/. GEN. – 2015. – #4. – pp. 117-1b16. – geo.; abs.: eng
The paper dwells on the results of experimental studies on the electrodialysis processes under conditions of simultaneous action of gravitational and forced convection in a desalination chamber of the water purification electromembrane system. The experiments were carried out with NaCl aqueous solutions of various concentrations for a wide range of parameters such as an initial concentration, electric current density and a jump in the electrical potential in the separation channel. It was been established that the membrane was highly effective at NaCl concentration from 10 g/l to 1 g/l. Tab. 3, Fig. 3, Ref. 5.

Auth.

b16.2.4.33. Stationary catalyzer for cotton oil hydrogenation. /M. Siradze, N. Neparidze, I. Goksadze, E. Chkhaidze, O. Diogidze/. GEN. – 2015. – #4. – pp. 112-119. – rus.; abs.: eng.
The research performed in the work and the selection of the catalyzer showed that the hydrogenate obtained in the result of cotton oil hydrogenation satisfied the demands for dietary fats and oils. Thus, by varying the copper:tin ratio in the nickel-copper-aluminum stationary catalyzer, we can provide high speed and selectivity of the process of cotton oil hydrogenation. Tab.2, Fig. 1, Ref. 3.

Auth.

b16.2.4.34. Technology of obtaining NI, NB and TA coatings on aluminum substrate. /M. Okrosashvili, G. Razmadze, T. Lomaia, T. Loladze, A. Peikrishvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. b161-175. – rus.; abs.: rus., geo., eng.
The directions of experimental research, by means of analysis of state diagrams of corresponding systems Al-Ni (Nb, Ta) are outlined and the optimal temperature ranges of condensation are defined. In case of nickel application it equals to 250-320°C, for niobium – 200-340°C, tantalum – 200-320°C. The microstructure, phase composition and hardness distribution in the cross section of the samples are studied. The influence of natural surface of aluminum on adhesion of coating with substrate is studied. Comprehensively sprayed coatings on aluminum technological samples of complex geometric shapes are obtained. Coatings satisfy all basic requirements foreseen by technical conditions. Fig. 21, Ref. 6.

Auth.

b16.2.4.35. Scaffolds for tissue regeneration. /N. Kebadze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 176-181. – geo.; abs.: geo., eng., rus.
Using the methods of ultrasonic and mechanical disintegration of two-phase system - water/chloroform solution of biodegradable polyesteramide, with subsequent freezing and lyophilization of obtained emulsion, the films with well-developed porosity were obtained. An electronic microscopical study of the films has shown that the pore size of the films is within 10-30 µm, that is in the range of pore sizes suitable for regeneration of adult mammalian skin. Tab. 2, Fig. 2, Ref. 7.

Auth.

b16.2.4.36. Two-phase segregation of irregular solid Al-Ti-Fe solution. /G. Gordeziani, G. Tsirekidze, A. Gordeziani, N. Kenchiashvili, N. Kanteladze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 189-194. – eng.; abs.: eng., geo., rus.
Based on the A6 (Wigwam) catastrophe, the new form of Gibbs potential is worked out that is suitable for thermodynamic analysis of irregular ternary systems. By minimizing this potential and using the Lagrange transformation, the numerical values of critical point are calculated for solid Al-Ti-Fe solution. Aluminum alloys of this system are attractive materials for automobile and aircraft technology and in the defense industry. As a result, the obtained values determine the process of two-phase segregation of given solution with the formation of a miscibility gap. The diagrams of twophase segregation of irregular solid Al-Ti-Fe solution are built by the use of CALPHAD approach. Tab. 2, Fig. 2, Ref. 4.

Auth.

b16.2.4.37. Rebar rolling with the use of new XIII–XIV stand rolling schemes for the purpose of rebar quality improvement at "Rustavi Steel". /V. Kopaleishvili, N. Mumladze, Z. Tabatadze, M. Tabagari, O. Barbakadze, R. Bakradze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 23-49. – geo.; abs.: geo., eng., rus.
The issues of rebar quality improvement at "Rustavi Steel" works, using new stand rolling schemes are discussed in detail. Fig. 8, Ref. 4.

Auth.

b2.5 Materials Engineering

b16.2.5.1. Development strategy of coal industry under conditions of globalization. /G. Lobzhanidze, B. Balavadze/. Mining Journal. – 2015. – #1(34). – pp. 66-76. – geo.; abs.; geo., rus., eng.
The paper analyzes the state and use at coal mining, the coal industry development trends in some advanced countries, together with the state of coal industry, industrial potential, strategic priorities and economic development in Georgia. Tab. 13, Ref. 25.

Auth.

b16.2.5.2. Economic, ecological and social aspects of development of chiatura manganeze deposit. /G. Tabatadze, M. Nadiradze/. Mining Journal. – 2015. – #1(34). – pp. 77-80. – geo.; abs.: geo., rus., eng.
The negative external factors of development of Chiatura manganese deposits and ore processing are considered in the paper. Based on the applicable literary sources related to research results conducted by different organizations, the urgency of problem of environmental protection in Chiatura and its resolving are stressed. The Georgian-American Alloys Company plans to conduct applicable works (in particular restoration works, reconstruction of the processing plants, etc.). The authors suggest that the issue of instituting of the damage in the form of costs should be considered based on the economic and social damages assessment. Fig. 1, Ref. 12.

Auth.

b16.2.5.3. Safety explosives. /Z. Kuchukhidze, A. Apriashvili, G. Bakhutashvili, G. Shatberashvili, G. Tkhelidze, I. Samkharadze/. – Mining Journal. – 2015. – #2(35). – pp. 59-64. – geo.; abs: geo., rus., eng.
The paper deals with special safety explosives, which are used in gas- and dust- ignition hazardous mines. The ignition hazard can be reduced by adding heat-absorbing components in explosives and chemical inhibition of gas oxidizing reaction. Accordingly, it is significant that additive components have inhibiting properties as well (for example, chlorides and fluorides), which effectiveness depends on their dispersion. The calculated and experimental characteristics of the explosives are given. It is noted that safety explosives must also have high detonation properties to avoid their burnout. For creation of large power high protective explosives, the low class explosives are placed in polyethylene film full of saline, which provides stable detonation. Tab. 3, Ref. 3.

Auth.

b16.2.5.4. Impact of temperature and moisture on formation of concrete strength. /A. Chikovani, D. Tevzadze/. – Mining Journal. – 2015. – #2(35). – pp. 65-67. – geo.; abs: geo., rus., eng.

The article considers the impact of temperature and moisture on the formation of concrete strength, which can take place during a dozen of years. The concrete hardening occurs as a result of hydration process under the most optimal condition for reactions (temperature +20^{0}C, moisture -100%). The hardening at low temperatures slows down the rate, but has a positive impact on the formation of the mature concrete strength. Also necessary is high moisture in order to avoid water vaporization from concrete. Without these actions the structure of concrete would fail and strength reduction at design age would reach up to 50%. Tab. 2, Fig. 4, Ref. 5.

<div align="right">Auth.</div>

16.2.5.5. Geological-genetic model of the gold occurrences related to hercinian formations of the Upper Svaneti. /D. Bluashvili, K. Benashvili, Sh. Janashvili/. – Mining Journal. – 2015. - #2(35). – pp. 72-74. - geo; abs: geo., rus., eng.

In the present paper is discussed the geological-genetic model of the gold occurrences related to Hercynian formations of the Upper Svaneti. According to the recent classification these occurrences are attributed to hydrothermal type of mineralization generated during the regional tectonic and magmatic activity, but away from the magmatic chamber. The classical examples of such type of mineralization are orogenicmineralizations which form in the actively developing orogenic systems. Such type of mineralization takes place under the conditions of high pressure (1.5-5kb.) and temperature (300-450^{0}C) at 4-15 km. depth. The mineralization host-rocks are metamorphites, migmatites and magmatites. Ref. 9.

<div align="right">Auth.</div>

16.2.5.6. The results of the analysis of microscopic ans x-ray fluorescence study of native gold grains from the Upper Svaneti. /D. Bluashvili, K. Benashvili, N. Inanashvili, Sh. Janashvili/. – Mining Journal. – 2015. - #2(35). – pp. 74-80. - geo; abs: geo., eng., rus.

In the paper are discussed the results of the study of native gold grains. The study was conducted in the Istanbul and Georgian Technical Universities. In particular, binocular and polarized microscope studies were carried out in the Istanbul Technical University, and the studies by X-ray fluorescence method (EDXRF SPEQTROMETER, model EDX3600B) were conducted in the Georgian Technical University. As a result of microscope studies was detected, that gold occurs in association with silver salts (pyrargyrite, proustite and sylvanite) and pyrite. According to XRF studies aside from silver (1.29-3.21%) gold is associated with copper (0.01-0.35%), iron (0.28-0.73%) and rhodium (0.66-0.92%). Tab. 6, Fig. 3, Ref. 2.

<div align="right">Auth.</div>

b16.2.5.7. Development of briquette compositions on the basis of local secondary resources, preparation of briquette samples and determination of some of their characteristics. /E. Topuria, N. Khetsuriani, Z. Gongliashvili, E. Usharauli, K. Goderdzishvili, I. Mchedlishvili, M. Chkhaidze, Z. Molodinashvili**/.** Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 217-221. – geo.; abs.: geo., eng., rus.

Several briquette compositions have been prepared on the basis of local secondary resources (coal, subdust, chipboard millings) with addition of binding materials (clay, heavy oils, etc.) and modificators. Samples of briquettes have been prepared from these compositions in different temperature and pressure conditions. Technical and mechanical characteristics of the briquettes have been studied and compression resistant compositions have been revealed. Tab. 2, Fig. 5, Ref. 4.

<div align="right">Auth.</div>

b16.2.5.8. New effective drug Giometrin against parasitic mites of animals. /O. Lomtadze, G. Chimakadze, K. Ebralidze, N. Shalvashvili, A. Ramishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 222-224. – geo.; abs.: geo., eng., rus.

An emulsion drug Giometrin with prolonged acaricidal action to protect animals from attack by parasitic mites has been developed. Field tests of Giometrin were conducted in different geographical and climatic zones of Georgia. The cost of protective measures performed by using Giomtrin was found almost two times lower than the costs using imported acaricidal drugs. Tab. 1, Ref. 3.

<div align="right">Auth.</div>

b16.2.5.9. Preparation of combustible briquettes from bio and mixed secondary raw materials. /E. Topuria, N. Khetsuriani, Z. Gongliashvili, E. Usharauli, K. Goderdzishvili, I. Mchedlishvili, Z. Molodinashvili, M. Chkhaidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 295-298. – geo.; abs.: geo., eng., rus.

Bio-and mixed (coal, manure, sludge, heavy oil) fuel briquettes are prepared from pine and spruce chips, millings of particleboard and maize roots. Physical, chemical and technical characteristics of the obtained briquettes are determined. Tab. 3, Ref. 6.

<div align="right">Auth.</div>

b16.2.5.10. New products containing peloids in dermatology. /D. Jincharadze, N. Bokuchava/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 303-305. – rus.; abs.: rus., geo., eng.

Properties of peloids determining their curative and prophylactic effect are observed. Compared pseudo-volcanic and slime peloids for medicinal purposes in dermatology. Procedures of their preparation and application aredescribed. Thus suggested adding of herbal extracts and miner waters to increase curative effect of developed products. Tab. 2, Ref. 8.

b16.2.5.11. Technological characteristics of metal sheet production in direct rolling. /G. Kevkhishvili, T. Namicheishvili, I. Zhordania, J. Loria, J. Sharashenidze, Z. Melashvili, V. Ramishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 117-122. – eng; abs: eng., geo.

For several years Georgian Institute of Metallurgy and Materials Science has been actively working now to develop the technology of direct rolling, where casting and rolling plant was designed and pilot version constructed. The method is a combination of two independent processes (continuous casting, hot rolling). First of all, we assessed the minimum strains providing properties of the rolled metal for the billet produced by the method. Examination of metallographic and mechanic properties of the samples produced with different strains show that the strain of 35-40% is quite sufficient for the billet to gain the properties of rolled metal. Under such strain proper time and velocity necessary for production of the metal sheet of h/2 thickness were theoretically calculated. The values of all parameters and their interdependence are provided in the paper as nomograms. The experiments show that the difference between theoretical computations and experimental data is no more than 5-7%. The mentioned method, i.e., the so-called direct method was used to develop the technology for production of aluminium sheets of 8, 9 and 10mm thickness. Fig. 3, Tab. 5, Ref. 5.

<div align="right">Auth.</div>

b16.2.5.12. Application of methionine-containing complexe and their composites with clinoptilolite in poultry nutrition. /I. Beshkenadze, S. Urotadze, V. Tsitsishvili, N. Zhorzholiani, M. Gogaladze, G. Begheluri/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 110-115. – eng.; abs: eng., geo.

A premix and its composite with clinoptilolite were prepared to study physiological activity of chelate compounds and natural zeolite-clinoptilolite, which was used to balance formula feed for poultry layers. Experiment lasted 60 days on three groups: control group was given feed used generally at the factory, I experimental group was given a feed balanced by premix prepared on the base of biometals (Mn, Zn, Fe, Co, Ca, Mg, Cu) and chelate compounds of sulfur-containing amino acid, methionine, while that of the II experimental group – by clinoptilolite and the same formulation premix composite. Observations were made over poultry development, egg-laying intensity and physical properties of eggs (egg yolk, white, shell mass et al). The role of amino acids, namely methionine, on the one hand, and that of biometals, on the other hand, is known in poultry an animal nutrition. Therefore, simultaneous presence of methionine and biometals in chelate form should provide sharp increase of their biological activity, decrease of toxicity and high grade of assimilation. It was proved by analysis of the obtained data. In particular, researches showed that live mass increase in the I group reached 6.7%, in the II group – 7.33%, while in the control one – 5.13%. Poultry preservation index in the I group equaled to 93.75%, in the II group - 95.06, while in the control - 81.3%. Productivity of layers, egg-laying capacity and egg quality and physical characteristics (egg mass, egg length, width, white mass, yolk mass, shell mess and others) were increased. The obtained results are conditioned by biometals in chelate form (I exp. group) and simultaneous presence of these chelate forms and clinoptilolite (II exp. group), which provided better assimilation of biometals and improvement of metabolism in experimental poultry. Tab. 2, Ref. b16.

<div align="right">Auth.</div>

b16.2.5.13. Determination of self-compacting concrete moisture permeability characteristics. /A. Sakvarelidze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 94-100. – geo.; abs.: geo., eng., rus.

An experimental theoretical investigation of determination of composite moisture permeability characteristics was carried out. Sample cylinders (d=70 мм l=70 мм) of age 28 day with moisture content of 3.95% (on weight) were tested. Before testing samples were isolated on both sides by paraffin (infinite cylinder) and put in environment with air relative humidity of 20%. In this state they were dried. The free drying from side surface of the cylinder had place (i.e. the talks of infinite cylinder in boundary conditions of the third type was realized). The experimental time-depended curve of material drying is determined. The theoretical expressions determining the cylinder humidity for any moment of the time are given. As a result of comparison and analysis of experimental and theoretical data, self-compacting concrete permeability characteristics there have been determined: coefficient of humidity diffusion, coefficient of moisture transmission and specific coefficient of moisture transmission have been determined. Tab. 1, Ref. 4.

<div align="right">Auth.</div>

b16.2.5.14. Perspective of using polymineral composites for the conservation of toxic water solutions. /L. Itriashvili, E. Khosroshvili, N. Nibladze/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 79-80. – rus.; abs.: geo., eng., rus.

This article shows the perspectives of using new PMC for localization and conservation of toxic water solutions. The dependence between absorbed solutions, its concentration and localized dry substances are estimated. The amount of solutions and concentrations, which give the maximum effect are also estimated. Tab. 1, Ref. 2.

<div align="right">Auth.</div>

b2.6 Medical engineering

b16.2.6.1. The effect of electrochemically synthesized aqueous sodium persulfate on the biotransformation of certain psychoactive medications mogely. /M. Khubutiya, V. Kolesnikov, A. Evseev, M. Goldin, A. Davydov/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 174-178. – eng; abs: eng., geo.

The psychotropic drugs amitriptyline, tisercin and carbamazepine were used as models for the investigation of the oxidizing activity of electrochemically synthesized sodium persulphate. Derivatives of phenothiazines, xanthene and benzodiazepines were oxidized by the persulphate-containing solution, and the oxidation products were low in toxicity.

The oxidation products were identical to well-known products of biotransformation (metabolites) of drugs in living organisms. Fig. 4, Ref. 18.

Auth.

b16.2.6.2. The level of naphthalene and its derivates in tobacco smoke. /D. Zurabashvili, G. Parulava, Z. Gvishiani, L. Shanidze, M. Garuchava/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 93-96. – rus.; abs.: geo., eng., rus.
The effect of naphthalene and its derivatives in tobacco smoke on the human health is discussed. Tab. 1, Ref. 18.

Auth.

b16.2.6.3. Changes of lipoperoxidation and antioxidative enzymes during crush-syndrome modelling. /N. Gamkrelidze, T. Sanikidze, N. Pavliashvili, T. Petriashvili, M. Topuridze/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 84-88. – eng.; geo., eng., rus.
Crush-syndrome (CS) is characterized by numerous pathological deviations due to the soft tissue damage and their further reperfusion. The aim of the study was to investigate pro- and anti-oxidative processes during different regimens of crush syndrome. The experiment was carried out on randomly selected 200-250gr. mass 50 laboratory rats using crush syndrome modeling classical method. Investigations were conducted at various stages of compression and decompression period. Activity of antioxidant enzymes – total ceruloplasmin, oxidized ceruloplasmin was determined in blood serum. LOO⋅ and free oxygen species were as well determined with the use of relevant methods. According to our findings we can conclude that - Lipoperoxidation intensity increases in compliance with crush syndrome duration - Short-term (3-hour) compression causes enhancement of lipoperoxidation however, in further 1 hour decompression there is revealed a trend toward normalization of processes. Lipoperoxides and free oxygen species content decreases and the antioxidant enzymes activity is almost restored; - Long lasting compression (6 hours) leads to severe disorders in the body (total ceruloplasmin impaired production and after 6 hours from decompression antioxidant enzymes inactivation). Fig. 7, Ref. 18.

Auth.

b2.7 Environmental engineering

b16.2.7.1. Finding optimal power of power plant taking into account uneven seasonal river runoff. /T. Magrakvelidze, V. Chichinadze, Kh. Lomidze, M. Janikashvili, I. Archuadze/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 44-48. – geo.; abs.: eng., rus.
The paper mentions that runoff of rivers in Georgia is very uneven. In particular, runoff in spring-summer may be 4-5 times more than in the autumn-winter season. To illustrate this, the monthly runoff of Mtkvari is taken (at Chitakhevi). In the authors' opinion, the existing method of selection power station is not perfect and should be determined using the methods of optimization. The respective optimization task is set and solved and the ontained results are presented for the specific river. Fig. 5, Ref. 3.

Auth.

b16.2.7.2. The prospects of application of heat pumps installations in various sectors of national economy of Georgia. /N. Mirianashvili, N. Gdzelishvili, V. Khatashvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 80-84. – geo.; abs.: eng., rus.
The modern level of application of heat pump installations in Georgia is considered and the important results achieved in this area are shown. The prospects heat pump systems in the metallurgical and chemical industry are analyzed. It is shown that wide introduction of heat pump systems in the industry gives possibilities to raise the economic standing of the country and well-being of the population. Tab. 1, Fig. 2, Ref. 7.

Auth.

b16.2.7.3. Technology and technical means for terracing of slopes. /V. Miruashvili, G. Kutelia, J. Nadirashvili/. Metsniereba da Tskhovreba. – 2015. – #2(12). – pp. 89-95. – geo.; abs.: geo., eng., rus.
The technologies of terracing slopes are analyzed and the new method of terrace formation and appropriate self-moving, automatically controlled technical equipment are offered, in which a brand new, free-piston internal combustion engine is used as a drive gear. Its expected technical characteristics, including engine efficiency, are much better in comparison with the currently known internal combustion engines, which is conditioned by the design simplicity and principle of operation of the engine itself. Fig. 6, Ref. 8.

Auth.

b16.2.7.4. On the geological environment of depressions. /D. Rogava/. Mining Journal. – 2015. – #1(34). – pp. 11-b16. – geo.; abs.; geo., rus., eng.
Depressions (troughs) are negative landforms of relief resulting from plicate dislocations and oscillations of the earth's crust. Researched in almost all regions of Georgia, they are of all sizes and depths; moreover, as a whole, the entire territory of the country is located in the intermountain troughs. Their origin and development provides a basis for assuming that both tectonic and erodible phenomena influence synchronously. Complex engineering-geological background is created by the existence of almost all types of rocks in the crust of its geological environment. Due to the existence of various complexes, considering the escalated environmental conditions, special attention is paid to the perspective of rational usage of the territories of basins (troughs), more specifically - of enclosed depressions. For

example, the article discusses the phenomena in the geological environment of the basin (trough) in the village of Pskhu, lake Ritsa, "Tbilisi Sea". Fig.4, Ref. 12.

<div align="right">Auth.</div>

b16.2.7.5. Thorium – energy for the future and prospects of finding its deposits in Georgia. /A. Okrostsvaridze, D. Bluashvili/. Mining Journal. – 2015. – #1(34). – pp. 17-21. – geo.; abs.; geo., eng., rus.
Thorium ore mineralization is genetically related to alkaline-acidic magmatism. Unfortunately, little is known about the reserves of this element in Georgia, since the planned prospecting-exploration works of thorium never have been done before in Georgia, though are marked 3 ore occurrences of this element: 1-in the Greater Caucasus Kakheti segment, in the hydrothermally altered rocks of the Lower Jurassic clay-shales, where thorium concentrations varied between 51 – 3882g/t; 2 – in the eastern periphery of the Dzirula massif, in the hydrothermally alteration rocks of the cambrian quartz-diorite gneisses, where thorium concentrations varied between 117-266 g/t; 3- in active contact zone of the Eocene volcanites and syenitic intrusive in Vakijvari orefield of the Guria region, where thorium concentrations varied between 185 – 428 g/t. The world class thorium deposit concentrations of this element vary within the limits of 200-300 g/t. Accordingly, on the basis of these data thorium deposits found in Georgia should be considered as perspective ore manifestations, the investigation of which should be one of the strategic interests for the state. Ref. 8.

<div align="right">Auth.</div>

b16.2.7.6. The first data about gold content n the Lakhvra and Orkari Riverheads (Upper Svaneti). / K. Benashvili, Sh. Janashvili/. Mining Journal. – 2015. – #1(34). – pp. 22-24. – geo.; abs.; geo., eng., rus.
The pre-Mesozoic crystalline basement of the Caucasus had been considered poor in the content of useful minerals before the end of last century. The investigations conducted in the last decades exposed groundlessness of this consideration. From this point of view significant is gold occurrence localized in the Lakhvra and Orkari riverheads. As a result of our investigations, the gold-quarts-low sulfidation genetic type of mineralization was identified, a brief characteristic of which is given in this paper. Fig. 1, Ref. 11.

<div align="right">Auth.</div>

b16.2.7.7. Gold ore manifestation in hydrothermal formations of the River Aslanura Gorge. /N. Adeishvili, N. Poporadze/. Mining Journal. – 2015. – #1(34). – pp. 25-26. – geo.; abs.; geo., rus., eng.
The availability of native gold concentration in the Khrami alluvial deposits with the view of mining it in future is discussed. By means of X-ray fluorescence analysis the gold content in the river Aslanura gorge's Late Variscian granites, quarts-porphyries and hydrothermal sulfide formations, developed in granite-porphyries as to establish whether the formations of sulfide mineralization are one of the sources of gold accumulation in the Khrami alluvial deposits; though at present the carried out researches do not enable us to outline definitely that there is considerable content of gold in the river Aslanura gorge hydrothermal formations or vice versa. Fig. 2, Ref. 2.

<div align="right">Auth.</div>

b16.2.7.8. On the application of a retaining sheet pile as the boundary of the array mounting recesses soil slopes. /T. Phirtskhalava/. Mining Journal. – 2015. – #1(34). – pp. 27-31. – geo.; abs.; geo., rus., eng.
In this paper we consider one of the most progressive ways to mount an array of soil pits (trenches), which consists in the use of sheet pile walls enclosing structure composed of wood or steel piles under construction in soft ground underground facilities open way. Piling is made to a depth until they cutting its heel not enter into impermeable layer underlying watered soils. In the analytical methods of calculating flexible retaining wall soil pressure on the structure is considered as the sum of a given active and reactive load resistance of the soil. A scheme of E. K. Jacobi algorithm and the results of the calculation sheet pile wall fixed one row spacers. Tab. 1, Fig. 4, Ref. 14.

<div align="right">Auth.</div>

b16.2.7.9. The results and analyses of the experimental research of mechanical-pneumatic dampers effectiveness for pressure hydro transport systems safe exploitation. /L. Makharadze, L. Gavasheli, S. Steriakova, V. Gelashvili/. Mining Journal. – 2015. – #1(34). – pp. 44-50. – geo.; abs.; geo., rus., eng.
The article reviews the results of the experimental research of mechanical-pneumatic dampers (worked-out in G. Tsulukidze Mining Institute) effectiveness for pressure hydro transport systems safe exploitation. The working parts of those dampers are made of different elements such as: elastomer, hermetic, air-filled, forms of torus, spheres, hose, and also metal made air-filled hermetic bellows. According to the result analyses, recommendations are considered for their exploitation in certain conditions. Theoretical calculation algorithms for the parameters of the above-mentioned working parts of the dampers are given in the article. Tab. 4, Fig. 1, Ref. 23.

<div align="right">Auth.</div>

b16.2.7.10. Development variant of updating the deficit in supply of the objects enrichment plant JSC "Madneuli" technical water. /V. Silagadze, L. Makharadze, M. Jangidze, K. Kekelidze/. Mining Journal. – 2015. – #1(34). – pp. 50-54. – geo.; abs.; geo., rus., eng.
The paper analyzes the potential for use of chemically unpolluted waters of the stream "Satkhebi" to replenish the deficit in supplying ore-processing plant with technical water. The water flow during low-water season was determined experimentally and its approximate maximum value during the rainiest period of the year was set based on hydrologic calculation, which amounted 1,4 m^3/s. Based on hydraulic calculation of pipeline and water intake unit it was established the possibility of gravity water supply to the point of consumption. The technical design developed on the basis of obtained results was submitted to JSC "Madneuli". Tab. 1, Fig. 2, Ref. 6.

<div align="right">Auth.</div>

b16.2.7.11. Actual aspects of economic development of the Georgian mining industry. /G. Lomsadze, G. Tabatadze, B. Kakhadze, G. Lobzhanidze, T. Butulashvili/. Mining Journal. – 2015. – #1(34). – pp. 81- 88. – geo.; abs.; geo., rus., eng.

The paper describs and analyzes the basic technical and economic characteristics of main species of the mining and mineral-resource base. It is shown the impact of globalization processes on the development of mineral resources in new tendencies of market; In addition, given an analyse of national wealth, the regional and sectoral aspects of mineral resources, the rational use of mineral resources and socio-economic market development's impact on the country, defined states strategic objectives and general principles in view of the mineral-raw material complex development, introduced the measures of state industrial-economic policy for effective utilization of the mineral resources. Tab. 3, Ref. 25.

<div align="right">Auth.</div>

b16.2.7.12. Research of crude oil physical-mechanical characteristics unsteadiness in main pipelines during the transporting, while depending on natural environment temperature, on purpose of its impact on technical-economical characteristics of the system and reliability of exploitation. /L. Makharadze, N. Khundadze, V. Gelashvili/. – Mining Journal. – 2015. – #2(35). – pp. 36-40. – geo; abs: geo.,eng., rus.

The article reviews the dependence of crude oil transported in main pipelines physical-mechanical characteristics (viscosity, density) unsteadiness on temperature, because it can significantly impact on choosing optimal route of pipeline; on calculation of pipeline hydraulic endurance; on defining the quantity of in-series pumps in the pipeline; on defining their location lengthwise the pipeline and working regime; which for its part considerably impacts on reliability of oil pipeline system exploitation and technical- economical characteristics. Fig. 7, Ref. 4.

<div align="right">Auth.</div>

b16.2.7.13. Analysis of the reliability of operation of main pipelines and oil product pipelines after the example of the systems running through the territory of Georgia. /L. Makharadze, V. Gelashvili, S. Steriakova/. – Mining Journal. – 2015. – #2(35). – pp. 41-48. – geo; abs: geo., eng., rus.

The article reviews a reliability analyses of the analogical systems exploitation, as the example of Baku-Supsa main oil pipeline and Khashuri-Batumi oil product pipeline through the territory of Georgia, which can be accepted for all analogical systems through the territory of Georgia. Above-mentioned systems are yoke objects, which are very difficult as for calculations, also for projecting and exploitation. It considers the impact of system equipment, functional scheme, climate and geographical conditions on its reliability. Fig. 7, Ref. 3.

<div align="right">Auth.</div>

b16.2.7.14. Selection of drilling fluids based on consideration of technological properties and safety aspects of driling operations. /T. Kunchulia, V. Khitarishvili, A. Maisuradze/. – Mining Journal. – 2015.– #2(35). – pp. 48-52. – geo; abs: geo., eng., rus.

The necessity of utilizing mud solutions for achieving high technical-economic indices and minimal harming of the environment is discussed. The usage of mud solutions prepared on the basis of carbohydrates diring sea drilling has been prohibited because of increasing ecology demands. Demand for water-based mud solutions has risen, the use of which can prevent any complication but give rise to the danger of occurring of sulphur hydrogen, which is rather toxic and corrosive. Reduction of pH indices in the solution is the main indicator of its presence. For increasing pH indices it is necessary to add zink containing products. To avoid negative results, a series of preventive measures should be taken. Tab. 1, Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.7.15. Ecology and environmental protection. /D. Tevzadze, M. Tevzadze/. – Mining Journal. – 2015. – #2(35). – pp. 89-92. – geo; abs: geo., rus., eng.

The article mentions certain building materials which harmfully affect the environment and human health during the manufacturing process and usage. Therefore the meeting of definite sanitary-hygienic standards in labour protection while designing enterprises and their exploitation is absolutely necessary. Tab. 1, Ref. 5.

<div align="right">Auth.</div>

b16.2.7.16. Study of Mtsarekhevi oil. /N. Nonikashvili, N. Kavtaradze, Z. Amiridze, T. Uchaneishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 214-2b16. – geo.; abs.: geo., eng., rus.

Physical-chemical operational indicators of oil of Mtsarekhevi mine are studied. Studied oil belongs to the oil of heavy type, is characterized by the small exit of the petrol and light fractions, by the low content of general sulfur and by low freezing point. By technological classification is determined by the code: 1T2M2I1P2. The hydrocarbonic composition of oil fractions is studied by GC-MS method. It is established that in isomeric alkanes the content of the mono substituted isomers predominates over the disubstituted isomers. Tab. 5, Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.2.7.17. Quantitative determination of chlorine and iodine in the fresh waters of Gvishtibi Village, Tskaltubo District. /M. Kikalishvili, M. Kukhaleishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 225-229. – geo.; abs.: geo., eng., rus.

It's the first time chlorine and iodine content has been identified in twenty-five water samples according to the different times of the year in the fresh waters of Gvishtibi village, Tskaltubo district for the purpose of which there have been selected relatively simple and fast methods –mercurometric methods for chlorine and Reznikova's methods for iodine. The average chlorine content of the selected samples is the most in #14 well water (153,4 mg/l) and it's the least in #2 well water (11,4 mg/l). Chlorine ranges from 21,4 to 93,3 mg/l in the rest of the waters. Iodine content is the highest in #4

(12,0 mcg/l), #17 (12,0 mcg/l), and #6 (12,4 mcg/l) well waters. Iodine content ranges between 2,0-11,0 mcg/l. The greatest amount of chlorine and iodine is contained in spring waters because of the abundant amount of percipitation in June and July. Tab. 1, Ref. 9.

<div align="right">Auth.</div>

b16.2.7.18. Expected "clay-slate disaster" and technological ways of its prevention. /E. Shapakidze, V. Skhvitaridze, L. Gabunia, I. Kamushadze, I. Gejadze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 230-233. – geo.; abs.: geo., eng., rus.
Danger of the expected ecological disaster in the river Duruji gorge and rational ways of avoiding it are discussed, which means maximal utilization of millions of ton of river load (decomposed clay-slates) accumulated because of mudflow for many years and using them in producing building materials. For this reason the most perspective is producing heat-insulating materials and mineral additives of cement. In the laboratory conditions, by sintering of clay-slates of the river Duruji and natural correcting additive at 1200-1250^{0}C temperature, light heat-insulating material of homogenous structure is produced with the following parameters: volume weight – 500-900 kg/m3, ultimate compression strength – 0.6–2.5 MPa, water absorption- 3.5–7%, porosity - 60–80%. Researches are being conducted for improvement these parameters. Not least important is producing mineral additives for cement by European standard (EN 197-1) on the basis of the falling rocks of mudflows of the river Duruji – for producing "Port land cement with burned clay-slates", which needs additional laboratory researches. Ref. 6.

<div align="right">Auth.</div>

b16.2.7.19. Taking out of the principal nutriments (NPK) in the harvest of tea leaf. /N. Kutaladze, A. Tsintskiladze, K. Telia, T. Gogolishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 306-308. – geo.; abs.: geo., eng., rus.
Taking out of nutrition elements grows up with the increasing of the harvest of tea leaf. Taking out of nutrition elements without fertilization is not large: N – 17,6 kg/ha: P – 4,12 kg/ha and K – 8,8 kg/ha (in 2009-2010). On the area with the harvest of green tea leaf with 60-80 center/ha the taking out makes 80 kg of nitrogen, 46 kg of phosphorus and 40 kg of potassium. Approximately, the taking out of such quantity of nutrition elements is by means of falling leaves and rough leaves. Taking out of nutrition elements relatively to the harvest of tea leaf may be graded down by the following way: N>P>K. 56-57% from the whole quantity of nutrition elements comes on nitrogen, 14-15% - on phosphorus and 28-29% - on potassium. Tab. 2, Ref. 5.

<div align="right">Auth.</div>

b16.2.7.20. Description of the ecological state of storage and disposal facilities of arsenic bearing waste. /N. Bagrationi, L. Gverdtsiteli, V. Gvakharia, A. Chirakadze, T. Sharashidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 309-312. – geo.; abs.: geo., eng., rus.
Ecological state of storage and disposal facilities of arsenic mining and processing waste on the territory of Lower Svaneti and Racha is described. Fig. 4, Ref. 4.

<div align="right">Auth.</div>

b16.2.7.21. Basic and possible directions of spread of contamination of arsenic toxic waste. /N. Bagrationi, L. Gverdtsiteli, A. Chirakadze, V. Gvakharia/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 313-3b16. – geo.; abs.: geo., eng., rus.
Basic and possible directions of arsenic toxic waste contamination at the territory of Lower Svaneti and Racha are studied. Tab. 1, Fig. 4, Ref. 4.

<div align="right">Auth.</div>

b16.2.7.22. Heavy metals content in the leaves of melissa (*Melissa Officinalis*) at the phenological development stages. /T. Chelidze, L. Enukidze, M. Chankashvili, T. Loladze, M. Churadze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 317-320. – eng.; abs.: eng., geo., rus.
The work is dedicated to the quantitative determination of the heavy metals (copper, lead, zinc and cadmium) in treatment plant - Melissa officinalis leaves at the different stages of phenological development them. Melissa is used as soothing, spazmolitic remedy, it improves the appetite, enhances the secretion of gastric juice, reduces the fermentation problems. During the use the Melissa medicinal the patient is freed from khu feeling, weakens or undermines takhikardic events and cardio pain. The differential-pulse polarographic method was used at the research of the content of heavy metals in Melissa leaves. It was established that quantitative content of the trace elements (Cu, Pb, Zn, Cd) in the leaves of Melissa is characterized by decrease of the concentration from spring to autumn. Of course, their concentration depends on environmental factors. The maximum decrease of the concentration coincides with of vegetation at the last two stages and corresponds to phenological development stages – "adult leaves" and "old leaves". This period is recommended for medicinal plant collection. Fig. 2, Ref. 8.

<div align="right">Auth.</div>

b16.2.7.23. Ore occurrences in the Georgian segment of the Eastern Greater Caucasus: New research results. /A. Okrostsvaridze, K. Akimidze, N. Gagnidze, A. Akimidze, D. Abuashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 102-110. – eng.; abs: eng., geo.
After almost 30-year suspension of metalogenic research in the Georgian segment of the Eastern Greater Caucasus (within Tusheti and Kakheti regions) the authors were able to carry out a new geological prospecting work in the region. The already known ore occurrences of Tebulo, Ilurta, Satskhvre-khorkhi, Abano, Quachadala, Artana, Loduani, Chelti, Sharokhevi and Areshi were studied. At the same time, some new and very interesting ore occurences were discovered in the hydrothermally altered zone of the r. Stori (Gelia, Bendena and the zone enriched with Th) and pyrite-polymetallic ore occurence near the village Lechuri. The latter should be of great interest, since it shows lots of similarities to

Philizchay pyrite-polymetallic deposit by its geodynamic position and mineralogical-geochemical parameters, which makes necessary further detailed study of the above-mentioned ore. In addition, elevated concentrations of gold were detected for the first time in the region. Among them Tebulo ore field is worth noting, where elevated concentrations of gold were defined in both pyrite-polymetallic ores and silicified zones, which should be considered as one of the important results of our study. Moreover, the studied ore occurrences are characterized by concentrations of such important elements for modern high-tech industry as thorium, bismuth, cobalt and cadmium. Chemical analysis of samples were carried out with a ICP-MS device using different methods at AlxChemex laboratory of Vancouver (Canada), at chemical laboratories of the National University of Taiwan and "CMG" Ltd (Georgia). Fig. 5, Ref. 12.

<div align="right">Auth.</div>

b16.2.7.24. New tectonic map of Georgia (explanatory note). /E. Gamkrelidze, M.Gamkrelidze, M. Loladze, T. Tsamalashvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 111-1b16. – eng.; abs: eng., geo.
The map has complex character and contains wide spectrum of data on structure and development of the Earth's crust of the Georgian territory, composition, attitude and geodynamic nature of its constituent rocks. Namely tectonic deformation of rocks and history of their formation, different tectonic structures (faults and folds) and their kinematic nature, deep structure of the Earth's crust, shown by means of the structure contours of different geological horizons, geodynamic conditions of the Caucasus in Mesozoic and Early Cenozoic time, character (direction and velocity) of horizontal movements and stress conditions of the Earth's crust on the territory of Georgia at the neotectonic stage are pictured on the map. Fig. 1, Ref. 34.

<div align="right">Auth.</div>

b16.2.7.25. Forecast of avalanche and monoclynal wave debris flow movement. /O. Natishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 123-127. – eng.; abs: eng., geo.
Criterial correlation for prediction of the occurrence of avalanche movement of cohesive debris flow in the water flow riverbed is suggested. Simultaneous start of several alluvial heaths in erosive incision causes sudden increase of hydraulic parameters of debris flow and the occurrence of monoclynal wave on free surface of the flow. Methods of calculation of hydraulic parameters of monoclynal wave with the account of non-newtonian nature of the debris flow are worked out. Fig. 2, Ref. 8.

<div align="right">Auth.</div>

b16.2.7.26. Research of long-term pollution by petroleum products with GC/MS. /A. Dolidze, I. Mikadze, N. Kavtaradze, T. Uchaneishvili, L. Dolidze, V. Tsitsishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 79-83. – eng.; abs: eng., geo.
Use of territories of the former military airfields for the civil purposes is a priority task. Monitoring of the polluted territories is necessary for providing opportunities of their further civilian use. Recommendations for rehabilitation will be developed on the basis of the monitoring results. GC/MS researches of the territories polluted by petroleum products at several airfields in East and West Georgia (Kopitnari and Vaziani) were conducted. Soil samples were taken at a depth of 15-215 cm. It was established that in places of long-term pollution, partial degradation of initial petroleum products by biological agents of soil takes place. A part of petroleum products is transformed into more hazardous residues in the contaminated areas even after a long period. Therefore, preliminary monitoring and elimination of residual pollution prior to transfering those territories for civilian applications are necessary. Fig. 5, Ref. 8.

<div align="right">Auth.</div>

b16.2.7.27. Structural control on the distribution of hydrothermal alteration zones and mineralization in Dastjerdeh area based on remote sensing data, NW Iran. /R. Nouri, M. Arian/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 84-91. – eng.; abs: eng., geo.
The Dastjerdeh area is a part of Tarom volcano-plutonic zone which hosts many hydrothermal base metal deposits located in Zanjan, NW Iran. Understanding the tectonic events that can cause mineralization and hydrothermal alteration is a significant factor in assessing the exploration potential of different structures. In this research, hydrothermal alteration such as iron oxide, argillic, phyllitic, and propylitic zones were determined by Spectral Angle Method (SAM) and also lineaments identified by high pass filters and hill-shade DEM techniques on Advanced Space Borne Thermal Emission and Reflection Radiometer (ASTER) data. Field studies revealed that most alteration and mineralization occurred in NE-SW fractures. Fig. 5, Ref. 49.

<div align="right">Auth.</div>

b16.2.7.28. Geothermal waters with regard of energy efficiency policy. /K. Vezirishvili-Nozadze, E. Pantskhava, M. Jikhvadze, K. Mchedlidze/. GEN. – 2015. – #3. – pp. 62-64. – geo.; abs: eng.
The results of the efficient complex use of geothermal waters are discussed. Analytical dependences for designing of complex geothermal systems were obtained. The advisability of using the geothermal sources for complex heat-cool supply of agriculture, giving a considerable economy of fuel and improvement of ecologial conditions of the environment, is substantiated. Tab. 2, Ref. 3.

<div align="right">Auth.</div>

b16.2.7.29. Determination of the effect of controlling variables on the efficiency of separation of minerals of different density with a diaphragm jigging machine in the process of enrichment of manganese ore. /M. Gamtsemlidze, G. Javakhishvili, Z. Arabidze, T. Rukhadze, M. Tutberidze, D. Tevzadze/. GEN. – 2015. – #3. – pp. 70-74. – geo.; abs: eng.
The paper deals with the investigation of the gravity concentration of the fine fraction of manganese ore by jigging, in particular with a diaphragm jigging machine. For effective separation of different-density minerals, a driver source was

developed. It allows changing continuously the amplitude of fundamental vibrations of water as well as obtaining the low-amplitude vibrations. The dependence of controlling variables (water vibration amplitude, water consumption and impact force) participating in the process on the manganese content in the concentrate on the basis of correlation analysis is given. By the dispersion method, a significant impact of mentioned controlling variables on the manganese content in the concentrate was determined. Tab. 2, Fig. 3, Ref. 5.

<div align="right">Auth.</div>

b16.2.7.30. The results of monitoring of pollution of the River Kvirila and his vicinities with heavy metals in 2010-2015 period. /E. Bakradze, G. Kuchava, M. Arabidze/. GEN. – 2015. – #3. – pp. 65-69. – geo.; abs: eng.
This research deals with the degree of pollution of the Kvirila River and the adjacent territory with heavy metals, especially in the cities of Chiatura and Zestaponi. The concentration measured in reference areas and at anthropogenic influence points describes the dynamics of changes in the concentration of heavy metals in 2010-2015. Tab. 2, Fig. 4, Ref. 2.

<div align="right">Auth.</div>

b16.2.7.31. Method of determination of the dynamics of the gas distribution network failure risk in time by an example of Kaztransgaz-Tbilisi, Ltd. /D. Namgaladze, G. Sanikidze/. GEN. – 2015. – #4. – pp. 63-66. – geo.; abs.: eng.
The management of the exploitation of the gas distribution network is defined by reliability and durability, while an important index of the network is the risk of failure. The paper discusses the failure of the dynamic system and the restoration time in the coordinate phase space. As a result there was obtained the density of the probability distribution mixture of the gas distribution network element based on which it is possible to define any parameter of the process and to manage the process of reliability. Fig. 5, Ref. 4.

<div align="right">Auth.</div>

b16.2.7.32. Ecological problems of the Black Sea after the example of the territorial waters of Georgia. /R. Diakonidze, E. Shengelia, G. Gavardashvili, G. Chakhaia, L. Tsulukidze, T. Supatashvili, Z. Varazashvili/. GEN. – 2015. – #4. – pp. 93-95. – eng.; abs.: rus.
The paper deals with the evaluation of the ecological state of the Black Sea, which is recognized as an international problem, within the boundaries of the territorial waters of Georgia. At the first stage of the research, the background pollution of the Black Sea was evaluated. The depth distribution of hydrogen sulfide was determined at 3 miles from the coast. Fig. 1, Ref. 5.

<div align="right">Auth.</div>

b16.2.7.33. Elaboration of the technology of quarry water treatment by apilot plant. /N. Chkhubianishvili, M. Kavtaradze, G. Mchedlishvili, L. Kristesashvili/. GEN. – 2015. – #4. – pp. 104-106. – geo.; abs.: eng.
The paper deals with the elaboration of the technology of quarry water treatment by a pilot plant. The technological parameters of electrodialysis are determined. Tab. 2, Ref. 2.

<div align="right">Auth.</div>

b16.2.7.34. Lead in ancient Georgia. /G. Tsirekidze R. Chagunava/. Air Transport. – 2015. – #2(10). – pp. 141-156. – rus.; abs.: rus., eng., geo.
Based on the written sources and archaeological data, the facts of lead smelting in the territory of Georgia are indicated. The earliest among them, in terms of that purpose, is the simplest metallurgical process of restore-smelting in VI – V millenia BC that had been used in pre-dynastic Egypt. Svaneti should be mentioned as one of the land mining centers. Oter fact evidencing the usage of lead in ancient Georgia are given. Ref. 30.

<div align="right">Auth.</div>

b16.2.7.35. Small hydropower engineering - present experience and perspectives of development. /I. Lomidze, G. Khelidze, I. Bijamov/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 86-95. – geo.; abs.: geo., eng., rus.
The main priorities for development of hydropower engineering and electrical devices of small hydropower stations are given. The indications of hydraulic turbines of local and foreign production installed on small hydropower stations are presented. The necessities for performance of abrasive wear-resistance activities of flowing part details at the time of construction of hydraulic turbines are discussed. The advantage of low-pressure bulb-type horizontal hydraulic turbines with modern straight draft tubes is mentioned in comparison with vertical hydraulic turbines of Kaplan, which is demonstrated in deduction of power losses and growth of conductivity. Herewith, high-altitude and planned dimensions of bulb-type hydroblock are significantly less than the vertical shaft hydraulic turbines, which decrease the cost of hydro power station construction. Abilities of application of synchronous and asynchronous generators for different regimes of operation of hydropower stations are reviewed. Tab. 2, Ref. 7.

<div align="right">Auth.</div>

b16.2.7.36. Analysis of thermal regime of the opration period Enguri HPP dam. /P. Chichaghua, M. Kalabegishvili, M. Kodua/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 96-106. – geo.; abs.: geo., eng., rus.
The Enguri arched dam's non-stationary thermal regime analysis using two-dimensional finite-element model and taking into account the dam body's thermometric measurements of operation period are given. Tab. 1, Fig. 4, Ref. 12.

<div align="right">Auth.</div>

b16.2.7.37. Energy security and ways to its ensure in Georgia. /R. Arveladze, T. Kereselidze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 107-113. – geo.; abs.: geo., eng., rus.

The basic principle of energy security can be considered as a complete software economy and population quality energy resources available and at the same time stimulating economical use of energy prices. Complete energy security can only be achieved if the country in the long run from its own resources can fully meet the needs of the economy and population for energy. Given the current state of energy resources, their stocks and opportunities for their use, it is safe to say, that neither in the short nor in the long term in Georgia full Energy security will not be achieved. Currently, more than 70% of consumed energy resources are imported. In order to improve Georgia's energy security, creation a research center, that will develop program is Georgia's energy security. The program should include: • the maximum development of their own hydropower resources at an accelerated pace; • construction of high-performance regulating hydropower plants with the stricter requirements of environmental protection; • where there is a possibility to create complex pumped storage; • implementation of basic electricity import, instead of peak electricity export; • exchange of winter and summer electricity from the States concerned; • inclusion in the power balance of wind, solar and own resources of coal; • an increase in exploration and prospecting of oil and natural gas and the intensification of production; • replacement of some technological and domestic processes of hydrocarbon energy electricity. Ref. 6.

<div align="right">Auth.</div>

b16.2.7.38. On solar energy power supply to low capacity consumers. /Sh. Nemsadze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 114-121. – geo.; abs.: geo., eng., rus.

The autonomous micro-ennergy system, where the energy source is a semiconductor photo-voltaic convertor energy and electricity consumers - electric lighting and other electrical household devices is considered. Given that Georgia is a mountainous country having human settlements in mountainous regions with small populations, as well as farms, nature reserves, tourism and transport infrastructure located remotely from the network of power distribution, it represents the very area for development of micro-energy systems. The importance of solar panels operating at maximum power and the way of reaching this mode are stressed. Fig. 4, Ref. 5.

<div align="right">Auth.</div>

b16.2.7.39. On the ecological security of Mukhrani drinking water intake. /U. Zviadadze, N. Kezevadze, M. Mardashova/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 136-143. – geo.; abs.: geo., eng., rus.

In the extreme south-eastern part of Mukhrani valley, the 2.7 km^2 territory of Mukhrani water intake is situated. The water intake represents a spatial system of exploitation boreholes, situated on profiles oriented from north to south. The boreholes are subartesian and their exploitation is carried out in the pumping regime. The Mukhrani water intake is a significant component in the capital's water supply, especially during intensive rains, when due to high turbidity of water, the use of river filtrates is practically impossible. During the 30-year of exploitation the deposit reserves are not estimated and certified. Correspondingly, the borders of sanitary security zones are not calculated and certified, which often leads to confrontation between the concerned organizations during development of the deposit. The article, on the basis of analysis of the deposit's hydro geological conditions, gives the calculation of sanitary zones for the purpose of their certification, which is just one way to solve this topical question. Fig. 4, Ref. 6.

<div align="right">Auth.</div>

b16.2.7.40. The problems of wastes and waste-waters discharge into the sea /R. Imedadze, M. Manjavidze, E. Kristesiashvili, L. Kristesiashvili/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 144-151. – geo.; abs.: geo., eng., rus.

The problems od seaside towns associated with wastes and waste-water discharge are discussed problems. The authors have their own approach to this issue, which provides international experience. The article deals with the minimum pollution of marine waters, roads, as well as the list of the issues that are needed to solve these problems. The article shows well the problems of uncontrolled discharge into the sea of waste and waste-water and outlines the measures to be taken for eliminating existing shortcomings and solve the waste-water discharge problems. Ref. 10.

<div align="right">Auth.</div>

b16.2.7.41. Modern methods of purification of waste -waters. /R. Imedadze, E. Kristesiashvili, L. Kristesiashvili, M. Manjavidze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 152-159. – geo.; abs.: geo., eng., rus.

Many advanced countries are in the process of methodical study of this issue, which is related to harmful impurities and dirt removal from waste-water treatment facilities through, where the cleaning process is complete. Those processes include the use of active oxygen of high quality active mud, removal of different substances by microfiltration or multiple filters, phosphorus and nitrogen removal, activated charcoal processing of waste-water and the final cleaning of the physical and chemical cleaning instead of conventional biological clean-up. These methods should be implemented by environmental authorities. The suggestions for the improvement of methods of waste-waters treatment methods and equipment schemes are given. The phosphorus and nitrogen removal from waste-waters and sewage treatment to be carried out and the sequence of physical-chemical treatment method are discussed. The experience of leading countries and new approaches to the solution of these issues are discussed. Fig. 6, Ref. 5.

<div align="right">Auth.</div>

b16.2.7.42. New quick tightening material for the metallurgical blends and briquetting of silicomanganese. /R. Skhvitaridze, Sh. Verulava/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 123-127. – geo.; abs.: geo., eng., rus.

On the basis of scientific researches and developed technologies (know-how') in the Georgian Technical University's scientific center "Nanodughabi", also with the clinker produced by Kaspi cement plant (Heidelberg Cement), a new quick

tightening material for briquetting metallurgigal blends ans silicomanganise of the Zestaponi Ferro-alloy Plant has been developed. The details of the conducted work and obtained material are given. Tab. 1, Ref. 4.

<div align="right">Auth.</div>

b16.2.7.43. On the tensions in multicomponent enamel resulted from merging with copper. /V. Gordeladze, A. Sarukhanishvili, M. Kapanadze, M. Mshvildadze, N. Rachvelishvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 128-132. – geo.; abs.: geo., eng., rus.
The article deals with the tensions arusing im multicomponent enamels as a result of their merger with copper. Tab. 1, Fig. 1, Ref. 4.

<div align="right">Auth.</div>

b16.2.7.44. Synthesis of anti-corrosion cover enamels – planning and optimization of the experiment. /M. Razmadze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 133-139. – rus.; abs.: rus., geo., eng.
The possibility of applying the methods of computer planning and optimizing the synthesis of color, anti-corrosion cover of enamel on an integrated raw materials is shown. As a result of investigations, coating enamel frits that enable synthesis of clay-free slips are obtained. The following limits for composite ingredients in wt.% are defined: SiO_2 - 39-44; B_2O_3 - 4-10; Al_2O_3 - 8-10,5; Na_2O - 10-15; K_2O - 0,65-1,5; TiO_2 - 12-18; P_2O_5 - 1,3-3; CaO - 0,8-4; Li_2O - 1-8,5; Fe_2O_3 - 0,05-0,2; MoO_3 or WO_3 - 2-6. Tab. 4, Ref. 7.

<div align="right">Auth.</div>

b16.2.7.45. Optimization of grades, high quality of products, energy efficiency and environmental friendliness - main directions for development of global ferro-alloys industry. /S. Grischenko, I. Seleznyova/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 140-151. – rus.; abs.: rus., geo., eng.
A comprehensive analysis of the global production of ferro-alloys and the achievements of Ukrainian ferro-alloys industry against its background are given. Data are considered from the perspective of preparations for the International Ferro-alloys Congress INFAKON-14, which was scheduled to be held in Kyiv in 2015. Theoretical and practical issues of the development of ferro-alloy production, new technology and equipment, energy efficiency and resource conservation, the use of ferro-alloys in the steel industry, their importance in the production of high-quality special steels are discussed. Fig. 5, Ref. 5.

<div align="right">Auth.</div>

b16.2.7.46. Obtaining multicomponent ligatures during metallurgical processing of industrial waste for secondary treatment of liquid steel. /O. Mikadze, B. Gogichashvili, T. Buchukuri/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 152-b160. – rus.; abs.: rus., geo., eng.
The results of the development of the multicomponent refining ligatures' obtaining technology from the metallurgical, chemical, mining and processing industrial waste containing Mn, Si, Al, Ba, Ce, Ca, Mg, Fe are discussed. The high efficiency of the obtained ligation for secondary treatment of liquid steel for deoxidation and desulfurization and reducing it to the content of non-metallic inclusions is shown. Tab. 7, Fig. 5, Ref. 2.

<div align="right">Auth.</div>

b16.2.7.47. The oil pipeline and the global ecological policy. /T. Gelashvili, G. Archvadze, E. Gegeshidze, R. Tskhvaradze, I. Chkhetia, V. Jajanidze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 50-62. – geo.; abs.: geo., eng., rus.
The aspects of one of the most acute environmental problems of the present are considered: distributions of oil and oil products between the countries that is most important direction of global ecopolicy. Special attention is paid to the the Caspian region and Georgia in these processes, which relevance in many respects is defined by need of transportation of the Caspian oil to Western Europe. The geopolitical risks for Georgia are estimated. Tab. 1, Fig. 1, Ref. 10.

<div align="right">Auth.</div>

b16.2.7.48. Analysis of formation stability. /N. Rurua, E. Moistsrapishvili, A. Samkharadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 63-71. – geo.; abs.: geo., eng., rus.
The article considerd cylindrical and flat shapes of the homogeneous bound soils land masses curling. The graph-analytical and analytical methods for calculating the stability of formation are analyzed. The evaluation of the formation's general stability (embankments and slopes of cuts) by СТН Ц-01-95 standards to carry out in the first limiting state – load bearing-capacity (limit equilibrium state) is analyzed. In practical terms, the variational method of slopes' stability analysis is proposed. It is defined that all known methods for determining the stability of the formation slopes are rather conditional and non-reliable. The obtained results would be considered as satisfactory only for high-pistic homogeneous soils, when φ=const and c=const or only in moderate climat zone. Fig. 1, Ref. 6.

<div align="right">Auth.</div>

b16.2.7.49. The creation of the Georgian steel and his importance in the production. /T. Archvadze, M. Archvadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 270-273. – geo.; abs.: geo., eng., rus.
The research reviews history of the Rustavi Metallurgical Plant, the crisis during its renaming as JSC "Rustavi Metallurgical Plant", and the creation of a new brand of "Georgian Steel". The research also reviews the steps of the new management for returning the prestige of the old brand, for attracting investment and for further development. Ref. 4.

<div align="right">Auth.</div>

b16.2.7.50. System approach for analysis of regional natural-industrial structures (In case of Donbass and Tkibuli-Shaori Deposits). /C. Prikhodko, M. Kakhiani/. Transport and Machinebuilding. – 2015. – #3(34). – pp. b16-24. – rus.; abs.: geo., eng., rus.

Enterprises of fuel and energy complex of Donbas and Tkibuli-Shaori Deposit Region are a sphere of high risks and objects of enhanceable industrial danger that possess large potential possibilities for creation of catastrophe of technogenic character, different accidents, threats to the people and environment. Variety of risks outgoing from the enterprises of complex, the necessity of complex approach for minimization of possibility of accident and catastrophe, and also necessity of organization of the system of risk-management aimed at a decision scale to predetermines. Fig. 4, Ref. 6.

<div align="right">Auth.</div>

b2.8 Environmental biotechnology

b16.2.8.1. The joint influence of industrialization and ineffective environmental legislation on the country's ecology. /G. Khidesheli, G. Lobzhanidze, M. Javakhishvili/. Agrarian-economic Science and Technologies. 2015. – #4. – pp. 64-73. – geo.; abs.: geo., eng.

The article considers processes connected to the industrialization and their impact on the environment. It is just impossible to imagine the contemporary world without large industries and the global economy. The case of the People's Republic of China, as one of the most successful and economically developed countries and its fast growing economy mainly dependant on big industries are discussed. The main environmental problems faced by China nowadays are considered. Furthermore, a short analysis of the environmental law and regulations in China is given.

<div align="right">Auth.</div>

b2.9 Industrial Biotechnology

b16.2.9.1. Possibilities for use of technology for producing potassium compounds from potassium-containing nonmetallic feed. /L. Kartvelishvili, Zh. Kakulia, Sh. Malashkhia, N. Lomidze, M. Kandelaki, L. Chochia, N. Chkhobadze/. – Mining Journal. – 2015. – #2(35). – pp. 68-71. – geo.; abs: geo., rus., eng.

For improved and effective using of mineral resource in agriculture and industry the application of biotechnology method offers considerable possibilities. In this regard of special interest is the use of domestic resource supply of agro-mineral raw materials, in particular aluminosilicates and silicates. The possibilities of using the biotechnology method in the field are considered and the worldwide experience is analyzed. Ref. 15.

<div align="right">Auth.</div>

b16.2.9.2. Prospective preparative forms of antioxidants from unripe green fruits of hazelnut. /A. Dolidze, Z. Alavidze, M. Goderdzishvili, I. Mikadze, N. Kavtaradze, L. Dolidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 234-237. – eng.; abs.: eng., geo., rus.

Plant extracts are the main source of antioxidants. Unripe green hazelnuts have not been yet used for extraction of antioxidants mixture. The gathering of unripe green hazelnut fruits, reprocessing with extracting of antioxidant concentrates and elaboration of different preparative forms on their basis is proposed. Expansion of the raw material base for antioxidant preparations promotes improvement of health and living standards of population. Ref. 21.

<div align="right">Auth.</div>

b16.2.9.3. New generation of therapeutic and prophylactic products. /T. Tsivtsivadze, N. Chigogidze, R. Kldiashvili, R. Skhiladze, G. Sulakvelidze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #2-3. – pp. 238-241. – geo.; abs.: geo., eng., rus.

As a result of long-term purposeful searching and research, scientists of the scientific center of biologically active substances of Georgian Technical University selected a group of prospective reserve vegetable crops of strategic importance, among them Jerusalem artichoke, that is able to survive in harsh climatic conditions (within temperature range from -50°C to +50°C) and provides the nutrition of population after the natural disasters. Foods cooked of Jerusalem artichoke along with unique nutritional value have also invaluable therapeutic and prophylactic qualities. Jerusalem artichoke contains up to 18% of natural polymer - inulin - a biologically active substance that has antidiabetic qualities and is used in medicine to substitute sugar and starch in the treatment of diabetes. We have proposed antidiabetic new generation white bread "Elite" that is enriched with flour made of Jerusalem artichoke (up to 5%), its compositions and production flow chart are elaborated. New generation black bread "Savoury" with the concentrate of mixture of Georgian spices as antidiabetic supplements has been also proposed. It was awarded with certificates of conformity and production standard. We have proposed new type of iodinated "Mustard bread." Patented technological innovations and a number of "know-how" are used in its production. Iodinated "Mustard bread" is primarily useful to consumers who suffer from intestinal dysbacteriosis, goitre, and diabetes. Ref. 15.

<div align="right">Auth.</div>

b16.2.9.4. Perspectives of fuel production from biomass of *Camelina Sativa* in Georgia. /A. Dolidze, I. Mikadze, T. Uchaneishvili, N. Kavtaradze, L. Dolidze, N. Nonikashvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 321-323. – geo.; abs.: geo., eng., rus.

Due to shortage of energy resources the necessity of transition to alternative sources grows, which is caused by increase in prices of fossil fuels, as well as by threat of global climate change. Prospect of development of biofuel production depends on many factors, including competition of nontraditional energy sources (wind, helioenergy). Works on diverse remains of plant, which were not applied earlier (corn trunk, cellulose, etc.) are begun. Some scientists do not consider the full transition to the application of biofuels expedient, as they believe it will increase the costs of agricultural production and food prices. It is expected that due to multilateral use of oil of camelina sativa (diet, paint, medicine, perfumery, medical cosmetics, aromatherapy), received product supposedly completely will be sold in the domestic market. Ref. 9.

Auth.

b16.2.9.5. Flavonoides – biologically active natural compounds with antioxidant properties. /L. Tatiashvili, M. Stepanishvili, N. Tserodze, I. Mikadze/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 324-328. – geo.; abs.: geo., eng., rus.
The range of different flavonoide group compounds are being studied. A rational method for separation of substances with antioxidant properties from plant raw materials is selected. The technology for receiving water-soluble flavonoide ethyl acetate fraction from savory is developed. Ref. 19.

Auth.

b16.2.9.6. Extraction methods of biologically active substances from plant materials. /K. Kochiashvili, T. Dgebuadze, M. Japaridze, M. Stepanishvili, R. Tsiskarishvili/. Proceedings of the Georgian National Academy of Sciences, Chemical Series. – 2014. – v. 40. – #4. – pp. 332-336. – geo.; abs.: geo., eng., rus.
Extraction of biologically active agents – flavonoids from vegetable raw materials the major stage for receiving medical preparations. Purity of the received flavonoid depends on endemic raw materials, a methods and extraction conditions. Tab. 1, Ref. 13.

Auth.

b16.2.9.7. Selection of industrially valuable Xylanase producer strain. /M. Jobava, L. Kutateladze, N. Zakariashvili, E. Kvesitadze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 1b16-121. – eng; abs: eng., geo.
Xylanase (hemicellulase) is one of the key enzymes in the creation industrial process of natural biopolymers enzymatic degradation. The importance of this enzyme from the viewpoint of alternative sugar and biofuel production from plant row materials is attracting more and more attention. The objective of the present study was the primary selection of xylanase producing fungi from soil – rich microflora sources of the Caucasus, selection and optimization of the carbon content and nitrogen components in nutrient media under submerged fermentation for industrial xylanase production. Initially, fungal strains, including extremophiles, were isolated from different soils of climatic zones of Georgia. In total, more than 420 strains were isolated and purified. Among them 85 were defined as extremophilic strains (halophiles). Finally, 21 most active producers of xylanase were chosen from this collection. Further selection revealed five strains representing the following genera: *Aspergillus, Penicillium, Sporotrichum* and *Trichoderma* according to their relatively high activity of extracellular xylanase (with maximum 52 U/ml, *Penicillium canescence* AEM 85). Nutrient medium for xylanase cultivation in submerged condition for *P. canescene* AEM 85 was optimized. The xylanase activity selected producer, while the growth on the optimized medium as compared with the basic medium, increased by more than 40%. Tab. 1, Fig. 2, Ref. 7.

Auth.

b16.2.9.8. Tolerance of Israel local strains of entomopathogenic nematodes steinernema feltiae and heterorhabditis bacteriophora at the 37°C temperature. /N. Mikaia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 122-126. – eng; abs: eng., geo.
The overall aim was to study the tolerance of some entomopathogenic nematodes. The experiments were conducted at Laboratory of Nematology, Institute of Plant Protection, ARO, Israel. The strains of *Steinernema feltiae* (SFG) - SFG-Besor, SFG-zeelim orange, HP-Besor, HP-Dvora, HP-Grofit and *Heterorhabditis bacteriophora* (HP) were used in experiments. In control tests the SFG was used. The nematodes were transferred to Petri dishes, where the distilled water was poured. Petri dishes with nematode suspensions were placed at the room temperature during 24 hr; after t at the alive nematodes were calculated. The tolerance of entomopathogenic nematodes strains *Steinernema feltiae* (SFG-Besor, SFG-Zeelim orange) and *Heterorhabditis bacteriophora* (HP-Besor, HP-Dvora, HP-Grofit) at 37ºC is presented. The higher tolerance of SFG strains - SFG-Besor, SFG-Zeelim orange in comparison with HP (HP-Besor, HP-Dvora, HP-Grofit) is established. The aim of the present study was to isolate native strains of EPNs from varied climatic regions in Israel and to evaluate traits which are important as biological control agents. Fig. 4, Ref. 9.

Auth.

b16.2.9.9. Study and wasteless utilization of the residue after profilaxis of oil pipe-line. /G. Khitiri, I. Chikvaidze, T. Gabunia, M. Tsurtsumia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 103-106. – eng; abs: eng., geo.
During the pipeline operation a large amount of heavy components are deposited in the form of semisolid, viscous-flow mass. The residue reduces a pipeline throughput capacity and causes various delays which may be followed by some serious accidents and ecological problems. To avoid such results it is necessary to inspect and clean the pipeline periodically. After cleaning the pipeline a heavy semisolid viscous mass of residue is accumulated, utilization of which is one of the topical problems of chemistry and ecology today. The residue is characterized by specific physical and chemical properties. The main components of residue are relatively high-molecular saturated naphtenic, aromatic hydrocarbons and heteroatomic compounds. Its composition is quite different from the oil wastes, and it is much more prospective for production of some deficient goods. The chromatomasspectrometric study of the sample of pipeline

reasidue taken in 2013, show that it consists of: 5% resins, 5% water, 17% liquid hydrocarbons, 72% solid hydrocarbons, among them octan, nonan, dakan, hydrocarbons of eikozan, tricozan, tetracozan groups, and the others. It should be noted that the sample-2013 contains approximately 28% of mechanical impurities, while the sample-2012 only 8.3%. As a result of vacuum fractionation of the residue in the rectifying column, five fractions under study were obtained: 80-190; 190-300; 300-350; 350-450°C and the residue >450°C. The main parameters of the fractions are determined: yield, inflammation and explosion points, acid number and the content of sulfur, paraffins, arenes, naphtenes, resins and pyrobitumens. Recommendations on the spheres of utilization of these fractions are worked out. The ecologically safe scheme is elaborated for wasteless processing of oil pipeline residue, which gives possibility to obtain high-quality deficient products by means of rectification and molecular distillation preventing cracking and bypassing expensive stages i.e. by a simple technique. Tab. 1, Ref. 2.

Auth.

b16.2.9.10. Beidellite of the Okriba bentonite clay. /A. Makharadze/. GEN. – 2015. – #4. – pp. 90-92. – rus.; abs.: eng.
The beidellite clay associated with the Okriba formation of sheet slates is the product of subaerial weathering of andesite tuffs. In its basic parameters, this beidellite is similar to the reference one from the Black Jack Mine, Idaho,USA. Fig. 1, Ref. 1.

Auth.

b16.2.9.11. Perspectives of algae application in bioenergetics. /T. Shamatava/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 122-128. – geo.; abs.: geo., eng., rus.
Modern technologies of extraction of the third generation biofuel, which are based on large-scale utilization of algae are considered. Various methods of oil extraction from algae presented and the prospects of development of this direction in Georgia and in the World are discussed. Fig. 4, Ref. 13.

Auth.

b16.2.9.12. Biological implants in abdominal wall hernia repair (Review). /N. Abatov, R. Badyrov, A. Abatova, E. Assamidanov, B. Kaukenov/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 7-12. – rus.; geo., eng., rus.
The use of synthetic meshes as a material for abdominal wall hernia repair does not always ensure a recurrence-free treatment outcome and full recovery of the abdominal wall functional activity. There are well-known disadvantages such as poor resistance to infection, the infiltrate formation in the place of implantation, expressed adhesive process in cases of intraperitoneal fixation, to create certain restrictions on the using of these implants for abdominal wall reconstruction. The search for alternative materials that could minimize the risk of complications, has led to the study of biological grafts. It is known that various methods for the manufacturing biological implants determine endogenous properties for each material separately, and may be cause a variety of biological responses in vivo after implantation. The question has not been resolved, what the fresh raw material is better to use for derive biological implants. In this review we investigated the interaction of different types of biological implants between the abdominal wall and the organs of abdominal cavity of the recipient, their ability to resist infection and the development of relapses, as a leading indicator of the effectiveness of hernioplasty. Ref.30.

Auth.

b2.11. Other engineering scinces and technologies

b16.2.11.1. Automation of a high-temperature resistive furnace. /B. Bendeliani, G. Dgebuadze, I. Metskhvarishvili/. Science and Technologies. – 2015. – #1(718). – pp. 9-12. – geo.; abs.: geo., eng., rus.
A high-temperature, automated, multipurpose furnace is developed, the big sizes chamber of which allows simultaneous, quick and comfortable treatment of a large series of samples. The program control function makes it possible to change the temperature and time modes without continuous presence of the service personnel. The sound alarm system turns on at reaching the control point and automatic shut-down is provided in emergency situations. Fig. 1, Ref. 3.

Auth.

b16.2.11.2. Heating spot welding items by half-working electrodes. /A. Sulamanidze, G. Kakhishvili/. GEN. – 2015. – #3. – pp. 45-47. – geo.; abs: eng.
A technique of heating of items of spot welding has been elaborated. It is shown that the location of the welding spot determined by the elaborated method depends on the thickness ratio of the items to be welded. Fig. 3, Ref. 4.

Auth.

b16.2.11.3. Chemical composition of promising raspberry strains and their antioxidant potential. /V. Kvaliashvili, L. Gulua, M. Zhgenti, T. Turmanidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 112-114. – geo.; abs.: geo., eng.
The chemical composition of promising raspberry strains found in Georgia are discussed. The content of polyphenols, monomeric anthocyanins and vitamin C has been determined. Each individual strain has been characterized according to their antioxidant activities. Fig. 1, Tab. 2, Ref. 6.

Auth.

b16.2.11.4. Biological features and productivity of lentil crop. /N. Mikava, G. Danelia, Z. Chankseliani/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 115-117. – geo.; abs.: geo., eng.
The main biological parameters of lentil crop: proteins, elements of ash (mineral part) and raw cellulose were studied in Georgia. The lentil products were found to be in compliance with standards and usable for consumption. Georgia has

god prospects for producing lentil crop, which can frequently replace protein and improve the food value of production for population and for animal husbandry. Fig. 3, Ref. 4.

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b16.2.11.5. Influence of shock freezing on some indicators of meat semi-finished products. /D. Tavdidishvili, D. Tsagareishvili, Ts. Khutsidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 121-123. – geo.; abs.: geo., eng.

The influence of different conditions of freezing on the duration of the minced meat semi-finished products' cold treatment process was investigated. In comparison with traditional freezing conditions, the shock freezing was found to had significantly reduced the duration of cold treatment and loss of mass of the chopped meat semi-finished products. Fig. 1, Tab. 1, Ref. 2.

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b16.2.11.6. Study of some indicators of the chemical composition and safety of kiwifruit (actinidia) and mulberry. /Ts. Khutsidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 124-126. – geo.; abs.: geo., eng.

Some inducators of the chemical composition and safety of kiwi fruit (*Actinidia*) and mulberry are determined and their high nutritional value is established; the content of toxic elements and their microbiological parameters do not exceed the maximum permissible norms, which indicates the ecological safety and microbiological reliability of the investigated fruits. Using the studied fruit, different food products – mulberry and kiwifruit sauce and cream soufflé were developed with kiwifruit. Fig.2, Tab. 2, Ref. 3.

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B3. MEDICAL AND HEALTH SCIENCE

b3.1. Basic medicin

b16.3.1.1. Recognition memory impairment and neuronal degeneration induced by intracerebroventricular or intrahippocampal administration of okadaic acid. /T. Naneishvili, M. Chighladze, M. Dashniani, M. Burjanadze, N. Chkhikvishvili, G. Beselia, L. Kruashvili, N. Pochkhidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #3. – pp. 155-b161. – eng; abs: eng., geo.

In the present study, we evaluated and compared effect of intracerebroventricular (ICV) and intrahippocampal bilateral microinjection of okadaic acid (OA) on recognition memory function assessed in open field paradigm and hippocampal piramidal cell loss in rats. Rats were divided in the following groups: Control(icv) - rats injected ICV with aCSF; Control(hipp) - rats injected intrahippocampally with aCSF; OAicv - rats injected ICV with OA; OAhipp - rats injected intrahippocampally with OA. Nissl staining of hippocampal sections showed that the number of pyramidal cells in the CA1 region of the hippocampus in the control group is significantly higher than that in the OAhipp and OAicv groups. The number of pyramidal cells in OAicv group is significantly higher than that in the OAhipp. The results of behavioral study indicate that bilateral microinjection of OA into the dorsal hippocampus induced impairment in recognition memory. Control rats as well as OAicv treated rats clearly reacted to the modification of the configuration by exploring the displaced (or novel) object more than nondisplaced (or familiar) ones. The present findings indicate correlation between recognition memory impairment and hippocampal cell loss induced by OA treatment. Our results give the possibility to assume the involvement of the hippocampus in object and spatial recognition memory and it may be suggested that the OA-induced recognition memory impairment may be attributed, at least in part, to the hippocampal cell death caused by the drug. Fig. 4, Ref. 15.

<div align="right">Auth.</div>

b16.3.1.2. Lung functional test trajectories leading to chronic obstructive pulmonary disease. /T. Atanasov/. Georgian Respiratory Journal. – 20b16. – v. 12, #1.– pp. 24-35. – geo.; abs.: geo.

It was assumed that the chronic obstructive pulmonary disease (COPD) was developed secondary as a result of accelerated decrease of maximum volume of forced expiratory (FEV1), but it is possible that normal reduction of FEV1 also leads to the development of COPD in those persons, whose FEV1 maximum limit is less to compared with population norms. The study participants were divided into 3 separate groups (the Framingham OffspringCohort, the Copenhagen City Heart Study, and the Lovelace Smokers Cohort) according to pulmonary function tests at the beginning of the study (FEV1's prognostic value ≥80% or <80%) and the existence or non-existence of COPD during the last visit of the study. The average age of involved patients was about 40 years. At the end of the study was defined the COPD status and the frequency of FEV1reduction in participants. Out of 657 patients, whose FEV1 value prior to 40 years was less than 80%, in 174 (26%) - COPD developed after 22-year follow-up, while out of 2,207 patients, whose baseline FEV1 value prior to 40 years was at least 80%, after 22 years of observation only in 158 (7%) has developed COPD. At the end of the observation period, approximately half of patients with COPD, i.e. 332 of them, under 40 years had a normal rate of FEV1 and afterwards occurred rapid decline with an average 53±21 m rate per year. The remaining half had low rates of FEV1 at the young age, and then it was reduced by about 27±18 m per year, like smokers. Our research suggests that the low rate of FEV1 during young age is important for the development of chronic obstructive pulmonary disease and the rapid decline of FEV1 rates is not necessary for the development of COPD. Ref. 25, Fig. 1.

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b16.3.1.3. Frequency of polymorphism of VKORC1 and CYP2C9 genes in two regions of Georgia. /T. Jokhadze, N. Kakauridze, T. Buadze, M. Gaiozishvili, T. Lezhava/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 46-51. – rus.; abs.: geo., eng., rus.

The aim of the research was to study the frequency of VKROC1 and CYP2C9 genes different alleles for healthy donors and for patients with thrombosis, in two regions of Georgia – in Samegrelo and in Tbilisi and to reveal the interdependence of the studied genes products in the treatment of thrombosis with warfarin. Warfarin is an anticoagulant, causing the inactivation of the VKORC1 gene product, which is one of the clotting factors. The protein product of CYP2C9 gene is involved in the metabolism of warfarin. Genotyping of blood samples for studied genes alleles was carried out using a tube scanner (ESE Quant Tube Scaner), allowing identify SNPs. In the studied group of patients with thrombosis from Samegrelo region the wild-type homozygotes by for studied genes alleles was carried out using a tube scanner (ESE Quant Tube Scaner), allowing identify SNPs. In the studied group of patients with thrombosis from Samegrelo region the wild-type homozygotes by the gene VKORC1 were - 90%; heterozygotes - 10%; mutant homozygotes have not met at all. In the studied group of patients with thrombosis from Tbilisi, also predominated homozygous wild type (60%); heterozygotes were - 40%; mutant homozygotes were not met. The genotypes of healthy donors fromTbilisi did not differ from the same indicator of of Samegrelo (homozygous "wild" AA - 37%; genotype AB - 47%; and mutant genotype - BB - b16%). In patients with thrombosis, from Samegrelo, wild-type homozygotes and heterozygotes by CYP2C9 gene were almost the same rate (51% and 49% -, respectively); mutant homozygotes were not revealed. In patients from Tbilisi, the frequency of wild-type homozygotes was 70%, heterozygotes and mutant homozygotes was 20% and 10% - respectively. The ratio of the frequencies of CYP2C9 gene alleles in healthy donors from Tbilisi and Samegrelo is not different - wild-type homozygotes - 77%; heterozygotes - 23%; mutant homozygotes in both regions were not met. VKORC1 and / or CYP2C9 genes polymorphisms are presented in a number of clinical dosing algorithms and in prospective clinical trials. It is revealed the significant variation of genotypes in patients with thrombosis (in both studied regions), which indicates the importance of its rsearch in both the treatment process, as well as for the prevention of thrombosis. Fig. 4, Ref. 17.

Auth.

b16.3.1.4. The role of genetic polymorphism of TLR4 and TLR7 genes' receptors in the development of chronic hepatitis C and gender features of their distribution. /L. Sizova, T. Koval, I. Kaidashev, V. Ilchenko, G. Dubinskaya/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 51-56. – rus.; abs.: geo., eng., rus.

The aim of the study was to investigate the prevalence of polymorphisms Asp299Gly (rs4986790) TLR4 gene and Gln11Leu (rs179008) TLR7 gene in patients with chronic hepatitis C in general and in gender distribution. To achieve this goal the study used the methods of "case-control", which included 125 patients with chronic hepatitis C, who were treated in the Poltava Regional Clinical Hospital of Infectious Diseases. The group of population control for the study of the prevalence of polymorphisms Asp299Gly TLR4 gene included 90 healthy residents of the Poltava region, for Gln11Leu gene TLR7 - 85. Gender groups were equivalent. The study found that in patients with chronic hepatitis C genotype Asp299Gly TLR4 gene was detected in 15.2%, allele 299Gly - in 7.6%, which is 4.5-4.6 times higher than their rate in control group (3.3% and 1.7%, respectively, p<0.01). The presence of polymorphism of the TLR4 gene in the genome can be considered as a predictor of development of chronic hepatitis C, factors of increased risk are the Asp299Gly genotype and the allele 299Gly (OR=5.19, p<0.01 and OR=4.85, p<0.05 respectively). Polymorphic genotypes Gln11Leu and Leu11Leu of the TLR7 gene recorded in 18.4% of patients with chronic hepatitis C, among them Gln11Leu heterozygous genotype was detected in b16.8%, homozygous Leu11Leu - at 1.6%, with no statistical difference from the population control (25.9%, 22.4%, 3.5%, respectively, p>0.05). "Mutant" genotypes of the TLR7 gene were determined significantly more often in women with chronic hepatitis C (27.1%) and in healthy people (39.5%) comparing to men (13.0% and 14.9%, respectively, p<0.05). Tab.3, Ref. 15.

Auth.

b16.3.1.5. Psycho-educational program as a way of correcting motivational components in patients with paranoid schizophrenia with abdominal obesity. /V. Sinayko, L. Korovina/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 56-61. – rus.; abs.: geo., eng., rus.

The aim of the study was to investigate the influence of motivational and targeted psychoeducational programs designed for patients with paranoid schizophrenia with abdominal obesity. We observed 34 women aged 18-42 with continuous-flow type paranoid schizophrenia. All patients had a concomitant abdominal obesity, which developed secondarily after long-term administration of second generation antipsychotic medications (at least 1 year). Based on clinical-psychopathological and psychometric methods of assessment and on the analysis of Treatment Satisfaction Questionnaire we have developed modules for psychoeducational programs. Based on the results of the treatment we conclude that the application of psychoeducational programs is an effective component of complex treatment of patients with paranoid schizophrenia. Abdominal obesity should be regarded as an important and the main side effect of long-term therapy with atypical antipsychotic medications. It has a marked negative effect on subjective assessment of patients and decreases the level of their mental and social adaptation. This factor should be the basis for the formation of re-socialization and compliance-oriented actions. Ref. 11.

Auth.

b16.3.1.6. Alteration of oxidative metabolism and immunological parameters under the influence of UVA radiation in women of different ages. /K. Berianidze, A. Katsitadze, T. Sanikidze/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 97-101. – eng.; abs.: geo., eng., rus.

The purpose of study was to investigate the alteration of oxidative and immunological metabolism in blood of reproductive and menopausal age women after UVA irradiation. Women of two groups (1 - menopausal, 2 – reproductive age) were exposed to radiation with wave length 320-400 nm for 5-10 minutes per session in the solarium for the period of 3 months (6 days per month). Parameters of oxidative metabolism - activity of red blood cells (RBC), antioxidant

enzymes catalase (CAT) and superoxiddismutase (SOD) were studied by spectrophotometric method; reactive oxygen (O2-) and lipid (LOO) free radicals content in whole blood were studied by Electron Paramagnetic Resonance (EPR) methods with use of specific spin-traps - 5,5-Dimethyl-1-Pyrroline-N-Oxide (DMPO) and α-phenyl-N-tert-butylnitrone (PBN) (SIGMA). Parameters of immunological metabolism - IFN-α, IL-2, IL-10 cytokines content in blood were studied by immunoenzymatic assay ELISA. The study protocol has been approved by the Ethical Committee of the Tbilisi State Medical University. After the course of UVA irradiation in menopausal women CAT activity increased by 20%, SOD - by 24%, and EPR signal of spin trapped lipoperoxide radicals was detected. No alterations in blood redox-balance were detected in women of reproductive age. Values of blood immunological parameters in menopausal women were not changed under the influence of UV radiation; in women of reproductive age IL-10 content increase by 93% (within a normal value range) was revealed. Research results have shown that UVA rays cause a particularly significant influence on the oxidative metabolism in the women of menopausal age. Increase of IL-10 blood levels in women of reproductive age (considering its imunosupressing activity) represents an additional risk of cancerogenesis. Based on the study results, we recommend avoiding UV (including UVA) radiation procedures to women of both reproductive and menopausal ages.Tab. 2, Ref. 23.

Auth.

b16.3.1.7. Clinical and pharmaceutical aspects of the use of antithrombotic drugs in patients suffering from ischemic heart disease (review). /Y. Zhunussov/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 32-39. – eng.; geo., eng., rus.

The article discusses the possibilities and evidence base of the use of antithrombotic drugs in common clinical practice. It presents information about the basic clinical trials of the effectiveness of antithrombotic medications (CAPRIE, CURE, VA, RISC, ISIS2, PLATO) in the treatment and secondary prevention of the consequences of atherothrombosis. Also presents the algorithms for prescription of antithrombotic drugs and the principles of rational use of antiplatelet agents. Tab. 1, Ref. 43.

Auth.

b16.3.1.8. Optimum application of modern antithrombotic drugs among patients with the acute coronary syndrome with the risk of stricture formation of coronary arteries. /Y. Zhunussov, D. Taizhanova, R. Abdullabekova, U. Bitz, O. Visternichan/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 40-45. – eng.; geo., eng., rus.

The purpose of the research is to give the effectiveness and safety of ticagrelor in combination with acetylsalicylic acid as preoperative treatment of primary stenting in patients with ACS. We have investigated 42 patients with ACS, 3 of which were diagnosed with cardiogenic shock, age from 38 to 82 years (63±6.5 years). The ACS diagnosis was verified using the results of the ECG, a troponin test and x-ray contrast coronary angiography. The purpose of preoperative antiplatelet treatment prior to primary PCI ticagrelor was administered in the dose of 180 mg and aspirin at a dose of 200 mg. Emergency coronary angiography and primary PCI was performed 15-90 minutes from the time of diagnosis. TIMI III flow in the infarct-related coronary arteries was achieved in all patients. None of the patients the phenomenon of "No-Reflow" has not developed. The appointment of the antiplatelet drug ticagrelor before primary PCI contributes to the achievement of full blood flow restoration in the infarct-related coronary artery, and also reduces the risk of intraoperative and postoperative complications. Fig. 2, Tab. 1, Ref. 17.

Auth.

b16.3.1.9. NEVUS FLAMMEUS associated with dysplastic nevi and lichen sclerosus: the first report in the medical literature. /G. Maximov, A. Chokoeva, S. Philipov, J. Cardoso, G. Ivanov, U. Wollina, G. Tchernev/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 58-64. – eng.; geo., eng., rus.

We describe a rare case of a 28 year-old male patient with pruritus and increased sensitivity of the prepuce accompanied by erythematous confluent papules, unilateral nevus flammeus (NF) along almost the whole length of the right lower limb and two dysplastic nevi (DN), one located on the mid back and the other on the medial border of the right fifth toe, the latter coinciding with the NF. A biopsy of the prepuce revealed lichen sclerosus et atrophicus (LSA). Mental health assessment revealed anxiety disorder and predisposition to panic attacks. Several clinical, paraclinical and histopathological examinations were undertaken to evaluate potential underlying factors for such unusual combination of findings. Both dysplastic nevi were surgically removed. A topical calcineurin inhibitor treatment of the LSA was prescribed. For the first time in medical literature, we report an extremely rare association of NF, DN (including DN over NF) and LSA, and we are focusing our discussion on a potentially common genetic background which could explain this unusual combination of different diseases, which could in turn be caused by different mutations in common genes and/or different genes with close location in the genome. Fig. 3, Tab. 1, Ref. 13.

Auth.

b16.3.1.10. A study of impact of mercury chloride on myocardium in experiment. /R. Kamynsky, V. Primachenko, L. Sokurenko, Y. Chaikovsky/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 64-70. – rus.; geo., eng., rus.

The article is devoted to the study of the myocardium structural reorganization features under the action of 0,01 LD50 of mercury chloride (II) rats when comparing chronic (30 injections) and subchronic (10 injections) exposures. Structural-metabolic reorganization of the myocardium was studied using histological, histochemical and electron microscopic methods. Computer morphometric analysis with subsequent statistical processing was applied. It was established that the main mechanisms of cardiotoxic effect of mercuric chloride are: hypoxia (due to damage to micro vessels; disorder of myogenic regulation at the expense of damage intercalated discs) and the appearance of cell detrits and abnormal proteins as a result of the destruction of cardiomyocytes. Sensitive to the toxic effects of chloride mercuric in low doses are myofibrils, sarcoplasmic network and the energy apparatus of cardiomyocytes - the mitochondria. It was found that chronic exposure to low doses of mercury chloride causes non-specific qualitative and quantitative changes in all structural components of the heart, damage to the tissue barrier is ongoing and dynamic and resorptive insufficiency

hemomicrocirculatory bed of the heart that leads to chronic swelling that causes the development of diffuse fibrosis and enhances cardiac decompensation activities. Fig. 8, Ref. 15.

<div align="right">Auth.</div>

b16.3.1.11. A rare case of right diaphragm agenesis. /T. Sesitashvili, G. Tomadze, G. Gvantseladze, A. Rekhviashvili/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 7-10. – eng.; abs.: geo., eng., rus.
Diaphragmatic agenesis is the most extreme and rare form of congenital diaphragmatic maldevelopment and therefore diagnosis of it are only few in literature, especially in children. It may be unilateral or bilateral. Frequently, diaphragmatic agenesis is accompanied with diaphragmatic hernia, when through a congenital defect of the diaphragm liver, intestine and other viscera herniate into the chest. Diagnostics typically are made early in infancy and is generally associated with other genetic anomalies, especially aneuploidy syndromes. It is associated with a high mortality, if not treated in infancy. However, according to published literature only a few patients have survived till adulthood. In this report, we describe the case of a 63 years old male patient who admitted in a hospital with small bowel intussusception because of strangulated intestinal obstruction and peritonitis. While surgical operation and revision of abdominal cavity, partial right-sided agenesis of the diaphragm was revealed. Two operations were performed on a patient; one because of strangulated intestinal obstruction and accompanied peritonitis and the second, because of stitch insufficiency after 5 days from the first surgical operation. Taking into account the heavy overall status of the patient, diaphragm plastic was not performed and its performance postponed for future. Fig. 2, Ref. 7.

<div align="right">Auth.</div>

b16.3.1.12. Effects of vitamin D analogs on erythropoiesis-stimulating agent dasage and secondary anemia in hemodialysis patients. /C. Varim, S. Sipakhi, S. Yaylaci, T. Kaya, A. Nalbant/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 26-32. – eng.; abs.: geo., eng., rus.
Investigated are the effects of vitamin D analogs, paricalcitol and alphacalcidol on hemoglobin levels and erythropoietin-stimulating agents' dosage in hemodialysis patients with chronic renal failure. A total of 310 patients under hemodialysis treatment for chronic renal failure were included in this retrospective multicenter study. Data on serum parathormone and hemoglobin levels, erythropoietin-stimulating agents' doses, C-reactive protein, calcium and phosphate levels were collected from medical records to comparatively evaluate paricalcitol, alphacalcidol and no treatment groups. Apart from significantly higher levels for hematocrit in patients treated with paricalcitol compared to pre-treatment values (32.3(3.8) vs. 34.1(3.1) p=0.007), pre-treatment and post-treatment values for biochemical parameters were similar in paricalcitol and alphacalcidol groups including ESA dose. A significant increase in parathormone levels (p=0.000 for each) while a significant decrease in calcium (p=0.003 and 0.040, respectively), Hb (p=0.001 and 0.009, respectively) and hematocrit (p=0.001 and 0.021, respectively) levels were determined in paricalcitol and alphacalcidol treated patients compared with untreated patients. Also, phosphate levels in alphacalcidol treated patients were significantly higher (p=0.018) than untreated patients Our findings revealed insufficient suppression of parathormone levels and there of lower hemoglobin and hematocrit levels, but similar ESA dosage among CRF patients treated with Vitamin D analogs compared with untreated patients. Tab. 3, Ref. 20.

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b16.3.1.13. Memantine attenuates the okadaic acid induced short-term spatial memory impairment and hippocampal cell loss in rats. /M. Dashniani, M. Chighladze, M. Burjanadze, G. Beselia, L. Kruashvili/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 59-63. – eng.; abs.: geo., eng., rus.
In the present study, the possible beneficial effect of memantine on the Okadaic Acid (OA) induced spatial short-term memory impairment was examined in spatial alternation task, and the neuroprotective potential of memantine on OA-induced structural changes in the hippocampus was evaluated by Nissl staining. OA was dissolved in artificial cerebrospinal fluid (aCSF) and injected intracerebroventriculary (ICV) 200 ng in a volume of 10 µl bilaterally. Vehicle control received aCSF ICV bilaterally. Control and OA injected rats were divided into 2 subgroups injected i.p. with saline or memantine (5 mg/kg). Memantine or saline were given daily for 13 days starting from the day of OA injection. Behavioral study showed that bilateral ICV microinjection of OA induced impairment in spatial short-term memory. Nissl staining in the present study showed that the ICV microinjection of OA significantly decreased the number of surviving pyramidal neurons in the CA1 region of the hippocampus. Chronic administration of memantine effectively attenuated OA-induced spatial short-term memory impairment and the OA-induced neuropathological changes in the hippocampus. Therefore, ICV injection of OA can be used as an experimental model to study mechanisms of neurodegeneration and define novel therapeutics targets for AD pathology.Fig. 2, Ref. 23.

<div align="right">Auth.</div>

b16.3.1.14. Analysis of the association between THR83ALA polymorphism of matrix GLA-protein gene and lower extremity arterial calcification. /Y. Ataman, T. Ermolenko, A. Grek, A. Zharkova, D. Ovechkin/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 73-79. – rus.; abs.: geo., eng., rus.
Lower extremity arterial calcification (AC) is a common pathological process that has independent significance in the pathogenesis of many cardiovascular diseases. There is evidence that development of AC associated with Thr83Ala polymorphism of matrix GLA-protein gene. The objective of this study was to examine the association between Thr83Ala polymorphism of matrix Cla protein (MGP) gene and AC in male and female subjects of the Ukrainian population. 40 AC and 40 healthy controls were recruited to the study. MGP exon 4 Thr83Ala polymorphism (rs 4236) was examined using the polymerase chain reaction with subsequent restriction fragment length polymorphism analysis. The obtained data show that the substitution of threonin by alanine at position 83 in a molecule of MGP can affect its functional characteristics and anticalcinogenic properties. The distribution of homozygous carriers of a major allelic variant, and heterozygous and homozygous minor allele variants of Thr83Ala polymorphism in patients with AC was 40,0%, 47,5%, and 12,5% respectively. The corresponding distribution of variants in the control group was 32,5%, 42,5% and 25,0% (p=0,352 by χ2 –test). In women who are carriers of Ala/Ala-variant, CA occurs more rarely than in men with the same

genotype (p=0,036 by χ2 –test). The substitution of threonine by alanine due to MGP exon 4 Thr83Ala polymorphism is related to a decrease in the likelihood of CA in female persons in the Ukrainian population. Fig.3, Tab. 5, Ref. 15.

Auth.

b16.3.1.15. Role of SLC2A9 and ABCG2 gene polymorphisms in origin of hyperuricemia and gout. /A. Fadieieva, L. Prystupa, O. Pogorelova, N. Kirichenko, I. Dudchenko/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 79-83. – rus.; abs.: geo., eng., rus.
The article provides modern information about influence of the most common SLC2A9 and ABCG2 gene polymorphisms. These genes encode urate transporters (BCRP and GLUT9) that`s why associated with uric acid level and gout. The polymorphisms V253I, Q126X, Q141K of SLC2A9 and ABCG2 genes were characterized. GCA и GTC haplotypes of Q126X and Q141K variants can be predictors of gout. The relationship of these polymorphisms with hyperuricaemia according to gender, metabolic syndrome components, with the response to allopurinol was analyzed. It has been established that Q141K polymorphism can directly modulate BCRP-mediated allopurinol and oxypurinol efflux, the K allele is associated with a lower reduction in serum uric acid in response to allopurinol treatment. Ref. 32.

Auth.

b16.3.1.16. The study of the immune corrective properties of Greek walnut (Juglans regia L.) septa on the experimental model of leukopenia. /D. Dzidziguri, M. Rukhadze, I. Modebadze, E. Bakuradze, M. Kurtanidze, V. Giqoshvili/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 84-89. – eng.; abs.: geo., eng., rus.
From the positive effects of the drugs prepared from various parts of walnut described for a wide variety of diseases, their antitumor effect is remarkable. This feature can be used for treatment of leukopenia caused by radiotherapy and/or chemotherapy. Therefore, to study the immunocorrective properties of Greek walnut, the walnut septa were selected, aqueous extract of which has been studied on experimental model of leukopenia in white mice caused by a single injection of cyclophosphamide. The material of the study were the blood and bone marrow smears from intact and tested adult mice stained by Giemsa's dye. The quantity of leukocytes in peripheral blood was determined by the counting chamber under the light microscope with standard protocol. Cloud-point extraction, HPLC analysis and UV-visible spectrophotometry were used to study the composition of the walnut septa extract. It has been established that the Greek walnut septa extract has the correction ability of suppressed myelopoiesis in white mice caused by injection of cyclophosphamide. The blood formula normalization process by the mentioned extract is provided by the fast increasing in the number of immature (band neutrophil) and mature neutrophils in the peripheral blood. It was shown that walnut septa extract stimulates the division, differentiation and maturation of blast forms of myeloid as well as lymphoid line in the bone marrow of mice with leukopenia. Cloud-point extraction and liquid-chromatographic analysis revealed the presence of hydrophilic and hydrophobic components in the walnuts septum extract. Fig. 5, Ref. 12.

Auth.

b16.3.1.17. Ultrastructural organization of cellular elements and intercellular connections in statocysts of terrestrial pulmonary snail H. Lucorum. /G. Gorgiladze, R. Bukia, E. Kalandarishvili, A. Taktakishvili, N. Gelashvili, M. Davitashvili, N. Madjagaladze/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 95-101. – rus.; abs.: geo., eng., rus.
The organ of mollusc equilibrium - statocyst appears to be the analogue of acoustic-vestibular system in vertebrate animals. In terrestrial pulmonary snail the epithelial lining of statocyst cavity is created by two types of the cells - a small amount of large cells, provided with kinocilia of sensitive cells and considerably a large number of small supporting or inserted cells, covered with the microvilli. By means of transmission and scanning electron microscopy the ultrastructure and intercellular connections of these cells were studied. The sensitive cells have in a certain way structured cytoplasm, which consists of three layers: ectoplasm, granular layer and hyaloplasm. Myelin-like bodies having the granular, vesicular and drop-like formations in the centre appear to be the special structure of the cytoplasm. In the cytoplasm there are areas, saturated with electron dense glycogen granules. On the electronograms sometimes it is observed how the pinocytic vesicles in the supporting cells are created from the diverticulum of plasmatic membrane of sensitive cells. The boundary areas of plasmatic membrane of adjacent cells (sensitive cells with supporting or supporting cells with the support) are also characterized by the presence of specialized contacts, which are analogous to desmosomes in the epithelial tissues, as well as by the existence of cellular desmosomes, interdigitations. Numerous lacunas have been revealed in the intercellular space, which are connected by the thin tubules and ducts resulting in the formation of a complicated configuration of extensive system of communicating with each other lacunae, which have the exit in statocyst cavity. Fig. 6, Ref. 19.

Auth.

b16.3.1.18. Morphological features of rat mucous membrane of the tongue earlier affected by acrylic resin monomer. /V. Davydenko, M. Nidzelskiy, I. Starchenko, A. Davydenko, V. Kuznetsov/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 102-107. – rus.; abs.: geo., eng., rus.
Base materials, made on the basis of various derivatives of acrylic and methacrylic acids, have been widely used in prosthetic dentistry. Free monomer, affecting the tissues of prosthetic bed and the whole body, is always found in dentures. Therefore, study of the effect of acrylic resins' monomer on mucous membrane of the tongue is crucial. Rat tongue is very similar to human tongue, and this fact has become the basis for selecting these animals to be involved into the experiment. The paper presents the findings related to the effect of "Ftoraks" base acrylic resin monomer on the state of rat mucous membrane of the tongue and its regeneration. The microscopy has found that the greatest changes in the mucous membrane of the tongue occur on day 3 and 7 day after applying the monomer and are of erosive and inflammatory nature. Regeneration of tongue epithelium slows down. Fig. 8, Ref. 10.

Auth.

b16.3.1.19. Clinical and epidemiological characteristics of myelodysplastic syndromes in adults. /S. Semochkin, T. Tolstykh, G. Dudina, O. Fink/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 108-115. – rus.; abs.: geo., eng., rus.

The myelodysplastic syndromes (MDS) are a distinct group of clonal disorders of hematopoietic stem or progenitor cells characterized by ineffective hematopoiesis and peripheral cytopenias. The data on the epidemiology of MDS in Russia are absent.The aim of the study was to evaluate the incidence of MDS in adults, to evaluate methods of diagnosis confirmation and choice of therapy in the system of Moscow Health Care.The observational study included adult patients with newly diagnosed MDS in 2010. Two hundred and one adult patients (male – 110, female – 118) were registered. Median age at diagnosis was 71.5 years (range, 23.9-93.7). The incidence rate of MDS was 2.0 cases per 100.000 persons per year in the general adult population. All patients divided into 5 groups depending on the type of first-line therapy: 69 patients treated withepoetin alfa or beta; 20 – lowdose Ara-C; 12 – hypomethylating agents; 60 – symptomatic (red cell transfusion for low-risk MDS) and 38 - palliative care (elderly and weakened high-risk patients). Two patients with 5q- syndrome treated with lenalidomide. With a median follow-up for survivors 46 months 4-year overall survival (OS) for all patients was 34.8±13.4% (median 24.3 months). The incidence of MDS in Moscow, Russia is 1.5-2 times lower than in Europe and the United States. Current standards of survey under the mandatory health insurance does not provide for molecular and cytogenetic assays, which is one of the factors limiting the diagnostic potential. Fig. 2, Tab. 4, Ref. 18.

Auth.

b3.2 Clinical medicine

b16.3.2.1. The participation of hemopoietik bone-marrow derived stem cells in the regulation of damaged cornea stroma. Autoradiographical part. /K. Davitaia/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 127-133. – eng; abs: eng., geo.

The purpose of this study was to determine the source of the cells participating in regeneration of corneal stroma. The cornea of experimental animals was perforated up to lens by sterile preparative needle. This process was investigated in white adult mice and xenogenic radiation chimeras by means of histological, autoradiographic, immunofluorescence methods. For detection of proliferative activity of corneal stroma cells the pulse and late 3H-thymidine labeling method was used. 3H-thymidine (with specific activity of 52 cu/mM) with the dose of 2 µcu per gram of animal weight was injected into the abdominal cavity of operated animals. Non-operated mice served as controls and they received 3H-thymidine injections according to the same protocol as the operated mice. In both cases material was fixed after 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 days. A great number of the new-formed stromal fibroblasts, which include 3H- thymidine just at the moment of cornea injury (late labeling) did not correspond to the low proliferative potential of stromal cells (pulse labeling) and could not be explained by their multiplication. Results of autoradiographic investigations have shown: labelled fibroblast-like cells are found only in a new-formed stroma, while stromal fibroblasts of intact cornea and stromal fibroblasts of intact parts of injured cornea are not labelled during the whole experiment. We can conclude that precursors of cells involved in regeneration of the cornea do not develop via multiplication of stromal cells of cornea; precursors of cells forming the infiltrate in the injured cornea multiply intensively beyond the borders of damaged area and then migrate into the inflammatory area. Tab. 2, Fig. 2, Ref. 31.

Auth.

b16.3.2.2. The study of behavior changes in growing rats under the conditions of halothane anesthesia and premedication with midazolam. /D. Dzidziguri, E. Mitaishvili, A. Aptsiauri, E. Bakuradze, L. Dzidziguri, Z. Vadachkoria/. Translational and Clinical Medicine – georgian Medical Journal. – 20b16. – v. 1, #1.– pp. 8-10. – eng.; abs.:eng.

The reason for weak adaptation to environment after halothane anesthesia compared to intact animals may be the reducing of dendrite growth by halothane in growing animals and thus the inhibition of brain development. The fact that these effects are not revealed after midazolam premedication allow us to think that reducing the anxiety activity of animals after midazolam premedication provides to avoid the inhibition of dendrite growth and brain development. On the bases of our results it is established that a week after operation in growing rats under the halothane anesthesia midazolam premedication (single injection) does not cause any negative influence on behavior parameters of growing animals. Ref. 9, Fig. 2.

Auth.

b16.3.2.3. Meckels diverticulum´s injury after penetrating abdominal trauma. /A. Dogjani, B. Hasanaj, D. Doll/. Translational and Clinical Medicine – georgian Medical Journal. – 20b16. – v. 1. – #1.– pp. 18-19. – eng.; abs.:eng.

In 1595, for the first time, Hildanus described an ileal diverticulum, which was thoroughly scrutinized and defined by Johann Meckel in 1809. In most cases, Meckel's diverticulum does not cause any problems. In a small number of patients however, these diverticula can become infected (diverticulitis) cause an obstruction of the intestine, or cause bleeding from the intestine. We present a case of simultaneous rupture of Meckel's diverticulum and small bowel without abdominal pain following a penetrate trauma to the abdomen, sustained during a stab wound to the abdomen. Ref. 9, Fig. 5.

Auth.

b16.3.2.4. Early operative treatment for an enterocutaneous fistula after gunshot wound. /A. Dogjani, B. Hasanaj, E. Matevossian, D. Doll, R. Latifi/. Translational and Clinical Medicine – georgian Medical Journal. – 20b16. – v. 1. – #1.– pp. 20-24. – eng.; abs.:eng.

The successful treatment of an enterocutaneous fistula (ECF) is challenging even for experienced surgeons, as it is associated with potential complications such as infection, abdominal sepsis, fluid-electrolyte disturbances, septic shock and malnutrition. All of these conditions may congregate and lead to increased mortality in these patients, additional to the original trauma. We describe a 27-year old male who was shot once in the left thoraco-abdominal region without an

exit wound. On laparotomy, multiple injuries to jejunum, ileum and sigmoid were identified. Primary repair of sigmoid was done as well as end-to-end jejunostomy and end-to-end ileostomy. At postoperative day 10, an ECF erupted as a low output fistula (100ml/24h). The patient was put on full parenteral treatment. Following work up including CT scan and fistulogram, the patient was taken back to the operating room for washout and diverting ileostomy with fistula tract resection. He fully recovered uneventfully following this second operation. As shown in this patient without malnutrition and penetrating injury, early surgical treatment may work out advantageously and swift, compared to possible conservative treatment in this low output fistula following a gunshot of the thoraco- abdominal region. Ref. 22, Fig. 6,Tab. 2

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b16.3.2.5. Imaging guided percutaneal core biopsy of thoracic bone and soft tissue lesions – technique and complications. /T. Azrumelashvili, M. Mizandari, D. Magalashvili, T. Dundua/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 17-24. – eng.; abs.: geo., eng., rus.

The purpose of the paper is to present our experience of Imaging Guided Percutaneal Core Biopsy (IGPCB) of thoracic bone and soft tissue lesions in terms of procedure planning, biopsy technique, procedure complications and their management. The results of investigation of 81 patients are presented. According to imaging guidance type the patients were subdivided in two main groups - US guided biopsy (26 patients, 26 procedures) and CT guided biopsy (55 patients, 59 procedures). 85 procedures were performed. In 4 cases the repeated biopsy procedure has been performed as the obtained specimen appeared to be non-informative. Adequate tissue material was obtained at the first attempt in 77 (95.1%) cases; in 4 (4.9%) cases the repeated procedure was needed (when the target size was above 2-5 or >5 cm using CT guided biopsy and it was due to tumor necrosis. Procedure related complications were detected in 1(%) case (CT guided biopsy). In 1 case the significant pain, requiring administration of additional analgetics in postprocedure period was mentioned. Percutaneous US and CT guided bone and soft tissue lesions biopsy is an effective, highly accurate, and safe method of tissue obtaining for the diagnosis of indeterminate lesions. US is fast, cheap, avoids ionizing radiation, and allows the needle tip to be monitored throughout the procedure. CT has the ability to visualize both bone and soft tissue with the advantage of making easier needle localization into lesions too deep to see on US. CT also allows for better visualization lesions with a large amount of overlying cortex, and deep-seated lesions with extensive overlying soft tissue. CT-guided percutaneous biopsy is a safe and accurate method. US is the preferable tool for biopsy procedure guidance if the target is adequately imaged by US. CT should be used in cases when US imaging is not possible due to visualization problem. Fig. 17, Tab. 4, Ref. 22

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b16.3.2.6. Imaging guided percutaneal core biopsy of pulmonary and pleural masses – technique and complications. /T. Azrumelashvili, M. Mizandari, T. Dundua/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 25-33. – eng.; abs.: geo., eng., rus.

Paper presents the ultrasound (US) and computed tomography (CT) guided percutaneous lung core biopsy technique and procedure associated complications. 148 percutaneous biopsies of lung and peural lesions were performed in 143 patients in 5 (3.4%) cases the repeated procedure was needed). Procedure was guided by US in 42 cases, by CT - in 106 cases. Post-biopsy CT scan was performed and patients observed for any complications. No complications were detected after US guided procedures; No major complications were detected after CT guided biopsy procedures; minor complications (pneumothorax, hemothorax and hemophtysis) were detected in 24 (22.6%) cases. In 18 (17.0%) cases pneumothorax, in 1 (0/9%) cases - hemothorax and in 5 (4.7%) cases hemophtisis was detected on CT guided procedures. All hemothorax and hemophtisis and 13(12.3%) pneumothorax cases happened to be self-limited; in 3(2.8%) pneumothorax cases aspiration and in 2(1.9%) cases - pleural drainage was needed. Ultrasound is the most efficient for biopsy guidance if the "target" can be adequately imaged by this technique. If US guidance is impossible biopsy should be performed under CT guidance. Pneumothorax and hemothoraxs was associated with multiple needle passes, lesion diameter <2 cm and larger diameter needle use. Hemoptysis was not associated with multiple needle passes, lesioan size and larger diameter needle. No air embolism was detected on our study. The safety and biopsy procedure success high rate proves the use of imaging guided percutaneal core biopsy of pulmonary and pleural masses as a first choice procedure when the lung or pleural mass morphology is needed. Fig. 8, Tab. 3, Ref. 33.

<p align="right">Auth.</p>

b16.3.2.7. Basal cell carcinoma of the head-and-neck region: A single center analysis of 1,750 tumors. /I. Tourli, D. Langner, G. Haroske, G. Tchernev, T. Lotti, U. Wollina/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 33-39. – eng.; abs.: geo., eng., rus.

Basal cell carcinoma (BCC) is the most common malignancy in humans with a pre-dominance for the sun-exposed head-and-neck region. Its incidence is rising world-wide. Early detection and appropriate treatment ensures an excellent prognosis. We analyzed patients with BCC of the head-and-neck region treated at our Department from January 2008 to December 2012 with a follow-up between 2 to 6 years. Data were collected retrospectively. During a 4-year period, 1,750 BCC lesions of head-and-neck region were excised from 1,380 patients. Distribution of gender among the patients was nearly even. Mean age of patients was 74.3±11.4 years. Solid histological subtype dominated the series. Most tumors were removed surgically by delayed MOHS technique (77.0%). The recurrence rate of BCC was 1.6%. The highest recurrence rate of 15.5% was seen in cases of morphea-like BCC compared to 3.9% among solid BCC. The recurrence rate among R0 resected tumors was 0.24% compared to 19.8% among R1-resections (Pearson's Chi-square 56.000). The majority of recurrences occurred within the first 5 year-interval (64%). Multivariate analysis of risk factors for recurrences demonstrated an Odd's ratio for recurrences of 54.89 (95% confidence interval, 21.b16, 142.37) in case of R1-resection status. Gender had a minor influence with a slight benefit toward males versus females (Odd's ratio 0.51; 95% confidence interval, 0.28, 0.92). The age of the patients had no impact on recurrence rate. Although there is relatively low mortality attributable to BCC, the morbidity and cost of treatment are significant. Surgical excision remains

the mainstay of treatment. For head-and-neck BCC, delayed MOHS surgery offers significantly lower recurrence in both primary BCC and recurrent (secondary) BCC. Fig. 2, Tab. 2, Ref. 45.

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b16.3.2.8. Adiponectin and violation of metabolic control at different stages of nonalcoholic fatty liver disease in patients with type 2 diabetes. /I. Dunaieva, E. Dorosh, O. Zemlyanitsyna, N. Kravchun, Y. Karachentsev/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 40-46. – rus.; abs.: geo., eng., rus.

One of the urgent problems of Endocrinology is the study of the mechanisms of formation and progression of nonalcoholic fatty liver disease (NAFLD) in patients with diabetes mellitus (DM) type 2. Prognosis depends on the stage of NAFLD in which the changes occur and secretion of adipocytokines in the first place, adiponectin. The aim of the study was to: define adiponectin levels in the circulation of patients with type 2 diabetes at different stages of NAFLD and its impact on the detection of metabolic changes, the establishment of linkages with carbohydrate, lipid, protein metabolism, and liver function. The study determined the relevance of the study of pathogenetic mechanisms of NAFLD in the future, because the violation of metabolic control and reduce the protective properties of adipocytokines in patients with comorbid disorders is of great interest to further improve diagnostic capabilities, prevent complications and improve the quality of life of these patients. Tab. 7, Ref. 21.

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b16.3.2.9. The content of microelements in blood serum and erythrocytes in children with diabetes mellitus type I depending on level of glycemic control. /N. Gluschenko, Kh. Vasylyshyn, A. Roschupkin, S. Lekishvili, O. Gladchenko/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 66-71. – eng.; abs.: geo., eng., rus.

The aim of this paper is to investigate the content of chromium, cobalt and nickel in serum and erythrocytes in children with type 1 diabetes mellitus, depending on the level of glycemic control. The study was conducted on 68 children with type 1 diabetes mellitus. The patients were divided into four groups based on glycemic control. Group I was composed of 9 children with optimal level of glycemic control. Group II - 25 children with suboptimal level of glycemic control. Group III - 34 children with a high risk to life level of glycemic control. Group IV (control group) consisted of 30 healthy children. Compensation state of type 1 diabetes was evaluated according to ISPAD (Consensus for the Management of Type 1 Diabetes Mellitus in Children and Adolescens 2000). The content of trace elements in biological agents was determined by atomic absorbtion spectrophotometry method with C-115M1 mass-spectrophotometer, manufactured by «Selmi» enterprise (Ukraine). It is found that there is a decrease in serum concentrations of chromium and erythrocyte content of cobalt in patients with optimal level of glycemic control. The deficiency of chromium is accompanied by the deficiency of cobalt in patients with suboptimal level of glycemic control. The lower levels of cobalt and nickel are recorded simultaneously, but there is theexcess of chromium in the erythrocytes of these patients. Patients, who suffer from 1 type diabetes mellitus and high risk for life level of glycemic control have considerable polideficiency of cobalt, nickel and chromium in serum.The increasing level of chromium was recorded only in the erythrocytes. The level of glycemic control and the duration of 1 type diabetes mellitus are important in the forecasting of the development of chronic diabetic complications. It is found that the duration of 1 type diabetes mellitus influences the levels of cobalt and nickel in serum mostly, while the level of glycemic control influences the chromium content. Tab. 2, Ref. 13.

<div align="right">Auth.</div>

b16.3.2.10. Metabolic processes of organism in remote period after the combined effects of radiation and emotional stress. /G. Ilderbayeva, B. Zhetpisbaev, O. Ilderbayev, Zh. Taldykbayev, S.Bekeeva/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 76- 82. – rus.; abs.: geo., eng., rus.

Aim of the research was to study the role of free radical oxidation in the tissues of adrenal and immune organs and cells in remote period after combined effects of sublethal dose of gamma radiation (6 Gy) and emotional stress. Forty male Wistar rats were divided into four groups: I – control; II – exposed to emotional stress; III – exposed to radiation; IV – under the combined effects of emotional stress and radiation. Emotional stress in groups II and IV was simulated by tail suspension. In groups III and IV rats were irradiated once 90 days before the investigation at 6 Gy via TERAGAM Co60 («ISOTREND spol. s.r.o.», Czech Republic). The results of study showed that after the long term exposure gamma radiation has inhibitory effect of the radiation factor in the antioxidant protection. Ionizing radiation combined with emotional stress in remote period has a more pronounced effect on the formation of lipid hyper peroxidation syndrome than separately. Influence of the combined effects of emotional stress and ionizing radiation resulted in increased levels of DC and MDA, inhibition of enzyme activity of catalase and glutathione reductase in almost all the study objects, resulting in the development of dual-oxidative stress. Tab. 2, Ref. 24.

<div align="right">Auth.</div>

b16.3.2.11. The character of expression and the role of apoptosis markers in the development of placental dysfunction in pregnant with urogenital infections. /N. Shcherbuna, L. Vygovskaya, N. Kapustnik/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 12-b16. – rus.; geo., eng., rus.

The aim of the current study was to examine the expression level and possibilities of apoptotic markers in realization of placental insufficiency in pregnant women with urogenital infections. The study was conducted on 250 pregnant women with urogenital infections (1-st group – 50 pregnant women with bacterial infections (Chlamydia, ureaplasma, mycoplasma), 2-nd group – 50 pregnant women with viral infections (CMV and herpes simplex virus), 3-rd group – 150 patients with mixed viral and bacterial infections) and 50 pregnant women with normal pregnancy. The content of apoptosis inducers: sFasL and TNF-α in blood serum of pregnant women was determined; the level of caspase-3 in placental sample was analyzed; sonographic examination of the placenta was performed. Maximal indices of apoptosis inducers were observed in the 3-rd group (with mixed viral and bacterial infections). Changes in the placenta according to ultrasound data were determined in all pregnant women with urogenital infections. It was suggested that increased placental cell death in apoptosis might be one of the key points, triggering the development of placental dysfunction. Fig.3, Ref. 5.

b16.3.2.12. Intra-arterial infusions and doplerograpic control for complex treatment of upper and middle facial zones, concomitant with traumatic craniocerebral injuries. /G. Lagvilava, Z. Gvenetadze, E. Gibradze, T. Danelia, G. Gvenetadze/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. b16-21. – eng.; geo., eng., rus.

Maxillofacial traumatic injuries concomitant with craniocerebral trauma are still considered as an actual problem in emergency medicine. For this category of patients one of the dangerous and severe complications is development of inflammatory process in the injured areas. Fracture lines of upper and middle facial zones pass through the accessory sinuses of the nose, maxillary/upper dental arch area and are considered to be open and infected fractures. Combination of these fractures with craniocerebral injuries and especially, with open traumas creates predisposition for development of inflammatory processes in CNS that can result in heavy outcome. 29 patients (among them 5-females and 24 -males) with severe and open craniofacial fractures were observed by the authors. For prevention of inflammatory complications in complex treatment of the patients, intra-arterial infusions of therapeutic agents (wide spectrum of antibiotics, Heparin) were used for stimulation of reparative regeneration in fractured fragments of facial bones. After the main surgical interventions (neurosurgery, surgery of facial bones) sanitation of infected centers (accessory sinuses of the nose, oral cavity) and catheterization of external carotid arteries through the temporal arteries were performed. According to the severity of the trauma and its preferential localization, catheterization of carotid arteries was conducted unilaterally (12 cases) or bilaterally (17 cases). Insertion depth through femoral artery was 6-8cm. Catheter was stayed in the artery for 7-8 days. Intra-arterial infusions were carried out in the morning and evening. Therapeutic agents for arterial infusion included: antibiotic (Rocephin and its analogues), Heparin. To determine the effectiveness of vascular therapy dopplerography of external carotid artery, its branches and supratrochlear artery was performed. Dopplerography of supratrochlear artery, which is the branch of internal carotid artery, was conducted to detect the impact of therapeutic agents, administered in external carotid artery, on the internal carotid artery. During the treatment of complicated concomitant craniofacial injuries in a sequential order, development of inflammatory processes was not observed even in the patients with basic inflammatory processes in accessory sinuses of the nose. After infusion of therapeutic agents to external carotid artery, dopplerographically, sharp increase in blood flow in main artery and its branches, indicates to the stimulation of microcirculation that serves as a guarantee for osteogenic type healing of fractured fragments. Tab. 1, Ref. 11.

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b16.3.2.13. The effectiveness of physical factors in the treatment of compression-dislocation dysfunction of the temporomandibular joint. /O. Rybalov, P. Yatsenko, P. Moskalenko, O. Yatsenko, Yu. Lakhtin/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 26-31. – eng.; geo., eng., rus.

The aim of the study was clinical and functional assessment of the effectiveness of physical factors in the treatment of patients with compression-dislocation dysfunction of the temporomandibular joint. We observed two groups of patients. All patients were undergone the repositioning of the joint heads of the lower jaw. Patients of the index group were assigned a vibrating massage of all masseter muscles, tourmaline ceramic on the joint area and a local physical therapy. Patients in the control group had only lidocaine blockade of periarticular area twice a week. Treatment efficacy was evaluated on the eighth day after the start of the treatment according to the bioelectric activity of the genuine masseter and temporal muscles, the intensity of pain according to in Visual Analog Scale, and according to the results of the clinical examination. In most patients of the index group the electromyography data after treatment were approaching to norm, the phenomenon of dysfunction of the temporomandibular joints was reversed. In the control group the full restoration of the functional activity of muscle did not occur. The addition to the complex of therapeutic measures a vibration massage, tourmaline ceramics and local physical therapy for patients with dysfunction of the temporomandibular joints allows to get a positive effect. Fig. 3, Tab. 2, Ref. 19.

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b16.3.2.14. Original performance integrated circuits neuroprotective lechniya anterior ischemic optic neuropathy depending on blood pressure. /P. Bezdetko, D. Martynyuk/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 21-26. – rus.; geo., eng., rus.

Anterior ischemic optic neuropathy (AION) is one of the main reasons of vision disorders among middle-aged and elderly people. During the examination of patients with AION, we were interested by the fact of low efficiency of the standard treatment course. Moreover, over 60% of such patients underwent the development of AION on the other eye during 1 year after the beginning of the disease. The purpose of the given study is the development of efficient and original neuroprotection treatment scheme for AION, depending on the arterial pressure rate. We examined 58 patients (65 eyes) with AION, depending on the arterial pressure rate. The patients were divided into two clinical groups. For the first group of 38 patients (38 eyes), we used the original AION treatment scheme developed by us. The group was divided into 3 subgroups, depending on their arterial pressure rate: patients with normal ap., patients with hypertension of I-II stages and patients with hypotension. For the control group, the standard treatment scheme was used. The results received allow us to make a conclusion that the original treatment scheme, developed by us, is more efficient, and it can be recommended as a neuroprotection treatment scheme for AION among the patients with arterial hypertension of I-II stages. Fig. 4, Tab. 2, Ref. 11.

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b16.3.2.15. Alterations in brain creatine concentrations under long-term social isolation (experimental study). /N. Koshoridze, Z. Kuchukashvili, K. Menabde, Sh. Lekiashvili, M. Koshoridze/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 70-77. – eng.; geo., eng., rus.

Stress represents one of the main problems of modern humanity. This study was done for understanding more clearly alterations in creatine content of the brain under psycho-emotional stress induced by long-term social isolation. It was shown that under 30 days social isolation creatine amount in the brain was arisen, while decreasing concentrations of

synthesizing enzymes (AGAT, GAMT) and creatine transporter protein (CrT). Another important point was that such changes were accompanied by down-regulation of creatine kinase (CK), therefore the enzyme's concentration was lowered. In addition, it was observed that content of phosphocreatine (PCr) and ATP were also reduced, thus indicating down-regulation of energy metabolism of brain that is really a crucial point for its normal functioning. To sum up the results it can be underlined that long-term social isolation has negative influence on energy metabolism of brain; and as a result reduce ATP content, while increase of free creatine concentration, supposedly maintaining maximal balance for ATP amount, but here must be also noted that up-regulated oxidative pathways might have impact on blood brain barrier, resulting on its permeability. Fig. 3, Tab. 2, Ref. 23.

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b16.3.2.16. Reactive changes in spinal cord motoneurons after sciatic nerve injury after high-frequency electrosurgical instrument application. /A. Korsak, Yu. Chaikovsky, L. Sokurenko, V. Likhodiievskyi, A. Neverovskyi/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 77-83. – rus.; geo., eng., rus.
A new experimental model for tissues connection at peripheral nerve injury site in form of tissues welding was designed. In current study we investigated motoneuron state 1, 3, 6 and 12 weeks after peripheral nerve injury and surgical repair with high-frequency electrosurgical technology. Spinal cord sections was stained by Nissl method and observed with light microscopy. We found that postoperative period in animals from experimental groups characterized by qualitative changes in neurons from spinal motor centers that can be interpreted as compensatory processes as response to alteration. In animals from group with high-frequency electrosurgical technology usage stabilization processes passes more quickly comparatively to animals with epineural sutures. High-frequency electrosurgical technology usage provides less harmful effects on motoneurons than epineural suturing. Tab. 1, Ref. 11.

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b16.3.2.17. Combination therapy effectiveness of ezetimibe and atorvastatin in patients with acute coronary syndrome. /L. Japaridze, M.Sadunishvili, I. Megreladze/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 15-22. – eng.; abs.: geo., eng., rus.
Atorvastatin reduces low-density lipoprotein (LDL) cholesterol levels and the risk of cardiovascular events, but whether the addition of ezetimibe (EZE) , a nonstatin drug that reduces intestinal cholesterol absorption, can reduce the rate of cardiovascular events further is not known. We conducted a b16-week one-center, prospective, randomized, and open-label clinical trial, involving 323 patients who had been hospitalized for an acute coronary syndrome within the preceding 14 days. They were received atorvastatin 20 mg during 28 days and after that 292 patients, who had LDL cholesterol levels≥1.81 mmol/L, were randomized to ezetimibe 10 mg/day co-administered with atorvastatin therapy (EZE+Statin) or doubling their current atorvastatin dose. The primary end point was a composite of cardiovascular death, nonfatal myocardial infarction, unstable angina requiring rehospitalization, coronary revascularization (≥30 days after randomization), or nonfatal stroke. At b16 weeks, the mean LDL cholesterol level during the study was 1.60 mmol per liter in the atorvastatine-ezetimibe group, as compared with 1.91 mmol per liter in the atorvastatin-monotherapy group (p<0.001). The Kaplan-Meier survival rate at b16 weeks were 88 .1% in the atorvastatin-ezetimibe group and 77.0% in the atorvastatin monotherapy group (absolute risk reduction, 11.1 percentage points; hazard ratio, 2.099; 95% confidence interval, 1.b165 to 3.781; p=0.014). Patients receiving ezetimibe and statin were more likely to achieve target LDL-C after b16 weeks compared to patients doubling their statin dose. When added to statin therapy, ezetimibe resulted in incremental lowering of LDL cholesterol levels and improved cardiovascular outcomes. Ezetimibe/statin combination therapy was well tolerated among these patients, without safety concerns. Fig. 5, Tab. 3, Ref. 24.

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b16.3.2.18. Association of depression with hospital length of stay in patients with acute coronary syndrome. /S. Tatishvili, R. Jorbenadze, G. Kavtaradze/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 22-26. – eng.; abs.: geo., eng., rus.
Psychosocial risk factors are known to have a negative impact on coronary disease morbidity and mortality. The aim of our study was to establish contribution of depression on hospital length of stay in patients with acute coronary events. Depression screening was performed in the Chapidze Center, Tbilisi Georgia. Main inclusion criteria in the study were acute coronary events – non-ST elevation myocardial infarction or unstable angina. The total number of participants was 84. A binary logistic regression was used in order to assess contribution of depression on prolonged hospital stay. The mean age for both genders was 59.2 (10.2) years. Most patients had coronary risk factors. Higher BDI score was found in elderly patients, females, and in those with systolic dysfunction as well as in whom revascularization was not performed. In binary logistic regression model myocardial infarction and depression were found to be significant contributors of prolonged hospital stay. Depressive symptoms contribute independently to prolongation of hospital stay in patients with non-STEMI. Tab. 3, Ref. 9.

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b16.3.2.19. Fatal diagnosis and the horizon of human life (review). /M. Samsonia, M. Kandelaki, K. Samsonia, I. Jojua/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 37-41. – rus.; abs.: geo., eng., rus.
The majority of widespread cancers on the stage of clinical manifestation is incurable and therapy is only for the purpose of life extension. So, it isn`t surprising that most of people realize the word "cancer" as a verdict. A man himself doesn`t believe in his own death and doesn`t realize the fact that "Death is an appropriate phenomenon, but not punishment". Facing the death causes existential crisis. The understanding of inevitable fact of death arouses short, but desperate fight against it, which is, in most cases accompanied by anxiety. Some fundamental changes in phsycoemotional status take place within the young patients (knowing the diagnosis), which help an individual move into a new stage of actions with forming new values and aims. All these give conditions for better adaptation of an individual with phsychic traumas. So, the research of a person`s emotional situation, facing the death, will help to indentify the necessity of prophylactic

pharmacotherapy with anxiolytics and to overcome both the negative associations with death and the fear connected with it (preserving life horizon). Ref. 15.

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b16.3.2.20. Shock-wave therapy application in clinical practice (review). /N. Sheveleva, L. Minbayeva, Y. Belyayeva/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 42-47. – eng.; abs.: geo., eng., rus.
The article presents literature review on the use of extracorporeal shock-wave therapy in physiotherapeutic practice. The basic mechanisms of shock waves influence on the organism are spotlighted. Studies proving high efficacy of the method in treatment of wide variety of inflammatory diseases and traumatic genesis are presented. The data on comparative assessment of shock-wave therapy efficacy, and results of researches on possibility of extracorporeal shock-wave therapy effect potentiating in combination with other therapeutic methods are reflected. Recent years, the range of indications for shock-wave therapy application had been significantly widened. However, further study of the method is still relevant because mechanisms of action of the factor are studied insufficiently; methods of therapy parameters selection (energy flux density, number of pulses per treatment, duration of a course) are either advisory or empirical. Ref. 51.

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b16.3.2.21. Antibiotic sensitivity/resistancy of microbial strains, isolated from puerperas, newborns and samples of maternity ward environment. /D. Kobeshavidze, D. Chikviladze, Kh. Gachechiladze, M. Mikeladze/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 54-58. – rus.; abs.: geo., eng., rus.
In this article, there are given data of microorganisms sensitivity/resistancy investigation, to different groups of antibiotics. Microorganisms where isolated from puerperas, newborns and samples of maternity ward environment. Investigation was performed in L.T.D. "Imedis Clinica". Detection of microorganisms sensitivity/resistancy to antibiotics was performed by use of two methods: method of disc diffusion and serial dilution on solid breeding substratum. It was determined that gram positive, as well as gram negative microorganisms had sufficiently high level of resistancy to some penicillines, aminoglycosides, macrolides. Some species of gram negative microorganisms had resistancy to lincomicin in 100% of cases. High level of sensitivity was revealed to such antibiotics as amicalin, amoxiclav, cefepim, ciprofloxacin. Gram negative microorganisms had high level of sensitivity to imipenem-cilastatin and meropenem. Performed investigation confirms necessity of microbiological monitoring in different clinics, because it is one of the most significant components of infection control. It gives opportunity to perform exact antibiotic prophylaxis and if necessary – rational antibiotic therapy. Tab. 3, Ref. 12.

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b3.3 Health sciences

b16.3.3.1. Challenges In scientific-information provision of primary health care personnel In Georgia. /T. Verulava, J. Bechvaia/. Law and Economics. – 2015. – #6. – pp. 74-86. – geo.; abs.: geo., eng., fr.
Medicine is one of the rapidly developing field and it requires continuous education process. Information management and quality assurance is one of the necessary conditions for the provision of adequate medical services. The purpose of research was to study the information needs for primary health managers and specialists, to analyse the scientific and medical information sources and the modern scientific publications on the topic of primary health care. Within the qualitative research component in-depth interviews was conducted among of primary health care management and medical staff. As for the quantitative research component face-to-face interviewing by using of special questionnaire has been conducted among managers of medical institutions and medical staff. The wide range of primary health care institutions presented those located in Tbilisi (capital town of Georgia) and Zugdidi region (Western Georgia). Primary health care management and medical personnel are unsystematicly and spontaneously provided with scientific and medical information. Less attention is paid to scientific information, preference is given to the relevant sources of information available to the profession. Very few profiled journals are issued in Georgia, even do not exist in some of the fields, so the amount of scientific information is insufficient. Difficulty presents in finding appopriate sources, because many professionals do not know how to search the necessary information. A significaln role plays the language barrier, lack of time and financial difficulties. Accordingly, the satisfaction toward the information system is on low level. Information collection is mainly conducted by usage of Internet. However, information obtained in confidence is low. At present, objective demand in ensuring of the primary health care system with scientific information, the need for modern information technologies are critical issues. By applying of modern information technology the primary health care workers will be able to develop their knowledge and professional skills, to share experiences, learn about the diagnosis, treatment, innovative methods of prevention. In this regard, it is necessary to develop information security mechanisms, which will increase accessibility and quality of information, and this will have positive impact on the health care system's main goal - to achieve improvement for the population health. Tab. 5, Ref. 7.

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b16.3.3.2. Cancer incidence and mortality - major patterns in GLOBOCAN 2012, worldwide and Georgia. /F. Todua, R. Gagua, M. Maglakelidze , D. Maglakelidze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. b168-173. – eng; abs: eng., geo.
Estimates of the worldwide incidence and mortality from 27 major cancers and for all cancers combined for 2012 are now available in the GLOBOCAN series of the WHO International Agency for Research on Cancer. We review the sources and methods used in compiling the national cancer incidence and mortality estimates, and briefly describe the key results by cancer site worldwide and in Georgia. Overall, there were 14.1 million new cases and 8.2 million deaths in 2012. More than 12000 new cancer cases and more than 7000 deaths were estimated in 2012 in Georgia. Tab 1, Fig. 2, Ref. 5.

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b16.3.3.3. Parasitic diseases of lung. /T. Lobzhanidze/. Georgian Respiratory Journal. – 20b16. – v. 12. – #1.– pp. 37-68. – geo.; abs.: geo.

Parasitic infections of lung occur worldwide among both immunocompetent and immunocompromised patients and may affect the respiratory system in a variety of ways. This review provides an update on the presenting symptoms, signs, investigation, and treatment of parasitic lung diseases. The clinical presentation and radiology of many of these diseases may share common features with tuberculosis and malignancy. When symptoms of lung disease are associated with gastrointestinal, hepatobiliary or cutaneous symptoms or a peripheral eosinophilia, there should be a high index of suspicion for parasitic diseases. With increasing travel and migration, it is important to consider parasitic infections in the differential diagnosis of lung diseases. Parasitic lung infections have been described in patients following chemotherapy or transplantation and need to be considered in the differential diagnosis of lung infections in immunocompromised individuals. Direct identification of the causative organisms may be achieved definitively through microscopic examination of stool or respiratory tract samples, or indirectly via serological testing. If identified early, most parasitic lung and pleural diseases are curable with medical or surgical treatments. Fig. 10, Ref. 69.

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b16.3.3.4. Clinical features and management of acute viral bronchiolitis. /D. Zirakishvili/. Georgian Respiratory Journal. – 20b16. – v. 12. – #1.– pp. 74-93. – geo.; abs.:eng.

Bronchiolitis is a severe inflammatory disease of bronchioles, which is usually caused by viral infections, almost always by Respiratory Syncytial Virus (RSV). There are various definitions of Bronchiolitis, but the term is generally applied to wheezing in young children and infants under 12 months. The course of the disease is characterized with severity and reveals by subfebrile temperature, nasal congestion and rhinorrhea together with lower respiratory tract disease symptoms such as cough, tachypnea, shortness of breath, grunting respiration, nasal flaring, retractions, expiratory wheezing. The article gives current characteristics of pathogenesis of Bronchiolitis, environmental factors, the role of season, race, and gender in development of recurrent wheezing episodes. Modern approaches in diagnostics, management and prevention are also summarized. Studies aimed to determine safety and efficacy of nebulized hypertonic saline in children with acute bronchiolitis. Randomized studies were selected to compare the results of nebulization with hypertonic saline (HS) and normal saline (NS). 24 studies involved 3209 patients. 1706 of them were treated with nebulized HS. Much shorter delay period was observed in such patients, compared to those treated with NS or who underwent standard treatment procedures. According to results of 15 studies involving 1956 patients median difference (MD) made 0.45 days, 95% confidence interval (CI) – 0.82 to 0.08. Groups receiving hypertonic saline had lower post treatment clinical rates during first 3 days compared to groups treated with normal saline. According to results of 5 studies involving 404 hospitalized patients: day 1: MD-0,99, 95% CI-1,48-0,50; day 2: MD-1,45, 95% CI-2,06-0,85; day 3: MD-1,44, CI-1,78-1,11. Nebulized HS reduced risk of hospitalization by 20% compared to nebulized NS in outpatients. 7 studies involving 951 children were conducted; Risk ratio 0,80 95% CI-0,67-0,96. No significant side effects revealed. Evidence quality was rated as average due to inconsistent, controversial study results and limited number of studies. Thus, according to the new review nebulized HS reduces delay period by 0.45 day, approximately 11 hours and risk of hospitalization of outpatients by 20%. Concentration of nebulized solution and frequency of nebulization may influence effectiveness. It also suggests that nebulized HS is a safe and effective treatment of Bronchiolitis in infants, particularly if administered with bronchodilators. However, there are some controversial results as well; therefore further studies to support benefits of treatment with HS are required. Tab. 3., Ref.8.

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b16.3.3.5. Occupational asthma. /T. Mukhashavria, T. Khurtsidze/. Georgian Respiratory Journal. – 20b16. – v. 12. – #1.– pp. 95-99. – geo.; abs.:eng.

In most cases, it is possible to prevent occupational asthma. Moreover, the better study may give us more information about other types of asthma. In order to minimize the risk of worsening of health in long-term period, doctors should consider the possibility of the existence of occupational asthma when evaluating adult patients with asthmatic symptoms. Ref.5.

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b16.3.3.6. Diagnostic and treatment aspects of Lyme neuroborreliosis. /T. Akhvlediani, N. Kvirkvelia, T. Tsertsvadze, R. Shakarishvili/. Translational and Clinical Medicine – Georgian Medical Journal. – 20b16. – v. 1. – #1.– pp. 25-27. – eng.; abs.:eng.

Lyme borreliosis is the most common tick-borne disease in Europe and North America. Nervous system involvement– neuroborreliosis - is the most common manifestation of the disseminated Lyme disease. In Georgia, there is no information about the prevalence of borreliosis even though it is considered as an endemic disease and there is enough evidence to suspect that it is underdiagnosed. This article reviews certain challenging aspects of clinical manifestation, diagnosis and treatment of Lyme neuroborreliosis. Ref. 29.

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b16.3.3.7. Ultrasound monitoring features of postoperative hepatic echinococcosis. /Kh. Melia, N. Kokaia, M. Manjgaladze/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 7-11. – rus.; abs.: geo., eng., rus.

The aim of the study was to investigate ultrasound features (US) of liver after post operative anti-parasite recurrence treatment of patients with echinococcosis. The clinical analyses of 50 patients were carried out. It was concluded that the use of ultrasound can provide valuable data to the clinician to assess and monitor anti parasitic therapy echinococcosis of liver in post operative period. During the monitoring the positive dynamics of disease was observed in 94,5% of cases, in 5% of cases toxic hepatites with septic complication was diagnosed, and in 0,5% of cases the disease recurrence was revealed. Ultrasound semiotics of liver after post operative anti-parasite recurrence treatment of patients with echinococcosis was presented. Control and monitoring of patients in the postoperative period echinococcosis with appropriate antirelapse antiparasitic therapy should be held not less than 1-5 years. Fig. 13, Ref. 14.

b16.3.3.8. Effect of smoking on trasiently evoked otoacoustic emission. /Kh. Gegenava, Sh. Japaridze, N. Sharashenidze, G. Jalabadze, Z. Kevanishvili/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 12-b16. – eng.; abs.: geo., eng., rus.

Evoked otoacoustic emissions, EOAEs, are proved to be sounds aroused in response to external acoustic stimulus by the cochlear outer hair cells. Transiently evoked otoacoustic emissions, TEOAEs, are the most clinically utilized EOAEs. TEOAEs are detectable in 98% of people with normal hearing, regardless of age or sex, while two ears of any individual produce similar TEOAEs waveforms. The objective of the presented study was the comparison of TEOAE magnitudes in cigarette smokers and nonsmokers. The TEOAE occurrence and characteristics in individuals of both samples with audiometrically proved hearing losses and in those without were also specifically examined. 30 smokers and and 30 nonsmokers within the age range of 30-59 years were involved in the present study after informed concent. OAEs were performed to each subject by Madsen Capella's-OAE/ middle ear analyzer-GN Otometrics, (Denmark). After OAE testing each subject was performed routine pure-tone audiometry and tympanometry. Obtained results were statistically treated by the student's t-distribution. According to our results 76.6% of smokers and 3.33% of nonsmokers had marked different level decrease in TEOAE amplitude. Audiographic measurments showed altered audiogram in 6.7% of smokers and in 3.33% of nonsmokers. Based on the above mentioned results we suppose that smoking has significant influence on hearing function, especially on cochlear apparatus; At the same time, TOEAE, as a sensitive method can be used for very early detection of hearing loss, even when there are neither any subjective complains nor some changies on audiogram. Fig. 2, Tab. 2, Ref. 13.

b16.3.3.9. The current problems of nonspecific back pain. /S. Seleznyova, A. Zabara, D. Mamuladze/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 61-66. – eng.; abs.: geo., eng., rus.

The article deals with various aspects of pain in degenerative diseases of the spine and with the actual problems of non-specific back pain. The data on the mechanisms of pain and analgesic treatment algorithms of the patients with radicular syndrome, and pharmacological and non-pharmacological therapies is provided. The effect of structural-modifying drugs in relief of nonspecific back pain was investigated and compared with a traditional nonsteroidal anti-inflammatory drug (NSAID) therapy in combination with B vitamins, without chondroprotectors. The study population was composed of 85 patients (42 men and 43 women) aged 38 to 68 years (mean age - (46,3±2,6) years) with chronic vertebral pain syndromes (VPS). For objectification assessment of pain, severity of pain, and evaluate the effectiveness of therapy we used the visual analog scale (VAS).The majority (88%) of the patients included in the study, complained of a moderately severe pain (from 40 to 70 mm on the VAS). Patients were divided into two groups. The first (primary) group consisted of 55 patients (30 men and 25 women). The following treatment was applied: all patients of the first group, in addition to the NSAID administered with hondroprotektror arbitrarily - Struktum 1000 mg twice a day or 300 mg Piaskledin once a day for 40-60 days.The second (control) group consisted of 30 patients (14 men, b16 women). Patients in the control group administered with a traditional NSAID therapy in combination with B vitamins, without chondroprotectors. The results of the study on the influence of drugs Piaskledin 300, Struktum for the relief of nonspecific back pain revealed that in the treatment of vertebral pain, a combination of non-steroidal anti-inflammatory drugs with structure-modifying agents could achieve rapid rehabilitation of patients with locomotor activity and improve quality of life in general. Ref. 23.

b16.3.3.10. Ceftriaxone-induced gallbadder lithiasis in case of intenstinal bacterial infections (case reports). /M. Khotchava, E. Lashkhi, T. Jokhtaberidze, I. Shalamberidze/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 72-75. – rus.; abs.: geo., eng., rus.

Ceftriaxone is a third generation cephalosporin antibiotic and is one of the most often applicable parenteral drug, which has wide antimicrobial activity range. According to the literature gall bladder lithiasis is a complication which is described in the first days of the treatment with this antibiotic. The cases are seen mostly as undergdiagnosed conditions when ultrasound examination is performed due to the abdominal colics. The aim of the study was to observe Cholelithiasis in ceftriaxone-treated patients. Last year few cases of Cholelithiasis were observed in Children's Infectious Diseases Hospital. All of them were related to the dysentery treatment with ceftriaxone. All of the cases of Cholelithiasis were diagnosed at the beginning of the antibiotic therapy (in first 2-3 days of hospitalization). Gall bladder concernments/sludge were found accidentally. Cholelithiasis in these cases was transitory and in 2 weeks ultrasound investigation revealed no calculi/ sludge in the gall bladder. Further findings are supposed to be analyzed on a bigger number of the patients. It is necessary to follow up with gall bladder concernments till their absolute resolution. Fig. 3, Ref. 20.

b16.3.3.11. Some aspects of urban population awareness about joint responsibility for own health. /Z. Dauletkaliyeva, D. Kulov, T. Sergaliyev, M. Syzdykov, K. Abdrakhmanov/. Georgian Medical News (GMN). – 20b16. – #1(250). – pp. 87-92. – rus.; abs.: geo., eng., rus.

One of the key goals of public health policy is to improve the joint responsibility of the population in the promotion of their health. In this context, the aim of this study was to determine the public opinion poll on attitudes to own health and to health care. Total covered 450 people, aged 18 to 60 years. The share of women was 60.0%, men - 40.0%. Almost half of respondents (47.0%) had higher education, 36.0% - specialized secondary education and 17.0% - secondary education. More than half (60.0%) of respondents were employed in the production of intellectual work, 40.0% - individuals, over ⅔ (67.2%) of the respondents at the time of the survey had a family. As a result of self-rated health, a third (35.6%) of the respondents rated their health as good to excellent. Men are more often evaluated positively their health than women. Persons engaged in mental labor rarely considered themselves unhealthy than engaged in the production of physical labor. The majority of respondents agree that the health - the most important thing in life (82.9%),

for young people it is not significant and is ranked only third place (4.7%), giving primacy of material well-being (73.7%), and the appearance of the human (15.8%). They also found that the higher the education level, the more demanding patients to themselves as responsible for the health and the quality of medical services provided by the clinic. The bulk of the population doesn't want to part with the usual attributes inherent in the current system of public health (69.6%) state and free. With the introduction of compulsory health insurance of the population is afraid of losing with the innovations at least minimal social guarantees for the protection of health. Fig. 1, Ref. 12.

Auth.

b16.3.3.12. Gender and professional factors of medical students' psychological readiness for performing professional duties. /S. Omelchuk, L. Lymar/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 45-50. – eng.; geo., eng., rus.
The article describes the results of the psychological readiness for performing professional duties study performed in 2010-2015 among the O.Bogomolets' National medical university students; contains analysis of the gender and professional factors of the readiness. The authors have described the results obtained in motivation, cognitive, conative, emotional and communicative components of the psychological readiness by using the classic and author authentic methods. It has been estimated that the female respondents are characterized by a higher level of psychological readiness than the male ones, which may be explained due to higher female conformity resulting from higher demands for profession. The conducted analysis of professional factors of the psychological readiness has shown that the students of the "Preventive medicine" specialization exhibit higher level of psychological readiness than the "Pediatrics" and "Stomatology" specialization students due to dominating altruistic motivation of professional activity, independent career choice and higher level of the emotional component development. Fig. 2, Tab. 4, Ref. 18.

Auth.

b16.3.3.13. Features of bone metabolism in adolescents living in Kazakhstan (after the example of Aktobe). /R. Nurgalieva, A. Amanzholkyzy, A. Kaldybaeva, A. Dosimov, E. Stankevichus/. Georgian Medical News (GMN). – 20b16. – #2(251). – pp. 50-58. – rus.; geo., eng., rus.
The purpose of this work is to study by densitometry the bone mineral density (BMD) in Kazakhstan adolescents of Aktobe and biological markers of the bone metabolism. By obtained data revealed the presence of osteopenia among apparently healthy Kazakhstan adolescents in 72% of cases. Indicators of bone mineral density in two adolescent ethnic groups (Kazakhs and Russian) were unremarkable. Sexual features of the BMD concluded that the sign of osteoporosis was 1.5 times higher among boys than girls. Remodeling of bone tissue in the examined pupils was due to the markers of osteosynthesis and osteoresorption respectively PINP and ß-CrossLaps with their strong correlation (r=0.8) in normal and reduced BMD. Reduced BMD in Kazakhstan adolescents is reflected in increased value of the marker ß-CrossLaps and humoral regulator of PTH, responsible for osteoresorbtion of the overall process of the bone remodeling. Fig.2, Tab. 8, Ref. 32.

Auth.

b16.3.3.14. Incidence of tuberculosis among Hiv/Hcv co-infected patients receiving hepatitis C treatment with pegylated interferon and ribavirin in Georgia. /A. Abutidze, N. Bolokadze, N. Chkhartishvili, L. Sharvadze, T. Tsertsvadze/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 10-15. – eng.; abs.: geo., eng., rus.
Treatment of hepatitis C is necessary for ensuring higher life expectancy among HIV/HCV co-infected patients. However antiviral treatment for chronic HCV infection with Pegylated interferon (PEG-IFN) and Ribavirin (RBV) is associated with a variety of side effects. In Georgia up to 22% of HIV-infected patients were found to have active Tuberculosis (TB) and 22.4 to 32.6% had latent TB. The objective of this study was to describe the characteristics and clinical outcomes of tuberculosis in HIV/HCV co-infected patients receiving hepatitis C treatment with pegylated interferon and ribavirin and calculate incidence rate of TB. A retrospective study was conducted among HIV/HCV co-infected patients receiving antiviral treatment for chronic HCV infection at the Infectious Diseases, AIDS and Clinical Immunology Research Center, Tbilisi, Georgia from December 2011 to May, 2015. A total of 420 HIV/HCV co-infected patients received HCV therapy with PEG-IFN and RBV during study period. Six of 420 patients developed TB while receiving PEG IFN + RBV therapy. These patients were on Antiretroviral treatment. Baseline HIV RNA load was <34 copies/ml and CD4+ cell counts >350 cells/mm3. No opportunistic infections were observed in all cases. Three of 6 patients had a previous positive tuberculin skin test (TST) result and had completed isoniazid chemoprophylaxis several years before TB diagnosis. In 2 patients TST was not performed. Only one patient had experienced a previous episode of TB and had completed the anti-TB therapy 1 year before hepatitis C treatment. In all patients TB was diagnosed during the PEG IFN + RBV therapy. Hepatitis C treatment was immediately stopped in all patients. The incidence rate of TB was 1.4 cases per 100 person-years (95% CI=0.58-2.97). Our study emphasizes the necessity of screening for latent TB prior to the initiation of chronic hepatitis C treatment with PEG IFN and RBV. Tab. 1, Ref. 20.

Auth.

b16.3.3.15. Main trends in access to primary health care for adolescents in Georgia. /N. Mirzikashvili, N. Kazakhashvili/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 47-53. – eng.; abs.: geo., eng., rus.
This study identifies barriers to accessing primary health care among youth in Georgia to inform strategies for improving the appropriateness, quality and usage of primary health care services. The quantitative survey was conducted throughout Georgia among 1000 adolescents 11-19 years of age via interview. Multi stage probability sampling was used to administer questionnaires in the schools, universities and in the streets between March-May 2014 and September-October 2014. Young people in Georgia identified a range of problems in accessing primary health services. By far the most important issues were preventive checkups, geographical access, cost of care, and perceptions about the quality of care. The majority of respondents (78.4%) declared that they do not visit family doctor when well, and 81.9% said that no information was provided about reproductive health issues. Most (77.3%) stated that their family doctor had never talked about health promotion or life style risk factors. Access to health care is still problematic in the villages; and in some

areas young people must travel more than 30 minutes by public transport. Limited access in rural areas compared to urban areas was statistically significant ($p<0.05$). As our survey data shows, most adolescents do not visit a health provider annually, obviating opportunities to integrate prevention into clinical encounters. Because repeated contacts with a primary care provider may occur over several years, clinicians should ideally have multiple opportunities to screen and counsel an adolescent patient for risky health behaviors. However, young people report that there is little screening or discussion about healthy lifestyles. The biggest health challenge for young people in Georgia is overcoming barriers (socioeconomic, geographic, trust, and perceived competence) to visit a doctor for regular preventive checkups and to get health behavior advice from health professional. Addressing the health and development needs of adolescents requires a comprehensive and timely response, and interventions can be incorporated in many programs supported young population of Georgia. Fig. 3, Tab. 2, Ref. 12.

Auth.

b3.4 Health biotechnologies

b16.3.4.1. **The effect of medical tisssues impregnated with softeners on the properties of the biocomposition medium.** /N. Pailodze, E. Buadze/. Georgian Medical News (GMN). – 2015. – #4. – pp. 138-139. – geo.; abs.: eng.
The paper deals with the effect of softeners on the properties of the biocomposition medium. As expected, the addition of softeners to the biocomposition changed the medium towards a decrease in the pH value till a weak alkaline medium. It was established that, when determining the optimal composition of the biocomposition, among main characteristics (softnesss, hygienic and consumer properties, etc.), the pH value of the medium is one of the most important parameters of the biocomposition. Tab. 1, Ref. 3.

Auth.

b16.3.4.2. Modification of the method of corrosion casts for studying of bilio-vascular structures of liver (Brief communication). /N. Inauri, M. Kordzaia, I. Sikharulidze, M. Kakabadze, D. Kordzaia/. Translational and Clinical Medicine – Georgian Medical Journal. – 20b16. – v. 1. – #1.– pp. 15-17. – eng.; abs.:eng.
The description of the original method for preparation of corrosion casts of intrahepatic vessels and bile ducts is provided. Readily available compositions, such as "Protacryl-M" set widely used in dental and neurosurgical practice and the Latex manufactured by "Geng" used in different constructions/repairs were applied for the casting. It is demonstrated that corrosion casts of blood vessels and bile ducts obtained from above-mentioned resins obviously reflect the architectonics and surfaces of studied structures and are completely convenient for the macro- and microscopic observation. Ref. 7, Fig. 1.

Auth.

b16.3.4.3. Accurate diagnosis of thyroid nodules: A review of diagnostic dilemmas on thyroid fine-needle aspiration biopsies. /E. Barabadze, G. Burkadze, V. Munjishvili/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 89-95. – eng.; abs.: geo., eng., rus.
FNA biopsy is well known method for the first step evaluation of thyroid nodules, It is the "gold standard" for diagnosis and surgical approach of nodular goiter. Despite the high sensitivity and specificity of the method there are grey zone in the diagnosis of thyroid nodules, mainly due to the heterogeneous group of Bethesda category AUS/FLUS. There are also some difficulties in diagnosis of PTC, especially FVPTC, even on histologic sections. The limited studies exist that specifically address details of cytologic features associated with cytohistologic discrepancy. Cell-block is very helpful in the diagnosis of papillary thyroid carcinoma and the carcinoma of undefined category; as the papillary configuration and nuclear features were more obvious, also immunocytochemical markers are applicable for ancillary studies. The BRAF mutation detection, which is associated with papillary microcarcinomas and cancer, can be yield for preoperative diagnosis, as well as for prognostic marker and as therapeutic target for further management. Ref. 39.

Auth.

b4. Agrarian Sciences

b4.1 Agriculture, forestry and fisheries

b16.4.1.1. Problems in Georgian tea industry and importance of their solution for the national economy. /R. Jabnidze/. Agrarian-economic Science and Technologies. – 20b16. – #1. – pp. 30-41. – geo.; abs.: geo., eng.
During establishing of a market economy, the government must create a favorable environment for the sectors of agriculture that are potentially competitive and capable of filly using the national resources and export possibilities, as well as obtaining important revenues with minimal expenses in the near future. In this respect, promotion of Georgian tea and winning a niche on global markets in the near future is special importance. Ref. 5.
Auth.

b16.4.1.2. The efficiency of the use of mineral fertilizers on hayfields and pastures. /G. Kvartskhava, T. Lachkepiani, V. Zeikidze/. Agrarian-economic Science and Technologies. 2015. – #4. – pp. 13-17. – geo.; abs.: geo., eng.
The productivity of natural meadows and pastures as well as of all agricultural crops is conditioned by the action of four main factors: water, fertilizers, light and warmth. The major mineral fertilizers used in agriculture to ensure feeding and growth of crops are nitrogen, phosphorous and potassium (NPK). Ref. 3.

Auth.

b16.4.1.3. Criteria of estimation of climatic factors for programming a crop capacity of the maize breed "Adjametis Tetri". /O. Kharaishvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 215-217. – geo.; abs.: geo., eng., rus.

As a result of the long-term supervision at Mukhrani meteorological station, parity between total solar radiation and the growing sums of active temperatures was established. Based on the results of research, the parameters of solar radiation during the vegetative period fluctuate within: the sum of active temperatures 3245-3731°C, on the average - 3713°C. Radiation balance - 46472-102651 kkal/sm^2, on the average - 71813 kkal/sm$^{2;}$ photosynthetic active radiation of the sun - 40200-46091 kkal/sm^2, on the average - within 66286 kkal/sm^2. These parameters provide for the obtaining of a potentially possible top yield not only of corn, but also of other agricultural crops. Tab. 1, Ref. 3.

<div align="right">Auth.</div>

b16.4.1.4. Agricultural land-tenure under the modern economic conditions of Georgia (after the example of Shida Kartli Region). /G. Mekhrishvili/. Science and Technologies. – 2015. – #1(718). – pp. 13-17. – geo.; abs.: geo., eng., rus.

The issues on land-tenure, including changes to the structure of the agricultural lands during the last 20-25 years are discussed. The important potential opportunities for further development of the privatization process, extension of the areas to be leased are revealed. Tab. 3, Ref. 3.

<div align="right">Auth.</div>

b16.4.1.5. Secondary pine forests of Georgia and their succession by primary forests. /R. Kvachakidze, K. Iashagashvili/. Science and Technologies. – 2015. – #1(718). – pp. 38-42. – geo.; abs.: geo., eng., rus.

The natural succession of secondary pine forest (*pinus sosnovskyi Nakai*) by primary forests in mountainous regions of Georgia is studied. The principal regularities of forest regeneration successions are revealed. Ref. 7.

<div align="right">Auth.</div>

b16.4.1.6. EU integration requirements and Georgian agriculture challenges. /R. Javakhishvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 24-29. – geo.; abs.: geo., eng., rus.

In the EU association process of Georgia our country is facing the great challenges, especially in the sphere of agricultural development, among which the most important are: agricultural production modernization and support of its sustainable development; rational management of the land fund; melioration system improvement; enhancing the field competitiveness; employment of rural people and poverty reduction; expansion and development of insurance activities in the field of agriculture; financial development of the field; diversification of sales markets of agricultural products, etc. Ref. 7.

<div align="right">Auth.</div>

b16.4.1.7. Factors Influencing the formation of food quality. /M. Garuchava, G. Parulava, G. Chagelishvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 61-64. – geo.; abs.: geo., eng., rus.

The article deals with the role of food in the healthy human diet process. The major factors concerning the food quality formation, also their influence on human health are analyzed. Fig. 2, Tab. 2, Ref. 3.

<div align="right">Auth.</div>

b16.4.1.8. Influence of the soil-free substrate on the biometric parameters of bean and barley germination. /L. Eprikashvili, V. Tsitsishvili, M. Zautashvili, T. Kordzakhia, M. Dzagania, N. Pirtskhalava/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 139-144. – eng; abs: eng., geo.

In the laboratory conditions, influence of the substrate based on brown coal and natural zeolite (clinoptilolite) on the biometric parameters of bean and barley germination has been investigated. In the first version the soil (object of comparison) was used as the standard. In the second version the substrate was produced by mixing 50% of finely-grained (up to grain size < 1 mm) zeolite and 50% of soil. The third main version is similar to the second one, where brown coal (50%) was used instead of soil. The following biometric parameters were determined: germination energy (GE), relative value of germination energy (RVGE), germination (G), relative value of seed germination (RVSG), height of sprout (HS), relative size of height of sprout (RSHS), rate of germination (RG) and intergrowth (IG). As it is seen, introduction of zeolite into the soil has an essential influence on the calculated parameters, raising their values by 2% and higher. These parameters are even higher for the samples containing zeolites and brown coal. Variation of these parameters on the substrate occurs in the sequence: soil (object of comparison) < zeolite-soil < zeolite-brown coal. It was shown that the enrichment of the soil with zeolite in combination with brown coal substantially raises germination and development of the seeded cultures. The present work has preliminary character and the results provide a basis for field experiments, and for more detailed agrochemical research of the examined substrates. Fig. 3, Tab. 3,Ref. 17.

<div align="right">Auth.</div>

b16.4.1.9. Polymerase chain reaction-based assays for specific detection of barley. /I. Gabriadze, T. Kutateladze, B. Vishnepolsky, M. Karseladze, N. Datukishvili, T. Zaalishvili, G. Muskhelishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 145-150. – eng; abs: eng., geo.

Specific detection of barley (*Hordeum vulgare*) is needed for food and feed authentication and quality assurance.This study aimed to develop polymerase chain reaction (PCR) based assays for reliable and fast detection of barley. To this purpose new PCR primers targeting barley specific γ- hordein gene were designed. Their specificity was assayed by conventional qualitative PCRs with different plant species, namely maize (Zea mays L.), wheat (Triticum aestivum L.), and soybean (Glycine max L.). Gel electrophoresis of the amplification products demonstrated high specificity and

efficacy of three primer pairs generating amplicons of 82bp, 91bp and 150bp in size for accurate detection of barley. The developed PCR methods may be used in routine laboratory analysis of seeds, foods and feeds. Ref. 5.

Auth.

b16.4.1.10. Peculiarities of classification of some soils of Western Georgia based on macromorphological analysis. /T. Urushadze, T. Kvrivishvili/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #1. – pp. 151-154. – eng; abs: eng., geo

This article presents the efficiency of correlation of some soils of Western Georgia and World Reference Base classification on the basis of the morphological analysis of the studied soils. The research covered the soil types prevalent in Western Georgia – red, yellow and yellow brown forest soils. Field survey was carried out with the profile method. Morphological signs of three profiles of each type of soil were described. General correlation between soil types and the WRB groups was carried out based on the genesis ideas and general approach. Tab. 1, Ref. b16.

Auth.

b16.4.1.11. Phenolic compounds in grape bunch and wine of Georgian autochthonal vine variety Tsolikauri. /A. Shalashvili, E. Tsutskiridze, N. Beridze, I. Targamadze, B. Chankvetadze/. Bulletin of the Georgian National Academy of Sciences. – 2015. – v. 9. – #2. – pp. 71-78. – eng; abs: eng., geo.

The objective of the study was to determine qualitative composition and quantitative content of phenolic compounds in grape bunch (stem, grape skin, seeds) and wine of Georgian autochthonal vine variety Tsolikauri by high-performance liquid chromatography (HPLC). Tsolikauri bunch stem contains the following phenolic compounds: gallic acid (0.096 mg/g), protocatechuic acid (0.071 mg/g), (+)-catechin (0.021 mg/g), caffeic acid (0.026 mg/g), (-)-epicatechin (0.007 mg/g), rutin (0.112 mg/g) and quercetin (0.064 mg/g); trace quantities of vannilic acid, dihydroquercetin, o-coumaric acid. Syringic acid, ferulic acid, resveratrol and p-hydroxybenzoic acid were not found. Content of phenolic compounds in the grape skins is the following: protocatechuic acid (0.037 mg/g), caffeic acid (0.005 mg/g), (-)-epicatechin (0.014mg/g), rutin (0.149mg/g) and p-hydroxybenzoic acid (0.063mg/g); trace quantities of (+)-catechin, vannilic acid and o-coumaric acid. Gallicacids, syringic acid, ferulic acid, dihydroquercetin, resveratrol, quercetin were not found. Phenolic compounds content in the grape seeds is the following: gallic acid (0.535 mg/g), protocatechuic acid (0.212 mg/g), (+)-catechin (3.131 mg/g), syringic acid (0.313 mg/g), (-)-epicatechin (0.211 mg/g), ferulic acid (0.02 mg/g) and quercetin (0.102 mg/g); trace quantities of vanilic acid and o-coumaric acid. Caffeic acid, dihydroquercetin, rutin, resveratrol, p-hydroxybenzoic acid were not found. Phenolic compounds of Tsolikauri wine are: gallic acid (23.287 mg/l), protocatechuic acid (10.33 mg/l), (+)-catechin (23.987 mg/l), caffeic acid (0.6b16 mg/l), syringic acids (1.591 mg/l), (-)-epicatechin (1.13 mg/l), dihydroquercetin (0.556) mg/l), rutin (9.103 mg/l) and quercetin (1.629 mg/l); trace quantities of vannilic acid, ferulic acid and o-coumaric acid. Resveratrol and p-hydroxybenzoic acid were not found. Tab. 1, Fig. 1, Ref. 20.

Auth.

b16.4.1.12. Development of priorities in agrarian sciences and its guaranteed support. /G. Aleksidze, G. Japaridze, O. Keshelashvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 4-11. – geo.; abs.: geo., eng.

The article highlights the history of the development of agrarian sciences in Georgia. In the 30s, and particularly in the 60s of the last century the role and function of agrarian sciences have been determined as a critical pre-condition for agricultural industry development. The scientific researches influenced on implementation of new approaches and technologies, as well as modern strategic management style in agribusiness which helped Georgia to strengthen its economic function and its geo-political role in the region. The strategy of development of Georgian agriculture outlined in the article can be qualified as following: systematic scientific study of Georgian agriculture and other fields functionally connected with it; the sustainable and integrated researches based on modern methodological approaches and information communication systems considering natural-economic factors, technological systems and scientific potential of the country. The aim of the researches is to achieve economic stability and food safety, maintain ecological balance in compliance with the problems of globalization. The authors of the article support the idea that it is necessary to create the fund for developing agricultural sciences with regard of perspective model of scientific management in order to guarantee its methodological and sustainable development. The aims of the fund are outlined as following: on one hand, it should direct multifunctional and wide-scale researches based on the requirements of scientific-technical progress, organizational and technological novelties in agricultural industry and economy. On the other hand, it should raise and accumulate funds and attract material resources from different non-governmental or other types of organizations, also from physical or legal persons who wish to support the development of agrarian sciences through charity activities and sponsor the researches in the field. This approach will improve material and social conditions of the scientists and create a stable basis for further and sustainable development of scientific researches to achieve fulfillment in prioritized directions of agriculture. The main directions in Georgian agriculture include the following: technical and technological system of agricultural plant growing and cattle breeding, which includes genetics, selection, soil fertility, plant protection, water management and utilization, high technological machinery development, optimization of food safety, agro-technical service, agro-biotechnologies, keeping and processing of agro product, economic organization of agricultural industry, optimization of industry which guarantees the food safety, and other fields of agricultural activity. Ref. 5.

Auth.

b16.4.1.13. The Introduction of some species of genus *Lavatera L.* (fam. *Malvaceae Juss.*) in East Georgia. /M. Muchaidze, L. Gventsadze, E. Gogitashvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 12-17. – geo.; abs.: geo., eng.

The paper deals with the investigation results of introduction of some species of genus *Lavatera L.* in the arid zone of

East Georgia, such as: *Lavatera trimestris L., L. bryoniifolia Mill., L. thuringiaca L.* After studying and estimating morpho-biological characteristics, growth and development rhythm, ways of propagation, biological, economic and ornamental peculiarities of the plants there has been estimated that *Lavatera trimestris, L. bryoniifolia* are considered to be perspective and can be recommended for using in different types of landscape compositions. They can be widely applied in the phytodesign of the botanical garden as well as in the practice of landscape gardening of the city. As for *L. thuringiaca,* utilization of the plant under the local conditions with ornamental purposes is less promising, however, it is important as a medicinal plant and it should be kept in the collection. Tab. 1, Ref. 14.

Auth.

b16.4.1.14. Introduction of some species of genus Lysimachia L. and prospects of its utilization National Botanical Garden. /L. Gventsadze, E. Gogitashvili, M. Muchaidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 18-22. – geo.; abs.: geo., eng.
Introduction abilities and ornamental distinctiveness of five species of genus Lysimachia L. of different geographical origin (L.cletroides, L.nummularia, L.punctate) as well as those wildly grown in Georgia (L.verticillaris, L.vulgaris) have been studied. The above-mentioned species are distinguished by high introduction potential, good growth and development and reproduction ability. They preserve their ornamental peculiarities and can be recommended for using in phytodesign. Ref. 6.

Auth.

b16.4.1.15. Japanese cedar (*Cryptomeria japonica* D.Don) - invasiveness in the humid subtropics of Georgia. /L. Shavishvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 23-26. – geo.; abs.: geo., eng.
The biological peciluarity of the manifestation of invasion of the coniferous population of *Cryptomeria japonica* introduced in Georgia, favorable conditions and possibility of restructing negative outcomes are considered under specific environmental conditions. Ref. 26.

Auth.

b16.4.1.16. Keeping quality of some nectarine varieties found in Georgia. /V. Kvaliashvili, M. Jgenti, L. Gulua, T. Turmanidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 27-29. – geo.; abs.: geo., eng.
The results of chemical analysis of the following nectarine varfieties: Max-7, Morsian – 60 and Caldez -2000 found Georgia are described in the article. Dynamics of respiration duringthe kreeping period are studied. Losses in weight according to the varities are established. Fig. 1, Tab. 3, Ref. 4.

Auth.

b16.4.1.17. In vitro culture of strawberry *(Fragaria ananassa)* and the effect of plant growth regulators. /L. Mosiashvili, R. Mdivani, N. Mdivani, N. Zarnadze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 30-33. – geo.; abs.: geo., eng.
In vitro propagation of strawberry (*Fragaria X annanassa* Duch), var. San-Andreas using the MS modified nutrient media (G_1 - G_9) is discussed. In order to determine the effect of growth regulators, the MS media was supplemented with different combination of benzyl amino purine (BAP) 0.5, 1.5, 2.0, 2.5 mg/l and Indole butyric acid (IBA) 0.5, 1.5, 2.0, 2.5 mg/l. The best result (70%) of shoot proliferation was achieved in combination G_1 - (MS+BAP 0.5 mg/l+IBA 0,01mg/l). In the stage of rooting good results (60%) showed G9 - hormone free MS media. Fig. 2, Tab. 3, Ref. 11.

Auth.

b16.4.1.18. Production of table and raisin varieties of grape in Shida Kakheti Region. /G. Aleksidze, G. Japaridze, V. Gogitidze, D. Maghradze, T. Epitashvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 34-36. – geo.; abs.: geo., eng.
The article deals with the agro-climate conditions necessary for production of table and raisin varieties of grape in Shida Kakheti Region. Based on the method of climatic analogues, some climatic zones in Shida Kakheti Region where it is possible to grow table and raisin varieties of grape and produce high quality production were selected and studied. The article also gives some recommendations regarding the drying process of grapes. Ref. 4.

Auth.

b16.4.1.19. The major phenological phases of grape varieties of "Rkatsiteli" and "Saperavi" in Kakheti Region. /G. Aleksidze, G. Japaridze, V. Gogitidze, D. Maghradze, T. Epitashvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 37-42. – geo.; abs.: geo., eng.
The research discusses the problem of interdependence between the major phenological phases of grape varieties of "Rkatsiteli" and "Saperavi" widely spread in Kakheti Region and local climate conditions. It analyses how much the quality of product depends on the sum of active temperatures during the year and on intensity of air temperature. The major focus is made on changes in quality indicators before the varieties reach technical ripeness. Fig. 7, Tab. 1, Ref. 3.

Auth.

b16.4.1.20. Parameters of root meristem cells for the Georgian grape varieties. /L. Kharitonashvili, M. Baratashvili, I. Mdinaradze, R. Chipashvili, D. Maghradze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 43-45. – geo.; abs.: geo., eng.
The results of cytological investigation of the root's meristem cells of two Georgian native grape varieties named as

"Tamaris Vazi" (originated from Meskheti Province, South Georgia) and "Satsuravi" (Guria and Adjara Provinces, West Georgia), are given. The size of the cells, nuclear–plasma index, activity of cell division, morphology of chromosomes, and frequency of chromosomal aberrations are determined. Tab. 1, Ref. 10.

Auth.

b16.4.1.21. Terrace viticulture development perspectives in Meskheti. /M. Mirvelashvili, T. Gabisonia, L. Mamasakhlisashvili, G. Godabrelidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 46-48. – geo.; abs.: geo., eng.
Against the background of global changes, one of the most urgent before mankind is still the ecological safety, since due to the growth of soil erosion, hundreds of hectares of arable land are lost and the landscape is being deteriorated. The use of some land treatment measures (crop selection, planting scheme) provides a possibility to realize effective steps in order to avoid harmful results and their causes, as well as improve the economis status of rural population. Ref. 9.

Auth.

b16.4.1.22. Identification of basic chemical indicators of brown soils under Zelkova stand in the Babaneuri reserve in terms of soil fertility. /G. Danelia, T. Palavandishvili, M. Gogotishvili, Z. Chankseliani. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 49-51. – geo.; abs.: geo., eng.
As a result of evaluating the basic chemical indicators of brown soils under Zelkova stand, it was identified that these soils - according to the appropriate maximum permissible range - include: a) the humus (organic matter) - higher than average, b) provided with total nitrogen, pH in water suspension – weakly neutral, whereas the moving P_2O_5 and exchangeable K_2O are poor, which is characteristic of brown podzolic soils. Tab. 1, Ref. 5.

Auth.

b16.4.1.23. Importance of Georgian mountain forests and the ways of continuous tmber use. /L. Gvazava/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 52-54. – geo.; abs.: geo., eng.
The article discusses the Importance of forests, as well as the principles for the "continuous" use of timber. The cosmic-ecological-economic finction of forest that depends on the condition of forest is underlined. The necessirtty of conducting systematic changes within it, implying the creation of the primary management-level "service centers", responsible for the long-term developmend of area and the state program implementation is stressed by the author. Tab. 1, Ref. 6.

Auth.

b16.4.1.24. Tikeri forest biodiversity. /N. Alasania, N. Lomtatidze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 55-58. – geo.; abs.: geo., eng.
The biodiversity of Tiketi forest located in the area of Kobuleti district, the geographical location, territorial boundaries, area, soil and climatic conditions, as well as the plant cover, the natural formations characterized for the Colchis-type forest, also the species planted by the Forestry are described. Fig. 4, Ref. 4.

Auth.

b16.4.1.25. Agtotechnical features of farming the Caucasian pine and its medical properties. /R. Rukhadze, Z. Giorgaia/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 59-61. – geo.; abs.: geo., eng.
The agrotechnical methods of farming the Caucasian pine and its medical properties are discussed. Ref. 6.

Auth.

b16.4.1.26. Agronomic characteristics of the Iberian oak /*Quercus Iberica* Stev/. /R. Rukhadze, Z. Giorgaia/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 62-63. – geo.; abs.: geo., eng.
The paper presents the short dendrological forestry and economic properties of the species under study. The agrortechnical metghods of farming the Georgian (Iberian) oak are onsidered in detail. Ref. 5.

Auth.

b16.4.1.27. Fossils plants of Goderdzi Pass. /A. Dzirkvadze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 64-66. – geo.; abs.: geo., eng.
The unique petrified forest of Goderzi Pass in Georgia is described. Fig. 2, Ref. 13.

Auth.

b16.4.1.28. The forest-pathological situation of chestnut forests in Gezruli Forestry. /A. Shainidze, R. Chagalidze, A. Dzirkvadze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 67-69. – geo.; abs.: geo., eng.
The natural conditions of Gezruli forests and the pathological conditions of chestunut fiorests are described. The biological properties of the fungus causing the chestnut disease and its control measures are considered. Ref. 5.

Auth.

b16.4.1.29. The current state of chestnut woods in Tkibuli Municipality. /A. Shainidze, R. Chagalidze, A. Dzirkvadze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 70-72. – geo.; abs.: geo., eng.
The article studies natural conditions (climate, relief, soil, the structure of the territory) of Tkibuli Municipality. The description of chestnut woods and their diseases is given. The main causes of their disease and the recommendations for controlling them are given. Tab. 1, Ref. 7.

b16.4.1.30. The effect of mineral fertilizers on the chemical composition of soft wheat and its management. /T. Samadashvili, D. Bedoshvili, L. Shubladze, M. Melikishvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 105-111. – geo.; abs.: geo., eng.

On the basis of the conducted study, it is possible to conclude that the bread-baking quality of wheat can be increased if a correct soil fertility management system is applied. The application of fertilizers at plowing provides wheat plants with a possibility to reveal their genetic potential and produce grain yield with high protein content and high gluten quality characteristic of this variety. Further improvement of quality traits can be achieved through foliar application of complex fertilizers such as nutrivant and aminocat. Twofold application of nutrivant in spring (3 kg/ha each) will result in higher protein and gluten content in wheat. It can grow for as much as 29.2%- 53.2% depending on the genotypes. Tab. 9, Ref. 6.

b16.4.1.31. New self-polinated lines of maize. /L. Kirikashvili, T. Kodua/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 101-104. – geo.; abs.: geo., eng.

To receive new self-polinated maize lines, the American, Ukrainian, Gorgian hybrids and a local variety "Ajametis Tetri" were used. The combination ability of the obtained lines and their response to different types of cytoplasmic male sterility (CMS) were studied. As a result of studies, the promising starting material was revealed. To breed the middle-late vegetation hybrids, the yellow maize lines: AM73, AM75, AM159, AMb160 and white maize lines: T63, T73, T98, T156, T61, AM80, AM81 are notable. Fig. 1, Tab. 1, Ref. 3.

b16.4.1.32. The problems of land use in Georgia. /N. Chitanava/. Annals of Agrarian Science. – 2015. – v. 13. – #3. – pp. 91-94. – eng.; abs: eng., rus.

The paper discusses the post-socialist systemic approach to land use problems in Georgia. The existing features and tendencies of land resources' use are identified. The paper gives the social and economic aspects of land privatization, an analysis of the basic reasons for inefficient use of land, the land registry gaps. It justifies the need for making the Land Code and the land cadastre. The paper considers recommendations for raising the productivity of land, registry improvement and, in general, land management organization perfection. Ref. 7.

b16.4.1.33. The results of the research of the content of vitamins in pumpkin varieties grown in Georgia. /G. Kaishauri/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 11-15. – geo.; abs.: geo., eng., rus.

The results of a research of the content of solvable in water vitamins and carotin in pumpkin varieties Mindalnaia-35 and Mramornaia, grown in East Georgia are given. The pumpkins are found to contain the vitamins, the complex content of which increases their physiological activity. Tab. 1, Ref. 9.

b16.4.1.34. Selection from virsis-free potato seed of a plant resistant to pathogenic fungus. /M. Kukhaleishvili/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. b16-21. – geo.; abs.: geo., eng., rus.

The virus-free potato varieties, such as "Amoroza", "Arinda", "Nevski" and "Impala" were studied. The soil type, acidity and NPK quantity were determined. The microflora of potato rhizosphere during rthe vegetation stage was analyzed. Separated were the pathogenic fungi causing potato disease: *Phytophthora infestans, Rhizoctonia solani* and *Fuzarium* sp. Out of the above-mentioned varieties three were fiound to be resistant towards pathogenic fungi, except "Impala". Fig. 1, Ref. 4.

b16.4.1.35. Use of the soil spectral reflective ability for a comparative analysis in the Azerbaijan soil types. /E. Mammadova/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 114-117. – rus.; abs.: geo., eng., rus.

Rational use of the natural resources in Azerbaijan requires careful attention to the environmental problems. A significant role belongs to the distance method by a soil state control. The correct choice of the spectral ranges reduces time and value in the performed investigations. Ref. 6.

b16.4.1.36. Environmental assessment of the south slope soils of Greater Caucasus. /Ya. Mustafaev/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 130-132. – rus.; abs.: geo., eng., rus.

The present article analyzes the physical-geographical location, relief, geological structure, climate and development of the lake and river network. Detailed are the physical, chemical and physico-chemical indicators of fertility for the following soils: lowland brown mountain-forest soils, brown mountain-forest soils of middle and dry steppe, gray-brown (brown) soils on the southern slope of the Greater Caucasus after the example of Gabala region. Based on the analysis of actual materials, environmental assessmnent of souils was made using conventional scales. According to a comparative evaluation, advantage of brown mountain-forest soils of the lowland region was determined. Tab. 1, Ref. 7.

b16.4.1.37. Study of the effect of leaching regime on the salinization of irrigated soils. /F. Mustafayev, M. Mustafaev, G. Djhabrailova/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 133-137. – rus.; abs.: geo., eng., rus.

The article contains detailed information concerning a research of the effect of leaching regime on the salinization of irrigated soil. During the research, the leaching regime and water-physical properties of soils were studied for soils of different composition; as a result of a comparative analysis, the salinization and desalinization trends were identified depending on the granulometric composition. Tab. 4, Ref. b16.

<div align="right">Auth.</div>

b16.4.1.38. Sumulation of soil erosion processes on the Borjomi fire-damaged mountain slope. /G. Chakhaia, Z. Varazashvili, Sh. Bosikashvili, G. Kikuashvili, I. Khubulava, T. Supatashvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 191-196. – geo.; abs.: geo., eng., rus.

In order to visualize the negative consequences of ecocide in Borjomi valley in 2008, within a control section of the research integrated polygon arranged on the Borjomi fire-damaged mountain slope, 32 field experiments were carried out to study the dynamics of erosion processes under conditions of precipitation of different intensity, during which the scour parameters (average depth **-** h, average width - b) were measured. Based on the obtained data, the silumation of erosion processes on the Borjomi fire-damaged mountain slope were carried out, which demonstrated an essential growth of gullying that requires the implementation of effective measures to control erosion. Tab. 1, Fig. 6, Ref. 1.

<div align="right">Auth.</div>

b4.2 Animal and dairy science

b16.4.2.1. The effectiveness of using new feed prepared from the waste of milk and milk products in swine breeding. /A. Kharazishvili, D. Basiladze, M. Kobakhidze/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 69-72. – geo.; abs.: geo., eng., rus.

The article deals with the influence of the new starter feed "Mkhneoba" prepared from the waste of the lactic acid products on the growth and development of piglets. The new complete feed enriched with fats, complete proteins, vitamins of group B, etc. has been found to be successfully used in swine breeding for rearing up young animals of 60 days of age. Tab. 1, Ref. 3.

<div align="right">Auth.</div>

b16.4.2.2. Sheep breeding in Georgia. /M. Tsintsadze, N. Natroshvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 72-76. – geo.; abs.: geo., eng., rus.

The article deals with the general importance of sheep breeding and the present situation in Georgia. Former aboriginal species in Georgia, its importance in light industry and supply of Georgian population with sheep products are analyzed in detail. Also described in detail are the deplorable state of sheep breeding existed nowadays and the necessity to carry out a number of measures for solving these problems. Ref. 2.

<div align="right">Auth.</div>

b16.4.2.3. Wastes of agricultural production and industry used in feeding of animals. /M. Tsintsadze, N, Natroshvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 76-80. – geo.; abs.: geo., eng., rus.

The article discusses the need for the approval of animal fodder facility and scheme of finding fodder reserves, in which the leading role belongs to the use of agricultural wastes. The paper presents characteristics of some wastes and the mechanism of their inclusion in the combined feed. Ways of their future use are also designed. Tab. 3, Ref. 2.

<div align="right">Auth.</div>

b16.4.2.4. Improvement of natural meadows by undersow grass. /J. Sarjveladze, J. Jincharadze, N. Mikava/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 94-96. – geo.; abs.: geo., eng.

The article discusses and analyzes one of the effective measures of improving the deteriorated grasslands and pastures - undersowing proper varieties of haymaking and pasture forage grasses. Ref. 6.

<div align="right">Auth.</div>

b16.4.2.5. The evaluation of the Dedoplistskaro district vulnerability and working out of adaptation activities. /G. Tetradze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 97-100. – geo.; abs.: geo., eng.

The share of arcultural land in Dedoplistskaro district makes 75% (188,900 ha). Of it 51.9% (131,400 ha) falls on winter pastures, which plays an important role in the functioning of the country's nomade cattler-breeiding (mainly sheep-breeding). Ref. 4.

<div align="right">Auth.</div>

b16.4.2.6. General description of the agricultural production and industry remains used in animal feeding. /M. Tsintsadze, N. Orjaneli, N. Natroshvili, G. Tskvitinidze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 101-104. – geo.; abs.: geo., eng., rus.

The general description of the agricultural production and industry remains used in animals feeding, study of their chemical composition and use in the feeding of various species of agricultural animals are given. Tab. 1, Ref. 2.

<div align="right">Auth.</div>

b16.4.2.7. Sheep-breeding in Georgia. /M. Tsintsadze, N. Orjaneli, N. Natroshvili, G. Tskvitinidze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 105-112. – geo.; abs.: geo., eng., rus.
The article describes in detail the current deplorable state of sheep-breeding and the necessity to carry out a number of measures for solving these problems. Ref. 2.

<div align="right">Auth.</div>

b4.4 Agricultural biotechnologies

b16.4.4.1. The drying process optimization for spicy-aromatic fruits. /N. Alkhanashvili, M. Demeniyk/. Agrarian-economic Science and Technologies. – 2015. – #4. – pp. 24-29. – geo.; abs.: geo., eng.
Different vegetative parts of herbaceous spicy-aromatic raw materials: roots, flowers, over ground part, fruits (seeds) are used for spicy and medicinal purposes; at the same time, the fruits, compared to vegetative parts, are relatively more rich in target components and can more durably keep the initial properties and, other things being equal, refine more food products. Based on the above, the fennel, parsley and celery crops were selected as a target object of research. When collecting crops, the humidity of the spicy-aromatic curing plants is high, because of which the activity of enzymes in them is tiull ongoing. In order to retain the biologically active substances and minimize the microbial and fermentation processes, the spicy-aromatic curing plants must be dried immediately after harvesting. The Research Institute of Food Industry developed technologies for natural and artificial drying of the spicy-aromatic curing plants; the optimal regimes for artificial drying were established and the key physico-chemical features of the fruits before and after the drying process were studied. Tab. 1, Ref. 2.

<div align="right">Auth.</div>

b16.4.4.2. The impact of sulfur dioxide, titanium and ascorbic acid on the physicochemical parameters and organoleptic properties of oxidized wine. /L. Chkuaseli, Z. Geliashvili, M. Khomasuridze, V. Jijiashvili/. GEN. – 2015. – #4. – pp. 127-131. – geo.; abs.: eng.
Oxidation of wine is still a rather topical problem in modern winemaking. Hence various auxiliary materials (potassium metabisulfite, tannin and ascorbic acid) for wine were used in the investigation to find solutions to the problem and its prevention. The combined use of potassium metabisulfite and tannin is efficient for prevention of wine oxidation, while the combined use of ascorbic acid and potassium metabisulfite is efficient for improving the already oxidized wine. For usefulness of the results, physicochemical analyses of test wine materials were performed, and the organoleptic properties of wine were tested by a tasting commission. Tab. 5, Ref. 3.

<div align="right">Auth.</div>

b16.4.4.3. A priori formalization of the structure of an intelligent control system of agro-bio techno-dynamic complexes. /T. Kapanadze, N. Chalidze, N. Lomidze, L. Gurbeleishvili/. Automated Control Systems. – 2015. – #2(20). – pp. 66-72. – geo.; abs.: geo., eng., rus.
The paper discusses the structure of a decision-making support system as the nucleus of an intelligent control system. A priori proposed is the introduction into an intelligenet control system of a module for adoption effective decisions in intelligent control system of agro-bio techno-dynamic complex, which, according to the authors, will significantly reduce the decision-making time and increase the degree of optimality. Fig. 3, Ref. 7.

<div align="right">Auth.</div>

b16.4.4.4. The observations on phenophases of selected high-oil laurel plants. /Sh. Kapanadze, R. Kopaliani, L. Kopaliani, N. Jincharadze/. Novation. – 2015. – #b16. – pp. 23-26. – geo.; abs.: geo., rus., eng.
The article presents the results of a research carried out to establish peculiarities of the growth and development of the selected high-oil forms of laurel plants, being reproduced vegetatively and through seeds; for this purpose, phenological observations and biometric measurements have been carried out since the beginning of 2014. As a result, it has been found that the earlier selected high-oil forms of laurel are generally of esrly-maturing. Tab. 1, Ref. 3.

<div align="right">Auth.</div>

b16.4.4.5. On the priorities of natural withering of tea raw material. /N. Katamadze/**.** Novation. – 2015. – #b16. – pp. 27-30. – geo.; abs.: geo., rus., eng.
This work deals with the results of an experimental research of tea-picking in mountainous plantation area, the issues of natural withering, picking and storing of tea raw material in special containers. As a result, the raw material with improved organoleptic and chemical composition, which is the base of high quality produccion, is produced. Ref. 4.

<div align="right">Auth.</div>

b16.4.4.6. Determining flavonoid and phenolic compounds in "Dzelshavi" variety grape seed dried at different temperatures. /L. Kipiani/. Novation. – 2015. – #b16. – pp. 58-61. – geo.; abs.: geo., rus., eng.
Based on the examples of Georgian grape variety "Dzelshavi", its three drying versions were determined: 1. Drying at a temperature of 50-55ºC with intensive air delivery; 2. Convection drying at a temperature of 100-105ºC; 3. Convection drying at a temperature of 130-135ºC. Determination of phenolic compounds was carried out by spectrophotometric method with the use of Folin-Ciocalten reagents. Flavonoid composition was determined by using nitrate-aluminum

colorimetric method. The results obtained have shown that conservation of higher amount of flavonoids and phenols is ensured during drying of raw seed at a low temperature, and besides, a temperature increase results in destruction of almost all substances with antioxidant activity. Ref. 4.

<div align="right">Auth.</div>

b16.4.4.7. Study of grape-seed oil acetone extracts purification-clarification process during processing with natural adsorbents. /L. Kipiani/. Novation. – 2015. – #b16. – pp. 62-65. – geo.; abs.: geo., rus., eng.
It has been established that the necessary amount of bentonite clays for normal purification of grape-seed oil acetone extracts depends on the degree of turbidity and concentration. The desired results can be achieved with dosages of 1,5-2,5 gram of dry bentonite for 1 l of extract. Tab. 1, Ref. 3.

<div align="right">Auth.</div>

b16.4.4.8. The effect of the duration of fermentation on pomace on the physicochemical characteristics of the wine kept in the kvevri. /M. Meskhidze, N. Chkhartishvili, K. Jakeli, G. Andriadze, M. Khomasuridze/. GEN. – 2015. – #3.– pp. 90-92. – geo.; abs: eng.
The paper deals with the effect of the duration of keeping the pomace in the wine matured in the kvevri. The wine was produced from Georgian grape cultivars Aladasturi, Otskhanuri Sapere and Odzhaleshi by the Kakhetian technology. Tab. 2, Ref. 5.

<div align="right">Auth.</div>

b16.4.4.9. Phenols and their antioxidant activity in grape seeds of different cultivars. /G. Ugrekhelidze, R. Burdiashvili, N. Vepkhiashvili, M. Javakhishvili/. GEN. – 2015. – #4. – pp. 125-126. – geo.; abs: eng.
Both the total content of phenols and their antioxidant activity are different in the grape seeds of different cultivars. The analyses showed that not all grape cultivars can be used for production of wine by Kakheti technology (for example, Pink Rkatsiteli). The investigation results suggest that the fundamental research of not only the seeds of different grape cultivars, but of all hard parts of the bunches of grapes of different cultivars will allow defining the scope of their application. Tab. 1, Ref. 4.

<div align="right">Auth.</div>

b5. Social Sciences

b5.1 Psychology

b16.5.1.1. Psychobiological basis of killer and self-killer organisms formation depending on aggressive social environment. /N. Aleksidze/. Science and Technologies.– 2015.– #1(718).– pp. 105-114. – geo.; abs.: geo., eng., rus.
There psychobiological mechanisms of killer and self-killer organisms' formation depending on the aggressive social environmentare discussed. It is experimentally established that the serotonin and sex hormone levels play a fundamental role in the development of aggressive behavior. Aggression has been linked to other negative emotional states, such as suicidal behavior. Both behavioral responses are affected by seasonal fluctuation. Studies have shown that aggression is strongly responded to seasonal fluctuations. Findings indicate a sharp reduction of the lectin binding in the stressed rats. The non-pharmacological treatment of aggressive and suicidal behavior is briefly discussed. Manipulation of the serotonenergic system by nutrition and cognitive therapy will help people, who struggle to combat the pathological aggressive behavior and related mood disorders. Tab. 2, Fig. 7, Ref. 11.

<div align="right">Auth.</div>

b16.5.1.2. Methods of personnel management. /Kh. Kortiashvili/. Transactions of Technical University of Georgia.– 2015. – #3(497).– pp. 39-48.– geo.; abs.: geo., eng., rus.
The attitude of psychologists and of psychology as science in general to the personnel management issues, the types of management, administrative and legal techniques that affect the staff management methods are discussed. Fig. 1, Ref. 4.

<div align="right">Auth.</div>

b16.5.1.3. Behavioral characteristics of rats of various hierarchical levels under acute information stress. /T. Matitaishvili, T. Domianidze, N. Emukhvari, M. Khananashvili/. Georgian Medical News (GMN). – 20b16. – #3(252). – pp. 63-73. – eng.; abs.: geo., eng., rus
The aim of our research was to study behavioral indices of rats standing on various hierarchical levels under conditions of acute informational stress as well as their resistance to stress, taking into account their social status. The animals' behavior has been studied under conflict and agonistic conditions against the background of high food and thirst motivation. After determination of hierarchical relations the stressing procedure of two active avoidance reactions was performed simultaneously during one trial (14 days). During the experiment the behavioral indices of rats induced by stressing procedure were registered. We used the "open field" test in order to assess the animals' emotional state. The studies performed by us demonstrated behavioral characteristics of animals standing on various hierarchical levels. The obtained results showed that after stressing all the animals of the group were under the stressogenic influence of equal strength; behavior of the rats did not reliably differ under conflict situations. The rats (dominants) standing on a high hierarchical level remaine active in both conflict situations. The impact of stress on their behavior was less obswervable. The dominant animala maintained their hierarchical status. Submissive rats were more greatly influenced by stress. The

obtained results confirmed that dominant animals were characterized with more comprehensively developed self-regulating mechanisms of brain. Fig. 7, Ref. 20.

<div align="right">Auth.</div>

b5.2. Economics and business

b16.5.2.1. Semi-quantitative assessment of application of the eco-industrial park (EIP) concept for providing of environment-friendly and profitable industrial processing of waste into gaseous, liquid and solid fuels and other highly demanded marketable products. /A. Chirakadze, P. Kervalishvili, A. Gigineishvili, Z. Buachidze, L. Gurchumelia, V. Gvakharia, W. Toscano, N. Kavlashvili/. Proceedings of A. Eliashvili Institute of Control Systems. – 2015. – #19. – pp. 33-38. – eng.; abs.: geo., rus

The concept of eco-industrial parks (EIP) offers one of starting points for addressing the exact meaning of "sustainable development". Fundamental improvements in industrial environmental performance and resource efficiency are required to involve industry in strategies for sustainability. The problem is very urgent for the most of former soviet republics. Georgia (as a country associated with EU) is of particular interest for developing and testing of advanced models and concepts of building sustainable and knowledge based society in countries with high educational, scientific and technical capacity, but collapsed economics and weakly developed democratic (political and social) institutions. This country may be considered as an ideal testing ground for R&D aimed to establishing of an integrated EIP (a set of inter-regional EIP), development and testing of innovative approaches and concepts to build the sustainable and knowledge-based society. A big number of advanced and innovative processes and technologies (like microwave enhanced hydrometallurgical and pyro-metallurgical processing, microwave enhanced processing using circulating catalysts, self-propagating high-temperature synthesis, microwave enhanced high pressure acidic autoclaving, microwave enhanced chemical synthesis of inorganic and organic materials, catalytic gasification and bio-gas production, vacuum distillation, etc) is utilized in Georgia. The main products and by-products of the considered EIP are represented by low-carbon and low-phosphorous ferromanganese, metallic manganese, composite alloys, Mn-containing micro- and nano-powders and materials, liquid and gaseous fuels, alcohols, manganese containing fertilizers and feed additives, mineral and vitamin enriched feed additives, etc. The work deals with the semi-quantitative assessment of the socio-economic and environmental advantages of implementing the EIP model in Georgia. Ref. 8.

<div align="right">Auth.</div>

b16.5.2.2. The role of economic conversion in business management. /G. Gurgenidze, N. Goguadze/. Agrarian-economic Science and Technologies. 20b16. – #1. – pp. 5-10. – geo.; abs.: geo., eng.

Modern business management implies taking the decisions associated with the reduction of costs, quick realization of the process of reorganization, coping with the problems of competition, introduction of innovations. During the last two decades, a priority of economic conversion in the business management has been: gradual development of labor productivity in a specific field and the problems of motivation associated therewith, identification and implementation of the right lines of business strategy. Nowadays they are added with such key tasks as: raising the rate of own investments, the necessity of increasing the level of corporative responsibility, using more developed methods of choosing the right business partner, etc. Also, it is necessary to identify and set out a long-term strategic vision that will increase the quality improvement of successful brands and reduce the period their entry to the market. The implementation of the above is possible by establishing customer interfaces. The priority task of business managers is to be constantly working on the renovation and improvement of existing business plans, problems of economic conversion, which is the basis for future success. Ref. 3.

<div align="right">Auth.</div>

b16.5.2.3. The tax mechanism and recommendations for its improvement. /O. Keshelashvili/. Agrarian-economic Science and Technologies. – 20b16. – #1. – pp. 11-29. – geo.; abs.: geo., eng.

The article deals with the main factors of the tax system improvement and its and effective functioning, the priority principles of the modern tax system, types of taxes and their essential features, tax liabilities, as well as the basic requirements being reflected in the Tax Code as relevant principles. Ref. 4.

<div align="right">Auth.</div>

b16.5.2.4. Georgia's balance of payments and the role of agricultural sector in its impromemnt. /O. Keshelashvili/. Agrarian-economic Science and Technologies. – 2015. – #4. – pp. 18-23. – geo.; abs.: geo., eng.

The country's balance of payments, in particular its trade balance, is in a very heavy condition. The share of imports in the trade turnover exceeds 80 percent. True, the import of food products is no more than 15 percent, but there are reserves in this area that could significantly improve the operation of this sector. The circumstances inerfereing with the development of export production are considered. Among the immediate steps to be taken for improving the state of affairs are named: elimination of the negative tendencies in the accounting of export-import operations inteh local customs system, taking effective maesures against smuggling, strengthening control over goods in transit and protecting the local market from the so-called „fictitious transit". Ref. 3.

<div align="right">Auth.</div>

b16.5.2.5. Silk Road Economic Belt project and its future prospects. /Sh. Chikhladze, A. Chargazia/. Economics. – 20b16. – #1-2. – pp. 7-19. – geo., abs.: geo., eng.

The New Silk Road project" is one of the most mixed use developments of the 21st century, which intends to bring the old Silk Road route to modern reality. This plan, which was proposed by the President of the People's Republic of China Xi Jinping in 2013, provides for wide prospects. Despite of difference in viewpoints and positions, the project will be the guarantee of peace for the South Caucasus and the conflincting regions of Asia, as involving them into economic processes will reduce the actuteness of conflicts. Also important is that the influence of China will increase not only in

Asia, but in Europe too. The possibility of changing the political configuration makes implementation of the given plan plan more interesting in the global context. Ref. 9.

<div align="right">Auth.</div>

b16.5.2.6. The effect of foreign direct investments on the economic growth in Georgia. /Sh. Pharjiani/. Economics. – 20b16. – #1-2. – pp. 20-27. – geo., abs.: geo., eng.
The present empirical paper investigates the relationship between foreign direct investments (FDIs) and economic growth in Georgia, from the period 2000 to 2014 using a correlation-regression analysis. In general, FDIs are considered one of the most important factors of the economic growth in the transition economies, inclufing in the ghist ory of independent Georgia, although the attitude is far from being uniform. Based on the official statistical information and an empirical study is shown that the relationship between GDP per capita and FDI per capita and at the same time the relationship between the GDP per capita and the unemployment rate is positive and significant enough. The correlation between FDI and unemployment rate is also positive and quite enough. Thus, the FDIs have a positive effect on economic growth and the unemployment rate in Georgia. Tab. 2, Fig. 1, Ref. 5.

<div align="right">Auth.</div>

b16.5.2.7. Demographic problems of the population and their solutions in Georgia. /I. Chkhaidze/. Economics. – 20b16. – #1-2. – pp. 28–36. – geo., abs.: geo., eng.
At the current stage demographic problems are ranked as the most urgent global problems. The article discusses the demography-related threats, such as annual reduction of the population, critical birth rate, etc. that face Georgia as a whole and its Autonomous Rewpublic of Ajara. Ref. 4.

<div align="right">Auth.</div>

b16.5.2.8. Science and technology as the globalization factors. /L. Bochoidze, M. Chinchaladze, N. Darsavelidze/. Economics. – 20b16. – #1-2. – pp. 37-41. – geo., abs.: geo., eng.
The traditional form of deals being characteristic of the world economy at the early stage is no longer topical today. Economic entities use now to incorporate in a structure to supply goods in services globally. These entities can be parts of a multinational corporation or a network of contractors. The nationality of separate elements no longer counts, The most important now is the development of new technologies and putting them into practice in timely manner. These are the keys to rationalization of viability of modern society. Ref. 3.

<div align="right">Auth.</div>

b16.5.2.9. Intercultural relations in the global business. /M. Beruashvili/. Economics. – 20b16. – #1-2. – pp. 42-48. – geo., abs.: geo., eng.
Businesses have long passed the national framework and attracted people with the different cultural outlooks. The multicultural problems of the business sphere have arisen being expressed in the growth of obstacles under the new cultural and social conditions. The process of human cognition formation is based on the knowledge, belief, moral, laws, values, norms and habits they acquire in the community life development process. In the international business, the misinterpretation of the factors of cultural environment creates the most difficulties. The objective evaluation of the different national cultures in business becomes increasingly important. Ref. 4.

<div align="right">Auth.</div>

b16.5.2.10. The relationship between foreign direct investment and economic growth by sectors in Georgia. /Sh. Pharjiani/. Economics. – 20b16. – #1-2. – pp. 69-77. – geo., abs.: geo., eng.
This empirical paper investigates the relationship between Foreign Direct Investment (FDI) and economic growth by 5 selected sectors of economy in Georgia from the period 2007 to 2014. Tab. 2, Fig. 1, Ref. 5.

<div align="right">Auth.</div>

b16.5.2.11. Global regulation of sustainable development and the concept. /G. Subeliani/. Economics. – 20b16. – #1-2. – pp. 78-91. – geo., abs.: geo., eng.
The article deals with the essence of sustainable development, its importance and relevance in modern society. The problems that need to be resolved for achieving the sustainable development are shown. Ref. 7.

<div align="right">Auth.</div>

b16.5.2.12. Economic analysis of the quality of assets in commercial banks. /A. Kutateladze, Z. Chkhaidze/. Economics. – 20b16. – #1-2. – pp. 92-103. – geo., abs.: geo., eng.
There are a number of books, monographs and scientific articles published about the problems of the quality of material production, social production and services. However, the banking sector is considered as a peculiar branch of economy with regularities typical to it only. The quality of assets is the set of properties guaranteeing the recurrence of the monetary funds invested by the bank within the agreed term and by considering the accreted value due to the bank. The modern theory of banking considers the assets and liabilities management as a coordinated process of controlling the bank balance considering the alternative scenarios of the changes in the interest rates and liquidity. The essence of the assets and liabilities management lies in that it consolidates the currently used methods of a credit portfolio as a single process of the bank balance control rather than meaning the management of its separate parts. Ref. 6.

<div align="right">Auth.</div>

b16.5.2.13. A short review of the survey of personnel motivation in the field of tourism and hospitality in Adjara. /N. Khakhubia/. Economics. – 20b16. – #1-2. – pp. 104-117. – geo., abs.: geo., eng.
In order to define the level of personnel motivation in the tourism and hospitality field in the Autonomous Republic of Adjara, a survey was carried out from November 2014 to April 2015 by means of anonymous questionnaires. Due to the

rapid and stable growth of tourism in the region, a diverse and better development of the motivation system was expected, although the results revealed the opposite situation. Only 48% of the respondents agreed that the motivation system of their organization was satisfactory and this attitude was common for both local and foreign brand hotels, although it was supposed that high level hotels would have been more divergent in their practices. As for the recovering of the motivation system, employees suggested the following options: improvement of relations and communication between the employer and employees, implementation of exchange programs for gaining international expertise, arrangement of more trainings for staff, defining the flexible work schedule, fulfillment of conditions in accordance with the labor agreement, rising the salary together with the years of work and modification of the bonus system. As the survey showed, employees are more interested in non-monetary motivation and self-development. Ref. 8.

Auth.

b16.5.2.14. Competition in the Georgian aviation market and its regulation. /I. Jimsheleishvili, E. Kharaishvili/. Economics. – 20b16. – #1-2. – pp. 118-127. – geo., abs.: geo., eng.
The article analyzes the role of transport, mostly of air transport, in the economic development. It describes the competitive environment of Georgian aviation market. Furthermore, based on the examination of appropriate materials, it is concluded that the market was monopolized before 2005. In addition, the article evaluates the regulating ebvironment of the civil aviation market and proposes the ways of its improvement. Also, according to the 2015 statistics, the structure of passengers carried by Georgian Airways and Russian Airlines, as well as the structure of regular direct flights from the Tbilisi International Airport to different directions operated by different airlines are examined and given. Moreover, special conclusions regarding the important aspects of the Georgian aviation market competition are made and appropriate advices and recommendations are given. Fig. 2, ref. 10.

Auth.

b16.5.2.15. The development opportunities of a tourist company in Georgia after the example of the strategic analysis of the company „City Sightseeing Tbilisi". /S. Stepanishvili/. Economics. – 20b16. – #1-2. – pp. 128-142. – geo., abs.: geo., eng.
The work provides the interested reader with the comprehensive information about the recommendations developed on the basis of analysis of the activity direction of the company "City Sightseeing Tbilisi". At the same time, it will assist in the evaluation of development opportunities for tourist companies in Georgia. The article discusses the effects of a combination of the factors and conditions on tourism business after the example of the company "City Sightseeing Tbilisi". Ref. 15.

Auth.

b16.5.2.16. The agribusiness risk insurance system and prospects of its development in Georgia. /T. Dudauri/. Economics. – 20b16. – #1-2. – pp. 143-154. – geo., abs.: geo., eng.
The availability of insurance system of agribusiness risks is one of the factors of stable development of the agribusiness sector. It is necessary to notice that insurance is only one of the possible strategies of risk management, and it is necessary to resort to it when the agribusiness entity identified all the possible risks for itself and determined the risks that are to be insured. The producers of agricultural production in different countries specify the industrial and weather, price risks, and also the risks connected with the change of legislation as the most significant risks for the entity. Monitoring and critical analysis of results of the insurance program allow changing or modifying the conditions of insurance products. We understand that the creation of the insurance system of agro risks is a major and labor-consu-ming problem. We hope that the professional evaluation of the possible insurance products and of the forms of the state support will enable the government the insurance sector of Georgia to create the management system of agribusiness risks capable of solvinge various and complex problems in the agribusiness sector. Ref. 9.

Auth.

b16.5.2.17. Recreation resources and conditions for forming recreational complexes. /N. Shapatava/. Economics. – 20b16. – #1-2. – pp. 155-b162. – geo., abs.: geo., eng.
The present article considers the recreation resources and conditions to form the recreation complexes, thei forms of and potential. Demand for active recreation and leisure represents a combined social and economic phenomenon, for recreation facilitates not only the improvement or maintenance of the health and labor capacity but also meets the cultural/cognitive demands of the customers. Therefore, the demand for recreation services is also complex, incorporating personalized demands as well. One of the ways to meet the customers' demands for recreation services is to create recreation complexes, where the focus should be made upon the recreational potential that in turn represents a uniform system of the interlinked natural, sports-tourists, health improvement and social-cultural subsystems. The activation of the recreation resources equally depends upon the favorable natural/cultural conditions and the economic sectors tightly linked to it. Ref. 4.

Auth.

b16.5.2.18. The firm's business plan and its relation to marketing program. /A. Tsulaia/. Economics. – 20b16. – #1-2. – pp. b163-173. – geo., abs.: geo., eng.
The business plan is a document that includes the company's goal, the way how to achieve it and the final financial results. The firm's business plan allows the firm to understand the growth prospects of its activities, to take into account the expected changes and the problems that will arise in the future, to control the operations and to assess the level of their own business progression. The referred work discusses the relationship between the business plan and the company's marketing programs. Although the business plans, by contrast, represent a broad view of the company's mission, strategy, the marketing plan for the allocation of resources has a more defined scope; the marketing plan is the basis for the company's strategy, where the customer is always the starting point. Upon assessment of the business plan the special attention is given to the marketing department, because the new company will focus on providing goods and

services; unless it is not determined in advance, none of the investments and actions will help the company to succeed. Thus, an effective marketing plan for the business plan is required to give the direction to the company's trademarks, goods, and generally determine the company's goal. Ref. 9.

<div align="right">Auth.</div>

b16.5.2.19. The essence of online and offline marketing and their role in modern business. /G. Kashibadze/. Economics. – 20b16. – #1-2. – pp. 174-184. – geo., abs.: geo., eng.
The Internet has fundamentally changed all aspects of our life, and technological advances achieved in the last 20 years have made people dependent on them. Connecting with the world has been simplified, which has lead to the growth of the business opportunities greatly. Hand in hand with the development of the Internet, businesses continue improving the online marketing offers to reach more potential customers than they had before. The article discusses the essence of online and offline marketing, differences between them and the interrelations of their functions. It presents as well the role of internet marketing for business. More and more, the functions and tools of internet marketing strongly influence not only on the online products and services but also on the traditional offline markets. Online markets are dynamic in the places where customers and suppliers are open, easily share information, and simply make decisions. Online marketing tools are creating the possibilities for the new objectives and goals, which, for its part, require the new strategies. Ref. 10.

<div align="right">Auth.</div>

b16.5.2.20. Leader country in energy resources in the South Caucasus. /M. Kelendjeridze, R. Abdulaev/. Economics. – 20b16. – #1-2. – pp. 185-192. – rus., abs.: geo., eng.
Geopolitical and geoeconomic factors served as the basis for large projects in the world oil and gas sector, the importance of which is measurable today only by their investment policy analysis. Geopolitics in the energy resource consumer and producing countries has become the world regulator of the international and economic sphere policy. The present article considers the role of Azerbaijan in th context of energy security in the South Caucasus, as well as the problems associated with global oil resources in general. Fig. 2, Ref. 6.

<div align="right">Auth.</div>

b16.5.2.21. El estado actual de las pequeñas y medianas empresas en América Latina (The current state of small and medium business in Latin America). /M. Kiknadze/. Economics. – 20b16. – #1-2. – pp. 193-198. – eng., abs.: eng., geo.
The article is dedicated to the research of small and medium businesses in Latin America, the region which is insufficiently studied in the Georgian science. The paper examines the current state of small and medium business, its evolution and role in the region's economy. It also presents the advantages and disadvantages of Latin-American small and medium-sized enterprises (SMEs), outlines the main principles and directions of SMEs development. Ref. 7.

<div align="right">Auth.</div>

b16.5.2.22. Investment project as an object of management. /A. Kutateladze, T. Matua/. Economics. – 20b16. – #1-2. – pp. 199-211. – geo., abs.: geo., eng.
The conceptual basis of the investment process is the investment theory, which represents one of the important directions of economics, for it contains a wide range of complex challenges or problems. Based on analysis of researches in the investment theory performed by Georgian and foreign scientists, we can regard the investment as the input of capital in various activities with a rather lengthy (over one year) period that is necessary for achieving a definite result. On the other hand, under the "capital" we should imply all that can bring revenue, or the resources needed by humans for producing goods and services. Fig. 2, Ref. 4.

<div align="right">Auth.</div>

b16.5.2.23. Legislation bases of management of the migration processes in Georgia. /G. Tsintsadze/. Economics. – 20b16. – #1-2. – pp. 218-228. – geo., abs.: geo., eng.
The matters of in- and out-migartion, immigration are established, also considered and presented is the the Migration Policy Action Plan for 20b16- 2020, which aims is to create a legal framework to ensure the country's rapprochement with the EU. Ref. 4.

<div align="right">Auth.</div>

b16.5.2.24. The new economic factor of international relationships: BRICS in action, its potential and prospects. /S. Oniani, Z. Gamtenadze, A. Chargazia, T. Kavlelashvili, T. Beshkenadze/. Economics. – 20b16. – #1-2. – pp. 239-251. – geo., abs.: geo., eng.
The article gives an analysis of the economic and financial characteristics of one of the largest economic unions - BRICS. The purposes of was the union's creation are explained, the directions of its activity it the regions or spheres of its interest are presented. A short survey of the econ omic development of its members - Brazil, India, China, the Russian Federation and South Africa – and their current state is presented by individual chapters. Also analyzed are relations between the member countries, which cover the political and economic aspects and a scenario of the possible development of the union is given. Ref. 14.

<div align="right">Auth.</div>

b16.5.2.25. Small and medium business in Brazil. /M. Kiknadze/. Economics. – 20b16. – #1-2. – pp. 252-265. – geo., abs.: geo., eng.
Brazil is one of the largest countries in Latin America, whose economic prosperity is inextricably linked with the development of small and medium enterprise (SME) sector. It is worth noting that SME represent over 99% of the formal enterprises in Brazil. In this sense, the article provides an overview of the Brazilian small and medium business, investigates the importance of the SME sector size measured by the share of the SME employment in total employment, and the level of human capital in the SME sector. Furthermore, it reviews the experience of state support of small and

medium business in Brazil, the advantages and disadvantages are identified, and some suggestions are given for possible improvement of the sector. Ref. 8.

<div align="right">Auth.</div>

b16.5.2.26. Strategies of Georgian firms for penetrating the EU market. /N. Daghelishvili/. Economics. – 20b16. – #1-2. – pp. 266-278. – geo., abs.: geo., eng.
This paper analyzes the process of internalization of Georgian firms to the EU market on the one hand and outlines the obstacles to access to the EU market on the other hand. The main emphasis is put on the influence of the signed Association Agreement and its integral part the Deep and Comprehensive Trade Area (DCFTA) on the main strategies f or penetrating the EU market. In addition, a brief analysis of different theories is provided. Fig. 5, Ref. 20.

<div align="right">Auth.</div>

b16.5.2.27. Global inequality: the analysis of modernization and dependency theory. /N. Lobzhanidze, K. Jin-chveleishvili, A. Kenchashvili, S. Lomsadze/. Economics. – 20b16. – #1-2. – pp. 279-293. – geo., abs.: geo., eng.
The modernization and dependence theories are discussed. A detailed analysis of global inquality, its causes and effects is given with the presentation of numerous cases and examples. Ref. 21.

<div align="right">Auth.</div>

b16.5.2.28. The role of transnational corporations in the development of the so-called Southern countries. Case: Chinese corporations in Africa. /S. Oniani, Z. Gamtenadze, T. Kavlelashvili/. Economics. – 20b16. – #1-2. – pp. 294-304. – geo., abs.: geo., eng.
The activities and nature of the transnational corporations (TNSs) targeted at developing countries, Africa in particular are described. The positive and negative outcomes of their activity on the African states and the life of their population are detailed. Ref. 10.

<div align="right">Auth.</div>

b16.5.2.29. Economic regress and the reasons of its detection in economy of Georgia. /R. Abesadze/. Ekonomisti. – 20b16. – v. 8. – #1. – pp. 6-29. – eng.; abs.: eng., geo.
The concepts of "the consolidated economy" and "economic regress" introduced for the first time in economic literature are examined in the article. The essence of these concepts is revealed and sources of economic regress are established. Function of the state as "helmsman" of economy is defined. Ref. 24.

<div align="right">Auth.</div>

b16.5.2.30. Monetary crises in Georgia: lessons and prospects (1995-20b16). /D. Aslanishvili, K. Omadze/. Ekonomisti. – 20b16. – v. 8. – #1. – pp. 89-108. – geo.; abs.: geo., eng.
The history of the origin and development of three main monetary crises in Georgia since its independence is discussed. Recommendations for coping with the monetary crises and their prevention are given. Special attention is paid on an analysis of mistakes made in the prevention of monetary crises. Tab. 15, ref. 18.

b16.5.2.31. Russuan-Turkish relations and Georgian power engineering. /S. Pavliashvili, Z. Garakanidze/. Ekonomisti. – 20b16. – v. 8. – #1. – pp. 109-120. – geo.; abs.: geo., eng.
The article deals with the energy security problems of the region and the potential scenarios of power engineering development in the country. The possible options, advantages and disadvantages of the development of the energy transport corridor of the Caucasus and Georgia proper are given. Ref. 5.

<div align="right">Auth.</div>

b16.5.2.32. The ways of improvement of innovative activities of Georgian firms. /T. Gogokhia/. Ekonomisti. - 20b16. – v. 8. – #1. – pp. 121-134. – geo.; abs.: geo., eng.
The main purpose of the study is the description of the current state of innovative activities of Georgian firms and setting up the ways for imprioving them. Recommendations and conclusions made as a resut of the study can be used both in the process of management of industrial companies as well as in the implementation of their innovation policy. The recommendations concern two directions – ensuring easy access to financial resourcesand promotion of necessary knowledge development. Tab. 1, Ref. 13.

<div align="right">Auth.</div>

b16.5.2.33. Evaluating the performance of an investment portfolio using the Sharp ratio. /L. Gurgenidze/. Automated Control Systems. – 2015. – #2(20). – pp. 42-45. – geo.; abs.: geo., eng., rus.
The Sharpe ratio is a classical indicator a measure for calculating risk-adjustment return. It is often used to evaluate the performance of an investment portfolio. The Sharpe ratio helps to make the performance of one investment portfolio comparable to that of another investment portfolio by making an adjustment for risk, the value indicator has direct connection to the income. Fig. 1, Ref. 2.

<div align="right">Auth.</div>

b16.5.2.34. Investment securities' portfolio and calculation of J. Tobin's portfolio. /L. Gurgenidze/. Automated Control Systems. – 2015. – #2(20). – pp. 46-51. – geo.; abs.: geo., eng., rus.
James Tobin's portfolio is a kind of investment model by G. Markovitz. The Tobin model allows taking into consideration the risk-free assets, government bonds, bonds of highly reliable issuers and real estate. The assessment of risk and income has several disadvantages. To forecast the future profitability of bonds only by the multifactor method is difficult. These disadvantages can be solved with the help of multivariate methods of forecasting risk and income. Fig. 3, Ref. 3.

b16.5.2.35. Paradigm of national currencies devaluation. /S. Pavliashvili, B. Kitsmarishvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 12-15. – geo.; abs.: geo., eng., rus.

The national currency stability and credibility as a significant factor in the development of the economy of country is analyzed in the article. According to the authors, the improper use of monetary policy instruments or their non-use causes the exchange rate fluctuations, which ultimately provoke inflation. It is concluded that both the Government and the National Bank should be more cautious and show more prudent attitude to the "young" GEL and comprehensive approach to it. Ref. 7.

<div align="right">Auth.</div>

b16.5.2.36. Sustainable development – future of tourism in Georgia. /G. Nadirashvili, D. Jangulashvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 15-24. – geo.; abs.: geo., eng., rus.

The article explores the scope of sustainable development, formulation of concept of sustainable development, the role of international organizations in the development of sustainable tourism and the ways of shifting to the sustainable development of tourism. Ref. 5.

<div align="right">Auth.</div>

b16.5.2.37. Issues of improvement of crediting by commercial banks. /G. Tsaava/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 30-33. – geo.; abs.: geo., eng., rus.

The article deals with the essence of credit, author's definition of credit; also analyzed are the essence of basic loan products, activation of the accumulation of monetary funds in banks free from legal entities and society and the importance of formation of "Deposit Insurance Fund" for the creation of own national resourcesl. Ref. 4.

<div align="right">Auth.</div>

b16.5.2.38. Management challenges for commercial banks' financial sustainability. /G. Khantadze/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 40-45. – geo.; abs.: geo., eng., rus.

The article deals with the analysis of bank, as a portfolio of assets and liabilities, at the optimal case based on the volumes, terms and cost of separate active and passive groups of balanced cash resources. Bank portfolio risk includes: portfolio (balance) risk; percentage risk; non-compliance risk according to the liquidity imbalance or non-compliance with the terms and volumes of resource structure; current liquidity risk. The risk solution system is considered as a unity of banking products (bank financial technologies, rules and procedures) or a combination of the production methods and financial processes in a financial-credit organization, which provide bank capital (own and paid monetary resources) management. The bank portfolio risk is the probability of adverse circumstances, which may arise as a result of the decision-making process with regard to the conditions of the bank's portfolio management under uncertainty conditions. The main reason of a bank portfolio management (or solution of a risky situation) is to promote the acceptable ratio of profitability and liquidity while managing in order to minimize the possible bank losses. Ref. 6.

<div align="right">Auth.</div>

b16.5.2.39. State contribution to the development of small and medium businesses. /G. Shanidze/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 46-49. – geo.; abs.: geo., eng., rus.

Contribution to the business development is one of the main directions of market reforms in the country. In economically developed countries small and medium businesses are the basis of forming the middle class that is the basis for the stable development of economy and employs the majority of the population. 50-70% of GDP in these countries are produced by small and medium companies. In Georgia, if we consider the production of products by the size of enterprises, we find that the total share of the small and medium businesses is 18.7%, while their share in the total turnover is 9.7%. Employment in small and medium businesses accounts for 37% of the total employees. It is concluded that the development of small and medium businesses needs more motivation from the state in order to guarantee the further economic stability of the country, to develop a wealthy community and support the long-term economic growth and political stability,as well as to solve the acute social problems. Tab. 2, Ref. 3.

<div align="right">Auth.</div>

b16.5.2.40. Challenges for "Green Economy" formation. /G. Natroshvili/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 49-52. – geo.; abs.: geo., eng., rus.

The article deals with the advanced trends based on new structural transformations, which experts have called "Green Economy". A collection of documents, which is expedient to be used as an elaboration and realization of the strategy of sustainable development is analyzed. The problematic spheres have been revealed and characterized in less extent for Georgia as ecologically safe for the formation of socially fair competitive economics based on a wide utilization of innovation. Tab. 1, Ref. 2.

<div align="right">Auth.</div>

b16.5.2.41. Comparative analysis of approaches to assessment of tourism service quality. /I. Vatsadze/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 52-57. – geo.; abs.: geo., eng., rus.

Based on an analysis of approaches to the assessment of quality, the author introduces the concept of "approach in terms of control". By using this concept, the author proves advisability of differentiated approach to the assessment of tourism service quality, in particular, assessment of the material component of the product in terms of control and non-material component – in terms of the consumer. Ref. 9.

<div align="right">Auth**.**</div>

b16.5.2.42. How to conduct in social networks a contest beneficial to the company. /N. Lomidze/. Novation. – 2015. – #b16. – pp. 66-71. – geo.; abs.: geo., rus., eng.
The article shows that holding of a profitable contest is necessary for attracting new participants and increasing their number for the sale of brand movement. To do this, one will need to create motivation, to expand the audience and find all the necessary means of creating favorable competition. Conducting a profitable competition in social networks contributes to the company's sales. Even the smalles prize of institutions in the competition gives the buyer motivation to the buyer to act by the rules of competition in achieving the set out goal. For effective use of a contest, it is necessary to understand the mechanism of its work, ways and means. Ref. 2.

<div align="right">Auth.</div>

b16.5.2.43. Organizational forms of entrepreneurial activities of international business. /N. Grdzelishvili/. Law and Economics. – 2015. – #6. – pp. 19-28. – geo.; abs.: geo., eng., fr.
The article states that transnational corporations play a leading role in the internationalization of production, which is now more widespread among the enterprises of various countries. In the process of expanding entrepreneurial links particular emphasis is given to transnational corporations in the economies of small countries. Positive and negative sides of transnational corporations on the economies of various countries are analyzed, as well as the motivations of investment activities of transnational corporations. Ref. 5.

<div align="right">Auth.</div>

b16.5.2.44. The main obstacles of tourism development in Georgia and solutions to this problem. /A. Mazmishvili/. Law and Economics. – 2015. – #6. – pp. 59-63. – geo.; abs.: geo., engl., fr.
The article deals with the problems hindering the development of tourism in Georgia and offers solutions to this problem. The main significant problems impeding the advancement of the tourism sector in our country are analyzed. Without solving these problems the development of tourism will be impossible in Georgia. Ref. 3.

<div align="right">Auth.</div>

b16.5.2.45. Museum-tourism as an important factor in the development and strategy of Shida Kartli. /T. Iremashvili/. Law and Economics. – 2015. – #6. – pp. 64-73. – geo.; abs.: geo., eng., fr.
The development of museum-tourism in Shida Kartli is essential factor and strategy. There are 14 museums on the territory of Shida Kartli, which increases the potential for the development of cultural tourism in this region. The m,ain opuroose of the study was to identify the support on the part of Gori Municipality in connection with the development of cultural (museum) tourism in the region. Fig. 7, Ref. 6.

<div align="right">Auth.</div>

b16.5.2.46. Land taxation and tax mobilization of existing problems and improvement. /L. Darchiashvili/. Mining Journal. – 2015. – #1(34). – pp. 89- 90. – geo.; abs.; geo., rus., eng.
The paper discusses the problems related to taxation of land in Georgia that directly prevent the establishment of fair tax rates and improvement of the budgetary system. The issues of effective use of the ciuntry's land resources and creation of a civilized land market are discussed.

<div align="right">Auth.</div>

b16.5.2.47. Modern information technologies in modeling of marketing processes. /M. Okhanashvili, M. Khartishvili/. GEN. – 2015. – #4. – pp. 29-31. – geo.; abs.: eng.
The functions of marketing in industry, the urgency of implementation of new information technologies in this field and the effectiveness of simulation are discussed. The stages of marketing process modeling and software applications based on UML technology are considered. The problems of management of contract drawing, production planning and accounting are underlined. A model of the marketing system and the simulation model algorithm were elaborated. Nowadays modern information technologies and the integrated information systems, created on their basis, become the irreplaceable tool in providing the achievement of the strategic purposes and steady development of companies and organizations. Fig. 2, Ref. 4.

<div align="right">Auth.</div>

b16.5.2.48. Financial analysis at a commercial bank. /M. Dvalishvili, Mikh. Dvalishvili/. GEN. – 2015. – #4. – pp. 35-38. – geo.; abs.: eng.
The paper deals with the financial analysis in commercial banks. Its role and importance are discussed. Fig. 2, Ref. 4.

<div align="right">Auth.</div>

b16.5.2.49. For raising awareness of Georgian wines. /T. Kunchulia/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – 1(35). – pp. 137-140. – geo.; abs.: geo., eng.
The matters concerning subjection of winegrowers and wineries to the same goal are considered. Desirability of establishment of such interrelations when the winegrowers do not try to artificially raise the price of grapes at the expense of gaining extra income and deteriorating the quality of grapes is stated. An agreement between wineries and winegrowing cooperatives needs to be made to provide the production of optimal amount of grapes per one hectare, the use of fertilizers and plant protection agents within the rate, the strict regulation of irrigation dates. Complience with the above conditions is a guarantee for making quality wines and make them popular.

<div align="right">Auth.</div>

b16.5.2.50. Impact of standardization on macroeconomic indicators. /Z. Phutkaradze/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 141-144. – geo.; abs.: geo., eng.
The role of standsardization in the economic policy is noted after the example of developed countries, such as: Germany,

United Kingdom, USA, France, Canada, as well as ra\didly developed economies, such as: China, Russia and Brazil. Ref. 4.

<div align="right">Auth.</div>

b16.5.2.51. Forms and methods of feed organization in tourism. /S. Tsagareishvili/. Bulletin of the Georgian Academy of Agricultural Sciences. – 20b16. – #1(35). – pp. 145-147. – geo.; abs.: geo., eng.
The forms of public catering the resort and tourist centers are described. Ref. 3.

<div align="right">Auth.</div>

b16.5.2.52. Promotion of small and medium enterprises through participation in government purchases. /E. Shilakadze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 55-66. – geo.; abs.: geo., eng., rus.
The nature and functions of small business under current conditions are given; the necessity of the promotion of its development on the part of the State is justified; the possibility of interaction of the public sector and small business through government purcases on a sunbcontractual bas is are discussed. Ref. 7.

<div align="right">Auth.</div>

b16.5.2.53. Proposals for restoring taxation justice and accelerating economic development in Georgia. /T. Bakradze/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. 77-85. – geo.; abs.: geo., eng., rus.
The reasons of falling in exchange of GEL in and the economic problems associated therewith in the country are considered. A substantiated proposal on the necessity of restoring a progressive income tax is given. The separation of a social tax from the income tax and its imposition on again on legal persons or employers are considered as unreasonable. In order to stimulate the opening of new enterprises and accelerate the economic development, it is recommended to reduce taxe by half in the first year of functioning of a new enterprise and restore the payment of taxes at full rate from the second year. Finally, the article recommends to give preference for creation of joint ventures and frenchises as weel as cooperation and establishing business relations with leading foreign firms. Ref. 11.

<div align="right">Auth.</div>

b16.5.2.54. Theoretical bases of land cadastre production. /L. Darchiashvili/. Transactions of Technical University of Georgia. – 2015. – #2(496). – pp. b160-b166. – geo.; abs.: geo., eng., rus.
The current level of land cadastre production and its development prospects are reviewed. The reduction of land resources productivity of Georgia as a result of negative natural end anthropogenic events is mentioned. The necessity for raising land productivity with a number of organization-economic measures is emphasized. Mentioned are the role of land cadastre and the information support of the measures and formation of cadastral business according to each cadastral land plot that should ensure the regulation of patrimonial relations, the introduction of a complex of measures for production and rational use of land resources; the theoretical and methodological aspects of land cadastre maintenance are fully represented. Ref. 3.

<div align="right">Auth.</div>

b16.5.2.55. Audit planning and regulation. /I. Parsegashvili, T. Kikvadze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 17-23. – geo.; abs.: geo., eng., rus.
The overall audit strategy and detailed program-making issues are analyzed. A list of the necessary audit procedures is given together with the standards to which an audit should meet. Ref. 4.

<div align="right">Auth.</div>

b16.5.2.56. Problems of screening and ranking in open innovation. /J. Gagloshvili, Z. Gasitashvili, S. Khutsishvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 49-62. – geo.; abs.: geo., eng., rus.
The structural models of open innovation process, which we refer to as open innovation method is presented. It is formed on the basis of synthesis of significant characteristics of open and closed innovation models of older generation. Innovation process in the mentioned model is represented as a sequence of certain phases with direct and backward linkages. If the principle of development of innovations only inside the company formed and still forms the basis of closed innovation model, the open innovation theory defines the process of research, development and realization as an open system. It means transfer from the use of only internal (inside one company) closed knowledge and researches to the efficient use of ideas, knowledge and researched existing in internal, as well as in external environment. For the purpose of optimization of the initial phase rsults (idea generation phase) of innovation process, the tasks of screening (selection) of ideas and their further ranging is set. The multi-criteria expert method, based on the principles of theory of fuzzy sets is offered for solution of the set tasks. Multiple criteria mean the existence of qualitative and quantitative assessment indicators and the simultaneous use of the indicators of the mentioned type becomes possible with consideration of properties of fuzzy numbers. In the course of practical realization of the method, existence of about ten experts and the use of ten-twelve indicators is desirable, although their number is not limited. All phases of expert method are realized, namely: qualitative assessment indicators are formed; special approach is used in the case of existence of quantitative indicators; fuzzy scale of assessment is determined; the level of agreement of experts is determined (concordance ratio is calculated); indicator weights and integral fuzzy assessment for each idea are calculated; fuzzy indicators are brought up to crisp (real) numbers and further ranging of the selected ideas is carried out. Under certain conditions, quantitative values of risk are calculated which makes the process of ranging of ideas more efficient. The above-described approach to solution of the set tasks conditions is selection of efficient ideas, targeted towards the goal and strategies, their arrangement according to importance and further realization of priority ideas. Tab. 2, Fig. 5, Ref. 10.

<div align="right">Auth.</div>

b16.5.2.57. Features of financing methods of commercial banks acceptance and receivable accounts. /G. Khantadze, G. Tsaava/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 72-83. – geo.; abs.: geo., eng., rus.

The features of the methods of financing commercial banks acceptance and receivable accounts are discused. Short-term loans issued in the form of working capital for commercial enterprises should be taken into account while analyzing the bank's loan portfolio. In general, they are used for financing commodity stocks and receivable accounts. Medium-term (from one to five years) loans mainly represent the credits issued to finance capital goods, transportation of goods and credits for various special purpose. Long-term loans, which are issued for more than five years, are mainly used to finance large projects of transnational corporations, foreign governments and state enterprises. The easiest way to finance foreign receivables is an open account. In such cases the buyer and the seller agree that payment should be performed on a particular day, without any exchange financial document. Bank acceptance is the task in the form of bill of dated debt. It was developed by one side in favor of the one (drawer) or the other party (the recipient). The factor, or the factoring producer, buys receivable accounts without a right of regression. Forfaiting, like factoring, represents the financing of receivables without a right of regression. Fig. 1, Ref. 9.

Auth.

b16.5.2.58. Peculiarities of calculation of the time value of money and currency exchange rates. /G. Tsaava, G. Khantadze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 84-92. – geo.; abs.: geo., eng., rus.

The article clarifies that the same amount of money received or paid at different times has different meanings and comparison of these payments can be made only on the basis of adequate methodological approach called the time value of money. It is stated that exchange rates or foreign exchange rates show how many units of one currency cashare paid for one monetary unit of another currency. The rule for currency quotation and the cross-rate calculation is given in in the form of a table. Tab. 2, Ref. 5.

Auth.

b16.5.2.59. Economic efficiency of city transport firms' functioning. /O. Gelashvili, G. Piriev, O. Bichiashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 7-14. – rus.; abs.: geo., eng., rus.

An analysis of the efficiency of transport firms' functioning shows that there is a lot of studies, in which the issues of city transport are considered, which however, lack an integrated approach taking into account the influence of design, road, transport, financial and climatic conditions on the efficiency of transport firms. Therefore, the problem of improving the quality and efficiency ofhe city transport system efficient functioning is urgent, as this process is of both social and economic importance. The work justifies an economic approach to the evaluation of the efficiency of functioning of transport firms; it deals with the analysis of technical and operational performance and considers the ways of improving the quality of transport services and the efficiency of city passenger transport firms. Ref. 2.

Auth.

b16.5.2.60. Economic risks in container transportation. /G. Piriev, O. Gelashvili, O. Bichiashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 15-22. – rus.; abs.: geo., eng., rus.

Many works deal with the efficient functioning of transport companies engaged in container transportation, although little is said in them on the impact of risks upon the efficiency of transport companies.The article mentions the existing shortcoming in the classification of possible risks and the ways of improvibng the situation in the container transportation sector. Ref. 6.

Auth.

b16.5.2.61. Macroeconomic problems of industry management development. /G. Tkeshelashvili, Z. Kupatadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 88-94. – geo.; abs.: geo., eng., rus.

The article refers to the four kinds of market infrastructure necessary for development of market relations. It is indicated that the most adjustable out of these kinds is to be considered the currency market, while the market infrastructure segment - finance market - i.e. securities exchange, is being gradually developed in Georgia. There are some objective and subjective factors for its full actuation. As noted in the article, the market infrastructure cannot be in a perfect state unless the market infrastructure attributes, commodity exchange and labor exchange are given a wide scope. Although such stock exchanges are operating, their reputation in the population is quite poor. The article analyzes the main reasons of macroeconomic problem manifestation, which hinder the effectiveness of industry development; it is pointed out that in our case these problems are associated with the ineffectivene macroeconomic management and tax legislation. Ref. 5.

Auth.

b16.5.2.62. Fuzzy analysis and prospect of its application in the solution of economic problems. /I. Amanatashvili, T. Diasamidze, N. Elashvili, D. Shanidze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 105-115. – geo.; abs.: geo., eng., rus.

The article deals with traditional and non-traditional approaches to the field of economic and mathematical modeling. In particular, fuzzy analysis and a prospect of its application in solving practical problems of the economy are considered. It is recommended to introduce the economic and mathematical tools during a fiaincial and economic analysis that could fully take into account the existing business management reality on the one hand and will be based on the modern directions of the economic science, one of which is the theory of fuzzy analysis. Ref. 33.

Auth.

b16.5.2.63. Industry and its significance for the development of the Georgian economy. /D. Shanidze, I. Amanatashvili, T. Diasamidze, N. Elashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 1b16-127. – geo.; abs.: geo., eng., rus.
The article analyzes the industry and its significance for the development of the Georgian economy. It is grounded that the industrial development requires the creation of favorable conditions, the improvement of the investment environment. It is necessary to attract local and foreign investors and enable them to expand their activities without any problems in the field of industry and service. It requires the active participation of the banking sector in investment projects, minimizing problems and risk factors, creation of a simplified lending system, raising the trust to the banking sector. Fig. 2, Ref. 6.

Auth.

b16.5.2.64. The intraproductive financial stabilization mechanisms for crisis management. /I. Gigauri/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 205-211. – geo.; abs.: geo., eng., rus.
In anticrisis management system of enterprise the main role has the intraproductive mechanisms of financial stabilization. It is stated that the successful application of these mechanisms would not only avoid the financial stress of insolvency threat, but also significantly prevent the dependency of enterprise on borrowed capital, accelerate its economic development rates. Every stage of financial stabilization of the enterprise must comply with its specific internal mechanisms (of "defensive" and "offensive nature"). Choice of the direction of the financial stabilization mechanism is dictated by the real character of the enterprise solvency. Tab. 1, Ref. 3.

Auth.

b16.5.2.65. Business policy of Georgia in aspects of enterprise anti-crisis management and production competitiveness. /I. Gigauri, T. Kiladze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 212-217. – geo.; abs.: geo., eng., rus.
Sustainable economic development of the national entrepreneurship for world market is possible only by raising the level of competitiveness. Where the leading role belongs to the state, the government, business and society are the three areas, the coordinated action of which gives the possibility to overcome or minimize the negative consequences of the crisis. Important way to achieve competitive advantage of industrial structures is the continuous modernization of production and other business activities. In particular, the main driving force of economic development is the innovative process, creating new types of products. The business policy of flexible specialization contributes to the creation of business clusters, development of network "buyer-supplier", development of technology transfer programs, creation of a venture innovative programs. Ref. 4.

Auth.

b16.5.2.66. Problems of corporate financial management. /N. Inasaridze, R. Tetvadze, D. Shanidze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 224-229. – geo.; abs.: geo., eng., rus.
The main privilege of the loan is rapidity. It is much more time consuming applying for a loan, than all the required organizational work for issuing obligations. On the one hand, the company, which is applying for a loan is obligated to give to the bank more information about itself than can be found on the market. On the other hand, the bank will grant a loan, when it is sure in the applicant's solvency. Therefore the company has to decide, which source of financing to resort in the given moment. Ref. 8.

Auth.

b16.5.2.67. Prospects of the EU policy implementation on the Georgian railway. /M. Archvadze, T. Archvadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 264-269. – geo.; abs.: geo., eng., rus.
The article deals with the reflection in the national legislation of the EU directives on the railway transport as provided by the EU-Georgia Association Agreement signed on 27 June 2014 in Brussels and introduction on the Georgian Railway of the mechanisms tested in Europe. Also considered is an analysis of the reforms carried out on railways of European countries and their outcomes, which allow making definite conclusions in the process of reforing the Georgian Railway. Tab. 1, Ref. 6.

Auth.

b16.5.2.68. Development of transport corridor (TRACECA) and the role of Georgia. /G. Tkeshelashvili, M. Papiashvili, N. Nakashidze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 45-51. – geo.; abs.: geo., eng., rus.
TRACECA is the transport corridor running through the South Caucasus. It is to ensure the development of transport processes for freight turnover and passenger transportation in Western Europe and Central and Northern regions. In the development of the above mentioned corridor Georgia has one of the leading roles. Accordingly, the development of TRACECA on the one hand will help the growth of the transit of goods through Georgia on the one hand and increase the international authority of Georgia and create the better conditions for accelerated development of the transportation system on the other hand. Tab. 2, Fig. 1, Ref. 3.

Auth.

b16.5.2.69. Current issues of modern project management research. /G. Tsiskaridze, K. Chikhradze, L. Telia/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 52-58. – geo.; abs.: geo., eng., rus.
The following three processes required for implementation of a project are condisdered: 1) strategic analysis; 2) strategy working out and selection; 3) strategy realization. There is a direct correlation between responsibility of project manager and successful implementation of the project. Of importance are the people, who can have a positive or negatively effect on the project. Also of importance for successful implementation is to define the problem properly and analyze the results correctly. A project group should be able to evaluate the real case and balance the demands for a successful project. Ref. 5.

b16.5.2.70. The role of road transport in the application of country's transit potential. /G. Maisuradze, T. Matsiashvili, N. Nakashidze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 64-68. – geo.; abs.: geo., eng., rus.
The paper identifies the most critical problems hindering the economic development of the country's road transport and ways of their possible solution. The Georgia-EU Association Agreement having the Deep and Comprehensive Free Trade Area (DCFTA) as its integral part is aimed at the gradual economic integration of Georgia in EU's internal market and creating new opportunities to increase the competitiveness for the private sector of Georgia. The well-developed transport and logistics infrastructure is one of the most important factors for competitiveness and improvement of the country's transit potential. Ref. 3.

<div align="right">Auth.</div>

b16.5.2.71. Complex interest congruence in corporations. /I. Tedeev/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 107-113. – geo.; abs.: geo., eng., rus.
The interacorporate and intracorporate aspect of interest congruence are discussed. It is stated that mechanism of complex interest congruence implies the congruence of interests in the quasi-hierarchic polycorporate system. Ref. 3.

<div align="right">Auth.</div>

b16.5.2.72. Trend analysis of logistics market in the South Caucasus. /G. Doborjginidze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 172-179. – rus.; abs.: geo., eng., rus
The globalization and growing economic integration between companies in East and West and further internationalization of the markets create a unique opportunity for the South Caucasus to be integrated in the international trade. Logistics is a key pillar for economic development of the South Caucasus countries. The efficient logistics system enables the region to become a part of global logistics network and attract global players. One of the major steps for development of the South Caucasus as a competitive logistics location is a systematic development of transportation infrastructure, which will give the transportation system the network effect and increase its efficiency. Fig. 5, Ref. 7.

<div align="right">Auth.</div>

b16.5.2.73. The essence of adjustments and preparation of adjusted trial balance. /M. Achuashvili, M. Chinchaladze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 100-106. – geo.; abs.: geo., eng., rus.
The accounting is often called the "language of business". In the world of business it is the means of acquisition and transfer of business information. The processing of accounting data involves a systematic analysis of business daily activity. Information about the company's financial position is presented in the balance sheet, results of enterprise performance – in profit and losses statements. Financial documents start to be completed after every transaction, as well as basic accounting adjustment have been recorded in the ledger and moved to the main account book. To verify the accuracy of these processes, two types of a trial balance are completed. The first one is called non-adjusted trial balance, while the other – adjusted trial balance is compiled following depreciation and other corrective entries. Ref. 4.

<div align="right">Auth.</div>

b5.3 Educational sciences

b16.5.3.1. Pedagogical foundations for forming readiness of professional relationship with students' parents. /L. Menteshashvili/. Metsniereba da Tskhovreba**. – 2015. – #2(12). – pp. 155-b160. – geo.; abs.: geo., eng., rus.
Family is one of the most important social institutes of upbringing. Teacher must be in close contact with the family. Future teacher must know the forms of relationship with the parents in detail (communicational, interactive, and perceptical) and models (relationship – supporting, relationship – correction, relationship on friendly mood). Ref. 8.

<div align="right">Auth.</div>

b16.5.3.2. Professional skills of the lecturer - effective strategies of communication. /T. Shervashidze/. Metsniereba da Tskhovreba**. – 2015. – #2(12). – pp. b168-171. – geo.; abs.: geo., eng., rus.
A professional skill of the lecturer greatly depends on the pedagogical culture. The pedagogical culture includes a whole range of human, personal and professional characteristics and can be divided into several blocks. The professional skill of the lecturer is a complicated and variable system; it considers a creative approach at the time of making specific decisions. The culture determines the pedagogical skill and covers each other in occasions. The professional skill of the lecturer depends on the communication strategies (verbal and nonverbal). Skill of the teacher, lecturer is to give them organized form by alternation of appropriate form in the specific cases. The lecturer should listen to the students in the same way as she/he requires the same from the students. Thus, we are dealing not only with one of the professional side, but also the whole complex of skills, which is globally considered in joint pedagogic activity. Ref. 7.

<div align="right">Auth.</div>

b16.5.3.3. Career guidance as a basis for the future successful career. /Ts. Tsertsvadze/. Metsniereba da Tskhovreba**. – 2015. – #2(12). – pp. 172-176. – geo.; abs.: geo., eng., rus.
Career gudance becomes especially topical in schools during senior years. It helps students to make adequate choice for their future occupation. Sometimes people only tend to see the attractive sides of occupations. They often do not seem to realize that certain professions demand a lot of work and that their choice fails to meet their requirements and understabnd personal interests. So the main purpose of career guidance is to help the student to choose the right job by considering own interests, features, values and market demands. Ref. 4.

<div align="right">Auth.</div>

b16.5.3.4. Field school in soil science: results and prospects. /T. Urushadze, T. Kvrivishvili, R. Kakhadze/. Annals of Agrarian Science. – 2015. – v. 13. – #3. – pp. 51-57. – eng.; abs: eng., rus.

In soil science alongside theoretical issues, a great significance is given to field training. In the world's leading universities (Moscow Lomonosov State University, the University of Maryland, Munich Technical University, etc.) soil study literally means teaching soils in the field. In the process of teaching soil science to the students of various universities, who are mostly studying agronomy, forestry, biology, geography or ecologicy, the diversity of soils must be explored under natural conditions. In order to explore soils under field conditions a Field School of Soil Science was established at the Agricultural University of Georgia, which involves various institutions of higher education. The material presented in the article describes the results and prospects of the school activities. Ref. 14.

<div align="right">Auth.</div>

b16.5.3.5. Rule-based expert system learning model. /R. Kutateladze, A. Kobiashvili/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 30-38. – geo.; abs.: geo., eng., rus.

Presented is the expert system model for improvement the learning process. Possibilities of the rule-based expert systems based on exercises and practical experience are shown. The algorithm of learning refinement process is described. Conceptual construction for learning process refinement is offered. Fig. 2, Ref. 7.

<div align="right">Auth.</div>

b16.5.3.6. Regarding formation of expert systems. /L. Klimiashvili, N. Natsvlishvili, D. Gurgenidze/. Hydroengineering. – 2015. – #1-2(19-20). – pp. 80-84. – geo.; abs.: geo., eng., rus.

The process of identification of key concepts of the problem sphere and formation of expert systems is discussed. Choice of adequate ways of implementation of systems and subsystems of interaction with a customer, the ways to obtain knowledge from an expert, its transmission, performance and management strategy are analyzed. It is accepted that for an experimental check of any idea, for example the making of an industrial system or its prototype and its further transfer to the industrial version, the efficiency issue of the chosen means is rather urgent. Ref. 2.

<div align="right">Auth.</div>

b5.4 Sociology

b16.5.4.1. Social inclusion and persons with disabilities. /Sh. Dzamukashvili/. Metsniereba da Tskhovreba**. – 2015. – #2(12). – pp. b160-b164. – geo.; abs.: geo., eng., rus.

Social inclusion is the most important aspect of teaching persons with special educational needs (SEN) and persons with disabilities, their education and development. Social inclusion gives opportunities to poor and marginalized people to use the global opportunities, particularly in the labor market, political, social and physical areas with equal access. Barriers and discrimination approaches in the education, employment and social integration of persons with disabilities increase the risks of their families socially leading to financial insecurity and public "poverty" of the isolation. Today it is urgent to protect persons with disabilities from social exclusion. In the world lots of projects are implemented concerning social inclusion of persons with disabilities and the increase of inspiration of knowledge and public awareness. It is necessary to take drastic measures for cultivation social inclusion of persons with disabilities and persons with SEN. Ref. 2.

<div align="right">Auth.</div>

b16.5.4.2. Professional self-determination. /K. Kitsmarishvili, I. Prangishvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 74-79. – geo.; abs.: geo., eng., rus.

Process of professional self-determination is a long-term period of life – started from the professional interests and inclination revealed in childhood, ending by final establishment in the chosen sphere of professional activity at the full age. During this period the professional, social and life self-determination takes place. In the notion of "self-determination", which has become very popular in social literature, the important moment of understanding a person's development problem which is connected to his/her independent choice of professional way and the way of life. Ref. 5.

<div align="right">Auth.</div>

b5.5 Law

b16.5.5.1. Forensic-accounting expertise and legal importance of primary accounting documents. /G. Sakhokia/. Metsniereba da Tskhovreba**. – 2015. – #2(12). – pp. 34-39. – geo.; abs.: geo., eng., rus.

As one of the key elements in the method of accounting, the document is the main tool for analysis, control and management of economic activities. Additionally, the document carries economic and legal information and has the legal power in management, planning, control and analysis of industrial processes. Document assigns the legal power to each economic/industrial activity; therefore accounting documents are required to have accuracy, completeness, timeliness and clearness of the content. Accounting documents are written and legal confirmation of really happening economic activities. The creation and formation of accounting documents should be carried out according to the predefined rules and current legislation. Accounting documents are extremely important for the forensic-accounting expertise and they have the main legal power for the investigation. Ref. 10.

<div align="right">Auth.</div>

b16.5.5.2. Domestic crime and violence in family. /D. Julukhadze/. Metsniereba da Tskhovreba**. – 2015. – #2(12). – pp. 96-101. – geo.; abs.: geo., eng., rus.

The article deals with Article 126^1 of the Criminal Code – criminal nature of violence in family. In particul, the concept of violence in family, its characteristics, as well as the aggravating circumstances of liability are discussed. Ref. 4.

<div align="right">Auth.</div>

b16.5.5.3. Separation of criminality and the tool of criminal behavior from the the tool of criminal behavior and crime. /E. Gventsadze/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 101-106. – geo.; abs.: geo., eng., rus.
The crime functioning rate is said to be general-social, the level of criminal behavior - personal, micro-grouped, micro-conditioned, while that of crime - the same but neing at the same time individually important. Criminality is subject to social regularities, whereas the criminal behavior and crime – to the social-psychological and the personal-psychological ones. Ref. 6.

<div align="right">Auth.</div>

b16.5.5.4. Perspectives of justice of juveniles in Georgia. /K. Koberidze/. Metsniereba da Tskhovreba**.** – 2015. – #2(12). – pp. 107-111. – geo.; abs.: geo., eng., rus.
Juvenile Justice Code which is one of the most important documents in the country to establish a fair administration of justice will be launched on January 1, 20b16. The article briefly reviews the juvenile justice practices, criminological factors of juvenile delinquency, analyzes innovations which suggest the above-mentioned Code for the investigation and consideration of juveniles in conflict with the law. Moreover, this article discusses significant events and measure which ensure the full resocialization and rehabilitation of juvenile convicts. Ref. 6.

<div align="right">Auth.</div>

b16.5.5.5. The role of intellectual property law to upgrade the educational level of a nation. /M. Getsadze/. Novation. – 2015. – #b16. – pp. 85-88. – Geo.; abs.: geo., rus., eng.
The aim of the work is the function of the role of intellectual property law in improving the educational level of the nation. Nowadays the copyright is more protected than in the last century, the basis of which is the more deepening and restriction of legislation. This is evidence of respect being expressed toward the intellectual humanity. The supremacy of law and equality before law is a precondition for country's might. Ref. 5.

<div align="right">Auth.</div>

b16.5.5.6. Probation correspondence with European standards. /I. Kandelaki/. Law and Economics. – 2015. – #6. – pp. 35-47. – geo.; abs.: geo., eng., fr.
This article analyzes correspondence of the Georgian probation system with the European standards. Article also exposes a number of vices and inconsistences in the Georgian probation system and gives the ways of its improvement. The vices are: a small number of probation officers and an incredibly large number of probationers' cases, also the bureaucratic regulations that allow a probationer to set himself free from the probation system partially or absolutely in lieu of payment a certain sum of money, etc. Ref. 9.

<div align="right">Auth.</div>

b16.5.5.7. Treaties signed at the Paris Peace Conference and their role in the creation of the new world order. /V. Modebadze/. Law and Economics. – 2015. – #6. – pp. 48-58. – geo.; abs.: geo., eng., fr.
The article analyzes the treaties signed at the Paris Peace Conference, which have radically changed the political map of Europe. The treaty of Versailles, the treaty of Saint-Germain, the treaty of Trianon, the treaty of Neuilly and the treaty of Sevres laid the foundations of the new world order, which was named the Versailles system. The above-mentioned treaties could not neutralize the tense political situation in Europe. On the contrary, the political situation became even more uncontrollable. The Versailles system turned out to be quite shaky and unstable. Fig. 5, Ref. 6.

<div align="right">Auth.</div>

b16.5.5.8. Analysis and recommendations for technical safety supervision over the objects with heightened technical danger. /A. Bezhanishvili/. Mining Journal. – 2015. – #1(34). – pp. 100-104. – rus.; abs.; rus., geo., eng.
Georgian normative acts in force in the sphere of technical safety and their shortages are considered. It should be noted that the *Law of Georgia – Product Safety and Free Movement Code*, as well as some resolutions of Georgian Government for this problem are accomplished partially. Analysis and recommendations cocerning supervision implementation over the technical safety at objects with heightened technical danger are given. It is necessary to enlarge the sphere of supervision over the objects with heightened technical danger, to begin accreditation of inspection organs, revise technical terms in normative acts of this sphere in order to create the favourable conditions for accidents prevention at the objects and increase the level of technical safety. Ref. 13.

<div align="right">Auth.</div>

b16.5.5.9. On labour protection in Georgia. /A. Bezhanishvili/. Mining Journal. – 2015. – #1(34). – pp. 104-107. – eng.; abs.; eng., geo., rus.
Georgian occupational safety and health legislation, activity of various bodies and some problems in this sphere are considered in this article; analysis of occupational diseases in enterprises of Georgia in 1990-2010 and the factors provoking such diseases are given; recommendations for correct management of labour protection system, mplementation of which will considerably improve labour conditions and decrease the rate of accidents and occupational diseases in the enterprises of Georgia are considered. Tab. 1, Ref. 1.

<div align="right">Auth.</div>

b16.5.5.10. Legal aspects of land resources management in Georgia. /I. Bachiashvili/. Annals of Agrarian Science. – 2015. – v. 13. – #3. – pp. 95-99. – eng.; abs: eng., rus.

The author of this article made a critical analysis of the issues of agriculture and land tenure in Georgia. Main problems that exist in Georgia today are put forward for consideration on the basis of the statistical data. The article sharply criticized the power structure's activity for the management of agriculture and land tenure. The author considers that the elimination of all governmental managerial bodies which existed before 2004 was the fundamental mistake. Instead of reforming the governance structure of agriculture and land tenure, the government of those days liquidated the Department of Land Management. Also, there were eliminated the local land management bodies. All this has led to absolute anarchy in the management and settlement of land issues. To this day, there is no offi cial data on the number and types of land in the country. There is no accurate data on the belonging of land to a particular owner. The President and the Prime Minister are given clear recommendations of state legal regulation of these issues. The author analyzes the issue of land ownership in the article. Based on the data of most European countries, the author formulates recommendations for the regulation of the issue of land ownership. Ref. 11.

<div align="right">Auth.</div>

b16.5.5.11. Regulatory support of transport logistics' functioning. /T. Shubitidze, O. Gelashvili, G. Tsertsvadze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 59-63. – geo.; abs.: geo., eng., rus.
The matters of regulatory support of the functioning transport logistics, based on the provisions of Georgian laws, Civil Code and technical standards are discussed. Ref. 6.

<div align="right">Auth.</div>

b16.5.5.12. Aspects of legal regulation of logistics. /G. Tkeshelashvili, H. Giorgadze, R. Tetvadze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 190-197. – geo.; abs.: geo., eng., rus.
The article discusses the problems of development of logistics of enterprises in a market economy. It describes the logistic chain and elements included in him. It is noted that the main driving force of logistics are transport companies that are focused on achieving economic results. The work includes the directions of the legal management of logistics and contract drafting models. Ref. 8.

<div align="right">Auth.</div>

b5.6 Political Science

b16.5.6.1. The convergence process in the modern constitutionalism. /K. Pridonashvili/. Law and Economics. – 2015. – #6. – pp. 4-12. – geo.; abs.; geo., eng., fr.
It is stated that the concept of socio-legal state and fundamental human rights are set forth in constitutions of different democratic states, regardless their structure which the author considers as a consequence of the process of convergence and supports the formation of a middle social startum of manegers through significant facilitation of scientific progress by the state. Ref. 10.

<div align="right">Auth.</div>

b16.5.6.2. Political psychology, streamline of policy and its applied aspects. /O. Kandelaki, G. Kalandadze/. Transactions of Technical University of Georgia. – 2015. – #3(497). – pp. 224-243. – geo.; abs.: geo., eng., rus.
For many people the perception of public life and political realities is based on the psychological phenomenon. On the contrary, for the most people, subjective experience does not affect the objective reality. Political psychology plays the important role to resolve this dilemma. It allows scientific and reasonable determining as well as identifying independent human objective laws and avoiding over-evaluation of the role of psychology, seeig its significance for understanding the logic of political phenomena. Political psychology studies the impact of psychological factors on human behavior and political groups as well as the impact of political events. We study normal and deviational personal characteristics of politicians to identify the conditions of their actions and decisions, as well as psychological factors of activity of the political groups and intergroup relations. Interests include political psychology and the study of motivation of the desire for power of the individuals and groups, as well as a psychological technique to retain power. Ref. 9.

<div align="right">Auth.</div>

b5.7 Social and economic geography

b16.5.7.1. Improvement of train traffic safety upon movement in deadlocks. /N. Rurua, G. Samsiani/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 72-79. – geo.; abs.: geo., eng., rus.
The article considers the issues of improvement of trains traffic safety upon movement in deadlocks and in the process shunting works in station tracks. The shortcomings of current railway deadlock outriggers' structures in deadlock tracks atr analyzed. The application of modern railway holders with friction elements consisting of the attached on track rails brake blocks in station deadlock tracks and blocking deadlocks is recommended. The values of the sliding length of train with friction elements as a result of its collision with the railway holder depending on the rolling stock velocity and weight are determined. Fig. 6, Ref. 6.

<div align="right">Auth.</div>

b16.5.7.2. Urgent issues of Georgian railroad freight activity improvement at the given stage. /P. Kenkadze, O. Klateishvili, L.Telia, G. Tsertsvadze, G. Katsitadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 80-87. – geo.; abs.: geo., eng., rus.
The article considers the topicality of solving the key problems for increasing the quality of traffic safety optimization of railway and marine complex operation in terms of improvement of the competitiveness of the railway passenger transport for the recent stable functioning under the present conditions.The necessity of improvement of traffic safety quality is

caused by the factor of dangerous loads transportation on the Georgian Railway (bulk petroleum products, up to 60% of the total freight traffic). The optimization of railway and sea transport will contribute to the rational implementation of the final phase of the complete cycle of the transportation process. The improvement of the competitiveness of railway passenger transportation will increase the passenger traffic flow on the railways. Ref. 8.

<div align="right">Auth.</div>

b16.5.7.3. Reserves of increasing the technical speed of trucks. /V. Kharitonashvili, D. Ashotia/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 128-134. – geo.; abs.: geo., eng., rus.
In the supply chain of transport logistics, analysis of the raising of the average technical speed under the given maintenance conditions shows that the main reserve for an increase in the technical speed is the raising of the operational proper ties and the safety coeff icient of the motor vehicle toigether with the improvement of road conditions and the organization of traffic, also the psychological training of drivers. Fig. 2, Ref. 3.

<div align="right">Auth.</div>

b16.5.7.4. Predicting the stock of cars of Georgia. /V. Kharitonashvili, G. Khudaverdovi/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 135-140. – geo.; abs.: geo., eng., rus.
The proposed method of predicting the size of the stock of cars allows considering and assessing different options of the stock of cars formation. The articles details the issues of raising the vehicle exploitation period in the critical for aumobilization periods, which will ensure the increasing of the stock of cars on the one hand and ause the ageing of the stock of cars and incrsae in the import of used cars on the other hand and the load on the service system. Tab. 1, Fig. 1, Ref. 2.

<div align="right">Auth.</div>

b16.5.7.5. Identification of fuel consumption rate of a vehicle by swiching off the enige cylinders. /V. Kharitonashvili, B. Nakaidze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 142-147. – geo.; abs.: geo., eng., rus.
Tariffs on transport services in the supply chain of logistics depend on the perfection of the vehicle's design and variable expenses in the cost of services. Given the continuous growth of cost of fuel, the taking of measures for rational consumption of fuel and perfection of the vehicle's design and the modes of movement becomes more urgent. Recommendations for specification of the fuel consumption rates of the vehicle with the switched-off engine cylinders, which allows realization of the strategy of rational use of expenses in the logistics system, are corroborated. Tab. 1, Ref. 4.

<div align="right">Auth.</div>

b16.5.7.6. The method of determining the guaranteed life of mobile machines and their units. /V. Lekiashvili, G. Mardaleishvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 181-186. – geo.; abs.: geo., eng., rus.
The efficiency of mobile machines largely depends on the detection of the reliability indicators and the improvement of their management principles and methods in the process of exploitation. Noteworthy in this regard is to determine and adjust the guaranteed life for a specific model under certain operation conditions. The method involves determining the regularity of the distribution of faults of units and components according to the product and is conditioned by a standard characterized of high reliability. The probability of no-failure operation, which under conditions of guaranteed production shall not less than 0.95. Fig. 2, Ref. 2.

<div align="right">Auth.</div>

b16.5.7.7. Features of evaluation of machinery and equipment. /V. Starinski, A. Kuprin/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 187-194. – rus.; abs.: geo., eng., rus.
The article examines the impact of the cost of machinery and equipment by the value of net assets and other indicators of financial and economic activity of the enterprise, while making decisions by the owners or managers of companies of different management in relation to the fixed assets of the enterprise. Major and complex questions of evaluation of plant and equipment are the analysis of the impact of the cost of machinery and equipment by the cost of production, taxation, the net asset value and other indicators of financial and economic activity of enterprise. Tab. 1, Ref. 3.

<div align="right">Auth.</div>

b16.5.7.8. Georgia's geopolitical position and prospects for road transport development. /G. Maisuradze, M. Maskhulia, T. Matsiashvili/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 200-204. – geo.; abs.: geo., eng., rus.
The paper considers the geopolitical position of Georgia and its connection to the country's economic growth. The rational use of the transport corridor provides general as well as the economic safety of the state. At the same time, the transit cargo transportation can significantly increase the central budget revenues. Ref. 3.

<div align="right">Auth.</div>

b16.5.7.9. Logistic analysis of ecological safety problems of the Europe-Caucasus-Asia Corridor (TRACECA). /R. Tedoradze, G. Sisvadze/. Transport and Machinebuilding. – 2015. – #2(33). – pp. 218-223. – geo.; abs.: geo., eng., rus.
The article deals with the problems of polution of ambient air with harmful substances by the motort transport, such as carbon, nitrogen and sulfer oxides, soot, organic matter solid particles over maximum permissible rates, which affect not only the human health but also the environment and material values in genertal. Tab. 1, Fig. 6, Ref. 5.

<div align="right">Auth.</div>

b16.5.7.10. On main installations and auxiliary equipment of automobile gas filling compressor stations working on natural gas. /A. Bezhanishvili, J. Iosebidze D. Kupatadze, G. Abramishvili, D. Aladashvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 5-15. – geo.; abs.: geo., eng., rus.

Technical requirements to main equipment of automobile gas filling compressor stations working on natural gas – compressor and gas drier installations, as well as auxiliary equipment – systems of ventilation and compressed air (gas) feed, fire-prevention equipment are considered. The operations dealing with the putting into operation and stopping, exploitation, maintenance and repair of compressor and gas drier installations and succession of their execution are described. A list of necessary works for maintenance and repair of ventilation and compressed air (gas) feed systems upon their operation is given. Ref. 1.

<div align="right">Auth.</div>

b16.5.7.11. Assessment of cyclic modes of motor vehicle movement by the efficiency factor. /D. Pridonashvili, N. Diasamidze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 80-84. – geo.; abs.: geo., eng., rus.
The article considers such widely spread modes of motor vehicles movement as the cyclic mode. The impact of it components (acceleration, steady motion, free rolling, braking) on such operational parameters of vehicle as average speed of movement and fuel efficiency is shown. A comparison of closed cyclic modes having various parameters is made. In order to perfect these process, the generalized technical parameters, the efficiency factor, which simultaneously takes into account the speed of movement and variability of fuel consumption are proposed. Fig. 1, Ref. 3.

<div align="right">Auth.</div>

b16.5.7.12. Urgent issues of transport policy. /T. Shubitidze, O. Gelashvili, G. Tabatadze, G. Tsertsvadze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 85-90. – geo.; abs.: geo., eng., rus.
The existing in the transport sector regional problems, the proper solution of which is a prerequisite to the development and successful operation of the transport companies are considered. It is known that a significant share of the country's budgetary income is made by transport activities, effective operation of which increases incomes. Stated are the effective ways of development of transport policy and guidelines based on the principles of logistics, because of which the efficiency of transport operations could be improverd are considered. The application of logistics approaches makes a substantial impact on both the transport policy and the activities of the given sector. The article a;so considers urgent issues of transport policy that indicate the necessity of implementation of management logistics systems and ensure the effectiveness of the transport companies' operation. Ref. 6.

<div align="right">Auth.</div>

b16.5.7.13. Features of using microprocessors in the alarm and interlocking railway systems. /N. Mgebrishvili, M. Moistsrapishvili, G. Mgebrishvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 151-158. – geo.; abs.: geo., eng., rus.
A system consisting of microprocessor blocks enabling reliable centralized management of the rolling stock is conssidered. A specialized control computer ECC is characterized. The ECC-CU universal module and an algorithm change indication are described. Advantages of microprocessor centralization compared to the existing systems are shown. Fig. 4, Ref. 5.

<div align="right">Auth.</div>

b16.5.7.14. Priority directions of transport research in Georgia (given the EU transport policy). /T. Gorshkov/. Transport and Machinebuilding. – 2015. – #3(34). – pp. b165-171. – rus.; abs.: geo., eng., rus.
Development and improvement of the transport system in Georgia require taking into account the EU policy of transport. This provides for joint use of requires use in common of existent technologies, approximation of technical characteristsic of these systems, security and solving the ecology problems, amalgamation of intermodal transport between countries, etc. Ref. 5.

<div align="right">Auth.</div>

b16.5.7.15. Logistic analysis of development of transport freight transportation in the Georgian section of TRACECA. /G. Doborjginidze, R. Tedoradze, G. Sisvadze/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 180-183. – rus.; abs.: geo., eng., rus.
The article highlights the freight turnover in the Georgian section of TRACECA, given the logistic analysis of the volatility of freight and its growth forecast for 2020 is made. The article also studies the pollution level of ambient air for human health with harmful substances within the corridor of TRACECA by the road transport and the caused environmental problems. Tab. 2, Ref. 3.

<div align="right">Auth.</div>

b16.5.7.16. Research of the pneumatic balancing vibration system of a multiaxial vehicle. /Z. Bogvelishvili/. Transport and Machinebuilding. – 2015. – #3(34). – pp. 184-189. – geo.; abs.: geo., eng., rus.
The mathematical model of the oscillatory dynamic multi-axis suspension system of the vehicle with pneumatic elastic elements of high pressure is considered. Using techniques of of the functions of structural schemes and transmission functions developed in the theory of automatic regulation and control, the longitudinal plane of vertical and angular oscillations of the sprung mass of the vehicle are described. Fig. 1, Ref. 2.

<div align="right">Auth.</div>

b16.5.7.17. Inspection of freight cars' running order in operation. /R. Morchiladze, Z. Morchiladze, G. Tskitishvili /. Transport and Machinebuilding. – 2015. – #3(34). – pp. 198-205. – geo.; abs.: geo., eng., rus.
The article considers the types of widespread failures of railway rolling stock's (freight type cars) basic units and ways for their revealing. The circumstances of origination of failures of automatic coupling device and running gears (bogie) and

impact of these types of failures on traffic safety are considered. The application of detecting failures of basic units of the running gears – wheel pairs in operation - is recommended. Fig. 2, Ref. 2.

Auth.

b16.5.7.18. The qualitative evaluation of windy erosion taling place on the Georgia territory given its determinal factors. /O. Okriashvili, Z. Varazashvili/. Collected Papers of Institute of Water Management. – 2015. – #70. – pp. 156-b160. – geo.; abs.: geo., eng., rus.
Nowadays wind erosion still remains an urgent unsettled problem for many countries. Its magnitude is important for Georgia too. The article focuses on natural factors, which are determined by the landscape and the climate conditions of Georgia and contributes to the development of wind erosion, also showing the method for determining the number of wind erosion (A) which is considered as a relative characteristic of the process and the overall picture of the region. Tab. 1, Fig. 6, Ref. 6.

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