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CONNEXTION

THE NEWSLETTER FOR MEMBERS OF THE EU HITACHI SCIENCE & TECHNOLOGY FORUM

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Editorial note

Juan les Pins, Kreffeld, Dublin, Brussels, Budapest. Our Forum is now five years old, some Hivips have attended all Forum meetings, others have attended several ones, for some others Budapest was a first experience. Looking back over these five years I want to congratulate you, the Forum members, for your active participation, for your willingness to be personally involved in working group activities and for your commitment to this Forum.

You may already put in your agenda the date of the 2003 Forum. It will be organised in Antwerp from the 16th May to 18th May and we will dicuss Energy as the central topic.

The Forum ambitious goal is to make its members part of the public policy debate on the role of science and scientists in today's European society.
Together with Connextion you have found the summary of the Budapest meeting. Compared with last year the content has been greatly improved with more accurate reporting and detailed reporting on the working groups findings. Please help us to improve our mailing list by suggesting names of friends, colleagues, people interested in the water issues who would be interested in getting the new summary.

Next year we will be dealing with energy. This is a broad topic which will require precise focus. This will be the role of the working group which will be meeting in November in Brussels for which its members deserve our deep appreciation.

Please keep in touch, do not hesitate to contact us with comments, suggestions, ideas they will benefit to all of us.

Yours sincerely,

Norikiyo Koide
General Manager
Hitachi Corporate Office, Europe

Water and Sustainable Development

Norbert Kroó

The topics of the 2002 Forum, held in Budapest from the 24th until the 26th of May, has been water, one of the most vital issues of this Century.

The striking paradox of our time is that although we seem to have unlimited quantity of water, freshwater resources are getting scarce, and badly managed, distributed and used. Millions die each year from preventable water-related diseases and many more suffer from illnesses.

In order to overcome these problems multiple actions are needed.
The **governments** should pay more attention to water management, to drinking water and water catchment area protection, public utility systems and waste water cleaning, first of all by legislative, support, control, administrative and pricing actions.

The **citizen** should be more environment sensitive, law abiding with esteem for expertise and order.

Science should play a significant role in water related issues first of all in minimising consumption. The largest consumer is **agriculture** and therefore growing more food with less water is one of the goals. Traditional irrigation is wasteful, much of the water soaks into the ground and evaporates without assisting the plants. At the same time it degrades the land by erosion, waterlogging and salination.

There are, however, technologies, which may reduce water demand at least by 50%. Drip systems lead to 20-70% higher crop yields and reduce water demand by 30-70%. But sprinklers perform also almost as well as the drip ones, if properly designed. Scheduling the timing of irrigation to match optimally the plants needs and to recycle water and use it more than once may also contribute to the minimalization of water consumption.

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Prof. Norbert Kroó

More economical crops (higher yielding, early maturing wheat or rice) and the reconfiguration of the diets of mankind by consuming less meat and more food from the lower elements of the food chain may also contribute to the same goal.

Water should be kept from running away by building reservoirs, from leaking away in pipes and should be saved by decreasing the amount of water used in each single action like toilet flush. Industrial processes may also be optimised for minimal water consumption by inventing new technologies in traditional processes and by turning toward less energy consuming activities (e.g. telecommunication against travel).

Extracting freshwater from the salty oceans is one of the means to increase its quantity. The classical method based on evaporation is energy consuming and costly. Modern distillation plants recycle heat or use membrane desalination based on reversed osmosis. Fresh water can be transported in huge bags or in the form of ice from one place to another via oceans.
Treating wastewater by capturing used water, treating it appropriately and reuse it on different levels is a practice which should also be followed. The purity of water, when used to recharge groundwater aquifyers, to supply industrial process, to irrigate different crops or augment potable supplies could be different with different costs of treatment.

As far as **Europe** is concerned the water situation is not yet critical but problematic. Therefore the research Framework Programmes of the EU include projects on water issues.

The **topics** of the Budapest Conference (water and sustainable development; integrated water management; consumer habits) is in line with the ideas described above. It is a source of optimism that one of the global industrial players, HITACHI stepped in to organise and support this conference.

Prof. Norbert Kroó is Secretary-General of the Hungarian Academy of Science. At the 2002 EU Hitachi Science & Technology Forum, he gave a presentation on Science and Sustainable Development.

Water Issues and their Impact on European Society*

Tom Jones

Water management was the theme of the 5th Hitachi Science and Technology Forum (Budapest, 24-26 May 2002). This was a very timely event for several reasons. First, water problems are becoming more serious in many parts of the world. The overpumping of groundwater, pesticide and chemical pollution, reservoir leakage, habitat destruction, and desertification are among the water-based problems facing developed and developing countries alike. The World Summit on Sustainable Development in Johannesburg last month focused global attention on water management problems, especially on the significant infrastructure investments that will be needed to provide clean water and sanitation services to an expanding global population.

Water issues are also very much on the minds of Europeans, with the coming into force of the European Water Framework Directive in 2000. The choice of Budapest as the venue for the Forum was also propitious -- Hungary lies at the “bottom” of the Carpathian Basin, and the recent cyanide/metal spill on the Szamos and Tisza tributaries brought into clear focus the vulnerability of water resources to serious local pollution events. The Danube Basin also has a long and rich heritage of international co-operation on water issues (e.g. EU/PHARE Environment Programme; International Convention for the Danube River Basin), so Budapest was again ideally suited for a discussion of these questions.

The Forum expressed broad agreement on the kinds of solutions that will eventually be necessary. For example, there is a clear need for a river basin approach --

one that reflects all ecosystem realities that drive the water cycle in each location. This is sometimes called “integrated water management”, and it explicitly recognises that decisions made in one part of a river basin affect opportunities for water use and protection in another part of that same basin.

We also need to do a better job of matching the supply of water to demand for its services. Economic instruments, such as water pricing and the trading of rights to use water, can play an important role here. Water pricing provides incentives to conserve water, as well as the financing needed to provide the services people want from water. Water pricing systems can also be designed to be equitable for all participants, because they usually penalise “excessive” water use.

Workshop participants also felt there was a need to promote new partnership arrangements to facilitate the management and infrastructure improvements that will ultimately be needed. The potential role of the private sector seemed to be one area that warrants attention here. It was recognised that water management will always require a strong presence from the public sector, but that there are specific areas in which the private sector could play a very useful supporting role. The most obvious of these is the financing and operation of water supply and sewage treatment infrastructure services, where the private sector has both considerable expertise and a long history of collaboration with the public authorities in some countries.

Participants also agreed that water is such an important a part of everyone’s lives that key decisions concerning its allocation and protection need to be made with the active involvement of citizens. An engaged public is therefore likely to be a very important part of an efficient, effective, and equitable water management strategy. For example, the role of consumers of water services in key decisions about water use and protection is growing, and is likely to continue to do so in the future. Education about the role and vulnerability of water will also be important.

Overall, the Budapest workshop confirmed that, although the challenges are daunting, there are many proactive steps that can be taken to improve water management. The business community in general, and the technology sector in particular, each have important contributions to make to ensuring that these improvements actually get put into place.

Mr. Tom Jones is head of the Global and Structural Policy division in the Environment Directorate of the OECD. At the 2002 EU Hitachi Science & Technology Forum, he gave a presentation on Water and Sustainable Development.

• The opinions expressed in this overview are those of the author alone, and do not reflect the views of either the OECD or its Member countries.

Water is Life

Stephan Müller

This statement could summarize the Hitachi Forum 2002. I was impressed by all the facts, figures and issues presented and discussed by the speakers on the topic „water“. We all enjoyed an excellent overview of the „Issues on Water“. Furthermore, during the working sessions we were able to gain a deeper insight into the background, influences and forces on the topics „Water and Agriculture“, „Water and Environment“ and „Water and Consumers“ from different discussion leaders. This was the place to gain information, exchange ideas and thoughts and have interesting discussions on all of these topics with all other forum members.

The forum 2002 „Water Issues and their Impact on European Society“ has been discussed related to science, technology and society. I believe that all forum members have become aware of the water problems today and in the future. This is crucial not only for the forum but also for our future society, as water does not have boundaries.
Not only the thematic exchange on the topics itself, but also the communication between the participants was very interesting. This was enforced by attractive visits to the drinking water supply of Budapest and during the boat trip on the Danube. These excursions were excellent places to get to know each other and foster friendships.
Moreover, the visit to the MTA-SZTAKI (Computer and Automation Research Institute – Hungarian Academy of Sciences) and the presentations on electronic, material and software science was very informative, exciting and showed how strong research is in Hungry.

Dr. Stephan Müller was chairman of the 2002 Working Group. He is head of the department “Water and Agriculture” at EAWAG which is the Swiss Federal Institute for Environmental Science & Technology.

PartnerJob.com

Laure van Schendel

As participants in the HIVIPS program of HITACHI, we acquired an international experience. Some of you may currently be expatriates or your company may relocate you to a different country in the future. We all have experienced this great opportunity to work in and discover a country with a different culture. An opportunity, yes, but when you have a spouse or partner, what about his or her career…?

According to a survey on relocation*, spouse/partner dissatisfaction is an issue in 92% of the expatriate assignment failures. With such statistics in mind, several multi-national companies launched PartnerJob.com in September 2000. PartnerJob.com aims to facilitate the geographic mobility of member companies' employees by helping their employees' spouses and partners pursue their career at their new location. It primarily uses a web site – http://www.PartnerJob.com – to provide:

- A database of job openings worldwide posted by member companies and other authorized institutions
- A database of resumes from member-company spouses and partners.

A self-financing association, PartnerJob.com assesses its member companies an annual membership fee. Membership permits the spouses/partners of relocating employees to post their resumes and consult the jobs on the site. The association may also grant companies that do not have mobile employees, a free access to the site to post job openings and consult the resumes of highly qualified, international candidates. Partnerjob.com welcomes new members – eight multinational companies have already joined – as well as new affiliated companies. PartnerJob.com has already resulted in several concrete job offers for member-company spouses in America, Europe, Asia and Africa. Based on the current successful job placements, it seems fair to say that PartnerJob.com has a great potential to help expatriate spouses and partners move forward with exciting careers no matter where they may be.

To learn more about:
PartnerJob.com, you may contact Laure van Schendel (HIVIPS 98 – 98.laure.vanschendel@aist.enst.fr).

** From the "GLOBAL RELOCATION TRENDS 2001 SURVEY REPORT », sponsored by GMAC Global Relocation Services, National Foreign Trade Council and SHRM Global Forum is based on 150 answers from companies with a total of more than 33 000 expatriates*

HITACHI NEWS

Hitachi's 'Hitagene' could bring cures for killer diseases closer

Following a successful pilot with the Department of Clinical Medicine, Trinity College, Dublin, bioinformatics researchers at Hitachi Dublin Labora-tory are now in the final stages of developing a new gene hunting software system which will soon be available commercially. 'Hitagene' will help to find cures for killer diseases faster, by drastically reducing the time taken to locate the genetic causes of conditions, through the rapid identification of genes involved in causing disease susceptibility.

Hitagene is a computer based system which will revolutionise the way that gene hunters and medical researchers work: enabling them to more quickly, robustly and accurately find the genetic causes of many diseases. Hitagene will make computation time over 100 times faster than the conventional technology, meaning calculations which currently take 24 hours can be performed in under 10 minutes. Hitagene can also provide robust statistical validation of these results thus boosting the value of this important analysis technique for researchers. Its speed and accuracy should significantly reduce the time needed to find the genetic causes behind some of the world's most prevalent killer diseases.

Currently 3 per cent of us are born with some kind of genetic defect. While many of these defects will not automatically signify a problem, some defects (often in combination with environmental factors) will be behind conditions such as colour blindness, Diabetes, increased susceptibility to Osteoarthritis and certain Cancers and Heart Disease. Genetic defects are also responsible for other common, but poorly understood conditions such as Coeliac Disease and Parkinson's Disease.

The key approach to finding genetic causes of common and complex diseases is to use a technique called linkage disequilibrium (LD) mapping as part of an association study. This essentially means finding a variation in the DNA of people with the disease that is significantly different from those without the disease. However, LD requires the computational analysis of huge quantities of complex data, and current computation systems are cumbersome, time consuming and expensive.

Hitachi's Hitagene system is designed to tackle two fundamental issues faced by gene hunters using LD: speed and accuracy. Any gene defect search necessarily involves a vast quantity of data and computation time can take up a significant proportion of a researcher's time. Hitagene's high performance computing hardware together with innovative, flexible software will cut computation time by over 100 times. Hitagene also provides a high degree of accuracy using a 'bootstrapping' technique, providing estimates of the error within the data that is being analysed.

Hitagene is the latest example of a pioneering new advancement which has been developed collaboratively. Hitachi teamed up with Trinity College Dublin, whose expertise has helped to develop the system and whose feedback during the on-going pilot has led to improvements in the flexibility and ease of use of Hitagene.

As part of this collaboration, Hitagene is already being used by researchers at The Department of Clinical Medicine, Trinity College, in their search for the genetic cause of Coeliac Disease.

European Connextion is published by Norikiyo Koide and edited by Hans Craen. The Hitachi Corporate Office, Europe welcomes and encourages your comments and ideas.

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