

Newsletter



for the History of Science in Southeastern Europe

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ABACUS: ASPECTS OF COMPUTERS HISTORY IN GREECE



Organised by the *Institute for Neohellenic Research* of the *National Hellenic Research Foundation* and the *Laboratory of Science Didactics & Epistemology and Educational Technology* of the *Department of Education- University of Athens* in the frame of the EU funded programme *Hephaestus*, an educational exhibition under the title “*Abacus | Aspects of Computers History in Greece*”, was presented in the premises of *NHRF* in Athens from 6th of December 2011 till the end of January 2012 and is now travelling as a mobile exhibition unit in other destinations over the country.

The exhibition “*Abacus | Aspects of Computers History in Greece*”, was an attempt to showcase aspects of the technological history of Greece as well as issues related to scientific and technological heritage. Through the history of calculating machines and the subjects who create and manage them unravels the country’s social and economic history, the role of technological equipment and innovation, collective ideas and national guidelines are denoted.

Measurement and calculation appear very early in the history of human civilizations, and, from the beginning, measurement was associated with the efforts of man to create computational tools. Different creatures in every culture, the tools and instruments of calculation gives a series of information on social and economic organization of societies, on systematization of knowledge and on the cultural capital of each



formation.

With this insight, Abacus, ruler, compass and astrolabe, mechanisms with gears, slide rule and automation were implemented in the frame of the Abacus exhibition as steps towards an interesting route, which includes calculator and analog or electronic modern computers.

The exhibition was designed according a museological scenario developing in four units:

Calculating with Abacus & Gears

Punched cards & Electronic Probes /

Computing Machines in Greece 1920-1970

Personal computers & National Strategies /
Greece 1970-1980

And one devoted to the establishment and development of the National Documentation Centre (EKT) under the title From large Greek databases to open digital content.

Exhibits were used mainly as starting points and occasions for further discussion on each era's technological and cultural capital, development attitudes and strategies, level of state infrastructure.

Thus a clear and simple design was promoted with the formation of four modules with distinct colours as thematic eye guidance from panels and a series of five key - showcases. Alongside, electronic devises mainly from the 1980 decade were exhibited together with a quite complete unit on publication on IT and computers. A precious hand made network plan from 1946, rare photographic and audiovisual material.

The Abacus exhibition had a strong educational character, accompanied by Educational Programme with three Activities Workshop for school groups and young audiences entitled *Constructions with Gears, Symbols, Codes and Cryptography and The Algorithm* which was the *Little Red Hood*.

Printed material was published, a bilingual Greek – English catalogue and an educational

portfolio for children including an exhibition guide and Activity Working Sheets.

As an educational attempt, the Abacus exhibition has a vivid social profile: It stands as a procedure to help in communicating science to society, to explore creative learning practices and to promote social awareness, especially of children and young people in matters concerning the scientific and technological heritage.

ANTIKYTHERA MECHANISM IN PARIS

The Musée des Arts et Métiers (Museum of Arts and Crafts) in Paris is hosting the adaptation of the initial “Antikythera Mechanism” exhibition which took place in Athens. Its title is “Anticythère, l’énigmatique machine surgie du fond des temps” and it will run until the end of July 2013.



The entrance of the exhibition

The exhibition is located at the beginning of the permanent collections of the Museum. The first part of the exhibition offers visitors a 3D film about 8 minutes length, directed by Philippe Nicolet, which narrates the history of discovery of the Antikythera wreck, the treasure and the Mechanism, by sponge divers off the coast



A decorated planetarium from CNAM collection

of Antikythera. It also explains the functions of this device and present a modern clock inspired by the Antikythera Mechanism, built by Swiss manufacturer Hublot. Next to the 3D screen there is a stand for viewing the mechanism of a watch designed by the Swiss watch-maker Hublot.

Using a small high definition camera, the visitor explores the minute details of the movement which simultaneously broadcast on a big screen.

A separation wall with motives of luni-solar cycles leads to the model of the of the Antikythera Mechanism designed and built at the University of Thessaloniki, which introduces this space dedicated to clock-making, immersed in a blue world half aquatic, half terrestrial, and in a warm and enveloping abstract sound of mechanical watches and clocks. There, the visitor will discover clocks nestled behind a gangue. The mechanism of a clock will move again especially for the occasion, visitors will discover the astronomical clockworks from the sixteenth to the nineteenth centuries.

The exhibition was produced in partnership between the Musée des Arts et Métiers and the National Hellenic Research Foundation (Project Hephaestus, FP7 REGPOT 2008-1 funded by the European Union), in collaboration with the National Archaeological Museum (Athens, Greece) and the Antikythera Mechanism Research Project. The exhibition is under the auspices of the Permanent Delegation of Greece to UNESCO and was sponsored by the watch manufacturer Hublot (Geneva).

The exhibition movie can be watched online at <http://nvp3d.com/en/antikythera-mechanism-the-fingerprints-of-genius>

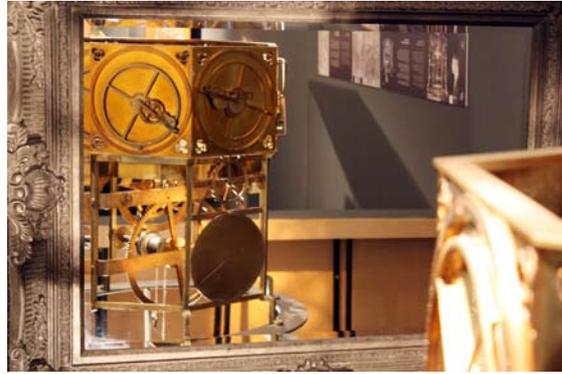
LES HORLOGRES DU CIEL

L'embarcadère du savoir, Liège



A view of the exhibition

The exhibition “Watchmakers of the sky” took place from September 15 to December 15 2011 at the Museum “L’Embarcadère du savoir” in Liège, and presented astronomical calculators and clocks from the Mechanism of Antikythera until the 20th century. The public discovered exceptional pieces, among which two models



Dondi's Astrarium designed by Emmanuel Poulle

of the Antikythera mechanism, astrolabes and other astronomical instruments to measure time of the writer Max Elskamp, the reconstruction of the Astrarium of Dondi (14th c.), an astronomical clock of the Liège watchmaker Hubert Sarton (18th century), an astronomical clock of the clockmakers school of Liège and other precious exhibits. The exhibition was not organized in Liège by chance. Liège is today the epicenter of an international pole of basic and applied research, and industrial activities. Astronomical observations are made in Liège since the middle ages. To this “astronomical tradition” can be added the tradition, born in the 18th century, of goldsmiths and watchmakers capable of designing astronomical precision mechanisms, a tradition that continues today in technical schools of the city.



Michael Wright and Robert Halleux in front of the Antikythera models

The city of Liège possesses a superb collection of astronomical artifacts, including planetaria reproducing the solar system and several former astrolabes. This collection, bequeathed by the writer Max Elskamp to the city, is exceptionally out of the reserves of the Musée de la vie Wallonne to be presented at the exhibition. The exhibits of multiple origins (France, United Kingdom, Denmark, Italy...),



Jean-Marie Bouqueneau and Carole Champenois at work.

date from different periods. The oldest is a Gothic style astrolabe and dates from the 13th century while the more recent planetaria date from the late 19th century.

It took 15 years to Giovanni Dondi (1318-1389) to build the technological masterpiece of its time, the Astrarium (planetary clock), considered as a new wonder of the world. The clock indicated time, the days, the months, the position of the Sun, the Moon, the movement of the planets and marked the solstices and the equinoxes. Unfortunately, the Astrarium traces are lost from the 16th century. The very precise and illustrated treaty on its construction written by Dondi allowed experts to reconstruct it. There model presented at the exhibition belongs to the Observatory of Paris and was made following the instructions of the famous specialist of Renaissance astronomy, Emmanuel Poulle.

The Satron clock, dated 1795, is part of the permanent collections of the Museum Grand Curtius. It is the work of the great watchmaker of Liège Hubert Sarton. Mounted on black marble covered in gold leaf, this superb astronomical clock has several dials in white enamel. Each has its specificity: the central dial shows on the month, the date, and the hour; other dials indicate the phases of the Moon, solar hours in



Yaël Nazé with a young visitor of the exhibition

53 different places around the Earth, the hours of sunrise and sunset. The Sarton clock is a beautiful sample of the type of astronomical clocks used in the 18th century.

Two Antikythera models were presented: the model of Professor Kyriakos Efstathiou (Aristotle University of Thessalonika) and of the specialist of mechanisms Michael Wright.

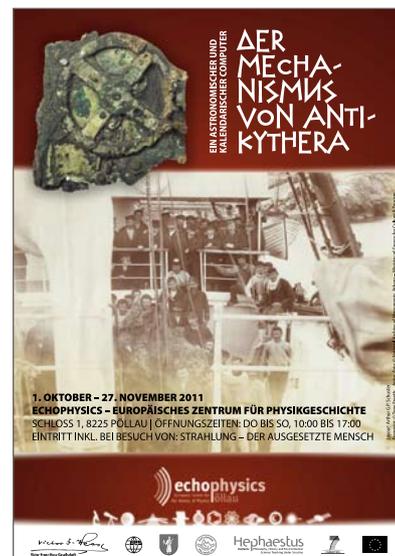
The exhibition was free for the public and guided tours were organized for groups. Workshops for the solar system for young people and the public were organized at the Maison de la Science, and a public conference on the Mechanism of Antikythera by Efthymios Nicolaidis and Michael Wright took place at September 17th. Michael Wright, a worldwide known specialist of the Antikythera mechanism presented all the details of his model to the public.

The exhibition was designed by Efthymios Nicolaidis (HPST, INR/NHRF) and Yaël Nazé (astrophysicist, FNRS-Univ. of Liège). It was made possible due to the efforts of Jean-Marie Bouqueneau, administrator of the “Emarcadère du savoir”, Robert Halleux, director of the CHST-Univ. of Liège and Carole Champenois, responsible of the exhibitions of the Museum. It was sponsored by Hephaestus project and the Province of Liège.

The booklet of the exhibition can be found at: http://www.ulg.ac.be/upload/docs/application/pdf/2011-09/horlogers_du_ciel-dossier.pdf

ANTIKYTHERA MECHANISM IN POELLAU

Exhibition “Antikythera Mechanism der erste Computer der Welt“, Poellau, Austria



The exhibition “Antikythera Mechanism” took place from October 1 to November 27 2011 at the European Center for the History of Physics (ECHOPHYSICS), Poellau Castle, 8225 Poellau, Austria. It presented a fully developed exhibition of the Antikythera Mechanism, e.g. details of its discovery, models developed through the 20th century for the explanation of its function, the latest analysis with high technology of its inscriptions etc.. The exhibition was organized in Poellau because there exists the first organized European Center for the History of Physics with already significant activities in the field. Among them the organization of a permanent exhibition of scientific instruments from the 18th to 20th century and a lot of archival material about Austrian scientists in general and the Austrian Nobel laureate Victor Hess in particular (see www.echophysics.org)



An Antikythera model was presented and it was the central item of the exhibition causing admiration from the visitors. The exhibition was free for the public and guided tours were organized for groups. A grand opening took place where Austrian political authorities and members of the Austrian academia were present. Dr. George N. Vlahakis who assisted in the organization of the exhibition spoke as representative of Hephaestus project while Prof. Dr. Walter Bauer, Universität Salzburg gave a very detailed lecture titled “Der Mechanismus von Antikythera - Der erste Computer der Welt!”

The curator of the exhibition was Dr. Peter Schuster, Chairperson of the History of Physics Group of the European Physical Society and President of the Victor Hess Society. The exhibition was sponsored by Hephaestus project.

The exhibition was a great success as during the relatively short period it remained open more than 5000 people and students have visited it.

A brochure about the Antikythera Mechanism was published in German as well as a poster about the exhibition.

ANTIKYTHERA MECHANISM IN MAX PLANCK



Hephaestus project organized, in collaboration with the Max Planck Institute for the History of Science - Department I (Director: Prof. Dr. Jürgen Renn), an exhibition on the Antikythera Mechanism. From MPI responsible was Dr. Matteo Vallerianni. The exhibition took place from December 1, 2011 to January 31, 2012 at the building of the MPI for the History of Science in Dahlem, Berlin. A webpage of the exhibition was created and several visual materials have been presented on-line.

The central piece of the exhibition was a working model of the mechanism which attracted the admiration and interest of the visitors. The story of the way the mechanism was discovered, how it works and the last research results about the mechanism were presented through a series of posters and videos. Furthermore several other exhibits connected with the mechanism were also exhibited.

As the mechanism is a unique piece in the history of ancient science and technology, the exhibition has been received with much interest by the MPI and Berlin scholars and it attracted many visitors. Berlin exhibition was a successful one in the series of the exhibitions of the Antikythera Mechanism all over the world, organized by Hephaestus.

A brochure in German was edited and offered to the visitors.

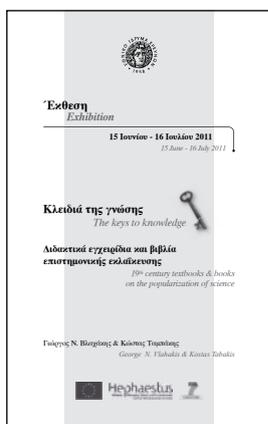
THE KEYS OF KNOWLEDGE

15 June – 16 July 2011

NHRF, Athens

The exhibition was organized by George Vlahakis and Kostas Tampakis, and sponsored by Hephaestus project, FP7, capacities, RegPot-1, 2008.

In the exhibition, visitors had the chance



to see a series of science textbooks, collected from various periods and various countries. As the title of the exhibition asserts, its goal was to present textbooks not only as keys of knowledge, but also as objects, products of technology, artistic creations and scientific artefacts.

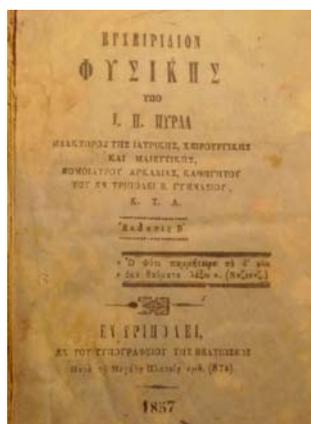
Care was taken to include exhibits from many European areas and languages, as well as from North America.

The 19th century was a century of changes and revolutions, which did not leave the sciences untouched. Many of the theories now forming the foundations of the natural sciences were first articulated or discovered during that period. In Physics, classical mechanics acquired their final mathematical formalism, electromagnetism was formulated and thermodynamics was established as the study of the flow and conversion of energy. The Periodic Table transformed chemistry, as did the reemergence of the atomic theory and the first artificial synthesis of an organic compound. Natural History was slowly replaced by Biology, while the theory of natural selection shook the entire western worldview. Finally, Geology and Astronomy enjoyed a series of theoretical and observational triumphs. Even beyond the many theoretical and technological advances, the 19th century also witnessed a change in the institutional and vocational aspects of scientific practice. The professional scientist, the notion of academic research, the specific differentiation between scientific disciplines and the specialized laboratories were all products of this period.

A concurrent, but not as famous, revolution was also taking place in education. For the first time, European and other states, Greece among them, were establishing public systems of education, which in theory were open to all. At the same time, the pedagogical theories of Pestalozzi, Herbart and Bell were appropriated across the western world, in the fertile soil created by the demands for a wider education. Newly appearing states and recognized superpowers of the era were establishing or rejuvenating educational institutions and legislations. An example is what we today would recognize as secondary education, which spread and became public during the 19th century. In the German

lands, in the same period, a series of educational innovations, such as research seminars and the secondary-tertiary education conjunction changed educational and scientific practice. By the end of the century, they were widely copied in Europe and America.

In the center of all these developments the science textbooks are to be found. The creation and publishing of a textbook requires a series of considerations. In the first place, it is a scientific act, which requires an author who has the authority to write on the particular subject. It is also an educational act, since a textbook by definition must be used in teaching, whether the author intends it to or not. Finally, publishing is an economical and technological act, which is defined by the printing capabilities of the era and by the economical and social status of the target audience, and thus of society as a whole. And yet, the traditional point of view would have textbooks confined to be “the last existential act” of a scientific community. Their importance, if any, is seen to be drawn by their universality or from the author’s prestige. Their role is assumed to only be the transfer of static knowledge from place to place and from subject to subject. They must thus be by nature conservative in their content, since their goal is considered to be the presentation of what is widely accepted and not to influence scientific research.



This exhibition has as a goal to contribute in the reexamination of these implicit assumptions in the study of textbooks. Recent historical and philosophical investigations have brought to the fore the plethora of roles and practices in

which textbooks are immersed. The famous Scientific Revolution was in part made possible by the spread of the printing press, which allowed for a rapid and affordable reproduction of textbooks. Even more, from the Renaissance onwards, if not earlier, the differentiation between textbooks, monographs and manuals was not at all self evident. Landmarks of thought, such as Newton’s *Principia* or Lavoisier’s *Traité élémentaire de chimie* are not easy to label, nor has their role been univocal in different contexts.

In many cases, they were attacked, or accepted specifically because they also had an educational function. In the same vein, it has become apparent that the process of translation and reissue of science manuals explicitly educational, such as the various Physics of Ganot, in different languages, was something far more complex than a simple transcription. Each such publication was accompanied by changes in the layout, context and, in many cases, the content itself. Different editions rendered different epistemic depictions of the same science. Each textbook acted as a powerful node within the network of scientific practice formed in each country, since it signified the acquisition of recognition and financial gains by the author or translator and the authority to put forth an opinion on the status of each discipline. Finally, textbooks were often used as arguments in debates on modernization, on science's national role or in the delineation of the identity of the scientist, still a newly emerged professional in the 19th century.

PHYSICS AND MATHEMATICS IN THE BALKANS

Dissemination and development

Symposium

17-18 October 2011, Sofia, Bulgaria

Symposium dedicated to the 100th anniversary of superconductivity, 115 anniversary of Georgi Nadjakov, and anniversaries of many prominent physicists was held in the Institute of Solid State Physics at the Bulgarian Academy of Sciences (17-18 October 2011). The decision of the Scientific Council (Protocol № 43 of 9 December 2010) gave start to the theme "Dissemination and development of physics and mathematics on the Balkans".

Organizers of the symposium were the Institute of Solid State Physics, Institute for Nuclear Research and Nuclear Energy, Institute for Balkan Studies and Center of Thracology – BAS, and the three unions: of the scientists, of the mathematicians and of the physicists in Bulgaria. Professor George Vlahakis from the Greek Open University, Prof. D.Sc. Peter Popivanov (member of BAS), Prof. D.Sc. Damyan Damyanov president of the Union of scientists in Bulgaria (corresponding member of BAS), Prof. D.Sc. Lozan Spasov (corresponding member of BAS), Prof. Nikola Balabanov and Assoc. Prof. Dr. Alexandre Kostov joined to the programme committee. Symposium was organized successfully thanks to the skillful leadership of Prof. D.Sc. Alexander G. Petrov

(member of BAS), chairman of the programme and organizing committee. Members of the Organising committee were: Prof. D. Sc. Nikolay Tonchev, Assoc. Prof. Dr. Plamen Mateev, Assoc. Prof. Dr. Milcho Tsvetkov, Penka Lazarova, and Dr. Milen Zamfirov. Radostina Kamburova was the second secretary.

Scientists from Greece and Macedonia responded our invitation. The deadline for abstracts (15 August 2011) was extended. By the end of September, 29 authors proposed 36 reports. Because there were more than one report from some authors (Krum Kolentsov – 7; Dr. M. Zamfirov – 6; I. Azmanov – 3, etc.) we decided each participant to give only one report, and the rest papers to be posters. Five participants failed to come for health and financial reasons (Dr. Manolis Kartsonakis, Prof. D.Sc. Elena Vateva, Prof. Asparuh Petrakiev, Dr. Milen Zamfirov, Prof. Grozio Stanilov). Twenty one authors took part in the symposium. They presented 21 reports and 7 posters.

Special guest of the symposium was Dr. Peter Maria Schuster director of the European centre for the history of physics Echophysics, president of the Group for "History of physics" at the European physical society (EPS). He gave away his book "Moving the stars" to Professor D.Sc. A. G. Petrov. Dr. Peter M. Schuster congratulated the hosts and guests of the symposium and talks about the significance of the history of physics and for upcoming events in 2012.

Dr. Peter M. Schuster chaired the first session. In it, Professor George Vlahakis and Dr. Ts. Sofronieva (from the Max Planck Institute for history of science) showed Pierre Beron (1798 – 1871) as a typical 19th century over national Balkan savant. Professor Victor Urumov and Dr. Alexander Gyurchinovski from the University in Skopje, Macedonia analyzed the presence of the Balkan countries in modern databases. Dr. Maria Terdimou examined the introduction of European mathematics in the Greek intellectual world in the 18th century.

Other chairmans of the sessions were Professor George Vlahakis, Professor Viktor Urumov, Professor D.Sc. Chavdar Palev (member of BAS), Prof. D.Sc. Savcho Tinchev, Assoc. Prof. Dr. Alexandre Kostov and Penka Lazarova.

The program of the symposium included two sessions in English and four sessions in Bulgarian language. Plenary lecture was proposed by Professor D.Sc. Chavdar Palev for the first time. The invited lecturer Professor D.Sc. Ivan Todorov (member of BAS), fascinates us with

the story about forgotten founder of quantum mechanics Pascual Jordan. The thematic sessions were devoted to: a) history of physics and mathematics in the 16-19 century, b) 100 years superconductivity c) Georgi Nadjakov memorial session d) biographical session, and e) some special scientific topics.

Chairman of the session dedicated to 100th anniversary of superconductivity was Prof. D.Sc. Savcho Tinchev. From the five reports in this session the most inspired and strong was the report of Prof. D.Sc. Todor Mishonov. Huge number students came to listen him. For a short time hall 300 was full. Professor Janko Dimitriev from the Chemical Technology and Metallurgy University in Sofia and Dr. Timur Nurgaliev from the Laboratory of superconductivity and cryoelectronics at the Institute of electronics – BAS gave their presentations for the research on high temperature superconductivity in Bulgaria. From the Institute of solid state physics, Professor Dr. Vasil Lovchinov presented the history of cryogenics, and Assoc. Prof. Dr. Elena Nazarova supported its view about the history of superconductivity in Bulgaria.

Assoc. Prof. Dr. Nadejda Nancheva from the Russe University told us the story about the education of physics in Ruse. Assoc. Prof. Dr. Plamen Mateev and Assoc. Prof. Dr. Maroussia Slavtchova-Bojkova from the Faculty of mathematics and informatics at the Sofia University presented their study of the history of the Mathematical institute at the University.

Professor Nicola Balabanov from the Plovdiv University presented a unified theory of Croatian scientist Rudjer Boskovic (1711 - 1787) on the occasion of the 300th anniversary of his birth. Alexander Karastoyanov turned face to the problems of the century to mark the 100th anniversary of Prof. Assene Datzeff (member of BAS). Liliana Yourukova talked about achievements of Prof. Razum Andrejchin. Assoc. Prof. Dr. Nedialka Stoilova from the Institute for Nuclear Research and Nuclear Energy – BAS presented emotional her memoirs and assessments for Prof. Christo Yankov Christov (member of BAS). The little-known founder of optical education and the optical instrumentation in Bulgaria Petko Popov was the subject of the report of Alexander Bankov. Assoc. Prof. Dr. Ekaterina Radeva from ISSP – BAS showed applications of organosilicon plasma polymers in electroluminescent display structures.

The session devoted to Georgi Nadjakov included memoirs of Assoc. Prof. Krum Kolentsov, Assoc. Prof. Dr. Stefan Balabanov

and Iskren Azmanov. Heirs of Georgi Nadjakov – his daughter Assoc. Prof. Dr. Elka Nadjakova and her husband Nikola Nikolov – gave digital version of documentary film about Georgi Nadjakov created during his lifetime. The symposium began with the film and floral tributes to the monument of Georgi Nadjakov.

We are thankful to the Institute for Nuclear Research and Nuclear Energy for the good sound in the hall 300. Concomitant event of the symposium was exhibition. It aimed to show products of the private companies in using advanced physics technologies. In the exhibition Isma Ltd was presents new “Coronary bench system” for the treatment of cardiovascular diseases.

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NEWS FROM CROATIA

*Promotion of the 3rd edition of the book on
modern experimental physics and philosophy
in Croatia*

*A cultural event within the symposium:
From Petrić to Bošković: Changes in the
Philosophy of Nature
September 21 – 24, 2011
Cres, Croatia*

The 3rd edition of the book *Experimental physics and theory of knowledge*, published by Školska knjiga (School Book – one of the greatest publisher in Croatia, located at Zagreb), has been presented as the scientific-cultural event of the symposium “*From Petric to Boscovich: Changes in the Philosophy of Nature*” held at September 21-24, 2011, at the town of Cres, Croatia. The author is *Tomislav Petković*, a scientist and philosopher from the University of Zagreb known in the domain of philosophy and history of science and technology. An unique series of the books was published in the last 20 years by the same publisher and by the same author, according to the following dynamics: *Modern Experimental Physics and the Theory of Knowledge* (1st ed. 1990, in Croatian), *Experimental Physics and Theory of Knowledge* (2nd ed. 2005, with Meaning of Acronyms and Glossary, chapter summaries in Croatian and English, in Croatian), and *Experimental physics and theory of knowledge*, Including Meaning of Acronyms and Glossary, Name Index and Subject Index, and Book summary in English;



Postscriptum to the 3rd edition: A lecture on the precision experiments of the Standard Model and new expected physics at the LHC at CERN, *Školska knjiga*, 3rd revised edition (in Croatian), Zagreb 2011. An associated photo shows an opening of the presentation: Prof. *Ivica Martinović*, PhD, president of the Programme Committee of the symposium, opens the event whereas the 3rd edition of the book is at the bottom (September 22, 2011, Town of Cres).

The 2nd edition of the book publisher *Školska knjiga* dedicated to celebration of the *World Year of Physics 2005* in Croatia, according to the 100th anniversary of the Einstein's 1905 miraculous year in 2005. However, the 3rd edition *Školska knjiga* published on the occasion of the 300th anniversary of the *Boscovich's birth*, in the light of the *Boscovich's year 2011* in Croatia and in the World. Therefore, a special acknowledgment goes to the publisher *Školska knjiga* (www.skolskajniga.hr) and to the editor of the book (*Jelena Lončarić*), who decided to publish the book which reconciles modern experimental physics and philosophy with great achievement of *Boscovich* and his legacy important for the modern particle physics picture of the Nature. *Rogierus J. Bošković* comprehended - on the shoulders of *Newton* and *Leibniz*, also *Descartes*, *Plato* and *Aristotle* - the *single universal law of forces* in the 18th century [*vérité de raison*], as the draft for *theory of everything* which is important in the 20th as well as in the 21st history and evolution of modern physics.

A remark of gratitude goes also to the Dean's Office of the Faculty of Electrical Engineering and Computing (FER) of the University of Zagreb, particularly to the Dean Prof. *Nedjeljko Perić*, PhD, since the significant financial support '*Ex beneficio decano*' provided the 3rd edition to be possible. A support given to publisher *Školska knjiga* is along the permanent pedagogical care of the FER for the students, for their inquiring

for the new knowledge and actual results in the field of high energy physics and high speed information technology. Experimental physics at the high energies produces an interesting world of subatomic particles at the smallest laboratory distances (about 10⁻¹⁸ m) and, therefore, our theory of knowledge and ontology have to be modernised. A new philosophical concepts and epistemological flows in philosophy, together with an experimental and theoretical physics, required publication of the revised 3rd (higher) edition of *Experimental physics and theory of knowledge*. It is based on the journal papers in physics and technology, with a great respect 'to the leading edge' of science and technology and their mutual interactions. The outstanding characteristics of the book are didactic tools, such the *Acronyms* and *Glossary* which count both 75 items. Seven among them: detectors, energy, ether, ionization chamber, cosmology, theory of knowledge, science and knowledge, were elaborated over more than one standard page of the book.

Key words or notion of the book: Paradigm of theory of knowledge, Modern physics and philosophy, Searching for the truth, Basic physics experiments, Accelerator's experiments, Nuclear physics, Few-Body physics, Philosophy and techniques, Quantum mechanics, Standard model, New physics at the LHC, Unification of physics, Modern synthesis of experiments and knowledge

A reviewer of the 3rd edition was Professor *Marko Uršič*, PhD, from the Philosophical Faculty of the University of Ljubljana, Slovenia, well known philosopher and historian. He wrote a remarkable and brief review on the book. His review on the 3rd edition is included as the *Supplement* to the present report.

Tomislav Petković

Tomislav Petković
FER, University of Zagreb, CROATIA
& Member of the Editorial Board of *Almagest*

EXPERIMENTAL PHYSICS AND THEORY OF KNOWLEDGE

Prof. dr. Tomislav Petković
Ekperimentalna fizika i spoznajna teorija
treće izdanje, 2010

Prof. *Tomislav Petković* is among those few contemporary scientists – at least in our own, Middle-European region – who are active philosophers next to their main scientific work in “hard sciences”. He is an expert in scientific,

mathematical and experimental methods on the one hand, and philosophical, epistemological, conceptual analysis on the other. The principle intention of this book is to build bridges between physics and philosophy. In this way, the main methodological problem is to find an appropriate *language* which would enable not only superficial, but really constructive connections between scientific and philosophical theories. Petković combines very successfully the formal language on the one hand, and the philosophical discourse on the other.

From the didactical point of view – and this book is supposed to be at least so much didactic for students as informative for a wider circle of intellectuals – the author of such a work is confronted with the question how much formal apparatus, how many formulas should be included. The extreme attitude of Stephen Hawking, the author of the famous book *A Brief History of Time*, is well-known: he said that every formula in a popular book on science would halve the number of readers. But this abstinence of the formal approach is probably not the best solution, and other authors of scientific bestsellers (for example, Roger Penrose, Steven Weinberg, Martin Rees, Brian Greene and others, actually also Hawking in his later books) do include some formal apparatus – in order to be *better understood*. So, Tomislav Petković also includes in his book quite a lot of formal explanations, and I think that this approach is appropriate for the discussed topics.

Next principal problem in writing philosophical books about science is a choice of a proper philosophical, conceptual “reference frame”, i.e., what philosophical method would be appropriate: analytical, phenomenological, historical, dialectical? Petković presents and proposes several different philosophical “frames of reference”, however, the main philosophical method of this book is the analytic philosophy in the broad sense, which is probably the best candidate for considering most issues in the epistemology of science.

The appendix (*Postscriptum*) in the new edition is interesting and useful for the reader. On the one hand it presents recent research in the field of particle physics in the giant LHC machine in CERN, and on the other hand it is a philosophical, epistemological study of these scientific investigations, especially from the point of view of Thomas Kuhn, so that the essential question is discussed here (not definitely solved, of course), whether these new experimental and theoretical achievements open

the way to a new scientific “paradigma”.

I highly recommend the new, extended edition of Petković’s *Experimentalna fizika i spoznajna teorija* for print. It is an interesting reading for specialists in the philosophy of science, useful for postgraduate and graduate students of sciences and humanities, and informative also for a broader circle of readers.

*Prof. dr. Marko Uršič, Filozofska fakulteta
Ljubljana, 22. 12. 2010.*

A COSMIC CLOCK

*Aleksandar Petrovic, Canon of the Ice Age
(Канон ледникового периода)
Institute for the History of Science and
Technology of the Russian Academy of
Sciences, St. Petersburg 2011, pp 132. ISBN
978-5-98187-741-4*



In late 2011, the Institute for the History of Science and Technology of the Russian Academy of Sciences in St. Petersburg published a book *Canon of the Ice Age* (*Канон ледникового периода*) by the University of Belgrade professor Aleksandar Petrovic. The book consists of seven chapters that illustrate the historical development of Milankovitch’s mathematical theory of climate and his struggle to prove that the underlying basis of the dynamics of climate change are astronomical causes that bring into harmony celestial mechanics and geological records. This is now fully accepted in paleoclimatology, but Milankovitch had to traverse a thorny path, as his approach was challenged by the greatest European authorities in climatology at that time, among whom were Julius Han and Albrecht Penk.

This book by Aleksandar Petrović is important because it connects Milankovitch’s life path, his family history and his struggle for the preservation of Serbian historical identity

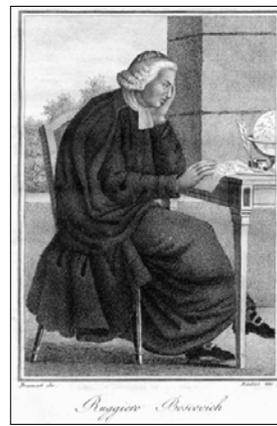
in the Habsburg Monarchy with his theoretical work that also took place largely during the war years. The history of science recalls not many works similar to the Milankovitch's *Canon of Insolation* (1941) which raised itself to a purified canonical expression. Milankovitch's solution of the periodic arrival of ice ages is a part of a big cosmic picture associated not only with the relations of the Earth, but also with all other planets and the Sun. It brings us back to an image of the Sun that governs over climate as a key condition of maintaining life. Aleksandar Petrovic notes that Milankovitch's theory, after those of Aristarchus and Copernicus, is the third large heliocentric theory. Petrovic thoroughly and logically shows that Milankovitch, analyzing Pleistocene ice ages, created a great unifying climatology of the planets of the Solar System, giving the principles of climate modeling, along with a new mathematical expression of heliocentric theory. Based on this Milankovitch's theory, a great insight into the conformity among loess and ocean sediments, and among loess sediments on different continents was achieved. Thus Milankovitch's cycles are actually clocks by which cosmic and geological times are wound. By pointing to this in his study, Aleksandar Petrovic brought Milankovitch even closer to the global audience and exposed him more to the culture from which he originated. *Канон ледникового периода* truly conveys an authentic vision of the work of Milankovitch that represents a significant date in the history of science.

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BOSCOVICH IN BELGRADE AND ST. PETERSBURG

Serbian – Italian Conference on Roger Joseph Boscovich
Serbian Academy of Science and Arts,
November 2011

In 2011 was celebrated all around Europe 300th year from the birth of philosopher, astronomer, mathematician, natural scientist, engineer and inventor Roger Joseph Boscovich. In the *Encyclopedia Britannica* about Boskovic it is written: "Serbo-Croatian RUDJER JOSIP BOSKOVIC (b. May 18, 1711, Ragusa, Dalmatia, Venetian territory [now Dubrovnik, Croatia]--d. Feb. 13, 1787, Milan [Italy]), astronomer and mathematician who gave the first geometric procedure for determining the



equator of a rotating planet from three observations of a surface feature and for computing the orbit of a planet from three observations of its position. Boscovich's father was a Serbian (converted from Eastern Orthodoxy to Roman Catholicism), and his mother was

Italian. He entered the Society of Jesus (Jesuits) in 1726 and studied mathematics and physics at the Collegium Romanum, Rome, where he was appointed professor of mathematics in 1740. One of the first scientists of continental Europe to accept Isaac Newton's gravitational theory, he published nearly 70 papers on optics, astronomy, gravitation, meteorology, and trigonometry."

Joining pan-European celebration Serbian Academy of Science and Arts with Astronomical Observatory in November 2011 organized Serbian – Italian conference on the life and work of Boskovic. President of the Scientific Board was Dr. Zoran Knezevic, member of SASA and director of the Observatory. Participants and their papers were: Dr Giovanni Pareschi, *Bošković as a founder of the Brera Astronomical Observatory*, academician Đorđe Šijački *The Ruđer Bošković fundamental forces law – a challenge for XX century physics*, Dr Rade Hajdin Ruđer Bošković: *Founder of Modern Civil Engineering*, Dr Branislav Jelenković Ruđer Bošković – an important figure in a long history of optics, Dr Milan Božić *Ruđer Bošković as a mathematician*, Dr Dragoslav Stoiljković *Contemporary verifications and applications of Bošković's theory of natural philosophy*, Dr Aleksandar Tomić *Synthetic view of the astronomical works of Ruđer Bošković*, Dr Paolo Battinelli *The real length of the geodetic base along Via Appia: a one century lasting quarrel*, Dr Zlata Bojović *Ruđer Bošković as a writer*, Dr Aleksandar Petrović, *Work of Ruđer Bošković in the light of history of science*.

It is also worth of mentioning that last year was celebrated also as 300th year from the birth of Mikhail Lomonosov. On that occasion Russian Academy of Science held in St. Petersburg Lomonosov Memorial Conference chaired by the Nobel Prize winner Zhores Alferov. Among other matters at the conference was

discussed relationship between Lomonosov's and Boscovich's work. In his paper *Lomonosov and Bošković: from the transit of Venus to the linguistic transition* Aleksandar Petrovic pointed out the scientific and spiritual propinquity of Mikhail Lomonosov (1711 - 1765) and Rudjer Bošković. This closeness could not be overlooked, although the two connoisseurs of the eighteenth century had a different historical background, different education in different cultural conditions. They inevitably share the ideas of Enlightenment, which at that time were on the rise throughout Europe from south to north, from Ragusa to St. Petersburg. Born in the same 1711 year they belong to the same zeitgeist that is traced by a similar thought and scientific pursuits. But their closeness remains determined not only by the general framework of the Enlightenment - though they belong to far distant areas of Europe and the Slavic world, these two savants show a similar cognitive attitude while facing the scientific issues and problems. This closeness is visible yet by a simple fact that both of them were members of St. Petersburg and Bolonian academy. And it is even more interesting because it has not been subject of the scientific research, although it is obvious that such a comparative study of Lomonosov and Bošković could deepen understanding of both scholars.

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HISTORY OF SCIENCE IN BULGARIA: THE CANCER PROBLEM

Prof. Stefan Konsuloff (1885- 1954)

In the first half of the 20th century the Sofia St. Clement of Ohrid University gave to European biological science two great scientists closely related in their creative work: Prof. Metodii Popoff – founder of the stimulation theory, and his associate Prof. Stefan Konsuloff.

From the standpoint of the stimulation theory Prof. Stefan Konsuloff carries out numerous experiments on the nature and therapy of the cancer cases published a series of articles which testify his leadership in the carcinogenesis problems in Bulgaria. Together with Prof. Dontcho Kostoff who studies tumor formations in plants called after his name "*tumors of Kostoff*", they leave deep mark in these problems.

Prof. Stefan Konsuloff publishes his first article "On the theoretical explanation of



*Prof. Stefan Konsuloff
1885, Sofia - 1954, Sofia*

treatment by raising the temperature in connection with the problem of cancer" as early as in 1926 (1). In this paper he discusses the method of the Austrian psychiatrist Julius Wagner who treats patients suffering from progressive paralysis by affecting them with malaria and achieves relatively good results. In this therapy and in other similar therapies a feverish condition of the patient is induced by increasing his temperature which provokes a healing effect. Prof. Stefan Konsuloff explains this phenomenon by the stimulation theory of Prof. Metodii Popoff.

Prof. Metodii Popoff is the first to claim that raising the temperature of the organisms can be regarded as an instrument of stimulation. His original idea is applied by Prof. Konsuloff who considers that the temperature of the patient's body can rise also without available parasites able to provoke infectious process as it occurs at the experiments with malaria pathogens: "*From the position of the before given explanation of the stimulation, this is also the explanation of the therapeutic effects of the various drugs*" (1, p. 7).

This Bulgarian scientist examines in details the problem of cancer from the viewpoint of the stimulation theory. He suggests two hypotheses about the nature of cancer: when the cause of the disease is parasitic in nature and when there is no such nature. Once assuming that cancer is of parasitic origin then in the case of progressive paralysis a therapeutic effect can be obtained by increasing the patient's temperature. The analogy in this case is large, as Prof. Konsuloff indicates.

Following the second hypothesis saying that the cancer formations are not of parasitic nature - the conclusion is that two types of cells exist in the patient's body: normal and cancer which differ in their physiology. By

applying the stimulation theory he concludes that “*cancer cells like the rest will stand without relapse the endurable by the organism increased temperature*” (1, p.15).

The question remains however whether in the life of the cell are states in which this same cell may be vulnerable to some coagulation factor. This is the time in which the kariokinetics is going on. Konsuloff cites the experiments which German scientist G. Politzer makes by exposing to X-ray a germ of Salamandra maculosa and observes positive stimulation when applying low doses while high doses provoke narcoses and death. According to Prof. Konsuloff this is due to the liquefaction of protoplasm caused by radiation. In another publication Prof. Konsuloff together with his assistant N. Gancheva establish the influence of the serum as food on the growth of transplanted tumors (4).

Of particular interest is also the article of Prof. Konsuloff concerning theory and therapy of cancer and the biological significance of cancer cachexia (3). In this article he concludes: “*In the other diseases when nutrition is better some restoration of forces may be appropriate, but this is fatal with cancer because in much stronger degree enhances the growth of cancer with all consequences that may proceed. This result is in harmony with our known delusions*” (3, p. 120): “*And also that when nutrition is poor cancer cells suffer much more then the normal ones*” (3, p.122)

As can be seen from the reviewed articles Prof. Stefan Konsuloff gives significant contribution to development of the cancer theory by applying the cellular stimulation theory of another great Bulgarian scientist – Metodii Popoff – and achieves original and satisfactory results in the therapy of the cancer formations.

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STUDIES IN OTTOMAN SCIENCE

*Publications from the Department
of the History of Science
Istanbul University, Turkey*

The journal *Osmanlı Bilimi Arastirmalari (Studies in Ottoman Science)* is currently published both online and in hard copy. All issues published so far are accessible at <http://www.iudergi.com/tr/index.php/oba/issue/archive>

The vol. XII, Nr.1 (2010) and Nr.2 (2011) of the journal gathers together articles related to the history of pharmacy in Turkey.

Vol. XII, Nr.1 (2010) – History of Pharmacy I: Pharmacists and Pharmacies

Articles: The historical ‘Sihhat’ Pharmacy at the Anadolu University Faculty of Pharmacy, Eskişehir (*Neşe Kırmır*); The final years of the Toptaşı Mental Asylum Pharmacy, 1913-1927 (*Şeref Etker*); Drugs for the Toptaşı Lunatic Asylum in Scutari: A request list compiled in 1878 by Yanko Efendi, the hospital pharmacist (*Fatih Artvinli*); Boyacıköy Pharmacy: A witness to the local history of the Bosphorus in Istanbul (*Gülten Dinç*); Long-forgotten galenic forms and medicines (*Afife Mat*); Medicinal use of apple cider: A historical compendium (*Christiane Staiger*); Cardiotonics in philately (*Ahmed Doğan Ataman*); Treatment with *Boswellia* from past to present (*Ahmed Doğan Ataman*); Turkish Pharmacists in Afghanistan: Ord. Prof. Selahattin Tandal (*Şeref Etker*); Murat Özdoğan’s Turkish pharmaceutical history collection at Pharmacy Tolga (*Ayten Arıkan*); Haldun Taner and *Fazilet Eczanesi* (The Virtue Pharmacy): A play shedding light on the Turkish history of pharmacy (*Halil Tekiner*); National archives in Turkey and their relevance to the history of pharmacy (*Zeynep Çalğan, Selen Yeğenoğlu*); Pharmacy in caricatures (*Halil Tekiner*); The

changing position of pharmacists in Turkey:
From the late Ottoman era to the present-day
(*Günseli Naymansoy*)



Toptaşı Mental Asylum Pharmacy, 1913-1927
(Coll. Ş.Etker)

Vol. XII, Nr.2 (2011) – History of Pharmacy II: Pharmaceutical Education, Research and Texts

Articles: The foreign professors in the School of Pharmacy of Istanbul University (1933-1962) (*Asuman Baytop*); The doctoral dissertations in pharmaceutical sciences in Istanbul University prior to 1983 (*Emre Dölen – Çağlar Demirbağ Usta*); The naming of pharmaceutical forms in Sabuncuoğlu Serefeddin's 'Terceme-i akrâbâdîn' (15th c.) (*Sibel Murad*); *Lugât-ı müşkilât-ı eczâ*: A seventeenth century medical and pharmaceutical dictionary (*Şaban Doğan*); *Fenn-i İspençiyari*: A textbook for pharmacy education in early 20th century Turkey (*Afife Mat*); Rudolf Stetter's *Pharmacology* and *Pharmaceutical Technology* lessons at the Ankara Higher Institute of Agriculture Veterinary Faculty (*Şeref Etker*); Addendum to Prof. Ömer Şevket Öncel's published works: The first (1920) edition of *Lessons on Analytical Chemistry, Kimya-yı Tahlili-yi Tavsiî Dersleri* (*Şeref Etker*); I wish I had an Aspirin! Reflections of Aspirin® in Turkish literature (*Halil Tekiner*); *La Revue Médico-pharmaceutique et la transmission du savoir médical européen en Turquie: Une étude sur l'année 1888* (*Feza Günergun*). Meetings: The Opening Ceremony of the Historical Building of the Faculty of Pharmacy, Istanbul University 19.12.2010 (*Feza Günergun – Afife Mat*); The Presentation Ceremony of the Asuman Baytop Festschrift, 24.02.2011. Book Review: Leigh Chipman, *The World of Pharmacy and Pharmacists in Mamlūk Cairo* (*Şeref Etker*).

Vol. XIII, Nr.1 (2011)

Articles: The Anatolian expeditions of Turhan Baytop (1920-2002) and his plant collection (*Asuman Baytop*); From workshop to gunpowder mill: Saltpetre production in



Istanbul University Observatory, 1936

Karaman province in the 18th-19th centuries (*Yunus İnce*); Nineteenth century Turkish architectural drawings: Reflections on some new examples (*Orhan Cezmi Tuncer*); Transnational 'cruising' of scholars: European astronomers in Istanbul University (1933-1958) (*Feza Günergun – Sevtap Kadioğlu*); Archeologists, anthropologists and diplomats who have collected plant specimens from Anatolia (*Asuman Baytop*); Articles in translation: Istanbul University Faculty of Sciences Regulations of 1924 (*Şeref Etker*); The Statute of the Union of Turkish Engineers and Architects established in İzmir in 1924 (*Şeref Etker*); Activity report: 2004-2009 Activities of the Department of the History of Science, Faculty of Letters, Istanbul University (*Gaye Şahinbaş Erginöz*)

KRITIKI: CRITICAL SCIENCE AND EDUCATION

Issue 11

The 11th issue of the bilingual journal *Critical science and education* was published, dated May 2011.

Contents:

Scott Gerard Prinster, "The Heresy Prosecution of Renaissance Scholars. Domenico Scandella, Giordano Bruno, and Galileo Galilei"; Nathalia Jaramillo-Peter McLaren, "Rethinking Critical Pedagogy: Socialismo Nepantla, and the Specter of Che"; Maria Pournari, "Representation, intentionality, and the epistemological problem of the other mind". Articles in Greek by Dimitrios Athanasakis, "Mass policies in Spinoza and Negri"; Christina Palliou, Erofilia Papastavrou, "Collective practices and public space: the case of December"; George Vlahakis, "The circle of the thirty. Contribution to the study of the Greek scientific community during the period between the two Wars".

Site of the journal: <http://www.hpdst.gr/el/publications/kritiki>.

ALMAGEST 2/2



The fourth volume of *Almagest, International Journal for the History of Scientific Ideas*, published in November 2011 is a volume of varia.

Contents:

Piedad Yuste, “Ancient Geometry: Thinking about how to measure the circle”, Vaios Argyrakis, “The

clepsydra experiment, clepsydra’s functioning and the related devices in Heron’s *Pneumatics*”, Vincent Jullien, “Le calcul logique de Roberval”, Maria Terdimou, “Mathematics, Greek trade and technology during the period of the Ottoman rule: three mutually connected sectors”, Kostas Tampakis, “The unrecognized mechanism: History of science education in the 19th century”, Sevtap Kadioglu and Gaye Sahinbas Erginöz, “An emigrant scientist in Istanbul University: Richard Martin Edler von Mises (1883-1953)”, Gianna Katsiampoura, “The Byzantine sciences in the first modern Greek history of science textbook: Michael Stephanides, *Introduction to the history of natural sciences*”. It also contains book reviews.

Almagest site: <http://www.hpdst.gr/publications/almagest>

INRF-NHRF AGREEMENTS

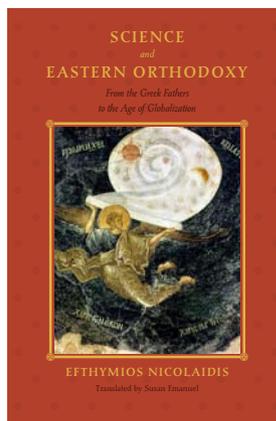
INRF-NHRF agreements with Institutes for the History of Science

The Institute for Neohellenic Research of the National Research Foundation has signed bilateral cooperation agreements in the field of history of science and technology and scientific heritage, as a result of the Hephaestus project exchanges, with the following institutions:

- Musée des arts et métiers – CNAM
- Institute for the History of Natural Science, Chinese Academy of Sciences
- Centre d’Histoire des Sciences et des Techniques de l’Université de Liège
- UFR Lettres et Langues de l’université de Nantes
- The Needham Research Institute, Cambridge, UK

SCIENCE AND EASTERN ORTHODOXY

From the Greek Fathers to the Age of Globalization
Efthymios Nicolaidis
translated by Susan Emanuel
Baltimore: The Johns Hopkins University Press, 2011



People have pondered conflicts between science and religion since at least the time of Christ. The millennia-long debate is well documented in the literature in the history and philosophy of science and religion in Western civilization. *Science*

and Eastern Orthodoxy is a departure from that vast body of work, providing the first general overview of the relationship between science and Christian Orthodoxy, the official church of the Oriental Roman Empire. This study traces a rich history over a long span of time, from Saint Basil’s *Hexameron* of the fourth century to the globalization of scientific debates in the twentieth century. Efthymios Nicolaidis argues that conflicts between science and Greek Orthodoxy—when they existed—were not science versus Christianity but rather ecclesiastical debates that traversed the whole of society. The author explains that during the Byzantine period, the Greek fathers of the church and their Byzantine followers wrestled passionately with how to reconcile their religious beliefs with the pagan science of their ancient ancestors. What, they repeatedly asked, should be the church’s official attitude toward secular knowledge? From the rise of the Ottoman Empire in the fifteenth century to its dismantling in the nineteenth century, the patriarchate of Constantinople attempted to control the scientific education of its Christian subjects, an effort complicated by the introduction of European science in the seventeenth and eighteenth centuries.

Science and Eastern Orthodoxy provides a wealth of new information concerning Orthodoxy and secular knowledge—and the reactions of the Orthodox Church to modern sciences.

*The 5th International Conference
of the E.S.H.S.*



*The 5th International Conference
of the European Society
for the History of Science
will be organized in Athens, Greece,
November 1 to November 3, 2012*

The theme of the Conference is:
**Scientific cosmopolitanism
and global culture:
religions, ideologies, societies**

Important dates:

Deadline for abstracts submissions: March 2 2012

Deadline for early registration: May 4 2012

Site of the Conference: 5eshs.hpdst.gr