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## MATHEMATICS AND TECHNOLOGICAL SCIENCES

*Vuvunikian Y.M., Trifonova I.V.* Composite Evolution Nonlinear Operators of Second-Order Multiplicity.  
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## SCIENTIFIC EVENTS

## BOOKS

*Ivonina L.I.* Klessmann Bernd. The Triumph of War. Forms and Functioning of War Declarations in Europe of the XVII<sup>th</sup> Century. Mainz. 2007. 357 p. ISBN 978-3-8053-3707-6.

*Ivonin Yu.E.* Stollberg-Rilinger B. The Emperor's Old Clothes. The History of Constitution and the Language of Symbols. Munich: Publishing House K.C. Beck, 2008. 439 p. ISBN 978-3-406-57074-2.

*Ovchinnikov V.M.* Two New books about Vauban (Jean-Deni D.D. Lepage. Vauban and French Military Science during the Age of Luis XIV: an Illustrated History of Fortification and Strategy. McFarland and Co. London. 2010. 302 p. ISBN 978-0-7864-4401-4).

## **CONFERENCES**

*Belutin R.V.* The XVI<sup>th</sup> Republican Scientific-Practical Conference «Relevant Issues of Germanic Philology and Methods of Teaching Foreign Languages» (Brest, the Republic of Belarus, February 24, 2012).

*Astakhov V.V., Zaitsev N.E., Kuzovova T.I.* The VI<sup>th</sup> International Interschool Scientific-Practical Conference «The Glory of These Days will Never Cease...».

*Belutin R.V.* Concepts «Sustainable Development» and «Dissemination of Results» in Education Management.

## **OUR AUTHORS**

# **SYNOPSIS OF THE JOURNAL**

## **PHILOLOGY**

**V.V. Ilyin**  
**Alexandr Tvardovsky and Nicholay Rylenkov:**  
**the Issue of the «Smolensk Poetic School»**

Key words: *literature study; poetics; typology; connection with Smolensk.*

*The article deals with the complex relationships between the two poets: N. Rylenkov and A. Tvardovsky, highlights the differences of their poetry.*

**L.L. Gorelik**  
**Mythologem Hamlet in B.L. Pasternak's Novel «Doctor Zhivago»**

Key words: *mythologem; passiveness; mysticism; self-denial; opposition; Vygotsky.*

*The article shows the similarity between the protagonist in B. Pasternak's novel with W. Shakespeare's Hamlet: they possess a number of common features and perform a common function. A suggestion is made that Pasternak perceived Shakespeare's character as a mythologem. This is close to the idea of Vygotsky's early work about Hamlet.*

**A.G. Stepanov**  
**Spirits in Clouds:**  
**On one Case of Rhythrical Resonance between Brodsky and Pasternak**

Key words: *poetics; prosody; form and sense; reminiscence; quotation; the semantics of meter.*

*The material of the study is Brodsky's poem «Clouds» and the chorus of spirits from Goethe's «Faust» translated by Pasternak. The two texts are linked rhythmically and thematically, as well as emotionally. Their semantics deal with the fullness of human life embodied in nature.*

**N.G. Medvedeva**  
**«Stanzas in the Manner of Alexander Pope» by O. Sedakova:**  
**the Principles of Artistic Text Organization**

Key words: *stanzas; intertextual ties; leitmotivs; composition.*

*Some ways of interpretation of one of the poetic cycles written by O. Sedakova are suggested in the article. The interpretation is made with the purpose to discover intertextual ties and to specify the genre of the cycle.*

**A.V. Korolkova**  
**Aphorism Studies and Fiction Genres**

Key words: *aphorisms; proverbs and sayings; popular expressions; phraseological units.*

*Until now, the problem of the linguistic nature of aphorisms remains debatable. For its solution it is necessary to consider not only the linguistic features of aphorisms, but their differences from the genres of literature.*

**O.A. Selemeneva**  
**The Utterances with the Meaning «State of Nature» in the Russian Language**  
**(to the Problem of Their Classification)**

Key words: *linguistic picture of the world; utterance with the meaning «state of nature»; Observer; metaphorical utterance.*

*The article analyzes the utterances, representing different states of the natural space and the natural objects in the Russian language. All utterances with the meaning «state of nature» are classified on the basis of two aspects: the way of perceiving of the state by the Observer and the way of its display. Particular attention is paid to metaphorical utterances with the meaning «state of nature».*

**I.A. Korolyova**  
**The History of Family Names**  
**Derived from the Names of Professions in the Russian Language**  
**(on the Material of Smolensk Business Scripture)**

Key words: *family name; name of profession; history of family names formation; the means of forming professional family names; Smolensk Region.*

*The present article considers the formation of family names formed on the basis of names of various professions in the Russian language. The material of the research is based on the scripture sources of the XVIth–XVIIIth centuries i.e. the time of the formation of the Russian family names system. Special attention is paid to the professional family names of Smolensk Region.*

**K.J. Kours**  
**History of Literary Onomastics**

Key words: *literary onomastics; history of science; periodization; directions of onomastic research.*

*This article presents the material which reflects the history of the formation of literary onomastics as a special field of knowledge. Stages of its development are given. Attention is drawn to the key works which gave rise to modern onomastic research. The adjacent nature of linguistic and literary settings of literary onomastics is emphasized. The prospects of further development of this young scientific field are determined.*

**T.M. Zybina**  
**Isomorphic Analysis of Suffixational Noun Derivatives**

Key words: *semantic types of the text; rematic dominant; univerb; suffixational noun derivatives; isomorphic analysis; isomorphic dissonance.*

*The article presents isomorphic analysis of suffixational noun derivatives in various semantic types of texts on the basis of isomorphism of syntactic and word-building processes. The article also presents a comparison of the mentioned analysis with that of prefixational verb derivatives, the content and procedure of isomorphic analysis, proves its linguistic and practical importance.*

**E.F. Troitskiy**  
**Material Gradation in Coordinating Design**

Key words: *material gradation; means of expression; sphere of application; bases, types and shades; real communication of components equal in rights with the general element.*

*Objects and phenomena of the world surrounding us differ in weight and other characteristics. There are special means of expression of these relations in the coordinating designs. Coordinative conjunctions present the greatest interest.*

**V.S. Khrakovskiy**  
**Grammatical Verbal TAM-Categories: Aspect, Tense, Mood  
(Hierarchy and Interaction)**

Key words: *hierarchy; interaction; verb; grammatical category; aspect; tense; mood.*

*This paper aims to discuss and rationalize two arguments. Argument 1: The relationship between the elements of a verbal word (and thus between the elements of every verbal wordform) constitute a hierarchy. Argument 2: The elements of a verbal word (and thus of every verbal wordform) interact with each other. Based on the theoretical conclusions made, the paper proposes an analysis of the verbal TAM-categories (tense, aspect, mood).*

**S.N. Andreev**  
**Semantic Metalanguages: Similarity and Differences**

Key words: *semantic metalanguage; correlation of characteristics; Jaccard coefficient; degree of similarity.*

*The paper is devoted to the comparison of the structure of semantic meta-languages, worked out by the compilers of three English dictionaries – Cambridge International Dictionary, Collins Cobuild Student's Dictionary and Macmillan English Dictionary.*

**G.G. Silnitsky**  
**«Sequential» lexical meanings**

*Key words:* «sequentially» correlated lexical meanings; antecedent; consequent; implication; monoagentival – polyagentival sequences; relational semantics; textual linguistics.

*The article is dedicated to the introduction and elaboration of the notion of «sequentially» correlated lexical units (primarily verbs) denoting consecutive, mutually implicative stages of one and the same referential process ('seek' → 'find', 'question' → 'answer'). The specific features of 'monoagentival' and 'polyagentival' sequential series are examined, as well as their place in comparison with synonymy and antonymy in the system of relational semantics and their role in the process of text generation as studied by textual linguistics.*

**R.W. Gurevich  
Prose of M.L. Kashnitz**

*Key words:* tradition; modernism; short story; novelette; autobiographical prose.

*On the basis of the analysis of prose by Kashnitz (short story, novelette, autobiographical prose) the article reveals the means of cohesion of tradition and modern novelties which are characteristic of her creative work. These are traced in the mythopoetical principle underlying her prose, in the structure of plots where, as a rule, gradual wearing away of borders between reality and fantasy takes place, in peculiar atmosphere of «poetic silence» when the author hides the essentials rather than speaks out.*

**G.N. Ermolenko  
Kinds of Irony in A. de Musset's Theatre**

*Key words:* A. de Musset's work; romantic theatre; kinds of irony.

*The article is devoted to the analysis of different kinds of irony (irony of plot, verbal, parodic irony) in A. de Musset's Theatre.*

**E.J. Kozhina  
The Compound Epithet as a Stylistic Device and the Specificities of Its Translation**

*Key words:* Sylvia Plath; compound epithet; compound adjectives; structurally equivalent translation; compensatory techniques of translation.

*The article examines the problem of translation of compound epithets into Russian and raises the question whether it is possible to preserve this original stylistic device in a translated text. The material, which our research is based on, is the poetry of Sylvia Plath, in whose works compound epithets are particularly abundant. In the final part of our study we formulate the conclusions about the degree of translatability of compound epithets and describe some alternative ways of their translation.*

**HISTORY**

**Yu.E. Ivonin**

## **The Contemporaries about the Permanent Imperial Diet in Ratisbon in the second Half of the XVIIIth – at the Beginning of the XIXth Centuries**

Key words: *Holy Roman Empire; Germany; Diet; Parliament; Federalism; Law of State.*

*The author studies the viewpoints of the contemporaries concerning the Permanent Diet in Ratisbon – German jurists of the second Half of the XVIIIth – the Beginning of the XIXth Centuries – on the basis of their works and contemporary scientific methods. The main problem, which is discussed in the article, is the question if the Permanent Diet was the predecessor of contemporary Parliaments. The author remarks that in the activities of the Permanent Diet can be traced the features of federalism and the territorial representation on the level of contemporary Bundesrat in the Federative Republic of Germany. The author sees it in the appraisals of the Permanent Diet which were made by its contemporaries, namely by German jurists.*

## **V.I. Borisov Peasantry and Food Policy of Soviet Power in the South of Russia during the Civil War (1919–1920)**

Key words: *food policy; agricultural policy; serednyak; Soviet economy; grain monopoly.*

*The article highlights the food policy of the Soviet Power and its character in the South of Russia. The position of the peasantry, which was subjected to violence by «red», «white» and other military-political forces is described in the given work. The results of food supply of the country in the late 1920s are given.*

## **S.V. Vostrikov History of the Treaty: the Discussion, Interpretations and Myths about «Eastern Pact»**

Key words: *historical falsification; myth-making; deontology; historical truth; realism; arguments; facts; lessons of history.*

*One-sided and biased interpretation of historical events, manipulation of facts, myth-making and -reproduction has become effective means of deontological wars. Politics, projected on the historical past, is often used to exert pressure on the opponent, and achieve their own selfish interests. In this respect, there is no exception for the «Eastern Pact» in 1939, concluded between the Soviet Union and Germany. It was concluded under complicated historical and political conditions, when the international controversies in Europe reached the highest point. It made it possible for our country to win certain time and space before the II World War. Lessons of the historical past and the hard realities of our time make scientific forecasting of the future an urgent task.*

## **A.A. Kostyuchenkov Organization and Structure of the Subsidiary Police (Guards) on the Occupied Territory of Smolensk Region in 1941–1943**

Key words: *military collaborationism; subsidiary police; district guards; city guards; regional guards.*

*The article is devoted to the conditions which were the basis for forming subsidiary police (guards), the issues of its recruiting, clothing and money allowances of its members, and also the development of the organization and structure of the subsidiary police on the occupied territory of Smolensk region.*

**O.V. Gorbachev**

**Migration Statistics of the Second Half of the XXth – the Beginning of the XXIst Century  
as a Historical Source**

*Key words: migration; demography; Soviet and post-Soviet migration; migration statistics; population census; current migration registration.*

*The article presents a general description of the Soviet and post-Soviet migration, discusses its basic form. It analyzes the features of migration fixation as compared with other kinds of demographic registration. The representativeness of migration statistics in terms of historical research is estimated. The factors affecting the quality of statistics are presented. The unsatisfactory level of both Soviet and post-Soviet migration statistics is described. A conclusion is made that the problems associated with incomplete and poor comparability of migration data can only be solved with the introduction of a unified register of population.*

**PSYCHOLOGY AND PEDAGOGY**

**E.V. Chmeleva**

**Worldview and Pedagogical Conception by M.M. Manaseina**

*Key words: history of pedagogy; pedagogical system of M.M. Manaseina; faith and science.*

*This article analyses pedagogical conception by M.M. Manaseina. Some elements of the theory can be used in school education of today. Pedagogical theory and practice of nowadays needs M.M. Manaseina's brilliant ideas.*

**A.S. Streltsov**

**Pedagogical Value of Inner World Outlook Wholeness  
(on the Basis of Philosophical Works by S.N. Bulgakov)**

*Key words: Weltanschauung; Russian philosophy; basis of philosophical world outlook; religion; world outlook wholeness.*

*In the pedagogical process of world outlook formation, a great meaning has its inner wholeness, which greatly depends on its philosophical basis. This pedagogical fact brings closer philosophy and pedagogy. We find important material on bringing them closer in Russian philosophy history in the works by S.N. Bulgakov.*

**T.M. Zybina**

**Teaching Speech in Secondary Educational Institutions**

## **in the Second Half of the XIXth Century**

*Key words: theory of philology; general philology; particular philology; goals; tasks; methods and modes of teaching philology.*

*The article presents the analysis of philological theory as a school subject from the point of view of teaching speech, gives a general characteristic of theoretical and practical guide-books which were used in the second half of the XIXth century, analyses their speech-study opportunities, linguistic and methodological contents.*

**V.S. Selivanov, L.N. Selivanova  
Laws of Educational Process**

*Key words: education; formation; law; tendency; regression.*

*In addition to the laws of upbringing as a pedagogical process formulated by pedagogy, the article proves the existence of other objective and essential interrelations between its parts. They include educational laws of the originality of educational situations, incompleteness of education as a process, its orientation on self-change, pupil's participation in the pedagogical process as its subject and laws of regression and nonlinearity of personal qualities formation.*

**V.Y. Lykova  
Pedagogical Support for Child in Education**

*Key words: education; pedagogical support; humanization; harmonization of relations; continuity.*

*The article discusses the impact of pedagogical support in education and stresses the importance of creating cultural and educational space as life medium in which the child is able to realise his creative potential, to find means of self-expression and self-cognition. The article presents reasons for humanization of relations and consistency of upbringing as a factor of pedagogical support to children in their individual development.*

**S.I. Maslov  
Foundations for Subject Classification in Modern Education**

*Key words: education; subject; didactic foundation; principle component.*

*The article deals with different modern didactic approaches to the subject classification. New classification based on three-component content structure of any subject is suggested.*

**E.A. Sergeev  
The Development of Regional System of Education in the Sphere of Culture and Art  
(on the Example of Smolensk Region)**

*Key words: development; system of education; school; institute; professional training; culture; Art.*

*The paper addresses the issue of creation of the education system in the sphere of culture in Smolensk region, defines the phases of its development starting from the XIX<sup>th</sup> century up to now.*

**S.O. Avchinnikova**

**Pedagogical Basics of the Healthy Lifestyle Formation in the Social Work System**

*Key words: healthy lifestyle; client of social work; social worker's pedagogical activity, technology of healthy lifestyle formation; principles; social-pedagogical conditions; methods; resources.*

*Health-saving activity is considered to be a promising and popular direction of social security practice at the individual level. The article reveals the nature and specific character of the healthy lifestyle of the clients, technological bases, principles and conditions of a social worker's pedagogical activity aimed at the healthy lifestyle formation.*

**L.A. Jadvirshis**

**Training of Social Pedagogues for Work with Risk Group Children**

*Key words: typology of risk group children; social pedagogue professional training; social pedagogue main competences for work with risk group children.*

*The author examines specific character of social pedagogy students' professional training for the work with risk group children; typology of these children is more specifically defined. The article shows that professional training content of social pedagogues is determined by the children's problems.*

**A.P. Smantser**

**Pedagogical Conditions of Preparation of Future Teachers to Work with Children under the Conditions of Inclusive Education**

*Key words: pedagogical conditions; children with special educational needs; inclusive education; professional competence; competence structure; competence hierarchy.*

*The following types of competence were found necessary for the teacher to work successfully under the conditions of inclusive education: monitoring, diagnostic, contents, forecast, designing, reflective, communicative, conflict solving, research. Besides, types of competence connected with technologies and technique of work with children under the conditions of inclusive education are necessary. They are also required for work with children with special needs.*

*The offered hierarchy of competencies, necessary for successful work of the teacher under the conditions of inclusive education, and their realization during educational work in high school will render positive influence on the quality of teachers training.*

**N.G. Preobrazhenskaya**

**Modern Requirements to Educational Literature for School Students**

*Key words: intensive development education; multi-level approach to students; educational literature; two-level textbook.*

*The article addresses the necessity to create new educational literature for school students, adapted for different levels of their development and the quality of their knowledge and skills (high, medium, low) and aimed at intensive development of intellectual and practical activities of every student.*

**G.S. Merkin**

### **The Principle of Inculcation in Methods of Teaching Literature at School**

*Key words: principals of teaching Literature; principal of inculcation; creative potential of pupils; research; scientific work of pupils.*

*The article presents a system of principals for teaching Literature at school, suggests groups of principals, examines the principle of inculcation and defines its types and forms in practical activities.*

**E.I. Khachikyan**

### **Moral Development at the Lesson of Literature**

*Key words: moral development; ways to actualize moral potential at the lessons of Literature.*

*Literature as a subject has a great potential for moral development of students. The article analyzes the specific ways to use Literature for moral development of school students, reveals the methods of actualization of the moral potential of Literature.*

**A.A. Romanova, G.E. Senkina**

### **Designing of Bilingual Electronic Dictionaries in Pedagogical Sciences: the Results of the Ascertaining Phase of the Experiment and the Conceptual Model**

*Key words: educational dictionaries; terminological dictionaries; electronic dictionaries; dictionaries and reference books in pedagogical sciences; bilingual dictionaries; designing of dictionaries.*

*At the ascertaining phase of the experiment potential users' preferences of bilingual electronic dictionaries in pedagogical sciences are explored. The theoretical and methodological foundations of the designing process for such type of dictionaries are identified. The major requirements for bilingual electronic dictionaries in pedagogical sciences are highlighted.*

**E.S. Samoylenko, V.N. Nosulenko**

### **Verbal Comparison of Sounds as a Factor of Subjective Evaluation of Their Similarity**

*Key words: comparison; verbalization; auditory perception; subjective evaluation of similarity.*

*The experimental study concerned the role of verbal realization of similar and different sounds in subjective evaluation of their similarity. As experimental stimuli, sounds produced by animals, noises and musical fragments were used. The experiments showed that the degree of influence of verbal sound comparison on subsequent evaluation of their similarity depends upon the nature of the sounds.*

## BIOLOGY AND NATURAL SCIENCES

**M.Yu. Gildenkov**

### **New Data on Taxonomy and Distribution of Genus *Carpelimus* Leach, 1819 in Northwest Pakistan (Coleoptera, Staphylinidae, Oxytelinae)**

*Key words: Coleoptera; Staphylinidae; Oxytelinae; Carpelimus; Palaearctic; Pakistan; new species; new synonymy; new data on distribution.*

*The article presents the description of new species *Carpelimus* (s. str.) *elegantus*, sp.n. from the northwest of Pakistan. The synonymy is established: *Carpelimus* (s.str.) *peregrinus* (Cameron, 1919) = *Carpelimus* (s.str.) *angusticollis* (Bernhauer, 1907), syn. n. New data on the distribution of *Carpelimus* representatives on the territory of Pakistan is presented.*

**O.A. Starodubtseva**

### **Efficiency of Various Methods of Staphylinid (Coleoptera, Staphylinidae) Collection Specifically in the Southwestern Non-Black Soil Area of Russia**

*Key words: Coleoptera; Staphylinidae; methods; Barber soil traps; entomological sieve.*

*The article assesses the efficiency of various methods for the collection of different subfamilies of Staphylinidae (Coleoptera) with the help of Barber soil traps and entomological sieves specifically in the southwestern non-black soil area of Russia.*

**E.S. Tolstenkova, V.A. Zabrodin, O.A. Vassileva**  
**Specific Features of Thyroid Glands Morphology:**  
**Comparison of Mammal Animals and Humans**

*Key words: thyroid gland; people; mammal animals; morphology; isthmus.*

*The article presents the results of morphology investigation of 304 thyroid glands in 12 types of mammals at the territory of Smolensk region: the difference of topography of thyroid gland, change of the place of lobes from the dorsal surface to the frontal plate. With the increase of mammal size the thickness of thyroid capsule grows and the isthmus appears, which developed from connective tissue structure to parenchimal structure.*

**E.A. Gorodnichenko, G.V. Korotkova**  
**Physical Activity in Assessment of Abilities of Cardio-Vascular System**

*Key words: cardio-vascular system; static exercise; sex; age; correlation analysis.*

*The efficiency of the local static exercise application was proved for the estimation of the blood-vascular system functional capacities of people of different age and sex.*

**T.A. Palkina**  
**Geographical Analysis of Segetal Flora of Ryazan Region**

*Key words: segetal flora; agrocenosys, species composition; geographical elements; alien plants.*

*The article presents the results of the analysis of geographical elements of segetal floras of Ryazan region. Alien (38% species) and native components are revealed in its structure. Spectra of primary and modern areas of their species are shown. The role of zonale floristic complexes in the structure of agrocenosyses is considered. Features of territorial distribution of weed-field plants within the limits of the region are revealed.*

**Z.A. Ataev**  
**Assessment of Resources for Local Hydropower Industry  
of the Central Economical Region of Russia**

*Key words: Central economic region of Russia; territorial organization of power engineering; renewable energy sources; hydropower resources of the territory; local hydropower engineering; local power engineering; local power supply systems.*

*The article is devoted to the issues of preliminary assessment of hydropower resources for the development of local hydropower industry in the Central economic region of Russia. The identified proportions between gross, technical and economic potentials demonstrates the unrealized possibilities of the extensive development of local energy systems based on small-scale hydropower facilities. Involvement in the overall energy balance of even a part of the economic potential of hydropower resources can improve the reliability of power supply within the limits of conjugated development of central and local power supply systems.*

**T.I. Pototskaya, S.V. Ivanov**  
**Territorial Organization of the World «Silver Industry»**

*Key words: precious metals industry; silver; territorial organization of the industry; industry of the world economy; industry of national economy; Russia.*

*This article contains the results of the study of the territorial organization of the «silver industry» around the world. The composition of the industry based on IBAN and NACE. The authors identified the properties of silver and the related areas of metal use. The article shows the technological features of silver production, that are affecting the placement of this industry. The authors defined the geography of reserves, production, use of silver in the world (by groups of countries, regions, countries) and in Russia.*

**I.V. Ankinovich, V.A. Skalikov**  
**The Main Characteristics of the Chemical Composition of Snow in the City  
(at the Example of Smolensk)**

*Key words: snow cover; city area; weather conditions; urban roads; content of pollutants; acid-base properties.*

*The article presents the research results of the spatiotemporal changes in the chemical constitution of snow melt within the territory of Smolensk. The influence of weather conditions in winter on the concentration of some elements in snow is shown. The results of the analysis of the chemical constitution of melted snow water in the city in areas of various anthropogenic impact are presented.*

## MATHEMATICS AND TECHNOLOGICAL SCIENCES

### **Y.M. Vuvunikian, I.V. Trifonova Composite Evolution Nonlinear Operators of Second-Order Multiplicity**

*Key words: evolutionary operator; generalized vector-function; support of generalized vector-function; space infinitely differentiated finite from left functions; composition of operators; multiple nonlinear evolutionary operator; component of evolutionary operator; convolution; tensors product; tensor degrees.*

*Evolutionary operators of second-order multiplicity are widely used in the study of nonlinear multidimensional evolutionary systems with two input and output signals. Composition of nonlinear evolutionary system operators allows us to describe the system impulse characteristics, which is one of the most pressing problems in the theory of nonlinear systems. The article defines a composite evolutionary nonlinear operator of second-order multiplicity and describes the composition of such operators with nonlinear evolution operators of second-order multiplicity.*

### **Y.M. Vuvunikian, D.S. Shpak Operator Components of Quasi-Inverse Evolution Operators for Nonlinear Differential Equations of the Second Order**

*Key words: evolution operator; quasi-inverse evolution operator; the generalized impulse characteristic; operator components of evolution quasi-inverse operator delta-function; convolution; tensor product.*

*In the article the general formulas for the operator components of the first, the second and the third order of the quasi-inverse evolution operator for the evolution operator generated by the nonlinear differential equation of the second order  $x'' + ax' + bx + cx^2 = f(t)$  have been found. With the use of these formulas the operator components of the quasi-inverse evolution operator for some differential equations for the specific values  $a, b, c$  have been constructed.*

### **G.S. Evdokimova Systems with Limitations**

*Key words: systems with limitations; incoming flow; variables; construction of mathematical models; leading measure; mean intensity; order of admission; periodic parameters; ergodic properties; markovian process.*

*In this paper we study the multiline queuing systems with limitations, provided that the incoming stream of requirements with Poisson's leading measure of time  $\tau$  and service requirements of the system is in the order they are received.*

**E. Kiryatzkii**  
**Some Properties of the Classical Averages**

*Key words: Euclidean space; distance; harmonic mean; geometric mean; mean; standard deviation.*

*The article investigates some properties of classical averages. The Duality Theorem for these averages depending on dimension of Euclidean space is established.*

**O.N. Kuprikova**  
**About of the Solution of the Boundary Value Problem of Neymann**  
**in Class of Quasiharmonic Functions of the Third Genus**

*Key words: quasiharmonic function; differential equation; boundary value problem of Neymann.*

*The article is devoted to the investigation of boundary value problem of Neymann for quasiharmonic functions. The necessary and sufficient conditions under which the problem is solvable were discovered and a constructive method for its solution in class of quasiharmonic functions of the third genus in the unit disc was found.*

**K.M. Rasulov**  
**About Solvability of the Three-Element Boundary Value Problem of Riemann**  
**for Analytical Functions in Explicit Form**

*Key words: three element boundary value problem of Riemann; piecewise analytic functions; analytic continuation; closed curve of Lapunov.*

*The article is devoted to the investigation of three element boundary value problem of Riemann in classes of piecewise analytic functions for which the jump line is closed curve of Lapunov. The sufficient conditions are obtained under which the considered boundary value problem has the solution in the form of the Cauchy type integral.*

**A.G. Haydarov, V.N. Chepikova, V.A. Kholodnov, E.S. Borovinskaya, V.P. Reshetilovsky**  
**Application of Interval Analysis for the Research of Biocatalytic Processes in Microreactor**

*Key words: interval mathematics; biocatalytic processes; kinetic parameters; microreactor.*

*The application of microreaction technology becomes increasingly important in the intensification of the biochemical processes, as it increases the rate of such processes due to the possibility to support them in a continuous mode.*

*In the study of biochemical process it is necessary to determine the values of kinetic parameters. Experimental data for calculating the kinetics of chemical reactions have*

*measurement error. If it is impossible to accurately measure the parameters, the interval approach is to be used, which makes it possible to perform calculations under the conditions of uncertainty and ambiguity of the experimental data. In this article we used the interval approach which enables us to compute estimates of the unknown parameters of the model in the form of the parameter field. The program algorithm for computing the interval of the the values of all kinetic parameters is presented. All the results were obtained using the software package «Wolfram Mathematica».*