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EDITOR'S NOTE

The Scientific Research Fund of the Serbian Academy of Sciences and Arts (SASA) allocates funds for scientific-research work, publishing activity, interacademic and international cooperation, for the participation of SASA members and their associates at scientific gathering in the country and abroad, for the acquisition of scientific literature and other scientific-research work needs.

Scientific research programme of the Serbian Academy of Sciences and Arts is carried out through some 150 research projects organized and coordinated by eight Academy's departments and about 50 scientific committees. All projects are conceived and led by the members of the Academy. Contact persons are the project leaders.

For 29 years now the Serbian Academy of Sciences and Arts has been publishing the *Scientific Research Fund Bulletin* in the Serbian language (ISSN 0351-2358). It provides detailed data on most important results of individual projects financed by the Scientific Research Fund of the Serbian Academy of Sciences and Arts. A part of that research is carried out in the Academy itself and its Institutes, whereas another part is done at Universities and other scientific institutions of Serbia. SASA projects greatly rely on laboratory equipment of other institutions. Some 900 researchers have been included in the implementation of SASA projects to a varying extent, representing about 10% of all researchers in Serbia. Leading researchers on these projects are SASA members.

With a view to informing foreign scientific and cultural public about its projects and obtained results, SASA is launching an English edition of *The Bulletin of Scientific Research – Annual Report* for the previous year that will represent a summary review of work on projects, accompanied by selected bibliography of works for each individual project. At its end The Bulletin gives a review of SASA publications published in the previous year. The English version is considerably shorter than the Serbian one, especially its part on the work published in Serbian. Apart from hard copy, this Bulletin will be available in electronic form at the SASA web site.

Vidojko Jović
*Corresponding
Member*

**DEPARTMENT OF MATHEMATICS, PHYSICS
AND EARTH SCIENCES**

EARTH SCIENCES

Project: **INVESTIGATION OF PALEOFLORA AND PALEOFAUNA OF
SERBIA**

(Corresponding Member Marko Ercegovac)

1. The historical and geological evolution of Serbia in Phanerozoic

The complex study of Paleozoic, Mesozoic and Tertiary sediments of Serbia from palaeontologic, biostratigraphic and palaeoecological aspects is continued in 2003. It included a solution of stratigraphic and tectonic relationships between marine sediments of Paratethys and freshwater formations.

2. Investigation of fossil flora and fauna of Serbia

The study of palaeontologic and biostratigraphic characteristics of green algae (dasycladacean of Cretaceous and Paleogene), rudists (evolution, phylogeny, biostratigraphy, and taxonomy of the Senonian rudist genus *Pseudopolyconites*), echinoids (Eocene), conodonts (Triassic of Serbia and Hungary), radiolarians (Jurassic), ostracods (Miocene), palynomorphs (Permian-Triassic of Carpatho-Balkanides and Dinarides, Upper Cretaceous of Vojvodina, Miocene of Panonian Basin) and Miocene mammals is continued.

De Capoa P., Distasio A., Giardino S., Radoičić R., 2003: New biostratigraphic evidences in the Central-eastern belt of the Vardar Zone (Internal Dinarides). **Memorie della Societa Geologica Italiana**, 57 (2002), 173–183.

De Capoa P., Radoičić R., 2003: Geological implications of biostratigraphic studies in the external and internal domains of the Central-southern Dinarides. **Memorie della Societa Geologica Italiana**, 57 (2002), 185–191.

Dimitrijević M.N., Dimitrijević M.D., Karamata S., Sudar M., Gerzina N., Kovacs S., Dosztaly L., Gulacsi Z., Less Gy., Pelikan P., 2003: Olistostrome/ melanges – an overview of the problems and preliminary comparison of such formations in Yugoslavia and NE Hungary. **Slovak Geological Magazin**, 9.

Ercegovac M., Kostić A., Karg H., Welte D.H., Littke R., 2003: Temperature and burial history modelling of the Drmno and Markovac depressions, SE Pannonian Basin, Serbia. **Journal of Petroleum Geology**, 26 (1), 5–27.

Filipović I., Jovanović D., Sudar M., Pelikan P., Kovacs S., Less Gy., Hips K., 2003: Early Alpine evolution of the Jadar Block (NW Serbia) and Bükkium (NE Hungary) terranes; some paleogeographic implications. **Slovak Geological Magazin**, 9.

Project: **PALYNOMORPHS FROM PALEOZOIC AND MESOZOIC
SEDIMENTS IN SERBIA**

(Corresponding Member Marko Ercegovac)

Paleontological and geological investigations of volcano-sedimentary deposits of Devonian age at some classical localities from the following geotectonic units: Stara Planina, Poreč, Kučaj, and Ranovac-Vlasina are finished.

Investigations of palynomorphs from the Upper Permian and Lower Triassic sediments of some profiles in Stara Planina were continued. The revision of complete studied paleontological material until now is done.

Ercegovac M., Milivojević J., 2003: Permian and Early Triassic palynomorph assemblages from Carpathian-Balkan and Dinarides (Serbia and Montenegro). **International Congress on Carboniferous and Permian Stratigraphy**, Utrecht, 10–16 August, 2003, Abstracts, 139–141.

Project: **GEODYNAMICS**
(Academician Stevan Karamata)

1. Terranes of Serbia and neighboring areas (Academician Stevan Karamata)

Separating of terranes in Eastern Serbia, in particular the Kučaj terrane and its relationship to the neighboring ones, and defining of relation of the Eastern Bosnian-Durmitor terrane to the neighboring units, are continued.

2. Movement of blocks and plates (Prof. Milorad Dimitrijević, Ph.D.)

Movement of blocks and units which are located southern of Tisia, according to the present paleomagnetic data, facial developments and geological relations, as well as phytopaleontological data, is defined for a period between Permian and Tertiary.

Karamata S., Stefanović D., 2003: Evolution of the Vardar Ocean during Mesozoic. **Annales Universitatis Scientiarum Budapestinensis**, Sectio Geologica, 35, 141–142.

Karamata S., Stefanović D., Krstić B., 2003: Permian to Neogene accretion of the assemblage of geologic units presently occurring to the south of the Pannonian Basin – Development of the Vardar Composite Terrane and adjacent units. **Acta Geologica Hungarica**, 46 (1), 63–76.

3. Ophiolitic belts of the Balkan Peninsula and the evolution of oceanic realms (Academician Stevan Karamata)

International field workshop “Correlation of ophiolitic belts exposed in Serbia” (6–11 October 2003) with the guide book under the same title is organized. The members of Geological Group of the Hungarian Academy of Sciences and the members of Working Group and specialists from Belgrade, Republic of Srpska and Switzerland participated.

4. Cherts, influence of geological environment on their properties (Academician Stevan Karamata)

Cherts from Uzlomac in Bosnia formed on continental shelf under carbonate platform during Upper Triassic and Jurassic were investigated.

Vasić N., Vujnović L., Karamata S., 2003: The chert sequence of Uzlomac (Bosnia) Formation: a continental slope formation in front of the Dinaridic Upper Triassic-Jurassic carbonate platform. *Annales Universitatis Scientiarum Budapestinensis, Sectio Geologica*, 35, 129–130.

5. The rift-magmatism of the Dinarides (Prof. Vera Knežević–Djordjević, Ph.D.)
Metabasalts from Dudin Krš near Kosovska Mitrovica were studied.

6. The post-collisional magmatism in the axial part of the Balkan Peninsula (Prof. Vera Knežević–Djordjević, Ph.D.)

Geochemical and mineralogical characteristics of Mesozoic and Tertiary granitoids in Central Serbia, between Serbian-Macedonian massif and the Kopaonik block, were analyzed.

7. Metamorphism related to the emplacement of ophiolite complexes (Academician Stevan Karamata)

Metamorphic rocks from Banjska, Troglav and Ozren, which are located in a base of ultramafic rocks, as well as geochemical characteristics of amphibolites due to determination of protolyte and type of basaltoids from which they formed, were studied.

8. Metamorphism in the area of Gora (south of Prizren) (Prof. Vera Knežević–Djordjević, Ph.D.)

9. The Neogene of Serbia (Nadežda Krstić, Ph.D.)

International field workshop of limnologists of the Carpatho-Balkan Geological Association (July 6–12, 2003) was organized. Geologists from Albania, Bulgaria, Germany, Romania, Slovakia and Serbia participated. Neogene basins: Vranje, Leskovac, Popovac, Koštunići, and on margins of Fruška Gora, were presented.

10. Rocks formed under high pressure – eclogites (Academician Stevan Karamata)

The chemistry of coexisting minerals from eclogites of Djunis and Gornji Brestovac near Bojnik is studied.

11. Mercury distribution in geological materials and its impact on the environment (Academician Stevan Karamata)

Project: **GEOMORPHOLOGICAL MAP OF SERBIA IN SCALE 1:50.000**

(Academician Stevan Karamata)

The geomorphological map – Sheet Vlasotince 2, Leskovac 1 and Užice 3, was finished.

Project: **GEOCHEMISTRY**
(Academician Zoran Maksimović)

1. Geochemistry of the Upper Mantle and the igneous rocks of the Earth's crust

The ultrapotassic rocks of Tertiary age, their basic geochemical and petrological characteristics, as well as their relation to basaltoid rocks in Serbia of different composition but of similar age, were investigated. Using modern isotopic methods (Sr and Nd) a general geodynamic model of evolution of entire Tertiary magmatism was proposed.

Prelević D. (2003): **A geochemical and petrological study of the Tertiary ultrapotassic province in Serbia and its relation with other Serbian volcanic provinces**. Ph.D. Thesis, Mathematisch-Naturwissenschaftlichen Fakultät, Greifswald, Germany, 242 p.

2. Geochemistry of the rock alteration

In collaboration with the Hungarian Academy of Sciences geochemical study of karstic bauxites of Grebnik (Metohija) is continued. The presence was established of nickel mineral (nickel-bearing chlorite with 6.5 % NiO – Ni-ripidiolite) in association with synchysite-(Nd), which was discovered earlier and described as a new mineral.

The content of uranium in the environment in Serbia is studied. There are some geological formations in Serbia with uranium (granitoids, crystalline schists, volcanic rocks, per-Tertiary terrigenous sandstones and Tertiary sediments).

Maksimović Z. (2003): An unknown Ni-Al hydrosilicate. **Acta Geologica Hungarica**, 45 (4), 313–320.

Radošević B., Kovačević J., Jović V. (2002): Natural occurring uranium in Serbia and possible environmental effect. **Journal of Environmental Protection and Ecology**, 3 (3), 706–718.

3. Mineralogy

After mineralogical study of ore occurrences in the area of Gokčanica it was found that arsenopyrite is the most abundant ore mineral. Native gold is associated with arsenopyrite.

Using atomic force microscope (AFM) three-dimensional shape of the polygonal serpentine crystal, known as povlenite, is determined.

Alteration of spodumen from Konjuh^{AN}nica (Cer Mountain) is studied. It completely transformed into fine-grained muscovite or mixture of muscovite and kaolinite.

Structural and optical characteristics of mineral schwazite from Dragodol are determined.

Karanović Lj., Cvetković Lj., Poleti D., Balić-Žunić T., Makovický E. (2003): Structural and optical properties of schwazite from Dragodol (Serbia). **Neues Jahrbuch für Mineralogie Monatshefte**, 11, 503–520.

MATHEMATICS AND MECHANICS

Project: **ASYMPTOTIC BEHAVIOUR OF GENERALIZED FUNCTIONS,
THEORY AND APPLICATIONS**
(Academician Bogoljub Stanković)

Different asymptotic behaviour of generalized functions has been studied. The obtained results have been applied to Tauberian type of theorems and to solutions of mathematical models arising in mechanics.

Pilipović S., Stanković B., 2002: Wiener-Type Tauberian Theorems for Fourier Hyperfunctions. *Zeitschrift für Analysis und ihre Anwendungen*, 21 (4), 1027–1042.

Stanković B., 2003: Solution to a partial differential equation appeared in mechanics. *Bulletin Académie serbe des sciences et des arts, Sciences mathématiques*, 28, 41–61.

Project: **SEMI-RIEMANNIAN GEOMETRY**
(Academician Mileva Prvanović)

Matsumoto's investigations concerning the intrinsic properties of minimal hypersurfaces of flat spaces, are generalized for the complex hypersurfaces of complex space forms.

Prvanović M., 2002: Some intrinsic formulas for complex hypersurfaces of complex space forms. *Recent Advances in Analytical Dynamics, Control, Stability and Differential Geometry, Proceedings*, Matematički Institut SANU, Beograd, 67–71.

Project: **NONLINEAR ANALYSIS IN FUZZY STRUCTURES**
(Academician Olga Hadžić)

Using some new results from the theory of triangular norm in these papers existence results on the fixed point for single-valued and multi-valued mappings in probabilistic metric spaces are obtained. Some applications to random operator equations are given.

Hadžić O., Pap E., 2003: Fixed Point Theorems for Single-valued and Multi-valued Mappings in Probabilistic Metric Spaces. *Atti Seminario Matematico e Fisico dell' Università di Modena, LI*, 377–395.

Hadžić O., Pap E., 2003: New Classes of Probabilistic Contractions and Applications to Random Operators. In: *Fixed Point Theory and Applications*, Vol. 4, Yeol Je Cho, Jong Kyu Kim, Sahin Min Kang (editors), Nova Science Publishers, Inc., New York, 97–119.

Hadžić O., Pap E., Radu V., 2003: Generalized Contraction Mappings Principles in Probabilistic Metric Spaces. *Acta Mathematica Hungarica*, 101 (1–2), 131–148.

Project: **COMPUTER AIDED INVESTIGATIONS IN DISCRETE
MATHEMATICS**

(Academician Dragoš Cvetković)

Combinatorial optimization, a long term area of investigation within this project, was present in 2003 by a study of complexity indices for extremal problems on weighted graphs. A new way of forming a short edge subgraph has been proposed. Edges of this subgraph play a crucial role in finding optimal solution so that it is possible to get some information on the running time of some algorithms for solving the problem considered.

Investigations in graph theory supported by the expert system GRAPH are among important activities in this project. The programming package GRAPH, an expert system for graph theory, was developed in Belgrade in the period 1980–1984. Although implemented by very modest tools in terms of recent standards, the package is very useful and still in use.

It was decided in 2002 to implement a new version of the system GRAPH using recently available programming tools. The new system got the name newGRAPH and its implementation started in 2003 with the use of programming language JAVA. D. Stevanović and V. Brankov have completed a working version of the system.

Cvetković D, Mitrović–Minić S., 2003: A generalized short edge subgraph for a combinatorial optimization problem. **SYM-OP-IS 2003**, 319–321.

Stevanović D, Brankov V., 2003: **NewGraph Manuals**. Faculty of Sciences, Niš.

Project: **ASYMPTOTIC FORMULAS IN ANALYTIC NUMBER THEORY**

(Academician Aleksandar Ivić)

The main fields of scientific investigations in 2003 were the Riemann zeta-function $\zeta(s)$, Hecke series, as well as obtaining certain error terms in the asymptotic formulas for arithmetic functions, in particular for $\pi(x)$, the number of primes not exceeding x . The methods of integral transforms, complex integration and spectral theory were used, combined with certain elementary techniques. The results have applications to various arithmetic functions from multiplicative and additive theory which are related to $\zeta(s)$.

Asymptotic formulas for the sums

$$\sum_{\kappa_j \leq K} \alpha_j H_j^r(1/2) \quad (r = 3, 4),$$

are given, where $H_j(s)$ is the Hecke series, while κ_j and α_j are standard quantities in the spectral theory of the non-Euclidean Laplace operator [1]. The results sharpen previous results of N.V. Kuznetsov.

The paper 2 also belongs to the spectral theory of the non-Euclidean Laplace operator and also to the theory of $\zeta(s)$. Therein one finds estimates of $Z_2(s) = \int_1^\infty |\zeta(1/2 + it)|^4 t^\sigma dt$ for $1/2 < \sigma = \Re s < 1$, and the relations of such estimates with the estimates for $\zeta(s)$.

The paper 3 gives the asymptotic formula for the sum of reciprocals of $\pi(n)$ where $n = 1, \dots, x$, and $\pi(x)$ denotes the number of primes $\leq x$. The formula sharpens a recent result of L. Panaitopol.

Paper 4 is a review paper, dedicated to the memory of the academician Jovan Karamata on the occasion of the centenary of his birth. Therein results on arithmetic functions involving slowly varying functions are discussed.

Paper 5 gives a new, sharp theorem for mean values of moments of $\zeta(s)$ and related Dirichlet series.

Book 6 is the second edition (the first one was by John Wiley & Sons in 1985) of the extensive monograph on the Riemann zeta-function.

1. Ivić A., 2002: On the moments of Hecke series at central points. **Functiones et Approximatio**, 30, 49–82.

2. Ivić A., 2002: On the estimation of $Z_2(s)$. In: **Anal. Probab. Methods Number Theory** (eds. A. Dubickas et al.), TEV, Vilnius, 83–98.

3. Ivić A., 2002: On a sum involving the prime counting function $\pi(x)$. **Univerzitet u Beogradu, Publikacije Elektrotehničkog fakulteta, Serija Matematika**, 13, 85–88.

4. Ivić A., 2002: On summatory functions of additive functions and regular variation. **Publications de l'Institut Mathématique (Belgrade)**, 71(85), 27–39.

5. Ivić A., 2003: On mean values of some zeta-functions in the critical strip. **Journal de Théorie des Nombres de Bordeaux**, 15, 163–178.

6. Ivić A., 2003: **The Riemann zeta-function (2nd edition)**. Dover, New York, XVI+517 p.

Project: **QUALITATIVE AND NUMERICAL ANALYSIS OF SOME CLASSES OF DIFFERENTIAL AND DIFFERENCE EQUATIONS**

(Academician Vojislav Marić)

Two kinds of problems are studied: 1. problems related to the approximation of solutions in the boundary layer of some nonlinear differential equations; 2. asymptotics of solutions of the half-linear differential equations.

Marić V., Kusano T., Tanigawa T., 2003: Asymptotics of some classes of second-order half-linear differential equations. **Bulletin Académie serbe des sciences et des arts, Sciences mathématiques**, 28, 61–74.

Project: **APPLICATIONS OF THE VARIATIONAL PRINCIPLES OF MECHANICS TO NONLINEAR AND NONCONSERVATIVE DYNAMICAL SYSTEMS**

(Academician Božidar D. Vujanović)

The subject of the research has been focused on the application of the Hamilton-Jacobi method to rheonomic dynamical system with one and two degrees of freedom. Special attention has been directed toward rheo-linear vibrating systems. Similar classes

of dynamical problems were treated by the field-momentum method for the cases when the method of Hamilton cannot be applied. Some engineering problems of the Optimal Control Theory have been studied by the method of the coordinate-field theory.

Bačić B.S., Vujanović B.D., 2003: The Hamilton-Jacobi Method for Arbitrary Rheo-Linear Dynamical Systems. *Acta Mechanica*, 163 (1–2), 51–59.

PHYSICS AND METEOROLOGY

Project: **STATISTICALITY AND CAUSALITY IN QUANTUM MECHANICS**
(Academician Fedor Herbut)

The research was confined to the working cabinet with ample use of the world wide web.

Field of research: distant correlations, quantum information theory, and theory of quantum communication.

The notion of physical twin observables has been simplified substantially. The relation between a quantum observable and a quantum state has been investigated in detail from the point of view of coherence entropy. It has been shown that the quantum discord can be expressed in terms of coherence entropy also in the case of some mixed states.

Herbut F., 2003: The Role of Coherence Entropy of Physical Twin Observables in Entanglement. *Journal of Physics A: Mathematical and General*, 36, 8479–8495.

Project: **NUMERICAL SIMULATION OF WEATHER AND CLIMATE**
(Academician Fedor Mesinger)

Activities during 2003 were aimed at further developing the Eta Model, as well as at its application for weather and climate purposes. A task elaborated in 2003 was the initialization of the model for weather prediction purposes, using a modified form of the so-called super-Matsuno scheme. Initialization results arrived at were compared with those obtained using a standard digital filtering scheme. Modified super-Matsuno scheme is expected to have some advantages: it is straightforward to implement and may be used in forward-only mode, so that asynchronous data might be better assimilated. Comparison results showed that both schemes worked well, with little difference between them. Thus, there are good prospects of using the modified super-Matsuno scheme with possibly advantages as mentioned.

Another subproject addressed the effects of the release of contaminants into the atmosphere above Serbia by the NATO bombing campaigns during April 1999.

Trajectories of contaminants emanating from a bombed chemical plant were calculated using the Eta Model. Compelling indications of the resulting increased precipitation (Unkašević et al. 2003) were determined. Similarly, transport of Saharan dust into the region of and around Serbia has been studied.

A final topic to be reported on is that of the refinement of the Eta coordinate discretisation via the introduction of “sloping steps”. Related tasks accomplished in 2003 were testing the replacement of the model’s vertical advection scheme by a piecewise linear scheme, and that of using the vertical advection every model’s elementary time step (Lazić). Encouraging preliminary results were obtained with partially implemented schemes using the “sloping steps”, an add-on to the current Eta code (Mesinger and Jović). This refinement now represents a highly promising development, in view of the operational Eta having achieved in the United States’ mountainous West in the first year of operational comparison results, much better than those of a higher resolution model, “NMM”, that used the sigma coordinate. In simulating downslope windstorms, it is expected that the refinement will remove the Eta coordinate’s weakness, compared to sigma.

Mesinger F, 2003: Numerical Weather Prediction: the problem, where are we, and what can we expect? Lessons learned from the Eta Model. **Bulletin T. CXXIV de l’ Académie serbe des science, Classe des science mathématiques et naturelles, Science naturelles**, 40, 29–61.

Mesinger F, DiMego G., Kalnay E., Shafran P., Ebisuzaki W., Fan Y., Grumbine R., Higgins W., Lin Y., Mitchell K., Parrish D., Rogers E., Shi W., Stokes D., Woolen J., 2003: NCEP Regional Reanalysis. **Symposium on Observing and Understanding the Variability of Water in Weather and Climate**, paper 5.7, Combined Preprints CD-ROM, **83rd AMS Annual Meeting**, Long Beach, CA.

Unkašević M., Lazić L., Tošić I., Vukmirović Z., 2003: Effects of Uncontrolled Particulate Matter Release on Precipitation Under Warfare Conditions. **Environmental Science and Pollution Research**, 10, 89–97.

Project: **DYNAMIC PROPERTIES OF THE SOLAR SYSTEM**
(Academics Božidar Vujanović and Fedor Mesinger)

1. Chaos and Stability in the Motion of Celestial Bodies in the Planetary Space (Zoran Knežević, Ph.D.)

Testing of conditions for the application of Nekhoroshev’s theorem to real dynamic system – family of small planets Cornis, was continued.

2. Study of the Motion of Large Planets’ Satellites (Vojislav Protić–Benišek, M.S.)

The passage of Mercury before the Sun disc was observed on May 7, 2003 from the Belgrade Astronomic Observatory using CCD and other techniques. We carried out observations and preliminary processing of the filmed CCD material of mutual eclipsing and occultations between Jupiter’s satellites (international campaign PHEMU03, led by Bureau de Longitude, Paris). Work has been done on the expansion of ICRF (International Celestial Reference Frame) to objects observed in the optical, infrared, radio X and other wavelengths domains.

Project: **SHAPES AND SHIFTS OF SPECTRAL LINES IN GAS PLASMAS
AND ELECTRIC GAS DISCHARGES**
(Corresponding Member Nikola Konjević)

A part of the Project activities is directed towards experimental testing of various theoretical approaches, which describe broadening and shifting of non-hydrogenic spectral lines in gas plasmas. It is shown that considerable progress has been achieved recently. Systematic studies along Balmer series of atomic hydrogen are directed toward higher members of Balmer series and their potential use for low-electron density plasma diagnostics. Plasma sources of importance for further investigations of optical emission spectroscopic methods for low electron density plasma diagnostics are studied also.

Analysis of the Doppler broadened Balmer alpha line shape study in an abnormal, plane cathode glow discharge in hydrogen and deuterium is completed. It is proven that cathode material plays an important role in line shape formation.

Gemišić-Adamov M.R., Obradović B.M., Kuraica M.M., Konjević N., 2003: Doppler spectroscopy of hydrogen and deuterium Balmer alpha line in an abnormal low discharge. **IEEE Transactions on Plasma Science**, 31, 444–454.

Ivković M., Jovičević S., Konjević N., 2003: Old “new” method for low electron density plasma diagnostics. **4th Conference on Plasma Physics and Plasma Technology (PPPT-4)**, Minsk, 14–19 September 2003, Institute of Molecular and Atomic Physics National Academy of Sciences Belarus, 392–395.

Jovičević S., Ivković M., Konjević N., 2003: Two-mode operation of an atmospheric pressure stabilized argon arc. **4th Conference on Plasma Physics and Plasma Technology (PPPT-4)**, Minsk, 14–19 September 2003, Institute of Molecular and Atomic Physics National Academy of Sciences Belarus, 63–66.

Konjević N., 2003: Comment on ‘Stark broadening parameters predictions and regularities of singly ionized Lead’. **Journal of Physics B: Atomic, Molecular and Optical Physics**, 36, 2139–2140.

Konjević N., Ivković M., Jovičević S., 2003: Application of hydrogenic and non-hydrogenic spectral line shapes for low electron density plasma diagnostics. **Invited lecture, 4th Conference on Plasma Physics and Plasma Technology (PPPT-4)**, Minsk, 14–19 September 2003, Institute of Molecular and Atomic Physics National Academy of Sciences Belarus, 329–332.

Project: **A PHYSICAL AND MATHEMATICAL MODEL FOR A PROCESS OF
MESO PROPORTIONS**
(Corresponding Member Zaviša Janjić)

The general objective of the project is to develop a physical and numerical model of the atmosphere that can be used for simulation and forecasting of mesoscale atmospheric processes, as well as for studies of environmental problems on meso scales. In 2003, the work continued on validation and upgrading of the model and the preprocessing, post-processing and computer graphics systems developed in previous years. In order to avoid the restriction on the time step due to strong vertical motions that the model develops on the meso scales, the Crank-Nicholson time differencing method was introduced for vertical advection of the basic dynamic variables. The Crank-Nicholson scheme is neutral

and unconditionally stable, but requires somewhat higher computational effort due to increased complexity. Theoretical work on rectangular horizontal grids used in numerical models of the atmosphere was completed (Gavrilov, 2004). In collaboration with Dr. Rajković, an off-line comprehensive testing of the new land surface scheme was initiated. Upgrades of the Betts-Miller-Janjić scheme for deep and shallow moist convection are being developed for transitional, single digit horizontal resolutions. The Mellor-Yamada-Janjić turbulence scheme was upgraded to include the effects of entrainment at the top of the planetary boundary layer. The model for propagation of chemically inert mineral aerosols in the atmosphere developed by Ničković Ph.D. at the University of Malta (Ničković, 2003a,b; Ničković et al., 2003a,b, Wang et al., 2003), and the land surface model developed by Mihailović Ph.D. at the University of Novi Sad (Lalić et al., 2003; Mihailović et al., 2004) are being considered for coupling to the mesoscale model.

Gavrilov M.B. 2004: On Nonstaggered Rectangular Grids Using Stream Function and Velocity Potential or Vorticity and Divergence. **Monthly Weather Review**, 132, 1518–1521.

Janjić Z.I., 2003a: A Nonhydrostatic Model Based on a New Approach. **Meteorology and Atmospheric Physics**, 82, 271–285.

Janjić Z.I., 2003b: The NCEP WRF Core and Further Development of Its Physical Package. **Fifth International Workshop on Non-hydrostatic Modelling**, Bad Orb, Germany, 27–29 October 2003.

Janjić Z.I., Black T.L., Rogers E., Chuang H., DiMego G., 2003a: The NCEP Nonhydrostatic Meso Model (NMM) and First Experiences with Its Applications. **EGS-AGU-EUG Joint Assembly**, Nice, France, 6–11 April 2003.

Janjić Z.I., Black T.L., Rogers E., Chuang H., DiMego G., 2003b: The NCEP Nonhydrostatic Mesoscale Forecasting Model. Extended abstract, **10th Conference on Mesoscale Processes**, AMS, Portland, Oregon, 23–27 June 2003, 16 p.

Lalić B., Mihailović D.T., Rajković B., Arsenić I.D., Radulović D., 2003: Wind profile within the forest canopy and in the transition layer above it. **Environmental Modelling and Software**, 18, 943–950.

Mihailović D.T., Kapor D., Hogefre C., Lazić J., Tošić T., 2004: Parameterization of Albedo over Heterogeneous Surfaces in Coupled Land-Atmosphere Schemes for Environmental Modelling. Part I: Theoretical Background. **Environmental Fluid Mechanics**, 4, 57–77.

Ničković S., 2003a: Saharan Dust Outbreaks: Modelling. **First EARLINET Symposium on the Structure and Use of the Data Base Derived from Systematic Lidar Observations**. February 11–12, 2003, Max-Planck-Institut für Meteorologie, Hamburg. http://lidarb.dkrz.de/earlinet/earlisymp/talks/earli_presentation2_icod.ppt

Ničković S. 2003b: DREAM Dust Model: Ongoing and Future Developments. **2nd Workshop on Mineral Dust**, Paris, 10–12 September 2003, LISA, Paris, France (invited lecture). <http://terre.lisa.univ-paris12.fr/dust2003/preliminaryprogramGB.html#nickovic>

Ničković S., Musić S., 2003b: Regional Modelling of the Saharan Dust Storm Lifecycle. **First EARLINET Symposium on the Structure and Use of the Data Base Derived from Systematic Lidar Observations**. February 11–12, 2003 Max-Planck-Institut für Meteorologie, Hamburg. http://lidarb.dkrz.de/earlinet/earlisymp/posters/icod_earli_poster3.pdf

Wang X. , Amodeo A., Chaikovsky A., Ničković S., Papayannis A., Perrone M.R., Rizi V., Spinelli N., 2003: Volcanic Dust Characterization by the European Aerosol Research Lidar Network (EARLINET project) during Etna's Eruption in 2001–2002. **First EARLINET Symposium on the Structure and Use of the Data Base Derived from Systematic Lidar Observations**. February 11–12, 2003, Max-Planck-Institut für Meteorologie, Hamburg. <http://lidarb.dkrz.de/earlinet/earlisymp/posters/P3-3.pdf>

Interdepartmental Committee:
DEFICIENCY OF SELENIUM AND MAGNESIUM IN SERBIA
(Academician Zoran Maksimović)

Investigations of the supplementation effects of Se on quality parameters of cultivated plants are broadened to plants used as a fodder, e.g. alfa-alfa. Special attention is paid to the influence of Se on quality of plants cultivated in non-favorable conditions (geological, anthropogenic and meteorological). In plants, animals and humans the tolerance to oxidative stress depends on the present content of trace elements and activity of antioxidative protection.

Investigations of patients with lung cancer during radio-therapy showed that Se supplementation could improve a quality of life, but not influence the result of the disease. Investigations of patients operated for colorectal cancer who received Se in post-operative phase gave valuable data concerning the status of Se and other elements, their anti-oxidative protection and stress.

Investigations of the supplementation effects of Se on trace element contents and anti-oxidative protection on experimental animals which are exposed to irradiation and cytostatics were continued. Animals with higher Se content showed a better protection from cytostatic agents and obtained a degree of protection of particular organs depending on chemical form of Se, age, sex, etc.

Samples of food, seven-day meals and human material (hair, blood, urine) were analyzed. Special attention is paid to Se, Fe, Mn, and Mg, because of the fact that outstanding disturbances in contents of these elements in soils, water, crops, animals and human population appeared in some regions.

Djujić I., 2003: Agricultural production of selenium enriched food in low selenium areas. **Annals of Nutrition and Metabolism**, 47, 395–405.

Djujić I., Jozanov–Stankov O., Demajo M., Protić S., Krivokapić Z., 2003: Benefits of selenium enriched food consumption by humans and animals with low selenium intake. **Annals of Nutrition and Metabolism**, 47, 406–415.

Djujić I., Milovac M., Djermanović V., Jozanov–Stankov O., 2003: Prevention of selenium deficiency in humans by selenium rich soybean. **Trace Elements in Medicine**, 1, 55.

Jovic V., 2003: Selenium in soils and some plants in Serbia. **Материалы Четвертой Российской биогеохимической школы “Геохимическая экология и биогеохимическое изучение таксонов биосферы”**, 3–6 сентября 2003, Российская академия наук, Москва, Наука, 26–27.

Jozanov–Stankov O., Demajo M., Djujić I., Mandić M., 2003: Effect of gamma irradiation on magnesium content in rat tissues. **Magnesium Research**, 16 (3), 176–182.

Pajović S.B., Saičić Z.S., Spasić M.B., Petrović V.M., 2003: The effect of ovarian hormones on antioxidant enzyme activities in the brain of male rats. **Physiological Research** 52, 189–194.

Pavlović Š.Z., Ognjanović B.I., Štajn A.Š., Žikić R.V., Saičić Z.S., Radojičić R.M., Petrović V.M., 2003: Antioxidant defense enzyme activities in the interscapular brown adipose tissue of rats treated with cadmium and coenzyme Q₁₀. **Oxidants and antioxidants in biology**. Book of abstracts, El Puerto de Santa Maria, Cadiz, Spain, February 6–9, 170.

Stević Z., Nikolić A., Blagojević D., Pavlović S., Apostolski S., Spasić M.B., 2003: Activities of antioxidative defense enzymes in FALS and carriers with Leu144Phe SOD1 mutation. **35th International Danube Symposium for Neurological Sciences & Continuing Education Collaborating Society of the European Federation of Neurological Societies**, September 11–14, 2003, Belgrade, Book of abstracts, 134.

Interdepartmental Project:
KARST OF SERBIA
(Academician Stevan Karamata)

Multidisciplinary investigations (geomorphological, paleontological and archaeological) in Gradašnica cave on Miroč Mountain were carried out. There is a huge amphitheater in the cave, and remains of cave bear are uncovered.

In Hadži Prodan's cave near Ivanjica two Paleolithic horizons were excavated, containing chipped stone artefacts and a great amount of Pleistocene fauna.

Topic: **Biospeleological investigations** (Prof. Božidar Ćurčić, Ph.D.)

After investigations of 41 caves in the area of Stari Vlah new species for fauna of Serbia: 12 new genus and 31 new species were found.

**INTERACADEMIC COOPERATION OF SASA AND MONTENGRIN
ACADEMY OF SCIENCES AND ARTS**

Project: **THE STUDY OF FOSSIL FLORA AND FAUNA OF MONTENEGRO**
(Corresponding Member Marko Ercegovac)

Palynomorphs and micro fauna of Upper Cretaceous and Paleogene from a great number of localities belonging to the Durmitor flysch were investigated. Previous results referred to the fact that the terrains of Montenegro during Upper Cretaceous and Paleogene probably belonged to the Tethys ocean, considerable distant from similar terrains in Serbia. The aim of this study is to establish the presence of elements of "African terrestrial flora" in these sediments of Montenegro.

**DEPARTMENT OF CHEMICAL AND BIOLOGICAL
SCIENCES**

PHYSICAL CHEMISTRY

Project: **NEW CATALYTIC SYSTEMS**

(Academician Paula Putanov)

Study of enzyme catalysts, as highly organized catalytic systems, encompassed the following:

1. possible contributions of aromatic and Π -electron rich groups present in enzyme active cavity to catalytic activity
2. active complex formation, due to perturbation made by substrate and conformational changes, essential for stereospecific reactions
3. the necessity of quantum mechanical approach for resolving catalytic mechanisms.

Plavšić M., Putanov P., 2003: Significance of Aromatic Excited Molecular Complexes for Enzyme Catalysis. **XLVII ETRAN**, 319–322.

Putanov P., Plavšić M., 2003: Quantum Aspects of Enzyme Catalysis. **XLVII ETRAN**, 315–319.

Project: **THEORETICAL INVESTIGATIONS ORIENTED TOWARDS THE
DEVELOPMENT OF INDUSTRIAL CATALYSIS**

(Academician Paula Putanov)

Investigations of alumina or zeolite supported metal catalysts, frequently used in industrial processes, encompassed the mechanisms of their transformations, the kinetics of corresponding catalytic reactions and the ecological aspects of their application.

Bošković G., Putanov P., 2003: Kinetics of N-Hexane Isomerization on Promoted Pt-Y Catalyst. **IV European Congress of Chemical Engineering**, Granada, Book of Abstracts.

Kiš E., Putanov P., 2003: Influence of Transition Metal Ions on the Textural Properties of Alumina and Aluminosilicates. **Reaction Kinetics and Catalysis Letters**, 325–334.

Project: **ISOLATION AND STRUCTURE INVESTIGATION OF NATURAL
PRODUCTS**

(Academician Bela Ribar)

From the chloroform extract of dried overground part of the plant *Hieratium plumulosum* A. Kerner *Aseraceae* a new compound was isolated by different chromatographic

methods. Single crystals were obtained from ethanol solution by evaporation at room temperature, while cell dimensions and space group of the compound were determined by X-ray diffraction.

CHEMISTRY

Project: **CHEMISTRY AND BIOCHEMISTRY OF STEROIDS AND TERPENOIDS AND CHEMICAL EXAMINATION OF DOMESTIC FLORA**
(Academician Milutin Stefanović)

For centuries the plant variety *Tanacetum parthenium* has been used for the treatment of migraine, rheumatism and other ailments. It has been determined that it contains lactone parthenolide, which is a carrier of pharmacological activity. Analysis of plantation grown plant near Pančevo has confirmed the presence of parthenolide. At the beginning of blossoming the content of parthenolide was 0,4-1,0 %, and in full flower it contained 0,7-1,0 %. Samples of the wild variety *Tanacetum larvatum*, picked at different locations in Montenegro had parthenolide content between 0,4 and 1,0 %.

Project: **ORIGIN, STRUCTURE AND PROPERTIES OF SEDIMENTARY ORGANIC MATTER APPLIED TO PROBLEMS OF ENVIRONMENTAL PROTECTION AND NEW ENERGY SOURCES EXPLORATION**
(Academician Dragomir Vitorović)

The results observed in the studies of oil shale kerogen structure and coal-peat bitumen and petroleum composition and properties are applied to solving some environmental problems as well as searching for new energy sources.

Ercegovac M., Grgurović D., Bajc S., Vitorović D., 2003: Oil shales in Serbia: geological and chemical-technological investigations, actual problems of exploration and feasibility studies. In: **Mineral Material Complex of Serbia and Montenegro on the Crossings of Two Milleniums**, MISKO MMIII, Inženjerska akademija Jugoslavije i Savez inženjera rudarske i geološke struke, Beograd, 368-378.

Grujić S., Jovančičević B., Polić P., Wehner H., 2003: Biomarkers of oil-type pollutants in surface soil. **Fresenius Environmental Bulletin**, 12, 359-363.

Jovančičević B., Polić P., Vrvic M., Sheeder G., Teschner T., Wehner H., 2003: Transformations of n-alkanes from petroleum pollutants in alluvial ground waters. **Environmental Chemistry Letters**, 1, 73-81.

Manović V., Grubor B., Ilić M., Jovančičević B., 2003: Sulphur retention ash during coal combustion – II. A model of the process. **Journal of the Serbian Chemical Society**, 68, 171-182.

Šolević T., Jovančičević B., Vrvic M., Wehner H., 2003: Oil pollutants in alluvial sediments – the influence of contact with ground waters on effect of microorganisms. **Journal of the Serbian Chemical Society**, 68, 227-234.

Vrvic M.M., Dragutinović V., Matić V., Spasić S., Cvetković O., Vitorović D., 2003: A kinetic study

of the depyritization of oil shale HCl-concentrate by *Thiobacillus ferrooxidans* at different temperatures. **Journal of the Serbian Chemical Society**, 68 (4–5), 417–423.

Project: **SYNTHESIS OF STEROIDAL ANALOGUES OF ARTEMISIN AND 1,2,4,5-TETRAOXANES**

(Academician Milutin Stefanović)

Applying our synthetic approach to mixed tetraoxanes a new series of steroidal 1,2,4,5-tetraoxacyclohexanes was synthesized and evaluated as antimalarials. High in vitro activity revealed some members of the series as potential lead compounds.

Opsenica D., Angelovski G., Pocsfalvi G., Juranić Z., Žižak Ž., Kyle D., Milhous W.K., Šolaja B.A., 2003: Antimalarial and Antiproliferative Evaluation of Bis-Steroidal Tetraoxanes. **Bioorganic & Medicinal Chemistry**, 11 (13), 2761–2768.

Opsenica D., Kyle D.E., Milhous W.K., Šolaja B.A., 2003: Antimalarial, Antimycobacterial and Antiproliferative Activity of Phenyl Substituted Mixed Tetraoxanes. **Journal of the Serbian Chemical Society**, 68 (4–5), 291–302.

Project: **CHEMICAL REACTIVITY AND BIOACTIVITY OF NATURALLY OCCURRING HYDROQUINONES AND THEIR DERIVATIVES**

(Academician Miroslav Gašić)

Covalent modifications of b-lactoglobulin by steroid and sesquiterpenoid quinones were examined.

Novaković I., Vujčić Z., Božić T., Božić N., Milosavić N., Sladić D., 2003: Chemical modification of b-lactoglobulin by quinones. **Journal of the Serbian Chemical Society**, 68 (4–5), 243–248.

Sladić D., Novaković I., Vujčić Z., Božić T., Božić N., Milić D., Gašić M.J., 2003: Protein covalent modification by biologically active marine sesquiterpene quinone avarone. **Chemistry and Biology of Marine Organisms**, Book of Abstracts, 174, September 21–26, 2003, Kolympari, Crete, Greece.

Project: **INVESTIGATIONS IN MATHEMATICAL CHEMISTRY**

(Academician Ivan Gutman)

In our plan for year 2003 we specified three topics, within which we intended to conduct research. In this Report we mention only those results that have been published in 2003.

Some papers are concerned with investigations of graph variants used for describing physico-chemical characteristics of organic compounds. Emphasis was on invariants based on distance and on eigenvalues of molecular graphs, both ordinary and Laplacian.

Some papers report investigations in the theoretical chemistry of benzoid and similar polycyclic conjugated systems.

One paper does not belong to any of the mentioned topics, but deals with chiral stereoselection.

A monograph on chemical graph theory has been published.

Bapat R.B., Gutman I., Xiao W., 2003: A simple method for computing resistance distance. **Zeitschrift für Naturforschung**, 58a, 494–498.

Borovičanić B., Gr̃newald S., Gutman I., Petrović M., 2003: Harmonic graphs with small number of cycles. **Discrete Mathematics**, 265, 31–44.

Caporossi G., Gutman I., Hansen P., Pavlović L., 2003: Graphs with maximum connectivity index. **Computational Biology and Chemistry**, 27, 85–90.

Dress A., Gr̃newald S., Gutman I., Lepović M., Vidović D., 2003: On the number of walks in trees. **MATCH Communications in Mathematical and in Computer Chemistry**, 48, 63–85.

Dress A., Gutman I., 2003: Asymptotic results regarding the number of walks in a graph. **Applied Mathematics Letters**, 16, 389–393.

Dress A., Gutman I., 2003: The number of walks in a graph. **Applied Mathematics Letters**, 16, 797–801.

Gutman I., 2003: **Introduction into chemical theory of graphs** (in Serbian: **Uvod u hemijsku teoriju grafova**). PMF, Kragujevac, IV + 201 p.

Gutman I., 2003: Relation between the Laplacian and the ordinary characteristic polynomial. **MATCH Communications in Mathematical and in Computer Chemistry**, 47, 133–140.

Gutman I., 2003: Impact of the Sachs theorem on theoretical chemistry: A participant's testimony. **MATCH Communications in Mathematical and in Computer Chemistry**, 48, 17–34.

Gutman I., 2003: Algebraic structure count of linear phenylenes and their congeners. **Journal of the Serbian Chemical Society**, 68, 391–399.

Gutman I., 2003: A spectral property of graphs. **Graph Theory Notes of New York**, 44, 10–13.

Gutman I., 2003: On an upper bound for Laplacian eigenvalues. **Graph Theory Notes of New York**, 44, 41–43.

Gutman I., 2003: Some properties of Laplacian eigenvectors. **Bulletin de l'académie serbe des sciences et des arts, Classe des sciences mathématiques et naturelles, Sciences mathématiques**, 127, 1–6.

Gutman I., 2003: Graphs with smallest sum of squares of vertex degrees. **Kragujevac Journal of Mathematics**, 25, 51–54.

Gutman I., Arsić B., Furtula B., 2003: Equiseparable chemical trees. **Journal of the Serbian Chemical Society**, 68, 549–555.

Gutman I., Furtula B., 2003: Hyper-Wiener index vs. Wiener index. Two highly correlated structure-descriptors. **Monatshefte für Chemie**, 134, 975–981.

Gutman I., Pavlović L., 2003: On the coefficients of the Laplacian characteristic polynomial of trees. **Bulletin de l'académie serbe des sciences et des arts, Classe des sciences mathématiques et naturelles, Sciences mathématiques**, 127, 31–40.

Gutman I., Tırker L., 2003: Correcting the azimuthal angle concept: nonexistence of an upper bound. **Chemical Physics Letters**, 373, 425–427.

Gutman I., Tırker L., 2003: Angle of graph energy – A spectral measure of resemblance of isomeric molecules. **Indian Journal of Chemistry**, 42A, 2698–2701.

Gutman I., Vidović D., Cmiljanović N., Milosavljević S., Radenković S., 2003: Graph energy – A useful molecular structure-descriptor. **Indian Journal of Chemistry**, 42A, 1309–1311.

Gutman I., Vidović D., Furtula B., 2003: Chemical applications of the Laplacian spectrum. VII. Studies of the Wiener and Kirchhoff indices. **Indian Journal of Chemistry**, 42A, 1272–1278.

Gutman I., Vidović D., Furtula B., Vesel A., 2003: Relations between topological indices of large chemical trees. **Indian Journal of Chemistry**, 42A, 1241–1245.

Gutman I., Vidović D., Furtula B., Zenkevich I.G., 2003: Wiener-type indices and internal molecular energy. **Journal of the Serbian Chemical Society**, 68, 401–408.

Khadikar P.V., Lukovits I., Agrawal V.K., Shrivastava S., Jaiswal M., Gutman I., Karmarkar S., Shrivastava A., 2003: Equilized electronegativity and topological indices: Application for modeling toxicity of nitrobenzene derivatives. **Indian Journal of Chemistry**, 42A, 1436–1441.

Klavžar S., Gutman I., 2003: Relation between Wiener-type topological indices of benzenoid molecules. **Chemical Physics Letters**, 373, 328–332.

Marković Z., Ivanov–Petrović V., Gutman I., 2003: Extremely branched alkanes. **Journal of Molecular Structure (Theochem)**, 629, 303–306.

Salem K., Gutman I., 2003: On sextet and cell polynomials of catocondensed benzenoid hydrocarbons. **Kragujevac Journal of Science**, 25, 93–106.

Todorović D., Gutman I., Radulović M., 2003: A stochastic chiral amplification model. **Chemical Physics Letters**, 372, 464–468.

Vukičević D., Gutman I., 2003: Note on a class of modified Wiener indices. **MATCH Communications in Mathematical and in Computer Chemistry**, 47, 107–117.

Xiao W., Gutman I., 2003: On resistance matrices. **MATCH Communications in Mathematical and in Computer Chemistry**, 49, 67–81.

Xiao W., Gutman I., 2003: Resistance distance and Laplacian spectrum. **Theoretical Chemistry Accounts**, 110, 284–289.

Project: **SYNTHETIC TRANSFORMATIONS OF ORGANIC COMPOUNDS
BY FREE RADICAL AND IONIC REACTIONS**

(Corresponding Member Živorad Čeković)

Synthetic applications of the free radical 1,5-hydrogen migrations in an alkoxy radicals were investigated. When alkoxy radicals were generated by photolysis of alkyl benzenesulfenates a phenylthio group was introduced to the non-activated δ -carbon atom. Synthetic importance of the δ -phenylthio compounds is in their easy transformations into the carbanionic and carbocationic intermediates.

Petrović G., Čeković Ž., 2003: Synthesis of Tetrahydrokusitone. Annulation of the Cyclohexane Ring by Free Radical and Carbanionic Sequence of Reactions. **Journal of the Serbian Chemical Society**, 68 (4–5), 313–320.

Petrović G., Saičić R.N., Čeković Ž., 2003: Regioselective Free Radical Phenylsulfenation of a Non-Activated δ -Carbon Atom by the Photolysis of Alkyl Benzenesulfenate. **Tetrahedron**, 59, 187–196.

Petrović G.N., Saičić R.N., Čeković Ž.M., 2003: Synthesis of Scopin and 6,7-Didehydrohoscyanin. Intermolecular Phenylsulfenylation of Nonactivated Methylene Group of Ethyl N-Demethyl-3-O-(phenylthio)tropine-N-carboxylate. **Helvetica Chimica Acta**, 86, 3179–3186.

Čeković Ž., 2003: Reactions of δ -Carbon Radicals Generated by 1,5-Hydrogen Transfer to Alkoxy Radicals. **Tetrahedron**, 59, 8073–8090.

BIOLOGY

Project: **CATECHOLAMINE METABOLISM AND CELL PROTECTION FROM OXIDATIVE DAMAGES – EFFECT OF ENVIRONMENTAL FACTORS**

(Academician Vojislav M. Petrović)

Experimental work on the effects of thyroid hormones on changes in monoamine oxidase (MAO) activity in brown adipose tissue under extreme environmental conditions was reported at the **Symposium on Catecholamine and Other Neurotransmitters in Stress**, held in Smolenice, Slovak Republic (June 28 – July 3, 2003).

Cvijić G., Petrović N., Djordjević J., Davidović V., Petrović V.M., 2004: Effect of Cold Exposure on Serum DBH and Interscapular Brown Adipose Tissue MAO Activity in Hypothyroid T₃- and T₄-Treated Rats. **Annals of the New York Academy of Sciences**, 1018, 214–219.

Djordjević J., Cvijić G., Davidović V., 2003: Different activation of ACTH and cortisterone release in response to various stressors in rats. **Physiological Research**, 52 (1), 62–72.

Petrović N., Cvijić G., Davidović V., 2003: Thyroxine and triiodothyronine differently affect the uncoupling protein-1 content and antioxidant enzymes activities in the rat interscapular brown adipose tissue. **Journal of Endocrinology**, 176 (1), 31–38.

Project: **ADAPTIVE LIMITS OF POPULATION-GENETIC POLYMORPHISM**

(Academician Dragoslav Marinković)

Eleven polymorphic gene-enzyme systems of the sugar-phosphorus metabolic cycle were allozymically analyzed in each of 400 *D. melanogaster* individuals synchronously, and models and limits of their variation have been studied in detail. Out of many thousands of possible combinations of allelogenes (ca 78.000) from eight loci at two largest chromosomes, no more than 200 genotypes have been determined, that limits adaptive combinations in this system to less than 0.3%. The scopes of variation in micronuclei of peripheral blood cells have been also studied in humans, as a consequence of reaction on therapeutic treatments with hormones and chemotherapies.

Marinković D., 2002: Genetic bases of the evolution of organisms. **Genetika**, 34 (2–3), 53–58.

Marinković D., 2003: Population-genetic aspects of reproductive capacities of inhabitants. In: **Medicine and Quality of Life III** (Eds. V. Šulović, Dj. Jakovljević). SASA, Belgrade, 61-74.

Milošević O., Grujičić D., Marinković D., et al., 2003: Effects of various doses of gestogens on MN frequency in human peripheral blood lymphocytes. **Human Reproduction**, 18 (2), 433-436.

Živanović G., Andjelković M., Marinković D., 2002: Chromosomal inversion polymorphism of *Drosophila* from south-eastern part of Europe. **Journal of Zoological Systematics and Evolutionary Research**, 40, 201-204.

INTERDEPARTMENTAL COMMITTEE FOR FLORA AND VEGETATION

Project: **STUDY OF FLORA AND VEGETATION OF SERBIA**

(Academician Dragoslav Marinković)

Studies of flora and taxonomy of plants are proceeded by numerous specialists from the Faculties, Institutes and Museums in Serbia. The manuscripts for the 2nd and 3rd volume of **Flora Serbia** are prepared for publication. The edition of **Vegetation of Serbia** is also in print and 2nd volume is ready to be published.

Blaženčić J., Stevanović B., Blaženčić Z., Stevanović V., 2002: Estimation of threat species of Charophytes distributed in the Balkans – preliminary Red Data List. **6th European Paleobotany-Palynology Conference, Proceedings**, Athens, Greece.

Boža P., Igić R., Anackov G., Knežević A., Polić D., 2003: Rare autochthonous plants in flora of Vojvodina (I). **Medicinal Plant Report**, 10 (10), 16-25.

Stevanović V., Šinžar-Sekulić J., Stevanović B., 2003: On the distribution and ecology of macrophytic flora and vegetation in the river Danube reservoir between Silovo islet and the mouth of the Nera tributary. **Archive für Hydrobiologie Supplement**, 147 (3-4), 283-295.

INTERDEPARTMENTAL COMMITTEE FOR PHYSICAL CHEMISTRY OF MATERIALS

Program Physico-chemistry processes of novel materials technologies consists of four projects. Realization of these projects included researchers from: Institute of Technical Sciences of SASA, Center for Multidisciplinary Studies, Belgrade University, Technical Faculty, Čačak, Institute of Physics, Belgrade, and Institute for Electrochemistry IHTM, Belgrade.

This Committee organized a Scientific Conference Sintering – Theory and Technology which was held in SASA on April 16 and 17, 2003. This Conference dedicated to 40 years of the Belgrade School of Sintering included a publication Belgrade School of Sintering (40 years). Fifty nine papers were presented at this Conference in the following sections: Fundamental problems in science of sintering; Sintering of ferroelectric materials; Biomaterials and mechanical activation, amorphous and sintered materials.

Project: **INVESTIGATION OF PROCESSES OF THE CONSOLIDATION OF MATERIALS**

(Academician Momčilo M. Ristić)

Reaction sintering of the CdO-Bi₂O₃ system was investigated. A method for analysis of sintering processes 3-D liquid bridge between 2 and 3 spherical particles was developed. Cluster mechanisms of anomalous diffusion were also considered. Sintering

of amorphous materials and their properties has been studied. A photoacoustic method for investigation of cold sintering powder has been applied for the first time.

Maričić A.M., Kalezić–Glišović A, Minić D., Ristić M.M., 2003: Correlation Between Changes of the Thermoelectromotive Force and Electric Conductivity on Structural Changes of the $\text{Co}_{70}\text{Fe}_5\text{Si}_{10}\text{B}_{15}$ Amorphous Alloy During Heating up to 900 K. In: **Science of Sintering: Current Problems and New Trends**, SASA and IISE, Belgrade, 403–407.

Maričić A.M., Mitrović N.S., Jordović B.A. 2003: The Influence of the Changes of Free Electron Density on Electrical and Magnetic Properties of $\text{Co}_{70}\text{Fe}_5\text{Si}_{10}\text{B}_{15}$ Amorphous Alloy. **Proceedings of the 5th International Power Systems Conference**, Timisoara (Romania), 553–556.

Nikolić Z.S., 2003: Visualization of the Liquid Bridge During Liquid Phase Sintering. In: **Science of Sintering: Current Problems and New Trends**, SASA and IISE, Belgrade, 13–28.

Nikolić P.M., Luković D.T., Vujošević D.J., Ristić M.M., 2003: Investigation of Sintered Se by Photoacoustic Frequency Transmission. In: **Science of Sintering: Current Problems and New Trends**, SASA and IISE, Belgrade, 433–438.

Ристић М.М., Срећковић Т., Власова М., Казакеј И.И. и др., 2003: Синтез керамике на основе системе $\text{CdO-Bi}_2\text{O}_3$. **Неорганичке материјали**, 39 (9), 1–8.

Project: **ELECTROCHEMICAL INVESTIGATIONS**

(Academician Aleksandar Despić)

The first task concerned investigations of deposition of alloys consisting of one metal from the iron group and one refractory metal, which cannot be deposited alone from aqueous solutions of their ions. The “induced type” of deposition provides conditions for obtaining such alloys. In particular kinetics of deposition of nickel/tungsten alloys of different tungsten content was investigated and their properties (hardness and corrosion resistance) were evaluated.

The second task involved determination of species which act as reactants in the electrochemical evolution of hydrogen. It was established that in solutions of acetic acid of medium acidity it is undissociated acid molecule which is the source of hydrogen.

Obradović M.D., Stevanović R.M., Despić A.R., 2003: Electrochemical deposition of Ni-W alloys from ammonia-citrate electrolyte. **Journal of Electroanalytical Chemistry**, 552C, 185–196.

Obradović M.D., Stevanović R.M., Despić A.R., Kowal A., 2003: Morphology of electrodeposited Ni-W alloys. **Workshop on SPM**, Crakow, Poland, Book of Abstracts, 44.

Project: **RESISTIVITY OF MATERIALS TO CORROSION**

(Academician Dragutin Dražić)

Metallic chromium in acidic solutions exhibits not fully understood behavior that besides the electrochemical corrosion as well known for many other metals, simultaneously corrode by a direct, non-electrochemical reaction of chromium with water molecules

from the solution, at rate much higher than the electrochemical one. This peculiar reaction was studied in deaerated 0.5 M sodium sulfate solution with addition of sulfuric acid to make pH 0.5–3.

Special attention was paid to study the effect of temperature on both, electrochemical and chemical reactions. Energies of activation of 66 kJ/mol for both chemical and electrochemical reactions were obtained, while energy of activation of the electrochemical hydrogen evolution was only 19.5 kJ/mol. Since hydrogen evolution controls the electrochemical corrosion rate and has no effect on the chemical corrosion, increase of temperature faster accelerates chemical corrosion than the electrochemical one becoming up to 10–15 times larger at 65°C than the usual electrochemical corrosion. Practical consequences of this are discussed.

Popić J.P., Dražić D.M., 2003: Electrochemistry of active chromium. Part III. Effect of temperature. **Journal of the Serbian Chemical Society**, 68, 871–881.

Project: **SYNTHESIS AND PROPERTIES OF NEW CRYSTAL AND AMORPHOUS MATERIALS**
(Academician Pantelija M. Nikolić)

Characterization of some isotropic and anisotropic materials which are used in microelectronics and optoelectronics has been studied. Investigation of properties of PbTe and PbSnTe doped with B and Pd have been continued. Synthesis and characterization of thermal diffusivity of $12\text{CaO} \times 7\text{Al}_2\text{O}_3$ has been studied.

Nikolić P.M., Djurić S., Radulović K.T., Vasiljević–Radović D., Nikolić M.V., Luković D.T., Vujošević D. Lj., Ristić M.M., 2003: Possibility of Characterization of Powders Using a Horizontal Coherer. In: **Science of Sintering: Current Problems and New Trends**, SASA and IISE, Belgrade, 203–208.

Nikolić P.M., Luković D.T., Savić S., Urošević D., Djurić S., 2003: Thermal diffusivity of sintered $12\text{CaO} \times 7\text{Al}_2\text{O}_3$. **Science of Sintering**, 35, 147–154.

Nikolić P.M., Nikolić M.V., Luković D.T., Savić S., Ristić M.M., 2003: Photoacoustic properties of sintered NiO. **Zeitschrift für Metallkunde**, 147–150.

Nikolić P.M., Romčević N., Radulović K.T., Romčević M., Vujatović S.S., Djurić S., Blagojević V., Konig W., Siapkas D., Zorba T.T., 2003: Optical Properties of Lead Telluride Doped with Group III Elements. **Bulletin SASA, tome CXXVI, Classe des Sciences Techniques**, 29, 9–15.

Radulović K.T., Nikolić P.M., Vasiljević–Radović D., Todorović D.M., Vujatović S.S., Bojičić A.I., Blagojević V., Urošević D., 2003: A Contribution of Carrier Transport Processes to the Photoacoustic Effects in Doped Narrow Gap Semiconductors. **Review of Scientific Instruments**, 74 (1), 595–597.

INTERDEPARTMENTAL COMMITTEE ON BIOMEDICAL INVESTIGATIONS

Project: **COMPARATIVE NEUROBIOPHYSICAL AND BIOENERGETIC INVESTIGATIONS**

(Academician Radoslav Andjus)

Topic: **Application of Nuclear Magnetic Resonance in Bioenergetics**

In cooperation with Prof. S. Macura, foreign member of SASA, data were processed that were obtained by proton NMR spectroscopy of cerebral and myocardial extracts in experiments on neonatal rat, ground squirrel and sea fish *Scyliorhinus conicula*, exposed to reversible anoxia in deep hypothermia. These are comparative investigations of bioenergetic mechanisms of resistance to anoxia.

Topic: **Electroretinographic investigations**

In cooperation with the Institute of Sea Biology from Kotor (Montenegro) electrophysiological investigations were carried out of functional properties of visible organs in euryhaline species of fish. Comparative analysis was done of electroretinographic indicators of fish (*Scyliorhinus conicula*) and mammal (rabbit).

Project: **HOMEOSTATIC MECHANISMS AND REGULATION SYSTEM OF BEHAVIOR**

(Academician Ljubiša Rakić)

Topic: **Plasticity of the Brain: Expression of Neural Genes in Physiological and Pathological State**

Investigations continued of the effects of psychostimulatory substances amphetamine and phencyclidine and their combinations on molecular and behavioral level. The effect of these substances on the level of transcription showed that there are selective mechanisms of gene expression which are activated under the influence of amphetamine and phencyclidine. Behavioral tests (location and stereotype) showed a correlation with the level of induced transcription of examined genes.

Topic: **Transport and Metabolism of Nucleosides and Purine Bases on Blood Cerebral Barrier**

In 2003 application of choroid plexus epithelium culture was introduced and experiments were made with it. The technique of obtaining choroid plexus epithelium cells consists of isolating choroid plexus of lateral and the fourth cerebral chamber from directly anaesthetized and sacrificed sheep. After enzyme digestion of choroid plexus tissue, by a series of procedures, individual choroid plexus epithelium cells were isolated, and

sowed on permeable membranes (inserts), placed in 12 wellplate wells. In this way, two compartments are limited by inserts – the upper one towards which apical membrane of epithelium cells sowed on the insert is differentiated, and which corresponds to CST compartment, and lower, towards which basolateral cell membrane is differentiated, which corresponds to compartment of plasma. That is how an in vitro system was obtained which can be used for direct measurement of molecule transport through monolayer of epithelium cells and drawing molecules into epithelium cells.

Topic: **Tumor Biology and Antitumor Effects of Synthetic Analogs of Nucleosides**

Investigations continued of antitumor, antiproliferative, apoptotic and immunomodulatory characteristics of some nucleoside analogs on tumor cells. Fifteen newly synthesized compounds were examined, among which are derivatives of tiazofurin, tionucleosides and nucleosides on five cell lines: MCF (human breast cancer), HTB177 (human lung cancer), K562 (human leukemia, FemX (human melanoma) and B16 (mouse melanoma). Neutral red uptake test was used to detect viable cells which accumulate this vital dye in their lysosoma based on absorbance which is determined on 540 nm on Microplate reader. The examined substances were added to cells in concentration range 1–100 μ M, and incubation time was 72 hours. The examined compounds did not manifest antitumor potential in relation to referent substances of tiazofurin and 5-fluorouracil.

Dekanski D., Stošić–Grujičić S., Piperski V., Jokanović M., Mostarica–Stojković M., 2003: Effects of tiazofurin on experimental allergic encephalomyelitis development in DA rats. **Immunology Letters**, 87 (1–3), 302, **Special Issue: Abstracts of the 15th European Immunology Congress** (EFIS 2003), Rhodes, Greece, June 8–12, 2003. Dobrić S., Jokanović M., Milovanović S. R., Bokonjić D., 2003: Amifostine protects against acute soman toxicity in rats. **XXIII International Congress of European Association of Poisons Centres and Clinical Toxicologists**, Rome, Italy, 69.

Milanović D., Milošević I., Kanazir S., Rakić Lj., Ruždijić S., 2003: Effect of amphetamine and phencyclidane on DNA binding activities of serum response and dyad symmetry elements. **Neurochemistry International**, 42 (5), 409–417.

Miličević I., Peković S., Subašić S., Mostarica–Stojković M., Stošić–Grujičić S., Medić–Mijačević Lj., Pejanović V., Rakić Lj., M. Stojiljković, 2003: Ribavirin reduces clinical signs and pathological changes of experimental autoimmune encephalomyelitis in Dark Agouti Rats. **Journal of Neuroscience Research**, 72 (2), 268–278.

Mladenović A., Perović M., Raičević N., Milanović D., Kanazir S., Rakić Lj., Ruždijić S., 2003: 6-Hydroxydopamine Lead to the Alterations of Dopamine Receptor mRNA in Hemiparkinsonian Rats at the Early Time Points after Administration. **International Symposium Synaptogenesis**, Vienna, Austria, Abstracts, 48.

Pejanović V., Stokić Z., Stojanović B., Piperski V., Popsavin M., Popsavin V., 2003: Synthesis and biological evaluation of some novel 4'-thio-L-ribonucleosides with modified nucleobase moieties. **Bioorganic & Medicinal Chemistry Letters**, 13, 1849–1852.

Pešić V., Janić B., Milanović D., Tomić M., Veskov R., Rakić Lj., 2003: Motor effects of amphetamine in rats with either dizocilpine or phencyclidine. **Behavioural Brain Research**, 147 (1–2), 211–215.

Petroianu G.A., Hassan M., Kosanović M., Arafat K., Nasser O., Saleh A., Vijayasarthy C., Jokanović M., 2003: In vivo protection of RBC cholinesterase by metoclopramide from inhibition by organophosphates: A study using paraoxon (Pox) and mipafox (Mpxf). **Proceedings of the Fourth Annual UAE University Research Conference**, Al Ain, United Arab Emirates, April 2003, 54–57, Research Affairs Publication Series 5.

Petroianu G., Hassan M., Kosanović M., Jokanović M., Arafat K., Nasser O., Saleh A., Vijayasarthy C., 2003: In vivo protection of RBC cholinesterase (RBC-AChE) by metoclopramide (MTC) from inhibition by paraoxon (POX). **Journal of Clinical Pharmacology**, 43 (9), 1016, **Abstracts of the 32nd Annual Meeting of the American College of Clinical Pharmacology**, 21–23 September 2003, Florida.

Piperski V., Dekanski D., Jokanović M., Stošić–Grujičić S., Mostarica–Stojković M., 2003: Apoptosis as a possible mechanism of immunomodulatory action of tiazofurin in experimental allergic encephalomyelitis in DA rats. *Immunology Letters*, 87(1–3), 144, **Special Issue: Abstracts of the 15th European Immunology Congress** (EFIS 2003), Rhodes, Greece, June 8–12, 2003.

Ristić S., Tasić J., Piperski V., Dačević M., Jokanović M., Petrović Lj., 2003: HPLC determination of tiazofurin in the rat brain. **Journal of Pharmac. Biomed. Analysis**, 33 (4), 839–843.

Stojiljković M., Miličević I., Stojkov D., Peković S., Šubašić S., Mijačević–Medić Lj., Rakić Lj., 2003: The effect of combination therapy of ribavirin and tiazofurin on suppression of experimental autoimmune encephalomyelitis in Dark Agouti rats. **6th IBRO World Congress of Neuroscience**, Prague, Czech Republic, 2355.

Stojiljković M., Piperski V., Dačević D., Rakić Lj., Ruždijić S., Kanazir S., 2003: Characterization of 9L glioma model of the Wistar rats. **Journal of Neuro-oncology**, 63 (1), 1–7.

Vasilev (Pešić) V., Veskov R., Janić B., Rakić Lj., Stojiljković M., 2003: Age-related differences in MK-801 and amphetamine-induced locomotor and stereotypic activities of rats. **Neurobiology of Aging**, 24, 715–723.

Vranić–Mandušić V., Medić Lj., Jozanov–Stankov O., Popov–Čeleketić D., Jokanović M., Dimitrijević B., 2003: Tiazofurin affects antioxidative system in rat erythrocytes. **13th Balkan Biochemical Biophysical Days and Meeting on Metabolic Disorders**, Kusadasi, Turkey, **Turkey Journal of Biochemistry**, 28 (3), P184.

Vranić–Mandušić V., Subota V., Savovski K., Medić Lj., Dramnićanin T., Jozanov–Stankov O., Popov–Čeleketić D., Jokanović M., Dimitrijević B., 2004: Erythrocytotoxicity of tiazofurin in vivo and in vitro detected by scanning probe microscopy. **Toxicology Letters**, 146, 175–284.

Project: **ETIOLOGY, DIAGNOSTICS AND THERAPY OF HIGH RISK PREGNANCIES, EXPERIMENTAL, EPIDEMIOLOGICAL AND CLINICAL RESEARCH**

(Academician Vojin Šulović)

Research continued of various elements that affect implantation of the fetus. Effects were analyzed of implantation disorders which can be manifested as various scientific biochemical pregnancies and spontaneous miscarriages, premature deliveries, intrauterine delay in fetus growth and preeclampsia. Special attention was devoted to intracellular adhesive molecules and their role in the regulation of the ovum and early development of the embryo. The influence of these molecules in interaction with cytokines in regulation of implantation was also considered.

Much attention was focused on the etiology of premature deliveries from the aspect of biochemical processes, among which the most important are prostaglandins, calcium channels and extracellular matrix. Epidemiological data point out to a possible genetic basis.

Analysis continued of glucocorticoid effects on metabolism and behavior of the fetus. The analysis included different effects of artificial maturation of lungs of the fetus on the course and outcome of pregnancy.

Fetuses with congenital anomalies were carefully studied. Pathophysiological mechanisms of the occurrence of disorders were examined, genetic changes that bring

them about, and possible therapeutic procedures were investigated.

Factors were investigated that might affect treatment of sterility and its prevention (obesity).

In the course of last year, various technologies were examined for the purpose of achieving better results in assisted reproduction / time of embryo transfer, introduction of new technologies of sonographic observation of embryo transfer, choice of media for embryo culture, and catheters for transfer.

Special emphasis was put on the course and outcome of pregnancy after assisted reproduction. The analyses included complications in pregnancies that resulted from assisted reproduction: spontaneous miscarriages, prematurity, intrauterine growth of the fetus, multiple fetation, ectotypic gestations, congenital malformations, manners in which pregnancies ended, perinatal morbidity and mortality.

Dopsaj V., Šumarac Z., Ljubić A., 2003: SICAM-1 in early embryo cultures during in vitro fertilization. **Clin Chem. Lab. Med.**, Barcelona, 41, S608.

Jovanović I., Krstić Z., Parezanović V., Ljubić A., Ilić S., Djukić M., Simeunović S., 2003: Quality of Living of Children Operated on for Congenital Heart Defects. **Medicine and Quality of Life**, 3rd SASA Scientific Conference with International Participation, Belgrade, 75–86.

Ristić A., Seferović P., Ljubić A., Jovanović I., Ristić G., Panković S., Ostojčić M., Maisch B., 2003: Pericardial disease in pregnancy. **Herz**, 27 (3), 209–215.

Vlaisavljević V., Ljubić A., 2003: Quality of Living of Extracorporally Conceived Children. **Medicine and Quality of Life**, 3rd SASA Scientific Conference with International Participation, Belgrade, 46–60.

Project: **KIDNEY AS AN ENDOCRINE ORGAN**

(Academician Sveto Suša)

In view of distribution of insulin sensitivity among normal population, from very low similar to that of type 2 diabetes to very high, our investigations include detection of insulin sensitivity, or resistance, by application of NOMA method, detection of microalbuminuria and albuminuria, as well as determination of lipid parameters as a prognostic factor of cardiovascular risk in a healthy population comparable according to sex, body mass index and age with a group of patients suffering from type 2 diabetes with whom identical parameters were detected.

Beside the stated, value of IGF-1 was determined with all subjects. The idea of the investigation is based on early detection of the factor of kidney defect development.

Project: **INVESTIGATION OF PARASITOFUNA OF FISH IN THE DANUBE, ITS TRIBUTARIES, WITH SPECIAL REFERENCE TO PARASITE OCCURRENCE DUE TO ANTHROPOGENIC FACTOR POLLUTION**

The project is conceived on the basis of cooperation between Serbian and Bulgarian Academy of Sciences. The head of the project on Serbian side is **Academician Zlatibor**

Petrović with associates, and on the Bulgarian **Prof. Igljka Nedeva, Ph.D.** with associates.

Investigation in the field of the river Danube fish parasites was carried out below “Djerdap II” Hydro-Electric power Station, near place called Kusjak, Negotin municipality. Positive ecto- and endoparasites were found in 25 samples of fish that belonged to the following families: *Siluridae*, *Cyprinidae*, *Percidae*, *Gobiidae* and *Syngnathidae*. Determination of the detected parasites is under way, but it is important to mention that fluke *Metagonimus yokogawi* was detected on scales of chub / *Leuciscus cephalus*). Grown-up flukes live in intestines of fish-feeding birds and mammals, and it is also a parasite of human beings (helminthozoonoses). This is the first time this parasite was found in helminthofauna of Serbia.

Except for the analysis of parasites in fish, the work included environmental, morphometric investigations, and analyses of blood smears of starlets (*Acipenser rithemus* L.) from the Danube.

Cakić P., Lenhardt M., Kolarević J., Petrović Z., 2003: Contribution to the knowledge of the sterlets (*Acipenser ruthenus* L.) parasites. Second International Conference **Bacterial, viral and parasitic infections in human and veterinary medicine**, Medical University, June 13–15, 2003, 44, Sofia, Republic of Bulgaria.

Kolarević J., Lenhardt M., Cakić P., Gačić Z., 2003: The Influence of Different Water Temperatures on Morphological Characteristics of Sterlet (*Acipenser ruthenus*) Erythrocyte Populations. **Third Symposium for European Freshwater Sciences (SEFSZ)**, 13–18 July 2003, 85, University of Edinburgh, UK.

Lenhardt M., Cakić P., Kolarević J., 2003: Assessment of the complex anthropogenic impact on fish population in the Danube River. **5th ICEF, Environmental Future of Aquatic Ecosystems**, 23–27 March 2003, ETH Zürich, 135.

Lenhardt M., Cakić P., Kolarević J., 2003: Impact of Iron Gates I and II construction on acipenseridae populations in the Danube River. **International Symposium of Ecohydrology and Physical Fish Habitat Modifications in Lakes**, Abstracts, 20, 26–28 November, Mondsee, Austria.

Lenhardt M., Cakić P., Kolarević J., Gačić Z., 2003: Morphometric recognition of two morphs in sterlet (*Acipenser ruthenus*) population induced by different reproductive behaviour. **The Fisheries Society of the British Isles as models of behavior, Annual International Symposium University of East Anglia**, Norwich, England, 30 June – 4 July 2003, 30.

Radev V., Nedeva I., Karaivanova E., Atanasov G., Cakić P., Gabrashanska M., 2003: 50 fish-helminth system as bioindicator for anthropogenic pollution of aquatic ecosystems in the river Danube. **Jubilee Scientific Session, 80 years, Faculty of Veterinary Medicine**, Trakia University, Stara Zagora, Bulgaria, May 13, 2003, 34.

Project: **MOLECULAR MECHANISMS OF STRESS RESPONSE**
(Academician Dušan T. Kanazir)

These investigations explain the role and mechanism of modulation induced by chemical or physical factors on the levels of: enzyme antioxidant protection, metabolism and function of neurotransmitters and genome. These enzymes are maintaining free radi-

cals on the physiological level and represent very important protectors of cell homeostasis. Also, antioxidant enzymes represent biomarkers over 100 pathological states. These studies enable better insight into mutagenic »load« of human population that is exposed to the influence of genotoxic factors. All experiments were made in collaboration with S.B. Pajović, M.B. Radojčić, S. Pejić and J. Kasapović (Molecular Biology and Endocrinology Laboratory, Vinča Institute of Nuclear Sciences).

Kanazir D.T., Pajović S.B., Radojčić M.B., 2004: **Molecular Mechanism of Stress Induced Cardiovascular Disease**. Editor Lj. Rakić, Serbian Academy of Sciences and Arts, Monographs, Vol. DCLV, Department of Chemical and Biological Sciences, Book 3, Belgrade.

Project: **THE ROLE OF STEROID HORMONES AS REGULATORS OF GENETIC PROGRAM OF DEVELOPMENT OF NEUROENDOCRINE CELLS**

(Academician Vladimir Pantić)

The aim of this study is to analyze the mechanisms of response on environmental stimuli, through a hypothalamo-adrenal axis and hepatocytes, which are producing acute-phase proteins, CRH hormones of the ROMC family, glicocorticoid catecholamine, nitrogen oxide, and APPs. Having in mind the role of feed-back mechanisms of the effects of steroid hormones on the brain neurones, CRH producers, ROMC hormones, and their role in the response of hepatocytes in APP synthesis, it has been concluded that steroid hormones could be used as modulators of gene expressivity of neuroendocrine cells, which code for regulatory proteins involved in a control of adaptation, growth, and reproduction.

Pantić V., 2003: Reactions of Neuroendocrine and Immunocompetent Cells to Environmental Stimuli. Universitatea de stiinta agricole si medicina veterinara a Banatului, Timisoara, Facultatea medicina veterinara, Lucrari Stintifice, **Veterinary Medicine**, XXXVI, 466, May 29–30, 2003.

Pantić V., 2003: Neuroendocrine and Immunocompetent Cells to Stress as Risk Factors. **XVI National Congress of Anatomists with International Participation**, June 5–7, 2003, Sofia, Abstracts, 73–74.

Project: **REGULATION OF CELL PROTECTION AGAINST OXIDATIVE DAMAGES UNDER CONDITIONS OF MAINTAINED HOMEOSTASIS AND ITS DISRUPTIONS**

(Academician Vojislav M. Petrović)

Gray K.D., Simović M.O., Chapman W.C., Blackwell T.S., Christman J.W., May A.K., Parman K.S., Stain S.C., 2003: Endotoxin potentiates lung injury in cerulein-induced pancreatitis. **American Journal of Surgery**, 186, 526–530.

Gray K.D., Simović M.O., Chapman W.C., Blackwell T.S. Christman J.W., Washington M.K., Yull F.E., Jaffal F.E., Jansen E.D., Gautman S., Stain S.C., 2003: Systemic nf-kapaB activation in a transgenic mouse model of acute pancreatitis. **American Journal of Surgery**, 110, 310–314.

Gray K.D., Simović M.O., Christman J.W., Blackwell T.S. May A.K., Chapman W.C., Stain S.C., 2003: Pancreatitis-induced lung injury: mechanism of injury involves hepatic NF-KB and cytokine mediated pathways. **American Journal of Surgery**, 114 (2), 292.

Krstić D., Janković T., Šavikin–Fudulović K., Menković N., Grubišić D., 2003: Secoiridoids and xanthenes in the shoots and roots of *Centarium pulchellum* cultured in vitro. **In vitro Cell Dev. Biol.-Plant**, 39, 203–207.

Ognjanović B.I., Pavlović Z.S., Maletić S.D., Žikić R.V., Štajn A.Š., Radojičić R.M., Saičić Z.S., Petrović V.M., 2003: Protective influence of vitamin E on antioxidant defense system in the blood of rats treated with cadmium. **Physiological Research**, 52, 563–570.

Stević Z., Pavlović S., Nikolić A., Trikić R., Lavrnić D., Rakočević V., Basta I., Vujić A., Apostolski S., 2003: Early treatment of patients with amyotrophic lateral sclerosis with riluzole. **35th International Danube Symposium for Neurological Sciences Continuing Education Collaborating Society of the European Federation of Neurological Societies**, Septemehr 11–14, 2003, Belgrade, Book of Abstracts, 187.

Interdepartmental Committee:

MAN AND ENVIRONMENT

(Corresponding Member Marko Andjelković)

Contacts are established and cooperation developed with national and international institutions dealing with various aspects of environmental protection and upgrading. Individual members of the Committee have been engaged in studying and protecting natural ecological resources, coordinating a cooperation with certain research institutions. Part of this research is implemented within the framework of international cooperation.

INTERDEPARTMENTAL COMMITTEE ON ENERGETICS

Project: SOLAR ENERGY – FUNDAMENTAL AND APPLIED INVESTIGATIONS AIMED AT INCREASING INSOLATION AND ENERGY GAIN OF OBJECTS USING NEW METHODS

(Academician Aleksandar Despić)

Investigations have been continued aimed at increasing the efficiency of collecting solar energy. In the present case solar thermal collectors were envisaged which use the principle of reflection of sun rays with a specially constructed reflectors built into the collector. A prototype was built and measurements of efficiency were made and compared with a classical type fixed collector. Manifold enhancement was recorded at some days.

Pucar M., Despić A., 2003: Greenhouse with changing insolation. **Patent P-169/03**, Savezni zavod za intelektualnu svojinu (in Serbian).

Pucar M., Despić A., 2003: Suntracking converter of solar energy. **Patent P-623/03**, Savezni zavod za intelektualnu svojinu (in Serbian).

Pucar M., Despić A., 2003: Solar collectors following the motion of the sun. Scientific Meeting **Alternative energy sources and the future of their application**, Montenegrin Academy of Sciences and Arts, Budva, October 2003, 67–72 (in Serbian).

Pucar M., Zeković S., Marić I., 2003: Prospective uses of renewable energy sources within the Technology Park in Vršac. Scientific Meeting **Alternative energy sources and the future of their application**, Montenegrin Academy of Sciences and Arts, Budva, October 2003, 186–193 (in Serbian).

Interdepartmental Committee:
**LIVES AND WORK OF THE SCIENTISTS IN SERBIA AND SCIENTISTS
OF SERBIAN ORIGIN OUTSIDE SERBIA**
(Academician Vladan Djordjević)

Complete manuscript of Volume IX of the Edition “Lives and Work of the Serbian Scientists” was prepared for publication. Volume IX contains 13 scientific biographies:

1. VLADIMIR FARMAKOVSKI, Zoran Savić
2. JOVAN TOMIĆ, Vidojko Jović
3. BRANKO DIMITRIJEVIĆ, Vidojko Jović
4. ALEKSANDAR KOSTIĆ, Vladimir Bumbaširević
5. MILADIN PEĆINAR, Petar Petrović, Mirko Milentijević
6. PETAR MARTINOVIĆ, Dušan Kanazir et al.
7. MILOŠ RADOJČIĆ, Rade Dacić
8. VOJISLAV AVAKUMOVIĆ, Vojislav Marić
9. SVETOPOLK PIVKO, Dragomir Zeković
10. GOJKO NIKOLIŠ, Vera Gavrilović
11. PETAR STEVANOVIĆ, Marko Eremija, Milorad Pavlović
12. PETAR DREZGIĆ, Borisa Špasojević
13. MIHAILO MIHAILOVIĆ, Živorad Čeković

Ten new manuscripts for the Volume X were collected, and are in the reviewing process.

**THE SERBIAN ACADEMY OF SCIENCE AND ARTS COMMITTEE ON
MUSEUM OF SCIENCE AND TECHNOLOGY**
(Academician Aleksandar Despić)

Project: **RESEARCH IN THE FIELD OF THE HISTORY OF SCIENCE,
TECHNOLOGY AND INDUSTRY OF SERBIA**
(Academician Aleksandar Despić)

In the course of 2003 work has continued within the Museum of Science and Technology on the research of the past of scientific, technical and technological development, as well as history of science in general.

Within this activity the following books have been published:

Vidojko Jović, *From the History of Geology in Serbia* (in Serbian: *Iz istorije geologije u Srbiji*), Belgrade, 2003.

Nikola Tesla, *Notes from Edison's Machine Factory* (*Beleške iz Edisonove fabrike mašina*, Nikola Tesla Museum, Federal Bureau for Intellectual Property, Belgrade, 2003 (publisher: Marija Šešić, Jelena Popović)

Budimir Pavlović, *History of the Serbian Medicine* (in Serbian: *Istorija srpske medicine*), Official Gazette of FRY, Sventovid, Belgrade 2002.

Ljubinka Trgovčević, *Planned Elite. On Students from Serbia at European Universities in 19th Century* (in Serbian: *Planirana elita. O studentima iz Srbije na evropskim univerzitetima u 19.veku*), Historical Institute, Official Gazette, Belgrade, 2003.

Proceedings of works from the Meeting of Yugoslav Astronomers were also published in English under the title: *Proceedings of the XIII National Conference of Yugoslav Astronomers*, Belgrade, October 2003. *History and Philosophy of Astronomy* (pp 257–355):

- 1) Grujić P.: The Concept of Hierarchical Cosmos (257–263);
- 2) Ćirković M. M.: The Third May out of the Anthropic Coincidence Quandary (263–267);
- 3) Ćirković M. M.: Anthropic – A Causal Approach to Solution of the Arrow of Time Puzzle (257–275);
- 4) Božić N., Ninković S.: Ethnoastronomical Investigation of the Zavojsko jezero Area (Piro, Yugoslavia) (275–279);
- 5) Francisty J.: Exact Identification of the Location in Vojvodina from which Count Luigi F. Mirsigli and Johann Müller Executed their Quadrant Measurements in July 1696 and the Accuracy of These Measurements (279–285);
- 6) Jovanović B. D.: Astronomy in “Serbskij narodnij list” (Serbian National Weekly) (285–289);
- 7) Milogradov–Turin J.: The Department of Astronomy of the University of Belgrade (289–293);
- 8) Djordjević R., Žirković M. M.: Debates on the Philosophy of Science Issues in Serbia at the Beginning of the XX Century (293–297);
- 9) Djordjević R., Ninković S., Đokić M.: Petronijević's Papers in Astronomy (297–301);
- 10) Trajkovska V.: Reform of Calendar: Maksim Trpković and Milutin Milanković (301–307);
- 11) Dragičević I., Žirković M.M.: Are Biological and Astrophysical Timescales Truly Uncorrelated? (307–313);
- 12) Milogradov–Turin J.: Astronomy Education in Yugoslavia 1999–2002 (313–319);
- 13) Božić N.: The Astronomical Section of the Research Society “Vladimir Mandić Manda” from Valjevo in the Period from 1996 to 2002 (319–323);
- 14) Zorkić A.: Astronomy on the WEB: Yugoslav Experience (323–329);
- 15) Protić–Benišek V.: Structure and Content of the Belgrade Plate Archive (329–333);
- 16) Dučić V., Petrović R.: Possible Astronomical Meaning of the Povlen Ball (333–337);
- 17) Mijatović V., Ninković D., Vemić D.: Astral Motifs of Late Medieval Funerary Monuments (337–343);
- 18) Jovanović B.D.: On the Date of Jovan (Julijan) Okor's Death (343–347);
- 19) Gerstbach G.: Mars Channel Observations 1877–90, Compared with Modern Orbiter Date (347–355).

**INTERACADEMIC COOPERATION OF SASA AND MONTENGRIN
ACADEMY OF SCIENCES AND ARTS**

INTERACADEMIC COMMITTEE ON CATALYSIS

(Academician Paula Putanov)

In the scope of permanent activity dedicated to stimulating scientific research, scientific–technical cooperation and international collaboration in the field of catalysis, special attention was paid to the preparation of the fourth seminar “New Challenges in Catalysis” to be held in 2004, and to organizing lectures in this field, for the attendants from university and industrial plants.

In 2003 the following lectures were presented:

Milka Avramov–Ivić, Ph.D., Prof. Slobodan Petrović, Ph.D., Prof. Dušan Mijin, Ph.D.: New Trends in Electrosynthesis – Interpretation of Medicine Electroactivity

Prof. Dragoslav Stojilković, Ph.D.: An Approach to the Mechanism of Ziegler-Natta Olefine Polymerization

Dušan Jovanović, Ph.D. et al.: The Catalyst for the Hydrogenation of Edible Oils and Fats.

**Project: ISOLATION, CHEMICAL AND BIOCHEMICAL
CHARACTERIZATION OF MARINE NATURAL PRODUCTS**

(Academician Miroslav J. Gašić)

Derivatives of known compounds were examined for their possible antifouling activity.

Bacchi A., Pelizzi G., Jeremić D., Sladić D., Gruden–Pavlović M., Andjelković K., 2003: Synthesis and structural characterization of copper (II) complexes with the 2' [1-(2-pyridinyl)ethylidene]oxalohydra zide ligand. **Transition Metal Chemistry**, 28 (8), 935–938.

**Project: STUDIES OF AQUATIC ORGANISMS AT THE COAST OF
SOUTH ADRIATIC AND POSSIBILITIES OF THEIR APPLICATION IN
AQUACULTURES**

(Academics Radoslav Andjus and Dragoslav Marinković)

The target of this study are threatened species of fishes of economic and ecological importance, with a possibility to develop them in reproductive systems of aquaculture. Experimental studies involve physiological, genetic, and biochemical analyses to determine optimal conditions for an artificial development of observed species, with a possibility of their re-introduction in the natural environment.

Mandić S., Kljajić Z., Joksić A., Mičković B., Hegediš A., 2003: Water potential of Šasko lake with a purpose of aquaculture development. **32 Conference on The Actual Problems of Water Protection**, Book of papers (reports), 99–103.

Project: **NATURAL PRODUCTS FROM PLANTS AND MARINE ORGANISMS: MEDICAL AND ECOLOGICAL SIGNIFICANCE**

(Academician Miroslav J. Gašić)

Plants belonging to *Gentianaceae* family from different locations were collected and the chemical composition of lipid extracts investigated.

Milosavljević S., Juranić I., Aljančić I., Vajs V., Todorović N., 2003: Conformational analysis of three germacranolides by the PM3 semi-empirical method. **Journal of the Serbian Chemical Society**, 68, 281–289.

Šavikin–Fodulović K., Aljančić I., Vajs V., Menković N., Macura S., Gojčić G., Milosavljević S., 2003: Hyperatomarin, an Antibacterial Prenylated Phloroglucinol from *Hypericum atomarium* ssp. *Degenii*. **Journal of Natural Products**, 66, 1236–1238.

Tešević V., Milosavljević S., Vajs V., Janačković P., Popsavin M., 2003: Dithiophenes and other constituents of roots of *Centaurea nicolai*. **Biochemical Systematics and Ecology**, 31, 89–90.

Trifunović S., Vajs V., Tešević V., Djoković D., Milosavljević S., 2003: Lignans from the plant species *Achillea lingulata*. **Journal of the Serbian Chemical Society**, 68, 277–280.

Vajs V., Vugdelija S., Trifunović S., Karadžić I., Juranić N., Macura S., Milosavljević S., 2003: Further degradation product of *Hypericum perforatum* (St. John's Wort). **Fitoterapia**, 74, 439–444.

DEPARTMENT OF TECHNICAL SCIENCES

Project: **THEORETICAL AND EXPERIMENTAL RESEARCH OF METAL STRUCTURES AND THEIR INFLUENCE ON CONTEMPORARY DESIGN AND CONSTRUCTION**

(Academician Nikola Hajdin)

First subproject deals with elasto-plastic behaviour of metal plates, plate and box girders. Box-girders with wide flanges subjected to bending and torsion, plate girders subjected to centric and eccentric patch loading are investigated experimentally and theoretically. Stability and ultimate load behaviour are analyzed. Second subproject deals with dynamics of structures where attention is directed to bridges. Research includes problems of the noise – structure borne sound and bridges as its source. Third subproject deals with composite structures of steel and concrete, their analysis according to theory of elasticity and theory of plasticity and with theoretical analysis of the influence of connectors deformability onto the behaviour of composite beams for various loading conditions and onto composite action.

Research is continued on all subprojects. Experimental research of the longitudinally stiffened plate girders subjected to patch load has been carried out and part of this research is completed and as well as theoretical considerations it is presented in Ph.D. thesis.

Ćorić B., Mijušković O., Pavlović M., 2003: The Optimum Stiffener Rigidity in Transversally-Stiffened Web Under Pure Shear. **Mechanics and Materials Conference**, Scottsdale, Arizona, June 17–21, 2003, 168.

Lučić D., 2003: Experimental Research on I-Girders Subjected to Eccentric Patch Loading. **Journal of Constructional Steel Research**, 59 (9), 1147–1157.

Lučić D., Šćepanović B., 2003: I-Girders Under Eccentric Patch Loading – Experimental and Numerical Research. **10th International Symposium of MASE**, Vol. I, Ohrid, 269–274.

Marković N., 2003: **Buckling of the plate girders subjected to patch loading**. Ph.D. Thesis, Civil Engineering Faculty, Belgrade, 137 p.

Project: **STUDYING, CONSTRUCTING AND EXPERIMENTAL TESTING OF THE SPECIAL EQUIPMENT FOR SHIPS**

(Academician Petar Miljanić)

The purpose of this project is to study building of modern river and sea ships, to study resistance and propulsion of vessels of various size in order to increase efficiency and to improve ship's equipment.

After carrying out analysis and after choosing optimal dimensions, the team proceeded to design a modern river container ship. The team made a preliminary design of a stationary vessel with catamaran type steel hull, the total area of the vessel being 2500 square meters.

Concerning the study of ships' resistance and propulsion an analysis has been done of diesel-electric drive on inland water ships and a 4 kW model was tested on the river Sava. A circular theory with a ring propeller was elaborated, a prototype was made and the electric parameters were checked.

The study of the active cathodic protection system against corrosion for ships and metal structures in river and sea water continued. The installed protection systems were checked regularly. After several years of studying the electric drive for vessels some results were summed up and given in the monography.

Lajić Z., Šovagović Z., Bulovan D., 2003: COM Technology Implementation In Ship Design Software. **Proceedings of European Inland Waterway Navigation Conference (EIWNC)**, Hungary, 269–280.

Nikolić Z., Počuča G., 2003: **Ships' electric machines and devices**. Monograph, Institute of the Technical Sciences of the SASA, Beograd, 263 p.

Nikolić Z., Stamenović B., Marinković M. 2003: Diesel–electric propulsion of the reconstructed paddle wheel river ship “Krajina”. **Conference Proceedings AES 2003 Broadening the Horizons**, Edinburgh, 117–123.

Project: **ACTUAL TECHNICAL CERAMICS**
(Academician Momčilo M. Ristić)

The aim of the study is the investigation of the functional ceramic materials synthesis regularity.

The kinetics of sintering process in disperse ceramic materials was investigated. It is suggested that transport of activated volume results the sintering process in terms of the fact that activated volume is a parameter which define system defect on the atomic level. Mechanochemical synthesis of oxide ceramic materials was studied by using electron paramagnetic resonance method and their kinetic mechanism was defined.

The sintering of $\text{Cu-Al}_2\text{O}_3$ system was investigated.

With a view to make clear the validity of macro processes in functional ceramic materials the Arrhenius parameter behavior in the relations, which characterized velocity of these processes, was examined.

Aćimović N. Z., 2003: Kinetics of sintering of real disperse materials. In: **Science of Sintering: Current Problems and New Trends** (edit. M.M. Ristić), SASA and IISS, Belgrade, 71–76.

Kakazey M., Vlasova M., Ristić M., Srećković T. et al., 2002: Thermal processes during mechanical treatment of ZnO and ZnO-TiO₂ powders and their role in the formation of defect structure. **International Journal of Fracture**, 113, L13–L18.

Nikolić N., Nikolić M.V., Radić Ristić S.M., Ristić M.M., 2002: Sintering as a process of transport of activated volume. **Science of Sintering**, 34, 53–56.

Nikolić M.V., Nikolić N., Ristić M.M., 2003: Influence of the Al_2O_3 content on the growth kinetics of inter-particle contacts during sintering of the $\text{Cu/Al}_2\text{O}_3$ system. In: **Science of Sintering: Current Problems and New Trends** (edit. M. M. Ristić), SASA and IISS, Belgrade, 85–90.

Pryadko L.F., Kunickii Yu.A., Shpak A.P., Ristić M.M., 2003: Thermoactivation processes in structural unstable OCK-metals. In: **New Technology in Powder Metallurgy**, IPM NANU, Kiev, 91–92.

Project: **SYNTHESIS AND PROPERTIES OF THIN AND THICK FILMS**
(Academician Pantelija M. Nikolić)

During the year 2003 the following was done:

The investigation of thermal properties of NTC thick films sintered on alumina and single crystal quartz were continued using the photoacoustic method.

We had cooperation with Prof. K.M. Paraskevopoulos from the Aristotle University, Department of Physics, Solid State Section, Thessaloniki. The investigation and characterization of paint from frescoes of old Serbian Monasteries studying the influence of Byzantine technology was continued.

The investigation of semiconducting superlattices using infrared spectroscopy was continued also in cooperation with Prof. K. Paraskevopoulos.

Aleksić O.S., Nikolić P.M., Vasiljević–Radović D.G., Luković M.D., Djurić S., Pejović V.Ž., Radulović K.T., Luković D.T., Vujošević D.Lj., 2003: Properties of Thick Film NTC Thermistor Layers Based on a nanometric Mn,Co,Fe-Oxide Powder. **Proceedings of X World Round Table Conference on Sintering – Science of Sintering: Current Problems and New Trends** (edit. M.M. Ristić), Belgrade, 427–432.

Todorović D.M., Nikolić P.M., Bojičić A., Smiljanić M., Vasiljević–Radović D., Radulović K.T., 2003: Photopyroelectric Elastic Bending Method. **Rev. Sci. Instrum.**, 74 (1), 635–638.

Project: **PRECISION MEASUREMENT OF AC CURRENT**
(Academician Petar Miljanić)

A measuring equipment is assembled in which the proposed modified definitions of rms (root mean square) voltage, rms current and average power are used. Utilizing the asynchronous samplings with the precision integrating voltmeters and the program written in Visual Basic, performances of the precision ac calibrator, made at the Technical Faculty of Novi Sad, are evaluated.

To improve precision and accuracy of ac current to ac voltage conversion, a new device is invented and made: the ac current to voltage converter based on the two-stage transformer built as the current comparator with magnetic shielding. Using an auxiliary transformer, the voltage on both secondaries of the two-stage transformer are brought to a few microvolts and consequently the capacitive error kept below 1 ppm (part per million).

The above research should improve the calibration facilities of our National Metrology Laboratory during the intercomparison of ac power, organized by EUROMET with the traveling precision ac power to dc voltage converter MSB, invented and designed in the Institute “Mihajlo Pupin” in Belgrade.

Project: **NEW MATHEMATICAL METHODS IN THEORY OF STRUCTURES, THEORY OF ELASTICITY AND THEORY OF PLASTICITY**

(Academician Djordje Zloković)

In his books **Group theory and G-vector spaces in structural analysis: vibration, stability and statics** (published by Horwood/John Wiley) and **Group supermatrices in finite element analysis** (published by Horwood/Prentice Hall), Zloković developed his concept of group supermatrices and introduced its implementation into finite element analysis, designating the new method as the group supermatrix procedure. This procedure is illustrated by applications in mechanics by examples of large complex structures of architectural, civil and mechanical engineering. The object of research in 2003 was to derive stiffness matrices of finite elements which possess no symmetry properties using the group supermatrix procedure.

The results of research in 2003 contain application of the group supermatrix procedure for derivation of stiffness matrices of quadrilateral and hexahedral isoparametric finite elements using the symmetry groups C_{2v} and D_{2h} respectively. The group supermatrix procedure introduces monomial shape functions in G-invariant subspaces, as well as nodal coordinates, Jacobians and matrix expressions pertaining to particular subspaces. Decomposition of the spaces of quadrilateral and hexahedral elements into four and eight G-invariant subspaces respectively is accomplished after the isoparametric transformation of the initial elements without symmetry properties into four rectangular and eight rectangular hexahedral elements. The computing of stiffness matrices of these elements by the group supermatrix procedure is programmed in Mathcad and in KOMIPS programs. In comparison with the conventional derivation and computation of stiffness matrices of these elements, the group supermatrix procedure provides substantial reductions in the amount of formulation and calculation, because it deals with monomial instead of polynomial shape functions, shorter expressions and smaller matrices.

Zloković Dj., 2003: Analysis of spherical networks in G-vector spaces based on octahedral and icosahedral symmetry groups. **Bulletin T. CXXVI de l'Académie serbe des sciences et des arts, Classe des sciences techniques**, 29, Beograd.

Zloković Dj., 2003: Vibration of cable networks formulated in G-invariant subspaces. **Bulletin T. CXXVI de l'Académie serbe des sciences et des arts, Classe des sciences techniques**, 29, Beograd.

Zloković Dj., Maneski T., Nestorović M., 2004: Group theoretical formulation of quadrilateral and hexahedral isoparametric finite elements. **Computers and Structures**, 82, 883–899.

Project: **INHIBITORS OF THE CORROSION OF METALS**
(Academician Dragutin Dražić)

Investigation is related to the improvement of the protective properties of cathaphoretic epoxy coatings on steel against corrosion, by previous modification of the steel surface with different electroplated alloys. This year the effects of Zn-Co and Zn-Fe

alloys were investigated. First, the optimal conditions for electrodeposition of these alloys were performed, and then overall anticorrosive properties with the cathodic coating evaluated. The best protection was obtained with the steel surface modified with Zn-Co alloy deposited from the corresponding chloride electrolytic bath at the current density of 5 A dm^{-2} .

Bajat J.B., Mišković–Stanković V.B., Dražić D.M., 2003: The corrosion behaviour of epoxy coatings on Zn-Fe alloy. **Proceedings of the European Corrosion Congress EUROCOOR 2003**, 28 September – 2 October 2003, Budapest, CD-ROM, Paper No. 093.

Project: **STABILITY TESTS OF CONTROL OF HUMANOID ROBOTS IN CONTACT WITH DYNAMIC ENVIRONMENT**

(Academician Miomir Vukobratović)

In 2003 a serious step was made in the domain of solving the problem of regular (repeatable) gait as a contact task of the humanoid robot in the contact with the ground. Further, some new, previously neglected, phenomena were introduced into the model, namely the effects of both the elastic character of the robotic mechanism joints and elastodynamic effects of the contacting surface of the artificial foot and the ground.

Beside the real effects that had to be introduced into the dynamic model of the gait, the cases were also considered of the gait functioning when the robot moves on the surfaces (supports) having six degrees of freedom (three translations and three rotations).

In this way a model was formed of the dynamics of the robot moving in the presence of programmed disturbances (walk on the platform).

In order to maintain balanced gait in this case it was necessary to synthesize such a control system which takes into account the control of the internal (relative) state coordinates, as well as the position of the system as a whole (global dynamic balance of the gait that directly depends on the position of the zero-moment point).

Katić D., Vukobratović M., 2003: **Intelligent Control of Robotic Systems**. Research Monograph, Kluwer Academic Publishers, Vol. 25.

Vukobratović M., Borovac B., 2004: Zero-Moment-Point – Thirty Five of Its Life. **International Journal of Humanoid Robotics**, Vol. 1, No 1, March 2004.

Vukobratović M., Potkonjak V., Matijević V., 2003: **Dynamics of Robots with Contact Tasks**. Research Monograph, Kluwer Academic Publishers, Vol. 26.

Project: **CONTEMPORARY PROBLEMS OF FLUIDS ENGINEERING**

(Academician Vladan Djordjević)

Several different problems that belong to modern developments in fluids engineering were planned to be tackled within the work on this Project during 2003:

- Investigation of nonlocal turbulent diffusion and the structure of swirling flow in pipes, and development of an approximate method for calculation of turbulent boundary layers,
- Rarefied gas flow in micro-channels with one porous wall,
- Modeling of rheological behavior of human cells by fractional derivatives, and
- Experimental investigation of wave propagation in fluidized bed systems.

The summary of the achieved results is as follows:

- For the first time the complex structure of the turbulent flow near the wall (buffer layer) in the swirling flow in pipes was investigated in detail, and the space and the time correlations were established. In addition, a new method for calibration of hot wire anemometers was developed. Also, a method based on integral form of turbulent boundary layer equations, with the use of Prandtl's mixing length hypothesis was proposed.
- Both gas rarefaction and wall porosity cause the gas to slip over the wall. Interrelation between these two slips was investigated in detail and useful formulas connecting the mass flow rate and the overall pressure ratio in a micro-channel were derived.
- It was shown that fractional derivatives embody essential features of cell rheological behavior, and finally,
- The propagation of waves in a fluidized bed system was investigated experimentally in detail, and an empiric formula for the dependence of the wave speed on the concentration of rigid particles was proposed.

Čantrak S., Benišek M., Nedeljković M., Lečić M., 2003: Turbulenz-Anisotropie und nichtlokale Diffusion in drallbehafteter Scherstroemung. **Pannonian Journal of Applied Mathematics and Mechanics**, 2, 346–347.

Djordjević V.D., 2003: Compressible channel flow over a permeable wall. **Facta Universitatis, Series Mechanics, Automatic Control and Robotics**, 3 (15), 973–980.

Djordjević V.D., Jarić J., Fabry B., Fredberg J.J., Stamenović D., 2003: Fractional derivatives embody essential features of cell rheological behavior. **Annals of Biomedical Engineering**, 31, 692–699.

Lečić M., 2003: **Theoretical and experimental investigation of turbulent swirling flows**. Ph. D. Thesis, University of Belgrade, Faculty of Mechanical Engineering (in Serbian).

Vujičić M., Crnojević C., 2003: Calculation of the turbulent flow in a plane diffuser by using the integral method. **Faculty of Mechanical Engineering Transactions, New Series**, 31(2), 69–74, Belgrade.

Project: **ERRORS IN FOUNDATION ENGINEERING**
(Academician Dušan Milović)

In civil engineering practice inappropriate type of foundations generally leads to the collapse of foundation soils or to serious and heavy damages of structures. The objective of the project is to find the reasons and valuable technical explanations for such unac-

ceptable behaviour of structures, to improve the quality of designing and to show how to ensure the required stability and safety of structures.

The main factors that have significant influence on the exactness of the solution of foundation problems are theoretical procedures for computing the bearing capacity of shallow and deep foundations, theoretical solutions for determining the values of settlements and rotation of structures, soil system and soil model used for the geotechnical calculation, shear and deformation parameters of subsoil, quality of soil samples and level of their mechanical and stress disturbance, relative rigidity of foundations, effect of liquefaction on the stability of structures caused by seismic forces. In order to verify the validity and the level of accuracy of the available theoretical methods for computing bearing capacity of shallow and deep foundations, theoretical results were compared with the results obtained by field load tests, carried out on piles in scale of 1:1. It is worth mentioning that in some tests a load of up to 1000 t was used.

The effect of the soil system and soil model on the calculated values of settlement is widely analyzed, using not only classical model of elastic, isotropic and homogeneous half space, but also multilayer system and model with the limited thickness of compressible layer. On the basis of the laboratory test results and the calculated values of bearing capacity and settlement it has been shown that the mechanical characteristics such as shear strength and deformation parameters play very important role in getting the results that will be in satisfactory agreement with the observed values. In general, due to mechanical disturbance the values of the most important soil parameters can be either overestimated or underestimated, that can lead to wrong conclusions and decisions. Special attention was paid to the macroporous loess soils and marine clays, because of their very significant sensitivity to the mechanical disturbance.

All obtained results in this study will be published as a monograph.

**Project: NUMERICAL TECHNIQUES AND DATA BASES FOR
DEVELOPMENT OF PLASMA TECHNOLOGIES FOR APPLICATIONS IN
MICRO ELECTRONICS AND NANO-TECHNOLOGIES**

(Corresponding Member Zoran Petrović)

The goal of the research in this project is to investigate integration of analytic, numeric and Monte Carlo codes with calculation of space charge effects in modelling of collisional low-temperature plasmas. Also the goal is to provide critically evaluated data for plasma models, cross sections and rate coefficients in particular.

Application of a hybrid analytic-numerical model of a Townsend discharge was completed to study non-linear phenomena in low current discharges. Comparisons with analytic local theory revealed the onset of non-linear effects which are mainly due to space charge effects.

Modeling of experimental data for axial emission profiles of normal and abnormal glow discharges allowed tests of scaling, application of the secondary electron yields from the breakdown data and provided foundation for more general models of secondary electron yields in higher current discharges.

Data needs, development of data bases and benchmarks for plasma models in micro and nano electronics were discussed at a joint European Union-Japan meeting.

Finally, we opened collection and reevaluation of the data for modeling fast neutral sources from collisional plasmas.

Marić D., Hartmann P., Malović G., Donkó Z., Petrović Z. Lj., 2003: Measurements and modelling of axial emission profiles in abnormal glow discharges in argon: heavy-particle processes. **Journal of Physics D: Applied Physics**, 36, 2639–2648.

Nikolić M., Djordjević A., Stefanović I., Vrhovac S., Petrović Z.Lj., 2003: Semianalytical models of Volt-Ampere characteristics of diffuse low-current low-pressure discharges. **IEEE Transactions on Plasma Science**, 31, 717–723.

Petrović Z.Lj., 2003: Calculation of transport coefficients, relaxation of swarm properties and distribution functions: a gap between plasma models and atomic collision data. **EU-Japan Joint Symposium on Plasma Processing**, University Stockholm, **Report on EU-JAPAN Joint symposium on plasma processing**, Open University UK, Association of Super-Advanced Electronics Technologies ASET Japan, 79–128.

Šašić O., Malović G., Strinić A., Nikitović Ž., Petrović Z.Lj., 2003: Dissociative Excitation of Methane by Electron Swarms. **Proceedings XXVI ICPIG**, July 2003, Greifswald (Eds. J. Meichsner, D. Loffhagen and H.E. Wagner), 3, 53–54.

DEPARTMENT OF MEDICAL SCIENCES

Project: **INVESTIGATION OF PATHOLOGICAL-MORPHOLOGICAL LESIONS OF CONGENITAL AND ACQUIRED HEART DEFECTS OF MYOCARDIUM (AND THEIR PULMONARY CIRCULATION), MYOCARDIUM AND CORONARY BLOOD VESSELS**

(Academician Vladimir Kanjuh)

Multidisciplinary scientific investigations and cooperation continued and it was devoted to morphological-clinical correlations in cardiovascular diseases. The following problems were investigated: possibility of myocardium biopsy, morphology of atherosclerosis and ruptures of atherosclerotic plate, connection of atherosclerosis with insulin resistance and diabetes, atherosclerosis in children – JUSAD study, lesions of endothelia, coronary disease, smoking and cardiovascular, malignant and other diseases, aortal-coronary vein and arterial bypass grafts, aneurysm of aorta – 574 autopsies, treatment of pulmonary hypertension in congenital heart defects.

Gojković–Bukarica Lj., Belestin–Čokić B., Novaković A., Kažić T., Žigon N., Sajić Z., Perić M., Kanjuh V., 2003: The effect of rilmakalim on the human internal mammary artery. **Geschlechtsspezifische Mechanismen der Arteriosklerose**. Herausgeber: H. Heinle, H. Schulte, H. Hahmann. 16. Jahrestagung der Deutschen Gesellschaft für Arterio-skleroseforschung 2002, 163–169.

Kanjuh V., Lalić N.M., Ostojić M., Lalić K., Beleslin B., Kanjuh S., Jotić A., 2003: Severity of coronary arterial stenotic changes correlates with increases in plasma insulin and plasminogen activator inhibitor I levels in patients with Type 2 diabetes. **The XIIIth International Symposium on Atherosclerosis (ISA)**, September 28 –October 2, 2003, Kyoto, Japan, Abstracts Book.

Lalić N.M., Ostojić M., Kanjuh V., Lalić K., Jotić A., Zamaklar M., Lukić Lj., Miličić T., Rajković N., 2003: Recurrence of myocardial infarction is strongly associated with insulin resistance and increased plasminogen activator inhibitor 1 levels both in type 2 diabetes and nondiabetic patients. **The XIIIth International Symposium on Atherosclerosis (ISA)**, September 28 – October 2, 2003, Kyoto, Japan, Abstracts Book.

Nedeljković M., Ostojić M., Beleslin B., Nedeljković I., Milić N., Đorđević–Dikić A., Stepanović J., Kanjuh V., 2003: Relation between coronary response to ergonovine and lipid profile in patients with non-significant coronary artery stenosis. **ESC Congress 2003**, Vienna, 30 August – 3 September 2003, **European Heart Journal**, 24, Abstracts Suppl., 319.

Seferović P.M., Ristić A.D., Maksimović R., Tatić V., Ostojić M., Kanjuh V., 2003: Diagnostic value of pericardial biopsy: improvement with extensive sampling enabled by pericardioscopy. **Circulation**, 107 (7), 978–983.

Simeunović S., Kanjuh V., Mujović V., Jovanović I., Đukić M., Parezanović V., Vukomanović G., Milinčić Ž., Ilić S., Ilić T., Kalanj J., Čuturilo G., 2003: Evaluation and therapy of high pulmonary hypertension in patients with congenital heart disease. **The First Asia-Pacific Symposium on Pediatric Cardiac Intensive Care**, Phuket, Thailand, February 20–22, 2003.

Stefanović E., Kanjuh V., Tasić N., 2003: Altered endothelial permeability secondary to ischemia

Project: **PHYSICIANS – MEMBERS OF THE SASA**
(Academician Vladimir Kanjuh)

The objective of the Project is to write individual bibliographies of physicians – members of SASA, but in the context of time, environment and conditions in which they worked, institutions in which they worked and the circle of their immediate associates.

According to new data, since the foundation of SASA, 131 physicians were members of SASA (including foreign members and members not in the working composition).

In 2003 printing and reporting continued on papers about Rudolf Virchow (1821–1902), the most significant pathologist of XIX century, and his influence on the development of pathological anatomy in Serbia.

Kanjuh V., Stevanović G., Ostojić M., Stanković Z., Dimitrijević J., Kanjuh S., 2002: Rudolf Virchow (1821–1902) and His Influence on Development of Pathological Anatomy in Serbia (in Serbian: Rudolf Virchow (1821–1902) i njegov uticaj na razvoj patološke anatomije u Srbiji). *Vojnosanitarni pregljed*, 59 (6 Suppl.), 11–19.

Project: **POPULATION GROWTH RATE OF SERBIA FROM SOCIAL AND MEDICAL ASPECT AND HIV INFECTED WOMEN**
(Academician Vojin Šulović)

In 2003, by means of a poll data were collected about the extent to which living and working conditions created in the course of 12 years of economic regress of the country, various material shortages, difficulties in diagnosis and therapy, chronic stress, personal and family insecurity, sanctions, bombing and other, affected reproduction capabilities and health of women in Serbia. Data from 1989 were taken to be the control group, since it was considered that at that time life proceeded in comparatively normal circumstances, and experimental group were the data from year 2001.

The investigation treated gynecological diseases, pregnancy, birth, prenatal morbidity and mortality of conceived children, morbidity and mortality of mothers, demographic indicators, equipment, laboratories and other diagnostic aids of related diagnostic departments.

Šulović V., Jakovljević Dj., 2003: Medicine and Quality of Life. Introductory lecture. **3rd Scientific Conference with International Participation, Medicine and Quality of Life** (in Serbian: Medicina i kvalitet života. Uvodno predavanje, III naučni skup sa međunarodnim učešćem, Medicina i kvalitet života, SASA, 21 May 2003, 3–10.

Nedeljković M., Šulović V., 2003: Quality of Life with Sexually Transmissible Infections. **3rd Scientific Conference with International Participation, Medicine and Quality of Life** (in Serbian: Kvalitet života sa polno prenosivim infekcijama. III naučni skup sa međunarodnim učešćem, Medicina i kvalitet života, SASA, 21 May 2003, 3–10.

Project: **ZOONOSIS IN OUR COUNTRY**
(Academician Zlatibor Petrović)

In the past year work continued on collecting data and studying zoonosis. Mostly helminthozoonosis were studied – trichinelosis, echinococcosis and dirofilariosis. Special stress was put on trichinelosis since it increasingly appeared both among people and domestic animals.

Project: **TUMOR BIOLOGY**
(Academician Ivan Spužić)

Immunological parameters during chemo-immunological therapy were studied in patients suffering from malignant melanoma in 2003. The number and function of certain cell sub-populations of the immune system were determined prior and during therapy and afterwards in in vitro treatment of cells by various modifiers of biological response. Immunophenotypes of cell characteristics of peripheral blood were studied in patients suffering from melanoma and malignant lymphoma and their relations with functional characteristics of these cells. The activity of NK cells was also studied and a comparison was made of in vivo and in vitro effects of alpha interferon, 13-cis retinoic acid and their combinations on the function of these cells, their expression of activation antigens and transcription of signal molecules. In lymph nodes of metastatic malignant melanoma subsets of lymphocyte population were determined as well as activation and adhesive molecules. Cell cycles were also determined, and DNA content in primary tumors of malignant melanoma and numerous tumor cell lines (FemX, HeLa, HL-60), and antiproliferating influence of interferon and retinoic acid on cell cycle, expression of antiapoptosis molecule, bcl-2 and MAP kinetic signal molecules. In cell culture, the influence was studied of TNF alpha, hormones and other coactive molecules on lymphocytes of peripheral blood, tumor lines, cells of primary tumors and their metastasis. The influence that was also studied was that of TNF alpha on the appearance of apoptosis via electronic microscopic changes in lymphocytes of peripheral blood of patients with lymphoma, spontaneous release and isotypes of lactate-dehydrogenase enzyme (LDH), and determination of steroid receptors and receptors for epidermal growth factor on the course, prognosis and therapy of patients suffering from hormone dependent tumors.

Elefthorakis E., Jurišić V., 2003: Haematological parameters during training at the high altitude environmental conditions of a football team. **Immunology Letters**, 87, WOO.14, pp. 200, **European Immunology Congress (EFIS2003)**, June 8–12, 2003, Rhodes, Greece.

Jurišić V., 2003: Estimation of cell membrane alteration after drug treatment by LDH release. **Blood**, 101 (7), 2894.

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Project: **ASSESSMENT OF CLINICAL APPLICATION OF FROZEN
CADAVER BONE GRAFTS, VASCULARIZED BONE AUTOLOGOUS
GRAFTS, AND COMBINED GRAFTS IN RECONSTRUCTIVE SURGERY
OF THE SKELETAL SYSTEM**

Project: **ELECTROSTIMULATION OF BONE GROWTH FOLLOWING
FRACTURES OF LONG BONES**

Project: **EXOSKELETON FOR THE PARAPLEGIC**

(Academician Živojin Bumbaširević and Academician Miomir Vukobratović)

In 2003, work continued on the new concept of active exoskeleton which was initially designed and constructed in Belgrade in 1972. All the collected data will be used for the commencement of the main project on exoskeleton construction for the paraplegic.

Project: **ETIOPATHOGENESIS, INCIDENCE AND TREATMENT OF
VARIOUS FORMS OF GLOMERULOPATHIES**

(Academician Sveto Suša)

Cytokines were determined in 43 patients suffering from various forms of glomerulopathies, whose results indicate a significant correlation with pathohistological changes

in biopsic kidney tissue. Electrophoresis curve of proteins in blood made for these patients is also in correlation with previous findings.

Antioxidant activity with chronic renal insufficiency of various etiologies was also examined, and the results point out to a correlation regardless of etiology.

The examination of the correlation between progressing of renal insufficiency and anemia was devoted to the influence of the applied recombinant human erythropoietin on anemia, quality of living and complications, especially artery hypertension and other with the same group of patients.

Project: **HEALTH CONDITION FOLLOW-UP OF MEMBERS OF THE
SERBIAN ACADEMY OF SCIENCES AND ARTS**
(Academician Sveto Suša)

In the course of 2003, follow-up of health condition of members of SASA continued, but it was better organized both as regards health documentation and as regards offering adequate medical assistance.

Project: **EXPERIMENTAL AND CLINICAL INVESTIGATION
OF BIOLOGICALLY ACTIVE SUBSTANCES (CONVULSANTS,
ANTICONVULSANTS, SLEEP PEPTIDE AND ITS ANALOGS) ON
EXCITABILITY OF CENTRAL NERVOUS SYSTEM**
(Academician Veselinka Šušić)

In 2003, investigations were focused on examination of convulsive activities of imipenem broad-spectre antibiotics from the class of carbapenemic antibiotics which are clinically applied. Imipenem is used intravenously in combination with cilastatine (1:1), which is a dipeptidase enzyme inhibitor. Imipenem/cilastatine was applied intracerebroventricularly in rats and its convulsive effect was examined. The effect was studied of different dosage of imipenem/cilastatine on convulsion latency, incidence, intensity, duration, lethality and time to lethal outcome. Behavioral phases of convulsive response are correlated with specific changes in EEG. In all experiments EEG records are analyzed visually and by means of spectral analysis. Investigations were done of the effects of classical antiepileptic phenobarbitone and phenytoin, competitive antagonist NMDA (N-methyl-D aspartate) APV [(±)-2-amino-5-phosphonovaleric acid], uncompetitive NMDA antagonist of remacemide APV [(±)- 2-amino-N-methyl-1.2-diphenylethyl) acetamide monohydrochloride]. The effect was examined of application of intensive sound stimulation (100 ± 3 dB, 60s) after administering the minimum convulsive dose of imipenem and as a result typical audiogenic convulsions occurred. The effect was studied of REM sleep deprivation on spontaneous and audiogenic imipenem/cilastatine provoked convulsions. Clinical examination refers to manifestations of different forms of epilepsy and their relation to sleeping, especially narcolepsy.

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Ristić A., Petrović I., Vojvodić N., Janković S., Sokić D., 2003: Clinical presentation and psychiatric origin of psychogenic nonepileptic seizures. **35th International Danube symposium for neurological sciences**, Belgrade, Serbia and Montenegro, p. 211.

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Project: **HIGH TECHNOLOGY IN MEDICINE AND NUCLEAR
MEDICINE: INSTRUMENTATION DEVELOPMENT, INFORMATION
TECHNOLOGY, AND BASIC EXPERIMENTAL RESEARCH**

(Academician Vladimir Bošnjaković)

In the domain of development of specific instrumentation new breakthrough was made in development of original construction of visual general-purpose device for nuclear medicine based on position-sensitive detector with a large continuous (area type) scintillation crystal of the type used by scintillation cameras with NaI(Tl) crystal. The device which is according to its construction a high-technology instrument was named General Purpose Scintillation Camera – GPSC, because being a system with two detectors, in compliance with the name we had given it, it enabled planar and tomographic

SPECT (single photon emission computed tomography) and PET (positron emission tomography) examinations.

In the domain of history, development of the new multidisciplinary branch of nuclear medicine in Serbia and partly in former Yugoslavia was presented in the monograph "Applied Physics in Serbia" published by SASA.

The work on other subtopics in the realization of the project in 2003 referred mostly to clinical and methodological investigations by evaluating diagnostic significance of nuclear medical techniques. These investigations included problems of nuclear cardiology, nuclear gastroenterology and hepatology, nuclear pulmonology and nuclear hematology.

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radionuclide approach for the quantification of left ventricular volumes: The "Geometric count based" Method. **Nuclear Medicine Communications**, 24, 915–924.

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Project: **ENERGY METABOLISM UNDER NORMAL AND PATHOLOGICAL CONDITION**

(Academician Zoran Kovačević)

The aim of the project is investigation of specificity of energy metabolism in tumor cells and signal transduction pathways in carcinogenesis, as well as protection of normal cells from antineoplastics toxicity by natural antioxidants.

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Kovačević Z., 2003: Is there any order in signal transduction in carcionogenesis. **European Journal of Biochemistry**, 270, Suppl. 1, p. 153, **FEBS Special Meeting on Signal Transduction**, Brussels.

Project: **IDENTIFICATION OF MYOCARD VIABILITY WITH DIPYRIDAMOLE AND DOBUTAMIN**

(Academician: Miodrag Ostojić)

In 2003, adenosine was studied through which in fact dipyridamole acts preventing the takeover of adenosine from circulation in the cell. The examination included 43 patients with disynergy at rest who were given intravenously 80, 100 and 110 mcg/kg of adenosine for 3 minutes while myocardial contractions were continuously monitored with two-dimensional echocargiogram. Coronary arteriography was applied in 41 patients. Twenty seven of them had revascularization of the artery that supplied disynergic myocard, and 16 were treated by medicamental therapy. Improvement of myocard contraction in long monitoring (mean 12 months SD 2 months) was used as the golden standard. Movement index of myocard walls improved from 1.55 ± 0.30 to 1.33 ± 0.26 with a small dose of adenosine. Out of 257 myocardial segments with disynergy adenosine identified 122 as vital, and 135 as necrotic. One-year monitoring showed that the index of wall movements improved to 1.31 ± 0.30 , sensitivity of adenosine stress echocardiography was 87%, and specificity 95% with total diagnosis accuracy of 90%. It was concluded that Adenosine stress echocardiography can be useful in prediction of viability of myocard.

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Nedeljković M., Ostojić M., Beleslin B., Nedeljković I., Milić N., Đorđević–Dikić A., Stepanović J., Kanjuh V., 2003: Relation between coronary response to ergonovine and lipid profile in patients with non-significant coronary artery stenosis. **European Heart Journal**, 24, Abstracts Suppl., 319.

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Project: **BIOCHEMICAL AND MORPHOLOGICAL CELL FEATURES AT THE ONSET OF PROGRAMMED CELL DEATH (APOPTOSIS)**

(Corresponding Member Bogdan Djuričić)

In 2003, research was focused on the introduction of the techniques of free-flow cytometry in the study of early phases of apoptosis. The indicator of apoptosis is binding of annexin to phosphatidylserin which appears on the outside of cells as the result of cell membrane inversion during apoptosis. Studies are directed towards the establishment of quantitative correlation between apoptosis diagnosed by morphological methods and assessment obtained by techniques of free-flow cytometry.

A part of the investigation was directed towards the clinical aspect, which refers especially to the changes in cells in peripheral blood with psychiatric diseases (cell membrane changes and oxidation stress).

Jurišić V., Bumbaširević V., Konjević G., Đuričić B., Spužić I., 2004: TNF α induces changes in LDH isotype profile following triggering of apoptosis in PBL of non-Hodgkin's lymphomas. **Annals of Hematology**, 2004, February, 83 (2), 84–91.

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Project: **INVESTIGATION OF GENETIC BASIS OF DEGENERATIVE DISEASES OF CENTRAL NERVOUS SYSTEM**

(Corresponding Member Vladimir S. Kostić)

In 2003, genetic basis of neurodegenerative diseases was studied, and a special contribution was given to understanding of the basis of Wilson's disease and phenotypic expression of Parkinsonism in genetically proved spinocerebral degeneration. The investigation of prevalence of focal dystonia is also among new contributions.

Phenotypic analysis of genetically proved cases of DYT1 and families with myoclonic dystonias has been completed. The study of parkin and DJ-1 mutations in a population of younger patients suffering from Parkinson disease is also at its end. Finally, the experimental part of the study on balism has been completed, with a special emphasis on its incidence, which so far has not been published in the existing references.

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Przedborski S., Kostić V.S., Giladi N., Eidelberg D., 2003: Dopaminergic systems in Parkinson's disease. In: U. Sidhu A., Laruelle M., Vernier P. (eds), **Dopamine receptors and transporters**. Marcel Dekker, New York, Basel, 364–402.

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Project: **INVESTIGATION OF THE ROLE OF CYTOSKELETAL PROTEINS IN THE PROCESS OF APOPTOSIS (PROGRAMMED CELL DEATH)**

(Academician: Vladimir Bumbaširević)

In 2003, investigations continued of mechanisms of apoptosis induction by disruption of the integrity of microtubules on isolated and cultivated thymocytes. The effect was investigated of specific inhibitors of cysteine prostheses (caspases), inhibitors of ionic pumps and inhibitors of protein synthesis on paclitaxel induced apoptosis.

Along with investigations of apoptosis mechanisms on isolated cells, investigations were carried out of the role of apoptosis in pathogenesis of myelodysplastic syndrome and other hematological diseases.

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INTERDEPARTMENTAL COMMITTEE FOR HUMAN REPRODUCTION BIOLOGY

(Academician Vojin Šulović)

On 21 May 2003, in SASA ceremonious hall, together with the Institute for Cardiovascular Diseases from Sremska Kamenica, the Committee organized the Third scientific conference with international participation on Medicine and Quality of Living for about 80 participants. Fourteen reports were presented in various fields of medical sciences: obstetrics and gynecology, social medicine, cardiac surgery, genetics, pediatrics, psychiatry, physiology, neurology, biochemistry, geriatrics, endocrinology, urology and microbiology.

All the papers were printed in a special book on 207 pages and they are presented on Internet (editors: Vojin Šulović and Djordje Jakovljević).

INTERDEPARTMENTAL COMMITTEE ON AIDS

(Academician Vojin Šulović)

On 29 December 2003, at SASA ceremonious hall, the Committee organized a lecture of Dr. Roscoe Moore, Assistant United States Surgeon General, on the topic "Global AIDS Epidemic: United States President's Emergency Plan".

COMMITTEE ON KIDNEY DISEASES

(Academician Sveto Suša)

COMMITTEE ON DEVELOPMENT OF MEDICAL SCIENCES IN SERBIA

(Academician Vladimir Kanjuh)

The Committee determined that the trend which still persists is drastic reduction of the number of performed clinical autopsies, despite positive legislature. With the exception of Novi Sad, in the most prestigious health institutions of Belgrade – the Clinical Centre of Serbia and the Military Medical Academy – autopsies are performed only for 10% of the deceased. This brings about the loss of true control of diagnostics and treatment of patients.

In cooperation with SASA and SLD Academy of Medical Sciences, School of Dental Medicine of Belgrade University published a book in 2003 titled Prospects and Achievements of Dental Medicine with papers from the scientific conference held in SASA on 13 December 2002.

COMMITTEE ON CARDIOVASCULAR PATHOLOGY

(Academician Vladimir Kanjuh)

Under auspices of the Committee, the following projects were worked on:

- (1) Preventive prospective study of cardiovascular diseases in seven countries of the world (S. Nedeljković, M. Ostojić and associates), and
- (2) Yugoslav study of precursors of atherosclerosis in children (S. Nedeljković, S. Simeunović, M. Vukotić, V. Kanjuh and associates).

The following scientific conferences were held by the Committee as the coorganizer:

1. Professional meeting of cardiologists of Serbia and Montenegro “Acute Coronary Syndrome”. Organizers: Coronary Club of Serbia and Montenegro, SASA Committee on Cardiovascular Pathology, Atherosclerosis Association of Serbia and Montenegro, and DLV-SLD Cardiological Section, Novi Sad, 27 June 2003.

2. Scientific Conference of Atherosclerosis Association of Serbia and Montenegro, SASA Committee on Cardiovascular Pathology and Medical School in Belgrade: “Atherosclerosis, Insulin Resistance and Diabetes: New Facts and Clinical Implications”, Belgrade, SASA, 26 September 2003.

3. Joint International Symposium “Modern Trends in Understanding, Prevention and Treatment of Atherosclerotic Process”, Association of Cardiologists of Serbia and Montenegro, Atherosclerosis Association of Serbia and Montenegro, and SASA, 13 October, 2003, during XIV Congress of the Association of Cardiologists of Serbia and Montenegro with international participation, Belgrade, 12–15 October, 2003.

4. Scientific meeting “Inflammations and Atherosclerosis” organized by SLD Academy of Medical Sciences, SASA Committee on Cardiovascular Pathology, and Atherosclerosis Association of Serbia and Montenegro, SASA, 11 November, 2003.

5. Symposium “Fundamental and Applied Investigations of Artery and Vein Grafts” as part of XXXII Symposium “Trends and Novelties in Medicine” of Medical School in Belgrade, 1–5 December 2003, organized by Prof. Ljiljana Gojković–Bukarica, Ph.D. and Institute of Pharmacology of Medical School and Pharmaceutical College in Belgrade, SASA Committee on Cardiovascular Pathology, and Atherosclerosis Association of Serbia and Montenegro.

COMMITTEE ON ALLERGOLOGY AND CLINICAL IMMUNOLOGY

(Academician Ivan Spužić)

DEPARTMENT OF LANGUAGE AND LITERATURE

LINGUISTICS

ONOMASTIC COMMITTEE

(Academician Milka Ivić)

Volume XVI of *Contributions to Onomastics* (in Serbian: *Onomatološki prilozi*) was published, and vol. XVII has been prepared to appear in 2004.

Volume XVI contains, on 444 pages, the following contributions (titles are given here as they are translated in the summaries):

- A. Loma, Aserb. вѣсь "Dorf" und seine Spuren in der Toponymie,
- J. Radić, La toponymie de la Belica [a region in Central Serbia near Jagodina],
- R. Ćimil-Remetić, Toponymy of the village Crna Gora on the mount of Durmitor,
- M. Ćurić, Namenkundliche Beiträge aus Ljubomir [in Herzegovina],
- D. Novakov, Personen- und Familiennamen aus Tomaševac [a village in Banat].

COMMITTEE FOR CRITICAL EDITIONS OF SERBIAN WRITERS

(Academician Nikša Stipčević)

Critical edition of *The Chronicle of Djordje Branković* in four volumes is being prepared for publishing. The first volume will be ready for printing by the end of 2004. Computer equipment and some books have been purchased for the Committee needs.

THE COMMITTEE FOR THE DICTIONARY OF THE SERBO-CROATIAN LITERARY LANGUAGE AND VERNACULARS

(Academician Milka Ivić)

The staff of the Serbian Language Institute has proceeded its work on the present volume(s) of Dictionary of the Serbo-Croatian Literary Language and Vernaculars (short: RSA). On April 25th an important meeting about the present state and the future prospects of the work on the great dictionary was held at SASA, to which besides the members of the Department some distinguished specialists in Serbian lexicography were invited. The participants repeatedly proclaimed RSA the top priority of SASA and supported its original lexicographical concept(ion). The main conclusion is that the immediate care of the dictionary should be taken by the (re-structured) Committee, whereas administratively the project would remain tied to the Institute.

COMMITTEE FOR RESEARCH IN LITERARY HISTORY

(Academician Predrag Palavestra)

In 2003 the Committee for Research in Literary History was engaged in the International TSAC project “The Balkan Saints” and the program “Cult and Culture”, of the University of Leicester, UK. Professor Mirjana Detelić, Ph.D., finished her study *Cities in the Serbocroatian Christian and Muslim Epics*, presented on CD. Academician Predrag Palavestra prepared an English edition of his book *Jewish Writers in Serbian Literature* (ASWA, London) and collaborated in the Routledge Curzon Companion to Modern Jewish Culture, Oriental Institute, Oxford, UK. He also published a book of essays *Necropolis* and edited three volumes of the *Collected Works* by critic Branko Lazarević (1883–1968). Committee has also organized a colloquium on the Literary Works of the late Academy member, novelist Slobodan Selenić (1933–1995) and published a publication *In Memories of the Poet Ivan V. Lalić (1931–1996)*.

OLD SLAVONIC COMMITTEE

(Academician Aleksandar Mladenović)

At the beginning of the year the small staff of the Old Slavonic Department suffered a heavy loss with the premature death of the leader of its project, M.Sc. Nikola Rodić. Nevertheless under the direction of Prof. Djordje Trifunović, Ph.D., the work on the project is continued. The first issue of the Dictionary of the Serbo-Slavonic gospels is almost finished and ready to print. Within the limits of the scarce resources placed by the FNI at this Committee’s disposal, the action of copying the 12th and 13th century inscriptions from the Virgin Mary’s Church in the Studenica monastery has been carried out.

COMMITTEE FOR THE ETYMOLOGICAL DICTIONARY OF THE SERBIAN LANGUAGE

(Academician Irena Grickat–Radulović)

The first issue of **Etymological Dictionary of the Serbian Language** (ERSJ) has been published. It contains the words in a-, over 600 entries on 257 pages. Including all the standard and vernacular lexicon of an etymological interest (with the exception of the transparent derivatives, recent loan-words, neologisms and internationalisms), ERSJ is intended as a thesaurus and the fundamental handbook of Serbian (Serbo-Croatian) etymology, making a contribution to Slavistics in the first place, but also to Balkanology, Indo-European linguistics and other disciplines (more about the concept of ERSJ in its pilot issue, **Ogledna sveska**, Belgrade 1998, Summary in English, pp. 87–99).

In August, it was presented on the 13th International Slavistic Congress in Ljubljana, in which three of its co-authors took part (A. Loma, J. Vlajić–Popović, M. Bjeletić). In the same year the team of ERSJ published one monograph and a number of papers dealing with Serbo-Croatian, Slavic, Balkan and Indo-European etymology. M. Djokić received a M.A. degree with a thesis about Serbo-Croatian phytonymic derivatives in -ika.

The collaboration on international linguistic bibliographies was continued, on the **Bibliographie linguistique** edited in the Hague by Jasna Vlajić–Popović and on the **Bibliografija Językoznawstwa Slawistycznego** edited in Warsaw by M. Bjeletić.

Etimološki rečnik srpskog jezika. Sveska 1: A / Dictionnaire étymologique de la langue serbe. Fascicule 1: A, by Marta Bjeletić, Jasna Vlajić–Popović, Aleksandar Loma (ed.) and Snežana Petrović, with the co-operation of Marija Vučković and Maja Djokić. Srpska akademija nauka i umetnosti, Odeljenje jezika i književnosti, Odbor za etimološki rečnik; Institut za srpski jezik SANU, Etimološki osek, Belgrade, 2003 [in Serbian].

Bjeletić M., 2003: A contribution to the study of S.-Cr. kojasiti se. **Studia etymologica Brunensia**, Prague, 2, 377–389 [in Serbian with English summary].

Bjeletić M., 2003: The formant -to- again. **Balgarski ezik**, XLIX/2001–2002, 1, Sofia, 114–119 [in Bulgarian].

Bjeletić M., Vlajić–Popović J., 2003: Implicit and explicit semantic interpretations in an etymological dictionary (the case of Etimološki rečnik srpskog jezika). **Zbornik Matice srpske za slavistiku**, Novi Sad, 64, 29–43 [in Serbian with English summary].

Loma A., 2003: The Eurasian steppe zone as a factor of the linguistic and the cultural history of the Slavs. **Zbornik Matice srpske za slavistiku**, Novi Sad, 63, 133–148 [in Serbian with English summary].

Loma A., 2003: The name Višegrad. In: **Zemlja Pavlovića**, Banja Luka / Srpsko Sarajevo, 529–540 [in Serbian with English summary].

Loma A., 2003: Where is Nish from? In: **Niš i Vizantija I**, Niš, 15–21 [in Serbian with English summary].

Loma A., 2003: Zur frühslavischen Nominalkomposition und ihren indogermanischen Grundlagen. **Studia etymologica Brunensia**, Prague, 2, 267–277.

Loma A., 2003: Common Slavic *komoňь ‘horse’. **Južnoslovenski filolog**, Belgrade, LIX, 35–38 [in Serbian with English summary].

Loma A., 2003: Skr. dial. trsiti ‘beschneiden, stutzen, roden’ im gemeinslavischen und indogermanischen Kontext. **Zbornik Matice srpske za filologiju i lingvistiku**, Novi Sad, XLV/2002, 1–2, 91–107 [in Serbian with German summary].

Loma A., 2003: “Two black ravens”: Corvus corax in Slavic epics – a comparative outlook. **Kodovi slovenskih kultura**, Belgrade, 8, 109–132 [in Serbian].

Loma A., 2003: Eine serbisch-ukrainische toponymische Parallele Semegnjevo : Semygyniv. **Naš jezik**, Belgrade, XXXIV, 3–4/2002–2003, 244–251 [in Serbian with German summary].

Loma A., 2003: Aserb. вьсь “Dorf” und seine Spuren in der Toponymie. **Onomatološki prilozi**, Belgrade, XVI, 1–16 [in Serbian with German summary].

Loma A., 2003: Toward an etymology of the Caucasian designation of the plough. **Ėtimologija**, 2000–2002, Moskva, 233–238 [in Russian].

Petrović S., 2003: On Some Serbian Dialectal Turcisms. **Sāpostavitelno ezikoznanie**, XXVIII/2, Sofia, 70–77.

Vlajić–Popović J., 2003: **Istorijska semantika glagola udaranja u srpskom jeziku. Preko etimologije do modela semasiološkog rečnika** / Historical semantics of S.-Cr. verbs with the principal meaning “to hit, to beat”. Institut za srpski jezik SANU, Biblioteka Južnoslovenskog filologa, n.s. knj. 21, Belgrade, 2002 [in Serbian with English summary, 385–396].

LITERATURE

COMMITTEE ON FOLK LITERATURE

(Academician Miroslav Pantić)

We completed the computer copying for critical edition of the **Proceedings of the Old Folk Poetry** by Valtazar Bogišić, a book that collected all recordings of our national poetry dating back to 15th and early 19th century.

Project: **HISTORY OF THE LITERATURE OF DUBROVNIK**

(Academician Miroslav Pantić)

Project director mostly dedicated his work to organising and binding his writings about the Dubrovnik authors from 15th to 19th century into 96 extensive volumes, as well as archival and library writings published in the country and abroad about the culture, life and writers from the past of Dubrovnik in some 100 books. This will represent a basis for the establishment of the “Office for Dubrovnik Studies” within SASA that will be at the service of all students of this ancient and important literature (and civilisation).

Project: **SERBO-ITALIAN AND ITALO-SERBIAN LITERARY AND CULTURAL TIES**

(Academician Nikša Stipčević)

Work on the project continued. A facsimile edition of a study **Andrić's Guicciardini**, as well as 10 contributions in magazines have been published.

Project: **SERBIAN LITERATURE IN THE 20TH CENTURY**

(Academician Predrag Palavestra)

Apart from the data, mentioned in the report of the Committee for Research of the Literary History, also published the following in 2003:

Necropolis, Biographical Essays (in Serbian: Nekropolje, Biografski eseji), Belgrade, 2003, 235 p.
Dogma and Utopia of Dimitrije Mitrinović (in Serbian: Dogma i utopija Dimitrija Mitrinovića), study, second edition, Belgrade, 389 p.

Jewish Writers in Serbian Literature (study, translated by Georg Nikolic), London–Belgrade, 2003, 199 p.
Serbian Literary Herald and the Serbian Civic Thought (in Serbian: Srpski književni glasnik i srpska građanska misao). **Sto godina “Srpskog književnog glasnika”**, Institut za književnost i umetnost, Belgrade, 2003, 25–30pp.

Milan Bogdanović as a Critic of Ivo Andrić (in Serbian: Andrićevi kritičari: Milan Bogdanović). **Sveske Zadružbine Ive Andrića**, 2003, XXII, 20, 177–189.

Serbian PEN in the Year 2002 (in Serbian: Srpski PEN u 2002. godini), **Godišnjak srpske književnosti**, Srpski PEN Centar, Belgrade, 2003, 5–9pp.

Proscriptive and Descriptive Literary Critics by Velibor Gligorić (in Serbian: Proskriptivna i deskriptivna kritika Velibora Gligorića). **Proceedings dedicated to Academician Miroslav Pantić**. Literature and Arts Institute and the Faculty of Philosophy in Novi Sad, Belgrade, 2003, 77–85.

Project: **SECESSION IN THE SERBIAN AND HUNGARIAN LITERATURE**
(Academician Imre Bori)

Research into the secession in literature was continued.

Bori I., 2003: **Az életés halál Ösfája alatt. Trások Juhász Ferencről**. Novi Sad, 141 p.

Bori I., 2003: **Az irodalom története a középkolak I. és II. osztálya számára**. II edition, Belgrade, 5–77 (co-author Laslo Gerold).

Bori I., 2003: **Tarka lepke, kis mese. Népmesék Arany Laszló gyűjtéséből**. Selection and Afterword. Belgrade, 89 p.

Bori I., 2003: Reflexió a “tüske a szivben” témajara Fehér Ferenc életében és költészetében. **Hungarológiai Közlemények**, 1, 58–60.

Bori I., 2003: Megkéssett sirató. Gion Nandor idézése. **Hid**, 3–4, 302–324.

Bori I., 2003: Brasnyó-muvek első olvasata nyoman. Recenziók és fülszövegek. **Hid**, 7–8, 820–824.

Bori I., 2003: “Az époszi gondolkodás állati szent viragos kertjében” Junasz Ferencről. **Hid**, 9, 885–889.

Bori I., 2003: Thaly Kálmán “kuruc versei”. **Hid**, 10, 1171–1179.

Project: **ECHOES OF THE ORAL TRADITION IN THE WRITTEN LITERATURE**

(Academician Svetozar Koljević)

In the past year the work on this project has been completed.

Koljević S., 2002: **English Authors of the 20th Century (1914–1918): From Wilfred Owen to Phillip Larkin** (in Serbian: Engleski autori dvadesetog veka (1914–1918): Od Vilfreda Ovena do Filipa Larkina). Institute for Textbooks and Teaching Aids (Zavod za izdavanje udžbenika i nastavna sredstva), Belgrade, 288 p.

Koljević S., 2003: **English Novelists of the 20th Century (1914–1960): From James Joyce to William Golding** (in Serbian: Engleski romansijeri dvadesetog veka (1914–1960): Od Džemsa Džojisa do Vilijama Goldinga). Institute for Textbooks and Teaching Aids (Zavod za izdavanje udžbenika i nastavna sredstva), Belgrade 336 p.

Koljević S., 2003: Flight to the Beginnings (Beg u iskon) (Serbian Poetry Today – Hundred Years of Prosvjeta and its Outstanding Authors/ in Serbian: Srpska proza danas – Sto godina Prosvjete i njenih znamenitih ličnosti). **Čorović’s Meetings of Prose Writers in Bileća – Scientific Gathering of Historians in Gacko** (in Serbian: Čorovićevi susreti proznih pisaca u Bileći – Naučni skup istoričara u Gacku), September 19–23, 2002, Prosvjeta, Bileća, Prosvjeta, Gacko, 61–68.

Koljević S., 2003: Serbian Novel in 2001 (in Serbian: Srpski roman u 2001) (Serbian Prose Today – Hundred Years of Prosvjeta and its Outstanding Authors /in Serbian: Srpska proza danas – sto godina Prosvjete i njenih znamenitih ličnosti). **Ćorović's Meetings of Prose Writers in Bileća – Scientific Gathering of Historians in Gacko** (in Serbian: Ćorovićeви susreti prozanih pisaca u Bileći – Naučni skup istoričara u Gacku), September 19–23, 2002, Prosvjeta, Bileća, Prosvjeta, Gacko, 94–99.

Koljević S., 2003: **An Unusual Poetic Homage (to Vasko Popa Poems for the Poet)** (in Serbian: neobičan pesnički omaž (Vasku Popi pesme za pesnika)), prepared by A Vasić, Matica Srpska, Novi Sad, Serbian Academy of Sciences and Arts, Novi Sad Branch, Vasko Popa Documentation Centre, Belgrade, 21–26.

Koljević S., 2002: Science Fiction or Future Reality? Relation Between Huxley and Borislav Pečić: Two Futuristic Perceptions of Social Metamorphosis (in Serbian: Naučna fantastika ili buduća stvarnost? Odnos Haksli i Borislav Pečić: Dva futuristička vidjenja društvene metamorfoze) Proceedings of the Scientific Gathering **Science and Our Social Reality**, Banja Luka, 141–156.

INTERDEPARTMENTAL COMMITTEE FOR FACSIMILE EDITIONS OF SASA, MATICA SRPSKA AND NATIONAL LIBRARY OF SERBIA

(Academician Miroslav Pantić)

A facsimile 1821 edition of the **Serbian Paper** was prepared (Božidar Kovaček, Ph.D., President of Matica Srpska), as well as of **Ljubica**, “a pastoral description” of Marin Gazarović from 1623 (Miroslav Pantić), whose only copy, unknown till now, recently appeared in Belgrade.

INTERACADEMIC COMMITTEE FOR DIALECTOLOGICAL ATLASES

(Academician Aleksandar Mladenović)

The Committee continued to coordinate, through its respective commissies, the work on the Serbian Dialectological Atlas (SDA) and the collaboration on the large international projects of Slavic Linguistic Atlas (OLA), Carpathian Dialectological Atlas (OKDA) and the Atlas of European Languages (ALE).

The restrictive financial policy of SASA has had a negative effect on the field-work. With the financial support of the Ministry of Science and the personal effort of Sl. Remetić and Sofija Miloradović, the annual meeting of the International Committee and of the Working Group of OLA has been organized, which took place from October 20th to 25th in Arandjelovac. The seventh (and last) volume of OKDA has been finalized by the Yugoslav team who are entrusted with its publication, which has been postponed for 2004.

DEPARTMENT OF SOCIAL SCIENCES

COMMITTEE ON THE SOURCES OF SERBIAN LAW

(Academician Aleksandar Fira)

Project: **HISTORY OF SERBIAN LAW**

Project: **DEVELOPMENT OF NEW LEGAL THOUGHT WITH THE SERBS**

A collection of papers was published titled **Foreign Influence on Serbian and Yugoslav Constitutional Law**.

Foreign Influences on Serbian and Yugoslav Constitutional Law

D.M. Popović, Foreign Influences on Serbian Textbooks in Constitutional Law (Matić and Milovanović); A. Fira, Foreign Influences on the Concepts of our Constitutional Legislation; M. Milojević, Foreign Influences on the Constitutions of Serbia and Yugoslavia; P. Nikolić, Declaration on Human and Civil Rights from 1789 and the Rights and Freedoms in 19th Century Serbia's Constitutions; O. Popović–Obradović, Legal Postulates of the Parliamentary Government in Serbia according to the 1903 Constitution Compared to the Classical Model; M. Pavlović, Foreign Influences on the 1931 Constitution of the Kingdom of Yugoslavia

Project: **CONSTITUTIONAL, LEGAL AND HISTORICAL DEVELOPMENTS AND MODERN TRENDS**

A meeting was held of members of Constitutional Law Group on the topic Legal Nature of December 1, 1918 Documents on the Establishment of the Kingdom of the Serbs, the Croats and the Slovenes. Papers will be published in special proceedings.

COMMITTEE ON PHILOSOPHY AND SOCIAL THEORY

(Academician Mihailo Marković)

A scientific conference was organized on *Social and Political Thought of Petar P. Petrović Njegoš* (in Serbian: *Društveno politička misao Petra P. Petrovića Njegoša*) (November 20 and 21, 2003). This was the tenth conference in a row in the field of scientific and research project Social Thought with the Serbs in 19th and 20th Century (in Serbian: *Društvena misao Srba u XIX i XX veku*). The presented 32 papers will be published in 2004.

Academician Mihailo Marković continued work on the study *Time of Changes* (in

Serbian: *Vreme preokreta*), and prepared the second edition of his book *Reappraisals* (in Serbian: *Preispitivanja*, published in 1972).

Having completed work on the project “Death as a Philosophic Problem”, Academician Ljubomir Tadić published a book titled *Puzzles of Death* (in Serbian: *Zagonetke smrti*).

Academician Ivan Maksimović continued work on his book *Social Economy – Capitalist Economy* (in Serbian: *Socijalna ekonomija – kapitalistička ekonomija*) and the study on *Economic Development in the Period 1950–1993* (in Serbian: *Ekonomski razvoj u periodu 1950–1993*.)

Marković M., 2003: **Philosophical Encounters** (in Serbian: *Filozofski susreti*), Beograd, Predrag-Nenad, 345 p.

Tadić Lj., 2003: **Puzzles of Death** (in Serbian: *Zagonetke smrti*), Beograd, Filip Višnjić, 251 p.

COMMITTEE FOR THE STUDY OF POPULATION

(Academician Miloš Macura)

Project: **EVOLUTION OF POPULATION POLICY IN SERBIA**

(Ana Gavrilović)

Investigations covered the period from the Second World War until 2003, and the fields in which measures of population policy were studied are the following: 1. Constitutional and legal documents; 2. Labour and labour relations; 3. Employment and rights of the unemployed; 4. Social security; 5. Retirement and disability insurance; 6. Social child care; 7. Health care and health insurance; 8. Tax policy.

The methods applied in the research were content analysis and statistical analysis, for which voluminous documentation was collected (laws, regulations, analyses, and reports on investigations in postwar period).

Project: **KRAJIŠTE ISA-BEGA ISHAKOVIĆA (CENSUS BETWEEN MAY 9 AND 18, 1445)**

(Academician Miloš Macura)

COMMITTEE ON ECONOMIC SCIENCE

(Academician Kosta Mihailović)

The viewpoint that prevailed in consultations among Committee members was that an attempt should be made to elaborate main guidelines of a unique strategy of development of Serbia and Montenegro that would serve as a basis for a scientific

conference where invited scientists would react by giving comments and suggestions in writing, which would be all published in a special publication. Last year passed in these consultations, preparations, procurement of references, and mobilization of economists who would assume the obligation of writing the bases of the strategy of development.

COMMITTEE FOR THE STUDY OF LIFE AND CUSTOMS OF THE ROMA

(Academician Ljubomir Tadić)

Work continued on preparations for the organization of an international scientific conference on «Culture and Language of the Roma», and investigations of the culture of the Roma in Vojvodina continued.

In cooperation with Ethnicity Research Center and OXFAM British non-governmental organization, in April 2003, occasioned by the investigation on *Roma Settlements – Living Conditions and Integration Possibilities of the Roma in Serbia*, a round table discussion was held devoted to the results of this investigation – on demographic, social and economic, medical, city planning, educational aspects of the status of Roma ethnic minority in Serbia.

COMMITTEE FOR THE PREPARATION OF SCIENTIFIC CONFERENCE «PHILOSOPHY BETWEEN THE EAST AND THE WEST»

(Academician Mihailo Djurić)

Meetings of the Philosophic Investigation Group raised the question of responsibility of philosophy for the current situation in the world stricken by an irrepressible process of modernization according to the European model. First, the relation between philosophy and religion was thoroughly examined on the example of a modern Buddhist criticism of Plato's theory of idea, then investigation proceeded with consideration of speculative thought on general unity in regard to similarities and differences between ancient Greek and modern European attitude to philosophy, and finally the focus was transferred to clarification of methodological and spiritual and historical assumptions of the concept of scientific knowledge and its alliance with techniques.

INTERDEPARTMENTAL COMMITTEE FOR STUDYING MINORITIES AND HUMAN RIGHTS

(Corresponding Member Vojislav Stanovčić)

Attention was devoted to investigation of political and legal aspects of the status of minorities in Hungary, Romania and former Yugoslav republics. There are strong both scientific and social reasons for studying the Serb diaspora, but such investigations do not

have a rightful place in our social sciences. It was especially kept in mind that in the past decade the status of the Serbs in neighbouring countries had utterly changed and that organization of a scientific conference on this topic would contribute to profundity of both methodological and theoretical, but also of knowledge acquired by experience on some aspects of the status of the Serbs in surrounding countries. Similarly, the aim was, based on the established situation within the given constitutional and legal framework of neighbouring countries, to make the utmost possible effort to enable our fellow Serbs to get the status and protection prescribed by European standards and accepted in declarations of their governments, although it is difficult to achieve a whole series of rights, so the situation is far from the mentioned standards.

An international scientific conference on «Status and Identity of Serb Minority in South-Eastern and Central Europe» was organized by the Committee in cooperation with SASA Ethnographic Institute and Ethnicity Research Center from 26 to 29 November, 2003 at the premises of SASA. Several ten experts from Serbia and representatives of Serb organizations and associations from Albania, Macedonia, Hungary, Croatia, Romania and Slovenia took part at the conference, as well as representatives of the Government of Serbia.

The participants stressed as the most significant problem of our fellow Serbs in the surrounding countries the protection or acquisition of the status and preservation of their cultural and linguistic identity. In this sense, it was concluded that it is necessary that the parent state make an effort aimed at the establishment and reinforcement of the existing institutions of the Serbs in the region, and that special attention should be devoted to cultural, educational and media cooperation and assistance to fellow Serbs.

The Interdepartmental Committee participated in the preparations of a conference on the Serbs in Hungary with the Serb Self-Administration in Hungary which was the main organizer, and Ethnicity Research Center and Agency for Cultural Development. The conference was held in Budapest from 4 to 6 October 2003.

Social Sciences on the Serbs in Hungary

Papers¹ were presented at the round table discussion held in SASA, from 6 to 8 December, 1998. Editors of Proceedings: N. Čobeljić, M. Macura, G. Bašić and P. Lastić, SASA, Belgrade, and Self-Administration of the Serbs in Hungary, Budapest, 2003, p. 292.

Beside the Foreword (7) and Introductory Speech of Academician Miloš Macura, the Proceedings consist of 34 papers classified in four big fields (Heritage, Life and Customs, Serbs in Modern Hungary, and Language and Culture). At the end are the speech at the opening of the exhibition «The Past and the Present of the Serbs in Hungary» and summaries of all contributions in Hungarian. The following contributions are published:

Heritage. Late Bishop Danilo Krstić, Buda Eparchy – An Example of Faith; S. Gavrilović, SASA St. Andrea Committee and its work on the history of the Serbs in Hungary; S. Bugarski, Spiritual Flow between Budapest and Temisoara, D.E. Stefanović, On Ancient Serb Records and Inscriptions; N. Gačeša, Optants from Hungary in the Kingdom of the Serbs, Croats and Slovenes; F. Bikar, Achievements in Investigation of the Past in St. Andrea; D. Urošević, The Origin and History of Brigands in Hungary;

¹ Papers are in Serbian and English, summaries in Hungarian.

D. Petrović, Buda and Pest in History of Serb Music; A. Vujić, «Freedom» – Common Weekly of the Slovaks, Serbs, Croats and Slovenes in the Period 1945/1946.

Life and Customs. Dj. Šarošac, Serb Population in Hungary; M. Prelić, Some Aspects of Ethnic Identity of the Serbs in Hungary; D. Drljača, Some Characteristics of Folk Customs of the Serbs in Hungary; Laszlo Felfoldi, About the Dances of Serbs Living along the River Maros (Moriš) (in English); M. Pavlović, Theoretical Framework of Ethnicity of Serbs in Batanja; M. Lukić–Krstanović, Serbs in Batanja: Methodological Framework of Ethnicity Research; B. Rus, Cultural Life of Serbs in Hungary; J. Kovanović, Several Previously Unpublished Records of Serb Songs of Annual Cycle from Mohacs.

Serbs in Modern Hungary. V. Stanovčić, What Changes After 1989 Meant for Minorities?; G. Bašić, Interethnic Relations and Status of Minorities in Modern Europe; A. Fira, Status of National and Ethnic Minorities according to Constitution and Law LXXVII of the Republic of Hungary; V. Vasović, Hungarian Political and Party System and Ethnic Minorities; T. Varady, Collective Rights of Minorities in Hungary; P. Lastić, Possibility of Self-Administration (Autonomy) of the Serbs in Hungary in Nineties of the 20th Century; A. Lastić, Political and Legal Status of Minorities (Primarily Serb) from 1945 until 1990; M. Vukomanović, Religious Changes in Hungary and Status of Serb Orthodox Church; T. Donceev, Investigating National and Ethnic Minorities in Hungary (in English).

Language and Culture. P. Stepanović, On Speeches of Serbs in Hungary; P. Papulin, On Some Psychological Problems of the Use of Language in Diaspora; M. Maticki, Serb Literature in Hungary; N. Savković, Last Years of the Life of Jovan A. Došenović (1781–1813) in Budapest; B. Kovaček, Contribution of Serbs from the Territory of Modern Hungary to the Beginning of Serb Theatrical Life; M. Timotijević, Siklus Mother of God; K. Vuković, Registering and Protection of Mobile Church Artistic Wealth of Buda Serb Orthodox Eparchy; Z. Vukosavljev, Historical development of Serb Orthodox Church Architecture in Hungary from the 15th until the 19th Century.

N. Pantelić, Speech at the opening of the Exhibition «The Past and the Present of Serbs in Hungary», A Magyarországi Szerbek a tarsadalomtudományok turkeben (Magyar nyelvu kivonatok).

On September 19 and 20, 2003, in cooperation with Ethnicity Research Center and Cultural Development Agency, the Interdepartmental Committee organized a round table discussion on the following topic: «Identity and Culture of Serb National Minority in South-East and Central Europe». The participants were representatives of Serb organizations from Slovenia, Croatia, Hungary, Romania, Macedonia and Albania, and experts in different aspects of identity and culture of national minorities.

Goran Bašić, MA, Secretary of the Committee, made a comprehensive report for the Government of Serbia on the status of Serb national minority in neighbouring countries.

The Committee also continued work on previously opened topics devoted to the status of Serbs in Romania and Hungary. Investigations continued of the past, cultural and spiritual heritage and the present status of Serb national minority in Romania: Stevan Bugarski and associates on the following topics: *Bibliography on Serbs in Romania, Ancient Serb Records and Inscriptions in Romania, Serbs in Romanian Historical Sources.*

Bašić, G., 2003: Standards of Protection of National Minorities in Modern Europe (in Serbian: Standardi zaštite nacionalnih manjina u savremenoj Evropi). **Proceedings Democracy and Multi-Culturalism in South-Eastern Europe** (editor: Goran Bašić), Ethnicity Research Center, Belgrade, 157–185.

Bašić, G., 2003: Interethnic Relations and Status of Minorities in Modern Europe (in Serbian:

Medjuetnički odnosi i položaj manjina u Savremenoj Evropi), **Proceedings of Social Sciences on Serbs in Hungary** (editors: Goran Bašić, Miloš Macura, Nikola Čobeljić), Serbian Academy of Sciences and Arts, Belgrade, 153–165.

Bašić, G., 2003: Role of Religion, language and Other factors in the Process of the Building of the Roma National Identity. **Compendium of works: Roma Religious Culture** (editor Dragoljub Djodjević), JUNIR, Niš, 55–64.

Bašić, G., 2003: Religion and Modern Conflicts (in Serbian: Religija i savremeni konflikti). **Proceedings on Democracy and Religion** (editors: Goran Bašić, Silvo Devetak), Ethnicity Research Center, ESCOMET, Belgrade/Maribor, 231–237.

Bašić, G., 2003: Status of Serb National Minority in Romania and Hungary. **Proceedings of Philosophic College in Kosovska Mitrovica**, 56–69.

Stanovčić, V., 2003: Democracy in Multi-Cultural Societies, Problems and Principles of Consociation: How to Live Together? **Democracy and Multi-Culturalism in South East Europe**, Belgrade, Ethnicity Research Center, 13–101.

Stanovčić, V., 2003: Constitutional/Legal Frames Concerning Religious Peace, Tolerance, Freedoms. In: **Democracy and Religion**, ERC-ISCOMET, Belgrade, 190–214.

Stanovčić, V., 2003: Legal Status and Rights of Minorities in Serbia and Montenegro, **European Yearbook of Minority Issues**, 2, 631–653, Koninklijke Brill, Netherlands.

DEPARTMENT OF HISTORICAL SCIENCES

COMMITTEE ON ARCHAEOLOGY

(Academician Nikola Tasić)

In the course of 2003, work on some projects was reorganized. Some were completed (Corpus vasorum antiquorum – with the book **Greek Vases from the National Museum** – in Serbian: Grčke vaze iz Narodnog muzeja, by Lj. Popović) and some were combined due to a small number of associates.

Project: **FONTES – ARCHAEOLOGICAL SUBJECT MATERIAL OF SERBIA**
FONTES ARCHEOLOGIAE SERBIAE

(Academician Nikola Tasić)

In cooperation with Archaeological Institute of Serbia, the book written by late Prof. Dr. A. Cermanović–Kuzmanović **Transdierna near Kladovo** was prepared for print.

Project: **ENEOLITHIC CULTURE AND COPPER FINDINGS IN EAST**
SERBIA

(Academician Nikola Tasić)

Associates N. Tasić and B. Jovanović handed in for print their manuscripts for the book titled **Bor and its Surroundings in Prehistory, Ancient Times and Middle Ages** (in Serbian: Bor i okolina u praistoriji, antici i srednjem veku).

Tasić N.N., 2003: Findings from the Legacy of Tatomir Vukanović and the Problem of Vinča Culture in Kosovo and the River Ibar Valley (in Serbian: Nalazi iz legata Tatomira Vukanovića i problem vinčanske kulture na Kosovu i u dolini Ibra (Introduction in the book by A. Bulatović: **Findings of Vinča Culture from Fafos and Valač**), Vranje, 5–11.

Tasić N.N., 2003: Eneolithic in: Serbian Prehistoric Archeology in the 1990s. **Recent Research in Prehistory of Balkans**, Thessalonica, 88–95.

Project: **THE ROMAN LIMES IN LOWER PANNONIA AND UPPER**
MOESIA

(Academician Slobodan Dušanić)

On the occasion of 50th anniversary of the beginning of excavations at Gamzigrad, a three-day international symposium was held in Zaječar. An exhibition was organized on the same occasion at the Museum in Zaječar.

Associates M. Vasić and M. Tomović sent in their article «Šarkamen – East Serbia, Tetrarchic Imperial Residential-Memorial Complex» to be printed in **Germania** periodical.

Project: **ANTIQUÉ INSCRIPTIONS OF MACEDONIA**
(Academician: Slobodan Dušanić)

Ancient Macedonian anthroponimia (M. Obradović) was studied, and the study on the history of Macedonian King Archelaus, 413–399 B.C. (S. Dušanić) was worked on.

Project: **METALLURGY IN THE PREHISTORIC AND ANTIQUE PERIOD**
(Academician Slobodan Dušanić)

Academician S. Dušanić handed in for print his study from the Symposium in Cividale del Friuli titled «Roman Mining in Illyricum: Historical Aspects».

Project: **INDUSTRIAL ARCHAEOLOGY**
(Academician Bogdan Brukner)

Cooperation continued with the Museum of Science and Technology and the Provincial Institute for Protection of Cultural Monuments. Fifty locations were recognized.

Kulenović R., 2003: Results of recognizing Industrial Heritage (in Serbian: Rezultati rekognisciranja industrijskog nasledja). **Glasnik društva konzervatora Srbije**, 27.

Kulenović R., 2003: Industrial Heritage on the Territory of the City of Belgrade (in Serbian: Industrijsko nasledje na teritoriji grada Beograda). **Godišnjak grada Beograda**, XLVII–XLVIII.

Project: **ARCHAEOLOGICAL MAP OF SERBIA**
(Academician Bogdan Brukner)

The part that refers to Vojvodina was done in cooperation with the Provincial Institute for Protection of Cultural Monuments, and the one that refers to Serbia to the South of the Sava and the Danube – with Archaeological Institute in Belgrade. AUTO CAD program was applied to enter 500 localities into data base and make geodetic foundations.

COMMITTEE ON THE HISTORY OF ART
(Academician Vojislav Korać)

Members of the Committee worked on individual projects.

Academician Dejan Medaković continued work on the Project **Serbs in Zagreb, History, Culture, Art**.

Academician Vojislav Korać continued work on the Project **Topics and Monuments of 14th Century Serb Architecture**. He continued studying the monasteries of Banjska in cooperation with Marica Šuput, Professor of Philosophic College and professional service of the Republican Institute for Protection of Cultural Monuments.

Academician Gojko Subotić continued research on the topic Monastery of Saint John the Baptist in Jašunja).

V. Korać, **Monuments of 14th Century Grandiose Architecture in Vardar River Valley** (in Serbian: Spomenici monumentalne arhitekture XIV veka u Povardarju). Belgrade 2003.

CHILANDAR COMMITTEE

(Academician Vojislav Korać)

Members of Chilandar Committee – academicians, university professors, scientific workers – focused their work on the history of Chilandar monastery at the time of Serbian state independence, under Turkish rule and after liberation from the Turks. According to tradition of previous investigations, work was directed towards the position of Chilandar in monastic community on Mt. Athos, the relation with parent Serb Orthodox Church and other Orthodox Churches. The fields of investigation are culture, arts, building trade.

In 2003, **Chilandar Proceedings** No. 11 was prepared for print and recently completed.

Also as customary, members of Chilandar Committee have published their papers outside SASA, in scientific periodicals and series of publications.

SZENTENDRE COMMITTEE

(Corresponding Member Dinko Davidov)

In 2003, editorial preparation for print of **Szentendre Proceedings** No. 4 was completed, which includes nine studies on Serb cultural heritage in Hungary.

COMMITTEE FOR HISTORY OF THE SERBIAN REVOLUTION 1804–1830

(Academician Slavko Gavrilović)

In the course of 2003, the focus of the work of the members, Academicians Čedomir Popov, Vladimir Stojančević, Milorad Ekmečić and Slavko Gavrilović, and Scientific Advisor Slavenka Terzić, was on writing papers for the book **Europe and Serb Revolution** (in Serbian: **Evropa i srpska revolucija**). These were voluminous texts on the First Uprising, its course and significance (Stojančević and Ekmečić), on Serban-French relations during the Uprising (Popov), on Serbian-Austrian relations (Gavrilović), on Serbian-Russian relations (Terzić).

Apart from that, Academician V. Stojančević studied the course of the First Uprising

in Eastern Serbia, and Academician S. Gavrilović collected diplomatic material on the Uprising (1812–1813) and edited and prepared for publication records by Avram Djukić from the period between 1815 and 1817.

COMMITTEE ON THE HISTORY OF THE SERBIAN PEOPLE
FROM XVI TO XVIII Century
(Academician Slavko Gavrilović)

In the course of 2003, the focus of the work of the Committee was on the studies of developments from the end of the 17th until the end of the 18th century, primarily of the Serbs in Austrian Empire, Hungary and Triune Kingdom. Priority was on the Serbs in the cities of Hungary, especially Buda, Pest, Szentendre, Komarom, Szeged. Their history with the emphasis on Buda and Pest, was studied through city magistrate protocols between 1636 and 1715/18, the central land register of Buda and Pest, and district records from the first half of the 18th century. Discovered data testify on a much greater significance of the Serbs in Hungarian cities, especially Pest, than previously known.

Collection of sources began about the Serbs at the time of 1703–1711 Rakoczi Uprising, which was crucial for their history during the 18th and the 19th century.

Attention was also devoted to the Serbs in Triune Kingdom, and their relation with the Croats in the 17th and the 18th century, primarily on Steničnjak and Šišljavić manorial estates.

Gavrilović S., 2003: Social/Economic Status of the Serbs in Habsburg Monarchy from the End of the 18th until the Middle of 19th Century (in Serbian: Društveno-ekonomsko stanje Srba u Habsburškoj monarhiji od kraja XVIII do sredine XIX veka). **History Teaching** (in Serbian: Nastava istorije), Vol. 16, Novi Sad, 2002 (publ. 2003), 47–59.

Gavrilović S., 2003: 1792 Proposal for Nobilitation of Respectable Serbs in Hungary (in Serbian: Predlog iz 1792. o nobilitaciji uglednih Srba u Ugarskoj). **Proceedings of Serbian Cultural and Publishing Society for History** (in Serbian: **Zbornik MS za istoriju**), 63–64, 191–209.

Gavrilović S., 2003: The Third (Last) Privilege of Potisje District (in Serbian: Treća (poslednja) privilegija Potiskog distrikta). **Proceedings of Serbian Cultural and Publishing Society for History** (in Serbian: **Zbornik MS za istoriju**), 63–64, 211–220.

Medaković D., 2003: Crossways in the Century of Jovan Rajić (in Serbian: Raskršća u veku Jovana Rajića). **Proceedings Jovan Rajić, Historian, Poet and Church Dignitary** (in Serbian: **Jovan Rajić, istoričar, pesnik i crkveni velikodostojnik**), Novi Sad, 2002 (2003), 11–17.

Pantić M., 2003: Jovan Rajić and Dubrovnik. **Proceedings Jovan Rajić, Historian, poet and Church Dignitary** (in Serbian: **Jovan Rajić, istoričar, pesnik i crkveni velikodostojnik**), Novi Sad, 2002 (2003), 41–63.

Davidov D., 2003: Visual Artistic and Graphical Contributions in History by Jovan Rajić (in Serbian: Likovno-grafički prilozi u Istoriji Jovana Rajića). **Proceedings Jovan Rajić, Historian, Poet and Church Dignitary** (in Serbian: **Jovan Rajić, istoričar, pesnik i crkveni velikodostojnik**), Novi Sad, 2002 (2003), 101–117.

Gavrilović S., 2003: History of the Serbs from the Great Movement (1690) until Abolishment of Peć Patriarchate (1776) in History by Jovan Rajić (Povesnica o Srbima of Velike seobe (1690) do ukidanja Pečke patrijaršije (1776) u Istoriji Jovana Rajića). **Proceedings Jovan Rajić, Historian, Poet and Church Dignitary** (in Serbian: **Jovan Rajić, istoričar, pesnik i crkveni velikodostojnik**), Novi Sad, 2002 (2003), 125–134.

Stojančević V., 2003: Two Serb Historians on Jovan Rajić (in Serbian: Dva srpska istoričara o Jovanu Rajiću). **Proceedings Jovan Rajić, Historian, Poet and Church Dignitary** (in Serbian: **Jovan Rajić, istoričar, pesnik i crkveni velikodostojnik**), Novi Sad, 2002 (2003), 183–188.

COMMITTEE ON THE HISTORY OF THE SERBS IN CROATIA

(Academician Vasilije Krestić)

Proceedings on the Serbs in Croatia No. 5 is in print and its publication is expected in the beginning of 2004.

The papers for **Proceedings** No. 6 are still arriving and so far the Committee received six manuscripts.

COMMITTEE FOR COMPILATION AND PUBLICATION OF MATERIAL ON FOREIGN POLICY OF THE KINGDOM OF SERBIA 1903–1914

(Academician Vasilije Krestić)

The Committee has sent to press all four volumes of the second tome prepared by Ljiljana Aleksić–Pejković and Života Anić. Printing of volume 3 is almost completed and it will be published in the beginning of next year in two tomes (January–June 1907). Printing of the first volume will begin (January–June 1906).

Editor of the first tome, volumes 3 and 4 for 1905, Andrija Radenić, Ph.D., has almost finished the job on preparing these volumes for print.

Prof. Mihailo Vojvodić, Ph.D., editor of the material for volume 3 (1908–1909) is preparing the first tome for print (January–June 1908) by working on collation of documents, making an inventory and a register.

Editor of the subject matter for 1910, Kliment Džambazovski, Ph.D., is collating the documents which were retyped.

COMMITTEE ON THE HISTORY OF THE SERBS IN XIX CENTURY

(Academician Čedomir Popov)

The entire activity of the Committee in 2003 was focused on the preparation of a thematic collection of papers **Europe and Serb Revolution 1804–1815** (in Serbian: **Evropa i Srpska revolucija 1804–1815**). This Project was realized in cooperation with the Committee on the History of Serbian revolution. The authors of contributions were Academicians Slavko Gavrilović, Milorad Ekmečić, Čedomir Popov and Vladimir Stojančević, members of the Committee Prof. Božidar Kovaček, Ph.D., and Slavenko Terzić, Ph.D., and university professors Tomislav Bekić, Ph. D., Branko Momčilović, Ph.D., and Šandor Pal, Ph.D. In the course of 2003, the work was completed. It resulted in a book *Europe and Serb Revolution 1804–1815* which was published by «Platoneum» publishing company in Novi Sad in the beginning of 2004.

Beside this publication (576 pages), Committee member, Prof. Mihailo Vojvodić, Ph.D., published his book **Vladimir Karić and Stojan Novaković** (in Serbian: **Vladimir Karić i Stojan Novaković**), with «Klio» publishing company.

Project: **BALCANOLOGICAL TOPICS**

(Academician Nikola Tasić)

Proceedings were prepared titled the **Work of Dragoslav Srejović in Antique Archeology and History** (in Serbian: **Rad Dragoslava Srejovića na antičkoj arheologiji i istoriji**) that resulted from a scientific conference with the same title held from October 31 until November 2, 2002 in Kragujevac, which was published by the Center for Scientific Research of SASA and University in Kragujevac.

Group of projects: **BYZANTINE TOPICS**

(Corresponding Member Ljubomir Maksimović)

1. Project: **CORPS OF THE FOUNDERS' INSCRIPTIONS ON FRESCOES, Vol. I (13th CENTURY)**

(Academician Gojko Subotić)

The project has been partly scheduled in cooperation with the Institute for Byzantine Research (Athens) and the Institute for Neohellenic Research (Athens).

2. Project: **GREEK ACTS OF THE CHILANDAR MONASTERY, Vol. II (14th CENTURY)**

(Mirjana Živojinović, Ph.D.)

In collaboration with a group of colleagues from the Collège de France, the project is a part of the famous edition Archives de l'Athos, which should contain charters and other documents from all the monasteries on Mount Athos.

Živojinović M., 2003: De l'histoire d'une vigne. In: **Byzantium – State and Society** (In Memory of Nikos Oikonomides), Athens, 565–569.

Živojinović M. (with Dj. Bubalo), 2003: Translation into the Oldserbian of the Act of Protos Theophanes (April 1312) [In Serbian: Akt prota Teofana (april 1312) u prevodu na starosrpski]. **Zbornik radova Vizantološkog instituta**, 40, 245–262.

3. Project: **BYZANTINE SOURCES FOR HISTORY OF THE PEOPLES OF YUGOSLAVIA, Vol. V (13th CENTURY)**

(Prof. Ninoslava Radošević, Ph.D.)

The volume should contain mainly the writings (translated into Serbian and commented) of archbishop Demetrios Chomatenos and historian George Akropolites.

Radić R., 2003: George Akropolites and the Serbs (Georgije Akropolit i Srbi). In: **Kralj Vladislav i Srbija XIII veka**, Beograd, 89–97.

4. Project: **TRANSFORMATION OF THE BYZANTINE EMPIRE FROM THE 9th TO THE 12th CENTURY**

(Corresponding Member Ljubomir Maksimović)

The project contains several studies, monographs or dissertations concerning various aspects of changes of the Empire. Some of them have been already published during the last two years, such as the study on the social profile of the Byzantine soldiers in the so-called middle Byzantine period (Lj. Maksimović), the book on the relations between the emperors and patriarchs in the times of the Macedonian dynasty (V. Stanković), the monograph on the noble and imperial family of Bryennioi (S. Rajković).

Krsmanović B., 2003: Αλλαγές στη δομή της κοινωνικής κορυφής μετά την εποχή του Βασιλείου Β' (Changes in the Structure of the Social Elite after the Reign of Basil II). In: **The Empire in Crisis? Byzantium in the 11th Century (1025–1081)**, Athens, 87–106.

Maksimović Lj., 2003: Το Τακτικόν του Εσκοριάλ και οι αλλαγές της επαρχιακής διοίκησης στο Βυζάντιο (The Escorial Taktikon and the Changes in the Byzantine Provincial Administration). In: **Byzantium – State and Society** (In Memory of Nikos Oikonomides), Athens, 361–367.

Maksimović Lj., 2003: The Byzantine Commonwealth: an Early Attempt at European Integration. In: **The Idea of European Community in History**, Athens, 99–110.

Maksimović Lj., 2003: Το Βυζάντιο και οι Σέρβοι τον 11ο αιώνα: ζήτημα εσωτερικής ή εξωτερικής πολιτικής (Byzantium and the Serbs in the 11th Century: A Problem of the Interior or Foreign Politics?). In: **The Empire in Crisis? Byzantium in the 11th Century (1025–1081)**, Athens, 75–85.

Pirivatrić S., 2003: Το Πατριαρχείο του Πρώτου βουλγαρικού βασιλείου και οι Βυζαντινοί: damnatio memoriae του 11ου αιώνα (The Patriarchate of the First Bulgarian Empire and the Byzantines: a damnatio memoriae in the 11th Century). In: **The Empire in Crisis? Byzantium in the 11th Century (1025–1081)**, Athens, 307–316.

Rajković S., 2003: **The Bryennius Family in the 11th and 12th Centuries** (in Serbian: **Porodica Vrijenija u XI i XII veku**). Vizantološki institut SANU, Beograd, 163 p.

Stanković V., 2003: **The Patriarchs of Constantinople and the Emperors of the Macedonian Dynasty** (In Serbian: **Carigradski patrijarsi i carevi Makedonske dinastije**). Vizantološki institut SANU, Beograd, 350 p.

Stanković V., 2003: The Nobelissimos Constantine, Michael V and the Paphlagoniens Family (In Serbian: Novelisim Konstantin, Mihailo V i rod Paflogonaca). **Zbornik radova Vizantološkog instituta**, 40, 27–48.

All the projects should be finished by the end of 2005. Some parts of their results

have been also published in two last volumes (vol. 41 being in preparation) of **Zbornik radova Vizantološkog instituta** (ZRVI) – vol. 39 (2002) and vol. 40 (2003).

INTERDEPARTMENTAL VARDAR COMMITTEE

(Academician Vladimir Stojančević)

Vardar Proceedings (in Serbian: **Vardarski zbornik**) No. 2 was published in 2003, which on 490 pages contained 15 papers and 4 obituaries of associates. The authors were two academicians (S. Ćirković, V. Stojančević), four university professors, three co-authors from Academy's institutes, an associate of the Institute for Literature and Art, one archivist from SASA Archives, one professor of the Academy of Theatrical Arts and an expert on colonization (prewar, 1941) of the Serbs in Macedonia. The topics of the Proceedings were different: history of Middle Ages and the Modern Age, cultural history, history of art, material on the Serbs – autochthonous inhabitants from regions of what is nowadays the Republic of Macedonia. Among the obituaries, let us mention the obituary by Corresponding Member Vojislav Stanovčić on Academician Miodrag Jovičić and Secretary of Kosovo-Metohija Committee Milan Ivanović on Professor and associate of the Institute for Serbian Language Svetozar Stijović.

In 2003, Vardar Proceedings No. 3 was prepared for print and its publication is expected in 2004.

Vardar Proceedings No. 4 is edited and awaiting financial resources.

COMMITTEE ON THE HISTORY OF BOSNIA & HERZEGOVINA

(Academician Milorad Ekmečić)

Members of the Committee worked on individual topics and prepared the **Proceedings on the History of Bosnia & Herzegovina** (in Serbian: **Zbornik za istoriju Bosne i Hercegovine**) in 2003. Papers were collected and reviews were written for volume 4 of the Proceedings, which contains 16 papers, and it was prepared for print.

Project: MATERIAL FOR THE HISTORY OF MILITARY BORDER IN XVIII CENTURY

(Academician: Slavko Gavrilović)

The focus of research in 2003 was on the history of Šajkaški Batallion as a specific military border unit, i.e. the territory of Military Border.

In Manuscript Department of Central Serbian Cultural and Publishing Society (Matica srpska) in Novi Sad, in group M «Manuscripts», Academician S. Gavrilović came across a manuscript on the history of Šajkaški Batallion from the first half of XIX

century written by Captain Trumić who had direct insight into developments in Šajkaška. This document is of crucial value for history, ethnography, demography of Šajkaška as a region and as a document that assigns a special place to Šajkaski Batallion in military border system between XIII and XIX century.

The author has found a highly explanatory supplement for Trumić's text in the manuscript of general Avram Djukić on the officers of Šajkaški Batallion during 1848–1849 Serb People's Movement and his chronological inventory of the entire officers' corps and headquarters' personnel in Šajkaški Batallion from 1763 until 1882, created on the basis of personnel registers kept in the Royal War Council in Vienna which is a unique document in the history of Military Border.

Gavrilović S., 2003: On Military Border (Krajina) Issue at the Assembly of Triune Kingdom in 1848 (in Serbian: O vojno-graničarskom (krajiškom) pitanju na saboru Trojedne kraljevine 1848. godine), **Memorial of «Srem» Historical Archives** (in Serbian: **Spomenica Istorijskog arhiva «Srem»**), Vol. 2, Sremska Mitrovica, 89–99.

Gavrilović S., 2003: Issue with critical texts of the book Franc Štefan Engel, **Description of the Kingdom of Slavonia and Srem Dukedom**: Biography of the author, review of the text, hundred odd comments, about fifty photos (in Serbian: Kritičko izdanje knjige Franc Štefan Engel, *Opis Kraljevine Slavonije i Vojvodstva Srema: Biografija pisca, redakcija teksta, stotinak napomena, pedesetak fotosa*), Novi Sad, 442 p.

Project: **MATERIAL FOR THE HISTORY OF THE SERBS IN CROATIA AND SLAVONIA**

(Academician Vasilije Krestić)

Head of the Project, Academician Vasilije Krestić continued the study of the letters by Vatroslav Jagić which are in SASA Archives in Belgrade.

In the course of 2003, he published two books:

1. **From the Past of Srem, Bačka and Banat** (in Serbian: **Iz prošlosti Srema, Bačke i Banata**), Belgrade, Srpska književna zadruga, 448 p.

2. **History of Serb Press in Hungary 1791–1914** (in Serbian: **Istorija srpske štampe u Ugarskoj 1791–1914**), Belgrade, Institute of Textbooks and Teaching Aids and Historical Institute in Belgrade, 612 p. Second edition.

Beside the mentioned books, V. Krestić published the following papers:

1. Načertanije – Serbian, Yugoslav or Greater Serbian Political Platform (in Serbian: *Načertanije – srpski, jugoslovenski ili velikosrpski politički program*). In the book: **Načertanije. Platform of Foreign and National Policy of Serbia at the End of 1844** (in Serbian: **Načertanije. Program spoljašnje i nacionalne politike Srbije na koncu 1844. godine**), Jagodina, 2003, 5–29.

2. Ideas of Greater Croatia (in Serbian: *Velikobrvatske idje*). In the book: **Greater Serbia – The Truth, Delusions, Abuses** (in Serbian: **Velika Srbija – istine, zablude, zloupotrebe**), SKZ, Belgrade, 2003, 243–260.

3. Victory of Science over Politics (in Serbian: *Pobeda nauke nad politikom*). In the book: **Serbian Prose Today** (in Serbian: **Srpska proza danas**). Hundred Years of «Prosvjeta» and Their Prominent Figures, Ćorović's Meetings of Prose Writers in Bileće – Scientific Conference of Historians in Gacko (in Serbian: *Sto godina «Prosvjete» i njenih znamenitih ličnosti, Ćorovićeви susreti prozних pisaca u Bileći – Naučni skup istoričara u Gacku*) 19–23 September 2002, 157–164.

4. Pledges for Autonomy are Anti-Serb in Character (in Serbian: *Zalaganja za autonomiju imaju antisrpski karakter*). In the book: **Fatherland above Party. The Truth about «Svetozar Miletić» Serb National Movement** (in Serbian: **Otađbinsko iznad partijskog. Istina o Srpskom narodnom pokretu «Svetozar Miletić»**). Novi Sad, 2003, 43–50.

5. On Problems of Spiritual Unity of the Serb People. (in Serbian: *O problemima duhovnog jedinstva srpskog naroda*). **Proceedings from scientific conference «Education of Teachers in the Past, the Present and the Future»**, Sombo,r 2003, 13–19.

6. Introductory Speech at the scientific conference **Greater Serbia – the Truths, Delusions, Abuses** (in Serbian: **Velika Srbija – istine, zablude, zloupotrebe**), SKZ, Belgrade 2003, 11–13.

7. Afterword for the book **Greater Serbia – the Truths, Delusions, Abuses** (in Serbian: **Velika Srbija – istine, zablude, zloupotrebe**), SKZ, Belgrade, 2003, 527–532.

Preface for the book **History of Novi Kneževac and its Surroundings** (in Serbian: **Istorija Novog Kneževca i okoline**), Novi Kneževac 2003, 9–11. He also edited the book and wrote the section from page 528 to 537.

Project: **JOVAN RISTIĆ, POLITICIAN, STATESMAN AND DIPLOMAT** (Academician Čedomir Popov)

The work on the Project was at a standstill in 2003. Its head, Academician Čedomir Popov, was fully engaged (as one of the authors and editor) in the work on the Project «Europe and Serbian Revolution 1804–1815», so reduced the work on his individual project to sorting out the already collected historical material and the beginning of the work on the topic «Jovan Ristić and Svetozar Miletić» which is planned to be completed in the beginning of 2005.

In connection with the project «Jovan Ristić, Politician, Statesman and Diplomat» is only the paper «United Serb Youth on the State» (in Serbian: *Ujedinjena omladina srpska o državi*) published in Proceedings **Greater Serbia – The Truths, Delusions, Abuses** (in Serbian: **Velika Srbija – istine, zablude, zloupotrebe**), SKZ, Belgrade 2003, 153–163.

Project: **CULTURE AND ART OF BRONZE AND IRON AGE OF YUGOSLAV DANUBE BASIN** (Academician Nikola Tasić)

Work on a big Project was organized by SASA Branch in Novi Sad as part of the topic «Vojvodina Between Early Bronze Metallurgy and Penetration of Celts». A voluminous synopsis was made for future work and it will be printed.

Tasić N., 2003: New data for Understanding Early Iron Age in Serbia. **Thracia**, XV, Sofia, 67–78.

Tasić N., 2003: Dardancite i dardanskiot supstrat. **Pirijhme** II, Kumanovo, 39–63.

Tasić N., 2003: Ancient Archeology in Works of Dragoslav Srejšović (in Serbian: Antička arheologija u delu Dragoslava Srejšovića), Proceedings from scientific conference **Work of Dragoslav Srejšović in Research of Ancient Archeology**, Kragujevac.

Project: **ANCIENT SOCIETY AND STATE**
(Academician Slobodan Dušanić)

S. Dušanić has continued his research on (a) political thought of the Greeks in the classical period, and (b) history of Roman institutions and society.

Dušanić S., 2003: The Unity of the Timaeus-Critias and the Inter-Greek Wars of the Mid 350's. **Illinois Classical Studies** (Urbana, 2003/4), 63–75.

Dušanić S., 2003: Plato on Legislation: Two Historical Aspects of the Problem. **Živa antika**, 52 (Skopje, 2002/3), 47–54.

Dušanić S., 2003: Asinius Maximus in AD 253. **ZPE**, 144 (Bonn), 254–260.

Dušanić S., 2003: The Five Standards of the Pre-Marian Legion. A Note On the Early Plebeian Militaria (together with Ž. Petković), **Klio**, 85 (Frankfurt), 42–56.

Dušanić S., 2003: The Imperial Propaganda of Significant Day-Dates: Two Notes in Military History. **Documenting the Roman Army, BICS Suppl.**, 81 (London), 89–100.

Dušanić S., 2003: Roman Mining in Illyricum: Historical Aspects. **Congress on Ancient Illyricum**, Cividale del Friuli, Italy.

Project: **EUROPE AND SERBIA IN THE MIDDLE AGES**
(Corresponding Member Jovanka Kalić)

In 2003, research was aimed at further studies of the connections of Medieval Serbia with the countries of Central Europe (Hungary, Austria, Germany) depending on the available historical material. Two topics distinguished themselves. The first was the status of foreigners with permanent residence in Serb lands (legal status, economic status, religion, culture), and the second was comparative analysis of data on Belgrade and other cities in parts of European travel books from the standpoint of essentially different periods in the «history of travel books» in Western and the Balkan world (types, objectives, choice of data, imagery, and other). A special unit is the investigation of modern scientific thought on Serbian Medieval history in the Western world in harmony with the development of Medieval history (novelties, methodology, prospects). These efforts are significantly affected by lack of funds for the work in foreign archives and libraries.

Kalić J., 2003: A glimpse at the Investigations on Serbian Middle Ages (in Serbian: Pogled na istraživanja o srpskom srednjem veku), **International Round Table at University Library**, Belgrade, 20/21 October 2003.

Kalić J., 2003: Les etrangers en Serbie medievale. **Tolerance and Repression in the Middle Ages**, ed. National Hellenic Research Foundation, Athens 2002 (2003), 357–362.

Kalić J., 2003: European Writers of Travel Books. In the book **Belgrade in the Works of European authors of Travel Books** (in Serbian: Evropski putopisci o Beogradu, u knj. **Beograd u delima evropskih putopisaca**), SASA Balcanological Institute, Belgrade.

Kalić J., 2003: Medieval Millennium. Chapter in book **Museum of the City of Belgrade** (in Serbian: Srednjevekovni milenijum, poglavlje u knj. **Muzej grada Beograda**), Belgrade.

Project: **SETTLEMENT OF THE VINČA GROUP ON GOMOLAVA – CULTURAL AND HISTORICAL RECONSTRUCTION**

(Academician Bogdan Brukner)

In 2003, work continued on sketching plans of Vinča settlement. Drawings were made of the relation between the necropolis from Ib phase Gomolava which is «buried into» the settlement Ia phase Gomolava, the total of 5 drawings. Drawing of mobile material from the houses of Ib phase Gomolava continued. So-called showering of ceramic material from houses began. Ten final maps were completed of geographic distribution of epipaleolithic, early neolithic and late neolithic culture in Balkan/Anatolian space.

Brukner B., 2003: The Effects and Consequences of Great Black Sea Flood on the Formation of Vinča Group. **Work of Vojvodina Museums** (in Serbian: Uticaji i posledice velike poplave Crnog mora na formiranje vinčanske grupe, **Rad vojvodjanskih muzeja**) (supplemented and extended article of the English version published in «Revista»/USA).

Brukner B., 2003: Central and Lower Danube River Basin, Unique Archeological and Cultural Circle – One of the Foundations of European Cultural Heritage – The Past for the Future (in Serbian: Srednje i donje Podunavlje, jedinstveni arheološki i kulturni krug – jedan od temelja evropske kulturne baštine – prošlost za budućnost). **Second International Danubian Conference on Art and Culture**, Belgrade, September 2003.

Project: **SERBS IN HUNGARY – CULTURAL PAST**

(Corresponding member Dinko Davidov)

In 2003, a manuscript was completed on **Serb Orthodox Szentendre Churches** (in Serbian: Srpske pravoslavne sentandrejske crkve). The book will be published in two tomes by Buda Epararchy in Serbian and Hungarian language.

Project: **TERRITORY AND SOCIETY OF MEDIEVAL SERBIA**

(Corresponding Member Miloš Blagojević)

In 2003 investigations continued and four articles were published on the following topics: a) founders of Chilandar Monastery; b) «otroci» and «posadnici»; c) hereditary title of «district prefect»; d) title and occupation of «grand duke» in Serb lands.

The manuscript for the supplemented edition of the book **Farming in Medieval Serbia** (in Serbian: **Zemljoradnja u srednjevekovnoj Srbiji**) was sent to press.

Blagojević M., 2003: Byzantine Hierarchy of Rulers in the Light of Serb Sources (in Serbian: Vizantijska hijerarhija vladara u svetlosti srpskih izvora). Symposium on **Bulgaria and Serbia in the Circle of Byzantine Civilization**, September 2003, Sofia.

Project: **HISTORY OF CIVILIZATION IN SERBIA
IN THE FIRST HALF OF THE 19th CENTURY**

(Academician Vladimir Stojančević)

In 2003 personal project was «enriched» by a great work by Academician V. Stojančević in Serbian and English language, *The Beginnings of Modern Serbian States* (in Serbian: *Počeci moderne srpske države*) (1804–1813) with abundant visual artistic documentation on 276 pages of text in two columns. The book offers basic pictorial documentation (portraits of participants in the uprising, battles, buildings, folk costumes, panorama of settlements and landscapes of Serbia, which lead to the conclusion on civilizational status of the country and the people at the time of the First Serbian Uprising as the general historical framework for the more narrow topic of the Project (The book is devoted to the bicentenary of the First Uprising and accompanied by the signature and blessing of Serb Patriarch Pavle).

V. Stojančević devoted about ten papers and several reports at scientific conferences all around Serbia and Republika Srpska to the bicentenary of the First Serbian Uprising.

COMMITTEE FOR THE STUDY OF THE KOSOVO AND METOHIJA

(Academician Stevan Karamata)

The activity of the Committee was mainly devoted to the registration and collection of documents related to the history of Kosovo and Metohija region, especially to the cultural monuments of that area, the investigation and presentation of the living conditions of the Serbs, as well as of other minority groups in Kosovo and Metohija during the last 20–30 years, but especially at present. Some results of these researches were presented at conferences in Belgrade, Thessaloniki, and in other places, and some are in press and will be available to the scientific community in 2004.

DEPARTMENT OF FINE ARTS AND MUSIC

COMMITTEE FOR THE DICTIONARY ON THE FINE ARTS TERMS

(Academician Olga Jevrić)

During 2003, the activities of the Committee were determined by an extremely restricted budget, which made the usual cooperation with the contributors impossible. In that respect, the Committee received a single new text.

On the other hand, an apparent need to enhance the systematization of core data about the texts gathered in the course of the realization of the project, was recognized. The digitalization of the card-file and the list of terms was carried out by Zoran Ševkušić, project assistant, and resulted in a searchable database containing all the relevant information about the existing dictionary references. The database provides full insight into the state of the project materials, and enables further statistical analyses.

Consequently, the list of terms was subject to considerable reduction and restructuring. In fact, the existing text materials cover 45% of the defined list of terms.

Project: **RECORDING OF SERBIAN FOLK MUSIC**

(Academician Dejan Despić)

Jelena Jovanović undertook her field work in the villages of Jarmenovci and Šatornja near Topola (in December 2003), in central Serbia. She also recorded some important performances of folk groups during the Festival of folk arts (Sabor) in Topola (October 2003).

Project: **COMPACT-DISKS AND CASSETTES PRODUCTION**

(Academician Dejan Despić)

A book about a folk group from Crnuća on Rudnik Mountain has been published, accompanied by a CD on which their singing and playing are recorded.

Petrović R., Jovanović J., 2003: **Hey, Rudnik, you Old Mountain Traditional Singing and Playing by the »Crnućanka« Group**. Belgrade (in Serbian and English).

Project: **CONTEMPORARY SERBIAN MUSICAL SCENE**

(Academician Dejan Despić)

The members of the Project have done research into the role of the Russian emigrant artists on the operatic and ballet stages in Yugoslavia between the two world wars

(Nadežda Mosusova, Melita Milin). Other members continued their earlier research into the domestic and international reception of Stevan Hristić's ballet *The Legend of Ohrid* (Ana Radošević), and the bibliography of articles concerning the Serbian operatic and ballet stages in the 20th century (Roksanda Pejović).

Milin M., 2003: The Russian Musical Emigration in Yugoslavia After 1917. **Muzikologija**, 3, 65–80 (in English with Serbian summary).

Mosusova N., 2003: The Work of the Brailowsky Couple in the Mirror of the Serbian Critique. **Muzikologija**, 3, 81–113 (in Serbian with English summary).

COMMITTEE FOR THE HISTORY OF SERBIAN MUSIC

(Academician Dimitrije Stefanović)

In order to keep and preserve the important recorded musical material of church and folk singing from the territory of former Yugoslavia, a plan was devised and preparations were made to re-record this material on compact disks.

At numerous lectures by members of the Committee held in the country and abroad the collected and recorded material has been used.

CENTER FOR SCIENTIFIC RESEARCH OF SASA AND UNIVERSITY OF NIŠ

SECTION FOR ARCHAEOLOGY AND HISTORY OF ART

Project: **NIŠAVA RIVER BASIN IN PREHISTORY, ANCIENT TIMES AND MIDDLE AGES**

(Miloje Vasić, Ph.D.)

1. WORK IN THE FIELD

In September 2003, excavations in Mediana continued. The work was primarily dictated by the plan for the construction of Archaeological Park in Mediana. Excavations took place on four locations: 1. approach to the villa with peristyle; 2. premise 17 of eastern wing of huts; 3. approach corridor to thermae; 3. trilinear hypocaust prefurnium with apse.

2. DOCUMENTATION

Gordana Milošević, M.A., and Gordana Jeremić, archeologist, continued work on processing documentation of Jagodin Mala locality, especially that which refers to the architecture and decoration of tombs. This documentation is processed in AUTOCAD. Digitalization of plans of Mediana and processing in AUTOCAD continued.

Milošević, G., 2003: Martyrium and Necropolis Basilica in Jagodin Mala in Niš (in Serbian: Martirijum i grobljanska bazilika u Jagodin mali u Nišu), International Scientific Conference **Byzantine Foundations of Modern Europe**, Niš, 2–5 June, 2003.

Milošević, G., 2003: Late Roman Martyrium and Basilica at the Necropolis in Niš. Conference **The Cult of Martyrs and the Relics, its Architecture in East and West (3–7 c)**, Varna, Bulgaria, 20–23 November, 2003.

Vasić, M., 2003: Mediana, domaine imperial ou la propriete privee. Regionaler Wissenschaftsdialog **Romanische Städte und Festungen an der Donau – Alexander von Humboldt Stiftung**, Belgrade, 16–19 October, 2003.

Vasić, M., 2003: Stibadium in Romuliana and Mediana. International Scientific Conference **Gamzigrad (Romuliana) – Period of Tetrarchy and Late Antique**, Zaječar, 28–30 October, 2003.

SECTION FOR BIOMEDICAL INVESTIGATIONS

Project: **RESEARCH ON ENDEMIC NEPHROPATHY IN SOUTHEAST SERBIA**

(Academician Sveto Suša)

The work on collection of earlier results was published and their analysis was carried out. Urinary syndrome was especially analysed, as very significant for the determination

of the type of kidney disease. Along with other analyses, attention was devoted to the results of electrophoresis of proteins in urine. All the studied electrophoresis findings of proteins in urine unambiguously indicated that it is a proteinuria of glomerular type. Not only in our country, but also in other countries where this form of the disease is found, glomerular type of proteinuria is lately increasingly detected, which is in correlation with pathohistological findings of biopsic tissue in kidneys in the regions of endemic nephropathy.

Results of the study of endemic nephropathy in different regions of our country show a gradual and slight increase of this disease which is especially concerning and warns that more intensive continuation of this research is necessary.

SECTION FOR CIVIL ENGINEERING AND ARCHITECTURE

Project: **CITY ARCHITECTURE ANALYSIS OR ROMA ENCLAVES IN NIŠ**
(Prof. Nikola Cekić, Ph.D.)

The research just began in October 2003.

SECTION FOR ENERGETICS

Project: **DEVELOPMENT AND INVESTIGATION OF FLAT SOLAR ENERGY RECEPTOR FOR THERMAL AND ELECTRIC CONVERSION**
(Prof. Tomislav Pavlović, Ph.D.)

With the support of the Ministry of Science, Technology and Development of the Republic of Serbia, WUS Austria, NISSAL Niš, for the needs of the Project laboratory premises were adapted for the acquisition and processing of experimental data, a solar water-heater was provided, it was connected to a solar module for forcible water circulation of water in the solar system, a hybrid and a thermal collector were made, a modern meteorological station was provided for obtaining meteorological data, instruments for measuring UV A, B and C radiation were acquired, and two computers, a scanner and a printer for acquisition and processing of data were provided.

LITERATURE SECTION

Project: **LITERARY AND CULTURAL LIFE IN SOUTH-EASTERN SERBIA IN 19TH AND 20TH CENTURY (until World War Two)**
(Academician Miroslav Pantić)

An international scientific conference was held on the topic *Literature and History VI – Transposition of Historical Personalities and Events in Short Stories of the Slavs* (21–22

November, 2003). Scientists from Serbia, Russia, Bulgaria and Macedonia took part.

Scientific Council of the Center gave its approval for the realization of an encyclopedic project titled *Culture History of Niš* (Head: Prof. Miroljub Stojanović, Ph.D.).

Jaša Prodanović – Life and Work (in Serbian: **Jaša Prodanović – život i delo**). Proceedings from the Round Table discussion held in Pirot on 28 December, 2000, Center for Scientific Research of SASA and University of Niš, Study Group for Serbian Language and Literature of Philosophic College of Niš, Niš, 2003, 164 pp.

Literature and History V: Literature and History in Romanticist Poems of the Slavs (in Serbian: **Književnost i istorija V: Književnost i istorija u romantičarskoj poemi kod Slovena**). Proceedings of scientific conference held in Niš, 11–13 October, 2001, Center for Scientific Research of SASA and University of Niš, Alliance of Slavistic Societies of Yugoslavia, Study Group for Serbian Language and Literature of Philosophic College of Niš, Niš, 2003, 159 pp.

SECTION FOR STUDY OF THE PEOPLES

(Prof. Dragan Žunić, Ph.D.)

Scientific Council of the Center gave its approval for the work on three projects:

1. *Traditional Esthetic Culture in South-East Serbia* (Project proposal prepared by Prof. Dragan Žunić, Ph.D.)
2. *Traditional Morality of the Serbs between Myth and Reality* (Project proposal prepared by Danijela Gavrilović, Ph.D.)
3. *Population of South-East Serbia* (Project proposal prepared by Prof. Petar Golubović, Ph.D.)

SECTION FOR SERBIAN LANGUAGE

Project: **TYOLOGICAL STUDIES OF SERBIAN SPEECH ON THE TERRITORY OF SOUTH-EAST SERBIA**

(Prof. Slobodan Remetić, Ph.D.)

The following topics were treated in the course of 2003:

- Possibility of dialect formation (typological deviations from standard language);
- Noun formation for denomination of similarities with ancestors;
- Homonym formation by adding suffix –je;
- Formation of verbal diminutives by elements –k and –c-;
- Formation of imperative by element –i-;
- Competition of po and po- in formation of nouns and adjectives;
- Derivatives with root tut-.

Occasioned by the centennial of publication of Olaf Brock's *Die Dialekte des südlichsten Serbiens*, on 14 November 2003 a scientific symposium was held which was titled *Olaf Brock and Serbian Dialectology*; participants were scientists from Serbia and Norway. Papers presented at the symposium will be published in special proceedings.

For *Dictionary of Crna trava Kalna* (Gligorijević – Bogdanović) words that begin with letter b were completed and the manuscript was handed over to the team of *Etymological Dictionary of Serbian Language* to use.

**CENTER FOR SCIENTIFIC RESEARCH OF SASA AND
UNIVERSITY OF KRAGUJEVAC**

(Academician Nikola Tasić)

SECTION FOR HISTORY AND ARCHAEOLOGY

(Corresponding Member Miloš Blagojević)

Project: **ANCIENT CULTURE ON THE TERRITORY OF CENTRAL
SERBIA FROM PREHISTORY TO MIDDLE AGES**

(Academician Nikola Tasić)

A monograph on Grivac, prehistoric locality in vicinity of Kragujevac, was prepared for print.

SECTION FOR STUDYING PEOPLE

(Ljubinko Radenković, Ph.D.)

Three topics were studied: Beliefs and Customs (Mile Nedeljković), Crafts and Supplementary Entrepreneurship in Šumadija in the Past and Present (Milorad Aleksić), and City Costumes of Šumadija (Dobriša Vlačković).

SECTION FOR LANGUAGE AND LITERATURE

(Academician Predrag Palavestra)

As part of Liceum series, a magazine was printed with international participation titled *The Cult of Saints in the Balkan II* (Liceum, No. 7, editor: Mirjana Detelić, Ph.D.):

Tatjana Subotin–Golubović, **Cult of Archangel Michael in Medieval Serbia** (in Serbian: **Kult arhandjela Mihaila u srednjovekovnoj Srbiji**)

Maja Jokimovska–Tošić, **Treatment of Miraculousness in the Cult of St. Joakim Osogovski** (in Serbian: **Tretman čudotvorenja u kultu svetog Joakima Osogovskog**)

Branislav Cvetković, **Icon in Context: Towards its Functional Adaptability** (in Serbian: **Ikona u kontekstu: ka njenoj funkcionalnoj prilagodljivosti**)

Danica Popović, **Life of Serbian St. Sava** (in Serbian: **Pustinožiteljstvo Svetog Save Srpskog**)

Jelena Dergenc, **The Holy Relics of St. Stefan Štiljanović** (in Serbian: **Mošti Sv. Stefana Štiljanovića**)

Miroslav Timotijević, **The Cult of St. Despot Brankovićs in 19th Century** (in Serbian: **Kult svetih Despota Brankovića u 19. veku**)

Aleksandar Novik, **Catholic Holidays, Rites and Folk Christianity in Dukadjin. Material from an Expedition to North Albanian Alps** (in Serbian: **Katolički praznici, obredi i narodno hrišćanstvo u Dukadjinu. Gradja sa ekspedicije u severnoalbanske Alpe**).

Project: **CULTURAL AND LITERARY LIFE OF KRAGUJEVAC**

Within the framework of the topic *Hometown Bibliography* **Bibliography of Dora Pilković Petani** by Violeta Jovičinac Petrović was published. Bibliographies of Slobodan Pavićević and Borislav Horvat are being prepared for printing, as well as the monograph of Mila Stojadinović.

Work on **History of National Library in Kragujevac** (author: Mila Stefanović) is almost completed.

SECTION FOR LEGAL, ECONOMIC AND DEMOGRAPHIC STUDIES

(Prof. Radovan Vukadinović, Ph.D.)

A series of lectures were given titled *International Integration and Constitutionalism* that will be published in proceedings with the same title (*Liceum*, No. 8).

SECTION FOR MATERIALS AND COMPONENTS

Project: **PHYSICAL-CHEMICAL AND PHYSICAL CHARACTERISTICS OF SOME NEW METAL AND NON-METAL MATERIALS IN CRYSTAL AND GLASS STATE**

(Prof. Aleksa Maričić, Ph.D.)

Structure changes were investigated that occur during the process of absorption and desorption of hydrogen on crystal powder of $\text{Ni}_{55.5}\text{-Co}_{44.5}$ system.

Relaxation processes were studied during deheating of amorphous iron and cobalt alloys. A completely original experimental method was developed for the regulation of density changes in electron state on Fermi level after every deheating.

The effect of Al_2O_3 content and temperature on structure changes during sintering of $\text{Cu-Al}_2\text{O}_3$ system was studied.

Kalezić–Glišović A., Novaković L., Maričić A., Marinković Z., 2003: Effect of Strain Degree During Annealing on the Kinetics and Thermodynamics of the Crystallization Process of the Amorphous Alloy $\text{Fe}_{89.8}\text{Ni}_{1.5}\text{Si}_{3.2}\text{B}_3\text{C}_{0.5}$. In: **Science of Sintering: Current Problems and New Trends**, SASA and IISE, Belgrade, 65–70.

Maričić A.M., Milovanović V., Minić D., Spasojević M., 2003: Kinetics of Hydrogen Absorption and Hydrogen Desorption of the Powder $\text{Ni}_{55.5}\text{-Co}_{44.5}$. International Conference **Novel Technologies in Powder Metallurgy and Ceramics**, Kiev, Ukraine, 8–12 September 2003, 73–75.

Maričić A.M., Mitrović N.S., Ristić M.M., 2003: Structural Relaxation of $\text{Co}_{70}\text{Fe}_5\text{Si}_{10}\text{B}_{15}$ Amorphous Alloy. International Conference **Novel Technologies in Powder Metallurgy and Ceramics**, Kiev, Ukraine, 8–12 September 2003, 261–262.

Maričić A.M., Ristić M.M., 2003: Correlation Between the Crystallization Process and Change in

Thermo Electromotive Force for the Amorphous Alloy $\text{Fe}_{89.8}\text{Ni}_{1.3}\text{Si}_{3.2}\text{B}_3\text{C}_{0.5}$. **Science of Sintering**, 35, 31–36.

Spasojević M., Maričić A.M., Rafailović L., Jordović B., 2003: The Effects of the Electrolysis Parameters on the Obtained Cobalt and Nickel Powder Properties. In: *Science of Sintering: Current Problems and New Trends*, SASA and IISE, Belgrade, 465–470.

SECTION FOR BIOTECHNICAL STUDIES

Project: **VARIABILITY OF GLIADIN ALLELES WITH DOMESTIC VARIETIES OF WHEAT**

(Desimir Knežević, Ph.D.)

The subject of investigation was the polymorphism of genes that control the synthesis of protein molecules in wheat. The analysis included 20 new varieties of wheat. The total of 57 alleles were identified so far, 35 of which are Gli alleles with 6 Gli-locus and 12 alleles with 3 Glu-1 locus. Two gliadin alleles were determined which were not identified in previously analyzed varieties of wheat.

Mićanović D., Knežević D., Zečević V., Raičević V., Dimitrijević B., 2003: Influence of diazotrophs on wheat. **XIth International Congress of Molecular Plant-Microbe Interactions**, Sankt Petersburg, 324.

Mićanović D., Mendum T., Raičević V., Zečević V., Knežević D., 2003: Determination of bacteria in rhizosphere of the wheat. **XIth International Congress of Molecular Plant-Microbe Interactions**, Sankt Petersburg, 324.

Zečević V., Knežević D., Mićanović D., Urošević D., Dimitrijević B., Urošević V., 2003: Components of variance and heritability of quality parameters in wheat cultivars. **Genetika**, 33 (3), 77–84.

SECTION FOR TECHNICAL SCIENCES

(Prof. Branko Ivković, Ph.D.)

Serbian-English Scientific-Technical Dictionary by Prof. Dr. Dušan Simić was printed.

Interdisciplinary project: **DEVELOPMENT OF METHODS AND SOFTWARE FOR NUMERICAL AND EXPERIMENTAL INVESTIGATIONS IN BIOMEDICAL SCIENCES**

(Prof. Miloš Kojić, Ph.D.)

Work continued on development of numerical methods and software for resolution of fields of physical quantities, especially in the field of biomedical sciences. Testing was completed of device for biaxial stretching of tissue in the Physiology Laboratory of Medical School.

A contract was signed between Kragujevac University and Harvard School of Public

Health (USA) on joint work on the Project “Particles in Developing Lung: Bioengineering Approach” in the following five years.

A contract was signed on installation of PAK Program (especially modules for biomechanics) with Polytechnic University (Hong Kong), and a contract on work on a joint project in the field of modeling and experimental investigation of muscle fatigue.

Filipović N., Kojić M., Ranković V., 2003: Computer simulation of flow pattern in stented arteries. **XXX Conference European Society for Artificial Organs**, Aachen, Germany.

Filipović N., Kojić M., Stojanović B., Ivanović M., Ranković V., 2003: Three-dimensional computer simulations of blood flow through the abdominal aortic aneurysm. **International Congress on Computational Bioengineering**, Zaragoza, Spain.

Filipović N., Schima H., 2003: Numerical simulation of the residence times within the aortic arch during cardiac assist. **XXX Conference European Society for Artificial Organs**, Aachen, Germany.

Kojić M., Filipović N., Rosić M., Pantović S., Vlastelica I., Kalinić Z., 2003: Finite element modeling of three-dimensional pulsatile flow in the blood artery using elastic and nonlinear orthotropic material models. **International Congress on Computational Bioengineering**, Zaragoza, Spain.

Kojić M., Filipović N., Vlastelica I., Živković M., 2003: Modeling of blood flow in the human aorta with use of an orthotropic nonlinear material model for the walls. **Second MIT Conference on Computational Fluid and Solid Mechanics**, Boston, USA, 17–20 June 2003.

PUBLISHING ACTIVITY IN 2003

Some 30 books have been published. (out of which 8 joint publications). One of these books was published in electronic form.

The following publications were published:

PRESIDENCY

ALMANAC CIX, FOR 2002

Bulletin of the Scientific Research Fund for 2002. No 28

DEPARTMENT OF MATHEMATICS, PHYSICS AND EARTH SCIENCES

Bulletin CXXVII, Vol. 28

DEPARTMENT OF CHEMICAL AND BIOLOGICAL SCIENCES

Bulletin CXXV, Vol. 41

Proceedings of works on Serbian fauna, Vol. VI

DEPARTMENT OF TECHNICAL SCIENCES

Special editions DCLII, Vol. 41, Borislav D. Zakić, *Wood Plasticity Bulletin CXXVI, Vol. 29*

Science of Sintering: Current Problems and Development Directions

DEPARTMENT OF LANGUAGE AND LITERATURE

Library Editions 19, Lidija Jelić, *Bibliography of Works of Academician Irena Grickat-Radulović. In the honour of her eightieth anniversary*

Serbian Dialectical Proceedings XLIX

Serbian Dialectical Proceedings L

Bibliography, Serbian Literature in Emigration 1941–1991 (electronic form) Scientific gatherings S, Vol. 15 Memorial of Ivan V. Lalić.

Special editions DCLIII, Vol. 54, Jozef Šic, *Old Serbian Miners' Lexis, Discourse from the Linguistic History*

Critical Editions of Serbian Authors VI, Ljiljana Juhas–Georgijevska, *Life of St. Sava by Domentian, History of the Text* (in Serbian: *Život svetog Save od Domentiana. Istorija teksta*)

Library Publications 17, *Review of the SASA publications 1997–1998* (in Serbian: *Pregled izdanja SANU 1997–1998*)

DEPARTMENT OF SOCIAL SCIENCES

From the Theory of Law 10 (Iz teorije prava 10), Foreign Influences on Our Law (in Serbian: Inostrani uticaji na naše pravo)

Scientific gatherings CIII, Vol. 23, *Strategy of Economic Development under Unstable Conditions* (in Serbian: *Strategija privrednog razvoja u nestabilnim uslovima*)

Scientific gatherings CI, Vol. 22, *Social Science on Serbs in Hungary* (in Serbian: *Društvene nauke o Srbima u Madjarskoj*)

DEPARTMENT OF HISTORICAL SCIENCES

Special editions DCLIV, Vol. 26, Vojislav Korać, *Monuments of 14th Century Serbian Monumental Architecture in the River Vardar Valley* (in Serbian: Vojislav Korać, *Spomenici monumentalne srpske arhitekture XIV veka u Povardarju*)

Proceedings for History, Language and Literature of the Serbian People – 2nd class, Vol. XXXV Slavko Gavrilović, *Materials from Vienna Archives on the First Serbian Uprising* (in Serbian: Zbornik za istoriju, jezik i književnost srpskog naroda – II odeljenje, knj. XXXV, Slavko Gavrilović, *Gradja bečkih arhiva o Prvom srpskom ustanku*) Volume V (1814)

Scientific gatherings CII, Vol. 29, *Serbia and the Liberation of the Serbian People in Turkey 1804–1912* (in Serbian: *Srbija i oslobodjenje srpskog naroda u Turskoj 1804–1912*)

Proceedings on the History, Language and Literature of the Serbian People (in Serbian: Zbornik za istoriju, jezik i književnost srpskog naroda) – II class, Vol. XXXVI, Slavko Gavrilović, *Sources on Serbs in Hungary from late 17th and early 18th Century* (in Serbian: *Izvori o Srbima u Ugarskoj s kraja XVII i početkom XVIII veka*) Vol. III

DEPARTMENT OF FINE ARTS AND MUSIC

Portraits in the SASA Arts Collection (in Serbian: *Portreti u Umetničkoj zbirci SANU*)

Exhibition Booklets 30, *A Certain Robert Duano*

Exhibition Booklets 31, *Serbian 18th Century Mural Painting*

Exhibition Booklets 32, B. Andjellković–Dimitrijević, J. Denegri, *A Century of Graphics, Works from the Graphic Collection of the Museum of Modern Arts in Belgrade*

SASA Gallery 100, *Naive Art in Serbia*

SASA Gallery 105, *Nikola Janković, Sculptures and Drawings*

I. Subotić, A. Čelebonović, *Ljubica Čučak Sokić*