



The Croatian Academy of Engineering (HATZ) is a Member of the International Council of Academies of Engineering and Technological Sciences, Inc. (CAETS), Washington DC, USA since 2000., and, starting with 2005, an Associated Member of the European Council for Applied Sciences and Engineering (Euro-CASE), Paris, France, EU

Review of the Colloquium

Development of New Technologies and Products in Croatia

Croatian Academy of Engineering, Zagreb, February 26, 2005

The Croatian economy is coming to a turning point regarding its profiling and survival on the global market. Since there have been no major investments into new technologies and the development of new products over the last 10 to 15 years, it is necessary to consider jointly the Croatian strategically important fields. Defining of the situation in the world as well as in Croatia is the basis for a directed and faster transfer of knowledge, processes and equipment and a more intensive development of Croatian own manufacturing procedures and products.

Within our scientific and university community, researches are being carried out and their results are mainly not applicable enough or not used to the full advantage of the Croatian economy. On the other hand, by the integration into the European research area we are facing the need to focus our own scientific and professional potentials, especially the research objectives, so that in the oncoming period we could make optimal and well-planned use of the EU funds, aimed also at our own economic benefit. Croatia still lacks a well-developed system for monitoring and motivating innovations, which is in all the industrially developed countries the basis for competitive viability on the market. Efficient transfer of results from scientific



Prof. Emeritus Kurt Richter, Ph.D., Honorary Member of the HATZ from Austria

research into the economy is determined, among other things, by the level of organization of the system (infrastructure) for the support and implementation of innovations, as well as for the application of results from the development and applied projects. The introductory lectures at the Conference presented the experiences of the functioning of the innovation systems in Austria, as well as the concepts, organizational structure and results of activities performed by the Croatian innovation system – HITRA. The main objective of this Conference was to show the realized projects related to the development of products and procedures regarding technical and biotechnical areas. A large number of these

projects have been financed by the MZOŠ (Ministry of Science, Education and Sports) within the HITRA system – programs TEST and RAZUM started 4 years ago.

Some of the most propulsive areas of research and development in the world are e.g.: genetic engineering and biotechnology, communication technologies and software engineering, new materials and production procedures, biomedical technology, environmental protection technologies, nanotechnologies, production for the usage of alternative energy sources, production of new food, production of new medicines, automation and robotization of manufacture, etc. Almost in every of the mentioned areas several papers were presented by the Croatian experts indicating that at least we are following and trying to adopt the advanced knowledge.

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Branka Magdalenic, Dipl. Oec., Representative of "Vindija", Inc., Varaždin, Croatia, Supporting Member of the HATZ

The information exchange of experts has indicated the possible directions of faster and well-planned development of the Croatian economy based on new knowledge, innovations, new products and procedures. The atmosphere among the participants was very optimistic, which, with the number and quality of contributions shows that critical awareness is being created and that there is an increasing number of scientists and experts who have recognized and who have the willingness and knowledge to strengthen the innovation and entrepreneurial

movement as function of the economic development. Due to the great interest and the topical issues, and on the initiative of the participants, the HATZ Presidency has decided to organize a Conference of similar form every two years.

The majority of authors of the presented papers are members of the Croatian Academy of Engineering (HATZ), which means that HATZ is ready to give incentive and to take very active part in directing the economic activities and that it is capable of assisting the economy in various ways in its high-quality development.

List of presented lectures:

- K. Richter (Austria, EU): Industrial Centres and Networks of Competence in Austria
- J. Božičević: Development of the Croatian innovation system
- H. Zorc: Program HITRA, subprogram TEST
- H. Prpić: Program HITRA, subprogram RAZUM
- M. Andrašec: Institutions of the Croatian innovation system derived from State office for standardization and metrology
- A. Carić: Program HITRA – From Ideas to Commercialization
- S. Pegan: Contemporary forms of spacial organization of the industrial locations
- N. Majdandžić: Centres for developing and applying of new production and information technologies – generator of production enterprises concurrence
- S. Car: Research and development of business activity
- N. Duić: Croatia as a knowledge exporter-drivers and barriers
- S. Risović: Technology project-from the idea to realisation
- J. Sečen: How to maintain production of the oil – domestic and international experiences
- Z. Haznadar: Technological challenges at the beginning of the 3rd Millennium
- Ž. Ilijevski: Eney and ground vehicles in the near and distant future
- V. Čorić: Maritime technique – new challenge for the Croatian oil and shipp-building industry
- K. Žiha, N. Ružinski, D. Bandula: Building of a prototype of a multipurpose vessel of a generic hull form
- V. Ferdelji: Practical experience of development new products and technologies in “Elektrokontakt”
- M. Šerčer: Development of one-fold CD-box
- T. Filetin, G. Marić, I. Kramer: Implementation of technology and application of the metal foams
- K. Čosić, M. Slamić: Applications of dual used technologies
- Z. Terze: Dynamic simulator for numeric analysis of landing of large transport aircraft
- M. Essert, B. Mauser, A. Magdić, I. Nakić: Live internet documents
- B. Salopek, G. Bedeković, I. Sobota: Solid waste comminution
- M. Kljajin: Recycling of waste from electrical and electronic equipment
- D. Katović, S. Bischof-Vukušić, J. Bartolić, S. Hrabar: Microwave device for thermal treatment of cellulose materials
- N. Frančula, M. Lapaine: Cartography and new technologies
- M. Skazlić, D. Bjegović: Perspectives of designing with new concrete types
- Ž. Skazlić, M. S. Kovačević, A. Szavits – Nossan: Soil improvement by beep vibro compaction
- V. Rajčić, I. Plavec: Project and prototype of the modern wooden family house
- J. Božičević, A. Caharija, G. Galinec, D. S. Vedrina: Assortment of the knowledge-based product developed by the researchers of the Department for measure and automatisisation process control of the Faculty of chemical engineering and technology
- V. Žiljak: Portraits on single-layer documents with 3D display
- Z. Kniewald: Genetic engineering in the food production – Croatia – “GMO-free”?
- Đ. Vasić-Rački: The novel technologies for the use of biocatalyst and biotransformations
- I. Grbac, D. Domljan: Furniture development in Croatia
- V. Živković, H. Turkulin: Improvements of surface layer by wood modification
- S. Klak, V. Koroman, B. Milković, S. Krivičić, S. Puljak, S. Sever: Third generation of medium – size forest skidder tibotrac FM 03
- J. Borošić, B. Benko: Research and development of tomato soilless culture in Croatia
- B. Novak: Sweetpotato – New vegetable in Croatia
- Ž. Nožica: A model for attracting foreign investments in system level integration in Croatia
- T. Drk Vojnović, B. Magdalenic: “Vindija” – Way to European Union
- T. Krička, Ž. Jukić, N. Voća, V. Janušić, A. Matin: Biofuels in a system of sustainable agriculture

The summaries of the papers in Croatian and English have been published in the Book of Abstracts and almost all presentations (PowerPoint) can be found on the HATZ web pages. Full papers in English will be published in the HATZ annual (“Annual 2005 of the HATZ”). Authors, but also all those interested in presenting similar topics, are kindly requested to send full papers to the HATZ Secretariat by June 25, 2005.

Prof. Tomislav Filetin, Ph. D.

Report

from the 20th Assembly (Elective) of the Croatian Academy of Engineering
Saturday, February 26, 2005 at 05:00 PM

The Agenda of the Assembly included the Report on the Activities of the Governing Board of the HATZ 2003-2005, Programme of Activities and Financial Plan of the HATZ for 2005 and the procedures of passing these documents.



Distinguished guests of the Assembly

The distinguished guests who attended the Assembly were Academician Milan Moguš, President of the Croatian Academy of Sciences and Art (HAZU), Prof. Jasna Lipozenčić, Ph. D., Vice-President of the Croatian Academy of Medical Sciences (HAMZ) and Mr. Vitezslav Schwarz, Economic Advisor at the Embassy of the Czech Republic to the Republic of Croatia.

Academician M. Moguš, President of the HAZU, addressed the members of the Assembly and the guests with greetings and congratulated HATZ on its numerous successful activities, realized both in Croatia and abroad. Prof. Jasna Lipozenčić, Ph. D., extended greetings and congratulations to the Assembly on behalf of Prof. Željko Reiner, Ph. D., President of the HAMZ. After that Prof. Vladimir Mrša, Ph. D., Dean of the Faculty of Food Technology and Biotechnology, University of Zagreb, also addressed the Assembly.



Assembly in session

Prof. Zlatko Kniewald, Ph. D., President of the HATZ, presented the Report on the Activities of the HATZ Governing Board in Croatia and abroad from July 1, 2003 to February 26, 2005 (the mandate of the current Governing Board will end on June 30, 2005). He also presented the Final Financial Report for 2004, after which the Programme of Activities and Financial Plan for 2005 were presented to the Assembly to decide upon. All documents were passed unanimously.

After the secret voting, new Governing Board of the HATZ was elected to the mandate 2005-2009: Prof. Zlatko Kniewald, Ph. D. (President of the HATZ), Prof. Branka Zovko-Cihlar, Ph. D. and Prof. Stanko Tonković, Ph. D. (Vice-Presidents of the HATZ) and Prof. Miljenko Lapaine, Ph. D. (Secretary-General of the HATZ).

The Assembly also granted the HATZ Awards for 2004 to the following candidates:

- Award for the Life Achievement “Power of Knowledge” to Prof. Marijan Bošnjak, Ph. D.,
- Annual Award “Rikard Podhorsky” to: Prof. Hildegard Auf-Franić, Ph. D., Prof. Jasna Franekić Čolić, Ph. D., Prof. Gojko Nikolić, Ph. D., Prof. Nedjeljko Perić, Ph. D. and Prof. Stanislav Sever, Ph. D.,
- Award for the Young Scientist “Vera Johanides” to: Ksenija Durgo, M. Sc., Ivica Garašić, Dipl. Eng., Assist. Prof. Mislav Grgić, Ph. D., Ante Jukić, Ph. D. and Vedran Slačanac, Ph. D.

The following candidates were elected to HATZ membership or promoted to higher categories of HATZ membership:

In the Department of Systems and Cybernetics:

- Prof. Mario Cifrek, Ph. D, Sadko Mandžuka, Ph. D. and Assist. Prof. Ivan Petrović, Ph. D. – Collaborating Members

In the Department of Architecture and Urban Planning:

- Prof. Mladen Šćitaroci-Obad, Ph. D. – Full Member
- Prof. Srećko Pegan, Ph. D. – Associate Member
- Prof. Tihomir Jukić, Ph. D. and Prof. Lenko Pleština, Ph. D. – Collaborating Members

In the Department of Information Systems:

- Prof. Nikola Rožić, Ph. D. – Full Member

In the Department of Communication Systems:

- Prof. Vladimir Lipovac, Ph. D. – Associate Member
- Assist. Prof. Krešimir Malarić, Ph. D. and Assist. Prof. Snježana Rimac-Drlje, Ph. D. – Collaborating Members

In the Department of Power Systems:

- Prof. Bernard Franković, Ph. D. – Full Member
- Prof. Ivan Viličić, Ph. D. – Collaborating Member

In the Department of Transport:

- Prof. Martin Lipičnik, Ph. D. (Slovenia) and Prof. František Palik, Ph. D. (Czech Republic) – Correspondent Members
- Prof. Emil Hnatko, Ph. D. and Prof. Ivan Županović, Ph. D. – Associate Members
- Prof. Dragan Čišić, Ph. D. and Prof. Serdo Kos, Ph. D. – Collaborating Members

In the Department of Civil Engineering and Geodesy:

- Prof. Miljenko Lapaine, Ph. D. – Full Member
- Prof. Davorin Kovačić, Ph. D. – Collaborating Member

In the Department of Mechanical Engineering and Naval Architecture:

- Prof. Jurica Sorić, Ph. D. – Associate Member
- Prof. Tonči Mikac, Ph. D. – Collaborating Member

In the Department of Chemical Engineering:

- Andrea Moguš-Milanković, Ph. D. – Collaborating Member

In the Department of Electrical Engineering and Electronics:

- Prof. Željko Štih, Ph. D. – Full Member

- Prof. Zdravko Hebel, Ph. D. and Prof. Krešimir Ćosić, Ph. D. – Associate Members
- Prof. Branislav Jajac, Ph. D. and Assist. Prof. Livio Šušnjić, Ph. D. – Collaborating Members

In the Department of Graphical Engineering:

- Assist. Prof. Klaudio Pap, Ph. D. – Collaborating Member

In the Department of Textile Technology:

- Prof. Drago Katović, Ph. D. and Prof. Dubravko Rogale, Ph. D. – Associate Members
- Prof. Đurđica Parac-Osterman, Ph. D. – Collaborating Member

Honorary Member of the HATZ:

- Prof. Emeritus Branko Ladanyi, Ph. D. (Canada)

Members Amici of the HATZ:

- Matko Bolanča, M. D. (PLIVA Croatia, Ltd., Zagreb, Croatia), Prof. Marcel Hofman, Ph. D. (Belgium) and Ivan Mravak, M. Sc. (Hrvatska elektroprivreda, Inc., Zagreb, Croatia)

Prof. Zlatko Kniewald, Ph. D.

Programme of Activities of the HATZ in 2005

1. Publishing of the HATZ Bulletin in Croatian “Tehničke znanosti” (“Engineering Sciences”)
2. Publishing of the HATZ Bulletin in English “Engineering Power”
3. Organization of the Colloquium “Development of New Technologies and Products in Croatia”
4. Organization of the Elective Assembly, presentation of the HATZ Awards: Award for the Life Achievement, Annual Award and the Award for the Young Scientist
5. Joining to CARNet and building of our own network for the HATZ members
6. Editing and publishing of “Annual 2005 of the Croatian Academy of Engineering”, containing the papers from the HATZ Colloquium “Development of New Technologies and Products in Croatia” and the updated “Who is Who in the Croatian Academy of Engineering”
7. Improving of activities of all HATZ Departments with the aim of creating our own technological affirmation in the fields encompassed by the Departments
8. Following-up, proposing and executing HATZ obligations within the CAETS
9. Following-up, proposing and executing HATZ obligations within the Euro-CASE
10. Co-organization and sponsorship at the domestic and international conferences and meetings in the fields of engineering and biotechnical sciences
11. Organization of meetings with the HATZ Supporting Members on the realization of direct co-operation and providing the advisory services of the HATZ experts
12. Implementation of the bilateral Memorandum of Agreement on Co-operation in the Fields of Engineering and Technical Sciences, signed between HATZ and the Chinese Academy of Engineering (CAE) in 2004
13. Participation at the semi-annual meetings of the Euro-CASE
14. Participation at the 16th CAETS Convocation in Cairns, Queensland, Australia, July 10-14, 2005
15. Participation of the HATZ President, Prof. Zlatko Kniewald, Ph. D., in the activities of the CAETS Board of Directors, in accordance with his mandate as a Member of the Board in 2005, which was decided upon at the CAETS Council Meeting in Stavanger, Norway, 2004
16. Completion of the environmental adaptation of the House of the HATZ and the adaptation of the HATZ Library
17. Activation of the HATZ Foundation, constitution of its Managerial Board, drawing and passing of the criteria and the Bylaws on the Activities of the Foundation
18. Drawing and signing of the agreements on sponsorship and donations with the new Supporting Members
19. Participation in the activities of harmonization of the Croatian Chamber of Engineers Act with the EU legislation
20. Co-operation with the Croatian Parliament and the Government on the programmes and activities of admission of the Republic of Croatia to the EU, NATO as well as on other obligatory international issues
21. Other current issues and activities

Prof. Stanko Tonković, Ph. D.

The HATZ Programme for Life-Long Learning

The Croatian Academy of Engineering has established its Center for Life-Long Learning, whose scope of activities shall, among others, encompass specialized seminars on various possible topics as follows:

1. Product development methods
2. Quality assurance in the production
3. Accreditation of the measurement laboratories
4. New standards (for instance, in the civil engineering or the food industry)
5. Systems of healthy food production
6. New materials and technologies
7. Nanotechnologies
8. Safety of the information systems
9. Development of furniture
10. Industrial design
11. Organization and surveillance of the complex projects
12. New graphical technologies
13. Protection of the intellectual property
14. Organization and management of small enterprises
15. Management of the production development
16. Mycrochip systems
17. Electromedical devices and equipment
18. Mechatronics
19. Food safety and quality – application of the GMO
20. Risks in food processing
21. Bioreactors and their application
22. Animal cells technology
23. Solar energy employment systems
24. Methods of decision-making
25. Transfer and implementation of modern technologies
26. Industrial business intelligence and competition analysis

27. Design of small (sports) boats and vessels
28. Organization of production clusters and newtorks

Other relevant topics may also be included in the Programme.

Organization: Development and promotion of educational issues are led by a team consisted of three HATZ members: Head of the Center and two assistants (one of them is a leader of the respective seminar, which is led as a unique project). The leader chooses teachers for the seminar and provides for its organization. The HATZ administration enables the technical support. Seminars will take place either in the House of the HATZ in Zagreb, 28 Kacic Street, Croatia, or in the institution/company of the participants. Promotive materials and special web page will be prepared for the complete programme of seminars.

Duration: Minimally 1 day (5-6 hours), maximally 5 days (25-30 hours).

Number of participants: Minimally 10, maximally 25.

Seminar expenses: 200-1000 EUR, depending on the programme, materials and the accomodation of participants during the seminar.

Prospected companies and individuals are invited to contact HATZ via e-mail: hatz@pbf.hr, with the "Subject" field specified as, for example, "Seminar 10 – Industrial design". After the seminar is successfully completed, the participants shall receive the certificate on participation at and completion of the seminar. The curricula include lectures delivered by university professors and prominent experts from the economy and industry.

Prof. Tomislav Filetin, Ph. D.

Standing Committees of the HATZ

The Assembly of the HATZ, at its 20th Session held on February 26, 2005, has constituted the following Standing Committees of the HATZ:

1. Committee for Awards

Chairman: Prof. Nikola Bogunović, Ph. D.

Members: Prof. Hildegard Auf-Franić, Ph. D., Prof. Marin Hraste, Ph. D., Prof. Milena Mandić, Ph. D., Prof. Borivoj Modlic, Ph. D., Prof. Ivo Soljačić, Ph. D. and Prof. Branka Zovko-Cihlar, Ph.D.

2. Committee for Ethics

Chairman: Prof. Marijan Bošnjak, Ph. D.

Members: Prof. Dubravka Bjegović, Ph. D., Prof. Ivan Ilić, Ph. D., Prof. Zvonimir Janović, Ph. D., Prof. Zlatko Kniewald, Ph. D., Prof. Vladimir Mikuličić, Ph. D. and Prof. Ivo Soljačić, Ph. D.

3. Committee for International Co-operation (constituted by fusion of the former Standing Committees: Com-

mittee for International Academic Co-operation and Committee for Co-operation with Scientists Abroad):

Chairlady: Prof. Jasna Kniewald, Ph. D.

Members: Prof. Zvonimir Janović, Ph. D., Prof. Srećko Pegan, Ph. D., Prof. Stanko Tonković, Ph. D. and Prof. Vilko Žiljak, Ph. D.

4. Committee for Co-operation with the Economy and Promotion

(constituted by fusion of the former Standing Committees: Committee for Promotion and Committee for Co-operation with the Economy):

Chairman: Assoc. Prof. Stjepan Car, Ph. D.

Members: To be appointed

5. Committee for Regional Co-operation and Development

(constituted by fusion of the former Standing Committees: Committee for Co-operation with the Academies and Scientific Associations and Committee for Co-operation with Towns):

Chairman: Assist. Prof. Goran Granić, Ph. D.

Members: To be appointed

Election of the President, Two Vice-Presidents and the Secretary-General of the HATZ (2005-2009)

At the 20th Annual (Elective) Assembly of the HATZ, which took place on February 26, 2005 in Zagreb, the President, two Vice-Presidents and the Secretary-General of the HATZ were elected.

Prof. Zlatko Kniewald, Ph. D., President of the HATZ



Kniewald (father's name: Milivoj) Zlatko, Zagreb (Croatia), June 2, 1938

Diploma: Dipl. Eng. of Biotechnology (1961), Department of Biotechnology, Faculty of Technology, University of Zagreb, Croatia

Specialization: Institute of Pharmacology, University of Milan, Italy (1968-1970). Ph. D. thesis preparation. Ford Foundation Scholarship. The British Council Seminars: Man-

chester (1991), Southampton (1995), UK

M. Sc.: Physical Chemistry (1966), Faculty of Pharmacy and Biochemistry, University of Zagreb, Croatia

Ph. D.: Biotechnology (1970), Faculty of Technology, University of Zagreb, Croatia

Employment: Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia (1980). Full Professor (permanently appointed) 1995-today

Fields of professional interest: Biologically active compounds isolation, neuro-endocrine mechanisms regulation, development and application of animal cells and tissues technology, scientific work planning, intellectual property protection.

Awards:

- Ruđer Bošković Annual Award (1986), granted by the Parliament of the Socialist Republic of Croatia, former Socialist Federal Republic of Yugoslavia
- Medal of Labor with Golden Wreath (1986)
- Annual Award (2001/2002), granted by the Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia

Detailed information: www.pbf.hr/knic.

Prof. Branka Zovko-Cihlar, Ph. D., Vice-President of the HATZ



Zovko-Cihlar Branka (father's name: Petar), Sarajevo (Bosnia-Herzegovina), May 19, 1933

Diploma: Dipl. Eng. of Electrical Engineering (1959), Department of Electrical Engineering, Faculty of Technology, University of Zagreb, Croatia

Ph. D.: Faculty of Electrical Engineering, University of Zagreb, Croatia (1964)

Specialization: LM Ericsson Factory Laboratory, Sweden (1970), Elektrisk Bureau Factory Development Laboratory, Oslo, Norway (1973), Nera Factory Development Laboratory, Bergen (1974), scientific and expert specialization in the LM Ericsson Factory Development Laboratories, Sweden

Employment: Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia (1960), Full Professor (permanently appointed) 1998-today

Field of professional interest: Radiocommunications, multimedia communications. Project leader on the project "Multimedia Communication Systems", national coordinator of the EC project COST-279.

Awards:

- Diploma of Honor for Outstanding Service as a Distinguished FEEC Professor (2003)
- University of Zagreb Memorial Medal (2003)
- Josip Lončar Golden Plaque (1991)

Detailed information: www.vcl.fer.hr/bzovko.

Prof. Stanko Tonković, Ph. D., Vice-President of the HATZ



Tonković (father's name: Kruno) Stanko, Zagreb (Croatia), July 17, 1942

Diploma: Dipl. Eng. of Electrical Engineering – Electronics (1964), Faculty of Electrical Engineering, University of Zagreb, Croatia

Specialization: CNRS Scholarship, Tours and Paris, France. Electrophysiology and bioelectric signal processing (1973-74).

M. Sc.: Faculty of Electrical Engineering, University of Zagreb, Croatia (1971)

Ph. D.: Faculty of Electrical Engineering, University of Zagreb, Croatia (1975)

Employment: Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia (1965), Full Professor (permanently appointed), 1998-today

Fields of professional interest: Electronic measurements and instrumentation, biomedical data acquisition and processing, bioelectric signal analysis, bioimpedance measurement, health technology assessments, clinical engineering

Awards:

- Josip Lončar Silver Plaque for an Outstanding Doctoral Thesis (1976)
- Order of Danica Hrvatska with the Ruđer Bošković Image – National Award for the Educational and Scientific Achievements (1996)
- Josip Lončar Golden Plaque for an Overall Contribution to the FEEC Development, Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia (1998)

Detailed information: www.hatz.hr/hrv/podaci.php?fid=192.

Prof. Miljenko Lapaine, Ph. D., Secretary-General of the HATZ



Lapaine (father's name: Nikola) Miljenko, Zagreb, Croatia, April 4, 1952

Diploma: Dipl. Eng. of Theoretical Mathematics (1976), Faculty of Science, University of Zagreb, Croatia

M. Sc.: Geodesy (1991), Faculty of Geodesy, University of Zagreb, Croatia

Ph. D.: Technical Sciences (1996), Faculty of Geodesy, University of Zagreb, Croatia

Employment: Faculty of Geodesy, University of Zagreb, Croatia (1978), Full Professor 2003-today

Fields of professional interest: Application of mathematics and computing in the geodesy and cartography

Awards:

- J. J. Strossmayer Award for the Best Publishing Enterprise, granted to the Faculty of Geodesy, University of Zagreb, Croatia, for the book "Drawing in Science", edited by M. Lapaine (1998)

Detailed information: www.geof.hr/~mlapaine.

Presidency of the Croatian Academy of Engineering (2005-2009)

The Presidency of the HATZ is consisted of: Members of the Governing Board, Secretaries of the Departments, Heads of the Centres and Chairpersons of the Standing Committees.



1. Prof. Zvonko Benčić, Ph. D., Secretary of the Department of Electrical Engineering and Electronics



2. Prof. Nikola Bogunović, Ph. D., Secretary of the Department of Information Systems and Chairman of the Committee for Awards



3. Prof. Marijan Bošnjak, Ph. D., Chairman of the Committee for Ethics



4. Prof. Juraj Božičević, Ph. D., Past-President of the HATZ and Head of the Center for Development Studies and Projects



5. Prof. Stjepan Car, Ph. D., Chairman of the Committee for Co-operation with the Economy and Promotion



6. Prof. Tomislav Filetin, Ph. D., Head of the Center for Life-Long Education



7. Prof. Nedjeljko Frančula, Ph. D., Head of the Center for Geoinformation and Cartography



8. Prof. Jasna Franekić Čolić, Ph. D., Secretary of the Department of Bioprocess Engineering



9. Assist. Prof. Goran Granić, Ph. D., Chairman of the Committee for Regional Co-operation and Development



10. Prof. Zvonimir Janović, Ph. D., Secretary of the Department of Chemical Engineering



11. Prof. Jasna Kniewald, Ph. D., Chairlady of the Committee for International Co-operation



12. Prof. Zlatko Kniewald, Ph. D., President of the HATZ and Head of the Biotechnical Center



13. Prof. Slavko Krajcar, Ph. D., Secretary of the Department of Power Systems



14. Prof. Miljenko Lapaine, Ph. D., Secretary-General of the HATZ



15. Prof. Vladimir Medved, Ph. D., Secretary of the Department of Systems and Cybernetics



16. Prof. Srećko Pegan, Ph. D., Secretary of the Department of Architecture and Urban Planning



17. Prof. Franko Rotim, Ph. D., Secretary of the Department of Transport



18. Prof. Branko Salopek, Ph. D., Secretary of the Department of Mining and Metallurgy



19. Prof. Ivo Soljačić, Ph. D., Secretary of the Department of Textile Technology



20. Prof. Mate Sršen, Ph. D., Secretary of the Department of Civil Engineering and Geodesy



21. Prof. Stanko Tonković, Ph. D., Vice-President of the HATZ



22. Prof. Đurđa Vasić-Rački, Ph. D. Head of the Center for Environmental Protection and Development of Sustainable Technologies



23. Prof. Ivica Veža, Ph. D., Secretary of the Department of Mechanical Engineering and Naval Architecture



24. Prof. Branka Zovko-Cihlar, Ph. D., Vice-President of the HATZ and Secretary of the Department of Communication Systems



25. Prof. Vilko Žiljak, Ph. D., Secretary of the Department of Graphical Engineering

Prof. Miljenko Lapaine, Ph. D.

The European Information Society Technologies Prize

Awards Ceremony, Palace of Academies, Hertogsstraat 1, Rue Ducale, Brussels
April 26, 2005

The European Information Society Technologies Prize (IST Prize, <http://www.ist-prize.org>) has been organized since 1995 by the European Commission and the European Council of Applied Sciences, Technologies and Engineering (Euro-CASE), an independent, non-profit organization of national academies from 19 European countries (<http://www.euro-case.org>). The Croatian Academy of Engineering has been an associate member of Euro-CASE since January 1, 2005.

The purpose of the prize is to raise public awareness of the work of innovative companies and to attract the attention of potential investors and the industry interested in application of technology. Therefore, the prize facilitates the growth and the competition of European economy, creates new vacancies and enhances the quality of life.

There were 430 applications from 29 countries (59 from France, 47 from The Netherlands, Italy and Spain – 35 each, and Germany and Great Britain – 33 each) this year. Most applications (78%) came from small and medium-sized companies this year. The committee selected 20 winners, which were awarded 5000 € each and were nominated for one of the three Grand Prizes.

Most projects from this year's competition were from the field of software and computer technologies, user-friendly interfaces, knowledge technology, communication infrastructures and microelectronic components and microsystems.

The projects were evaluated by an independent group of 16 professionals from 16 countries. The European Commission accepted the proposal of the group and selected 20 projects to be nominated for the Grand Prize. The projects were exhibited in The Hague in November of 2004. The Executive Jury consisting of 18 professionals from 18 countries interviewed people nominated for the Grand Prize. The jury proposed three winners of the Grand Prize to the European Commission, which made the final decision. The three winners of equally valuable Grand Prizes are:

- The *Cypak* company from Sweden, for the PIN-on-Card technology, which is an intelligent card with an integrated plate with PIN for secure verification via Internet
- The *Let it Wave* company from France, for CodeCID, software for compression which enables the storing of high-quality identifying photographs for official documents such as ID's, visas or badges, with as few as 500 bytes
- The *Praxim medivision* company from France, for Surgetics Kneelogics Application, a computer-assisted surgical system for precise determination of the position



Winners of the Awards with Viviane Reding, the EC Commissioner for the Information Society and Media

of implants and grafts in knee replacement and anterior cruciate ligament surgery.

On invitation by Mrs. Viviane Reding, member of the European Commission and Mr. Valentin Van den Balck, the president of Euro-CASE, I attended the Grand Prizes ceremony, which was held at the Palace of Academies in Brussels on April 26, 2005 with a festive program and attendance of a number of representatives of the awarded and representatives of academies members of Euro-CASE. Guy Demuyck, the president of the awarding jury and Pierre Klees, the president of Royal Belgian Council of Academies of Applied Sciences, greeted those present in the Throne Hall of the Palace of the Academies. Then there was a video presentation of past 10 years of awarding those prizes. After that, Valentin Van den Balck gave a presentation of the Euro-CASE, and Guy Demuyck explained the details related to the selection and awarding of the prizes. Mrs. Viviane Reding, member of the European Commission and responsible for information society and media held a speech which was followed by another video about awarding the European Information Society Technologies Prize.

The video was followed by the award ceremony. The Grand Prize is a statue "le profil retrouvé" by Yérasimos Sklavos. Each of the Grand Prize awardees was also given 200.000 € . The final part of the occasion was the photo session on the stage and cocktails.

At the end of this report, I would like to thank the Ministry of Science, Education and Sport of the Republic of Croatia for financial supporting of my attendance at the European Information Society Technologies Prize awards ceremony.

Prof. Miljenko Lapaine, Ph. D.

16th Convocation of the International Council of Academies of Engineering and Technological Sciences (CAETS) and International Symposium “Oceans and the World's Future”

July 10-14, 2005, Cairns, Queensland, Australia
Venue – Cairns International Hotel, 17 Abbot St., Cairns

Sunday, July 10

CAETS Business Meetings – Closed
10:00-13:00 Executive Committee
14:00-18:00 Board of Directors
13:30-17:30 Workshop on Tsunamis – Open to all Participants

Monday, July 11

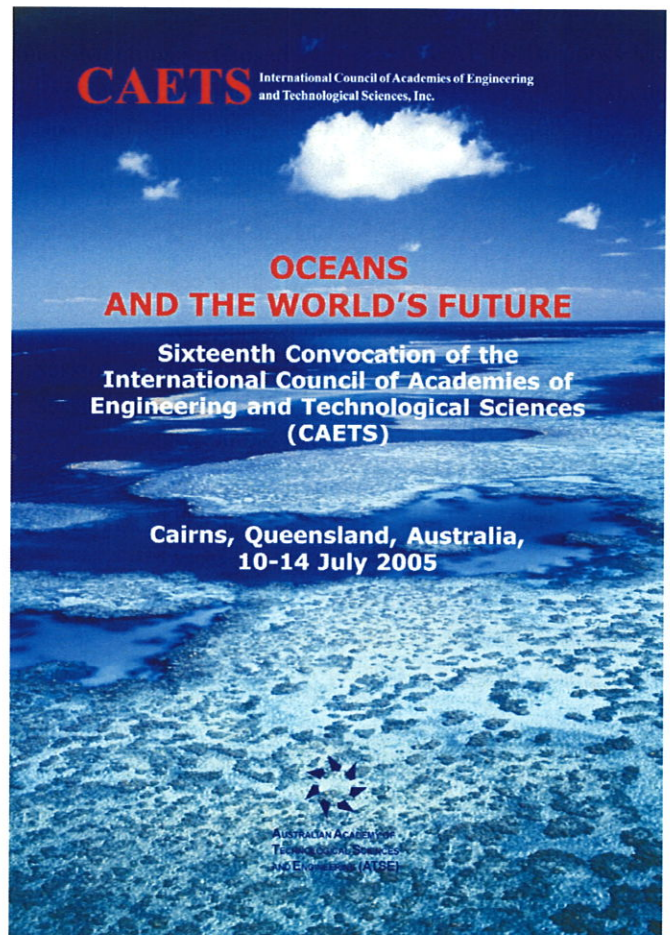
09:00-10:30 Session 1 Opening Ceremony and Keynote Address
11:00-12:30 Session 2 Oceans as Food Resources
14:00-15:30 Session 3 Oceans and Non-Living Resources
16:00-17:30 Session 4 Oceans and Climate
18:30-20:00 Welcome Reception

Tuesday, July 12

09:00-10:30 Session 5 Panel Discussion – Consequences for Humans of the Impacts of Climate Change on the Oceans
11:00-12:45 Session 6 Oceans and Coastal Regions
14:00-15:30 Session 7 Oceans and Transport
16:00-17:30 Session 8 Lakes and Inland Seas
19:00-22:00 Symposium Dinner

Wednesday, July 13

09:00-10:30 Session 9 Ocean Observation, Prediction and Protection
11:00-12:30 Session 10 Panel Discussion – Science, Technology and Engineering for Sustainable Use of the Oceans
12:30-13:00 Session 11 Summary and Closing of Convocation Symposium
13:00-14:30 Symposium Farewell Barbecue Lunch
14:30-17:00 Closed Session – For CAETS Member Academies' Delegations



Thursday, July 14

09:30-17:00 CAETS Council Meeting – For CAETS Member Academies' Delegations and Invited Guests
09:30-12:30 Seminar on Tropical Aquaculture – Open to all Participants

Detailed information:

www.atse.org.au/index.php?sectionid=546

Report from the Euro-CASE Board Meeting

March 16, 2005, Paris, France, EU

On January 1, 2005, the Croatian Academy of Engineering has become an Associated Member of the Euro-CASE and thus a participant in the part of the Euro-CASE activities. HATZ shall become a Full Member of the Euro-CASE after the admission of the Republic of Croatia to the European Union.

The seat of the Euro-CASE is 28 Rue Saint Dominique, 75007 Paris, France.

Joint dinner of all participants of the Euro-CASE Board Meeting was held on March 15, 2005 in the evening hours.

On this occasion new members of each Member Academy Delegation were presented, including HATZ as a new Member Academy in the Euro-CASE.

Working meeting of the Euro-CASE Board was held on March 16, 2005. Prof. Emeritus Kurt Richter, Ph. D., Honorary Member of the HATZ, attended the Meeting on behalf of the Austrian Academy of Sciences. His report from the Euro-CASE Board Meeting is presented herein.

Short Report

Euro-CASE Board Meeting Nr. 26, Paris, March 16, 2005

Before the meeting was opened the new members introduced themselves to the Board:

Henrik KUIKEN, NL
 Bruno JARRY, F
 Kurt RICHTER, A
 Reiner KOPP, D
 Zlatko KNIEWALD, HR
 Claus THOMSEN, DK
 Asbjörn ROLSTADÄS, N

1. Minutes of the last meeting Nr. 25, September 15, 2004

The minutes were approved with minor changes.

2. Euro-CASE Budget

2.1. Accounts to 2004

Alain Mongon and the new auditor Ginette Piquy presented the accounts to 2004 in detail. The increased expenses for communication (100%) were discussed. They were explained by the costs in connection with the exhibition in The Hague, NL and the advertisement for it as well as for the iST Prize celebration.

2.2. Budget 2005

For 2005 most of the membership fees have been paid already.

2.3. Report on VAT issues

€ 59 516 of paid VAT were paid back by Geramny. The same is expected from France for € 117 242 soon.

2.4. Reserve Fund

The Euro-CASE members are requested to pay an "advance" as an endowment, whereby it is up to the members if they are willing to pay 2 or 3 annual membership fees. It was made clear that this payment is not to be understood as an advance but as payment to establish the endowment. As reported in an earlier meeting France then will match the endowment by 49.9%. The vision to achieve an endowment of 10 million EURO has been reduced. The endowment should be used for financing projects.

Further it is planned that 10% of the company's contribution should be flow into the reserve. This and the question who will participate in the projects led to an extensive discussion which showed that at the moment the ideas are not digested enough.

3. Euro-CASE Enlargement

Richter offers to talk to representatives from Cyprus and Malta at the IEEE Region 8 Committee meeting in Paris in April in order to find out who should be contacted in their country for entering Euro-CASE as members.

4. Euro-CASE 2

4.1. Euro-CASE Foundation

A flyer (in French) was printed, to make the foundation visible to the public as well as for advertisement. The organizational structure of the foundation was presented. In the discussion it became clear that it has to be a French foundation because of the governmental contribution. Therefore, a French governmental representative has to be on the Board of the foundation. The other Board members, however, should be appointed by the Euro-CASE Board

It is planned that the foundation provides the seed money for projects, , when necessary. Preining states that this can be a good tool, but at the moment it can not be clearly seen.

4.2. The European Prize Foundation Charitable Trust Limited (EPFCTL)

Under this topic it was mentioned that Croatia can not participate in the IST-prize since at the moment it is not yet involved in the 6. Innovation Programme of the EU. The strong hope was expressed by the Board that Croatia can participate in the 7. Innovation Programme.

5. Euro-CASE Activities

5.1. Strategic Plan

In slide presentation which was handed out to the Board members once again the planned organization and structure Euro-Case 2 was described. Furthermore, a list of already existing as well as possible projects was handed out which could be jointly worked on by several member academies. The academies could participate in the one or other project, e.g. in "Leadership Education for Engineers". The necessary seed money could be allocated to the different academies. Euro-CASE, however, should be the leader or coordinator of the projects

5.2. Information from Academies

A report was given on SINAPSE (Scientific INformation for Policy Support in Europe). The main and general objective of SINAPSE e-network is to make better use of scientific knowledge in policy making. SINAPSE is open to all scientists, scientific organisations and anyone with an interest in science.

5.3. The European IST Prize

5.3.1. The European IST years 2004-2006

The winners of the IST Prizes 2005 are approved by the EU. However, the names will be kept secret April 26, 2005. Each Academy will receive a CD on the 2005 IST Prize

5.3.2. The European IST years 2006-2007

It was reported that the new EU commissioner is very interested and that the EU will support the IST Prizes 2005 and 2006.

The IST Prize 2006 ceremony should be organized by the Austrian Academy of Science together with the Austrian Chancellor's office. Since Austria chairs the EU in the first half of 2006. the funds for the nomination are already available. Furthermore former IST Prize winners and large companies will be contacted for further funds. The EU still has to be convinced to finance the prizes.

5.4. Science Generation

The Euro-Case Science Generation Workshop: "Biotechnology and Society, the Science Generation Project", Vienna, October 27-28, 2004, was positively mentioned. Further reports were referring to proposals concerning Science Generation Food, Quality and Safety, the FutuRIS project, Energy and Environment, Patentability of computer implemented inventions.

The installation of a Euro-CASE "Research" Steering Group was discussed.

6. Euro-CASE's External Relations

Under this topic reports were given contacts to the Council of Academies of Engineering and Technological Sciences (CAETS) and to Scientific and Technological Options Assessment (STOA) in the European Parliament.

7. Next Board Meeting

September 14, 2005

8. Any other business

Prof. Manuel das Neves was adopted as a new member of the Executive Committee.

The Delegate from Finland reports on the Millennium Technology Prize funded by 1 million €.

Graz, April 13, 2005

Prof. Emeritus Kurt Richter, Ph. D.

The Croatian Academy of Engineering as a fully participating co-establisher is already included in the proposal on establishing of the Euro-CASE Foundation. The activities of the Euro-CASE Foundation shall continue in the future period in co-operation with the EU economy and industry.

During the Meeting we learned that a joint meeting was held in December, 2005 with the CAETS peers, during which the CAETS approach toward the UN and the Euro-CASE approach toward the EU, respectively, were agreed. Consequently, the representatives of both associations have prepared the adequate strategy. We also learned

that, at its forthcoming 16th Convocation in Cairns, Australia, CAETS intends to admit the German ACATECH to its membership. I shall vote on this issue as a Member of the CAETS Board of Directors at the CAETS Convocation in Australia.

The travel and accommodation expenses of my participation at the Euro-CASE Board Meeting in Paris were covered in total by the Ministry of Science, Education and Sports of the Republic of Croatia.

Prof. Zlatko Kniewald, Ph. D.,
Member of the Euro-CASE Board

Ethics in Application and Development of the Engineering Sciences

The Round Table Discussion "Ethics in Application and Development of the Engineering Sciences", organized by HATZ, was held on June 3, 2005 at the Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia. The meeting was attended by approximately 25 participants, including 14 lecturers.

The Program of the meeting was divided into two parts: Major Issues and Special Issues. Herein we present the authors and the abstracts of their lectures delivered at the meeting. The extended abstracts of the lectures will be published in English in the "Annual 2005 of the Croatian Academy of Engineering", while the papers in Croatian will be encompassed by a special publication – Proceedings of the Round Table Discussion.

MAJOR ISSUES

Prof. Zlatko Kniewald, Ph. D.

Ethics in Knowledge and Technology Transfer

Prof. Marijan Bošnjak, Ph. D.

Trend of Ethics as a Reflection of Science and Technology Developments

Prof. Mislav Ježić, Ph. D.

World Views and Ethical Principles

Assist. Prof. Tonči Matulić, Ph. D.

Application and Development of Technology: A Christian Ethics Perspective

Prof. Ivan Koprek, Ph. D.

Wisdom of the West and the Relation to Ethics

Melanija Strika, Prof. Soc.

Sociological Aspects of the Role of Ethics in Application and Development of the Engineering Sciences

Prof. Juraj Božičević, Ph. D.

Code of Ethics in the Field of Engineering Sciences

SPECIAL ISSUES

Prof. Srećko Pegan, Ph. D.

Reflections on Ethics in the Architecture and Urban Planning

Prof. Ivo Soljačić, Ph. D. and Assist. Prof. Tanja Pušić, Ph. D.

Ethics and Ecology in Textile Finishing and Textile Care

Prof. Hrvoje Domitrović, Ph. D.

Ethics and the Internet

Prof. Miljenko Lapaine, Ph. D. and Prof. Nedjeljko Frančula, Ph. D.

Ethics in Geodesy

Prof. Ivan Ilić, Ph. D.

Ethical Vertical of the Application of Fuel Cells in Energy Conversion

Prof. Zoran Zgaga, Ph. D.

Ethics in Biotechnical Sciences

Prof. Zvonimir Janović, Ph. D.

Ethics in Chemical Engineering

Prof. Milan Glavaš, Ph. D.

Forest Fires in the Republic of Croatia

Prof. Zlatko Kniewald, Ph. D., President of the HATZ, Head of the Biotechnical Center and Full Member of the HATZ

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ETHICS IN KNOWLEDGE AND TECHNOLOGY TRANSFER

Abstract

Every scientific discovery that is intended for direct application, while on its way to the market, may as well put

into question some ethical standards. The question is: Who is responsible in the process? The scientists that have achieved the discovery, for which they usually are not rewarded at all, or those that turn the scientific discovery into a market product with its commercial value? Are the scientists in the position to influence the producer, who, for instance, deliberately maintains an obsolete technology that not only pollutes the environment, but is also on the verge of rentability, not to mention the decrease of profit, while the existing production may still maintain the profit at the constant level? And, if they are in such position, in what way can they make the influence? Are the scientists in the

position to influence the decisions made by the "state" or the "politics" in cases when the demands of growth of the population standard is likely to change the appearance of the environment that has been preserved by traditional way of life? And, if they are in such position, in what way can they make the influence? Every day we face the derogation of the ethical standards, only the question is whether the one who derogates them is convinced that he does that with the aim of obtaining a greater good for his fellow men, or he does that for the sake of his own interest that ignores the ethical standards. Being ethical is a wisdom that we learn as long as we live, but we have to admit that the individual point of view is often crucial for ethical evaluation of someone's deeds. The world could hardly achieve a fast development if being ethical would be a wide-spread effort, obligatory everywhere and towards everyone. Thus this discussion does not aim to the final solutions, but instead it aims to reconsider the problem and make the personal framework for what is ethical or unethical. It also aims to keeping our deeds within the limits of a generally accepted behaviour during our lifetime.

Key words: *science, technology and ethics, market and ethics, life-long ethical approaches*

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TREND OF ETHICS AS A REFLECTION OF SCIENCE AND TECHNOLOGY DEVELOPMENTS

Abstract

Modern progress of the science with an especially fast development in the field of biological and technical sciences, catalyzed with a more and more efficient informatics, advanced potentials of human population tremendously. Therefore, we could hope for a safer future of the people that is characterized with an efficient environmental protection and better living conditions for all people. However, there is no guaranty for the increased knowledge and better technical and other possibilities to bring the benefit. We are witnesses of more and more frequent bad or even tragic consequences of science and technology advances, markedly caused by neglecting moral principles in people's activities. Because of still present hidden dangers, and especially of those unpredictable, which can arrive with uncontrolled progress, the processes of enhancing the ethical component of human community have been initiated, and one can expect that these processes would direct knowledge and technical advances to be applied undoubtedly for benefit, harmony and a maintainable and safe development. Actually, one can observe very pronounced activities of such a character worldwide. Being expressed through the organization of scientific and professional meetings, adaptation of education programmes for ethical behavior, spontaneous protests of people against defects or imperfections of new products and

technologies, and especially through an efficient organization of adequate institutions and working groups with a strong influence in favor of ethics and with an authority to ethically control the deviations with possible dangers for people and environment, these activities encourage us for our actions in the right direction. Now is the moment to enhance the activities in Croatia, especially since Croatia could fulfill the strongest ethical criteria if Croatian people, government and other relevant institutions would be systematically and efficiently engaged in this direction.

Key words: *trend of ethics, science, technology, development, worldwide activities*

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WORLD VIEWS AND ETHICAL PRINCIPLES

Abstract

Ethical systems are far more numerous than world views or especially than great cultures in which they appear. However, they can be systematized according to their main approaches. In this way we can notice that in different great cultures we can find congenial ethical approaches.

A theory of virtues was developed by Plato, and later elaborated by Aristotle, but it can be equally found in Hinduism or Buddhism.

A list of moral principles or commandments can be found in the Bible, but also in the Yoga, Buddhism or Jinism, and more than half of the list is practically identical.

A formulation of a universal categorical imperative demanded by our reason was attempted by Kant in the 18th century. A similar principle of universal legislation based upon duty and disregarding any interest was formulated in the Bhagavadgita two millenia ago.

The axiological foundation of ethics can be found in Old Indian lawbooks, as well as in Christian scholastic philosophy, moreover with the same list of values. A more recent example is the ethics of Max Scheller.

Utilitarian ethics can have a greater appeal to modern consumer societies. It will lack the deductive strictness, but will address human interests. Based on interests is the ethical approach of Peter Singer, who defends the interests of sentient beings, bringing our attitude to animals into the ethical sphere.

Modern ethics can be based on the principle of responsibility for life. It is endangered by our technology and therefore this approach is appropriate for our epoch. Hans Jonas formulates it as a universal imperative, resembling Kant's, but replacing its formalism with content.

Concerning the astonishing progress of our technology and its power today, the principle of responsibility may teach us that ethical consciousness, bioethical concerns and ecological responsibility should be all the more important for technology, medicine and biotechnology

the greater progress they make. If that proportion between ethics and technology cannot be maintained, human dignity can be crushed, and the living world can be destroyed.

Key words: *ethics, technology, responsibility, ecology, bioethics*

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APPLICATION AND DEVELOPMENT OF TECHNOLOGY: A CHRISTIAN ETHICS PERSPECTIVE

Abstract

In his contribution the author provides a systematic reflection on the epistemological, historical and philosophical as well as sociological implications of the development of technology with a special emphasis on the implications of the Christian ethics. Having as aim a clearer understanding of the essence of the transformed epistemological paradigm with respect to interpretation and understanding of technology, the issue is elaborated in the paper in five subsequent parts. In the first part, certain essential features of the historical metamorphosis of scientific and technological enterprise are reflected upon from their original culturological perspective, e. g. antique understanding of reality. In the second part, and opposing to the cosmological order of antiquity, certain intra-secular implications of God's creative will are reflected upon from a Biblical and Christian perspective. A series of important aspects of the modernity metamorphoses with respect to interpretation and understanding of the world, the man, the nature, the ethics and the technology, are reflected upon in the third part. In the fourth part, certain aspects of philosophical and ethical metamorphosis of the essential understanding of the relation between a purpose and a means are reflected upon. In the fifth part of the paper the author reflects upon certain aspects of social metamorphosis, stipulated and embraced by the idea of social progress in the materialistic sense of the word, which is supported by a technological conquest of the nature, including man himself. In the last, sixth part of the article, certain principal suggestions on the (pre)conditions for the realization of a partnership dialogue between the technology and the Christian ethics are presented. In the realization of this dialogue, certain essential theological pre-suppositions of the Christian ethics have to be particularly emphasized, because without their clear recognition it is both unconceivable and unfeasible to realize a fruitful and partnership dialogue of the Christian ethics and technology.

Key words: *cosmos, nature, (bio)technology, natural science, metamorphoses, Christianity, creation, salvation, culture, dialogue, Christian ethics*

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WISDOM OF THE WEST AND THE RELATION TO ETHICS

Abstract

According to B. Russell, the philosophical tradition of the West differs firstly by its practical wisdom of the Greek genius from the speculations of the spirit of the East. The concept of **wisdom** – σοφία *sofia* (Greek), *sapientia* (Latin) – for the Greek meant a way of living, thinking and acting in accordance with the supreme moral principles – the philosophy, “love for the wisdom”, the science of wisdom. The first Greek philosophers were inventors, mathematicians, physicists, chemists, teachers, pedagogues... They studied the motion of the celestial bodies, state governance, social relations...

The practical and theoretical thought of the Greek has set a basis for all subsequent scientific systems of the West. It may as well be said that the Western civilization has been created under the influence of the “Greek miracle”.

There is no doubt that Socrates is a personalized image, an ideal of philosopher and sage who is a theorist and a practitioner at the same time. Yet only the philosophy of Aristotle became crucial for the principal differentiation between the *theoretical philosophy* that encompassed sciences (such as mathematics and physics) and the *practical philosophy* that, according to Aristotle's classification, encompassed politics (ethics), dialectics and rhetorics. However, he did not consider the theoretical and practical philosophy to be divided by an insurmountable divide, but was convinced that they differ only in their ways of reaching the truth.

In most general terms, today we consider philosophy a scientific discipline that seeks to answer the essential questions on the world, the man and his cognition, the society... a discipline that ought to lead from knowledge to wisdom. The author of this paper shall demonstrate the development of the Western ethical thought (wisdom), starting with classical theses of ethics all the way to the newest attempts of its founding. His intention is to point at the necessary elements of the “science of wisdom”, which today's sophisticated techniques and the contemporary sciences need the most.

Key words: *philosophy, theoretical and practical philosophy, ethics, practical wisdom, moral principles, Socrates, Aristotle, virtues, moral responsibility*

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SOCIOLOGICAL ASPECTS OF THE ROLE OF ETHICS IN APPLICATION AND DEVELOPMENT OF THE ENGINEERING SCIENCES

Abstract

A sociological reflection on the double role of ethics in engineering sciences will be presented in the paper. The ab-

sence of ethics in its meaning of philosophical discipline is implied by a growing distance between philosophy and the engineering sciences. The affirmation of ethics in the engineering sciences is also implied, but in the meaning of reduction of ethics to "practical ethics" that lacks a unique theoretical foundation. The rise of the engineering sciences overlaps with the idea of progress as a key idea that marked the age of modernity and might well be detected in the etymological definition of the terms "technique" and "technology", with particular emphasis on performance-oriented knowledge and practice as their constitutive elements.

Key words: *sociology, ethics, philosophy, engineering sciences, progress, modernity, technique, technology, performance-oriented knowledge, practice*

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**CODE OF ETHICS IN THE
FIELD OF THE ENGINEERING
SCIENCES**

Abstract

A genuine care for the quality and its improvement in the higher education is a direct enticement and encouragement to ethical behavior, and thus we advocate the thesis that, in such an environment, the students would interiorize the values essential for a successful performing of the engineering profession. While fulfilling their duties, the engineers must primarily act responsibly in taking care of safety, health and well-being of the people. Further, they must perform their tasks in the field of their competence only. Their publicly announced statements must be true and objective, and their personal conduct must be honorable, responsible and ethical.

Thus all mentioned criteria are a basis for the engineering oath that the students should profess when receiving their engineering diploma:

- I shall perform my profession freely, consciously and with dignity.
- I shall strive to the application of my skills for the well-being of the people, of the Earth and its species.
- I shall not allow that my work and my duties are influenced negatively by the factors (such as: nationality, political orientation, prejudice or material benefit) that, if wrongly oriented, may create ethically unacceptable consequences.

This is a frame for consideration on the proposed issue, e. g. the importance of the code of ethics in the contemporary conditions.

Key words: *code of ethics, engineering sciences, quality of higher education, engineering oath, international recognition of the engineers' profession,*

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**ETHICS AND ECOLOGY IN TEXTILE FINISHING
AND TEXTILE CARE**

Abstract

Plenty of water and chemicals are used in textile finishing and care, which can pollute environment to a great extent. For years possibilities of substituting harmful chemicals by less aggressive and biodegradable chemicals have been investigated intensely. Stronger regulations have been passed. Many chemicals were banned or their maximum quantities being used are limited. New dye groups have been introduced and potentially carcinogenic dyes and dye-stuffs containing harmful ions of heavy metals have been displaced. Energy and water consumption is reduced.

The same can be stated about the processes of textile care. By introducing enzymes and bleach activators, efficient washing at lower temperatures with a lower detergent consumption is enabled. The permitted perchlorethylene consumption must not exceed 2 % of the amount of dry cleaned textiles.

Hydrocarbon solvents partly substitute perchlorethylene. The possibilities of the application of new solvents are being investigated, of which liquid carbon dioxide has the best prospects.

The sewn-in labels prescribe care regulations, label textile quality and sometimes environmental values (Eco labels). They determine whether the textile product is manufactured in an environmentally friendly manner and whether harmful substances are contained.

Key words: *textiles, ethics, ecology, finishing, texcare, eco-labels*

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ETHICS AND THE INTERNET

Abstract

In the growing line of media, the Internet is the latest and in many respects the most powerful one. Its decentralized nature and two-way flow of information gives all the users the opportunity to be both the source and the end point of information, thus enabling the elimination of time and space as barriers in communication. Omnipresence and availability of Internet have long overcome its limitations as a strictly professional and scientific medium. Nowadays, the internet has become a new *Forum Romanum*, the place where social, political, business as well as cultural life take

place. Due to progress in technology, human privacy and intimacy is exposed on this virtual *Forum*. Therefore, the Internet is truly a place where all the good and the bad things man does are exposed to the public eye and judgment.

The human person and the human community are the object and the measure of social communication, so it is necessary to evaluate this medium not only by its technical potential or financial effect, but by the ethical values as well. In this paper the author deals with some ethical areas of concern by analyzing the phenomena related to the possibilities the Internet gives, the ways of using it and the types of information published on it.

Key words: *ethics, Internet, social communication*

Prof. Miljenko Lapaine, Ph. D., Secretary-General and Full Member of the HATZ
and Prof. Nedjeljko Frančula, Ph. D., Head of the Center for Geoinformation and Cartography and Full Member of the HATZ

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ETHICS IN GEODESY

Abstract

The paper first discusses the issue of existence of ethical codes in the geodetic profession in Croatia. Although there is the *Croatian Geodetic Society*, it does not have a code of ethics. There is the *Code of Professional Ethics of Croatian Architects and Engineers in Civil Engineering* created in 1998, which is valid for geodesists who are members of the *Croatian Chamber of Architects and Engineers in Civil Engineering*. The Faculty of Geodesy is a part of the University of Zagreb, but the University does not have its ethical code yet. According to the *High Education Law*, the Croatian parliament was supposed to nominate the *Committee for Ethics in Science and High Education*, but as far as the authors know, such a committee has not been established yet. We also have not found a code of conduct of officials in public or state service in Croatia.

Furthermore, the paper considers the ethical codes for geodesists in other countries, such as e.g. Australia, USA and Slovenia, and in professional societies (*Fédération Européenne d'Associations Nationales d'Ingénieurs Européen* – FEANI, *International Federation of Surveyors* – FIG, *American Society for Photogrammetry and Remote Sensing* – ASPRS). The example of research of ethics in public services in countries members of the European Union shows an increase in interest for that subject.

Finally, the paper describes in details the Code of Ethics of FIG. The authors recommend its adoption in Croatia.

Key words: *ethics, geodesy, surveying, Croatia*

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ETHICAL VERTICAL OF THE APPLICATION OF FUEL CELLS IN ENERGY CONVERSION

Abstract

By directly converting chemical energy into electrical, with the aids of fuel cells, environment pollution with toxic nusproduct of incineration is avoided in whole. Except of avoiding the toxic effect on environment, fuel cells have much higher efficiency, what corresponds to extra quality of ethical vertical. It is already built and in use in power units of couple of MW, which allows the distributed production of electrical energy directly to the consumer.

In the past approximately 15 years, major world's car industries invested huge assets in exploration of application of fuel cells in electromobile's drive engine, and thus already critical pollution of urban centres by exhaust gasses of classic engine vehicles would be avoided.

It might be concluded that we are on the doorstep of a new and, from the ecological point of view, a clean era in energy conversion. It may be expected that with time this technology would overcome technological and economical problems in amount high enough that its key ecological advantages would greatly influence decision of replacing old, ecologically toxic technology with new, ecologically clean fuel cells technology.

Key words: *ethics in technics, fuel cells, energy conversion, ecology, electromobile*

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ETHICS IN BIOTECHNICAL SCIENCES

Abstract

In the mid-70es of the 20th Century, the techniques that enabled targeted genetic manipulations began to develop. Today, by application of the genetic engineering techniques, it is possible to substitute a single nucleotide in the entire genome, e. g. to transform a function of a single protein, at least in some organisms. All the more, the genes may be isolated from one organism and inserted, as "transgenes", in the other organism, and the new genes may be synthetized as well.

The possibility of changing or "manipulating" the genetic material in this way has attracted the attention of the widest public, and the question of ethical conduct in biotechnical sciences has gained a meaning and a weight uncomparable to other disciplines within the engineering sciences. Although the most complex ethical questions have been opened in the field of application of this technology in the human cells, almost equal attention was paid to

the employment of the genetically modified organisms (GMO) in the human nutrition. In Croatia, like in the major part of Europe, an outstandingly negative public attitude was created towards such food. Aside from reproaches to its harmfulness and the negative environmental impact of the GMO, this technology has been put into question as "unnatural" and unethical. Moreover, it is usually suggested that the scientists engaged in this issue are behaving irresponsibly and unethically and that they are being led by their curiosity or profit only, forgetting the common good and common interests.

As being under such pressure, the scientists often avoid public debates and thus also a chance to demonstrate objectively the worthiness, but also the possible weaknesses of the respective technology. In this way we come to a new field of responsibility: the responsibility for non-acting. This type of responsibility is not characteristic to our social environment only and shall be illustrated by examples of the "yellow rice" and the Bt corn.

Key words: *genetic engineering, GMO, GMO and ethics, biotechnology and ethics, responsibility for applications of biotechnology*

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CHEMICAL ENGINEERING ETHICS

Abstract

Judging by the previous developments, production capacity and growth and its influence on the other production branches, chemical industry belongs to the leading manufacturing enterprises. The development of chemical industry is based on knowledge and scientific achievements and is able to materialize most of the innovative challenges. It is also a driving force for the development of many similar productions and therefore is a headstone of the overall breakthrough and the achievements of our material civilization. Also, chemical industry in the developed countries belongs to the most propulsive and profitable ones, having direct influence on the value of all production, investment and new employment.

However, besides new developments, particularly sustainable and environmentally acceptable processes and products, the chemical engineer in his practice should also recognize and obey the ethical principles.

The fundamental principles of conduct of engineers include truth, honesty and trustworthiness in their service to society, and honorable and ethical practice showing fairness, courtesy and good faith towards clients, colleagues and others. The engineers take societal, cultural, economic, environmental and safety aspects into consideration, and strive for the efficient use of the world's resources to meet long-term human needs. The engineers should examine the

societal and environmental impact of their actions and projects, including the wise use and conservation of resources and energy, in order to make well-informed recommendations and decisions. Chemistry and chemical engineering will have to respond to them. They should perform practice only in their areas of competence, in a careful and diligent manner and in accordance with standards, laws, codes of ethics, and rules and regulations applicable to the engineering practice.

Key words: *chemical industry, innovation, ethical principles, engineering principles of conduct, societal and environmental impact of engineering*

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FOREST FIRES IN THE REPUBLIC OF CROATIA

Abstract

The majority of forest fires appear in karst areas, primarily in the coastal and island regions. The Mediterranean and sub-Mediterranean belt of our forests covers an area of approximately 870,000 ha. In Croatia, computer assisted monitoring and analysis of forest fires began back in 1975. Since then, there have been several years (1983, 1985, 1988, 1998, 2000 and 2003) in which numerous forest fires occurred and large areas of state and private forests and uncultivated lands were burnt in the fires. The greatest catastrophe occurred in the exceptionally dry year 2000, when 706 forest fires broke out, and 68,106 ha of forests were burnt. The average burnt area per fire is very high in Croatia. The annual average is from 29 to 90 ha per fire. In Europe, a fire is considered to cause great damage when the average per fire is greater than 10 ha.

In terms of the time period in which forest fires occur, there are two peaks in Croatia: a smaller spring peak (usually resulting from weed burning) and a larger summer peak when the majority of fires occur.

The Canadian meteorological index of forest fire danger is applied in Croatia. Hrvatske šume, Ltd., Croatia (Croatian Forests) has divided all our forests into 4 levels of danger from forest fires:

Level I – very great danger, encompassing about 50,000 ha, Level II – great danger, about 142,000 ha, Level III – intermediate danger, about 625,000 ha and Level IV – low danger, almost 1 million ha.

Hrvatske šume, Ltd., Croatia, invests great efforts in forest fire protection. Professional firefighters, volunteer firefighting associations, Hrvatske šume, Ltd., Croatia, and citizens participate in extinguishing forest fires, with Kanader aircraft and helicopters of special significance in forest fire fighting. The greatest measure of protection is the education of all citizens, and their contributions to prevent forest fires from occurring.

Key words: *forest fires, forest areas, number of fires, human factor, protection measures*

HATZ provides Auspices upon the Ceremony of Presentation of the “Hrvoje Požar” Annual Awards and Scholarships

The Croatian Academy of Engineering has accepted to provide auspices upon the Ceremony of Presentation of the “Hrvoje Požar” Annual Awards and Scholarships, granted by the “Hrvoje Požar” Foundation of the Croatian Energy Association (HED), Member of the World Energy Council since 1992. The President of the Croatian Energy Society is Assist. Prof. Goran Granić, Ph. D., Collaborating Member of the HATZ and Chairman of the HATZ Committee for Regional Co-operation and Development.

The auspices upon these distinguished Annual Awards and Scholarships are also provided by the Croatian Academy of Sciences and Art.

This year's Ceremony will be held on July 5, 2005 in the Main Hall of the Croatian Academy of Sciences and Art in Zagreb, Croatia. Prof. Zlatko Kniewald, Ph. D., President of the HATZ, will attend the Ceremony on behalf of the HATZ.

Detailed information: www.hed.hr.

The Awards of HAZU Granted to HATZ Full Members Prof. Zijad Haznadar, Ph. D. and Prof. Mladen Šćitaroci-Obad, Ph. D.

On the occasion of the Day of the Croatian Academy of Sciences and Art (HAZU), celebrated on April 29, 2005, the 2004 HAZU Awards for the highest achievements in sciences and art in the Republic of Croatia were granted to the following Full Members of the Croatian Academy of Engineering:

- Prof. Zijad Haznadar, Ph. D., for his entire scientific work and



- Prof. Mladen Šćitaroci-Obad, Ph. D., for fine arts (co-authorship of the book “Croatian City Parks in the 19th Century” with Bojana Bojanić Obad-Šćitaroci, Ph. D.).



Hereby we express our congratulations to the distinguished members of our Academy on the Awards they were granted, and our wishes that they may continue with their successful scientific work in the future.

Prof. Miljenko Lapaine, Ph. D.

Last Minute Information

The Croatian Academy of Engineering hereby expresses its gratitude to its Supporting Member, “Hrvatska

elektroprivreda”, Inc., Zagreb, Croatia (www.hep.hr) for providing funds for the adaptation of the HATZ Library.

Past events

(January 1 – June 30, 2005)

February 20-23, 2005

4th Croatian Scientific Conference with International Participation “Biotechnology and Immuno-Modulatory Drugs” (www.hdb.hr/biotechnology4.html)

Great Hall of the Ministry of Economy, Zagreb, Croatia

Organizers:

- Croatian Society of Biotechnology
- **Croatian Academy of Engineering**
- Scientific Council for Agriculture and Forestry, Croatian Academy of Sciences and Art
- Croatian Academy of Medical Sciences
- Faculty of Food Technology and Biotechnology, University of Zagreb
- PLIVA Croatia Inc., Zagreb

Auspices provided by:

- European Association of Pharmaceutical Biotechnology

February 26, 2005

Colloquium “Development of New Technologies and Products in Croatia” (www.hatz.hr)

Great Hall of the Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia

Organizer:

- **Croatian Academy of Engineering**

20th Assembly (Elective) of the Croatian Academy of Engineering

Great Hall of the Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia

March 15-16, 2005

Euro-CASE Board Meeting (www.euro-case.org)

Paris, France, EU

Organizer:

- European Council of Applied Sciences and Engineering (Euro-CASE)

April 24-27, 2005

19th Croatian Meeting of Chemists and Chemical Engineers (www.hdki.hr/19_Skup_2005/index_19.htm)

Opatija, Croatia

Organizers:

- Croatian Chemical Society
- Croatian Society of Chemical Engineers

Auspices provided by:

- **Croatian Academy of Engineering**

April 26, 2005

The European Information Society Technologies Prize Awards Ceremony (www.euro-case.org)

Palace of Academies, Brussels, Belgium

Organizers:

- European Commission
- European Council of Applied Sciences and Engineering (Euro-CASE)

June 3, 2005

Round Table Discussion “Ethics in Application and Development of the Engineering Sciences” (www.hatz.hr)

Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia

Organizer:

- **Croatian Academy of Engineering**

June 8-10, 2005

47th International Symposium ELMAR-2005 “Multimedia Systems and Applications”

Zadar, Croatia

Organizers:

- Croatian Society for Electronics in Marine Affairs – ELMAR
- IEEE Signal Processing Society
- IEEE Region 8
- IEEE Croatia Section
- EURASIP

Auspices provided by:

- **Croatian Academy of Engineering**

June 15, 2005

Round Table Discussion “Initiative for the organization of joint activities of the Faculty of Textile Technology, University of Zagreb and the textile and clothing manufacturers on the development and transfer of knowledge and technologies in the Republic of Croatia” (www.ttf.hr)

New Building of the Faculty of Textile Technology, University of Zagreb, Croatia

Organizer:

- Faculty of Textile Technology, University of Zagreb

Co-organizers:

- Croatian Academy of Sciences and Art – Council for Technological Development
- **Croatian Academy of Engineering**

Forthcoming events

July 10-14, 2005

16th CAETS Convocation and the International Symposium "Oceans and the World's Future"

(www.atse.org.au/index.php?sectionid=546)

Cairns International Hotel, Cairns, Queensland, Australia

Organizer:

- International Council of Academies of Engineering and Technological Sciences (CAETS)
- Australian Academy of Technological Sciences and Engineering (ATSE) – Member Academy of the CAETS

September 23-24, 2005

Colloquium "Geoinformation and Cartography in the Education" (www.kartografija.hr)

Faculty of Geodesy, University of Zagreb, Croatia

House of the Croatian Academy of Engineering, Zagreb, Croatia

"Školska knjiga" Ltd., Zagreb, Croatia

Organizer:

- Croatian Cartographic Society

Co-organizers:

- Croatian Institute of Hydrography
- Croatian Geodetic Society

Auspices provided by:

- **Croatian Academy of Engineering**

Auspices requested by:

- Ministry of Science, Education and Sports
- National Geodetic Administration
- Faculty of Geodesy, University of Zagreb
- Tourist Office of the City of Zagreb

September 24-27, 2005

2nd Congress of Croatian Geneticists with International Participation (www.genetika.hr)

Velaris, Supetar, Island of Brač, Croatia

Organizer:

- Croatian Genetic Society

Sponsors:

- Ministry of Science, Education and Sports of the Republic of Croatia

- Faculty of Food Technology and Biotechnology, University of Zagreb
- Faculty of Science, University of Zagreb
- "Ruđer Bošković" Institute
- Institute for Medical Research and Occupational Health
- PLIVA, Inc., Zagreb

Auspices provided by:

- Croatian Academy of Sciences and Art
- **Croatian Academy of Engineering**

October 26-29, 2005

3rd International Congress "Flour – Bread '05"

(www.ptfos.hr/brasno-kruh)

Grand Hotel Adriatic, Opatija, Croatia

Co-organizers:

- Josip Juraj Strossmayer University of Osijek
- Faculty of Food Technology – Chair of Cereals Processing, University of Osijek
- International Association for Cereal Science and Technology

Auspices provided by:

- **Croatian Academy of Engineering**

2006

20th International Congress "Energy and the Environment 2006" (www.hsse.hr)

Opatija, Croatia

Organizer:

- Croatian Association for Solar Energy

Auspices provided by:

- **Croatian Academy of Engineering**

June, 2006

Symposium on the occasion of the 150th Anniversary of the birth of Nikola Tesla (www.tehnicki-muzej.hr)

Organizers:

- Museum of Technique, Zagreb
- Hrvatska elektroprivreda, Inc.

Auspices provided by:

- **Croatian Academy of Engineering**

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