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List of Publications Reflected in the Present Issue

- 1. Agrarian-Economic Science and Technologies, #2, 2009**
- 2. Akhali Ekonomisti, #3, 2009**
- 3. Proceedings of A. Janelidze Institute of Geology, 2008**
- 4. Economist, ##1, 2, 3 2009**
- 5. Modern Medicine, #1, 2010**
- 6. Collection of Scientific Works of Ivane Javakhishvili Tbilisi State University, 2009**
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- 13. Bulletin of the Georgian National Academy of Sciences, vol.3, #1, #3, 2009**
- 14. Proceedings of the Georgian National Academy of Sciences – Biological Series, vol. 7, #1-2, 2009**
- 15. Proceedings of the Georgian National Academy of Sciences – Chemical Series, vol.35, #1,#2, 2009**
- 16. Bulletin of the Centre of Strategic Development of Georgia, ##114, 2009**
- 17. Transactions of Technical University of Georgia, #1(471),2(472), 2009**
- 18. Geography of Georgia, 6-7, 2008**
- 19. IMEA Collection of Scientific Works, vol. 50, 2009**
- 20. GSA News, #10, 2009**

SUBJECT ENTRIES

A. SOCIAL SCIENCES

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- A4. Education
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B. NATURAL AND EXACT SCIENCES

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C. TECHNICAL AND APPLIED SCIENCES. SECTORS OF ECONOMY

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- C4. Mining. Metallurgy. Chemical Industry
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A. SOCIAL SCIENCES

A1. State and Law. Jurisprudence

5.A1.1. Spousal property relations – marriage contract. /A. Gugava/. Law and Economics. – 2009. – #1. – pp. 74-84. – Geo; res.: Geo, Eng., Fr.

The work depicts the legal nature of a contract and its importance in modern Georgian reality, contract form, subjects of contractual relations, issues of their legal subjectivity, rights and obligations of the parties and legal bases for contract termination. Marriage contract as a new institution has some particular characteristics; it responds to the requirements existing under conditions of a market economy and occupies its place together with other legal relations; although it should be noted that there are only few cases of marriage contract conclusions. As for the issue of acceptance by the subjects of Georgian marital relations, whether spouses define their property rights under such a contract, this is their right and also depends on whether the society will receive it pursuant to the Georgian character and traditions.

Auth.

5.A1.2. Georgian and French semi-presidential governments (comparative analysis). /K. Pridonashvili/. Law and Economics. – 2009. – #1. – pp. 6-22. – Geo; res.: Geo., Eng., Fr.

The French semi-presidential government in relation to Georgia is discussed. The final part of the work proposes an idea that the democratic principles that are directly or indirectly connected with the concept of separation of powers are not comprehensively reflected in the modern Georgian Constitution as in the French model. Correspondingly, the parliamentary government will not be a panacea unless the principles of checks and balances, replacement and continuity are not appropriately reflected in it at the proper level, also such an election mechanism is developed the fairness of which suits all the political substances. Therefore the authors believe that the assertion as if the semi-presidential government form has allegedly proved to be unsuitable for Georgia is a premature one, for the country has never had its classical form.

Auth.

5.A1.3. Some aspects of dealing with administrative claims by administrative organs. /A. Chankseliani/. Law and Economics. – 2009. – #1. – pp. 47-51. – geo.; res.: geo., eng., fr.

The General Administrative Code of Georgia was adopted on July 23, 1999. The general provisions and main principles of the activity of administrative bodies are defined by this Code. It contains the rules of issue and execution of administrative and legal acts, as well as the consideration of administrative complaints and statements and rules of the preparation, making and execution of administrative arrangements. Each of the issues is of special importance and urgency in terms of building the contemporary legal system in Georgia. The object of this article is one of the steps of the administrative complaint discussion procedure. Generally, the administrative complaint is the measure to protect legal rights and interests of legal or private entities.

Auth.

5.A1.4. Problems of direct democracy in political processes. /K. Pridonashvili/. Law and Economics. – 2009. – #1. – pp. 52-61. – geo.; res.: geo., eng., fr.

The author tries to find a juridical answer to recent political events taking place in Georgia. Consequently, the article deals with the forms of direct democracy enabling the public to express their opinion and will in a civilized matter, without street manifestations, and communicate with the government by observing definite procedural norms. The author reviews institutions of direct democracy in close relation with the democratic system and democratic processes, proposing adequate recommendations on full-value functioning of the direct democracy institutions.

Auth.

5.A1.5. Agreement conclusion features in Georgian and German laws. /S. Dughashvili/. Law and Economics. – 2009. – #1. – pp. 62-73. – geo.; res.: geo., eng., fr.

The purpose of the work is to highlight the peculiar features of making agreements in the Georgian and German law. The work applies a comparative research method existing in the international comparative jurisprudence and deals with the main juridical problems existing in both the Georgian and German law, including the issues and peculiarities concerning the will of the parties upon making an agreement that characterize an offer and acceptance. The work also encompasses such a question as determination of a form of agreement. In connection with a written agreement, being made by completing one document, the Georgian and German laws are characterized of a definite distinction. True, the making of two agreements on the transfer of a thing to another party is the legal guarantee of the parties, we, however, thinks that the regulation of such relationships under consolidated norms would be the no less legal guarantee. It should be mentioned here that in spite of the great resemblance between the two legislations of the countries, they are

still characterized of definite peculiarities being clearly demonstrated in the work on the basis of consideration of the legal regulation in connection with the agreement making.

Auth.

5.A1.6. Comparative analysis of political and legal aspects of national security of Georgia. /O. Kochoradze, N. Kacharava/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 123-128. – geo.; res.: geo., eng., rus.

National security has an absolute priority compared to other problems of politics. Science-based security system serves for preservation and strengthening of the basic values of the country: State sovereignty, safety, territorial integrity, and culture uniqueness and applies to the special governance by higher state organs. One of the main reasons of the specificity of Georgian State security problems is its geopolitical and geoeconomical location. One of the main directions and priority of Georgian national security problem is the integration of Georgia into European and Euro Atlantic political, economic and security systems.

Auth.

A2. Sociology. Demography

5.A2.1. Modern geodemographic crisis of Zemo Racha (Oni District). /G. Meladze, N. Elizbarashvili/. Geography of Georgia. – 2008. – #6-7. – pp. 6-16. – geo.; res.: eng., rus.

As a result of the of social and economic processes developed in Georgia in the 1990s, the demographic situation in Oni region has worsened. Presently we can include Oni in the demographically ‘dying” regions. The determinants of the mentioned fact: the unprecedented decline of population, catastrophic decline of fertility, very high stage of demographic aging, unprecedented high indices of demography burden. To regulate the existing hardest situation, serious attention should be paid to socio-economic and cultural development, without which it would be impossible to reach the desirable reproduction regime and population settlement on the place. The available mineral, landscape, recreational and other resources, their purposeful exploitation of which will contribute to the improvement of demographic situation in the region, should be reasonably used.

Auth.

5.A2.2. Global population explosion and follow-up period: demographic revolution and sustainable development. /S. Kapitsa/. Proceedings of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 5-12. – eng., res.: geo.

Of all the global problems looming on our common horizon that of population growth comes first. It sets the scene for considering major issues of social and economic development, of science, education and art, of growth and security. In dealing with these matters, a new way has to be found to comprehend the challenge of change. For one has to go beyond the agenda of demography and economics, sociology and anthropology, and see mankind as an evolving system. Without a broad vision of our past it is impossible to understand the present predicament of mankind, the crisis now facing us in so many dimensions of life, and project our future development. In this New World, not dictated by numerical growth, education and science will become the main issues in a knowledge society of an information-dominated world. It is then, when the old outnumber the young, to be sustainable, a new system of values is to develop.

Auth.

A3. Economy

5.A3.1. Global economic crisis and the problems of macroeconomic stabilization of Georgia. /J. Meskhia/. Economist. – 2009. – # 2. – pp. 8-19. – geo.; res.: eng.

The article gives the recommendations and proposals for the formation of an anti-crisis program. In particular, the author has proposed concrete measures to strengthen financial security, increase the level of economic independence of the country, increase the flow of foreign investments and their efficient use, make anticrisis state budget, liberalize tax system, transform monetary-credit system, improve the system of remuneration of labor in budgetary organizations, strengthening of state financial control and decrease the level of corruption.

Auth.

5.A3.2. Role of economic security indicators in the state regulation of market. /T. Murghulia/. Economist. – 2009. – # 2. – pp. 20-28. – geo.; res.: eng.

The Centre for Economics Problems Research has implemented a project “Development of Economic Regulatory Institutes in Georgia” with the financial support of Friedrich Ebert Foundation. One of the major research issues was the role of economic security indicators in market regulation. Several indicators proved that reforms implemented under the aegis of libertarianism in Georgia were unsuccessful. Nowadays, most

problems in the Georgian economy are directly related to ignoring the economic security factors in the economic regulation policy. Assurance of economic security is the exclusive authority of the State and all the developed countries in the world pay special attention to this issue.

Auth.

5.A3.3. Externalities and “abatement costs”. /R. Asatiani/. Economist. – 2009. – # 2. – pp. 29-33. – geo.; res.: eng.

Externalities have positive as well as negative expressions and are not reflected in the set of prices. Positive expression is connected with interest while negative one – with expenses. Sometimes the area of manifestation of externalities is very wide and encompasses the whole society. Many examples from the recent developments in Georgia can be presented as an illustration. Namely, at present the attraction of foreign investments is considered as one of the main objectives of economic development of Georgia while it would be much more important to direct the whole effort of the government at creating alternative means of savings and capital mobilization within the country. Foreign investments should be considered only as a source of replenishment of internal savings deficit of the country and not as the motive power of economic development. Such policy, alongside with positive effects, revealed particularly negative externalities which were, in the first place, manifested in the deficit of internal savings of Georgia. At the same time, the banking system, which depends on the dynamics of international markets of capital, has not sufficient amount of loan capital to provide internal demands of the country's economic development. This is negatively reflected on the economic activity, on the country's real sector and, together with many other negative effects, leaves export potential (e.g. agriculture) of Georgia without bank financing. This is the reason that the index of bank loan settlement for agriculture in 2007 was just 5.14%, although earlier, for example, in 2005 it was only 0.75%.

Auth.

5.A3.4. The necessity of state regulation of the institutional environment under the post-communist transformation conditions. /N. Kakulia/. Economist. – 2009. – # 2. – pp. 34-39. – geo.; res.: eng.

The work considers the necessity of transformation of existing institutions and their further merger. It clearly outlines that the establishment of balanced institutions should be based on specifics of each country and should play the stabilization role in the country's transformation period. An important part in this process should be played by the State, whose specific activities should be dictated by the national peculiarities and the state of economy in the exiting period.

Auth.

5.A3.5. Market economy, socially oriented market and institutionalism. /A. Kuratashvili/. Economist. – 2009. – # 2. – pp. 40-42. – rus.; res.: eng.

The work critically discusses the current theoretical views on socially oriented market economy. Within the effective functioning of social orientation of a market economy and the society as a whole, the particular attention is devoted to the legal factor, since the establishment and setting into action of the relevant socio-economic mechanisms and their practical realization are impossible without the appropriate legal basis and legal mechanisms, i.e. without the legal factor. The legal factor, in the author's opinion, should play a particular role in the protection of socio-economic interests and other rights and freedoms of a person – both of the manufacturer and the consumer that represents the precondition of efficient functioning of a market economy and its social orientation.

Auth.

5.A3.6. Globalization and regional integration: unity and controversial character. /E. Eterial/. Economist. – 2009. – # 2. – pp. 47-52. – rus.; res.: eng.

Certain internal contradictions are observable between the processes determining the modern world economy – globalization and regional integration. Hence, one might think of a definite incompatibility of the globalization and regional development and some cases of their completely controversial character. The regional integration process is a complex economic-political phenomenon developed on the basis of the intensification of economic relations, where the positive economic factors (international trade, capital flow and labor migration) of integration, together with the political goals of national states, create a symbiosis and represent the main prerequisite for decreasing negative aspects of globalization. One of the main ways for increasing the positive effects of globalization and declining its negative aspects is the deepening of integration processes. Integrated associations established on the basis of separately taken economic efficiency and political expediency cannot ensure the successful functioning of integrated groups, their transition to a higher level of integration and, in the end, the minimization of the negative aspects of globalization.

Auth.

5A3.7. Labor migration under conditions of globalization. /Z. Gudushauri, N.Katsitadze, E. Baliashvili/. Economist. – 2009. – # 2. – pp. 53-57. – geo.; res.: eng.

The article considers labor migration as the globalization-concomitant process. It outlines the trends lately developed in the process of migration. The authors critically analyze the given pattern of economic benefit and express the opposing view; in particular, they believe that the economic benefit is not everything, that Georgia has other far more important values being threatened by the globalization process, because of which highly skilled specialists leave the country and the local science is dying.

Auth.

5.A3.8. Globalization and management problems. /M. Kharkheli/. Economist. – 2009. – # 2. – pp. 58-62. – geo.; res.: eng.

Georgia is already involved in the globalization circuit. The country has an open economy and its business-subjects are open as well. Although Georgian companies are still at the initial stage of globalization (mainly the first or second), their marching towards the third and fourth stages is irreversible and therefore they have to start at once the training of global managers. The article analyses the qualities characterizing global managers, where and how to raise their skills, how and why to study the culture of other countries, etc., gives a self-appraisal test for global management.

Auth.

5.A3.9. Globalization process, globalization index and Georgia. /N. Mikiashvili/. Economist. – 2009. – # 2. – pp. 63-67. – geo.; res.: eng.

According to the Globalization Index, Georgia ranks the 90th (51 - Economic Globalization, 83 -Social Globalization, 138 - Political Globalization). These data show the real situation in the country. The Georgian government must provide special measures for strengthening economy and democracy, increasing social activity and, simultaneously, preserving the national originality.

Auth.

5.A3.10. Methodological issues of econometric modeling of inflation. /L. Totladze/. Economist. – 2009. – # 2. – pp. 81-85. – geo.; res.: eng.

Among other macroeconomic indices of inflation and country development a balanced relationship is the prerequisite for successful development of economy. Hence, the study of quantitative aspects of inflation mechanism by means of econometric modeling of inflation processes is very actual. In economic literature there exist econometric models of inflation offered by various scientists, which describe qualitative links among inflation and such macroeconomic indices as: mass of money, exchange rate, budget deficit, average wage.

Auth.

5.A3.11. The problems of the restoration of mountainous regions Georgia in the conditions of globalization. /M. Kvaratskhelia/. Economist. – 2009. – # 2. – pp. 86-89. – geo.; res.: eng.

The article deals with the diversity of relief of Georgia and the importance of usage of the great economic potential of the mountain under conditions of globalization. The restoration of mountainous regions in Georgia is the general national and political question. Historically, mountains have been assigned the greatest country-saving function and will be of great importance in the future in the development of energy as well as of tourism and health resort business.

Auth.

5.A3.12. Investment projects and state interests. /G. Keshelashvili/. Economist. – 2009. – # 2. – pp. 90-93. – geo.; res.: eng.

The work provides an analysis of the investment projects implemented by international financial institutions in Georgia. It justifies the necessity of protection of the state interests with respect of the direct foreign investments and offers analysis of EU and Canadian experience in this sphere.

Auth.

5.A3.13. Investment attractiveness and the ways of raising it. /K. Barbakadze, I. Mamaladze/. Economist. – 2009. – # 2. – pp. 94-98. – geo.; res.: eng.

The main purpose of bringing investments is to raise effectiveness of the company activity. The result of investment should be the growth of the company assets and other indicators of its activities. The company should take various steps to attract more investments and to fully satisfy the investors' demands. In order to raise its investment attractiveness, it is advisable that a clear-cut system of activities for raising investment attractiveness with its individual peculiarities based on the state of capital market be established. The implementation of such a program makes it possible to speed up the attraction of funds and cut down costs. It should be mentioned that the system of possible activities does not require essential expenditures, but its

realization will raise the investors' interest towards the company as well as the company performance effectiveness.

Auth.

5.A3.14. Accumulation of the market power and indexes thereof. /Sh. Gogiashvili/. Economist. – 2009.- #3.- pp. 27-30. – geo., res.: eng.

In the context of the economy, the market power means a company's (companies') potential to set prices above the competition equilibrium level for an extended period of time and gain a super profit. There exist various assessment tools of the market power. Some experts of the competition field give preference to the structural approach to the market power, which implies the determination of quantity of companies and the comparison of their shares in a total market (market shares are associated with the market power index). The market power index (so far as treated as the economic category), the economy of determination of the market volume and structure thereof, as well as various aspects of behaviour of agents within such market are directly connected to the determination of dominance of economic agents at a relevant commodity market and the accumulation of market power by them, the latter being directly connected to the legal aspects of the competition policy and laws. The determination of shares of economic agents and the assessment of their market powers play the crucial role in business discussions carried on by the authorities in the field of competition, as well as in the course of court hearings and decision-making regarding unlawful activities of monopolist economic agents and mergers and/or deals limiting the freedom of trade and competition.

Auth.

5.A3.15. Custom tariff as the main instrument of protection of internal market of Azerbaijan. /E. Ismailov/. Economist. – 2009.- #3.- pp. 53-56. – rus., res.: eng.

The classical method of regulation of custom policy, including foreign trade, is custom tariff which due to their character of activity belongs to economic means of regulation of foreign trade. Custom tariff is an instrument of efficient regulation, i.e. some changes are permissible. This is a systematized list of custom duties which impose tax upon commodities when imported and in separate cases when exported from the given country.

Auth.

5.A3.16. Leasing – an effective form of assistance to small enterprises. /M. Magradze, K. Kutateladze, A. Burduladze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 25-28. – geo.; res.: geo., eng., rus.

The paper deals with the use of leasing in Georgia and regards it as a form of assistance to small enterprises. Financial leasing is considered to be a specific form of capital investment. Unlike traditional bank credit, it enables companies to have necessary basic means without synchronous expenditures. Financial leasing is beneficial enough as it takes into consideration the peculiarities of leaseholder's activity, increases the financing amount of the operations and ensures fiscal advantages. Leasing will significantly simplify the problem of main credit risk of financial support to companies. Due to synchronous use of leasing and insurance operations, investment conditions will become attractive for investors, insurance companies and especially small enterprises.

Auth.

5.A3.17. Economic transformation in the countries of the Central and the Eastern Europe. /A. Abzalava, K. Kutateladze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 104-107. – geo.; res.: geo., eng., rus.

For two decades now the world has entered into a new phase of order. It can be said that it basically depends on the character of the economic transformation process ongoing in the so-called socialist camp countries.

Auth.

5.A3.18. The perspectives of innovation economy development. /G. Jolia, N. Jolia, K. Jolia/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 113-117. – geo.; res.: geo., eng., rus.

A modern innovation economy model of socio-economic development of highly developed and successful countries is considered. The main factors influencing the innovation economy are highlighted. The necessity of creation of new knowledge, its spread and purposeful use, as well as the role and importance of new human thinking and the necessity of the maximum and correct use of its potential possibilities for social economic development of the country are demonstrated.

Auth.

5.A3.19. The characteristics of state innovative development and its evaluation criteria. /G. Jolia, N. Jolia, K. Jolia/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 118-122. – geo.; res.: geo., eng., rus.

The cardinal changes in the world economy having created the perspectives for establishment of innovation economy are highlighted. The said changes concern all fields of public work and are to significantly change the mechanisms of socio-economic functioning. The preference is given to the creating of new knowledge, its spread and reasonable usage. The indicators of the innovation level evaluation of the country's economy and the main directions of its competition increase on the international area are demonstrated. It is noted that special attention will be paid to the development of hi-tech fields, activation of scientific and engineering personnel work, increase of investments in the research sphere, etc.

Auth.

5.A3.20. Parameters of economic safety in Georgia. /K. Tsimintia, T. Lachkepiani/. Agrarian-economic Science and Technologies. – 2009. – # 2(3). – pp. 26-33. – geo., res.: geo., eng.

Analysis of sustainable economic development possibility indicators enables to determine that the potential of sustainable development in the country is high and the bases of economic advancement have been generally formed. At the same time, in spite of their positive importance, the development parameters are not enough. As regards the social safety indicators, in this respect Georgia is characterized of negative parameters. Only two indicators from this group – the level of crime (according to registered crime) and the depopulation level have better parameters against the threshold indicator. The financial sector of Georgia for years has revealed the high stability potential. At the same time, the financial safety indicators show a high probability of such stability disruption.

Auth.

5.A3.21. Peculiarities of fiscal effect in Balatsky model. /J. Ananiashvili/. Economist. – 2009.- #3.- pp.14-25. – geo., res.: eng.

The article deals with the macroeconomic model (by Evgeny Balatsky) that estimates the first and second type Laffer fiscal points. In this model the major role is played by the Cobb-Douglas production function with changeable elasticity coefficients. The analysis of this model and its econometrical versions has shown that this type of the model has some shortcomings and contradictions. This circumstance points out that even the generalized Cobb-Douglas function, as it is shown in (1)-(4) model, can not be considered as the universal model representing the influence of institutional factor (particularly taxes) on economy. Moreover, the production function and the function shown in (1)-(4) model are transformative models. On the basis of this model it is not proper to characterize the economic subjects' behavior, which is determined by increasing or reducing taxes.

Auth.

5.A3.22. Activity of independent national regulatory commissions in Georgia. /D. Narmania, Sh. Murgulia/. Economist. – 2009.- #3.- pp. 35-39. – geo., res.: eng.

The Centre for Economics Problems Research has implemented the project "Development of Economic Regulatory Agencies in Georgia" with the financial support of Friedrich Ebert Foundation. One of the major research issues was to study activities of the independent national regulatory commissions and to work out recommendations.

Auth.

5.A3.23. The strategic directions of the economic development of Georgia. /N. Lazviashvili, N. Parulava/. Economist. – 2009. – #3. – pp. 40-45. – geo., res.: eng.

The strategic development of the country assumes special significance. The active dynamics of reforms is characteristic of a new economic policy in relation to western standards of a market economy. The integration of Georgia into a global economy proceeds at a good space as well as the implementation of such important projects as Baku-Tbilisi-Ceyhan oil pipe-line, Baku-Tbilisi-Erzurum gas pipeline and Kars-Akhalkalaki-Tbilisi-Baku railway to connect Europe with Kazakhstan and China. Also of importance is the development of the TRACEKA corridor (the Silk Road), connecting Western Europe through the Black and the Caspian Sea with Middle Asia and China.

Auth.

5.A3.24. Problems of economic integration in the Central Caucasus. /G. Kupunia/. Economist. – 2009. – #3. – pp. 57-68. – geo., res.: eng.

The article deals with necessary measures to be taken by Georgia, Azerbaijan, and Armenia to achieve economic integration in the Central Caucasus, the realization of which should provide the minimization, eradication of very complex hindering reasons and maximum operation of favorable factors. Attention is especially focused on the successive solution of such objectives of economic integration as: exchange of information and technologies between the countries, the strengthening of capital export-import, quick development of foreign trade, the improvement of market competitive mechanism, the achievement of high level of economic openness, the spreading and introduction of modern management, development of labor skills, investments in human capital, strengthening and use of export potential; on the basis of all these: the

elaboration of a new strategy, mapping out and implementation of concrete measures to achieve its goals, the acceleration of integration processes in the region, intensive involvement in the world globalization processes, the holding of a worthy position in international distribution of labor, regional and world markets, in the world economy as a whole.

Auth.

5.A3.25. The macroeconomic model of interaction between the general consumer, the general producer and the State as an instrument to estimate the efficiency of the state regulation of economy. /E. Mekantsishvili/. Economist. – 2009. – #3. – pp. 69-74. – geo., res.: eng.

The macroeconomic modeling of economic system foresees the creation of such adequate-analytical instrument (model), which reflects intercommunications between production, distribution and consumption, between savings and investments, etc. The macroeconomic model of interaction between the general consumer, the general producer and the State (which belongs to the class of the Computable General Equilibrium models) is used for the estimate efficiency of the state regulation of economy. In this model the economic system is considered as three economic subjects: general consumer, general producer and state.

Auth.

5.A3.26. Regulation of labor market by the State: problems and ways of their resolution. /M. Toria/. Economist. – 2009. – #3. – pp. 75-79. – geo., res.: eng.

The present situation on the Georgian labor market requires the conduct of the urgent measures targeted at the lessening of the current economic crisis results and increasing the effectiveness of the population's social security mechanism. To achieve the desired results in the sphere of labor relations, it is necessary that the labor market, which should provide not only an increase in the population employment but also the establishment of a functional link between production and types of public work, should be regulated. The main task of the marker regulation is the assigning of the general-national status to this problem

Auth.

5.A3.27. Some methodological aspects of financial accounting. /L. Gvenetadze/. Economist. – 2009. – #3. – pp. 80-84. – geo., res.: eng.

Firms use to independently determine their accounting policy. Its effect depends on the selection of the accounting methodology. International Standards of the Financial Accounting offer various methods and approaches related to the accounting practice. The presented work explains some peculiarities and characteristics of different methods of financial accounting. The work also explains the rationale behind of usage of these different methods. All this together constitutes the "Art of Financial Accounting".

Auth.

5.A3.28. Foundations of the state economic policy. /M. Gelashvili/. Economist. – 2009. - #3. – pp. 85-90. – geo., res.: eng.

At the modern stage, the state economic policy is a constituent part of reproduction. It enables to solve different tasks, such as the stimulation of economic growth, employment regulation, progressing of regional and branch structures, support of export. Specific directions, forms and scales of the state regulation of economy are conditioned by the character and urgency of the state economic and social problems in the given period. The state economic policy should have concrete aims and based on the strategies providing the possibility of achieving the set aims. The country's being in transition does not decrease the necessity of a strictly established strategy of economic development. Exactly under the strictly developed and determined economic policy conditions it is possible to influence the physical and human capital extent. If the capital rewserved in economy grows, the country's conomic potential will grow too, e.g. the economy is capable of creating more products and services in the future.

Auth.

5.A3.29. Investment chain in the process of business development. /Sh. Shaburishvili, M. Tavartkiladze/. Collection of Scientific Works of Ivane Javakhishvili Tbilisi State University. – 2009. – pp. 55-62. – geo., res.: eng.

In the sphere of venture and business angel investments, a company growth and development process is usually divided into stages. In marking out the development stages, a risk level and its character play the the decisive role. The marking out of project development stages is gaining great significance in contemporary business. It bears a distinct practical load for at the various stages the project is financed from the various sources. This phenomenon has been known as "investment chain". The firm's value is in nonlinear relationship with its development stages, which, naturally, proceeds from particular features of the firm and different and complicated nature of its development stages. As a rule, in case of business success, the firm achieves the superior growth during the several last years. According to the investors' slang, the diagram that describes the above phenomenon is known as "hockey stick".

Auth.

5.A3.30. Alternatives of the Laffer curve with “hysteresis”. /V. Papava/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol.3, – #1. – pp. 198-200. – eng., res.: geo.

The “corrections” to the Laffer curve are based on a factor of time. High importance is the question – in which direction the average aggregate tax is changing: upward or downward, when the Laffer effect always appears a couple of years later. Alternatives of the Laffer curve are constructed in the article.

Auth.

5.A3.31. Budgetary transfer policy in Georgia and foreign countries. /N. Grdzlishvili/. Law and Economics. – 2009. – #1. – pp. 85-101. – geo.; res.: geo., eng., fr.

The article deals with budgetary transfer relationships between Georgia and foreign countries, the role and importance of transfers in the process of making of the local budget. The transfer allocation criteria, their types, equalization forms are established, attention being paid to the criteria used in the calculation formula of equalization transfers. Problems existing in the transfer allocation area and the shortcomings of the equalization transfer formula are discussed. The matter concerns the “good will” of the central government in allocating transfers to local self-government bodies. The problems associated with the political decisions of the government rather than on science-based study and analysis results are discussed. Also considered are the ways of solving the existing problems, studying and sharing the best foreign practices in the area. The work concludes on the importance of the correct transfer policy in the country’s fiscal and socio-economic stabilization.

Auth.

5.A3.32. Agroproduction and regulative role of the State. /P. Koguashvili/. Akhali Ekonomisti. – 2009. – # 3. p. 21-27. – geo. res.: geo., eng.

The article deals with an economic analysis of the critical situation observable in Georgian agriculture, which states that these problems cannot be solved only within the agrarian sector because they require the working out and implementation of a system of complex measures. In particular, a stable production and non-production infrastructure of farming development shall be created, where the State should act as the initiator. At the same time, the economic motivation of cattle breeders in rural areas through the reasonable use of financial, credit, insurance and other levers should be carried out. In similarity to many countries of the world, the agrarian sector in Georgia also needs to be regulated by the State.

Auth.

5.A3.33. Modern tendency of business globalization. /Sh. Veshapidze/. Akhali Ekonomisti. – 2009. – # 3. p. 28-32. – geo. res.: geo., eng.

In describing the modern globalization tendency, one should consider such its guidelines as: the globalization of markets and a new strategy of companies, an increased participation of enterprises in international business, the factors stimulating production internationalism and its evolution, etc. A new stage conditioning the creation of a common global market is beginning. Globalization encompasses all economical sectors: scientific research, industry, services industry, finances. Only in compliance with the new requirements to the conduct on the world market, a company will be able to get involved into the global business.

Auth.

5.A3.34. The effects of the world financial crisis on the social situation of Georgian population and its statistic analysis. /N. Abesadze/. Collection of Scientific Works of Ivane Javakhishvili Tbilisi State University. – 2009. – pp. 63-73. – geo., res.: eng.

The article deals with some aspects of the actual economic crisis, serious tensions existing in the financial system, problems in the social sphere of the population, the inflation and price growth, their expected outcome. Based on the quantitative indicators and official statistics of the deterioration of the population’s standard of life, the respective conclusions are made.

Auth.

5.A3.35. The economic order policy: equilibrium of the competition order and the social order. /Sh. Gogiashvili/. Akhali Ekonomisti. – 2009. – # 3. p. 38-41. – geo. res.: geo., eng.

Any society requires the certain order and that shall be deemed as one of the key arguments and conditions for grounding existence of a state. The economic order plays the crucial role in the common order. In terms of a market economy, the former is nothing more or less than the competition order. On the basis of the foregoing, the competition economic policy, i.e. the competition order policy, plays the crucial role in the economic policy of a country if such country employs market relations. So far as the economic order policy is determined by the equilibrium of the competition order and the social order, along with optimization of the economic growth indexes, conduct of employment supportive economic policy, formation of the common

insurance system and establishment and enactment of the pension scheme, the equilibrium of elements of the economic order shall be changed in favor of the competition order. That is quite natural, since one of the key advantages of the market economy against the administrative-command model is the existence of the competition order proper.

Auth.

5.A3.36. Customer relationship management (CRM) and its impact on firm revenue performance.

/D. Shonia, N. Ketsbaia/. Akhali Ekonomisti. – 2009. – # 3. p. 42-48. – geo. res.: geo., eng.

To assess the winning of the customer relationship management (CRM) system, it is necessary that the costs on its making and operation as well as the expected operation-related effect be adequately determined. The making of investments in the CRM system implies the customer loyalty as the main indicator of the marketing asset. Different methods of assessing the CRM system are employed in practice by such well-known world consulting companies as *IT the Boston Consulting Group, Right Now Nucleus Research, Nvigorate LDT*, etc. We believe that the study and application of these methods would be very useful for modern firms in improving management. An increase in the revenue performance and dividends of a company will necessarily results in a rise in the cost of shares and, accordingly, in the company capitalization. The rise in the cost of shares is also secured by the factor that the formed marketing assets are of a long-term nature and they will, correspondingly, bring in additional revenues and positively influence the company asset value.

Auth.

5.A3.37. European Union facing a deep economic recession. /E. Varshalomidze, L. Chagelishvili/. Akhali Ekonomisti. – 2009. – # 3. p. 49-53. – geo. res.: geo., eng.

Since the second half of 2008, the world economy has been experiencing an increasingly sharp, synchronous economic slowdown that is proving to be far worse than expected in most economies. Global trade as well as industrial output in key industrial regions is contracting at a double-digit pace. For the year as whole, GDP expanded by just 0.9% in 2008 in the EU (0.8% in the euro area), a marked deceleration from previous year (+2.9% and 2.6%, respectively). The significant deterioration in economic activity in 2008 was broad-based across sectors. Capacity utilization in the EU and euro-area manufacturing sector slumped to 75% at the beginning of 2009. While value added growth in construction was still positive in the first half of 2008 in both the euro area and the EU, it activity fell in the second half, dragged down by the cooling in real-estate markets. Value added in the services sector – which represents 70% of total output – rose by almost 1% in 2008. Disruptions in money markets led banks to tighten lending conditions. The availability of alternative sources of funding was also curtailed. Investment growth declined rapidly in 2008. The external environment deteriorated significantly during 2008, aggravated by the financial crisis and the severe strains on banking systems and credit conditions worldwide, along with the fall in global production and trade. The massive slowdown in world output and trade is being caused by the decline in demand for capital and durable consumer goods, which have relatively high import content. For the year 2009 as a whole, exports are set to slump by around 13% in both the EU and the euro area. The decline in imports is also expected to be strong, particularly in 2009 (-10%), with a more moderate contraction persisting in 2010 (-1%). The current recession is affecting all demand components except government consumption and public investment.

Auth.

5.A3.38. Written communication in business. /L. Karchava/. Akhali Ekonomisti. – 2009. – # 3. p. 54-57. – geo. res.: geo., eng.

The article describes written communication as one of the forms of business-communication, its role and importance in business process. Upon written communication information is processed and communicated in writing. In the case of a written communication, information appears to be more complex and important. It is considered to have a documentary effect is stored for the most part for years. A wide spread of mobile phone and facsimile communication and the accessibility of electronic mail have significantly decreased the need of written documents but in spite of such an alternative, people use to send millions of letters. Thus, written communication remains to be as important today as it was a decade ago. Its advantages in relation to such forms of communication as oral (verbal) communication and gesticulation are shown.

Auth.

5.A3.39. Export of Georgia and importance of its stimulation for fast economic growth. /D. Shaburishvili/. Akhali Ekonomisti. – 2009. – # 3. p. 58-65. – geo. res.: geo., eng.

The article surveys the measures taken for export stimulation after the examples of “new Asian Tigers” of the East Asian countries. The export-import date of the East Asian countries, “new Asian Tigers” and post-Soviet countries are given. The dynamics of Georgian export reduction, the import and negative trade balance increase are analyzed. The influence of results of the negative trade balance on the country’s

macroeconomic stability is highlighted. The Georgian export indicators by commodity groups and countries, as well as the perspectives of export development are discussed.

Auth.

5.A3.40. Positioning the economy of Georgia under conditions of globalization. /L. Chagelishvili/. Akhali Ekonomisti. – 2009. – # 3. p. 70-74. – rus. res.: geo., eng.

In the contemporary period the development of globalization, the problem of the national economy development and its positioning in the global system becomes more urgent. Under condition of the inferior legislative base, economy is not free and the full-value socio-economic and political climate cannot be ensured. In its turn, the instable political environment, chaos and wars do not guarantee the socio-economic development. Up to this day the country lacks a program of the strategic development of the economy of Georgia according to scenarios to ensure the sustainable socio-economic development of the country. The article provides an analysis of the Georgian economy in the period of 2000-2007 and recommendations for guaranteeing the sustainable development of the country's economy in the global system.

Auth.

5. A3.41. Strategic thinking – how to reach the set aim. /T. Dudauri/. Science and Technologies. – 2009. – #4-6. – pp. 3-6. – geo., res.: eng., rus.

The article considers one of the important problems of modern economy - the achievement of long-term aims in business. It implies the taking of the logically consecutive actions and steps in the form as required by the long-term business aims. The article provides a scheme of interconnection of the strategic planning, business plan and the budget, as well as a number of questions, the realization of which will enable the Georgian economy to overcome the economical crisis results.

Auth.

5.A3.42. The methods of credit rating of firms. /E. Baliashvili, Z. Gudushauri, I. Kuliani/. Science and Technologies. – 2009. – #4-6. – pp. 7-9. – geo., res.: eng., rus.

The article critically analyzes foreign methods of bankruptcy prediction. Urgency of the problem is grounded with the current financial crisis in the country that might provoke the bankruptcy of banks. Also considered are the bankruptcy prediction models of E. Altman and L. Filosofov, out of which the priority for using in Georgia is given to the L. Filosofov model.

Auth.

5.A3.43. Global financial crisis and challenges to the banking system of Georgia. /L. Gudushauri/. Collection of Scientific Works of Ivane Javakishvili Tbilisi State University. – 2009. – pp. 47-54. – geo., res.: eng.

Modern banking is a dynamic business both globally and in Georgia. Despite of the fact that the Georgian banking is young, it has already passed the development and failure phases typical of the market economy countries. The article deals with the impact of the 2008-09 global financial crisis on the banking system of Georgia; the existing reality and the developed basic guidelines for coping with problems of the financial crisis are analyzed.

Auth.

5.A3.44. Sectoral tendencies of service business development. /O. Gigiashvili/. Collection of Scientific Works of Ivane Javakishvili Tbilisi State University. – 2009. – pp.10-15. – geo., res.: eng.

According to the statistical analysis, the work shows the sectoral tendencies of the Georgian service business development (growth) that shall serve as a basis for determining the strategic directions of the service business development.

Auth.

5.A3.45. Impact of economic crisis on used-car business. /G. Giguashvili, A. Tarkhishvili, D. Demetrashvili/. Collection of Scientific Works of Ivane Javakishvili Tbilisi State University. – 2009. – pp.16-21. – geo., res.: eng.

The global economic system recession has reached Georgia as well. The crisis has damaged almost every field of our economy, including car business. As a result of the August 2008 events and aggravation of the crisis, imports of used-cars have significantly reduced. According to importers, there are more salesmen than customers at the market. Along with the demand fall, one of biggest problems is the restriction on bank installments. The cost of car customs clearance needs to be reviewed as well. In order to overcome the crisis, it is necessary that the business be stimulated and actively supported by the State.

Auth.

5.A3.46. Marketing policy objectives and strategies in cellular communication. /G. Erkomaishvili/. Collection of Scientific Works of Ivane Javakishvili Tbilisi State University. – 2009. – pp. 22-26. – geo., res.: eng.

On the basis of studying of the market of cellular communication of Georgia, it may be said that the correct marketing strategy, charity and consumer-targeted actions have ensured success of two out of three companies (Magti, Geocell) on the market. Despite of the economic and financial crisis, in contrast to other sectors, cellular communication business in Georgia is functioning well which can be mainly ascribed to the proper and purposeful marketing strategy.

Auth.

5.A3.47. Marketing strategies for furniture market development in Georgia. /N. Todua, E. Urotadze, N. Karkashadze/. Collection of Scientific Works of Ivane Javakhishvili Tbilisi State University. – 2009. – pp. 27-35. – geo., res.: eng.

The article shows that furniture manufacturing is the traditional field in Georgia. Manufacturing of national furniture has contributed much to the economic activities of Georgia. At present, furniture manufacturing is one of the priority branches in the world industry. The article analyzes the world furniture manufacturing pattern and the main furniture suppliers, also highlighted are the furniture production rates in Georgia. The marketing research has been carried out for the furniture market analysis. Particularly, the customer's attitudes toward the native products have been revealed and respectively, the marketing strategies of furniture market development in Georgia are established.

Auth.

5.A3.48. Global financial crisis and business in Georgia. /I. Masurashvili/. Collection of Scientific Works of Ivane Javakhishvili Tbilisi State University. – 2009. – pp. 35-47. – geo., res.: eng.

Against the background of the global financial crisis deepening and the interpolitical opposition, Georgian economy is gradually accumulating negative processes. The above is ascribed to low revenues. In general, the expenditures should be planned in accordance with the expected revenues, while the revenues should be determined according to the country's economic standing.

Auth.

A4. Education

5.A4.1. Solution of some logical problems with the help of diagrams. /M. Deisadze/. Novation. – 2008. – #3. – pp. 239-245. – geo.; res.: geo., rus., eng.

The solution of some types of logical problems by means of the Euler diagrams is discussed. The Euler diagrams make it possible to construct a correct logical thinking based on the data of a specific problem. At this time, the student can visibly represent the problem data and make, on its basis, correct conclusions. The main attention at the time shall be paid to the formal-logical tasks that concern the relations between object groups, sets. A thorough and fundamental study of these issues will result in a simple solution of some logical problems by means of diagrams and shall assist the student in the development of a correct logical, mathematical thinking.

Auth.

5.A4.2. Problems of ensuring quality education in Georgia. /M. Magradze, E. Avlokhshvili, D. Gabunia/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 24-26. – geo.; res.: geo., eng., rus.

The article deals with the main directions to ensure quality of education in Georgia. The education quality is said to be a definite level of knowledge, skills, physical, mental and moral development. The main factors influencing the training quality are given, in particular: training programs; training material; training methods; training process management and control; financial, material and physical resources; human resources; training environment, etc. Also discussed are the functions of the higher education quality control services and their responsibility for the training quality.

Auth.

5.A4.3. Synergy of science and education – a powerful resource of innovative economy development. /G. Jolia/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 130-134. – geo.; res.: geo., eng., rus.

Synergy is considered to be a combination of educational and scientific activities, the main factor of economic innovation, its efficiency and computability. The experience of leading countries, the cooperation of the State and the private sector in financing the university science, as well as special features of creative education and its importance for the development of innovative economics are considered.

Auth.

5.A4.4. Computer-aided knowledge assessment system and its use. /Ts. Japiashvili/ Akhali Ekonomisti. – 2009. – # 3. p. 33-37. – geo. res.: geo., eng.

The computer-aided knowledge assessment system performs the entry of tests and their update, the formation of tasks (tests) for students, the testing process, the assessment of the testing results, their statistical analysis. The student fulfills the task on a personal computer in the interactive mode and can see the assessment results without a delay. The same mode is applied for updating the tests, forming the tasks, statistical analysis. The problem has been solved by using the Microsoft Office application system Access 2007. Working with this system is very easy for students. The student is only required to know how to use the mouse and keyboard to type a small text (test answers). The article includes rich material illustrating the system's application process.

Auth.

A5. Informatics/Computer Science

5.A5.1. High security cryptosystem. /Z. Kipshidze, A. Chaduneli, M. Chorkhauri/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 63-67. – geo.; res.: geo., eng., rus.

A new method of a cryptosystem design is used. It includes a nonlinear element which does not obtain any sign of linearity. Thus the systems linearity degree is reduced to 0.0003%, which is resolutely neglected within further rounds of processing. This, in turn, highly increases the security of the system against all the known cryptographic attacks. The system has adopted all major advantages of the U.S. standards DES and RIJNDAEL; the ciphering and deciphering process of the system is identical.

Auth.

5.A5.2. Representation of orthogonal functions as uninterrupted signals. /T. Giorkhelidze/.

Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 68-71. – geo.; res.: geo., eng., rus. Issues of generation of orthogonal functions (polynomial functions) in the form of uninterrupted signals is often raised when solving various scientific research tasks, particularly those of the mathematical physics. Orthogonal polynomial functions are topical and widely applied in the case of approximation of the signals represented in various analogous and discrete forms. Laguerre, Legendre, Hermite, Chebyshev and other orthogonal polynomials are widely applied in practice. Our objective is to elaborate simple and relatively precise methods of simultaneous generation of the orthogonal polynomials as uninterrupted signals. This is discussed in detail after the example of the Hermite polynomials. The obtained result allows constructing a simpler and more precise scheme on integrating operational amplifier, different from the existing ones. This scheme requires application of only a single operational amplifier to generate the next orthogonal polynomial.

Auth.

5.A5.3. Iterative algorithm of any variable coefficient linear differential operator. /A. Buksianidze/. Building. – 2009. – #1(12), – pp. 18-22. – geo.; res.: geo., eng., rus.

General solution algorithm of differential equation with variable coefficients is given. In addition, n-type differential operator is presented as a product sum of the first n-1 row operators, and the system of fundamental solutions – by exponential display integrals, containing the coefficient of these operators.

Auth.

5.A5.4. Modern systems for automation of business processes. /D. Kapanadze, T. Zhvania/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 77-81. – geo.; res.: geo., eng., rus.

The classification of applications, which are intended for automation of business processes, is discussed. Such systems are: workflow-systems, systems of modeling business-processes and BPM systems. Borders, content and services of each of them are defined.

Auth.

5.A5.5. The data aggregation in the OLAP cube and their hierarchical presentation. /L. Petriashvili, M. Kiknadze, E. Gvaramia, L. Gochitashvili/. Science and Technologies. – 2009. – #4-6. – pp. 10-16. – geo., res.: eng., rus.

The multi-measured data model the basic principle of its use that occupies a special place at the data full value analyses are considered. Also considered is the aggregation mechanism of the data formalization, where the set and graphs theory is widely used.

Auth.

5.A5.6. Introduction to the information logical fundamentals of modern science and education. /P. Asatiani, V. Chavchanidze/. Science and Technologies. – 2009. – #4-6. – pp. 17-20. – geo., res.: eng., rus.

On the basis of a political, social and economic analysis the information logical fundamentals of modern science and education are discussed. The history of condensed superfluid state physics as the two-fluid unitary model of informational system is developed.

Auth.

5.A5.7. On the stability of locally optimal solution in Boolean optimization problems. /B. Ghvaberidze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 60-62. – eng., res.: geo. The notion of the set of stability of a locally optimal solution is introduced for Boolean optimization problems; its properties are studied. A formula for calculation of the stability radius s obtained.

Auth.

B. NATURAL AND EXACT SCIENCES

B1. Mathematics. Mechanics. Physics. Cybernetics

5.B1.1. Study of distribution of an electric field in an ionizer of rotary movement. /G. Tskhomelidze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 29-32. – geo.; res.: geo., eng., rus. Distribution of an electric field of high intensity in an ionizer of rotary movement is considered; the influence of value and polarity of the enclosed pressure on value of intensity electric critical of a field is studied; it is shown that distribution of a field in an ionizer of the offered design is sharply non-uniform and demands detailed studying. The expediency of continuation of researches in this direction is given.

Auth.

5.B1.2. Definition of the maximal lift speed of lifters. /M. Tsereteli, N. Makharashvili/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 47-51. – geo.; res.: geo., eng., rus. The work is concerned with the determination of the maximal lift speed of lifters. Based on the technological process, a method making possible to determine the lift cycle length, the optimal weight of the lifted cargo, the optimal weight of a hoisted load, the speed multiplier value, and the optimal value of the maximum load movement speed according to the preliminary known annual productivity and the hoist height is given.

Auth.

5.B1.3. On the concept of relativistic mass. /V. Meladze, V. Kvintradze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 72-74. – rus.; res.: geo., eng., rus. The presented article, based on fundamental formulas of classical physics, suggests the solution of well-known formula of relativistic mass – mass of a moving body as the function of a velocity, earlier being given in the theory of relativity by theoretical reasons. It is shown that any mass, independently of its origin, should change according to this formula. This formula appeared to become a basis of the theory, according to which the mass of body depends on the velocity. In contrast to Feinmann's derivation, the authors' derivation of the formula is based on deep physical content.

Auth.

5.B1.4. Methods of plates' calculation of the axis symmetrical vibrations. /Z. Bichiashvili, J. Bichiashvili, G. Sichinava/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 79-84. – rus.; res.: geo., eng., rus.

This work is dedicated to the development of round and circular plates' calculation methods on the axis symmetrical vibrations. Discussed is the problem of calculation of plates located on both on free as well as on the elastic Winkler foundation for own axis symmetrical harmonious vibrations, given the effects of a displacement in the direction of the plate's axis of symmetry, rotational masses inertia, expansion (compression), shear and bend deformations, also of the longitudinal forces. The methods are based on the Kirkhhof hypothesis with the difference that after deformation the linear elements of a plate may not be normal in relation to the deformed intermediate surface. The plate material is elastic and is subject to the Hooke's law. The plate deformations are small and therefore the use of approximate depictions of curvatures is possible.

Auth.

5.B1.5. Orthotropic cylinder subsidence with preliminarily determined tightness. /T. Batsikadze, N. Murgulia, J. Nizharadze/. Building. – 2009. – #1(12), – pp. 36-40. – geo.; res.: geo., eng., rus. Calculation of a double-layer cylinder made from orthotropic material is carried out for a case when the tightness is set preliminary. The axisymmetric task is solved within the limits of the generalized flat tension condition. Intensity of uniform pressure corresponding to the contact interaction of layers is determined based on the movement compatibility condition.

Auth.

5.B1.6. Investigation of the strained-deformed state of multilayer inclined shell. /G. Kipiani, Z. Sopromadze, D. Kipiani/. Building. – 2009. – #1(12), – pp. 96-99. – geo.; res.: geo., eng., rus. Approximate and exact methods of calculation of a multilayer shell stability weakened by drills located anyway towards the shell are presented. Based thereon, the practical recommendations may be worked out in the mater of calculation and design of a multilayer collected shell plate widely spread in the construction.

Auth.

5.B1.7. Method of construction of contacting surfaces. /R. Gogoladze, K. Tshkuaseli, B. Churchelauri, G. Metreveli/. Building. – 2009. – #1(12), – pp. 100-103. – rus.; res.: geo., eng., rus.

The article reviews a class of tangent and space transformations. Two types of tangent transformation – point and non-point are considered. The construction method of contacting surfaces for treating technical surfaces is considered. The treated technical surface and the cutting tool are reviewed as contacting surfaces.

Auth.

5.B1.8. Elastic plane with a round hole and the edge loaded with supporting forces. /G. Kipiani, A. Sokhadze, D. Kipiani/. Building. – 2009. – #2(13). – pp. 58-63. – geo.; res.: geo., eng., rus.

A flexible plane with a round hole the edge of which is loaded with supporting forces is given in the article. The Flamant sum is used, i.e. when the supporting forces affect the linear border of a half plane and we have a radial stress.

Auth.

5.B1.9. Structure and kinematics of large deployable antennas of mechanical systems. /E. Medzmariashvili, V. Gogilashvili, Sh. Tserodze, N. Tsignadze, N. Siradze, V. Medzmariashvili/. Building. – 2009. – #2(13). – pp. 64-76. – geo.; res.: geo., eng., rus.

The work considers an asymmetrical closed system consisting of lever elements which transformation is carried out on the fictitious tapered surface being conditioned by an irregular arrangement of levers peripheral hinges towards the central hinges. The law of motion and geometrical parameters of the system providing the synthesis task solution given the initial parameters are established. Also presented are the basic scheme and the structural analysis of the chain system transformed on the spherical surface.

Auth.

5.B1.10. Analysis of oscillatory processes in mechanical systems in view of elastoplastic properties of its parts. /R. Adamia, B. Bandzeladze, Z. Nadiradze/. Novation. – 2008. – #3. – pp. 20-27. – geo.; res.: geo., rus., eng.

The article deals with the most complicated nonlinear task of estimation of oscillatory processes of mechanical system (machine units) given the elastoplastic deformation of their connecting parts. The existing methods of calculation are shown to make us to calculate own frequencies of the system and constants of integration at each change of the character of deformation, which is rather difficult and laborious, especial if the heterogeneity of entry conditions is taken into account. To simplify the task solution, proposed is a method of the solution construction where the valid system is replaced with equivalent discrete-linear system, by a chain of discrete weights connected by elastic parts. This excludes the operation of definition of constants of integration. The elastoplastic properties of the material are obtained by the closed polygonal loop. In this connection, the integration of differential equations is made on linear sites of this diagram given an interface of the solution function and their derivatives. The method allows transforming the non-uniform entry conditions in the homogeneous ones by their representation as equivalent external loads. On the basis of a concrete example of calculation of dynamic loads in the mechanical system containing parts with the elastoplastic properties, it is shown that the maximal values of stress arising in such parts are 15% lower than the maximal loads arising in the parts with elastic properties, i.e. without taking into account the plastic properties.

Auth.

5.B1.11. On the lattice isomorphisms of 2-nilpotent W-power hall groups and lie algebras. /M. Chabashvili, T. Bokelavadze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 56-59. – eng., res.: geo.

The paper deals with lattice isomorphism of 2-nilpotent Hall W-power groups and Lie algebras. Analogues of the fundamental theorem of projective geometry are proved. A corresponding example is constructed.

Auth.

5.B1.12. Effects of annealing on the optical properties of neodymium-doped phosphate glasses. /Yu. Blagidze, Sh. Gvatua, R. Tkhinvaleli, N. Gvatua, N. Papunashvili/. Science and Technologies. – 2009. – #4-6. – pp. 21-29. – geo., res.: eng., rus.

The work proves experimentally that the offered method of spectrophotometrical measurements consisting in the comparative analysis of spectrograms of the annealed and non-annealed samples of active phosphate glasses (APG) of the same thickness enables additional characterization of the activated glasses; in particular, observable are changes in the scattered light spectral distribution induced by the thermal treatment, whose average scattered light intensity is reduced according to the $\sim 1/\lambda$ regularity. Also the peculiarities of the fine annealing are shown to contribute to the formation of clusters in the glass structure in the different spectral domains. The original laboratory device for determining the glass softening temperature

T_g is also described, by means of which measured was T_g of the following APG marks: КГСС-1684 – $T_g=554^0\text{C} \pm 3,0^0\text{C}$ and ГЛС-22 – $T_g=482^0\text{C} \pm 3,0^0\text{C}$.

Auth.

5.B1.13. Relaxation oscillations of annual average temperature of the Earth. /M. Jibladze, A. Mikaberidze, Z. Razmadze/. Science and Technologies. – 2009. – #4-6. – pp. 30-33. – geo., res.: eng., rus.

By calculations of the thermal balance of the Earth it is shown that about half of the solar energy falling on the terrestrial surface is spent for evaporation of water from surfaces of oceans, seas and land. Part of it is absorbed by green plants, but thermal energy emitted because of human activity is by four orders less than the energy received by the Earth from the Sun. It is also noted that the infrared radiation of the terrestrial surface absorbed by molecules of CO_2 cannot evoke the greenhouse effect. It is shown that alterations of average-annual temperature of the Earth are characterized of relaxation oscillations with the period of 5-8 years. The relaxation oscillations are caused by the negative feedback between parameters of the Earth and energy received by the Earth from the Sun.

Auth.

5.B1.14. Modern method of the admixture concentration alloy. /I. Kalandadze, Sh. Khizanishvili/. Science and Technologies. – 2009. – #4-6. – pp. 34-38. – geo., res.: eng., rus.

In the GaAs epitaxial structures the photo-stimulation diffusion is scantily explored; therefore the aim of this work was the investigation of the photo-stimulation diffusion mechanism in GaAs with the admixtures. For this purpose n-type epitaxial films were used: the epitaxial layer thickness was $X_{ep}=0,46$ mkm, the charge bearers' concentration in the epitaxial layer $N_{ep,1} = 5 \cdot 10^{17} \text{cm}^{-3}$. For the volumetric diffusion study in GaAs the samples' surface on the one side was covered by silver or cadmium by the thermal spraying method ($T=100^0\text{C}$). Prior to the spraying, the samples' surface was careful cleaned by the standard chemical treatment.

Auth.

5.B1.15. The metamagnetism of the zone magnetic. /Z. Gamishidze/. Science and Technologies. – 2009. – #4-6. – pp. 39-41. – geo., res.: eng., rus.

The article deals with the metamagnetism phenomenon of the collectivized electrons. By using a simple theoretical model and the experimental data of the some zone metamagnetics, the effects conditioned by metamagnetism in the zone magnetics, in particular, transitions from the paramagnetic to the ferromagnetic state are established.

Auth.

5.B1.16. The entropy phenomena of the conscious and unconscious psychic processes. /L. Kadagishvili/. Science and Technologies. – 2009. – #4-6. – pp. 46-50. – geo., res.: eng., rus.

Experiments in the subsensor perception process showed that in determining the regularity of dynamics of elements on the way of the conscious and unconscious psychic research, the information obtained and analyzed for a standardized process is in opposition to the entropy. Thus, the statistical balance of the conscious corresponds to the entropy maximum, while the process the unbalanced state – to the entropy increase or decrease.

Auth.

5.B1.17. On general solutions of particular classes of ordinary nonlinear differential equations. /G. Kharatishvili/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp.13-19. – eng., res.: geo.

The article contains the formulae of general and subgeneral solutions for particular classes of ordinary nonlinear second and high order differential equations.

Auth.

5.B1.18. On unconditional convergence of series in Banach spaces with an unconditional base. /N. Vakhania, V. Kvaratskhelia/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 20-24. – eng., res.: geo.

Characterization of the Banach spaces isomorphic to the Banach space C_0 is obtained in terms of unconditionally converging series.

Auth.

5.B1.19. On the Riemann-Hilbert-Poincaré problem and I. Vekua's representation of holomorphic functions. /V. Kokilashvili, V. Paatashvili/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 25-29. – eng., res.: geo.

By generalization of the well-known I. Vekua's integral representation of holomorphic functions, solved is the Riemann-Hilbert-Poincaré problem in the classes of functions whose math derivative is representable by a Cauchy type integral with a density from a weighted Lebesgue space with a variable exponent in simply connected domains with piecewise-smooth boundaries.

Auth.

5.B1.20. On one property of the Wiener integral and its statistical application. /P. Babilua, E. Nadaraya, M. Patsatsia, G. Sokhadze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 30-39. – eng., res.: geo.

For the Wiener integral, one property of inversion is established. This property is used for construction of nonparametric statistical estimation of the unknown logarithmic derivative for distribution random processes, which is observed in Wiener noise.

Auth.

5.B1.21. Some approximate properties of the Cezàro means of order $\alpha \in]0,1[$ of trigonometric Fourier series and its conjugate. /D. Makharadze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 40-44. – eng., res.: eng.

Some approximate properties of the Cezàro means of trigonometric Fourier series and its conjugate are established.

Auth.

5.B1.22. On the hereditary integrability and abstract Lebesgue integral. /D. Gogvadze, P. Karchava/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 45-47. – eng., res.: geo.

The notion of hereditary integrability is introduced in this paper. It is demonstrated that every assumable function is hereditary integrable or is equivalent to some of such functions.

Auth.

5.B1.23 An approximate algorithm for one nonlinear beam equation. /J. Peradze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 48-55. – eng., res.: geo.

An initial boundary value problem is posed for the Kirkkhof integro-differential equation, which describes the dynamic state of a beam. The solution is approximated with respect to spatial and time variables by the Galerkin method and a difference scheme. For solving the system of nonlinear equations obtained by discretization the Jacobi nonlinear iteration process is used. The error of the Galerkin method is estimated.

Auth.

B2. Chemistry. Biology

5.B2.1. Investigation of complex formation of copper (ii) with azoderivatives of thenoiltrifluoroneacetone. /G. Tsintsadze, R. Aliyeva, R. Sulkhnejad, F. Chiragov, M. Tsintsadze, T. Thusiashvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 9-13. – rus. res.: geo., eng.

On the basis of thenoiltrifluoroneacetone new organic reagents have been synthesized. The constant of dissociation has been determined: $pK=7,95\pm 0,04$. The stability of the complexes of some metals with this reagent has been investigated by potentiometric and conductometric methods of titration. It is shown that stability of complexes changes in this order: $Fe > Ce > Ni > Co > Zn > Cd > Mn$. The complex formation of copper (II) with synthesized reagent in the presence and absence of ethyldiamine was studied. The ratio of component and interval of obey to Beer' law has been established. The technique of photometric determination of copper (II) in rocks was worked out.

Auth.

5.B2.2. Adsorption of trimellitic acid on mercury from aqueous solution. /Sh. Japaridze, N. Abuladze, I. Gurgenidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 14-16. – geo. res.: eng., rus.

The adsorption of trimellitic (benzentricarboxylic) acid from aqueous solutions is studied by measuring the differential capacity of the stationary drop Hg electrode. Analysis of the experimental data in terms of the Frumkin-Damaskin theory shows that the adsorption of trimellitic acid conform well to the Frumkin isotherm with particle-particle interaction corresponding to attraction. . It was indicated that at the anodic polarization adsorption was caused by the strong π -electron interaction of the aromatic ring with the electrode surface.

Auth.

5.B2.3. Adsorption of anthraquinone-9,10 and chloro- and aminoderivatives compounds at the mercury/ethilene glycol interface. /Sh. Japaridze, I. Gurgenidze, N. Abuladze/. Proceedings of the

Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 17-22. – rus. res.: geo., eng.

Adsorption power of anthraquinone-9,10 and its chloro- and aminoderivatives at the mercury/ethylene glycol interface have been determined. It was indicated that at the anodic polarization, adsorption was caused by the strong π -electron interaction of the aromatic ring with the electrode surface. The ability of anthraquinone to form the polymolecular adsorption layer (what has no place in case of chloro- and aminoanthraquinones, because of the stereo and dipole difficulties for this layer forming) has been determined.

Auth.

5.B2.4. Synthesis of new derivatives of the 2-phenylindole series. /Sh. Samsonia, N. Megrelishvili, I. Chikvaidze, N. Narimanidze, T. Doroshenko/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 23-25. – rus. res.: geo., eng.

New derivatives of 2-phenylindole were synthesized according to the E. Fisher reaction. The initial hydrazones were obtained by condensation of p-nitroacetophenone with the relevant hydrazines using the classical method. The cyclization of hydrazones was carried out in polyphosphoric acid. at 80-90°C. The aimed product was purified using the column chromatography method. The relevant aminocompounds were obtained by reduction of 2-p-nitrophenyl-5-methyl-, 5-bromo and 5-chloro indoles in hydrazinehydrate in presense of Rene nickel. The structure and the composition of the obtained compounds were established using modern physical-chemical methods of research. The biological activity of synthesized compounds was also studied.

Auth.

5.B2.5. Spectral characterization of 2-aminophenylindole derivatives. /I. Chikvaidze, Sh. Samsonia, N. Megrelishvili, G. Andronikashvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 26-28. – rus. res.: geo., eng.

IR-spectra of 2-phenylindole derivatives substituted in the 5th position have been studied. It was shown that when hydrogen bond occurs in these compounds, it results in additional spectral absorption line relatively in lower frequency area. Under influence of hydrogen bonds, the absorption line position of NH-bond changes. In a diluted solution, upon destruction of hydrogen bonds, a decrease or disappearance of absorption lines takes place. It can be concluded that in the mentioned compounds, the NH₂ –group common absorption line is shifted to higher frequency area under the influence of hydrogen bonds.

Auth.

5.B2.6. Acetylation of butyl and isoamyl alcohols by ethyl acetate on the modified forms of clinoptilolite. /A. Dolidze, N. Kalabegashvili, G. Balarjishvili, D. Ioseliani, Ts. Ramishvili, L. Samkharadze, M. Vacheishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 29-31. – rus. res.: geo., eng.

Acetylation of butyl and isoamyl alcohols by ethyl acetate on the modified forms of clinoptilolite H⁺Кл, Fe(ClO₄)₃/H⁺Кл, Fe³⁺Кл, Кл is studied in the stationary and flowing systems. In the mentioned reactions H⁺Кл and Fe(ClO₄)₃/H⁺Кл had differed by relatively high activity, and in the optimal conditions (flowing system, temperature and flow rate) outcome of acetic ethers of isoamyl and butyl alcohols on them was equal 45-76% on the Fe(ClO₄)₃/H⁺Кл, and 20-62% on the H⁺Кл.

Auth.

5.B2.7. Determination of Fe(II)/Fe(III) ion ratio in Fe-fructoze complex. /Ts. Gabelia, L. Djaparidze, E. Salukvadze, L. Kashia, S. Urotadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 36-38. – geo. res.: eng., rus.

Rapid, precise and low cost method of quantitative determination of Fe(II) in the presence of Fe(III) has been suggested.

Auth.

5.B2.8. On changes of effective diffusion areas in high temperature oxidation of Cr₂O₃ forming alloys. /O. Mikadze, I. Nakhutsrishvili, N. Maisuradze, G. Mikadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 39-41. – rus. res.: geo., eng.

New kinetic aspects of high temperature oxidation of chromium alloys, containing rare-earth metals which were connected with decreasing of the effective diffusion area and were characterized by good correlation of experimental and theoretical data have been identified and synthesized.

Auth.

5.B2.9. Investigation of dehydration of isopropyl alcohol on natural laumonite and its decationized form. /A. Rukhadze, T. Kheladze, Kh. Makharadze, N. Okujava, Sh. Sidamonidze, I. Pulariani/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 42-44. – rus. res.: geo., eng.

Investigation of catalytic reactivity of natural laumontite and its decationized form in reaction of dehydration of isopropyl alcohol has shown that the decationized form reveals high catalytic reactivity towards this reaction, this being conditioned by existence of the Brensted acid sites appearing in the structure of laumontite as a result of modifying its initial structure. In spite of the fact that the initial form of laumontite does not contain the Brensted acid sites, its high catalytic reactivity in the above process is apparently connected with the existence of polyvalent cations in its structure.

Auth.

5.B2.10. Electrochemical and spectrophotometrical characteristics of the pharmaceutical preparation – levomepromazine. /T. Chelidze, M. Khokhashvili, I. Gurgenidze, M. Chankashvili, N. Imnadze, N. Nizharadze, Sh. Japaridze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 45-49 – rus. res.: geo., eng.

The pharmaceutical preparation *levomepromazine* by influencing the human central nervous system has an anti-psychotropic effect thereon. Consequently, the development of methods of quantitative analysis of this preparation that are accurate and less laborious against the available ones is of importance. Correspondingly, the work deals with the polarographic and spectrophotometric methods of the preparation analysis within wide field of concentration ($6.0 \cdot 10^{-6} \div 1.7 \cdot 10^{-3}$ M). Investigations of the electrode/solution interface and the nature of adsorbed species were carried out by classical electrochemical measurements, such as the deferential capacity dependence on the potential. The results provide information on the dependence of the structure of the electrical double layer on the adsorption process of phenothiazine derivative – *levomepromazine*.

Auth.

5.B2.11. Advantages and specifics of fermentative catalysis. /I. Berdzenishvili, N. Geladze, N. Kvinikadze, M. Siradze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 50-52 – rus. res.: geo., eng.

Common principles of catalysis and specifics of ferment activities as catalysts are discussed. After the example of decomposition of hydrogen peroxide, the high activity of catalase in comparison with nonorganic catalysts is shown. Catalase has one of the highest turnover numbers of all enzymes. Short facts from history of ferments researches are given.

Auth.

5.B2.12. Influence of the *eluent* composition on the separation of ions of certain metals. /S. Urotadze, T. Kvernadze, N. Burkiashvili, N. Osipova, R. Devdariani/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 53-55 – rus. res.: geo., eng.

It has been shown that the eluents modified by complexing anions (tartrate and oxyisobuturate) can be successfully used for determination of certain divalent and transition metals.

Auth.

5.B2.13. Electrical properties of wet capillary-porous materials in weak electrical fields. /A. Khurtsilava/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 57-59 – rus. res.: geo., eng.

The work deals with the electrical properties of wet capillary-porous materials placed in weak electrical fields. Considered are such properties as electro conductivity, electrical polarization, dielectric loss. The given data enables to assume that dielectric loss of the capillary-porous materials placed in a weak electrical field of the radiofrequency range is generally conditioned by the process of carrying free and weakly bound ions of water and electrolyte solutions. Hence, dependence of the dielectric losses of a material on its physical properties will be conditioned by the same variable factors and approximately in the same ratio as the specific conductivity dependence.

Auth.

5.B2.14. Influence of initial carbon nanostructure on boundary thermodynamic conditions of diamond formation process in Me-C system. /N. Loladze, M. Tserodze, S. Zaslavski/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 60-61 – rus. res.: geo., eng.

Influence of the crystallite height L_c of initial carbonaceous materials on the boundary pressure necessary for the diamond-forming process of these carbohydrates has been studied. The theoretical and experimental data reveal that an increase in the crystallites height L_c (h_β) in carbonaceous materials leads to a decrease in the pressure necessary for the diamond nucleation in the Me-C system.

Auth.

5.B2.15. Characteristics of some synthetic zeolites used for desiccation of liquid environment.

/L. Eprikashvili, T. Kordzakhia, T. Andronikashvili, M. Zautashvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 62-64 – rus. res.: geo., eng.

Physicochemical, structural and sorption properties of some synthetic zeolites used for desiccation of liquid medium with low water content have been discussed. It has been shown that erionite and synthetic A type zeolites have more perspectives in the process of desiccation of various liquid systems.

Auth.

5.B2.16. Quantum–chemical investigation of complexing capability of pyridine-2-carboxylic acid methylamide. /M. Tsintsadze, D. Lochoshvili, G. Manvelidze, N. Maisuradze, A. Mamulashvili, J. Kereselidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 65-67 – rus. res.: geo., eng.

By quantum-chemical method AM1 an energy, electron and structural characteristics of pyridine-2-carboxylic acid methylamide have been calculated. A procedure for coordination of this molecule was determined on the basis of the calculated data.

Auth.

5.B2.17. Algebraic-chemical investigation of hydrogen halides within the scope of ANB-matrix method. /G. Chachava, M. Gverdtseteli, I. Laperashvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 68-69 – rus. res.: geo., eng.

Algebraic-chemical investigation of hydrogen halides was carried out within the scope of ANB-matrix method. Two correlation equations were constructed. The calculations show that correlations are satisfactory.

Auth.

5.B2.18. Synthesis and IR absorption spectra of nickel, zink, and cadmium celenocianate coordinative compounds with α -picolinamide. /M. Tsintsadze, G. Manvelidze, N. Maisuradze, I. Mamulashvili, G. Tsintsadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 73-74 – rus. res.: geo., eng.

Synthesis of nickel, zinc, and cadmium celenocianate coordinative compounds with α -picolinamide and IR absorption spectra are given. The structure of the synthesized compound is discussed.

Auth.

5.B2.19. Biological activity of *Alnus barbata* (C.A. Mey.) cones. /A.Skhirtladze, E.Shaburishvili, M.Malania, V.Mshvildadze, K.Shalashvili, E.Kemertelidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 75-77. – rus. res.: geo., eng.

The presence of condensed and hydrolyzed tannides in *Alnus barbata* with pentagalloyl glucose as main constituent is determined. *Alnus barbata* extracts exhibited cytotoxic activity in lung carcinoma and human rectum adenocarcinoma cell lines; they are found to have strong antimicrobial effect against *Staphylococcus aureus* strains, to exceed the known antioxidants, such as α -tokopherol and EDTA, in malondialdehyde (MDA) assay, also to inhibit free radicals by 94-97% in an assay with 2',7'-diclorfluorescein diacetate (DCFH-DA) as standard.

Auth.

5.B2.20. Investigation of methyletum coreuleum release from vagina suppositories and their standardization. /M.Javakhia, L.Churadze, T.Tsintsadze, P.lavich/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1 – pp. 94-97 – rus. res.: geo., eng.

A release of methyletum coreuleum from vaginal suppositories has been investigated with an emphasis on the influence of a number of factors on the degree of release. Cocoa oil, confectionery fat, gelatin-glycerin gel and three different types of emulgators were used for the purpose. According to the obtained results, the average release rate exceeded 60%, which complies with the existing standards. A method for standardization of the suppositories has been elaborated in line with the Pharmacopoeia requirements. A spectrtophotometry technique was used for quantitative analyses.

Auth.

5.B2.21. Adsorption of 1,2- and 1,3-butylenglicol on mercury electrode from aqueous solutions. /Z. Khuzishvili, T. Loladze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 146-148. – geo. res.: eng., rus.

Some results of adsorption studies of 1,2- and 1,3-butylenglycol on a mercury electrode from aqueous solutions are discussed. In particular, the matters concerning orientation to the dipole electrodes of these isomers under the adsorbed condition, as well as the interaction with the electrode and solution molecules.

Auth.

5.B2.22. Effect of ligand nature on the diffusion coefficient for ions Cu(II) and Cd(II). /T. Lezhava, N. Ananiashvili, M. Kikabidze, J. Metreveli/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 149-154. – geo. res.: eng., rus.

Regulation of mass-transfer processes has assumed a new matter in connection with a serious environmental pollution by ions of heavy metals as a result of operating of electroplating shops. This is expressed in the elaboration of the conception for obtaining of metallic coatings from the solutions of low-content of heavy metals without worsening of product quality. In the paper an effect of solution pH on the diffusion coefficient of Cu(II) and Cd(II) in ammoniate solutions has been considered as well as in solutions containing some symmetric and asymmetric bidentate ligands. It is shown that at complex formation of Cu(II) with ammonia, solution pH practically doesn't effect on the diffusion coefficient value of Cu(II). At the study of chelate amino-alcoholates in the series of mono-, di-, triethanolamine an expected reduce of diffusion coefficient of the complex of Cu(II) wasn't found as an amount of alcohol groups increases. This fact was explained by ability of Cu(II) to form a polynuclear complexes with di- and triethanolamine. In contrast to Cu(II), going from monoethanolamine to diethanolamine, diffusion coefficient of the complex of Cd(II) reduces nearly by a factor 2.5, which is probably due to the fact that Cd(II) forms only monodentate complexes with mentioned aminoalcohols. Because of this fact, a two-fold increase of alcohol group number, going from monoethanolamine to diethanolamine, has essential effect on friction force of complex ion with a medium as a result of an increase of the amount of hydrogen bonds of complex ion with solvent molecules. Comparison of diffusion coefficient values of chelate complex of Cu(II) with α -alanine, glycine and cerine has shown evidently a preferential role of ligand hydrogen bonds with a solvent (water) molecules and secondary role of its sizes in the deceleration of ion movement in viscous medium.

Auth.

5.B2.23. Syntheses of some new 3-ARYL derivatives of 3-ARYL-4-OXO-3H,5H-pyridazino[4,5-b]indoles. /Sh. Samsonia, A. Kalatozishvili, I. Chikvaidze, D. Stolz, U. Kazmaier/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 162-166. – rus. res.: geo., eng.

The general method of syntheses of 3-aryl-4-oxo-3H,5H-pyridazino[4,5-b]indoles has been studied. In order to detect new compounds with beneficial properties, new 3-aryl-4-oxo derivatives of 3H,5H-pyridazino[4,5-b]indoles which are heterocycles with three nitrogen atoms and azaanalogue of β -carbonyl have been synthesized. 2-Ethoxycarbonylindole has been selected as a key compound for the syntheses. Cl-, Br-, NO₂ groups of the second phenyl and benzyl are contained in the hydrazone fragment of the phenyl core. The optimum conditions, boiling in icy acetic acid during 1-3 hours, have been chosen for cyclization of these arylhydrazones.

Auth.

5.B2.24. Synthesis of some n-methyl-2-phenylindole arylazoderivatives. /I. Chikvaidze, Sh. Samsonia, N. Targamadze, N. Samsonia, D. Kadzrishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 167-170. – rus. res.: geo., eng.

In order to synthesize new compounds possessing potential bactericidal and anti-inflammatory activities were carried out azocoupling reactions of some N-methyl-2-arylindoles with p-Cl-, p-Br-, p-COOMe and p-NO₂ phenyldiazonium derivatives under pH 6-7 conditions. It was established that these reactions result corresponding 3-arylazoderivatives with the yield 80-97%. The structure of obtained compounds was established on the basis IR, UV, ¹H-NMR and Mass-spectral results.

Auth.

5.B2.25. Preparation of methylcyclopentens by use of zeolite catalysts. /G. Balarjishvili, A. Dolidze, L. Samkharadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 175-176. – rus. res.: geo., eng.

A diversity of catalysts prepared on the basis of synthetic and natural zeolites are tested in order to receive high outcome of methylcyclopentens from cyclohexanol. Catalyst Fe³⁺Ct prepared by ion-exchange method from natural clinoptilolite, is selected, in the presence of which it became possible to obtain the 87 percentage outcome of methylcyclopenten by one stage. The same results are obtained at a large-scale plant. Natural clinoptilolites and Fe³⁺Ct are also researched by EPR spectral method.

Auth.

5.B2.26. Quantum-chemical modeling of Hoffman's reaction mechanism. /J. Kereselidze, Z. Pachulia, T. Zarkua/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 177-178 – rus. res.: geo., eng.

A simplified model of mechanism of synthesis of N-methyl-N'-acetylurea by means of non-empirical quantum-chemical density functional theory method is offered. It is shown that the value of energy of activation is within acceptable limits and the reaction is an exothermic process. The data indicate adequacy to the offered model.

Auth.

5.B2.27. Thermodynamic estimation of influence of composition qualitative constitution on glass melting energetics. /E. Matsaberidze, N. Rachvelishvili, A. Sarukhanashvili, A. Lomidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 193-196. – rus. res.: geo., eng.

A possibility of using the method of theoretically necessary heat expenditures calculation for glass melting for the estimation of complex (technogenic) raw material containing composition's influence on the energetic of these processes is shown. By means of thermodynamics injection of complex raw material in the composition is found to decrease energetic expenditures in comparison with the composition which is obtained on the basis of usually used raw materials at the same glass constitution.

Auth.

5.B2.28. Chemical preparation of nanosized zeolite materials. Study of pre-crystallization processes. /V. Tsitsishvili, N. Dolaberidze, N. Mirdzveli, M. Alelishvili, M. Nizharadze, M. Suladze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 197-200. – rus. res.: geo., eng.

Acid treatment of natural clinoptilolite results in soft dealumination and strong decationation, the zeolite channel and microporous structure is collapsed generally. Aging of gels prepared by addition of the NaOH-solutions to amorphous aluminosilicate mixtures promotes formation of structures characterized by possibility to absorb water molecules at the same pressure conditions, as zeolite channels and micropores, but remaining amorphous character according to X-ray and IR-spectra indexes. To answer general question – have such nano-sized structures zeolitic character – results of detailed X-ray study are to be considered, that will be content of our next communication.

Auth.

5.B2.29. Neodymium and erbium chlorides complex formation with benzoylhydrazine and spectrophotometric research of complex pattern. /M. Tsintsadze, N. Maisuradze, G. Manveladze, G. Tsintsadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 201-203. – rus. res.: geo., eng.

Neodymium and erbium chlorides complex formation with benzoylhydrazine and spectrophotometric research of complex pattern in ethanol solution is analyzed. It is specified that complexes: $\text{NdCl}_3 : \text{BH} = 1:3$ and $\text{BH} = 1:4$ are derived in alcohol solutions.

Auth.

5.B2.30. Study of chemical resistance of MA-40 and MK-40 ion-exchange membranes in waters containing hydrogen sulfide. /Ts. Kurtskhalia, N. Pirtskheliiani, Z. Simonia, D. Partsvania, N. Erukidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 209-211. – geo. res.: eng., rus.

Chemical resistance of MA-40 and MK-40 ion-exchange membranes in the stationary state in contact with waters containing hydrogen sulfide at 20°C and 50°C has been studied. Concentration of hydrogen sulfide in sample waters is 0.8-1.0 mg/l (solution 1.) and 6.0- 6.5mg/l (solution 2.). Change of physical and chemical characteristics of membranes takes place in the first 10 days and has complicated character. Temperature do not influence this change. Change of physical and chemical characteristics of membranes (absolute exchange capacity, reduction of selectivity and resistance) do not exceed 10%. Accordingly, MA-40 and MK-40 ion-exchange membranes can be applied for electro dialysis treatment of waters containing hydrogen sulfide.

Auth.

5.B2.31. Thermodynamic analysis of carbothermic restoration of Cr_2O_3 and oxides mixtures $\text{Cr}_2\text{O}_3 - \text{SiO}_3$, $\text{Cr}_2\text{O}_3 - \text{SiO}_2 - \text{FeO}$, $\text{MnO} - \text{SiO}_2 - \text{Cr}_2\text{O}_3$. /J. Bagdavdze, I. Janelidze, K. Ukleba, M. Chumbadze, Z. Tsikaridze, R. Razmadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 212-218. – rus. res.: geo., eng.

A complete thermodynamic analysis of systems $\text{Cr}_2\text{O}_3 - \text{C}$, $\text{Cr}_2\text{O}_3 - \text{Cr}_7\text{C}_3$ (three compounds), $\text{Cr}_2\text{O}_3 - \text{SiO}_3 - \text{C}$ (four compounds), $\text{Cr}_2\text{O}_3 - \text{SiO}_2 - \text{FeO} - \text{C}$ (four compounds), $\text{MnO} - \text{SiO}_2 - \text{Cr}_2\text{O}_3 - \text{C}$ (five compounds) was fulfilled. The basic results for systems $\text{Cr}_2\text{O}_3 - \text{C}$, $\text{Cr}_2\text{O}_3 - \text{Cr}_7\text{C}_3$, $\text{Cr}_2\text{O}_3 - \text{SiO}_3 - \text{C}$, $\text{Cr}_2\text{O}_3 - \text{SiO}_2 - \text{FeO} - \text{C}$ are

presented in the form of diagrams (dependence of components content on temperature range 800-2000 K) and for system MnO–SiO₂–Cr₂O₃–C it was established a ratio of condensed phases for all compounds of fusion mixture (melting of slag, metallic solution and condensed carbon), a composition of metallic solution, extractions of Mn, Si and Cr in metallic solution in the temperature range 1550 – 2000 K.

Auth.

5.B2.32. Cyclic-dimeric mechanism of the prototropic tautomerism. /J. Kereselidze, Z. Pachulia, T. Zarkua, M. Makaridze, E. Churgulia, T. Kikalishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 219-224. – rus. res.: geo., eng.

In the review the results concerning prototropic tautomerism of carbonyl and nitrogen containing biologically active compounds received for last years by the authors and foreign scientists are systematized. On the basis of calculations, with the use of semi-empirical and non-empirical quantum-chemical methods and also infrared spectrometry it is concluded that a proton transfer in the process of the prototropic tautomerism is carried out by the cyclic-dimeric mechanism.

Auth.

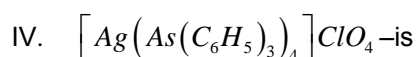
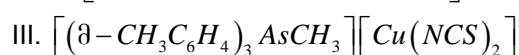
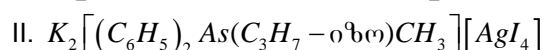
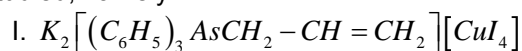
5.B2.33. Sulphur cycle in the nature. /M. Kikalishvili, N. Gvinianidze, N. Chkhartishvili/. Novation. – 2008. – #3. – pp. 77-84. – geo.; res.: geo., rus., eng.

When the water phase was formed on the Earth the whole amount of sulphur was combined in the form of sulphids. During the long period of time, through the action of water and carbonic (IV) gas sulphur, hydrogen was formed. The latter was oxidized and sulphur was isolated. Sulphur received was oxidized by forming sulphuric acid first and sulphur acid later. The sulphur acid received affected carbonates obtaining calcium sulphat as a result. Calcium sulphate was taken to the seas and oceans by water and through centuries a thick sulphate layer was formed. In the nature not only oxidation process look place but the reduction as well – sulphur was reduced to sulphuretted hydrogen. In the deep layers of the Earth calcium sulphate through the effect of methane isolated sulphuretted hydrogen. Isolated sulphuretted hydrogen was oxidized on the surface of the Earth again by isolation of sulphur and the cycle continued. Plants get sulphur necessary for protein synthesis from soil soluble sulphates. From plants the proteins are transported to the animal bodies lacking the ability of protein synthesis from sulphates. Part of the sulphur absorbed b> plants is gathered in the roots in the form of sulphate. The main part of the sulphates moves from the roots to the xylem vessels and is transported to the young growing parts of the plant where it is involved in the process of metabolism and loses the ability of transportation. Reduced forms of the sulphate (sulphur containing aminoacids) can move from the leaves to the growing plant parts of the leaves as well as to the places where substances are stored through phloem. In the seeds sulphur is presented in the reduced form and in the process of germination is transformed into a partially oxidized form. The concentration of sulphur in major part of the compounds is presented in the reduced form. Organic sulphur is met in the forms of plant and animal residues in the soil and due to saprophytic microorganisms undergoes the process of the mineralization resulting in isolation of sulphur hydrogen. Considering abovementioned, it can be concluded that in the nature continuous sulphur cycle takes place: Sulfates – proteins – sulphur hydrogen – sulphur — sulfates

Auth.

5.B2.34. Biocide effect of arsenic-containing substances on some microorganisms. /M. Gabelashvili, M. Kikalishvili, Z. Lomtadidze/. Novation. – 2008. – #3. – pp. 63-66. – geo.; res.: geo., rus., eng.

It is well acknowledged that microorganisms have specific characteristics against various chemical compounds. Certain synthesized elementorganic substances arc widely used in manufacturing and agriculture. For example, in order to get biostable compounds polymers are added to a lot of monomers containing arson. They show different biocide effects. A number of elementorganic synthesized compounds are studied, namely:



Biocide effect against certain actinomicet (*Nocardiopsis. dessonvillei*. *Actinomyces griseus*. *Actinomyces griseus* – 43). Biocide activity of the researched cultures was determined through the method of sowing and attenuation of Cpl in nutritious soil. It was observed that the abovementioned substances show their biocide effect against actinomicets. Most actively they can prevent the growth and development of *Actinomyces griseus* – 43. Substance II has the most negative influence on the growth and development of *Nocardiopsis clessonvillei* and substance IV on *Actinomyces griseus*.

Auth.

5.B2.35. Optimization of the leaching process of restored sulfate of barium lye. /V.Rukhadze, N.Nizharadze, M.Gegeshidze, I. Kamushadze, N.Fruidze/. Novation. – 2008. – #3. – pp. 67-70. – geo.; res.: geo., rus., eng.

The purpose of research is optimization of the process of leaching of barium sulfide from restored barium sulfate lye. The influence of four factors is investigated (temperature, a parity of liquid and solid, contents of barium sulfide in furnace and durations) on leaching quality and concentration of barium sulfide in a solution. With the help of experiments, on the basis of a method of an abrupt ascension on the fourth step the desirable result is achieved. The quality of barium sulfide leaching is 92,03; the concentration of sulfide of barium in a solution - 118g/l; temperature ($\xi_1 = 70^{\circ}\text{C}$; the parity of liquid and solid ($\xi_2 = 3.80:1$, ($\xi_3 = 16.5$. To raise the leaching quality, two-stage leaching was carried out by the countercurrent principle which censured 98,5% leaching quality, 115-120g/l barium sulfide content. By studying the process of leaching of the restored weight, major factors and the optimum areas for high-quality leaching and concentration are determined.

Auth.

5.B2.36. Research of adhesive properties secondary modified polyethylene compositions. /N. Kheladze, K. Pataridze, D. Kiria, T. Nadiradze, L. Kheladze/. Novation. – 2008. – #3. – pp. 71-76. – geo.; res.: geo., rus., eng.

Adhesive properties of the secondary modified polythene (ПЭВП, ПЭНД) are investigated. Predictably, because of destructive processes proceeding in secondary matrixes their adhesive properties a little bit less, than at pure polymers. This law is kept for both of ПЭНП and for ПЭВП in all systems with fibers of different types. It is established, that with use of modifiers it is possible to improve adhesive properties of secondary raw material, that in turn, determines increase of physic mechanical and deformation parameters of the received composite materials and properties of products from them. Are established also, optimum quantities of the filler and modifiers at which adaptability to manufacture and process secondary compositions are maximal and reception of products from them with high operational properties is possible. The maximal improvement of properties occurs at using as additive ФЭС in quantity of 1 weights of a part. Introduction of the filler in small quantities (up to 10 %) results in increasing of adhesive durability. Almost in all systems value increases for 20-30 %. At the further increase in quantity the filler durability of coupling monotonously falls. But despite of it, at working concentration (20-25 %) its value is higher, than at initial materials.

Auth.

5.B2.37. The scale growth morphology on heat-resisting alloys forming chromium and aluminum oxides. /G. Mikadze, S. Kurashvili, A. Gordeziani, O. Mikadze, N. Maisuradze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 62-65. – rus.; res.: geo., eng., rus.

Cromium and aluminum oxides possessing of extremely low parameters of volume diffusion form the bending morphology with oxide ridges on heat-resisting alloys. Such a scale is cracked and scattered at cooling. The necessary term of design of heat-resisting alloys forming of chrome or alumina is suppression of the scale growth morphology by means of blocking of grainboundary cation diffusion with barrier formations of stable phase.

Auth.

5.B2.38. Determining the level of radioactive pollution in some medicinal plants. /M. Gabelashvili, N. Ghvinianidze, N. Chkhartishvili, N. Julakidze/. Novation. – 2008. – #3. – pp. 130-134. – geo.; res.: geo., rus., eng.

Medicinal plants and the phyto-preparations obtained from herbs have been used in treatment as well as in preventive health care against almost all human diseases long since. Development of chemistry, especially of organic chemistry, has led to the implementation of synthetic pharmaceutical remedies in medical practice. Chemotherapy acquired a great importance. Yet phytotherapy still maintains its position. These days phyto-drugs consumed in our country comprise 40% of the medical preparations. They have substantial advantage over the synthetic preparations as when taking the phyto-drugs patient gets the whole complex of the relative compounds that bring much more benefits compared with the synthetic means. In the last few years the utmost pollution of the environment made the listed matters very relevant: in what conditions should the herbs be collected; whether they are good for medical purposes considering ecological factors or they may conversely cause contraindication. For this purpose the studies were carried to determine radionuclide concentration in some .it the drug plants (common knotgrass, lady's thumb, laurel, common plantain, common wormwood, coltsfoot, bur-marigold) grown in the surroundings of Kutaisi. The concentration of radionuclides varies in different parts of the plants. Among research plants the value of 0.011 radionuclide per hour was observed only in the roots of coltsfoot. The concentration of radionuclides is higher in flowers (from 0.008 to 0.017 radionuclides per hour).

Auth.

5.B2.39. Antiradical efficiency of some standard phenolic compounds. /Sh. Simonishvili, A. Shalashvili, N. Zambakhidze, I. Targamadze, M. Gogava, T. Mitaishvili, D. Chrikishvili, D. Ugrekhelidze/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 1-5. – eng., res.: geo., eng.

Antiradical efficiency of 31 standard phenolic compounds, including simple phenols, hydroxybenzoic acids, aldehydes, hydroxy-cinnamic acids and coumarins has been studied by means of a stable free radical, 1,1-diphenyl-2-picryl hydrazyl (DPPH•). It was shown that phenolic compounds are potential binding agents of free radicals, and their activity with respect to DPPH• is defined by chemical structure of their molecules. Among phenolic compounds, esculetin, pyrogallolcarboxylic acid, gallic acid, caffeic acid, protocatechuic acid, pyrogallol and protocatechuic aldehyde have high antiradical efficiency.

Auth.

5.B2.40. Bio-remediation of oil-contaminated soils by applying microscopic fungi. /I. Khokhashvili, L. Kutateladze, T. Aleksidze, M. Kharebashvili, E. Kvesitadze, M. Laskhishvili/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 6-11. – eng., res.: geo., eng.

Oil-destructing strains of microscopic fungi were isolated from oil-polluted territories of Georgia and identified in the collection of Durmishidze Institute of Biochemistry and Biotechnology as a result of screening. 10 strains with high oil-destructing abilities were selected. Conditions of cultivation of high active oil-destroyer strains have been established. In the case of application of destructor strains – *Chaetomium* sp. J 2-2 and *Trichoderma viride* J3-1 under laboratory and field conditions the extent of oil destruction in oil-polluted black and red soils made 85-90%. This indicates the high destructive activity of the strains and makes possible their application in bioremediation technologies of oil-polluted soils. According to high bio-degrading activity of the studied fungi, the technological scheme of bio-remediation of the polluted soils and obtaining of bio-preparations was elaborated.

Auth.

5.B2.41. Qualitative detection of genetically modified organisms. /T. Kutateladze, M. Karseladze, I. Gabriadze, G. Zaalishvili, N. Datukishvili/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 12-16. – eng., res.: geo., eng.

Assays of screening genetically modified organisms (GMO) were developed using dried powders as certified reference materials containing 0-5% Roundup Ready soybean and maize Bt-176 as well as seeds of 100% Roundup Ready Soya. Genomic DNAs were extracted by Qiagen DNeasy plant mini kit. Amplification quality of DNAs was assessed by plant specific polymerase chain reaction (PCR) appropriate for detection of chloroplast genome conserved sequences. The PCRs corresponding to 35S promoter and the NOS terminator revealed the presence of transgenic material in all GMO containing certified reference materials. No amplification signal was exhibited in negative water and non-GM samples. The high sensitivity of 0.1% GMO was achieved for screening methods. The results obtained show that DNA-based assays, described in this study, permit reliable, sensitive and rapid qualitative detection of genetically modified organisms.

Auth.

5.B2.42. B-Fructofuranosidase of the mutant strain *penicillium canescens* Ame-85. /A. Tsereteli, T. Buachidze, L. Daushvili, N. Butskhrikidze, E. Kvesitadze/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 17-22. – eng., res.: geo., eng.

β -Fructofuranosidase isolated from the culture liquid filtrate of the mutant strain *Penicillium canescens* AME-85 was purified up to electrophoretic homogeneity through precipitation by organic solvent, ion-exchange chromatography, and rechromatography on CM-cellulose column. Homogeneity of the enzyme was confirmed by electrophoresis on 8% PAAG with and without SDS. Specific activity of highly purified preparation was 540 U/mg protein, molecular weight – 148 kDa, temperature optimum – 50°C, pH optimum using 0,25% sucrose as a substrate – 5.0-5.3 and K_m – 11×10^{-3} M. The enzyme represents a glucoprotein and contains 6.0% carbohydrates. EDTA and PCMB did not inhibit the activity of the enzyme.

Auth.

5.B2.43. Pollination and male cone morphometry in *cedrus* species from the collection of Tbilisi Botanical Garden. /N. Shakarishvili, S. Khmaladze, K. Tugushi/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 23-29. – eng., res.: geo., eng.

Microsporangia dehiscence, timing and duration of pollination have been studied in 3 *Cedrus* species growing at the Tbilisi Botanical Garden. Observations conducted in 2008 revealed that pollination time overlapped in *C. atlantica*, *C. libani* and pollen release starts about one month earlier than in *C. deodara*. To characterize and discriminate species, which are genetically closely related, morphometric analysis of microstrobili was carried out, using 7 morphological parameters. Morphological traits of male cones differ

enough to be useful for identification of Himalayan cedars from species of Mediterranean origin. The program SPSS 13.0 was employed for statistical evaluation of measurement results by means of Principal Component Analysis (PCA) and Discriminant Function Analysis (DFA).

Auth.

5.B2.44. Genetic changes induced by action of pesticide zineb in seedlings developed from the soybean seeds of different age. /Zh.Chitanava, T. Zarnadze, A. Shatirishvili/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 30-33. – eng., res.: geo., eng.

The work aims at identifying genetic activity of pesticide zineb, on delayed soybean seeds of different age. One- two-, and three-year seeds of the soybean (*Glycine max*) genetic line L65-1237 have been used in the trial. The seeds were subjected to the action of agent zineb of various concentrations (0.02%, 0.04%, 0.06%, 0.08% and 0.1%) at 24-hour exposure. Induced somatic mutations were registered on the heterozygote (Yiyii) seedling leaves. In the seedlings developed from one-year seed, zineb induced only mutation changes. The direct mutation induction was carried out with much higher frequency in comparison with the back mutation. In the seedlings developed from two- and three-year seeds, zineb induced both direct and back mutations with a higher frequency as compared with one-year seed seedlings. The mitotic crossing-over occurs with high frequency. The “dose-effect” phenomenon was expressed. The age growth was found to be positively correlated with the mitotic crossing-over induction which is a result of the genetic material destabilization.

Auth.

5.B2.45. Features of spontaneous and induced mutants of *Citrus nobilis kovano vasse*. /M. Koridze, R. Khukhunaishvili, K. Dolidze, E. Jakeli/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 35-38. – eng., res.: geo., eng.

Both at spontaneous and induced mutations of *Citrus nobilis* Kovano vasse phenological and generative alterations take place. It concerns growth rate, leaf form, cutting morphology, fruit form and coloration, seminiferous and spicular characteristics, contents of C vitamin and sugar, early ripeness and other features. Bioproducts accumulated have potential of definite mutagenic effect on cell genetic system, which in turn increases capabilities of origination of spontaneous mutations of mandarin.

Auth.

5.B2.46. Engagement of different Fcγ receptors in phagocytosis of immune complexes containing antibodies to mutated human chorionic gonadotropin β chain (hCG β) and native hCG molecule. /N. Chikadze, N. Janikashvili, N. Gachechiladze, N. Mitskevichi, N. Lomishvili, N. Kvirkvelia, P. Delves, N. Porakishvili/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 39-46. – eng., res.: geo., eng.

The aim of this study was to investigate the role of Fcγ receptors (FcγR) *in vitro*, in phagocytosis of hormone-antibody complexes formed after immunization with the mutant hCGβ(R68E). Native, FITC labeled hCG was added to the sera from mutant hCGβ(R68E) immunized rabbits. The suspensions of phagocytic cells were selectively incubated with monoclonal antibodies to FcγRI, FcγRII, FcγRIII and the complement receptor 3 in order to block their functions and phagocytosis was visualized by flow cytometry. We show that the phagocytosis of immune complexes containing anti-hCGβ(R68E) sera of rabbits and native hCG molecules by monocytes and neutrophils is mediated by FcγRI(CD64) and FcγRIII(CD16) respectively in cooperation with the complement receptor 3 (CR3).

Auth.

5.B2.47. Characteristics of distribution of some erythrocytic group abo, rh, kell, mn system antigens and alleles among pulmonary tuberculous patients. /M. Nagervadze, S. Tskvitinidze, S. Donskov/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 47-53. – eng., res.: geo., eng.

Relation of erythrocytic group antigen composition with pulmonary tuberculosis was studied. Immunoserological methods with test-systems of anti -AB, -B, -A, -D, -CD(G), -C, -c, -E, -Ce, -e, -K, -M, -N specificities, standard erythrocytes of O(I), A(II), B(III) groups and serum were used. Obtained data were treated statistically. It was revealed that O(I) and B(III) group carriers are reliably sensitive to pulmonary tuberculosis, but A(II) group carriers less sensitive. High concentration of p(M) allele was recorded in tubercular patients, and vice versa, concentration of q(N) allele is higher (0.35) in control group. We might say that carrying of N-allele is somehow “defensive” feature. High distribution frequency of D-antigen was noted in patients. Reliable high frequency of CC was registered in patients, whereas distribution frequency of Cc and cc is higher in control group. Majority of consumptive patients (72.0±4.8%) is M-antigen carrier, which is explained by sensitivity of this antigen to tuberculosis, while the portion of N phenotypic groups is relatively higher in control group (21.0±4.07%).

Auth.

5.B2.48. Correlation of erythrocyte ABO and Rh-Hr group antigens with breast cancer. /I. Nakashidze, M. Nagervadze, R. Khukhunaishvili, A. Diasamidze/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 54-57. – eng., res.: geo., eng.

The prevalence of ABO, Rh-Hr group antigens in 105 patients with breast cancer and in the same number of healthy donors has been studied. Immunoserological methods have been used to identify the antigens. The studies have demonstrated sensitivity of A (II) and AB (IV) blood group carriers to the aforesaid pathology. A relatively high frequency of D antigen ($94.24 \pm 2.28\%$) has fixed in the patients with breast cancer, which exceeds that of in the control group ($82 \pm 3.8\%$). The diseased population has also revealed a high occurrence frequency of B antigen.

Auth.

5.B2.49. Amylase-producing micromycetes isolated from soils of South Caucasus. /T. Burduli, R. Khvedelidze, T. Urushadze, L. Kutateladze, V. Aplakov/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 58-62. – eng., res.: geo., eng.

A collection of micellar fungi isolated from different ecological niches of South Caucasus has been created in Durmishidze Institute of Biochemistry and Biotechnology. As a result of screening among collection strains 39 producers of amylase were revealed. Most of them belong to the genus *Aspergillus*. The temperature optimum of three strains was established to be within the range 60° - 75° C, making possible to use them in bio and enzymatic technologies to diminish the pollution of the reaction medium while conducting the fermentation process at pasteurization temperature (65°).

Auth.

5.B2.50. Development of technology for creation of “osteophage”- a composite stimulating bone regeneration. /I. Chkonia, A. Meipariani, D. Jhghenti, Z. Alavidze, M. Goderdzishvili, L. Dzidzishvili, N. Kvatadze, D. Mamamtavrishvili, G. Menabde/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 62-69. – eng., res.: geo., eng.

Protection of a dental canal by filling it with special substances represents a common problem in maxillofacial surgery. It has been determined that definite species of pathogenic and conditionally-pathogenic microorganisms including *Staphylococcus*, *E. coli*, *Streptococcus* and Candida-type fungi in association with these bacteria dominate in alveus. Study of microflora of oral cavity is very important in periodontitis to avoid post-operative complications. Based on the above, it is etiologically significant to create an osteorepairing, osteoinductive as well as anti-inflammatory composite, which will contain the substances with all those characteristics. The novelty of the given work is to incorporate bacteriophage into a composite as the best natural non-allergic tool in dealing with the infections, where antibiotics failed. In case of phage application the development of resistance is observed less frequently.

Auth.

5.B2.51. Distance interaction between yeast cells (*Candida kefir* strain BD2) by means of bioinformation technology. /Kh.Ganbarov, I. Abishev, S. Abdulgamidova/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 70-73. – eng., res.: geo., eng.

The fundamental potential of restoration of properties of yeast cells *Candida kefir* strain BD2 lost during the storage has been shown. Usage of bioresonance method allows to restore both, the form and the size of cells, and viability of culture.

Auth.

5.B2.52. The study of microorganisms participating in nitrogen turnover in the soils of Shida Kartli (East Georgia). /I. Gorozia, N. Ramishvili, N. Kotia, I. Buliskeria, Z. Lomtadze/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 74-81. – eng., res.: geo., eng.

A quantitative content of nitrifiers, denitrifiers, nitrate-reducings and free-living nitrogen fixatives has been studied in some soils of Shida Kartli. The physiological groups of dominant microorganisms participating in biogenic turnover of nitrogen in these soils was determined, as well as the main biochemical ways of mobilization and dissimilation of bound nitrogen. It has been established that the soils of Shida Kartli differ from each other by the ways of assimilation and dissimilation of nitrogen which has an influence on the fertility of the soils, as well as on qualitative and quantitative content of cenosis formed on the soils.

Auth.

5.B2.53. New data on microfungi associated with woody legume plants in Tbilisi environs. /M. Churgulia-Shurgaia, K. Kacheishvili-Tavartkiladze/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 82-84. – eng., res.: geo., eng.

The paper deals with the new data concerning microfungi on dead branches of legume plants (*Albizia julibrissin*, *Caesalpinia gilliesii*, *Cercis siliquastrum*, *Colutea orientalis*, *Gleditsia sinensis*, *Pueraria lobata*) in Tbilisi environs.

Auth.

5.B2.54. The preliminary results of palynological investigations of lower sarmatian deposits of Kakheti. /I. Kokolashvili, I. Shatilova/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 85-89. – eng., res.: geo., eng).

The Lower Sarmatian deposits of Kakheti have been studied by palynological method for the first time. About 152 elements of flora are determined. They belong to trees, ferns and grasses. Whole palynological complex is divided into groups in which the plants similar by their ecology are united.

Auth.

5.B2.55. Bioevents on the territory of Georgia during the Late Cenozoic as evidenced by foraminifers and palynomorphs. /I. Shatilova, L. Maisuradze, K. Koiava, N. Mchedlishvili, L. Rukhadze, S. Spezzaferri, A. Strasser/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 90-108. – eng., res.: geo, eng.

The foraminifers and palynomorphs from the Late Cenozoic in Eastern and Western Georgia were studied in more than 45 sections. The evolution of the foraminifers is traced and development stages are distinguished for the Sarmatian and the Meotian. The landscape-phytocenological method allows interpreting the evolution of vegetation depending on climatic fluctuations. Common turning-points in the development of marine and terrestrial biocoenoses are recognized and connected with changes in paleogeography and depositional environments in the region of today's Caucasus during the Late Cenozoic.

Auth.

5.B2.56. Extraction and purification of enzyme arginase and study of some physical-chemical features of its isoforms in the cestode *Piramicocephalus phocarum* plerocercoid. /A. Mamatsashvili, N. Melashvili/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 110-115. – eng., res.: geo., eng.

Purification of the arginase extracted from the cestode of *Piramicocephalus phocarum* was carried out by the gel-filtration and ion exchange chromatography methods. The enzyme appeared to have three peaks of activity, which corresponds to the existence of three isoforms and is also detected by the specific staining of gel electrophoresis. Molecular masses of single isoforms on a Sephadex G-200 column were established by gel-filtration and pH optimums.

Auth.

5.B2.57. Determination of DB1 lectin-binding sites in *helicoverpa armigera* midgut tissues. /M. Gaidamashvili, Y. Ohizumi, T. Ogawa, K. Muramoto/. Bulletin of the Georgian National Academy of Sciences. Biological Series. – 2009. – # 1-2. – vol. 7. – pp. 116-119. – eng., res.: geo., eng.

The binding of DB1 lectin to midgut epithelia of *Helicoverpa armigera* was examined by ABC staining. DB1 strongly bound to larval brush border and basement membrane. The results propose that antinutritive effects of DB1 may be attributed to specific binding and subsequent toxic effects in the midgut of insects.

Auth.

5.B2.58. Study of evaporation-crystallization process of carbonate solutions received from trachyte processing. /M. Mchedlishvili, L. Gvasalia, N. Barateli/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 54-57. – geo.; res.: geo., eng., rus.

There is constructed the solubility diagram of three-component system – $K_2CO_3+Na_2CO_3+H_2O$ at temperature 100°C. There have been defined compounds and yields at isothermal evaporation soda-potash solutions, obtained from complex processing of Georgian trachytes with the method of sintering. On the base of the isothermal diagram and corresponding calculations have been established, that each 100 kg of solution gives 7.658 kg pure K_2CO_3 (9.156nr in recalculation on $K_2CO_3-1.5H_2O$) and 9.342 kg anhydrous soda-potash mixture (81% K_2CO_3 , 29% Na_2CO_3).

Auth.

5.B2.59. The role of rare-earth metals in development of heat-resistance of Fe-Cr-Al system alloys. /G. Mikadze, S. Kurashvili, A. Gordeziani, O. Mikadze, N. Maisuradze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 59-61. – rus.; res.: geo., eng., rus.

Optimum alloying of heat resisting alloys of the system Fe-Cr-Al by rare-earth metals (0.3-0.5 wt%) leads to a change of the mechanism and morphology of a scale growth of these alloys that favourably affects adhesion of barrier oxide layers and durability of the metal matrix. A major factor influencing adhesion of the scale is prevention of voids on an alloy/scale interface and formation of pin microfastenings near the same surface.

Considering the conversion probability of pins into ways of the facilitated diffusion of oxygen, it is not advisable to obtain a big number of dimensional pins.

Auth.

5.B2.60. Drinking water and mineral water treatment method. /Ts. Kurtskhalia, N. Pirtskheliani, Z. Simonia, D. Partsvania, N. Enukidze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 143-145. – geo. res.: eng., rus.

Sorption method of drinking water and mineral water treatment for removing F and Ba ions has been developed by Scientific – Research Center “Membrane”. As a sorbent modified alumina is used. Modification of sorbent is carried out by processing alumina with 1% alkaline solution of CaCl₂. Selective removal of F and Ba ions by this method has been determined. At the same time the mineralization of the water do not change and the concentration of each ion remains within the natural range.

Auth.

5.B2.61. Application of zeolites for deep desiccation of refrigerator oil. /T. Andronikashvili, T. Kordzakhia, L. Eprikashvili, V. Pavliashvili, N. Pirtskhalava/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 179-185. – rus. res.: geo., eng.

Some aspects of application of natural and synthesized zeolites in the deep desiccation process of compressor oil have been considered.

Auth.

B3. Geology. Geodesy

5.B3.1. Prospecting criteria of gold deposits. /D. Bluashvili, N. Japaridze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 43-46. – geo.; res.: geo., eng., rus.

The results of investigations on gold, carried out beginning from second half of the last century till nowadays are analyzed. Three comparative informative groups are picked out and the necessary prospecting criteria of the Gold deposits in the 21st century are considered.

Auth.

5.B3.2. On genesis of Tbilisi olistostromes. /I. Gamkrelidze, G. Nadareishvili, T. Tsamalashvili, L. Bacheleishvili, S. Nadareishvili/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 24-29. – eng. res.: geo., eng., rus.

On the basis of field observation, analysis of boring and geophysical data is shown that formation of Tbilisi olistostromes of Middle Eocene age was connected with submeridional, long developed, condensed hidden deep fault (normal fault) tracing mainly along the right bank of the Kura River. Taking into account peculiarities of geological structure of the eastern part of the Adjara-Trialeti zone and boring data, one can assume that generation of this old deep normal fault took place seemingly already at the close of Early Cretaceous and it continued to develop during the accumulation of thick Albian-Lower Turonian volcanogenic suite, which developed mainly in eastern lying side of this fault (normal fault), but in hanging wall it replaced by carbonaceous deposits. The fault developed or underwent rejuvenation in the second half of Middle Eocene.

Auth.

5.B3.3. Tbilisi fault and seismic activity of Tbilisi environs (Georgia). /I. Gamkrelidze, T. Tsamalashvili, E. Nikolaeva, T. Godoladze, Z. Djavakhishvili, M. Elashvili/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 30-35. – eng. res.: geo., eng., rus.

A complex of geomorphologic, hydrogeologic, seismic data and distribution of rocks' temperature field show the existence in Tbilisi environs, close to the revealed old hidden deep fault, of a young submeridional fault which, proceeding from kinematics of deep and shallow faults of eastern termination of the Adjara-Trialeti zone and orientation of subhorizontal maximum compressive stress axis of this region, kinematically represents a reverse-right-slip fault. Tbilisi fault is characterized by seismic activity and with it is connected both the Tbilisi earthquake of April 25, 2002 and a number of historical earthquakes.

Auth.

5.B3.4. Cenozoic orogenic phases and sedimentation (by the example of Georgia). /F. Maisadze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 36-43. – rus. res.: geo., eng., rus.

On the basis of a litho-facial analysis of Cenozoic formations deposited during the manifestation of orogenic phases (phase of tectogenesis), the processes of sedimentation accompanying these phases as well as paleogeographic and structural changes have been considered. Each orogenic phase was accompanied by accumulation of synorogenic regressive formations, which are direct consequence and criterion of intensification of tectonic movements. It turned out that in some cases there is no temporal coincidence between the orogenic phase and regression, and the manifestation of the same orogenic phase in different

tectonic zones is not strictly synchronous. During the Cenozoic time, the most important were the Pyrenean and Styrian phases, which, along with the Chegem phase, created the principal morpho-structural units and predetermined, in general, the characteristic features and present-day setting of the region. Taking into account the age of regressive deposits and geochronological data, for the first time the duration of each orogenic phase has been determined for the territory of Georgia.

Auth.

5.B3.5. Neotectonic stage of the evolution of the territory of Georgia. /S. Kuloshvili, G. Maisuradze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 69-78. – rus. res.: geo., eng., rus.

The paper considers some problems of geological evolution of the territory of Georgia during the neotectonic stage. On the basis of newly obtained material in the last two decades, the authors revised such questions as the evolution of tectonic structures (both plicative and disjunctive) formed by la-test orogenic phases, development and distribution of molasses and volcanogenic sequences of the Black and Caspian basins, emergence of the present-day relief, formation of denudational and terrace surfaces, rates and character of neotectonic and recent tectonic movements, and some other problems.

Auth.

5.B3.6. History of the geological evolution of relief of Georgia in anthropogene (Quaternary period). /G. Maisuradze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 106-112. – rus. res.: geo., eng., rus.

The work describes the main stage of the evolution of the relief and environment of the territory of Georgia in Quaternary period (the past 2 Ma). In stratigraphic successions, the cause-and-effect interaction of such events as mountain glaciations, transgressions and regressions of the Black Sea, young volcanism, neotectonic movements, etc. is considered.

Auth.

5.B3.7. Model of working reference legend of geological formation of the main range zone of the Greater Caucasus. /G. Chichinadze/. A. Janelidze Institute of Geology, Proceedings. – 2008. – pp. 113-117. – rus. res.: geo., eng., rus.

Considering the data of the latest researches of the crystallinum of the system of the Main Range zone of the Greater Caucasus, a model of working reference legend has been worked out. The system of main geological formations (series, suits, complexes, magmatites) of the mentioned region has been graphically represented by a set of conventional symbols.

Auth.

5.B3.8. New data on the early Cretaceous (Barremian-Aptian) palaeogeography of the West Georgia (within the limits of the middle part of the Rioni River Basin). /I. Kakabadze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 118-125. – rus. res.: geo., eng., rus.

On the considered territory of west Georgia comparatively deep-marine and shallow-marine areas, as well as submarine elevations and temporary islands are revealed. All principal moments of the paleo-environmental changes are considered against the background of alternation of the transgressive and regressive subcycles and connected with them stratigraphical unconformities and variations in fauna composition.

Auth.

5.B3.9. Correlation of the lower jurassic zones and their constituent ammonite complexes of Georgia with the adjacent regions of Azerbaijan and Russian Federation. /M. Topchishvili/. A. Janelidze Institute of Geology, Proceedings. – 2008. – pp. 126-136. – rus. res.: geo., eng., rus.

In the Lower Jurassic deposits of Georgia and the adjacent regions of Azerbaijan and Russian Federation fossil remains of cephalopods are irregularly distributed; but stratigraphically highly valuable zonal complexes, comprising the species that are known in stratotype sections, often represent them. This circumstance allows to allocate here zones of Western Europe and to ascertain their presence. The collected actual material has enabled to update the stratigraphic range of separate species of ammonites and to supplement with them some zonal subdivisions. Based on the data obtained due to correlation of the Lower Jurassic zones of Georgia with its contiguous regions, an inference on the similarity and difference between the constituent ammonitic complexes of the above regions is made.

Auth.

5.B3.10. New data on the zonal subdivision by foraminifera of the Aptian of the Georgian block. /L. Tsirekidze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 157-160. – rus. res.: geo., eng., rus.

On the basis of an analysis of rich palaeontological and stratigraphic data, for the first time in Georgia by benthic foraminifera the Lower Aptian Zone *Gavelinella infracomplanata* is established. Moreover, by planctonic foraminifera in the upper part of the Lower Aptian, the Zone *Blowiella blowi* and in upper part of

the Middle Aptian the Zone Hedbergella trocoidea were established. The noted zones are traced in the same levels of the Aptian in the Mediterranean and South Russian regions.

Auth.

5.B3.11. New data on the bio-stratigraphy of the Upper Hauterivian deposits of Georgia. /M. Kakabadze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 161-167. – rus. res.: geo., eng., rus.

In the Upper Hauterivian (Lower Cretaceous) zonal scheme of Georgia a new level – beds with Pseudothurmannia simionescui is established. It corresponds to the Subzone Pseudothurmannia catulloi in the Lower Cretaceous zonal scheme for the Mediterranean Faunal Province (Hoedemaeker et al., 2003).

Auth.

5.B3.12. On the bio-stratigraphy of the Tchokrakian layers of West Georgia. /G. Ananiashvili, Ts. Minashvili/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 168-176. – rus. res.: geo., eng., rus.

Based on the researches of new, rich paleontological material (mollusks, foraminifers and nannoplankton) obtained from Tchokrakian layers that are widespread in West Georgia, within the limits of the mentioned straton has been confirmed the existence of three independent substages. Our conclusions, though some explorers disagree with them, are based on the fact that, in the Tchokrakian sediments that are spread on the territory of West Georgia, became possible to establish the existence of three qualitatively differing faunal complexes; they express evolution history of the mentioned paleontological groups through time. It directly depends upon the variations of hydrological regime of the Tchokrakian basin. In defining the stratigraphic range of the Tchokrakian sediments and its subdivision into straton, the representative of nannoplankton – *Perforocalcinella fusiformis* Bona has the leading role. It was established, that this form on the whole territory of West Georgia is connected only with the sediments of the Tchokrakian regiostage. It is an index-species of this stratigraphic unit and in geological section it was not found in adjacent sediments.

Auth.

5.B3.13. Shell morphogenesis of Holcodiscus Uhlig (Ammonoidea) genera representatives. /I. Kvantaliani, M. Sharikadze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 184-189. – rus. res.: geo., eng., rus.

Results of a morphogenetic study of shells of two widespread species of the Barremian ammonites of genus Holcodiscus Uhlig have been introduced for the first time. On the basis of study of septal line in ontogeny, it is found to be developed at the expense of differentiation of the initial saddle disposed between the umbilical (U) and internilateral (I) lobes. The similar pattern of septal line development had been established earlier for three other genera of the family Holcodiscidae; this family has been treated in the superfamily Desmoceratoidea

Auth.

5.B3.14. New petro- and geochemical data on Precambrian magmatites of the Caucasus. /D. Shengelia, I. Gamkrelidze, T. Tsutsunava, L. Shubitidze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 190-203. – eng. res.: geo., eng., rus.

According to new data, Precambrian magmatism has been found to be widespread in the Caucasus. On the basis of large analytical material, distribution peculiarities of petrogenic elements, RE and REE (Sm/Nd, La_n/Yb_n, Rb/Sr, Eu/Eu*, Sr/Nd, Rb/Sr-SiO₂ et al.) in Precambrian magmatites are stated. According to petro- and geochemical parameters, granitoids are represented mainly by crustal and upper crustal formations, but among basites predominant are ophiolites. It is established that Precambrian magmatites of various structural units of the Caucasus differ from each other by their age, composition and geodynamic conditions of formation, also by petro- and geochemical characteristics.

Auth.

5.B3.15. Petro- and geochemistry of Late Variscan granitoids of the Caucasus. /D. Shengelia, I. Gamkrelidze, T. Tsutsunava, L. Shubitidze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 204-221. – eng. res.: geo., eng., rus.

Within the Caucasus Late Variscan (Sudetic) orogeny is a period of formation of post-metamorphic potassic granitoids and, as a result, formation of true continental crust. It is also a time of exhumation of deeply buried crystalline rocks. Late Variscan granitoids are mainly represented by two-mica or biotite bearing microcline granodiorites, rarely – by granites and alaskites. It is stated that granitoids of all the exposures are characterized of similar mineral composition, petrologic-geochemical parameters and geodynamic conditions of formation. The granitoids correspond to rocks of normal alkalinity and subalkaline varieties of the calc-alkaline series. According to geochemical data, most of Late Variscan granitoids are attributed to the upper-crustal formations and are more comparable with the S-type granitoids and the lesser part – to common-crustal and correspond to the I-type granitoids. Distribution of RE and REE (Sm/Nd, La_n/Yb_n, Rb/Sr, Eu/Eu*,

Sr/Nd, Rb/Sr-SiO₂ et al.) in the granitoids as a whole corresponds to that of these elements in uppercrustal granitoids of the other regions of the world.

Auth.

5.B3.16. Contact metamorphism of Jalovchat gabbroid intrusive enclosing rocks and xenoliths (Great Caucasus). /G. Chichinadze/. A. Janelidze Institute of Geology, Proceedings. – 2008. – pp. 222-225. – rus. res.: geo., eng., rus.

Contact influence of the Jalovchat intrusive on the enclosing rocks and their xenoliths, having been metamorphosed in the conditions of the staurolite facies regional metamorphism, are investigated. As a result of thermal influence of the intrusive, in these rocks there have been formed parageneses of hornblende-hornfels facies of the contact metamorphism – Grt+Cor+Spi+Sill, Cor+Grt+Spi+Pl⁸²⁻⁷⁸ +Qtz, Gedr+Pl+Bt+Grt+Qtz±Cor.

Auth.

5.B3.17. Typomorphism of minerals of lead-zinc and barite deposits of the Kvaisa ore-field on the basis of the study of fluid inclusions in ore-forming minerals. /I. Dolidze, Z. Otkhmezurii/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 255-263. – rus. res.: geo., eng., rus.

Here are studied typomorphic peculiarities of ore-forming minerals of the Kvaisa ore-field from the standpoint of fluid inclusions. For this purpose, in order to define the temperature minimum of the formation of ore-forming minerals (quartz, calcite, barite, pyrite, galena), a method of decrepitation was applied and cumulative decrepito-grams were produced; they are represented as a chart (1 figure). The work deals with the data of homogenization carried out by different authors. Comparing the homogenization and decrepitation data, one can make an inference that the ore formation took place at gradual decrease of temperature from 320 to 100°C and lower, and the productive ore-formation proceeded within the interval of 320-200°C. In the same minerals, chemical content of fluid inclusions was studied using the triplicate extraction techniques. In the work presented are triangular diagrams (3 figures) of anions (Cl, HCO₃, SO₄) and cations (K, Na, Mg, Ca) they make possible to assume that the content of ore-forming fluids changes successively for different ore types. Morphological characteristics (colloform and metacolloidal textures) of ore minerals (sphalerite, galenite) are indicative of fluid saturation of the ore-forming minerals proved to be true by the presence of similar extremums on the decrepito-gram of ore-constituting minerals, pointing to simultaneous saturation-induced extraction of ore minerals. For different types of mineralization, the following changes are established: in lead-zinc ores they were of calcium-hydrocarbonate-sulfate character, in barite-bearing lead-zinc ores – of calcium-hydrocarbonate-chloride, and for the barite type ores they were of calcium-sulfate-chloride character. The reference list contains 16 items

Auth.

5.B3.18. Character of metal distribution in bottom drift of the rivers Chorokhi and Adjaristkali. /V. Gvakharia, N. Machitadze/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 264-276. – rus. res.: geo., eng., rus.

The source of the sulphide elements in the solid drift of the rivers Chorokhi and Adjaristkali is a range of polymetallic sulphide deposits of the South Caucasus located within the catchment basins of the rivers both in Georgia and Turkey. Among them the largest are Merisi (Adjara) and Murguli (Artvin district, Turkey) deposits. Many long years on the basis of the latter gold abstraction and ore mining and processing enterprises are being operating. Ore mining and processing plant operating in Merisi in 50-60-ies of the last century has been temporarily closed up. In the Chorokhi bottom sediments high concentrations of Cu and Zn – 180 and 290 mg/kg respectively – are observed. Mn and Fe content in the Chorokhi and Zn, Cu and Mn concentrations in the Adjaristkali bottom sediments are in the limits of relevant Clark values. Ore components in the Adjaristkali bottom sediments have not been observed. According to the granulometric fraction analysis data Cu and Zn in the Chorokhi sediments are mainly accumulated in 0.07-0.2 mm fractions. Content of this fraction within the bottom sediments of the river is 5%. Maximum content of Cu and Zn in the Adjaristkali bottom sediments has been observed in the finest fractions (<0.07mm), presumably absorbed on the clay minerals. The character of inter-fraction distribution of Mn and Fe shows that the maximum content is found in 0.14-0.07 mm particles. It has been estimated that Cu represents the marker element of the sulphide minerals depletion products, whereas Mn and Fe are the marker elements of the Adjara-Trialeti folded system forming volcanogenic rock depletion products. Based on obtained results character of correlation of the metals has been determined.

Auth.

5.B3.19. Conditions of mineral formation and typomorphism of pyroxenes of Achara-Trialetian volcanites. /G. Nasidze, R. Akhvlediani/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 283-290. – rus. res.: geo., eng., rus.

The work has attempted to recover paleotemperature and pressure of mineral formation of pyroxenes from Achara-Trialetian volcanites with the account of computer versions of the known thermodynamic estimations by Klodie, Kurepin, et al. It has been determined that for the monomineral (diopside, enstatite-diopside, augite, diopside+orthorhombic pyroxene, enstatite-diopside+orthorhombic pyroxene and augite+orthorhombic pyroxene) pyroxenes from the Paleogene volcanogenic formations of Achara-Trialeti the paleo P-T conditions respectively fall within 3,2 – 16,2 kilo bar and 895°C – 1340°C.

Auth.

5.B3.20. Geological-geophysical and geochemical models of ore magmatic systems of porphyry copper deposits of the Kedabek mining district. /J. Doebrich, V. Babazade, S. Kekelia, V. Ramazanov, Z. Mamedov, A. Ismailova, Sh. Abdulaeva, M. Kekelia, S. Kuloshvili, N. Gagnidze, N. Sadradze/. A. Janelidze Institute of Geology, Proceedings. – 2008. – pp. 307-315. – rus. res.: geo., eng., rus.

A recent analysis of the data on the known gold-porphyry copper deposits of the Kedabek mining district (Azerbaijan) related to the Atabek-Slavyansk plagiogranites (Karadag, Kharkhar, Djagirchai) allows to establish ore-metasomatic zonation of these deposits. With the use of geophysical methods – magnetic, electrical, deep seismic sounding (DSS), geophysical models that may be helpful in mapping of ore-bearing areas have been made. The article contains geochemical characteristics of some ore objects of the region. An inference has been drawn that both the hydrochemical anomalies and the primary geochemical aureoles of Cu, Mo, Pb, Ag, as well as lithochemical dispersion trains of Au, Pb, Cu, Zn can be for practical purposes.

Auth.

5.B3.21. Geological conditions of the formation of non-ferrous metal deposits in the Bolnisi district (Georgia). /S. Kekelia, M. Kekelia, S. Kuloshvili, G. Asatiani, A. Razmadze, N. Sadradze, N. Gagnidze/. A. Janelidze Institute of Geology, Proceedings. – 2008. – pp. 316-329. – eng. res.: geo., eng., rus.

The paper presents brief characteristics of ore-bearing volcanostructures and principal non-ferrous metal deposits of the Bolnisi district. A geological-genetic model of the development of hydrosystems is proposed, and some considerations concerning the main causes of ore formation are discussed. The similarity between the mineralogical zonation of epigenetic and volcanogenic-sedimentary deposits is underlined. This resemblance can be explained by: 1) similar composition of ore-forming fluids, and 2) similar physico-chemical conditions of ore accumulation. A problem of the source of water and ore matter for barite-polymetallic and copper veinlet-disseminated deposits is also considered. The source of ore matter for barite-polymetallic mineralization might have been underground highly-saline brines that were buried in the basement rocks; as for copper stockwork ores that were, most likely, formed according to the principle of the convective model (displacement of hydrotherms under the influence of the thermal field of intrusions), their fluids could have been heterogeneous formed as a result of intermixture of magmatogenic and meteoric waters. (4 Figures, 4 tables).

Auth.

5.B3.22. The definition of optimal conditions of lutetium oxyorthosilicate single crystals growth. /M. Namtalishvili, A. Mikaberidze, N. Basharuli, Z. Razmadze, P. Magalashvili/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 370-377. – rus. res.: geo., eng., rus.

In the present work perspective crystal scintillators based on the large, optically perfect Ce – doped lutetium oxyorthosilicate single crystals LSO:Ce for nuclear spectrometry (γ – Ray Detectors) and positron emission tomography have been received. Traditionally in the Department Physical Crystallography of the Institute of Geology single crystals were grown by the vertically and horizontally directed crystallization methods (modified Stockbarger-Bridgman method). Our preliminary investigation has shown that the most perfect crystals are grown by the method of horizontally directed crystallization. In this case, the elements of directed crystallization are combined with the zone melting advantages. Crystallization is carried out in the conditions of sufficiently developed mirror of melting, which helps the evaporation of undesirable impurities. As a result in this case the chemical purity of crystals increases and the crystals had the following parameters: decay time – not more than 40-43 ns; energy resolution (R,%) over ^{137}Cs – not worse than 11-13 %; light output with respect to $[10 \times 10 \times 2] \text{ mm}^3 \text{ NaI(Tl)}$ at irradiation by ^{137}Cs (E=662 keV) – not less than 70-76 %.

Auth.

5.B3.23. Basalt fibers and metallization of basalt fibers fabricated from basalt of Marneuli deposit. /M. Namtalishvili, M. Jibladze, G. Dgebuadze, A. Mikaberidze, Z. Razmadze, P. Magalashvili, B. Zhorzholiani, V. Arzumanov, G. Tsereteli/. A. Djanelidze Institute of Geology, Proceedings. – 2008. – pp. 378-382. – rus. res.: geo., eng., rus.

The work reviews mining rocks – basalts, their physical and chemical parameters and dependence of basalt melt viscosity of various deposit basalts on temperature. The fabrication technology of basalt fibers is considered and tensile strength values of these fibers at various temperatures and diameters are presented too. Previous results of basalt fiber metallization by low-melting metals are presented.

Auth.

5.B3.24. Study of the technical condition of the Bagrati Temple. /I. Gujabidze, R. Mzhavanadze, Z. Lebanidze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 36-39. – geo.;_res.: geo.,_eng., rus.

A detailed study of the technical condition of the Bagrati Temple - an important monument of Georgian architecture of X-XI centuries, was carried out in 2008. The study includes: the investigation of conditions of the walls, conchs, pillars and basements of different constructions, the recording of the damages, fissures, micro and macro cracks and cavities, the determining of the physical and mechanical features of lining stones, rubble stones, basement stones and building mortar under the field, and laboratory conditions. During the study, the equipment and technologies of the Swiss companies PROCEQ and FIBER OPTIC were used.

Auth.

5.B3.25. On groundwater inflow into construction pit on the territory of Tbilisi. /U. Zviadadze, M. Mardashova, D. Chutkerashvili, N. Kitiashvili/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 45-50. – geo.; res.: geo.,_eng., rus.

Within large urban centres, the fulfilling of construction work is seriously interfered by inflow of groundwater into the foundation pit. By the example of the Capital Tbilisi, considered are hydro geological conditions of one of large construction object – *Sakanela*, situated in the centre of the city, in terms of groundwater inflow into the construction pit. On the basis of a corresponding calculation, the intensity and quantity of inflow are determined.

Auth.

5.B3.26. The endogenous ore formation depth of Okriba barite-bearing knot. /M. Japaridze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 51-53. – geo.; res.: geo., eng., rus.

The endogenous ore formation depth of Okriba barite-bearing knot is considered. The upper parts of barite ores are found to be formed in the mineralization process existed at a depth of 650 – 800m. from the surface. As for distances between the upperest and lowerest blind ore-bearing rock changes from 300 to 1250 m. The ore vertical spread is considerable and hesitates from 500 to 1450m.

Auth.

5.B3.27. Sakeni ore-field (Greater Caucasus) – Geological evidence and prospects. /A. Okrostsvaridze, D. Bluashvili/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 84-87. – eng., res.: geo.

In the crystalline basement of the Greater Caucasus, in the contact zone between the Upper Variscan Sakeni intrusive of dioritic-granodioritic composition of the mantle-crust generation and the Pre-Alpine anatectic granite-migmatitic complex, the authors discovered a Sakeni ore field. There, four isolated ore-manifestations of quartz-gold-lowsulfide hydrothermal genetic type were established, being formed at a medium depth (2-3km), that are entirely controlled by the Alibek regional overthrust and a system of young cross faults. Recent erosion strips, mainly, the frontal part of low temperature quartz-gold-antimonite mineralization. Due to it, more important gold stockwork type mineralization is expected in the deeper horizons.

Auth.

5.B3.28. The southern slope of the Greater Caucasus as natural raw material for ornamental stone (the Kvachadala deposit). /K. Akimidze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 88-92. – eng., res.: geo.

Three levels of volcanism are known in the shaly series of the southern slope of the Greater Caucasus. The most widespraed are Late Pliensbachian-Early Toarcian subalkaline basalts, evidenced as separate outcrops all over the territory of Georgia – from the upper reaches of the river Bzybi up to the border between Georgia and Azerbaijan. The author investigated analogous basaltoids, revealed in the upper reaches of the river Alazani, in the Kvachadala segment, presenting the results in this paper. Considering the data, the mentioned complex has been found to absolutely satisfy all the technical and technological requirements, it has fine external texture and is perfect raw material for manufacturing ornamental stone decorative tiles. Besides, according to the stable homogeneity of the basaltic complex within the limits of its spread, the author assumes it to be prospective as raw material for manufacturing ornamental stone blocks and tiles and recommends to carry out geological studies in this direction.

Auth.

B4. Geography. Cartography. Astronomy

5.B4.1. Landscape diversity of Georgia. /D. Nikolaishvili/. Geography of Georgia. – 2008. – #6-7. – pp. 17-28. – geo.; res.: eng., rus.

One of the most important problems of modern geography is to determine natural potential and trends of landscapes. This problem needs analysis of many indicators of landscapes, such as landscape diversity. The main objective of the research was to determine diversity of landscapes of Georgia. For analysis of landscape diversity, a landscape map of Georgia (1:500,000) was used. This issue is discussed from several points of view: by administrative units (regions, districts) of Georgia, by landscape units (classes, types, subtypes, genus, and types of vertical structure of natural-territorial complexes – NTC) per unit of the area. Thus, landscape diversity is high in those landscapes, which: are widespread, occupy large hypsometrical zones, are located between landscapes with different humidification, and are characterized of different anthropogenic transformation.

Auth.

5.B4.2. Adjarian soils evaluation in the territorial planning aspect. /L. Matchavariani/. Geography of Georgia. – 2008. – #6-7. – pp. 29-40. – geo.; res.: eng., rus.

The material given in the article constitute a part of the work carried out in Adjara within the framework of a joint project "Landscape Planning in the Caucasus Region" in partnership and with the support of Kassel and Berlin Technical Universities and German Nature Protection Federal Agency (BfN). Adjara is characterized of a great diversity of soils. Red soils (Alisols) are of especial unique nature that are a desirable substrate for valuable subtropical cultures. Specific anthropogenic effects that may cause certain natural conflicts in the region have been identified, as well as main goals: preservation of the biological productivity of unique soils; orientation to the development of agriculture; the suspension of erosion; the introduction of ecologically reasonable forms of soil use and making an emphasis on perennial subtropical crops; soils' fertility preservation, especially on terraces and the mountainous zone, etc. The appropriate measures and recommendations are provided; the Adjarian soils assessment and sensitivity maps have been drawn up.

Auth.

5.B4.3. Determination of the historical-architectural potential of a territory for educational and ecotourism purposes. /D. Maisuradze, Y. Verbetsky, T. Khutsishvili, G. Chanishvili/. Geography of Georgia. – 2008. – #6-7. – pp. 105-111. – rus.; res.: geo., eng.

The knowledge of a degree of saturation of a specific region with attraction objects, namely the monuments of anthropogenic origin, is of much importance in planning specific educational and ecological tours. The *size* and the *age* of any building are taken as a measure of "impression" produced on any ordinary visitor of that building. The formula for the Historical-Architectural Potential (HAP) of a building contains also two correctional coefficients: of the construction *type* (fortification, religious or dwelling one, etc) and of its present *condition* (i.e. preservation state), in addition to the dimensional and time components measured on a logarithmic scale. The HAP of individual buildings, as well as the full HAP value and its average density on a specific territory are calculated. The determinations and the method of HAP calculation offered here enables one to estimate and compare by the expected power of "impression" both the separate historical constructions and some regions as a whole.

Auth.

5.B4.4. Influence of global warming on agroecological zone of humid subtropics of Georgia. /G. Meladze, M. Meladze/. Geography of Georgia. – 2008. – #6-7. – pp. 95-101. – rus.; res.: geo., eng.

The article deals with influence of the global warming and climate change on the agroecological zone of the humid subtropics of Georgia caused by the anthropogenic factor. Regression inequalities are received and scenario for case of increase of the temperature by 1° according to regions is made up, the use of which allows making gradation of agroecological microzones with the corresponding sum of temperatures (above 10°) in each 100 m above sea level. It is established that upon the temperature rise by one degree (above 10°), the sum of temperatures increases by 220-240° on average to result in better provision of citrus crops with warmth and the rise of the existing zone up to 100-150 m above sea level.

Auth.

5.B4.5. Views on the visible world. /T. Batsikadze/. Science and Technologies. – 2009. – #4-6. – pp. 42-45. – geo., res.: eng., rus.

In the first part of the work the author's views about the origin and functioning of the visible world, according to which the visible world is a set of eternal expansion-compression processes. The visible and invisible worlds, taken together, exist as a potentiality of uncountable quantity and directions. In the second part of the work the author's views about the nature of a uniform field are stated. As it is known, A. Einstein for several decades was trying to create the theory of a uniform field on the basis of four known fields. In the author's opinion, the proved unsuccessful because except the known four fields, there are also fields of other nature (for example, biological, mental, etc.), which parameters were unknown in the days of A. Einstein. Therefore,

it may be presumed that that there exists a super-reasonable, uniform, energy-information field and the corresponding general, super-reasonable forces with enormous energy that adjust processes both in the visible and invisible worlds.

Auth.

5.B4.6. Batumi underwater spit. /S. Khorava, A. Kikava/. Science and Technologies. – 2009. – #4-6. – pp. 120-123. – geo., res.: eng., rus.

Batumi underwater spit is an interesting relief form in Batumi seaside zone. The development of its parameters was carried out under influence of dominant west waves and at the time of dominant north-west waves the spit joins the beach. Its main peculiarity is that it always strives to grow into a surface form, but the existing natural conditions that contribute to shifting of excessive sediments (50-60 thousand m³ per year) to Batumi underwater canyon make it stay in the underwater form. The Batumi underwater spit is a positive relief form and as a natural underwater breakwater it protects the seashore from washing away; therefore, its role is maintaining the Batumi seaside stability is great.

B5. OTHER NATURAL AND EXACT SCIENCES

5.B5.1. The basic principles of creation of a large deployable space antenna. /E. Medzmariashvili/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 135-150. – eng.; res.: geo., eng., rus.

In the basic principles of creation of the large deployable space reflector antenna, a process of comparison of the Georgian reflector that had been successfully tested in open space and a reflector antenna that has been created within the ESA program is discussed. In addition, the results of experimental researches conducted by the author and the features of construction actually detected in the open space that mismatch the reflector antenna created within the ESA program are considered. As a recommendation, the author presents a new version of a 15-meter deployable reflector antenna based on the analyzed and classified works.

Auth.

5.B5.2. Space technology. /E. Medzmariashvili/. Science and Technologies. – 2009. – #4-6. – pp. 51-56. – geo., res.: eng., rus.

A general systematization of space technology is given. A notion of the space object is defined according to international legal norms. Also, more specifically discussed are principal schemes of and general requirements to the creation of large-size deployable space reflective antennas.

Auth.

C. TECHNICAL AND APPLIED SCIENCES. SECTORS OF ECONOMY

C1. Power Industry

5.C1.1. Determination of reservoir wall width on overturning at various values of stability coefficient. /G. Sultanishvili, D. Danelia/. Building. – 2009. – #1(12), – pp. 23-25. – geo.; res.: geo., eng., rus.

The work compares weights of the rectangular and triangular profiles of dam walls and defines that in the case of the same values of the tilting (overturn) safety factor the rectangular profile dam wall's weight is much more (by 63 %), than in the case of the triangular profile. Such economy is not practically observed. Practically in the structure since theoretically, the triangular profile actually transforms into a trapezium (is trapezium shaped).

Auth.

5.C1.2. Statistic evaluation of parameters characteristic to extrem wave process in the dam crossing. /T. Gvelesiani, Z. Tsikhelashvili, T. Kirimlishvili-Davitashvili, B. Churchelauri, G. Metreveli/. Building. – 2009. – #2(13). – pp. 106-112. – geo.; res.: geo., eng., rus.

The work proposes a statistical evaluation method of the parameters characteristic to a wave process originating in the extreme geodynamic circumstances (earthquakes, landslide, etc.) and under conditions of other extreme effects (based on the application of a correlative and variational evaluation of statistical analysis). In addition, a relevant model-analysis attitude obtained by the deterministic approach is applied and a numeric example is reviewed.

Auth.

5.C1.3. On the technique of determination of heat mass transfer non-stationary coefficients in mine tunnels. /O. Lanchava, Z. Lebanidze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 40-44. – geo.; res.: geo., eng., rus.

Simple formulas for calculating non-stationary factors of heat and mass transfer in mine tunnels based on the application of generalized values of the dimensionless temperature and the dimensionless potential of energy and mass transfer obtained by a method of mathematical modeling are offered. By using the mathematical modeling, the nomograms determining the dimensionless temperature and dimensionless potentials of mass transfer in mine tunnels are built.

Auth.

5.C1.4. Energy saving should become priority of state energy policy. /G. Meskhia/. - Akhali Ekonomisti. – 2009. – # 3. p. 66-69. – eng. res.: geo., eng.

Wide-range implementation of energy saving activities in the country require the development of the appropriate energy saving policy, strategy, and legislative base; the working out of a mechanism for wide introduction of the energy saving technologies; the preparation of energy saving programs, etc. In order to sort out these problems, it is necessary to establish in the energy sector a new licensing body – Energy Saving Department. Functioning of the Energy Saving Department will significantly consolidate the energy safety of the country and make a certain contribution to the handling of social and environmental problems. For example, by making measures relating to the energy saving in Tbilisi, we may significantly save energy resources, including: 430.4 million kWt/hour of electric power, 64 million m³ natural gas and 13 million liters of car fuel. Using two energy saving bulbs, 350 families will save within 6 years GEL 5,44 per month. These energy saving measures will also contribute to a reduction of the emission of CO₂ into the atmosphere by 1,74 million tons, to the reduction of capacity shortage in the power system by 124,4 megawatts, etc.

Auth.

C2. Electrical Engineering. Electronics. Radio Engineering. Communications

5.C2.1. Investigation of materials' properties by an electronic technique. /N. Kanteladze, L. Zivzivadze/. Novation. – 2008. – #3. – pp. 28-32. – geo.; res.: geo., rus., eng.

The work shows the influence of materials' technical composition on the technological processes and preparation processes of raw materials. It gives a scheme for switching the assembling block into current voltage that depends on the polarization phenomena that causes delay during the counting time of measuring equipment and the appropriate inclinations. In order to investigate the materials' properties by applying an electronic technique, it is better to use alternating voltage when the energy conducted in the circuit contains the active and reactive components. Accordingly, the equivalent conductivity contains the active component which is connected with the material's dielectric permittivity. In a given scheme, there are presented the ampere-meter, volt-meter and phase-meter. On the basis of presentation of the measuring equipment, the electric conductivity and dielectric permittivity that express the materials' electric properties are calculated.

Auth.

5.C2.2. Study of controllable electric power lines and their some typical regimes. /O. Zivzivadze, L. Zivzivadze/. Science and Technologies. – 2009. – #4-6. – pp. 78-81. – geo., res.: eng., rus.

Controllable electric power lines are studied and their typical regimes are considered, such as no-load, load and natural power transfer regimes. Distribution patterns of the voltage and other regime parameters along the line are analyzed in accordance with the phase angle. Comparative analysis of the same regimes in accordance with ordinary doubly-circuit lines is given. Special attention is paid to the so-called regime of natural power transfer. It is shown that a regime of natural power in the controllable lines, unlike ordinary ones, is established at in-phase and reversal phase regimes. The calculating formulae for these powers are given. Dynamics of the loss of electricity in the controllable electric power lines is analyzed as well.

Auth.

5.C2.3. Correction of mistakes in second type bipulse code. /D. Nanobashvili, V. Nanobashvili/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 19-23. – geo.; res.: geo., eng., rus.

The possibilities of correction of mistakes in the second type bipulse code are considered. An error correction method for this code, which is advised according to 3B4B code, is selected. It is shown to provide the detection of errors with the probability of 1 with any number of them, the correction of single, sequential double and arbitrary triple damaged symbols with the probability of 1 and non-sequential double damaged symbols with the probability of 0,33.

Auth.

C3. Automation & Telemetry. Computer Engineering

5.C3.1. Investigation of metric properties of quality criteria space when solving multicriterion optimization problems. /M. Salukvadze, R. Gogsadze, N. Jibladze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #3. – pp. 41-56– eng., res.: geo.

The problem of the construction of an object functioning in the regime of optimum performance at the design stage is reduced to the solution of the problem of multi-criterion optimization, where the quality criteria are chosen to be its most essential characteristics (parameters). At the same time in all methods of multi-criterion optimization the vector quality criterion is considered basically in the linear Euclidean space. Actually, in most cases, the criterion space is non-Euclidean – it is curved. Therefore, such setting cannot give results adequately reflecting the processes running in real systems. In order for the design system to really satisfy the optimality requirements the authors of the given paper offer a resolutely new approach to the solution of the problems of multi-criterion optimization based on the definition of the quality criteria space and on finding an invariant corresponding to the distance between any two points of that space. The idea of the study of the metric properties of the quality criteria space and their use in solving problems of optimization was offered in the work [1]. But that idea, due to its complexity, has not been completely realized until now. When solving such problems the quality criteria space was automatically identified with the Euclidean space with corresponding metrics. In the general case this couldn't give results adequately reflecting the processes occurring in real systems. In the present paper metric properties of space criteria are studied for the first time, using as the main instrument the mathematical apparatus of tensor analysis, Riemannian geometry, differential equations in partial derivatives etc. Boundary problems relative to the components of the metric tensor of the n -dimensional space of the phenomenon states enabling to determine its metric properties are posed. The knowledge of the metric tensor furthers the objective appraisal of the phenomenon state and the definition of the optimal state.

Auth.

5.C3.2. Problems of verification of functional programs. /N. Archvadze, M. Pkhovelishvili, L. Shetsiruli/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #3. – pp. 57-60. – eng., res.: geo. Program verification arguments are considered together with structural and transfinite induction methods. The nature of an abstract program for the functional programming language LISP and its mechanical verification problems are discussed.

Auth.

C4. Mining. Metallurgy. Chemical Industry

5.C4.1. Study of biocidal activity of some of composite preparations. /B. Tsereteli, G. Chimakadze, Z. Kuratashvili, T. Katamadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1 – pp. 98-100 – rus. res.: geo., eng.

The biocidal activity of composite preparation containing N-chloro-toluol sulfamide of sodium and peroxycarbonate of sodium towards E.Coli and St. Aurues has been studied. The optimal composition has been exposed which, after a 30-minute exposition, fully kills bacteria.

Auth.

5.C4.2. Physical and mathematical substantiation of two-parameter dielcometric method for determination of humidity and density of materials. /A. Khurtsilava/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1 – pp. 113-115. – rus. res.: geo., eng.

The work deals with the electrophysical model of a material in a variable electrical field by an example of building materials representing a composite chemical product. The possibility of obtaining of active fillers of silico-organic spots by using the mechanical adsorption method based on a natural zeolite containing tufa was studied. The dependence of dispersion and degree of polymorphism on chemical consistence and quantity of surface active compounds used in the modification process of mechanical adsorption of clinoptilolite were established. Composition coatings with best physic-mechanical properties and organosuspensions with plastic strength were obtained in case of content of clinoptilolite with uniform, optimally organophylized surface. It makws possible by structural-mechanical properties of organosuspention of clinoptilolite optimize and obtain high effective fillers.

Auth.

5.C4.3. Utilization of winemaking waste in oil industry. /M. Siradze, I. Gogsadze, Kh. Dididze, M. Bekauri, I. Berdzenishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1 – pp. 116-117. – rus. res.: geo., eng.

New technology of alkaline neutralization of cotton oil by using water-alcohol solvent has been developed. Aliphatic alcohols have been used for suppressing the emulsifying activity of phospholipids. An increase in the yield of refined oils by 1.6-2.% is the advantage of new technology.

Auth.

5.C4.4. Use of gaseous flows in laser welding of cardan shaft. /M. Khutsishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 247-251. – rus. res.: geo., eng.

Possible options of cardan shaft welding are considered: arched welding in CO₂; friction welding and laser welding with soldered joint. Disadvantages of both options are described. Superiority of gaseous flows in laser welding of cardan shaft is justified. Based on the research, the technology of laser welding of cardan shaft is worked out. Use of additional impulsive gaseous flows enables to provide minimal width ($1,5 \times 10^{-3} \text{m}$), of soldered joint on all types of shafts and avoid the development of cavities, (rupture, fissure), improving the stability of melting inside for 80%. Soldered joints are characterized of high performance ensuring long duration of the cardan shaft.

Auth.

5.C4.5. Catalytic synthesis of sylvan from furfural. /I. Mikadze, T. Alavidze, R. Tsiskarishvili, T. Uchaneishvili, O. Baidoshvili, Z. Amiridze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 254-256. – rus. res.: geo., eng.

Hydration of furfural on copper-zinc-aluminium catalyst (НИАП-06-03) have been studied. Influence of temperature, molar ratio of hydrogen/furfural and flow rate on reaction process have been investigated. Optimal conditions for receiving sylvan were established.

Auth.

5.C4.6. Investigation of physical-mechanical and tribological behavior of composites obtained on the basis of phenolic resin and hard-sized clinoptilolite. /D. Gventsadze, E. Markarashvili, L. Gventsadze, G. Mindiashvili, O. Mukbaniani/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 257-260. – rus. res.: geo., eng.

The influence of a modifying additive of a liquid production waste of tetraethoxysilane (TES) on the physical-mechanical and tribological behavior of composites obtained on the basis of phenolic resin filled by mineral raw material of Georgia – clinoptilolite was investigated. It was shown that the modifier added in the quantity of 3 and 5% (weight) appreciably improves the strengthening properties of composites, achieving the maximal parameters at 50% of filling. The application of the modifier also improves the strengthening and tribological properties of the composites filled by binary filling clinoptilolite and graphite, reduced friction (3 times), raised the wear resistance (6 times), and appreciably decreases the temperature on the friction surface.

Auth.

5.C4.7. Development of silicomanganese smelting technologies, studies and industrial development by using high iron-containing low-quality manganese ores in the charge at the ferroalloys miniplant *Meteks Ltd.* /Z. Simongulashvili, T. Sharashidze, M. Tsirdava, B. Maisuradze, S. Nebieridze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 52-56. – rus.; res.: geo., eng., rus.

The possibilities of developing new techniques and technologies under conditions of a ferroalloys miniplant *Meteks Ltd.*, its flexibility to change the technology and the segment of the produced production in the shortest period of time, taking into consideration market demands have been discussed. The advantages of such miniplants over large plants have been analyzed. A new technology of producing silicomanganese in the charge using high iron-containing low-quality manganese ores has been developed for the first time.

Auth.

5.C4.8. Modernization of conveyor injection-molding machines in Zestafoni ferroalloys plant. /G. Jandieri, D. Robakidze, R. Gvetadze/. Novation. – 2008. – #3. – pp. 45-52. – geo.; res.: geo., rus., eng.

Tendencies of world production development in a direction of increasing the efficiency of the technological process of conveyor casting of ferroalloys are considered. A progressive cellular conveyor injection-molding machine is modernized and tested. The performance properties of them are described. Under production conditions of Zestafoni ferroalloys plant, the technological and technical efficiency of the modernized molds are investigated. It is established that the performance of the molding machines grows by 20%, the liquid metal losses decrease 1-1,5-fold, the full fractionating of solid ferroalloys is obtained, and the stability of moulds raises 6-7-fold. The dependence of the commodity output on technological casting regime and the empirical equation for definition of rational thickness of mold walls depending on the applied material are established. The expediency of application of steel (C-0,25%) in a place of cast iron (C-2,5%) as a material mould as well as the economic efficiency of introduction of the new technical solutions are noted.

Auth.

5.C4.9. Economic reform in Georgian mining industry. /G. Lomsadze, G. Lobzhanidze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 31-35. – geo.; res.: geo., eng., rus.

The objective necessity of reforming the Georgian mining industry in the period of transition to a market economy that requires a strict system approach to a whole number of economic indicators and provides for clear-cur formulation of objectives are discussed. The State regulation in the process of reform shall, under existence of the respective legislative base, ensure economic efficiency of the mining sector enterprises and growth of the country's industrial and economic potential.

Auth.

C5. Mechanical Engineering. Instrument-making

5.C5.1. Surface construction using first-class tangent transformations. /N.Abuladze, M.Chelidze, T.Shukakidze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 85-88. – rus.; res.: geo., eng., rus.

Surfaces are constructed by means of a directing equation given as a vector of the first-class tangent transformations. Surfaces considered as varieties consisting of tangent elements are used in the equation as a prototype and basic figures. The device allows constructing surfaces according to the specified positional and differential–geometric conditions being the prerequisite for its application upon machining of parts of an irregular shape on a machine-tool.

Auth.

5.C5.2. Capacity measurement of precision capacitive sensors. /B. Mamikonian, A. Antonian/. Novation. – 2008. – #3. – pp. 14-19. – rus.; res.: geo., rus., eng.

Capacity measurement of precision capacitor sensors is difficult mainly because of the influence on the measurement accuracy of parasitic parallel resistance representing active capacitor losses. The quantitative estimation of this influence is made and it is shown that the appropriate choice of the measurement method scheme and the realization of corresponding algorithm such influence can be eliminated.

Auth.

5.C5.3. Kinematics of the process of tracking in followers of the grinding machine tool. /Z. Balamtsarashvili, T. Mchedlishvili, Z. Chitidze, N. Gelashvili, M. Lomidze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 86-88. – rus.; res.: geo., eng., rus.

Earlier developed schemes of rotor–grinding copying machine tools are constructed on the basis of combination of rotary movement of a tool rotor with swinging of the copier levers mounted on a rotor of the machine tool. On the basis of the conducted kinematics researches, original mathematical regularities serving as a basis for revealing the nonlinear function of the position realized in the investigated copier and necessary for subsequent dynamic research are obtained.

Auth.

5.C5.4. Kinematic research of the grinding machine tool follower for processing profiled components. /Z. Balamtsarashvili, T. Mchedlishvili, Z. Chitidze, N. Gelashvili, E. Kristesiashvili/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 89-91. – rus.; res.: geo., eng., rus.

For solving the equation of function of the position of a pusher, the central profile of a cam (billet) and values of the movement of the centre of the grinding actuator given its elasticity and the fie hold-down pressure are determined. On the basis of the obtained movements, parameters of the swivel angle of the pusher and the follower bar are identified.

Auth.

5.C5.5. Optimal brake rigging with two-way pressing of shoes of the electric train motor car. /G. Sharashenidze, M. Dolidze, N. Mgebrishvili, S. Sharashenidze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 92-95. – rus.; res.: geo., eng., rus.

The necessity for optimizing the existing brake rigging of the electric train motor car is substantiated. An improved variant of brake rigging by means of replacing some of the shoes and articulated combinations has been designed. The new system has less levers and articulated combination. The work gives analytical expressions of reduction ratios by considering power and geometrical parameters of the braking system. Using the optimal brake linkage will ensure the meeting of the requirements for the safety of movement, economic efficiency of production and assembling of the linkage, as well as the braking effect at high speeds of movement.

Auth.

5.C5.6. Quadratic index exponential law of reliability factors distribution. /M. Shilakadze, Z. Kashiashvili/. Science and Technologies. – 2009. – #4-6. – pp. 82-85. – geo., res.: eng., rus.

On the basis of the carried out experimental and theoretical researches it has been stated that at stated operation of mechanical systems the law of refusals distribution is most effectively expressed with quadratic index exponential function. Therefore, the reliability indices of mechanical systems trustworthiness and the parameters of their spread are theoretically determined.

Auth.

C6. Light Industry

5.C6.1. The ways of improvement of process of wool dyeing implementing borax solutions. /K. Goginov/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 104-107. – geo. res.: eng., rus.

The work shows that application of borax in wool dyeing process as a color fixing agent improves the consumer and color characteristics of textile materials.

Auth.

5.C6.2. Bleaching of cotton lipids with natural and synthetic adsorbents. /M. Siradze, I. Gogsadze, I. Berdzenishvili/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 269-270. – rus. res.: geo., eng.

High bleaching capacity of natural and synthetic sorbents (bentonites and zeolites) is shown. It is stated that natural and synthetic sorbents show high activity relative to chlorophyll group pigments. The degree of preparation of pheophytins using zeolites is a little more than in case of ascanite using.

Auth.

5.C6.3. Determination of porosity and filling of a surface by strings of knitted filters for transfusion of blood. /Z. Vadachkoria/. Novation. – 2008. – #3. – pp. 120-123. – rus.; res.: geo., rus., eng.

The work specifies that one of the basic requirements to blood transfusion filters is porosity and filling of the filter surface by strings. It is shown that the proposed clearance area estimating method by M. Genser in the case of weft-knit fabric is unacceptable for. A new original method of pore surface measurement has been used. The data are shown in the table. The obtained porosity data allow identifying variants with the greatest number of pores and the smallest pores on the sample surface. The weaves of these variants are found to have the best parameters of filtration. It is established that porosity depends on the ratio of lengths of strings in loops, sketches and weft broaching and the density of the weft-knit interlacing. All this should be taken into consideration during optimization of the parameters of samples for achieving the highest filtration factor and the filter capacity.

Auth.

5.C6.4. The effect of the process of knitting of transfusion fabric filters on medical requirements to them. /Z. Vadachkoria/. Novation. – 2008. – #3. – pp. 124-129. – rus.; res.: geo., rus., eng.

The work deals with a mathematical model describing the process of knitting of fabric transfusion filters. The dependence characterizing the study parameters of the process (the length of a string in a loop in our case) and the independent changeable (factors) is found. The limits of variation by tension of the filling thread and ground yarn are established. By using a mathematical method of planning and processing of the test results, dependences of lengths of strings in loops of the ground and weft stockinet are established depending on the tension of threads of different systems.

Auth.

5.C6.5. Choosing of the sampling drum fitting on a rotor spinning machine. /M. Gogoladze, I. Chitorelidze/. Science and Technologies. – 2009. – #4-6. – pp. 91-93. – geo., res.: eng., rus.

The optimal fiber capacity of fittings proposed according to the results of their testing and regressive analysis is within the limits of $0.168-0.176 \text{ cm}^3/\text{cm}^2$. The slope angle of the front of a tooth that equals 70° and the pitch length of 2.5 mm is sufficient for sampling of the fibrous tape that facilitates the removal of down and dirt from the camera, improves the uniformity of fibrous tape lengthwise and increases the yarn quality and strength.

Auth.

5.C6.6. Preparing pure silk thread for knitwear manufacture. /Z. Vadachkoria, N. Idadze/. Science and Technologies. – 2009. – #4-6. – pp. 94-99. – geo., res.: eng., rus.

The technology of preparation of pure silk thread has been studied. The main factor interfering with the use of pure silk thread in knitting industry has been found to be its irregularity in linear thickness. According to mathematical calculations, the law of variation of thickness of a counterbalanced filament has been established.

Auth.

C7. Food Industry

5.C7.1. Oxygenation changes in the fermentation tea mass of different height. /I. Adamia, R. Melkadze/. Novation. – 2008. – #3. – pp. 84-87. – geo.; res.: geo., rus., eng.

Changes in the content of oxygen in a fermentation layer of a different thickness and fraction (from 5 to 50 cm) have been studied. In both fractions, the content of oxygen first falls, reaches the minimum, and then rises. The speed and size of falling of the content of oxygen depends on the thickness of a layer and a kind of fraction. The height of a layer is in direct proportional dependence on the speed and size of reduction of oxygen. For a rolled fine fraction, the size and speed of oxygen reduction is much over than for the second-rolling fraction. The difference in structure of oxygen is more pronounced between thick layers (30, 40, 50 cm) than between thin (5, 10, 20, 30) layers.

Auth.

5.C7.2. Manufacture of green tea product with addition of pomegranate leaves and their extract. /N. Chikovani, E. Kakhniasvili, N. Katamadze/. Novation. – 2008. – #3. – pp. 88-93. – geo.; res.: geo., rus., eng.

Technological regulations of manufacture of green tea products with the use of vegetable raw material - leaves of pomegranate and their extract - have been studied. A green tea product is manufactured by contemporary processing of pomegranate leaves and tea - their selection and fixation. The manufacture of green tea products with addition of pomegranate leaves is found to require a preliminary fixation of the leaves. An extract of 5-7% concentration is generally used.

Auth.

5.C7.3. Experimental substantiation of parameters of selective dry tea breaking. /Z. Japaridze/. Novation. – 2008. – #3. – pp. 94-97. – geo.; res.: geo., rus., eng.

The optimal values of selective dry tea crushing parameters are experimentally substantiated. Modeling of a breaking roller as a laboratory device enabling to change the operating factors in the given intervals is made. As a criterion of estimation of the tests, the criterion of technological efficiency of division of a two-component mix in two fractions is accepted. For search of an extremum of this criterion, the simplex method is used. As a result, it is concluded that the high effect of selective breaking of dry tea is reached at the minimum values of the roller diameter of the breaking machine and the hardness of its elastic surface. Illus.3, bibl.2.

Auth.

5.C7.4. Study of chronic toxicity of tea leaf extraction oil. /V. Khvedelidze, I. Bochoidze, G. Gorgodze, M. Gegeshidze, N. Khazaradze, G. Khvedelidze/. Novation. – 2008. – #3. – pp. 98-103. – rus.; res.: geo., rus., eng.

It has been experimentally found that a long-term application of tea leaf extraction oil does not have an inhibitory action on the liveweight gain in animals, does not entail changes in biochemical blood values as well as does essentially affect the morphological composition of the peripheral blood of laboratory animals (dogs). In terms of the outward look, coat, visible mucous membrane, food intake and conduct, the laboratory animals did not practically differ from the control group animals. The obtained data evidence that introduction of tea leaf extraction oil at the doses of 1/10 to 1/5 LD₅₀ does not essentially affect the functioning, condition and structure of the inner organs as well as the main values of animal metabolism.

Auth.

5.C7.5. Production of packeted tea enriched by a vegetable supplement. /N. Chikovani, E. Kakhniasvili, N. Katamadze/. Novation. – 2008. – #3. – pp. 104-110. – geo.; res.: geo., rus., eng.

Experiments on using different parts of a pomegranate leaves as a supplement in packeted tea mixes were carried out. The supplement (leaves) at the rate of 10-15% was found to ensure the improvement of quality characteristics of the green tea siftings, whereas the supplement at the rate of 10% enhances the main chemical components of the black tea siftings. The developed technological scheme includes cooking. The obtained product is characterized of having a specific taste, smell and more intensive color.

Auth.

5.C7.6. Control of sea citrus mealybug (*Pseudococcus maritimus*, Ehrh) in Imereti. /N. Chachkhiani, M. Kubaneishvili/. Novation. – 2008. – #3. – pp. 135-138. – geo.; res.: geo., rus., eng.

Citrus crops occupy a special place in agriculture of Georgia. Citrus crops are known to be liable to numerous pests, the mealybug being the most injurious for their harvest. The work aims at studying injuriousness of the mealybug under laboratory conditions of the F. Mamporia Laboratory of Citrus Genetics and Selection. The mealybugs harm leaves, flowers, fruits and stalks of the citrus and ornamental plants. A part of the mealybug-injured plants exfoliate and fade which, certainly, affects the yield. The following pesticides have been used against the sea mealybug: a coal-oil emulsion, carbophos, the new Bi-58 and the

combination of the coal -oil + Bi-58. A combined mixture of Bi-58 and coal-oil is recommended to control the said pest.

Auth.

5.C7.7. Effect of pesticides on living organisms. /N. Chachkhiani/. Novation. – 2008. – #3. – pp. 147-150. – geo.; res.: geo., rus., eng.

Pesticides are widely spread in the world. Especially widely used in national economy are insecticides (against destructive insects), fungicides (against fungi), herbicides (against weeds), zooids (against rodents), also plant growth stimulants. It should always be remembered that improper application of pesticides might lead to undesirable results. They can damage not only insects, plants and various microbes but also can kill warm-blooded animals. They are potentially dangerous to the nature and humans. Organochlorine and organophosphorous preparations are most widely used. Out of organochlorine pesticides, the following are applied in agriculture: DDT (dichlorodiphenyltrichloroethane), hexaloran, chlorophos, hetachlorine, etc. They are characterized of high stability to different environmental factors. For instance, DDT remains in soil for about 10-15 minutes and tends to accumulate in the adipose cells of poultry, fish, animals and human beings. After taking food polluted with organochlorine pesticides and compounds, the organochlorine compounds stay in the human body for a long time. DDT has been removed from the list of chemical agents recommended to control pests in agriculture in Georgia. The quantity of pesticide residues shall not exceed the maximum tolerated dose (MTD).

Auth.

5.C7.8. Calculation of grape husk drying machine operating on the infrared radiation energy. /M. Mikaberidze, Sh. Mikaberidze/. Novation. – 2008. – #3. – pp. 225-228. – geo.; res.: geo., rus., eng.

The work gives the results of research of drying grape husks in the field of infrared rays. The advantage of the method, the optimal regime of the process are given, as well as the geometric and energetic parameters of the said drying machine are calculated and its schematics diagram is developed.

Auth.

5.C7.9. Influence of a freezable body on the duration freezing. /T.Megrelidze, G.Gugulashvili, E.Sadagashvili/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 100-103. – geo.; res.: geo., eng., rus.

The freezing of food products is widely applied under both production and everyday living conditions. The freezing process is influenced by many factors, the most important ones of which are the shape and sizes of the freezable body. In practice, the most popular shapes of a freezable body are the sphere, the cylinder and the cuboid. According to the work results, the duration of freezing of any body depends on its volume and the heat transmission surface area. The body's freezing time is counter proportional to its surface area and directly proportional to its volume. For spherical and cylindrical bodies the geometrical value determining the freezing speed is the diameter, whereas for the cuboid bodies – the ratio of the lengths of their sides.

Auth.

C8. Construction. Architecture

5.C8.1. Kinematical analysis and structure of deployable 48 m span bridge. /E. Medzmariashvili, V. Gogilashvili, M. Sanikidze, N. Tsignadze, G. Bedukadze, N. Siradze, G. Medzmariashvili/. Building. – 2009. – #1(12), – pp. 6-17. – geo.; res.: geo., eng., rus.

The object of research is single-span, deployable, extreme, multiple application bridges that can be installed on a single transport-installation carrier – truck, tank or helicopter. It is laid and removed from surmount obstacle in the shortest term. During its installation and dismantle people do not leave the transport-installation carrier. In the presented structure, the bridge span is increased up to 48 meters, and the weight and overall dimensions of its folded package are the same as in the existing 24-meter span bridges. The paper provides the structural and kinematical analysis of the basic mechanism of the bridge – the pantograph type transformed system with regular structural elements; defines laws of change of geometrical parameters of the mechanism that provide the system's disclosing on an arch surface. On the basis of received results, the structural and constructional optimization of the researched object is carried out and the optimum structure of the single-span deployable bridge with corresponding technical characteristics is developed.

Auth.

5.C8.2. Definition of optimum parameters of a three-rod girder. /B. Gvasalia, D. Jankarashvili, T. Sherazadishvili/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 9-13. – geo.; res.: geo., eng., rus.

A mathematical model of a three-rod girder is determined. The three-rod girder is set as a task of selection and of the optimum parameters and design of the rods allowing to minimize the girder's weight and to meet the requirements to the strength and stability of the rods. A set of applied programs using a random search method for finding the global extremum to calculate the minimum value of the weight function is developed.

Auth.

5.C8.3. Testing of reinforced concrete construction elements on bending, vibration and identification of its initial rigidity. /I. Kvaraia, N. Mskhiladze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 14-18. – geo.; res.: geo., eng., rus.

The development of modern computer technologies allows exercising control over constructions in an uninterrupted automatic regime. This requires that the information on test results have to be obtained through existing converters and then put into in such a form that is easy to process. Therefore, during any test the parameters being under scrutiny should, first of all, be identified and the methodology for their identification selected. In order to identify the parameters in their entirety, which is important at any stage of a strained deformed state of bending reinforced concrete constructions, we have developed a simple methodology. Also experimentally determined and compared with a theoretical value of the rigidity were the initial dynamic and static rigidities.

Auth.

5.C8.4. Deformation of light concrete at cyclic pressing tension. /I. Kvaraia, N. Mskhiladze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 19-24. – geo.; res.: geo., eng., rus.

In Georgia, as in active seismic region, a wide application of light concrete is of great importance. Based on the effectiveness of light concrete, the production of manmade light concrete aggregates has long been practiced in the world, which is a rather costly process. As regards Georgia, it has practically the unlimited reserves of aggregates of natural volcanic origin, the physical and mechanical properties of which are well studied but which are poorly used in practice. Given the present construction boom in the country, the light aggregate-based concrete needs to be further studied. For this purpose, tests for axial compression and tension of light concretes were carried out both in the case a single and cyclically increasing static loads of seismic type.

Auth.

5.C8.5. Methods of the destruction of rocks under static and dynamic loads. /G. Baliashvili, F. Bezhanov, L. Gurchumelia, N. Sarjveladze, T. Rukhadze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 33-37. – geo.; res.: geo., eng., rus.

The work deals with the destruction of the samples of marble, sandstone and tuff by the action of static and dynamic loads upon their testing in the dry, water saturated and SAS saturated solution, in the air, water, and SAS medium. The methods of rock destruction and the causes of the variation of the value of specific destruction work are given.

Auth.

5.C8.6. Questions of formation of the architectural environment and interior of family type hotels in high mountainous regions of Georgia (by the example of “Piraketa Khevsureti” and “Ukana Pshavi”) /I. Gabashvili, M. Milashvili/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 57-62. – geo.; res.: geo., eng., rus.

The role of tourism as one of the leading spheres by its socio-economic significance of the world economy of the 21st century and as one of the important sources of economic wellbeing of our state is considered. As the basis of tourism development is the setting up of a network of hotels, the work outlines the urgency of establishing small family-type competitive hotels throughout Georgia. For this purpose, the most promising regions of Georgia “Piraketa Khevsureti” and “Ukana Pshavi”. These are very scenery, original and unique in architecture and historical past localities situated within complex natural landscape.

Auth.

5.C8.7. Calculation of a concrete mix with chemical admixtures. /A. Chikovani, D. Tevzadze/. Building. – 2009. – #1(12), – pp. 26-30. – geo.; res.: geo., eng., rus.

Chemical admixtures have made a revolution in the construction technology, dramatically changed a ratio of in-situ, precast and reinforced concrete in the construction industry. At present, almost everything in Georgia is constructed with in-situ concrete with admixtures, the calculation of which is a matter of great responsibility.

Auth.

5.C8.8. On a possible early collapse of reinforced concrete structures. /B. Grigolashvili, J. Esaiashvili/. Building. – 2009. – #1(12), – pp. 31-35. – geo.; res.: geo., eng., rus.

The works deals with the damages caused by earthquakes to reinforced concrete buildings, a critical review of the existing earthquake engineering codes and the experimental research of the possibility of early collapse of buildings and structures and the causes thereof.

Auth.

5.C8.9. Housing stock and service areas. /N. Tevzadze, N. Mchedlidze/. Building. – 2009. – #1(12), – pp. 44-48. – geo.; res.: geo., eng., rus.

The article deals with the problem of designation and placement of service areas in 3 structurally different types of dwellings: an apartment, an apartment building and a group of apartment buildings. A connection between the dwelling and the service areas and provides for a certain connection between housing and services, diversity of the function and architectural and artistic expressiveness of the dwelling.

Auth.

5.C8.10. Calculation model and differential equation of movement of the system “foundation building of floating piles”. /M. Chanturia, A. Gongadze/. Building. – 2009. – #1(12), – pp. 49-51. – geo.; res.: geo., eng., rus.

The article deals with a calculation models of the system “foundation building of floating piles” and differential equations of movement of the system representing a weightless overhanging design. The differential equations are solved by the Runge-Kutt method.

Auth.

5.C8.11. Properties and use of building reinforcement. /L. Okujava/. Building. – 2009. – #1(12), – pp. 84-91. – geo.; res.: geo., eng., rus.

The paper deals in general with the properties of reinforcing steel class A 500 and A 400 used in precast reinforced concrete structures. The advantages of reinforcement class A 500 against A 400 are demonstrated. The results of testing of the mechanical properties of specimens of the reinforcement produced in different metallurgical works and applied in Georgia are examined.

Auth.

5.C8.12. The effect of structural non-uniformity on the mechanical characteristic of concrete. /G. Dalakishvili, L. Dalakishvili/. Building. – 2009. – #1(12), – pp. 92-95. – geo.; res.: geo., eng., rus.

The article deals with the concrete deformation and deterioration process in terms of continued (uninterrupted) damage mechanics established on the basis of the fracture mechanics and the continued damage theory.

Auth.

5.C8.13. Peculiarities of a concrete mix preparation and shaping under conditions of a continuous concreting technology. /D. Bakradze, T. Amkoladze/. Building. – 2009. – #2(13). – pp. 6-9. – geo.; res.: geo., eng., rus.

Significant increase of hydrotechnical construction efficiency and quality is possible through wide application of continuous concreting technology of massive buildings. In our country, continuous concreting technology was first applied in the construction of Inguri arch dam, namely, during construction of its left side wall. The speed of erection of the above-mentioned wall greatly lagged behind the construction speed of the central part of the dam since the latter did not fall within the zone of cable lifting service and the existing technology could not ensure the required construction speed. The cargo ropeway involved in permanent concreting technological line, the continuous concrete factory and the conveyer transport facility with a concrete-laying machine made it possible to install a universal system of uninterrupted action.

Auth.

5.C8.14. Optimal engineering solution of a precast reinforced concrete framing of a single-storey industrial building. /Sh. Bakanidze/. Building. – 2009. – #2(13). – pp. 15-19. – geo.; res.: geo., eng., rus.

A variant designing was performed and processing indicators were were calculated to to identify the optimal engineering solution of a precast reinforced concrete framing of a single-storey industrial building.

Auth.

5.C8.15. Ways of avoiding cracks in the walls of a building and on their facing. /T. Magradze, R. Imedadze, M. Tsikarishvili, A. Tsakadze, L. Darbaidze/. Building. – 2009. – #2(13). – pp. 20-24. – geo.; res.: geo., eng., rus.

The article deals with the types of cracks originating in the course of construction, facing and exploitation of building walls, their description and the ways of avoiding them, also the causes of crack origination both on the walls and in the joints and the ways of avoiding them.

Auth.

5.C8.16. Methods of raising seismic resistance of skeleton constructions. /L. Kakhiani, R. Tskhvedadze, Z. Khidirbegishvili, A. Lebanidze/. Building. – 2009. – #2(13). – pp. 25-31. – geo.; res.: geo., eng., rus.

The recent achievements in the methods of seismic resistance growth of skeleton constructions as well as an analysis of conducted research and obtained conclusions are reviewed.

Auth.

5.C8.17. Optimal engineering solution of cast-in-situ reinforced concrete framing of a multy-storey building. /Sh. Bakanidze, B. Surguladze/. Building. – 2009. – #2(13). – pp. 43-49. – geo.; res.: geo., eng., rus.

A variant designing is performed and the criteria of manufacturability are calculated to the optimal engineering solution of cast-in-situ reinforced concrete frame of a multy-storied industrial building. on the basis of their comparison.

Auth.

5.C8.18. Analysis of the carrying capacity of reinforced concrete beams. /L. Avalishvili, D. Sanaia, G. Oragvelidze. S. Purichamashvili/. Building. – 2009. – #2(13). – pp. 53-57. – geo.; res.: geo., eng., rus.

The article concerns the principles of selection of reinforced concrete beams' crossing. Namely, the factors influencing the carrying capacity of square beams crossing, such as the crossing element size, reinforcement crossing space, the reinforcement class, the concrete class were differentially studied; the specific share of each factor in the carrying capacity rate for the actual practical range of parameters was quantitatively assessed; the results obtained are given in the form of a table and diagram.

Auth.

5.C8.19. Basic layouts of military bridges and a new assault bridge with a 48-meter span. /E. Medzmariashvili/. Building. – 2009. – #2(13). – pp. 77-87. – geo.; res.: geo., eng., rus.

The work deals with the existing variants and layouts of assault bridges, their main principles, operation characteristics and principal tactical and technical parameters. For the first time in history, an assault bridge with a 48-meter span, the dimensions and the weight of which are the same as those of the existing 24-meter deployable bridge, is proposed.

Auth.

5.C8.20. The calculation of stresses in composite sections given the probability nature of concrete creep. /M. Chanturia, B. Muradashvili/. Building. – 2009. – #2(13). – pp. 88-92. – geo.; res.: geo., eng., rus.

The works deals with the probability nature of stress changes caused by the development of creep deformation in composite sections. Strains and stresses are calculated on the basis of the theory of aging for concrete creep deformation.

Auth.

5.C8.21. On the failure mechanisms developed in structures as a result of a short-term dynamic force. /N. Eremadze/. Building. – 2009. – #2(13). – pp. 93-96. – geo.; res.: geo., eng., rus.

In general, failure mechanisms in structures subjected to the action of dynamic forces lack sufficient investigation. This issue is better studied, experimentally and theoretically, for static forces. Based on the above, the issue of the probable identity of failure mechanisms developed upon identical distribution of static and dynamic forces is of importance. The paper attempts at proving the identity of failure mechanisms in structures developed as a result of the action of short-term dynamic and static forces.

Auth.

5.C8.22. Investigation of the activity of a contact area of a natural aggregate – clinker and cement stone. /G. Khakhutashvili, T. Nareklivshvili/. Building. – 2009. – #2(13). – pp. 97-100. – geo.; res.: geo., eng., rus.

The work deals with the physical-mechanical and chemical interaction of a porous clinker and cement stone in light concrete, their positive impact on the general properties of concrete, given the technical-economic parameters.

Auth.

5.C8.23. Examination of shales located near the town of Kvareli and the possibility of their use in building materials industry. /G. Tsintskaladze, R. Skhvitaridze, B. Keshelava, T. Sharashenidze, G. Tatarashvili, M. Burjanadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 86-89. – geo. res.: eng., rus.

The article deals with the physical-chemical properties of shales accumulated in the valley of the river Duruji, near the town of Kvareli. The shale composition and structure is found to undergo significant changes after a thermal treatment at the temperature of 600⁰ C. The possibility of obtaining high quality cements by using the

burnt shale is confirmed by industrial tests. The elaboration and introduction of a shale-based cement production technology near Kvareli is one of real ways for preventing an ecological catastrophe.

Auth.

5.C8.24. Calculation of optimum cross-sections of a column. /B. Gvasalia, N. Natroshvili/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 9-14. – geo.; res.: geo., eng., rus.

A new method of determination of the optimum parameters of the cross-section of a column and of the tension reduction factor at the buckling of string is discussed. Randomization is used to find the extremum of function of variables.

Auth.

5.C8.25. Stained-glass windows, their types and method of fabrication. /G. Rokva, M. Milashvili/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 66-71. – geo.; res.: geo., eng., rus.

The article deals with the history an artistic stained-glass window, its essence and role as one of types of decorative-applied art in architecture - in the exterior and interior of buildings. Almost every type of stained-glass windows, their designation and various manufacturing technologies are described in detail.

Auth.

5.C8.26. Using expert systems for diagnosis and synthesis of designing. /A. Kobiashvili, R. Kutateladze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 72-76. – geo.; res.: geo., eng., rus.

The main concepts enabling the application of expert systems for diagnosis and synthesis of the process of designing are described. Examples of the implementation of these concepts in the domain of architectural concept of designing are given. The significance of graphical interaction in the expert design systems is demonstrated.

Auth.

C9. Agriculture and Forestry. Fishery

5.C9.1. Actual problems of soil fertility restoration and ecologically safe application of mineral fertilizers in Georgia. /I. Burtchuladze, I. Tsomaya, N. Kiknadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #2. – pp. 227-229. – rus. res.: geo., eng.

Soil-climatic conditions of Georgia and the diversified agriculture condition high efficiency of mineral fertilizers. Each lari spent on the application of fertilizers is two or three times repaid. According to an agro-chemical research, over 80% of the total farmland needs the application of phosphate fertilizers, and 65% – potash fertilizers. To make up a deficiency of nutritional elements, 250-300kg of NPK per hectare of tillage need to be applied, whereas only 10-12 kg has been applied lately. It is necessary that the a survey of agricultural lands be restored, the measures for enhancing soil fertility be taken as a guarantee of obtaining high and quality agricultural products.

Auth.

5.C9.2. State and perspectives of tea-growing in Georgia. /V. Tsanava, G. Ghlonti/. Agrarian-economic Science and Technologies. – 2009. – # 2(3). – pp. 48-53. – geo., res.: geo., eng.

Owing to the market restriction and fall of prices on tea products since the 90s, the tea-growing sector has found itself under very difficult conditions. The strategy for production of low-quality cheap tea has proved to be a failure and greatly affected even the domestic market. According to a science-based analysis, perspectives of the development of tea-growing sector is greatly dependent on the state economic policy – the effective activation of market mechanisms that should be carried out by a rational use of relatively abundant resources and introduction of price normals thereon.

Auth.

5.C9.3. The effect of zeolites on the chemical content of tea leaf. /N. Kiknadze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1. – pp. 78-79. – geo. res.: eng., rus.

Zeolites are conducive to a prolonged action of mineral fertilizers applied in agricultural land and increase their effectiveness, improving the exchange of cations in the soil. A study of the zeolites' aftereffect on the tea leaf content demonstrated that against the background of mineral fertilizers, natural phillipsite increases the content of phosphate, calcium, and magnesium in fleshes, whereas in terms of nitrogen, a tendency of its reduction is observable. This is caused by the ability of zeolites to absorb NH_4^+ -ions from the soil, which indisputably increases the nitrogen utilization ratio.

Auth.

5.C9.4. The results of monitoring and introduction of rare species of tulips and irises in the north-eastern part of Azerbaijan. /L. Dadasheva/. Novation. – 2008. – #3. – pp. 53-58. – rus.; res.: geo., rus., eng.

The article deals with the results of scientific researches on the introduction of wild-grown species of tulips and irises in the north-eastern part of Azerbaijan conducted on trial plots of the centres of ecological and experimental training in Apsheron, Kusar and Shemakha regions. In the course of monitoring researches during 2003-2008, a reduction of the interspecific variability and the age spectrum under the influence of the man-made factor was found. On the basis of long-term observations, the expediency of using these species in the laying out of parks has been determined.

Auth.

5.C9.5. Influence of different rates of sunflower oil in the diets of lambs on the absorption of cholesterol in the portal system. /E. Huseinova/. Novation. – 2008. – #3. – pp. 59-62. – rus.; res.: geo., rus., eng.

The work deals with the study of the intensity of cholesterol absorption in the interior vein of male lambs by complex catheterization that provided information on the influence of different rates of sunflower oil in this process. It is shown that upon addition of 5% and 7% sunflower oil to the forage of experimental animals the intensity of cholesterol absorption in the interior vein increases.

Auth.

5.C9.6. The fixation process intensification in green tea production. /M.Svanadze, D. Kethiladze/. Novation. – 2008. – #3. – pp. 211-214. – rus.; res.: geo., rus., eng.

The article deals with the expediency of using microwave heating in the production of tea to intensify the process of fixation of the tea leaf. It is found that to inactivate redox enzymes, fixation in the superhigh frequency field for 2-3 minutes would suffice; at that, humidity of the tea mass is reduced to 63-64%. A microwave heater for tea leaf fixation has been designed and the laboratory tests carried out on it have demonstrated its important technological, technical and economic advantages over the available fixation machines. The experimental production of the green tea obtained by the developed technology significantly excels the control in phenol compounds, extractive substances and amount of catechines. This advantage is expressed by an increase of outcome of the extra and first-class teas by 9.2%, of leaf teas - by 12.2%, and of the weighted average mark - by 0.19 points.

Auth.

5.C9.7. Studying the dynamics of phenol compounds during quince storage to determine the optimum fruit sale dates. /N. Gumbaridze, A. Porckhidze, V. Khvedelidze, J. Gogisvanidze/. Novation. – 2008. – #3. – pp. 246-249. – geo.; res.: geo., rus., eng.

Quince, when stored, is known to produce a sweet aroma, increase its sugar-acid index and improve gustatory and other qualities. Therefore, studying the dynamics of the content of phenol compounds of the stored fruit is of specific importance for processing. We have studied the changes in the content of chlorogenic acid, catechines, leicoanthocyanidins and flavonols during the quince storage and their effect on the fruit quality. The obtained results enable to establish the most appropriate period for selling the fruit.

Auth.

5.C9.8. Development of experimental equipment for defrosting frozen food fish. /G. Kvirikashvili/. Novation. – 2008. – #3. – pp. 215-219. – geo.; res.: geo., rus., eng.

It is well known that during defrosting fish undergoes serious physical-chemical and microbiological changes. These changes are effected by such different factors as: speed of defrosting; heating medium temperature; final defrosting temperature, etc. The correct, controlled defrosting procedure allows maximal preserving of the basic features and qualities inherent in fresh fish. As it is impossible to take into account all factors that affect the progress of thermal process, it is necessary that experimental investigations be carried out and the appropriate corrections to the defrosting regime be made on their basis. For this purpose, an experimental defroster, the principle scheme of which is given in the work, was developed. The experimental data on gray mullet defrosting showed absolute fitness of the developed equipment for fish defrosting with a wide variation of thermal process conditions.

Auth.

5.C9.9. Theory of turning of an adaptive motor vehicle chassis. /R. Makharoblidze/. IMEA Scientific Works . – 2009. – vol. 50. – pp. 7-21. – rus.; res.: geo., rus., eng.

The theory of turning of an adaptive motor vehicle chassis designated as a powered means in small farms is offered. Deduced is a design formula of turning radius for two options: drive of all the six driving and driven wheels and without a drive of the front driven wheels. The design formula reflects the impact of the front driven wheels slipper; wheel load re-distribution; hook resistance; differential hold factor; distance between the centers of pairwise-suspended tandem of wheels, and other geometric, kinematic and dynamic

parameters. The research results can be used in determining performance of perspective mobile powered means in the stage of design.

Auth.

5.C9.10. The effect of wheel slip on lateral displacement of a tractor on a slope. /R. Makharoblidze/. IMEA Scientific Works . – 2009. – vol. 50. – pp. 23-31. – rus.; res.: geo., rus., eng.

Theoretical analysis of the effect of wheel slip on lateral displacement of a tractor operating on a slope is given. Derived is a design formula for lateral displacement of the tractor on the downhill side of the slope considering: angle of the slope; weight of the tractor; wheel slip factor; speed of displacement and traveled path. Correspondingly, some performance characteristics of the tractor units operating on a slope are specified. The research results can be used in developing new mountain tractors.

Auth.

5.C9.11. Rotating mowing-shredding machine. /Z. Makharoblidze, R. Khazhomia, I. Lagvilava, T. Japaridze/. IMEA Scientific Works . – 2009. – vol. 50. – pp. 32-42. – geo.; res.: geo., rus., eng.

The article offers a new machine technology for cleaning arable lands from the remaining after harvest plant stock and grass. The new technology provides for cutting, shredding on the spot and spreading of the plant stock on the soil surface which, after placement into the soil converts to an organic fertilizer. A new tractor mountable rotary mowing-shredding machine has been developed. The machine is multifunctional. It can be used gardens fields, grapeyards and pastures. The machine's design enables a change of coverage within 1,2 to 2,35 m. The work gives the methods of power and energy calculation.

Auth.

5.C9.12. Prospects of scientific research of biopower complexes. /R. Japaridze/. IMEA Scientific Works . – 2009. – vol. 50. – pp. 43-56. – geo.; res.: geo., rus., eng.

Institute of Mechanization and Electrification of Agriculture one of first in the world began scientific researches of biogas units. Alternative energy is a priority direction in the modern world. In Georgia, there is a reserve of generation of billion m³ /year biogas. The development of new units on the basis of complex scientific researches with the support on the part of government structures is needed.

Auth.

5.C9.13. Family bioplant. Specifications and operating rules. /R. Japaridze, I. Aptsiauri/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 57-71. – geo.; res.: geo., rus., eng.

Under conditions of a global energy crisis the urgency of development and wide application of installations for generating alternative kinds of energy has increased. At the institute, a portable biogas plant BGG-4 has been developed. The publication provides the following data: 1. Designation; 2. Specifications; 3. Operating rules; 4. Principle of operation; 5. Provisioning; 6. Flowesheet; 7. Maintenance; 8. Transportation; 9. Energy data; 10. Safety regulations; 11. Storage, installation. It is noted that under conditions of Georgia the plant can generate up to 0,6-1 m³ of biogas per day.

Auth.

5.C9.14. Some questions of application of liquid manure received from a bioplant. /I. Aptsiauri/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 72-80. – geo.; res.: geo., rus., eng.

To increase the efficiency of liquid biomass (fertilizers) received from a bioplant, a method of compulsory or natural separation or on solid and liquid fractions is applied. The rates of separation in the fining agent through which periodicity of loading of the bioplant and its design data can be established are experimentally found.

Auth.

5.C9.15. Energy assessment of a graded tillage machinery. /Z. Zhorzholiani, K. Bodzashvili, N. Buchukuri, O. Asatiani/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 81-95. – geo.; res.: geo., rus., eng.

The article analyzes energy research and calculation of a new technology and machinery developed at the institute, which excludes a whole number of farming operations (tillage, re-tillage, disking), provides for pre-sowing soil cultivation in one passage and meets all agrotechnical requirements. The energy consumption needed for basic and new technologies is calculated. The energy effect (794.9 MJ/ha) indicates a reduction of the power costs and the advantages of the proposed technologies and facilities.

Auth.

5.C9.16. New resource-saving technology for overgrassing on mountain hayfields and pastures. /T. Tatishvili, R. Bochorishvili, I. Kalandadze, A. Panjavidze/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 96-108. – geo.; res.: geo., rus., eng.

The article considers the present state of natural forage hayland and the technological aspects of their surface improvement. Based on an analysis of advanced technologies and technical means and given the local natural and economic factors, a new resource-saving technology of for strip overgrassing into the sod

on slopes in one passage and the sowing of perennial grasses at the slope by one passage of aggregate and the design scheme of the modular block combined aggregate are considered.

Auth.

5.C9.17. Study of an overgrassing soil loosener module. /T.Tatishvili, R.Bochorishvili, D.Tavberidze, I.Kalandadze/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 109-120. – geo.; res.: geo., rus., eng.

The article deals with the findings of a study of a module of the soil loosener for overgrassing on hayfields and pastures. Advantages of operation of the rotor with a pintle are grounded for the proposed technology. The main elements of the machine design are determined, on which basis an operative embodiment has been developed and tested under the working conditions. The obtained results meet the agrotechnical requirements.

Auth.

5.C9.18. Selection of a schematic diagram and determination of design data for a subsoil and erosion-prevention cultivator. /N. Javakhishvili, I. Kalandadze, D. Tavberidze, A. Panjavidze/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 121-132. – geo.; res.: geo., rus., eng.

The schematic diagram and kinematics of a subsoil and erosion-preventive cultivator, also the flowsheet of the erosion-prevention cultivation on slopes are introduced. The design and kinematic parameters of the working device of the machine are determined. In selecting the schematic diagram of the machine with active working devices for soil slotting, the designers tried to ensure that the machine be of a simple design on the one hand and compact on the other hand, for on slopes with inclination over 8-10 degrees the possibility of using mobile machines and units sharply reduces. The making of compact machines will give the chance to mount them on different truck-tractors. The article does not determine theoretically such parameters as the travel speed, performance and capacity, for the authors consider that these parameters should be determined laboratory and field trials.

Auth.

5.C9.19. Theoretical analysis of a harvester's working device operating at a variable angular speed. /N. Javakhishvili, D.Tavberidze/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 133-146. – geo.; res.: geo., rus., eng.

The theoretical analysis of a harvester's working device operating at a variable angular speed is proposed. The methods of its kinematic and dynamic calculations are considered. The phases of action on material parts of the working device are determined.

Auth.

5.C9.20. Research of working devices of a tuber-scooping unit of a potato-planter on the basis of a 0.2-class tractor for work on small-contour plots. /V. Motiashvili/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 147-156. – geo.; res.: geo., rus., eng.

The article describes the need for implementation of high engineering technologies of potato cultivation on small-contour plots with the application of combined units on the basis of a 0.2-class tractor. A process flowsheet has been developed, according to which the unit can, in one pass, carry out the following operations: mineral fertilizer application, soil loosening, placing the tubers in the loosened soil and formation of combs. An analysis of the theoretical research of the tuber-planting unit has been conducted. For the normal progress of the technological process by the mathematic transformation are fixed the angles of setting of the planting cup and tuber separation from the drum, the length of dropping of the tuber from the drum, and the time for dropping the tuber into the box from the point of tuber separation from the drum.

Auth.

5.C9.21. Estimation and determination of parameters for mineral fertilizing and potato planting units of a combine 0.2-class tractor-based ridger. /V. Motiashvili, N. Gabunia, K. Torikashvili/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 157-166. – geo.; res.: geo., rus., eng.

The article deals with the issues of development of a combine potato high-technology cultivator and ridger on the basis of a 0.2-class tractor. The high technology potato cultivation on ridges using the combine provides for the performance of the following operations on one pass: mineral fertilizer application, soil loosening, planting of potato tubers and their placement in beds, . The ridger is formed by four concave disks, which are placed so, that during one pass forms two ridges. For normal passing of the technological process according the theoretical accountings the parameters of units were stated for distributing the mineral fertilizer and potato planting.

Auth.

5.C9.22. Operating time of the control system of scarifiers using the pneumo-dynamic effect. /M. Bagrationi, I. Lagvilava, A. Tsitlauri, L. Kordzakhia/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 167-178. – geo.; res.: geo., rus., eng.

The existing methods of the soil production restoration by means of its decompaction and application of fertilizers do not always help boost the harvest of agricultural crops and reduce erosive processes. At present, new efficient methods to improve the quality of soil cultivation are being sought. The studies of the new technologies and technical means to qualitatively cultivate the soil will allow using a pneumo-dynamic effect for this purpose, i.e. pulse energy of the compressed air by installing pneumo-dynamic intensifiers on the scarifiers. The advantage of cultivating the soil with such scarifiers is the use of the pulse stretching forces of the compressed gas when the energy consumption to scarify the soil is tens of times less than during its compression typical to the modern soil-cultivation tools. The dynamics of such equipment is not sufficiently studied at present. At the same time, the operating time of the control system of soil scarifiers with pneumo-dynamic intensifiers is the principal parameter defining the efficiency of the soil-cultivating machines and equipment designed according to this principle. The article describes the methods and gives relevant formulae to define the operating time of the control system of the soil scarifiers with pneumo-dynamic intensifiers.

Auth.

5.C9.23. Theoretical analysis of performance of an adaptive tandem-wheeled chassis. /A. Kobahidze, I. Lagvilava, O. Asatiani, L. Korzakhia/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 179-192. – geo.; res.: geo., rus., eng.

The self-propelled chassis of high-clearance CШ-28 4 (modified on the Ukrainian-made chassis CШ-28) was usually used in Georgia for cultivating and harvesting tea and other tall-stalked plants. However, the chassis CШ-28 had several shortcomings. Firstly, its design was hardly modified; secondly, it had a low level of universality and a low traction efficiency caused by its low load-carrying capacity. Besides, the usage of large wheels further hindered the working process along the narrow rows on plantations. To improve performance, a new adaptive type of tandem-wheeled performing system has been worked out for the modified self-propelled chassis CШ-28. Instead of the additional reduction gear and wheels, the new system suggests the usage of balanced reduction gear swinging on semi-axis, with leading wheels attached to its ends one after the other. The main advantage of the above system - four leading wheels –makes it possible to increase the load-carrying capacity and traction properties of the modified chassis. Also can be noted minor re-design of the existing model. Analysis of the theoretical power balances and traction efficiency of the adaptive tandem-wheeled chassis shows advantages of application of the tandem-wheeled chassis in comparison with the chassis with ordinary leading wheels.

Auth.

5.C9.24. Determination of reliability indicators of the driving gear of a tea cutting machine at the stage of design. /N. Maghlakelidze/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 193-200. – geo.; res.: geo., rus., eng.

The loss of efficiency of a tea cutting machine depends on many factors, on of which is the random load value affecting certain parts of the driving gear and causing the loss of efficiency of the machine. In order to prevent failure of the machine under the effect of random loads, it is necessary to elaborate such a methodology of calculation of strength of its parts that will connect its geometrical characteristics with the reliability characteristics. Such opportunity is provided through synthesis of the reliable probability theory with the determined methods of calculation for strength using the theory of the random function's fallout from the indicated level. The research work was conducted by the example of the driving gear crankshaft of the tea cutting machine. Loading in the tea cutting machine is of a random character. Designing of the machine with specified reliability indicators is economically feasible. For this purposes it is necessary that the functional connection between the nominal diameter and the mentioned indicators, for which we use the theory of fallout from the indicated level, be established. By using the theory of fallout from the indicated level of the accidental function, the functional connection of the nominal diameter with the statistical indicators of loading, the probability of no-failure operation and the terms of service of the machine are established. By a specific example, an opportunity of using the reliability indicators for strength calculation of the machine is demonstrated.

Auth.

5.C9.25. Heat transfer in rotating regenerating stoves. /E. Rekhviashvili/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 201-213. – geo.; res.: geo., rus., eng.

The methods of thermal calculation of rotating cold heat exchangers are sufficiently developed for checkerworks of infinitely high heat conductivity. Using of the same methods for heating surfaces of final thermal conductivity, for example, for spherical particles from non-metal materials, is allowable when the heat-transfer factors are put into computations, the values of which are established given the internal thermal resistance. The model of a heat transfer in working zones of the rotating regenerating stoves is offered. Some iteration-defined dependence between the characteristic parameters of the process is given.

Auth.

5.C9.26. Determination of the number and nomenclature of tractors necessary for prospective cost-effective agricultural production. /R. Makharoblidze, G. Chitaia/. IMEA Scientific Works. – 2009. – vol. 50. – pp. 214-237. – geo.; res.: geo., rus., eng.

To find the optimal number of machinery, the total of the mechanized operations shall be determined, taking into account the whole complex of growing, tendering and harvesting operations. Agrotechnical operations differ from each other by both the type and power intensity. To bring different operations and haulage equipment to a single system, a concept of a standard machine tractor and standard hectare is used and the total of mechanized operations is calculated. A calculation of the number of standard tractors is carried out and the nomenclature of tractors, their number by classes and distribution by regions of the country are determined.

Auth.

5.C9.27. Prospects of subtropical agriculture development in Georgia. /G. Gogitidze, G. Gogitidze, L. Chanukvadze/. Science and Technologies. – 2009. – #4-6. – pp. 112-116. – geo., res.: eng., rus.

The financial aid offered to Georgia in spite of the global economic crisis ought to be effectively used for maintaining economic stability, further development of the country and overcoming the damage incurred by the military conflict. In the first turn, the existing favorable conditions should be used for the fields which are potentially capable of yielding essential gain at minimum expense in the near future. A particular case is the subtropical crops being dealt with in the article under modern conditions. The prospects of their development under a market economy conditions are also well-defined in the article.

Auth.

5.C9.28. The effect of agro-climatic conditions on peach fruit quality and keeping capacity. /M. Zhgenti/. Science and Technologies. – 2009. – #4-6. – pp. 117-119. – geo., res.: eng., rus.

The article considers the effect of agro-climatic conditions – the sum of effective temperatures, hydrothermal coefficient and amount of precipitation a month before harvesting – on the quality and storage losses for some peach varieties. The effect of precipitation fallen a month before harvesting on the fruit weight is established and evidenced by a mathematical analysis of the obtained results.

Auth.

5.C9.29. Importance of plant radiobiology for development of agrarian radiology in Georgia. /M. Gogebashvili, M. Ivanishvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 42-47. – rus., res.: geo., eng.

The work provides an analysis of publications related to plant radiation research in Georgian agrarian scientific periodicals during the last decade. On the basis of a monitoring research, a ranked series according to both the number of publications and the applied radiobiological effect spectrum has been made.

Auth.

5.C9.30. Secondary growth of the apical meristem upon damaging action of gamma irradiation. /N. Ivanishvili, M. Gogebashvili, N. Popiashvili, E. Popiashvili, M. Kobaladze/. Radiological and Agroecological Researches. – vol. VI. – pp. 58-60. – rus., res.: geo., eng.

The plants developed from soya seeds exposed to gamma irradiation at comparatively high doses showed nonspecific second-order activity of the meristem characterized by significant duration. In an annual plant existence of two different growth stages - namely, the last growth stage of the generating organ and the stage of young seedlings allows using the given phenomenon as a biomodel for explanation the cause-and-effect relationships between the newly developed apical meristem and the mature generating organs. The mentioned model is advisable to be used for studying resistance of agricultural plants to temperature extremes.

Auth.

5.C9.31. The method of genetic sterilization in fighting destructive insects of agricultural crops. /L. Gonjilashvili, M. Macharashvili, G. Zardiashvili, J. Lolishvili, M. Dvali, M. Mikeladze/. Radiological and Agroecological Researches. – vol. VI. – pp. 60-61. – geo., res.: eng., rus.

The implementation of the subject is connected with the determination and introduction into production of a genetic method of fighting destructive insects of agricultural crops. It is based on such genetic changes of external influence in living organisms (insects in this case) when the somatic cells stay alive while the sex gonadic cells are damaged so “uniformly” that the insect retains the ability of moving and fertilizing eggs, caterpillars are still being hatched, detached from the development of zygote, and the female insect remains infertile. The novelty of the subject consists in the fact that in spite of its 50-year application genetic sterilization in the former Soviet Union countries, this method of controlling destructive insects has not been introduced.

Auth.

5.C9.32. Haricot – its national economic significance and selection tasks. /G. Zardiashvili, L. Gonjilashvili, N. Mindaashvili, G. Zardiashvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 62-66. – geo., res.: eng., rus.

The work deal with the countries where haricot is of industrial and export significance. Considered are such tasks as haricot selection, its gene pool in Georgia as the valuable starting stock for producing modern haricot varieties. Also discussed are the issues of the mutual application of irradiation and sexual hybridization. Characterized are the promising hybrid blends upon application of this method making it possible to produce modern haricot varieties.

Auth.

5.C9.33. Ionizing radiation background and soil radioactivity. /M. Mikeladze, M. Liparteliani, N. Imnadze/. Radiological and Agroecological Researches. – vol. VI. – pp. 66-69. – geo., res.: eng., rus.

The work considers the established relationship between the ionizing radiation background and soil radioactivity. Based on the available data, a graph divided into two parts - 0-20 $\mu\text{R/h}$ and 20-100 $\mu\text{R/h}$. The first part is a fraction-power function where such an equation is found which most accurately describes the given dependence. The second part of the graph is linear with a respective linear equation. In both cases the adequacy and the corresponding coefficients are calculated.

Auth.

5.C9.34. Accumulation of iodine in root vegetables. /E. Nadareishvili; I. Gakhokidze/. Radiological and Agroecological Researches. – vol. VI. – pp. 70-71. – rus., res.: geo., eng.

Root vegetables (beetroot, carrot) are cultivated in every vegetable-growing region of Georgia. Under conditions of long-term storage the root vegetables preserve their valuable qualities. The root vegetables are known to accumulate large amounts of iodine and thus their consumption can cope with the problem of iodine deficiency in the human organism.

Auth.

5.C9.35. Soil erosion phenomena and their overalls in Khashuri region. /L. Ulumbelashvili, E. Bibiluri, T. Bregadze, M. Bibiluri, D. Razmadze/. Radiological and Agroecological Researches. – vol. VI. – pp. 72-75. – geo., res.: eng., rus.

The eastern slope of Surami mountain range is the westernmost part of Shida Kartli. The region has been investigated from various aspects, including its soil erosion phenomena. Different types of soil erosion and their consequences in eastern Georgia are considered.

Auth.

5.C9.36. Effect of gamma irradiation on silkworm viability. /N. Partskhaladze; T. Bregadze, G. Gazdeliani, M. Iobashvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 76-79. – geo., res.: eng., rus.

Diapausing eggs were γ -irradiated for a long-term period at the summary dose of $\Sigma 2$ gray and for a short-term period at the start of incubation at the irradiation dose of 8 gray. The experiment was carried out in two series. In the first series, the irradiated were the silkworm eggs whose previous generations were not subjected to irradiation (irradiated control group). In the second series (experimental group), irradiated were the eggs whose previous generations were subjected to gamma irradiation. The results (in percentages) obtained for the experimental and control groups when irradiated with a short-term irradiation dose of 8 gray are as follows: survival 26 and 6.5; cocoon yield 65 and 22; emerged moth 35 and 10; cocoon shell mass 612 ± 89 mgr and 469 ± 60 mgr. When irradiated with the prolonged irradiation with a summary dose of 8 gray, the results are as follows: survival – 36 and 26; cocoon yield - 88 and 42.5; emerged moth - 78 and 42.5; cocoon shell mass - 642 ± 459 mgr and 607 ± 49 mgr. The above data show that silkworm eggs irradiated with high dose of gamma radiation – 8 gray sharply decrease the survival rate of larva, especially of the caterpillars whose previous generations were not subjected to irradiation. The prolonged irradiation of the eggs exerts a sparing effect on the viability of caterpillars.

Auth.

5.C9.37. Peculiarities of summer rape sowing and cultivation under conditions of Eastern Georgia. /Z. Tkebuchava, A. Tkheldze, I. Sarjveladze/. Radiological and Agroecological Researches. – vol. VI. – pp. 103-107. – geo., res.: eng., rus.

The main technological issues of summer rape sowing and growing are established on the basis of the suited carried out by the Georgian State Agricultural University.

Auth.

5.C9.38. The bioproductivity of fodder grasses of subalpine hayfields. /R. Lolishvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 107-110. – geo., res.: eng., rus.

The bioproductivity of fodder grasses of subalpine hayfields depends on soil fertility, the degree erodibility and herbage thickness, the soil rockiness and the specific composition of vegetation. The bioproductivity of grassy phytocenosis fluctuates from 8 to 21 tons. In the fractional structure, the greatest part from the general biomass comes on cereals. They are followed by motley grasses, leguminous plants (beans) and sedge. The overground phytomass of motley grasses is more than the phytomass of cereals in all cases, but in an underground part the phytomass of cereals exceeds the phytomass of motley grasses. The quantity of underground phytomass is 3.8-7.0 times more than the quantity of overground phytomass and makes 81-88% of the general biomass. The abundance of leguminous plants not only increases the reserves of roots but the soil fertility and the fodder quality of grassy communities as well.

Auth.

5.C9.39. Ecologically safe technology for raising productivity of saline soils. /N. Tugushi, L. Jorbenadze, E. Svimonishvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 110-112. – geo., res.: eng., rus.

Among soil-improvement, agrotechnical and biological measures to control soil salinity, the enhancement of salt tolerance of crops is the best. At the early development stage, crops are distinguished for special flexibility and relatively easily adopt to the changing environment; as for the crops that have undergone hardening under unfavorable living conditions, for the whole lifetime they preserve the acquired properties (salt resistance, draught tolerance, raised yield) and pass them to succeeding generations. The work deals with an ecologically safe technology designated and employed for raising soil productivity that envisages a presowing treatment and hardening of the seed material by a 3% NaCl solution. The method has proved to be effective for mildly and medium saline soils in terms of seed germination and crop development. In addition, it is distinguished for ecological and economic efficacy, for it does not render an adverse impact on the environment and does not require considerable energy and money inputs.

Auth.

5.C9.40. Use of a factor analysis in implementing anti-epizootic activities. /A. Kurashvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 113-114. – rus., res.: geo., eng.

A factor analysis can be used in implementing anti-epizootic activities on the territory of Georgia that consist of 19 factors united incorporated in three groups: I – epizootic factors; II – production territorial factors; III – natural (landscape) factors. These factors determine the risk of epizooties and serve as the basis for planning and implementing anti-epizootic activities (in our case on the nosology of anthrax, brucellosis and tuberculosis).

Auth.

5.C9.41. Rehabilitation of common black earth soils polluted by herbicides of the triazine group. /K. Bezhanishvili, E. Orjonikidze, R. Lolishvili, Kh. Bezhitashvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 115-117. – geo., res.: eng., rus.

In Georgia, pesticides are widely applied in crop protection against pests and diseases, which considerably pollute the environment, including soil. The paper deals with the influence of the agrotechnical measures (application of organic and inorganic fertilizers and that of siderites and zeolites) on the decomposition of pesticides. These measures change the soil response, its physicochemical properties and biological activity, which, in the last analysis, have an effect on the decomposition of pesticides.

Auth.

5.C9.42. Anthropogenic degradation of red soil fertility and measures of its prevention. /B. Godziashvili, M. Chebotareva/. Radiological and Agroecological Researches. – vol. VI. – pp. 117-119. – rus., res.: geo., eng.

The article deals with the effects of a prolonged application of mineral fertilizers on the fertility of red soils, including both the positive (increased content of humus, nitrogen, phosphorus, potassium) and negative (acidification of soil, growth of mobile forms of aluminum, diminished quantity of exchange base) factors. To improve fertility of such red soils and stop the dangerous process of soil salination, it is necessary that the calcium and magnesium carbonate forms be applied.

Auth.

C10. Water Industry. Melioration

5.C10.1. The plasmatron for plasma cutting in steam environment. /Z. Sabashvili, D. Tavkheldze, Z. Mchedlishvili, M. Babutsidze, N. Kodua/. Building. – 2009. – #2(13). – pp. 113-116. – rus.; res.: geo., eng., rus.

A plasmatron that allows obtaining steam directly in the plasma cutting head is proposed. The design of the plasmatron foresees application of a straight-flow water heater that provides water heating and evaporation

and cooling of the cutting head. Its use excludes additional costs on the water steam generator manufacture, reduces water consumption and ensures mobility of the device.

Auth.

5.C10.2. Methods to assess a water reservoir pollution risk factor. /D. Kereselidze, V. Trapaidze, M. Bliadze, G. Bregvadze/. Geography of Georgia. – 2008. – #6-7. – pp. 60-68. – geo.; res.: eng., rus.

The water quality in a water reservoir depends on different biological and chemical elements present in the water; their concentration frequently exceeds the upper allowable limit caused by different anthropogenic factors. The wastewater from agricultural land, surface and underground waters and ablation are worth mentioning out of these factors. The wastewater and ablation identification technique ambiguity leads to the results of ambiguous evaluation of water quality in water reservoirs. Therefore, the water quality evaluation requires a different approach. The present work employs a range of the reliability theory methods successfully used in different scientific fields to quantify the state and properties of the water in a water reservoir. This method was used to define the risk of pollution of Samgori, Sioni and Tsalka water reservoirs with biogenic elements. An analysis of the obtained results demonstrates that a great amount of biogenic elements are washed away from the agricultural land resulting in the possible activation of eutrophication processes and ecological catastrophe of the water reservoirs.

Auth.

C11. Foreign and Domestic Trade. Tourism

5.C11.1. The tasks of developing regional tourism in the Caucasus. /I. Khasaia, A. Gamakharia, B. Gultekin/. Novation. – 2008. – #3. – pp. 139-142. – geo.; res.: geo., rus., eng.

The article discusses the development of tourism not only as an economic phenomenon but as a factor contributing to the formation of a world without wars and confrontations. In the Caucasus, tourism can serve as an important geopolitical factor for stabilization of regional conflicts. Here, there is a powerful resource base for tourism development. The development of ecological and scientific tourism can be considered as a regional idea. The planning and development of regional tourism in the Caucasus must first solve the following tasks: creating a database of existing tourist potential, the formation of routes covering the Caucasus, cooperation in tourism education, development of regional corporate projects, integrated programs of services for tourists of the Caucasus region.

Auth.

5.C11.2. Exhibition – a means of marketing communication of a travel company. /I. Gabadadze, A. Mushkudiani, N. Mushkudiani, I. Tsereteli/. Novation. – 2008. – #3. – pp. 159-162. – geo.; res.: geo., rus., eng.

The history of development of mankind is unimaginable without tourism and tourist business. Because of scales of development and high rates it represents a world phenomenon. Its development promotes economic development of the country. The development of tourist industry is impossible without information, in the acquisition of which a certain role is played by fairs and exhibitions. Exhibition activities occupy a special place among the means of tourism marketing. Therefore, the participation in exhibitions is rather urgent and represents an effective means of the marketing communication of a travel company. The article deals with the stages of participation of a travel company in exhibitions, the marketing purposes of exhibition works, the aspects of choice of specific exhibitions, the indicators of effective participation in exhibition activities, etc. Today's large investment into Georgian economy can be ascribed to some extent to the development and extension in the country of hotel complexes, office buildings, trade centers, parks, etc.

Auth.

5.C11.3. Business portfolio compleion and evaluation in tourist business. /Kh. Berishvili/. Economist. – 2009. – #3. – pp. 91-95. – geo., res.: eng.

The present article describes and substantiates, by the example of the company "Caucasus Travel", how its business portfolio should be completed and evaluated through the growth/share matrix suggested by the Boston Consulting Group. Recommendations on services being rendered to "Caucasus Travel" by restaurants, hotels and transport companies on a contractual basis are given.

Auth.

5.C11.4. Aspects of wine tourism development in Georgia. /M. Gvinjilia, R. Bagration-Mukhraneli-Gabunia/. Science and Technologies. – 2009. – #4-6. – pp. 124-129. – geo., res.: eng., rus.

Wine tourism represents a significant direction in the world tourism market. In Georgia, historically high level of viticulture and wine growing, diversity of vintage wines, rituals connected with vintage, industry of a master of ceremonies and the tradition of hospitality create the best preconditions for wine tourism development.

The organic winemaking, the introduction of best world tourism practices and the implementation of a target-oriented economic policy create the best prospects for the wine tourism development in Georgia.

Auth.

C12. Transport and Machine-building

5.C12.1. Theoretical foundations of estimation of competitiveness of vehicles. /V. Kharitonashvili, V. Tsertsvadze/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 104-107. – geo.; res.: geo.,_eng., rus.

The article deals with an analysis of theoretical foundations of estimation competitiveness of a vehicle as a product of heightened risk for the human life and health. The vehicle competitiveness estimation is advisable to carry out by a method of comparative analysis of the vehicle, assessing its traffic and ecological safety, technical, maintenance and economic parameters.

Auth.

C13. Medicine. Healthcare

5.C13.1. Etiology and immunopathogenesis of acute rheumatic fever. /B. Lasareishvili, L. Dumbadze/. Modern Medicine. – 2010. – #1(14). – pp. 8-12. – geo.; res.: geo, eng.

The article deals with such matters as the etiological agent of rheumatic fever and its peculiarities; risk factors; genetic predisposition to the disease; the role of epitopes of the cross structure and super antigens of the etiological agent; the significance of the phenomenon of molecular mimicry in the induction of rheumatic fever; on the cellular and molecular mechanisms of the disease immunopathogenesis; on the laboratory criteria of its diagnostics and the principles of treatment.

Auth.

5.C13.2. Ohtahara syndrome. /N. Gaphrindashvili, K. Tison, T. Kapanadze/. – 2010. – #1(14). – pp. 29-32. – geo.; res.: geo, eng.

Early infantile epileptic encephalopathy (EIEE) or Ohtahara syndrome is the earliest form of age-dependent encephalopathies. This rare syndrome is characterized by a very early onset, during the first months of life, with frequent tonic spasms and a suppression-burst pattern on electroencephalogram. Partial motor seizures may occur. Brain imaging usually discloses gross structural abnormalities in the majority of cases. Metabolic disorders were present in a few cases. The course is severe with early death or marked psychomotor retardation and intractable seizures with frequent evolution to West syndrome and Lennox-Gastaut syndrome on 4-6th month of age. Antiepileptic drugs remain as first-line treatment.

Auth.

5.C13.3. Undemonstrated gigantic cystic adenoma in the case of a patient at puberty age. /N. Kintraia, E. Margalitadze/. – 2010. – #1(14). – pp. 34-37. – geo.; res.: geo, eng.

Cancer processes in the ovary can be developed at any age of a female – beginning from intrauterine development period of foetus including the old age. Development of such changes is related to the hormonal unction of the ovary. Cancerous formations of the ovary in females of puberty age constitute 1-4,6% in gynecology. Benign tumor of the ovary rank second (e.g. gonadoblastoma). The article deals with a clinical case of a 17 year-old patient, married; diagnosis – large size cystic adenoma of the ovary with somatic anamnesis (epileptic fit); a surgical treatment was performed. The case was interesting as the patient was only 17 years old, but the cystic adenoma was of quite a large size. There was no clinical sign expressed except for frequent urination. the cystic adenoma was diagnosed accidentally during an ultrasound examination performed to find the reason of infertility.

Auth.

5.C13.4. Popular formula in medicine. /K. Gabunia/. Novation. – 2008. – #3. – pp. 143-146. – geo.; res.: geo., rus., eng.

The articles contains several popular formulas with detailed descriptions selected for treatment of different diseases, such, for example, as angina, laryngitis, etc.

Auth.

5.C13.5. Fluorine and its role in the prevention of caries. /G. Kochiashvili, M. Zandarashvili/. GSA News. – 2009. – #10. – pp. 47-51. – geo. res.: eng.

The purpose of our study was to establish a scientific literature-based effectiveness of fluorine products in the prevention of dental caries. 20 patients aged 2 to 40 years were observed. All of them had caries of different stage. The effectiveness of the fluorine product – NAF was tested. After scaling and tooth brushing,

patients received qualified recommendations about oral hygiene and started treatment with the fluorine product – NAF. The product showed good results in the treatment of caries and noticeable improvement of the oral health.

Auth.

5.C13.6. Selection of a source of mesenchymal stem cells for the treatment of parodontosis. /Z. Alkhanishvili, L. Lursmanashvili/. GSA News. – 2009. – #10. – pp. 54-56. – geo. res.: eng.

The aim of this study was to compare the mesenchymal stem cell content in the mouse bone marrow and peripheral blood. A flow cytometry of the mouse bone marrow and PB-derived mononuclear cells (MNC) shows that the content of STRO-1 positive and CD45 CD34 negative cell count in the bone marrow MNC fraction is 15,7 times more than in PB MNC fraction. However, PB can be considered as the alternative source for mesenchymal stem cells because the bone marrow aspiration is much more invasive and painful procedure than the MNC collection from PB using cell separators.

Auth.

5.C13.7. Nanotechnology in cardiology. /N. Kipshidze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp.165-177. – eng., res.: geo.

The need for improved therapies of cardiovascular diseases and the rationale for angioplasty and stent therapy are based on the underlying pathology of the disease process. Recently has emerged a new approach for the site-selective delivery of therapeutic agents to areas of the injured or dysfunctional vascular wall, including vascular segments at risk. A number of important properties of these nanoparticles make them ideal as targeted delivery vehicles, including: 1. Increased adherence to damaged vasculature and endothelium; 2. Ability to non-covalently complex selected compounds; and 3. Exponentiation of compound uptake by cells or tissue. The most well studied and emphasized in the present report is the use of perfluorobutane/dextrose/albumin nanoparticles. Drugs can be incorporated into the micro-bubbles in a number of different ways, including binding of the drug to the micro-bubble shell and attachment of site-specific ligands. As perfluorocarbon-filled micro-bubbles are sufficiently stable for circulating in the vasculature as blood pool agents, they act as carriers of these agents until the site of interest is reached. Despite important pharmacologic and interventional strategies to treat atherosclerotic vascular disease, it remains a serious clinical problem today. Intravenous micro-bubbles have been developed which can be used to detect where endothelial dysfunction exists, and which can be targeted to detect inflammatory and pro-thrombotic mediators on the plaque surface. These same micro-bubbles can then be used for site specific delivery of agents which inhibit plaque progression. These novel diagnostic and treatment strategies have the potential to significantly alter patient outcomes in atherosclerotic vascular disease.

Auth.

5.C13.8. Differential diagnostics of nodular goiter. /B. Chakhvadze, L. Karanadze, M. Shervashidze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 178-180. – eng., res.: geo.

Among numerous diagnostic methods, fine-needle aspiration biopsy under ultrasonic examinations is still considered to be an optimal method of diagnosing a euthyroid nodular goiter. Analysis of the examination of 512 patients showed high diagnostic value of this method at colloid nodes (sensitivity – 93.2%, specificity – 87.1%), adenomas (sensitivity – 72.5%, specificity – 91.6%), and autoimmune thyroiditis (sensitivity – 82.5%, specificity – 96.9%). The method allows to select a group of patients with high risk level, suspected malignant tumour of the thyroid gland with a high probability (sensitivity – 80.7%, specificity – 93%) and conduct adequate surgical treatment according to the principles of oncology.

Auth.

5.C13.9 Portal and biliary hypertension as a cell proliferation trigger (landmarks for future investigations). /D. Kordzaia/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 181-190. – eng., res.: geo.

The outcomes of the study demonstrated that the violent activation of cellular proliferation in liver tissue can be triggered by partial hepatectomy (PH), as well as by common bile duct ligation (BDL). However, the causes of the mentioned activation are not still clearly defined. 54 white Wistar male rats of II postpubertal age with weight 200-220 g were included in PH or BDL models. In PH setting, pressure in portal vein was measured before and immediately after PH, as well as at 6th, 24th, 48th, and 144th hours past the operation. Mitotic bodies were counted immediately after PH, and at 6th, 32nd, 72nd and 144th hours after the operation. In BDL setting, the pressure in common bile duct was measured before and at 1st, 3rd, 72nd, 96th and 120th and 144th hours after its ligation, and pressure in portal vein in this same setting was measured at 1st, 6th, 24th, 72nd, 144th hours past the operation. Mitotic bodies were counted at 24th, 48th, 72nd, 96th and 144th hours after BDL. On the basis of data obtained and analyzed the following conclusions are made: portal and biliary hypertension appeared to serve as a trigger for cellular proliferative activity in PH and BDL

settings. The comprehensive evaluation of the processes involving liver regeneration following partial hepatectomy and post- BDL biliary ductular proliferation hence requires not only the reduction of intervals between experimental data and refinement of the morphological and/or molecular/biological techniques of the study, but also the development of new experimental models with novel approaches.

Auth.

5.C13.10. Recurrence quantification analysis of arterial blood pressure and heart rate variability in patients with essential hypertension. /M. Janiashvili, T. Matcharashvili/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #3. – pp.166-168. – eng., res.: geo.

The present research investigates the dynamics of systolic and diastolic arterial pressure and heart rate variability in three groups of patients with different stages of hypertension. Essential increase of extent of order in systolic and diastolic arterial pressure, as well as in heart rate variability has been observed using recurrence quantitative analysis (RQA) approach. Both measured and compiled from original data SDH time series have been investigated. We conclude that increase of order in blood pressure and heart rate variation in hypertension reflect general features of changes in heart dynamics and are not caused by unavoidable local trends in the analyzed physiological data sets.

Auth.

5.C13.11. Extra-islet intermediate cells of pancreas and the effect of plaferon in the alloxan-induced diabetes mellitus. /I. Latsabidze, T. Machavariani, I. Gachechiladze, T. Ghvamichava, K. Kavtashvili/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #3. – pp.169-172. – eng., res.: geo.

Using the methods of light and electron microscopy, pancreas was studied in the experimental model of alloxan diabetes (AD) at various times of the experiment (1 and 6 months) at different degrees of AD and after the action of plaferon. Special emphasis was made on the display of compensatory changes in opportunity of occurrence in extra-islet cells special granules, characteristic of insulin producing β -cells. Data obtained suggest that extra-islet cells possess structural features of both acinar as well as endocrine cells. They represent a transitory structure under transformation into the endocrine cell and rise in number in adaptive compensatory response to alloxan-induced diabetes mellitus. Plaferon is shown to have positive influence on the content of sugar and insulin in the blood in alloxan-induced diabetes mellitus. Plaferon is suggested to promote maturation and transformation of extra-islet cells. Presumably plaferon takes part in the neogenesis of β -insulinocytes.

Auth.

5.C13.12. Commitment of progenic precursor cells: use of plasma irradiation under critical condition. /Z. Kheladze, Zv. Kheladze, S. Jaiani, B. Tsutskiridze/. Critical Care & Catastrophe Medicine. – 2008. – # 4. – pp. 8-11. – eng. res.: geo., eng.

As a result of use of plasma irradiation, a clear-cut increase in the quantity of marrow and peripheral blood cells erythrocytes as well as leucocytes and thrombocytes, especially of young cells, takes place. In addition, the above-mentioned increase remains stable during the first couple of weeks of critical conditions. Parallel to the abovementioned increase, the oxygen supply of bone marrow micro-environment and partial pressure of carbonic oxide and oxidation in the environment take place. A considerable growth of progenic axial and immune competitive cells, showing a tendency towards stability, is significant as well. Against such a background, a decrease of the accompanying complications, improvement of the indices of lethality and disability, the shortening of the time necessary for healing the patients and bringing them out of the critical condition are observable, implying the cutting down the treatment time and expenses.

Auth.

5.C13.13. Commitment of progenic precursor cells: use of electric current under critical conditions. /Z. Kheladze, Zv. Kheladze, R. Shonia/. Critical Care & Catastrophe Medicine. – 2008. – 4. – pp. 12-15. – eng. res.: geo., eng.

As a result of the use of electric current, a clear-cut increase in the quantity of marrow and peripheral blood cells erythrocytes as well as leucocytes and thrombocytes, especially of young cells takes place. Besides, the above-mentioned increase stays stable during the first couple of weeks of critical conditions. Parallel to the abovementioned increase, the oxygen supply of bone marrow micro-environment and partial pressure of carbonic oxide and oxidation in the environment take place. A considerable growth of progenic axial and immune competitive cells, showing a tendency towards stability, is significant as well. Against this background, a decrease of the accompanying complications, the improvement of the indices of lethality and disability, the shortening the time necessary for healing the patients and bringing them out of the critical condition are observable, meaning the cutting down of treatment time and expenses

Auth.

5.C13.14. Commitment of progenic precursor cells: use of nitroglycerin under critical condition. /Z. Kheladze, Zv. Kheladze/. Critical Care & Catastrophe Medicine. – 2008. – 4. – pp. 16-19. – eng. res.: geo., eng.

As a result of the use of nitroglycerine, a clear-cut increase in the quantity of marrow and peripheral blood cells erythrocytes as well as leucocytes and thrombocytes, especially of young cells takes place. Besides, the above-mentioned increase stays stable during the first couple of weeks of critical conditions. Parallel to the abovementioned increase, the oxygen supply of bone marrow micro-environment and partial pressure of carbonic oxide and oxidation in the environment take place. A considerable growth of progenic axial and immune competitive cells, showing a tendency towards stability, is significant as well. Against this background, a decrease of the accompanying complications, the improvement of the indices of lethality and disability, the shortening the time necessary for healing the patients and bringing them out of the critical condition are observable, meaning the cutting down of treatment time and expenses.

Auth.

5.C13.15. The experience of using plasma jets in the prevention and treatment of complications in patients under critical conditions and during early postoperative period. /Z. Kheladze, S. Jaiani, B. Tsutskiridze, Zv. Kheladze, M. Daraselia, N. Kvitsiani, G. Chakhunashvili, D. Chakhunashvili/. Critical Care & Catastrophe Medicine. – 2008. – 4. – pp. 48-52. – eng. res.: geo., eng.

The article encompasses the prevention and treatment by plasma jets of pneumonias, including the respirator-associated ones, gynecological postoperative infected wounds and decubital ulcers in patients under critical conditions. The proposed method's advantages include its simplicity, reliability and cost-effectiveness.

Auth.

5.C13.16. A predictive-analog scale of rating bedsores in critically ill patients. /N. Kvitsiani, B. Tsutskiridze, S. Jaiani, Z. Kheladze, Zv. Kheladze/. Critical Care & Catastrophe Medicine. – 2008. – 4. – pp. 53-57. – eng. res.: geo., eng.

Based on a retrospective study of the medical histories of more than 1200 patients treated at the Institute of Critical Care Medicine a new predictive-analog scale of bed sore rating critically ill patients was developed. 6 most important predictive criteria were identified: general condition severity; the local and general factors affecting the development, depth, localization and the nature of a bed sore. Each of these criteria was divided into 5 levels. The new scale helps to determine the general condition, severity and estimate conditions of bedsores not only according to its stages, but also according to the localization, the nature, the depth, the area and the complementary factors facilitating the bed sore development. This makes it possible to determine the criteria of bed sore readiness for surgical operation and specify the sequence of therapeutic tactics.

Auth.

5.C13.17. The effect of VVP pacing on cardio hemodynamics in the critically ill patients. /R. Shonia/. Critical Care & Catastrophe Medicine. – 2008. – 4. – pp. 61-68. – eng. res.: geo., eng.

In critically ill patients and in an experiment, the effect of the rarefying paired ventricular pacing (St1 + St2 delayed impulse; code in the former USSR – VVP) on cardio hemodynamics of with acute cardiovascular insufficiency carried out against the background of respiratory and routine antishock therapy of acute cardiac insufficiency being associated with supraventricular tachycardia was studied. Doppler-echo cardiography, different modes of cardiac pacing, catheterization of the heart and main vessels, electromagnetic blood flow meter and angiocardiology were performed. It was proved that VVP pacing in the presence of the intact ventriculoatrial conduction created functional retrograde blockade and V1-V1>A-A version of the ventriculoatrial dissociation. The VVP pacing application promoted significant growth of efficiency of a routine anti-shock therapy, increased volume loading on ventricles, myocardial contractility, its performance and aortal pressure.

Auth.

D. INTERSECTORAL PROBLEMS

D1. Organization and Management

5.D1.1. Efficiency of psychological influence of advertising on the consumer. /S. Zhorzholiani/. Novation. – 2008. – #3. – pp. 151-154. – rus.; res.: geo., rus., eng.

Market economy conditions contributed to the development of advertising as of a social institute and professional activity in thousand peoples. From an amateurish trade offer the advertising has turned into a main mechanism of influencing the consumer. An advertisement works at a subconscious level, addressing

the irrational in the human nature. Being confronted with advertising, the consumer gets involved in the constant cognitive-evaluation activity. Therefore, the advertisement makers should make such an advertisement that could psychologically convince the man that exactly the advertised goods are in full compliance with his needs, or to cal or help the consumer in comprehending new needs.

Auth.

5.D1.2. Internet as the best tool in a system of marketing. /S. Zhorzholiani/. Novation. – 2008. – #3. – pp. 155-158. – rus.; res.: geo., rus., eng.

The technological opportunities of the Internet condition rapid development of the world information community and change of the associated with it approaches to the management of business and marketing. In an expert opinion, the Internet marketing renders a powerful catalytic effect on the development of business and is capable to make revolutions in the world economy. The essence of the Internet marketing is not something stark and constantly changes together with the development of information technologies. It is noteworthy that at the present stage of development, the significance of Internet marketing as one of the types of marketing is most adequately understood. More precisely, Internet marketing is the principal tool necessary for achieving the common objectives of marketing.

Auth.

5.D1.3. Moral values in business. /M. Bandzeladze, A. Butskhrikidze, V. Menabdishvili/. Novation. – 2008. – #3. – pp. 235-238. – geo.; res.: geo., rus., eng.

Business area frequently involves problems based on ethical behavior. The ethical behavior of human beings is conditioned by working conditions, existing problems which are finally reflected in the individual system of values. The values belonging to social consciousness, the concepts of justice and injustice, good and evil prove to be considerably interesting in terms of ethics. These values not only describe the existing reality, but also evaluate, approve or disapprove it. They are related to the human activity and their content is determined by a certain kind of business area. The article touches upon the role of personal qualities in decision making. Individual values are formed gradually in the process of gaining life experience. They significantly influence private lives as well as the organizational culture of the largest companies. Each individual employed in a company keeps the working discipline which is based on the nature of production. The final goal of any business activity is economic effectiveness. However, it ought to be dominated by the motive of humanism. High moral standards are the guarantee of successful business.

Auth.

5.D1.4. Co-branding. /K. Chagelishvili/. Economist. – 2009.- #3.- pp.105-109. – rus., res.: eng.

Nowadays, standard brand promotion methods – the development of a solid brand promotion budget and its advertising, the display of goods on attractive shelves in shop – are no longer effective. The reason is that the efficiency of ordinary advertising that no longer attracts the consumer is rather low. The article demonstrates branding as a very complex and complicated phenomenon. To be successful, each detail of branding should be specified and comprehensively dealt with. The article outlines practical steps towards branding and standard mistakes made by brand managers as well as the ways to avoid them.

Auth.

5.D1.5. Innovation in management – team work and team self-administration. /D. Meskhishvili/. Economist. – 2009. - #3. - pp.110-114. – geo., res.: eng.

The article considers the effectiveness of team work and underlines its advantage in comparison with administrative management. Under conditions of a team work, managers no longer have to administrate employees. Their duty is just to employ them and provide them with all necessary resources. The article compares teams with groups and shows advantages of a team work. The article says that because of high effectiveness, the principles of self-governed team work should be implemented in big Georgian companies, such as *Kazbegi*, *Coca-Cola*, *Elit Electronics*, etc. and provides recommendations for setting up advisory councils responsible for staffing such teams.

Auth.

5.D1.6. Conflicts and ways of their solving in an organisation. /L. Kadagishvili/. Economist. – 2009. - #3. - pp.115-119. – geo., res.: eng.

The article deals with the nature of conflicts in an organization, their types and causes, and methods of solution. It is noted that the solution of a conflict the manager should start with the identification of factual causes and then with the using of the respective methods. The eradication of a conflict causes is greatly dependent on a correct choice of its solving method.

Auth.

5.D1.7. Types of pedagogical relations and style of leadership in management. /A. Asatiani/. Transactions of Technical University of Georgia. – 2009. – #2(472). – pp. 27-30. – geo.; res.: geo., eng., rus.

A skilful selection and use of managerial communication types is a tactical issue of business administration, whereas their formation, which takes place much earlier, in line with the formation of a person's spiritual world and communication skills, is the basic problem of upbringing and education, which explains the existence of the cause-and-effect relations between them. Practice has proved that managers with good communication skills having acquired them at the early age, already at the general education level, and further developed at the higher education level, within the framework of democratic pedagogical relationship, are most prone to turn into successful leaders. Hence, the formation of a person's communicative skills should be given the proper attention at each step of training and education.

Auth.

D2. Environmental Protection. Ecology

5.D2.1. Increase of ecological compatibility of motor vehicles by using waste oils as new oil base. /J. Iosebidge, G. Abramishvili, T. Apakidze, L. Zurabishvili, A. Chkheidze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 89-93. – geo.; res.: geo., eng., rus.

The so-called waste oils of M 8B1 and M 8Г2K brand were used as a base for new automotive transmission oils, the utilization of which does not take place in Georgia. An effective multifunctional addition – the amorphous high dispersive carbon (AHDC) and additive “Akop 1”, representing a stabilizer of the AHDC suspension in the base oil, were added to the oils, after they have been cleaned from water, oil and solid particles, to give them new and high functional properties. The carried out experiments showed that the obtained transmission oils outperform the well known commodity transmission oils TAn 15B and TCn 15к. The production and use of these oils will ensure reduction of the environmental pollution not only from residues of waste oils, but also from harmful exhaust of the engine.

Auth.

5.D2.2. The effect of petrol properties that determine its detonation stability on the ecological compatibility of a motor vehicle. /D. Iosebidge, G. Abramishvili, T. Apakidze, L. Zurabishvili, A. Chkheidze/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 94-100. – geo.; res.: geo., eng., rus.

On the basis of the results of existing scientific studies, the effect of indicators of petrol detonation stability (octane number; content of aromatic hydrocarbons, actual pitches, sulfur, period of inductivity, etc.) on the toxicity of worked out gases of a motor car engine were determined by a new approach and a conceptual dependence between these indicators and ecological safety of motor cars was established. It is proved that out of the indicators of anti-detonation properties of petrol, the octane number and content of actual pitches and aromatic hydrocarbons render a significant effect on the completeness of burning of the working mixture, fuel consumption and, therefore, on the quantity of toxic components of motor cars' exhausts.

Auth.

5.D2.3. Some rational schemes of water supply to industrial consumers. /M. Mchedlidze, Kh. Khatiuri/. Building. – 2009. – #2(13). – pp. 10-14. – rus.; res.: geo., eng., rus.

Aspects of anthropogenic and technogenic contamination of surface water reservoirs (rivers, lakes, etc.) are given. In addition, rational schemes of water supply to industrial consumers, based on repeated application of processed industrial waters after appropriate cleaning in the water supply turning system are reviewed.

Auth.

5.D2.4. Estimation of sources of environmental contamination by polychlorinated biphenyls on the territory of Georgia. /K. Amirghanashvili, K. Tavamaishvili, K. Gamkrelidze, N. Nadiradze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1 – pp. 82-83 – rus. res.: geo., eng.

The content of polychlorinated biphenyls (PCBs) in transformers on the territory of Georgia has been studied by the US EPA 8082 method, including the determination of various kinds of PCBs (Aroclor 1016, 1221, 1232, 1242, 1248, 1260, 1254). According to the results of estimation, the total amount of PCBs in electric equipment (transformers, condensers) exceeds 200,000 kg, and the total possible annual emission to the air makes 220-582 kg.

Auth.

5.D2.5. Definition of critical narrowing of washed and unwashed bottom under conditions of planned river-bed stability. /V. Mamasakhlisi/. Novation. – 2008. – #3. – pp. 33-38. – rus.; res.: geo., rus., eng.

The work deals with and defines the questions of critical narrowing of a river-bed upon application of transverse barrier for a washed and unwashed bottom. Applying the mentioned conditions and based on the experimental research results, the equations for calculation of the coefficient of the river-bed's critical

narrowing with the washed and unwashed bottom upon mounting of the transverse barrier at the 90° angle are determined.

Auth.

5.D2.6. Environmental problems of Georgia. /N. Kiladze/. Novation. – 2008. – #3. – pp. 163-166. – geo.; res.: geo., rus., eng.

Lately many environmental problems have been accumulated in Georgia. The amount of harmful substances in the atmosphere increased twofold. The most polluted areas are Kutaisi, Rustavi, Batumi and Zestafoni. The main source of air pollution is transport. Water is polluted by pesticides, fertilizers and industrial waste. Pollutants cause various infectious diseases and are the main reason for such awful disease as carcinoma.

Auth.

5.D2.7. Environmental problems of forests. /N. Kiladze/. Novation. – 2008. – #3. – pp. 167-170. – geo.; res.: geo., rus., eng.

Georgia is rich in its forests. The function of forests rather diverse: photosynthetic, soil-protective and sanitary. Forests are greatly damaged by fires, the majority of which are of anthropogenic origin. The increased amount of pollutant substances in the air and soil, different insects and fungi also affect the forest ecology.

Auth.

5.D2.8. Letchkhumi region protected territory system. /D. Mikautadze, N. Bliadze, Ts. Davituliani/. Novation. – 2008. – #3. – pp. 229-234. – geo.; res.: geo., rus., eng.

The whole Caucasus, and especially Georgia is distinguished for its biodiversity. Nowadays Georgian branch of WWF tries to protect and improve wildlife. Its main goal is adaptation of those international categories (state reserves, national parks, natural sights and etc) to Georgian reality in accordance with the programmes worked out by the UNESCO

Auth.

5.D2.9. Problems of radioecology of the Caucasus and education for sustainable future of region. /M. Tsitskishvili, M. Tsitskishvili, A. Chkhartishvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 28-34. – rus.; res.: geo., eng.

Problems faced by mankind were united in a uniform dilemma of the further development of the civilization, in a philosophical problem "purpose of man's existence". Ecological crisis – the main alternative of modern civilization development – sets before the developing world community a number of problems, including the educational one. The role of education under rapid globalization of human society is to promote harmonization; the main emphasis at the present stage of development should be made on the establishment of environmental, environmental educational goals and tasks. The work specifies the basic criteria of delimitation of ecology as a science from other natural sciences – the necessary presence of ecological triad; the principal problems of ecology of the Caucasus are identified and the basic objectives of environmental education necessary for sustainable development of the region are formulated.

Auth.

5.D2.10. The balance of radionuclides in the ecological chain of Gardabani region. /Kh. Khutasvili, M. Oniani, G. Buzalaze/. Radiological and Agroecological Researches. – vol. VI. – pp. 79-81. – geo., res.: eng., rus.

The work deals with the results of studies carried in Gardabani region, in particular the investigation of the content of radionuclides in the samples of soil, water, vegetation, as well as the meat, skin of cloven-hoofed animals and of half-digested feed in them taken at a 800-100 m distance from the TPP. The content of radionuclides was determined by means of multi-channel alpha and gamma spectrometer.

Auth.

5.D2.11. Soil-ecological indices of agricultural areas of Kvemo Kartli. /M. Tvalavadze, R. Mardaleishvili, N. Kisishvili, N. Dzebisashvili, M. Mardaleishvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 97-99. – geo., res.: eng., rus.

Soil-ecological indices (SEi) make it possible to assess quantitatively and comparatively the ecological conditions of specific areas in terms of their plant productivity. In the region, by high SEi are distinguished the following soils: south chernozem (black earth) – 130, typical cinnamon – 115, grey cinnamon dark – 91, meadow grey cinnamon – 82, grey cinnamon ordinary – 80. In the soils characterized of the fertility limiting factors, such as salinity, alkalinity, compactness, the SEi goes down to 58-63. According to the SEi data, clearly shown are the perspective indices that can be achieved as a result of irrigation and other melioration activities.

Auth.

5.D2.12. On the impact of current and pending changes of climate on agriculture of one of the most dehydrated regions of Georgia. /T. Turmanidze, M. Gigilashvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 100-102. – geo., res.: eng., rus.

The article evaluates the impact of current and pending changes of climate on agriculture in one of the largest and the most dehydrated regions of Georgia – Dedoplistskaro. For a comparative analysis and evaluation purposes, two periods are observed: the so-called basic 1955-1975 period, when there were no signs of climate warming tendencies, and 1990-2005, with obvious signs of climate changes. The key indicators of productivity of agricultural plants – production of corns of winter wheat and sunflower, as well as meat, milk and average turnout of the above-listed agricultural goods, and the milking ability of cows for human consumption are analyzed. The tendency of deterioration of these indicators is observed. An attempt was made to predict the expected changes in productivity of agricultural production of the region until 2100. As a result of analysis of the obtained actual and projected data, the quantitative indicators of warmth and humidity of the region area – changes in the sums of active temperatures, precipitation, evapotranspiration, moisture requirement of agricultural plants and irrigation norms are determined.

Auth.

5.D2.13. The concept of ecovet safety in Georgia. /E. Khorguani, G. Mamatsashvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 120-123. – geo., res.: eng., rus.

The article proposes projects of programs the implementation of which will ensure a sustainable ecovet safety of the country. The necessary prerequisite of implementation of the final concept is the working out of said programs with indication of the cost of estimates/budget to be approved and financed at the governmental level.

Auth.

5.D2.14. On some problems of regeneration of man-caused ecosystems in Georgia. /T. Subeliani/. Radiological and Agroecological Researches. – vol. VI. – pp. 143-146. – geo., res.: eng., rus.

The articles consider the issues of regeneration of man-caused ecosystems of Chiatura manganese ore deposit. The peculiarities of the soil profile regeneration are studied; changes in the morphological traits, micro-aggregate composition and interconnection with the age factor are identified; it is established that the humus accumulation feature in young soils is the high variability of rates. The rate of humus accumulation at the initial stages (0-15 years) makes 0.2-0.25% per annum. In the next period (15-45 years), it goes down to 0.1-0.12% per annum. In the composition of the organic matter dominate fulvic acids. Organic residues are characterized of low ulmification. The soil-formation rate under acacia forest at the early stage made 3mm/year, whereas at the next stage (14-45-year period), it dropped to 2.2. Mm/year. Under grasses, this indicator is a little higher, making 2.6mm/year.

Auth.

5.D2.15. Utilization of hazardous and harmful substances using novel technologies: liquidation of oil pollution of the environment. /T. Sikharulidze, E. Bibiluri, Z. Chankseliani, D. Razmadze, M. Bibiluri, T. Bregadze, L. Ulumbelashvili/. Radiological and Agroecological Researches. – vol. VI. – pp. 155-157. – rus., res.: geo., eng.

The article deals with such novel methods of liquidation of oil spills as bacterial strains and preparations produced on their basis. The development of the method, its utilization efficiency and conclusions of its testing are given.

Auth.

5.D2.16. Ecological problems of soil pollution by oil wells located in Eastern Georgia. /N. Naskidashvili, L. Shavliashvili, N. Vashakmadze, M. Tabatadze/. Radiological and Agroecological Researches. – vol. VI. – pp. 219-223. – geo., res.: eng., rus.

The article deals with two events of soil pollution in 2004-2006 due to an emergency emission of crude oil from the operating and abandoned wells of oil companies located on the territory of Eastern Georgia. The spilled oil distribution area on the surface and underground is studied; by means of mathematical modeling the minimum time necessary for carrying out of rehabilitation works in order to reduce oil seep to the minimum is established.

Auth.

5.D2.17. Agroclimatic zone scenarios of the distribution of crops with account of global warming. /G. Meladze, M. Meladze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp.151-155. – eng., res.: geo.

Main aspects of global warming as a result of man-caused (anthropogenic) impact and partially the unstable ecological state of the biosphere are considered. A trend towards a rise in air temperature in Eastern Georgia against Western Georgia is identified. In this connection, a rise in temperature by 2 and 1°C, respectively for agroclimatic zones is taken into consideration. According to the completed regression

equations, the sums of active temperature at a 1000°-gradation of air temperature (above 10°) are determined. Five agroclimatic zones for distribution of respective crops are marked out for the territory of Georgia in the case of a rise by 2 and 1 degrees under the developed scenarios, according to which in the case of a rise in temperature by 1 and 2 degrees, the sum of active temperatures exceeds on the average the sum of active temperatures in the currently existing zones by 200-300 degrees and 400-500 degrees, respectively.

Auth.

D4. Other Intersectoral Problems

5.D4.1. Investigation of physical parameters of spatially structured butadiene-styrene thermoelastoplastics used for shoes bottom of diabetic patients. /M. Shalamberidze, N. Lomtadze, M. Gdzeldze/. Proceedings of the Georgian National Academy of Sciences. – Chemical Series. – 2009. – vol. 35. – #1 – pp. 118-120. – rus. res.: geo., eng.

Process of swelling of butadiene-styrene and zibeline thermoelastoplastics with latent solidification, as well as their sulfurous vulcanizations in cyclohexane and benzene were studied. Physical parameters of spatial net of structured polymers were determined

Auth.

5.D4.2. Economic and mathematical model of sustainable use of a landscape as a tourist recreational resource. /B. Barkalaia/. Transactions of Technical University of Georgia. – 2009. – #1(471). – pp. 101-103. – geo.; res.: geo., eng., rus.

The article considers an economic and mathematical model of sustainable landscape use as a tourist recreational resource. The main emphasis is made on the landscape use as a tourist recreational resource under which together with the getting of a stable economic gain its preservation for future use will be secured.

Auth.

5.D4.3. The wars of the first quarter of 21st century and the new configuration of interdependent military strategy, operational art and tactics at the current development stage of armed forces. /E. Medzmariashvili/. Building. – 2009. – #1(12), – pp. 52-62. – geo.; res.: geo., eng., rus.

The major spectrum of modern researches in the field of military theory is the prediction and research of the wars of the first quarter of the 21st century with its nature, origination, reasons and results. From this standpoint, most important is the military theory of “indirect actions” and its suitable systems – asymmetrical wars and threats. At the given stage an optimal model of self-defence must contain mobility, manoeuvres, management, artillery systems and hi-tech complexes and be oriented to the four cardinal directions: (i) the modern nature of war; (ii) the modern meaning and main points of the information war; (iii) the principal structure of modern model of the military art; (iv) the adequate realization of military art model in the meanings of armed forces. For gradation purposes of the wars of first quarter of the 21st century the following systematization can be discussed: (i) wars between nations; (ii) wars between national and public or military political groups that inside a country or involving other nations; (iii) wars between military political groups or between military political groups and society that can occur inside a country or on the territory of other countries. The work deals with the information war of third generation and its positive and negative aspects. The viewed material makes it possible to discuss interrelationships of a military strategy, operational art and tactics that can be presented as a diagram. Such a system optimally responds to the realization of operational principles of the central authority – the unity of organization, responsibility, management and maintenance. The work also touched on the issue of future formation of armed forces in Georgia.

Auth.

5.D4.4. Distribution of average speeds of lateral mass movement and establishment of longitudinal velocity rate in the case of interaction of high-water bed and channel flows. /Z. Danelia, M. Topuria, G. Melikadze/. Building. – 2009. – #1(12), – pp. 63-71. – geo.; res.: geo., eng., rus.

The article deals with the determination of the average speed of lateral mass movement in the case of the turning action of the vortex filament within the surrounding liquid as well as of the conditions of the vortex separation and its movement to the main channel flow.

Auth.

5.D4.5. Determination of the Chézy coefficient and average speeds upon interaction of channel and high-water bed flows. /Z. Danelia, M. Topuria, G. Melikadze/. Building. – 2009. – #1(12), – pp. 72-78. – geo.; res.: geo., eng., rus.

The article deals with the dependences explaining values of the Chézy coefficient for channel and high-water bed flows upon their interaction. These dependencies were received as a result of adopting the empiric

correctional factors for roughness coefficients n . This made it possible to obtain a close-dependence system for determining average longitudinal velocities of the said flows upon their interaction.

Auth.

5.D4.6. Method of solving the obtained system of equations. /Z. Danelia, M. Topuria, G. Melikadze/. Building. – 2009. – #1(12), – pp. 79-83. – geo.; res.: geo., eng., rus.

As a result of channel and high-water bed flow interaction, their average longitudinal velocities tend to change. The system of equation obtained for their calculation is based by the method of gradual approximation. Graphic charts were built to compare the test and calculated average velocities that demonstrated their close approximation/coincidence. The difference did not exceed 6%, this being explained by different forms of the river bed.

Auth.

5.D4.7. Some considerations on the determination of the optimal height of composed welded beams according to N.S. Streletsky. /N. Berishvili, Kh. Gorjoladze/. Building. – 2009. – #2(13). – pp. 32-36. – geo.; res.: geo., eng., rus.

The work considers the task of determination of the optimal height of composed welded beams given in the works of different well-known authors. The study points out the inaccuracies that run counter to other assumptions made upon establishment of the calculation model of the beam and complicate the correct application of the mathematical apparatus. The study provides determination of the coefficient c and $\delta_{\text{კვლ.}}$ as a variable and dependent on the beam's height and shows the way of elimination of the indicated inaccuracies in order to make the beam's calculation correct in terms of both mathematics and structural mechanics.

Auth.

5.D4.8. Investigation of metal coating properties of bimetallic goods. /M. Babutsidze, D. Tavkheldze, Z. Sabashvili, Z. Lolua, M. Kirkitadze/. Building. – 2009. – #2(13). – pp. 37-42. – eng.; res.: geo., eng., rus.

The work proposes a method of study of the structure and wear of the bimetallic coating material developed by employees of the Georgian Technical University and JSC *Grails 92*.

Auth.

5.D4.9. Mental integration possibilities in Central Caucasus. /L. Chagelishvili, L. Beridze/. International Scientific-Analytical Journal Economist. – 2009. – #2 March-April. – pp. 69-80. – geo.; res.: eng.

The article deals with the aspects of mental development and its connection with the cultural, political and religious factors. Cultural branches of the region of Central Caucasus are analyzed in the historical perspective; a research of mental globalization possibilities in this region is given. As a result of analysis, it is demonstrated that the society's culture and mentality grows on the basis of its level of upbringing and education. Cultural diversity in the global space does not mean the absorption of national culture. Quite the contrary, it is proved to be a helping factor of mentality in an educated society. Despite the 70-year Soviet rule and its disfigured "mental legacy", the modern period of globalization clearly demonstrates the aspiration for new values, relations, knowledge, education, culture and mental integration in the countries of Central Caucasus.

Auth.

5.D4.10. Study of the stability of finite difference schemes to solve Saint-Venant equations. /R. Kiladze/. Bulletin of the Georgian National Academy of Sciences. – 2009. – vol. 3. – #1. – pp. 96-99. – eng., res.: geo.

The article deals with the motion of water flows of a variable mass on the water-permeable bed and their expression by a system of respective differential equations when the system is being solved by numerical methods using the finite-difference schemes. The requirement of stability of such schemes is indicated and a respective criterion applying the approaches existing in this field is adopted.

Auth.

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