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NOTE ON SLAVIŠA PREŠIĆ

Dragić Banković
Faculty of Science, Kragujevac, Serbia

Slaviša Prešić was born in 1933 in Kragujevac. He finished second grammar school in 1952 in Kragujevac . In 1957 S. Prešić graduated the Mathematics at Faculty of Science of Belgrade University. He finished his PhD thesis in 1965. Professor Prešić had a great achievement in the field of algebra and logic, especially in polynomial theory and universal algebra. He was successful in artificial intelligence, functional equations and numerical analysis as well. He gave a great contribution to the applying of the reproductivity to solving equations in algebraic structures.

Professor Prešić was concerned himself with mathematical logic and its applications for 45 years. His book "Elements of mathematical logic" has been used at universities in Serbia over 40 years.

TEXTBOOKS AND MONOGRAPHS IN LOGIC

Branislav Boričić
Faculty of Economics, University of Belgrade

By following the chronological order, we present a short overview of some monographs, textbooks or their parts, published in Yugoslavia, Serbia or written by some participants of the Mathematical Institute Logical Seminary of Serbian Academy of Sciences and Arts. We also try to give, as much as possible, a complete reference list of textbooks and monographs in philosophical and mathematical logic published in the area of Former Yugoslavia or written by the authors originating from this area.

DOCTORAL DISSERTATIONS IN LOGIC

Mirjana Borisavljević
Faculty of Transport and Traffic Engineering, University of Belgrade,

We will present Doctoral dissertations in logic of Serbian scientists. Apart from Doctoral dissertations of scientists who received PhD degree in logic at Universities in Serbia, this presentation will also consist Doctoral dissertations of scientists who received PhD degree in logic at other Universities in Europe and America. Serbian scientists who gave valuable contribution to logic, but whose Doctoral dissertations do not belong to that area will be mentioned too. Finally, our presentation will contain some Doctoral dissertations

which can be considered a mixture of logic and some related areas as philosophy or mathematical areas: algebra, topology and computer science.

MIHAILO MARKOVIĆ

Milan Božić
Faculty of Mathematics, University of Belgrade

Mihailo Marković (1923–2010) was among the most important and prominet Serbian philosophers of the 20th century. As modern thinking took place in the whole region of former Yougoslavia in that period he can be considered as one of the most importan thinkers of all times in Serbia. His intelectual and political work was wide and comprehensive, enveloping the critique of contemporary Stalinism, introduction of anthropocentric Marxism and investigations in gnoseology and epistemology. Altough well known as philosoper his importance in introducing an encouraging investigations in modern logic is less known. It this paper we will give a brief overview of his life, work and importance in above mentioned area.

SLOVENIAN COMPETITIONS IN LOGIC

Izidor Hafner
Faculty of Electrical Engineering, University of Ljubljana

Slovenia, although a small European country, has a long tradition in organizing competitions in many scientific disciplines. The competition in logic seems to be a peculiarity of the country.

In the paper the general information of the competitions is given: the reason of starting them, the source of posed problems, aims to be achieved, organization problems, and research implications from them.

MATHEMATICAL LOGIC IN SLOVENIA

Izidor Hafner
Faculty of Electrical Engineering, University of Ljubljana

In the article the development of mathematical logic in Slovenia will be explained. The main contributions of Slovenian logicians will be presented. Available courses and textbooks will be mentioned.

OVERVIEW OF AUTOMATED REASONING IN SERBIA

Predrag Janičic
Faculty of Mathematics, Belgrade

In the talk, a short overview of the history of automated reasoning in Serbia will be given. We will list some of the achieved results, publications, and conference organized in this discipline over the last decades.

SEMANTIC TABLEAUX METHOD AND ITS APPLICATION IN AUTOMATED THEOREM PROVERS IN LOGICAL SYSTEMS

M. Kapetanović, A. Krapež
Matematički institut SANU, Beograd

The method of semantic tableaux was devised by E. W. Beth, but in its standard and most elegant form it is due to R. Smullyan. Its appearance in Serbia goes back to 1973, when it was first applied to many-valued propositional logic. Further applications included modal logic and search for finite models of predicate formulas. Its variant called dual tableau method served as a basis for automated theorem provers. Recent uses of the method concern substructural logics as well as infinitary model theory.

Based on dual tableau method several prover programs were implemented to work in parallel on a PC computer augmented with several transputers. The architecture of the computer as well as the methods of distribution of clauses obtained during formula reduction in these programs are presented.

ON CONTRIBUTION OF SERBIAN MATHEMATICIANS TO SET THEORY

Miloš S. Kurilić
Department of Mathematics and Informatics, University of Novi Sad,

Serbian mathematicians contributed significantly to set theory. Today, the results of Professor Đuro Kurepa are classical and Serbian researchers working abroad (Todorčević, Veličković, Farah, Spasojević, Vuksanović ...) obtained several important results in this field. Also, in Belgrade, Novi Sad and Niš there are mathematicians working in set theory or using its methods and the aim of this talk is to present their work.

INTUITIONISM

Zoran Marković
Matematićki instutut SANU

The first logician in Serbia with a serious interest in (and the knowledge of) Intuitionism was Aleksandar Kron. Allthough his dissertation was on multiple-valued logic, in 1963/64 he had a year of post-doctoral study in Holland, where he worked with Beth and Heyting. In 1972-73 he prepared, with Zoran Marković, a series of lectures in the logic seminar on different semantics for Intuitionistic logic (pseudo-Boolean algebras, topological models, Beth models and Kripke models). As a result came the first M.A. thesis in Intuitionism in 1974 by Zoran Marković with Aleksandar Kron as supervisor. Zoran Marković continued his studies at University of Pennsylvania, where he obtained Ph.D. for a dissertation "Model theory of Intuitionistic logic" in 1979 (with Scott Weinstein as supervisor). Kosta Došen was a student of A. Kron who went to Oxford for graduate study where he obtained a Ph.D. for a dissertation on structural rules in Gentzen systems (with Micheal Dummet as supervisor) in 1980.

Milan Božić, another student of Kron, worked with Došen on intuitionistic modal logic. The Ph.D. dissertation of Božić, allthough dedicated primarily to relevance logic, had also a part on intuitionism (in 1983, supervisor was Kron). Branislav Boričić defended in 1984 a thesis on intermediate propositional logics, i.e., extensions of Intuitionistic propositional logic. Mirjana Šovljanski worked on resolution rules for Epistemic and Intuitionistic arithmetic and obtained the Ph.D. Degree in 1988 (supervisor was Zoran Marković). Several other logicians in Serbia worked on systems related to Intuitionism: Slobodan Vujošević on Heyting Algebras, Daniel Romano on constructive algebra, Zoran Petrić and Mirjana Borisavljević on Category theory approach to proof theory, Silvia Ghilezan on lambda calculus.

The latest addition was an M.A. thesis by Jelena Ivetić on formal calculi for Ituitionistic logic in 2008 (with Silvia Ghilezan as supervisor).

ALGEBRA AND LOGIC IN MACEDONIA – A TRIBUTE TO PROF. G. ČUPONA (1930–2009)

S. Markovski
University of Skopje

Prof. G. Čupona is the founder of the Macedonian algebra and the introducer of the mathematical logic in Macedonia. He was the first Macedonian mathematician who started to investigate the algebraic problems. The first obtained results were in the theory of *n*-ary algebraic structures, where generalizations

of several groupoids properties to n-ary groupoids were given. Later, general algebraic structures were considered, especially connected with the problems of embedding of an algebra (A,F) into a groupoid (mainly, semigroup) from some variety of groupoids. The notion of vector valued (v.v.) algebraic structures was also introduced by Prof. Čupona, and the theories of v.v. groups, v.v. semigroups, v.v. quasigroups were developed. The last stage of his investigation was the structure of the free objects in some varieties of groupoids and the connection between the injective and the free objects.

During his carrier, Prof. Čupona collaborated with many mathematicians from former Yugoslavia, especially from Belgrade, Novi Sad, Zagreb, Niš, Sarajevo, Priština. We have to emphasise that several young mathematicians all over Yugoslavia have made their beginning steps in algebra under his surveillance and control. He started the wider collaboration of Yugoslav algebraists by organizing the first Algebraic conference in Skopje in 1980, that later became Yugoslav Conference for Algebra and Logic.The sincere friendship between Prof. G. Čupona and Prof. S. Prešić (the founder of the Mathematical logic in Serbia and, as well as, in Yugoslavia) resulted in introducing the Mathematical logic in Macedonia. There were organized several seminar where the beginning knowledge was spread out into Macedonian algebraists and computer scientists. Since mostly of the researchers were algebraists, the theory and applications of the Model theory were especially treated, and it have found applications in several research projects. Also, in the curricula of some bachelor and graduate studies, courses of mathematical logic were introduced.

ĐURO KUREPA (1907–1993)

Žarko Mijajlović
Mathematical Faculty, Belgrade

Đuro Kurepa, born on August 16, 1907 in Majske Poljane, Srpska Krajina, was the fourteenth child in his family. He finished elementary and secondary school in Majske Poljane, Glina and Križevci. He obtained his diploma in theoretical mathematics and physics from the Faculty of Philosophy of Zagreb University, in 1931. Kurepa spent the years 1932–1935 in Paris, at the Faculte des Sciences and College de France. He acquired his Ph.D. from the Sorbonne in 1935, under the supervision of Maurice Frechet. He did his post-doctoral studies at some of the world's best institutions: Warsaw University and Paris University of (1937). After World War II, he went to Cambridge (Massachusetts), the mathematics departments of the Universities of Chicago, Berkeley and Los Angeles, and the Institute of Advanced Studies at Princeton.

Kurepa started his professional career at Zagreb University in 1931, as mathematics assistant. He became an assistant professor at the same institution in 1937, associate professor in 1938, and full professor in 1948. He stayed in Zagreb until 1965, when he moved to Belgrade where he was offered the post of a full professor at the Faculty of Science of Belgrade University. He remained there until his retirement in 1977. Meanwhile, he was a visiting professor at Columbia University in New York (Summer School 1959), and Boulder, Colorado, in 1960. Besides teaching, Kurepa also successfully organized scientific activities and dealt with administrative matters. He was the founder and president of the Society of Mathematicians and Physicists of Croatia, president of the Union of Yugoslav Societies of Mathematicians, Physicists and Astronomers, president of the Yugoslav National Committee of Mathematics, and president of the Balkan Mathematical Society. Furthermore, he was the founder, and for many years the Editor-in-Chief, of the scientific journal *Mathematica Balkanica,* now published in Sofia. Kurepa was also on the editorial board of Belgrade's *Publications del'Institut Mathematique,* and the German periodical *Zeitschrift fur mathematische Logik und Grundlagen der Mathematik.*

Prof. Kurepa received many awards, honours and distinctions. He was the recipient of the highest state honour of former Yugoslavia - *the AVNOJ Award* (1976). He was a full member of the Serbian Academy of Sciences and Arts (SAND), the Academy of Science of Bosnia and Herzegovina, and a corresponding member of the Yugoslav Academy of Sciences and Arts (JAZU) in Zagreb. He, also, was a member of the Tesla Memorial Society of the U.S.A. and Canada (1982), and received *the Bernhard Bolzano Charter,* and *the Marin Drinov Charter* of the Bulgarian Academy of Science (Sofia 1987).

Scientific opus of Prof. Kurepa is fascinating. He published over 200 scientific reports and more than 700 various pieces of writings: books, articles, reviews. His papers appeared in journals all around the world and some were published by the most distinguished mathematical periodicals. Many of his texts were translated into English, French, Italian, and some other languages. He gave lectures at universities across Europe, America and Asia. He participated at dozens of international symposia, many of which were organized by him. Prof. Kurepa had contacts with numerous mathematicians from around the world and thanks to him many of them visited Belgrade. He was especially proud of his encounter with Nikola Tesla, and was very fascinated by the great Serbian scientist and engineer.

The influence of Prof. Kurepa on the development of mathematics in Yugoslavia was immense. At Zagreb University he introduced several mathematical disciplines, mainly in relation to the foundations of mathematics and set theory. Sibe Mardešić, a professor at that University, best described him: *He had a great influence on our University, particularly by introducing modern aspects into mathematics, and his work was also of great benefit to*

our community. With his doctoral dissertation *in extenso,* published in Belgrade's *Publications del'lnstitut Mathematique* in 1935, Kurepa entered the Belgrade mathematical circle. These contacts became more frequent in the 1950s. His arrival to Belgrade in the mid-sixties, and the subsequent influence on its mathematical circle, may be described in similar words. Prof. Kurepa used seminars, courses and talks to reveal the latest results obtained in various mathematical disciplines. In lectures, among other topics, he addressed the following ones: the construction of Cohen forcing, questions concerning independence results in cardinal and ordinal arithmetic, ordered sets and general topology. He also taught mathematical analysis, algebra, number theory, and even computer science. His lectures inspired many mathematicians and graduate students to write mathematical essays, and obtain master's and doctoral degrees. Many of these mathematicians continued and further developed Kurepa's work.

Kurepa was interested in many areas of mathematics, and he greatly improved them. His especial interests were set theory, general topology, foundations of mathematics, number theory and algebra and also included topics of partially ordered sets, particularly trees, the continuum hypothesis, the principle of mathematical induction, cardinal functions in topology, the general theory of uniform and metric spaces, fixed point theorems, the so-called left factorial function, and certain problems in matrix theory. Several important mathematical notions were named after him: Kurepa tree, Kurepa hypothesis, Kurepa line, Kurepa space, etc. Only the greatest scientists deserve such honour.

CATEGORIAL PROOF THEORY IN SERBIA

Zoran Petric
Matemati;ki institute SANU

Categorial proof theory started to develop i Serbia in the late 80's of the last century under the direction of Prof. Kosta Došen. This talk is about the results obtained by his group.

AN OVERVIEW OF DEVELOPMENT OF ALGEBRA IS SERBIA

Zoran Petrović
Matematički fakultet, Beograd

Based on the doctoral theses in the field of Algebra and related fields from the Virtual Library of the Faculty of Mathematics in Belgrade, the picture of the development of Algebra in Serbia is presented. The main research topics as well as the centers are emphasized.

DEVELOPMENT OF NON STANDARD ANALYSIS AND PROBABILITY LOGICS IN SERBIA

Miodrag Rašković
Matematički institut SANU, Beograd

The first occasion to hear about and to learn the elements of the Non Standard Analysis were the lectures on Model Theory in the seminar of mathematical logic held by Žarko Mijajlović after his return from Madison University (United States).

Later, it was applied in logics, theory of functional equations, functional analysis, topology, astronomy, etc. At the same time, many scholars worked on its foundations, and apart from Žarko Mijajlović we will mention the contributions of Rade Zivaljevic, Miodarg Radakovic, Dragan Aranđelovic, Stojan Radenović, Radosav Đorđevic and others.

Probability Logics were (probably) for the first time introduced in our country in the doctoral dissertation of Aleksandar Kron. Nevertheless, the strongest influence on our mathematicians from this field was made by M.J.Keisler and his disciple Hoover.

During the latest thirty years, in our country (Yugoslavia and later Serbia), the work of many mathematicians contributed strongly to the development of these logics.

Dozens of scientific papers were published, five doctoral dissertations were received while three PhD candidates are working on their theses. Also, four students were awarded master's degree in this field.

Their contribution gave: Miodrag Rašković, Radosav Đorđević, Zoran Ognjanović, Zoran Marković, Rade Živaljević, Branislav Boričić, Predrag Tanović, Nebojša Ikodinović, Aleksandar Perović, Dragan Doder, Silvana Marinković, Milanka Bradić, Vladimir Ristić, Angelina Stepić-Ilić, Miloš Milošević etc.

LOGIC IN CROATIA IN XX CENTURY

Zvonimir Šikić
University of Zagreb

This paper is a survey of development of mathematical and philosophical logic in Croatia in XX century, along with a short overview of several ideas from the XIX century, with a special accent on interferences and oppositions between mathematical and philosophical approach.

MODEL THEORY IN SERBIA

Predrag Tanović,
Mathematical Institute SANU, Belgrade

The talk will conrain a short survey of results related mainly to the first-order model theory.

MULTI-VALUED LOGICS AND GRÖBNER BASES

Dragana Todorić,
Matematički fakultet, Beograd

We will describe a polynomial model for modal multi-valued logics developed in the nineties by the group of authors. Then, well known applications of Gröbner bases technique to the above model will be discussed.

ALEKSANDAR KRON IN RELEVANCE LOGIC

Slobodan Vujošević
University of Motenegro, Podgorica

We survey of the main results of Alexandar Kron in relevance logic.

A BRIEF HISTORY OF THE LOGIC SEMINAR IN SERBIA

Đorđe Vukomanović
Faculty of Civil Engineering, Belgrade

The Seminar for Algebra and Logic was founded in 1965 by a group of mathematicians and philosophers headed by Slaviša Prešić and Aleksandar Kron within the framework of the Faculty of Sciences and Mathematics of the University of Belgrade. In 1970 the Seminar changed its name into the Seminar for Mathematical Logic and has come under the authority of the Mathematical Institute of the Serbian Academy of Sciences and Arts. Before 1965 the logic in Serbia was considered as a very traditional discipline and the 19th and 20th centuries logic heritage was pushed into the margins and ignored.Owing to the merit of the Seminar, Mathematical Logic became the part of under-graduated and graduated mathematical and philosophical curriculums. It can be said, without exaggeration, that the world level in the development of the modern logic in Serbia at present is connected with the Seminar activities. From the beginning, the Seminar has been opened for topics from those scientific and philosophical disciplines to which the results and/or methods of Mathematical Logic can be applied. The Seminar always welcomes people from other institutions (in former Yugoslavia) and foreign countries, as well. About fifty world renowned logicians, mathematicians, computer scientists and philosophers have given lectures at the Seminar, among them: Tarski, Jech, Arhangelskii, Keisler, Burgess, Henkin, van Benthem, Dragalin, Barendregt, Todorčević. Finally, the Seminar is directly or indirectly responsible for more than a hundred M.Sc. and Ph.D. theses from Logic and related disciplines which were defended in Serbia or abroad.