[newsletter] Number 40
April/May 2003

Words from the new President

Another eventful year has passed, and I am very grateful - after five exciting years as the General Secretary - to pursue the honourable assignment as the new president for the IUR, after Dr. Gilbert Desmet. To be president of such an essential organisation as IUR involves a great responsability, which I will do my best to carry.

In recent years much focus has been on the *future* of radioecology, and much of the debate has been concerned with how to refocus or revitalise our field. I am confident that radioecology most certainly has a future, and I believe that one of IUR"s primary challenges is to identify the *future role* of radioecology in our society.

Last year, the IUR was involved in organising *the International Conference on Radioactivity in the Environment* held in Monaco, 1-5 September. The conference covered a wide range of topics, divided into the themes: protection of the environment, human and societal effects of exposure to radiation, technologically enhanced concentrations of naturally occurring radionuclides in non-nuclear industries, radioactive waste storage, vulnerable ecosystems and extreme climate conditions, remediation and restoration of contaminated ecosystems, and radioecology. The conference was truly international with more than 300 participants from 40 countries.

The new IUR board received much useful input from this conference that will be helpful in identifying where more effort is needed and where new challenges should be met in our evolving field of research. The earlier focus on protection of humans from the consequences from ionising radiation has been replaced by a broader view on protection of the whole environment. This shift has revealed large areas of previously undiscovered ground. An example is the lack of many fundamental parameters describing the transfer and accumulation of important radionuclides in terrestrial and aquatic food-chains. Data is also needed on dose-response relationships for plants and biota and there is a need for more appropriate dose models.
Releases of naturally occurring radionuclides from non-nuclear industries have received much attention recently, and more research is clearly needed on the implications of radium releases from oil industry, for example.

In 1997 the IUR initiated its work to incorporate general principles for environmental protection into a framework for environmental radioprotection. This framework was conceptualised in 2000, in an IUR report presented at the IRPA 10 conference in Japan. Furthermore, this report was followed up with an international consensus conference in October 2001 and a second IUR report in 2002. During the last IUR board meeting in April this year, a statement was issued on this topic. Details are available on the IUR web site (www.iur-uir.org). Numerous other international organisations have also embraced the principal importance of an environmental protection framework, and the IUR is actively collaborating with many of these organisations. Reflecting our envolving field of research, the IUR is also expanding, and the newest branch is an Asian division that will have its first meeting in August this year. IUR is excited to be involved in this increasing interest shown for radioecology in this part of the world.

I look forward to an exiting future for the IUR. Many of IUR"s task groups continue their important work and will present their findings in the near future, while many challenges lies ahead to be addressed.

Per Strand

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XXV General Assembly Report

The XXV General Assembly has been gathered during the Monaco Conference held in the Grimaldi Forum on September 3rd, 2002. With an attendance of 42 regular members, it endorsed the new elected board, defined its organisation and responsabilities, reported on recent activities and presented the future orientations and goals.

The following proposed agenda was agreed:
1. Presentation of the newly elected board.
2. Status of IUR activities and report by the President.
3. Financial report and budget.
4. Outline of the programme for 2003.
5. Any other business.

Presentation of new elected Board members

- President: Per Strand (Norway)
- General Secretary : François Bréchignac (France)
- Treasurer : John Hilton (England)
- Vice-President , Coordinator of IUR activities in Asia : Yongguan Zhu (China)
- Vice-President : Rudolf Alexakhin (Russia)
- Coordinator of scientific development and education : Deborah Oughton (England)
- Coordinator of publications and external relations : George Hunter (Scotland)
- Coordinator of IUR activities in CIS : Gennady Polikarpov (Ukraine)

Election to the various responsabilities within the Board had been previously worked out in detail and agreed upon based on consensus prior to the General Assembly. The General Assembly unanimously endorsed the new Board.

Report by the President on recent activities

The President reported on the last year changes and most significant achievements of the Union. After recalling the context of the new board election, he expressed warm thanks to the previous Board and its President, Gilbert Desmet. On behalf of this later, he next gave an overview on the status of the scientific work performed during the past year, commented the 2001 financial operating statement and presented the provisional budget for 2003. The current rates for the membership fee have been reconducted..

Six Task Groups are currently in action, and their respective achievements have been reported on by their leaders (or representatives).

The continuation of two previous Task Groups has been questioned due to lack of activity: Mediterranean fruit radioecology and Soil-to-plant transfer.

There has been a growing interest noticed on two emerging topics Natural radiation and TENORMs, Tropical ecosystems.

Report by the General Secretary on the strategy and goals for the future

The General Secretary gave an overview on the strategies and goals to be developed for the Union during its next term and the associated future organisation, as resulting from discussions in a prior Board meeting

Future Goals - Mission statements
To continue and strengthen IUR role as a recognised worlwide pool of environmental scientists and experts dealing with the impact of radioactivity on both the environment and man.

Improve and further develop the scientific knowledge, concepts, principles and practical aspects required to ensure the acceptable management of ecological risk to both, the environment and man (exclusive of human epidemiology).

To provide society with independant advice and recommendations on all issues related to radioactivity in the environment.

Future strategies
Enlarge the past focus on «transfers» to the identification and quantification of environmental «stocks and fluxes» (emphasis on the long-term and more radionuclides (other than only Cs and Sr).

Develop information on «effects» at all levels of organisation from mixed contamination, at low doses and from long exposure.

Assimilate methods and concepts from other disciplines such as ecotoxicology, measurement methodologies and ecosystem functioning/integrity theories to avoid incompatibility with approaches used for non-radioactive pollutants.

Assimilate and develop all aspects of «ecological/ envionmental risk assessment» (ERA).

Tools For achieving the goals
IUR aims to facilitate on-going or new initiatives through Task Groups, networking, international coordination, promoting education and courses, meetings, workshops and conferences, and the dissemination of knowledge and advice.

Task Group requirements: to have an identified TG leader, a list of active participants, an action plan with clear objectives and schedule, to annually report to the General Assembly.

IUR does not fund research directly.

Education (with Summer courses in particular) is an area requiring particular stimulation since IUR, although having a strong past experience, is not active anymore in this field.

Active Task Groups and outline of the 2003 programme
A list of 6 different Task Groups that have been active in 2002 has been presented, with a short report from their current leaders or representatives. It has been noted that all these groups have promoted the organisation of a dedicated meeting/Symposium with a larger audience on each respective topic.

- Exposure and effects in Biota - Environment protection (leader : Per Strand)
- Arctic and Antarctic (leader: Brenda Howard)
- Application of Radioecology to other Contaminants (AROC) (leader: tbd, previously Gilbert Desmet)
- Philisophy, ethics and policy (leader: Deborah Oughton)
- Radioecology and waste (leader: Rodolfo Avila)
- Speciation (leader: Brit Salbu)

IUR is actively involved in the cooperative organisation of some key forthcoming internationl conferences (*for more details, see the «Announcement» section*):
- Stockholm Conference, 2003
- ICOBTE Conference, 2003
- ECORAD 2004

Finances
The President presented the operating statement for the years 2000 and 2001 and the anticipated budget for the year 2002. These have been endorsed by the General Assembly. The 2002 rates for the membership fees have been reconducted for the year 2003. In order to reduce the running costs, decision was taken to publish future Newsletters on the website only, from which it can be downloaded.

Future organisation
A «Legislation Committee» to be created will implement an updating of the Union regulations such as to allow for the most optimal operation towards achieving its goals. It is expected that it will consist of typically 6 people (2 board members + 2 external experts + 2 IUR members nominated by the General Assembly).

Additional responsibilities within the board will be identified in order to coordinate and assist in implementing the various goals of the Union: scientific development, publications, external relations, education, …

Task Group requirements: to have an identified TG leader, a list of active participants, an action plan with clear objectives and schedule, to annually report to the General Assembly.

Education (with Summer courses in particular) is an area requiring particular stimulation since IUR, although having a strong past experience, is not active anymore in this field.

Operating statement

ORDINARY	**31/12/2000**	**31/12/2001**
Income		
Membership fees	12 129,51	12 887,28
Interest	6 247,40	853,01
Transactions	3 125,84	0,00
Third party support	2 465,00	0,00
Total Income	***23 967,75***	***13 740,29***
Expense		
Council/secret. running costs	-10971,76	-9661,11
Newsletter	-4 632,51	-5 596,17
Bank costs & interest	-278,05	-70,03
Exchange difference	0,00	-470,37
Total Expense	**-15 882,32**	**-15 797,68**
DEFICIT ORDINARY	***8 085,43***	***-2 057,39***
SPECIFIC ACTIVITIES*		
Contract DG XII	-822,73	0
Doses to Biota	7163,78	-5261,1
Arctic Activities	-5501,82	-13063,58
Antwerp meeting		6356,79
SURPLUS SPECIF. ACTIVITIES	***839,23***	***-11 967,89***
NET SURPLUS	***8 924,66***	***-14 025,28***
Year start balance	***64305.37***	***73230.33***
Year end balance	***73230.33***	***59204.75***

* annual net profit\ loss

Anticipated budget 2002

	Item	Euros	Euros
Income	Total fund balance	52848	
	Monaco conference	15000	
	Nato conference	31964	
	fees	12000	
	interest	300	
	total	**112112**	
Costs			
	Council \ secretariat running costs		9500
	Newsletters		5500
	publications, web site etc		1000
	bank charges		300
	Initiating new task forces		10000
	total		**26300**
	Arctic and Antarctic (incl conference)		15313
	AROC		3000
	waste biosphere		3000
	Monaco conference		25000
	Antwerp conference (Publication)		2800
	Nato conference		31964
	total		**81077**
Total		**112112**	**107377**
Projected balance at end of 2002		4735	
Start bank account		59205	
Final bank account		**63940**	

News from the Secretariat

Overview on discussion promoted by members

In order to cover for other areas of the world than only Asia and CIS, the Board called for additional Coordinators candidacies to form an advisory panel in charge of promoting IUR activities as worldwide as possible (Northern America, Southern America, Africa, Australia, Pacific islands, etc...).

A request was put forward to clarify the list of experts involved in the work of the Philisophy, Ethics and Policy Task Group.

The objectives of the Speciation Task Group were stressed mentioning that it is not to be restricted to «hot particles» as a key issue. The Workshop organised prior to the Monaco conference gathered about 30 scientists who drafted a statement of work for the group.

A brief summary of the history of the Mediterranean fruit Task Group has been recalled: established in 1996, it joined the BIOMASS project in 1997, and as such took advantage of the support from IAEA. Currently involved in promoting the publication of results, the inclusion of tropical fruits was stressed for potential further consideration.

The lack of information concerning the soil-to-plant transfer Task Group has been stressed.

The organisation of summer schools by IUR has been stopped 5 years ago. Many members manifested a renewed interest, including in non-European countries.

The next IUR General Assembly will be gathered in Stockholm, October 2003, on the occasion of the Conference on Protection of the Environment from the effects of ionising radiation, the organisation of which the Union will be contributing.

Website news

A need for rationalising and optimising the Website has been identified, and a refurbished version with a new look and facilities is under construction, the launch of which is expected for the Summer time. This is meant as an interactive tool at the disposal of all members who are encouraged to submit all informations/scientific news/debates/points of view/relevant anouncements to the Secretariat (iur@irsn.fr) for publication on the website.

The various forms for membership application and fees payment will be available online for downloading, and facilities for direct on-line payment will be made available based on Credit Card.

Restricted areas dedicated to Task Groups or Projects members will also be made available to facilitate the exchange of results, informations, draft documents, etc.

New members

From October 2002, the Excecutive Committee has accepted 13 new members to IUR:

ZAPANTIS Alex	Australia
LITTLEWOOD Karl	Scotland
OLEKSYK Tarek	USA
LEGARDA Fernando	Spain
DANESI Pier Roberto	Austria
HERRANZ Margarita	Spain
AKSOY Abdulkadir	Saudi Arabia
AL-AZMI Darwish	Kuwait
LEHTO Jukka Kalevi	Finland
DALE Paul Geoffrey	Scotland
KARCHER Michael	Germany
DOMEL Renate Ursula	Australia
AGUERO Almudena	Spain

New Sustaining Members

IRSN/DPRE/SERLAB
ANDRA
BNFL
ENRESA
NIREX
NUMO
POSIVA
SKB
UKAEA

Representant in South America

Paulina Schuller - Instituto de Fisica
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News from the Secretariat

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Fees 2003

Enclosed with this Newsletter is the 2003 Subscription Renewal Form. If you have not paid, please could you do so, preferably by providing the treasurer with credit card details. If you need to arrange another method of payment, please contact the treasurer (jho@ceh.ac.uk).

Membership grade	CIS, China Cuba, Colombia	Central Europe	Other countries		
	$	$	€	$	£
Student	7	10	20	20	13
Regular	14	20	50	50	32
Senior	21	30	70	70	44
Fellow	21	30	70	70	44
Emeritus	7	10	20	20	13
Honorary	0	0	0	0	0
Supporting organisation	>140	>200	>400	>400	>265

Obituary
Eugeny Danilovich Stukin
(3 February 1937 - 23 January 2003)

On January 23rd, 2003, tragically died Eugeny Danilovich Stukin.

He started his scientific career in 1958 as a student engaged in pratical work at the Moscow Institute of Physics and Engineering. Since 1961, he has worked his way up from a junior research associate at the Institute of Applied Geophysics of the USSR Goskomhydromet (Governmental organization on hydrometeorology) to the head of laboratory at the Institute of Global Climate and Ecology of Roshydromet (Russian Governmental organization on hydrometeorology) and Russian Academy of Sciences.

E.D. Stukin was a well-known scientist in the field of radioactivity studies following nuclear explosions and accidents. His activities promoted the establishment and operation of the national network of radiation control, he was a major contributor to the development of theory and methods for radiation monitoring. His contribution to science is indisputable: above 100 publications including four monographs.

E.D. Stukin worked at the Semipalatinsk and Novaya Zemlya nuclear test sites, in the East-Urals Radioactive Trace area formed after the «Mayak» accident in 1957, took part in airplane and ship experimental studies, carried out research in the near zone of the Chernobyl NPP, in region where the nuclear submarine «Kursk» sank. In 1986, E.D. Stukin headed the Operation group of the USSR Goskomhydromet in Chernobyl within the Government commission on the liquidation of consequences of the Chernobyl accident. Totally he had worked in the near zone of the Chernobyl accident for about 8 years.

E.D. Stukin was known for his highest professionalism, remarkable capacity for work and pretention to purity of scientific experiment. He was very attentive and responsive to his numerous colleagues and pupils. His vivid presentations at conferences, workshops and symposia remain unforgettable for all of those who had the pleasure to meet him.

Active Task Groups

Exposure and Effects in Biota - Environment Protection
(Task Group leader : Per Strand, per.strand@nrpa.no)

Efforts in instigating policy changes have been successful, as demonstrated by the activity now undertaken under the auspices of international organisations (IAEA, ICRP, OECD/NEA, EC,…). Particular emphasis is to be invested on coordination of international effort and strengthening the scientific grounds for environment protection. After strong commitments during the Monaco conference, large efforts are yet to be undertaken and achieved worldwide in order to secure the development of a consensual and scientifically sound approach towards protection of the environment.

Currently, the IUR observes from the recent developments that there is a risk to over-emphasize the regulatory aspects at the expense of securing the scientific grounds upon which they are to be based.

An IUR technical report features the current status and the prospects for the future. (Download at www.iur-uir.org/Publications/IURreport03.doc)

In view of the proliferating initiatives which are currently growing worldwide, from science to ethics, philosophy, legal and regulatory aspects, and the variety of potential approaches and views which they generate, the IUR Board of Council has put a recent effort on building a consensual statement in order to define its position and future directions of work. (IUR Statement Protection of the Environment, download at www.iur-uir.org). (Last update: May 2003)

Arctic and Antarctic Regions
(Task Group leader: Brenda Howard, bjho@ceh.ac.uk)

This Task Group has the overall objective of contributing to the understanding of the processes governing the behaviour of radionuclides in Arctic and Antarctic ecosystems. The remit covers a consideration of experimental activities, field studies and modelling.

A key focus for the Task Group over the last few years has been interaction within the activities of the radioactivity expert group of the Arctic Monitoring and Assessment Programme (AMAP). Input has been provided into the second Arctic Monitoring and Assessment report, specifically on Amchitka in the USA and Iceland, responding to data omissions in the first AMAP report. Publications have been prepared on the studies in Iceland showing that the spatial variation in global 137Cs fallout was successfully predicted using the AMAP methodology proposed in the first AMAP report.

Reindeer and caribou are key species in terrestrial Arctic radioecology, and radioecological studies involving these animals have been carried out in many Arctic areas for decades. During the last years, intensified grazing, and partly overgrazing, in many Nordic areas may have significantly affected radionuclide transfer, and may consequently have implications for emergency preparedness. In the Nordic countries there is therefore a renewed interest into reindeer radioecology, focusing on regional differences in transfer and long term trends.

A recent initiative by G. Polikarpov has been to set up the Antarctic sub-group focusing on the application of radiotracers to study the large-scale oceanographic, biogeochemical and environmental processes in the Antarctic region. For instance, the radioecologists from Institute of Biology of the Southern Seas (IBSS, Sevastopol, Ukraine) have surveyed the radionuclide concentrations across Atlantic and western Antarctic waters in 2002, including ice sampling at a glacier near the Ukrainian Antarctic Station «Akademik Vernadsky». The results of this expedition have been accepted for publication in the 5th issue of Bulletin of the Ukrainian Antarctic Centre. Such surveys will be carried out regularly in future under the framework of the National Programme of Ukraine for Antarctic research. Information about the establishment of the IUR Antarctic sub-group has been submitted to the Marine Ecological Journal published by IBSS. In other work in the Antarctic by Chilean and German members, Cs-137 behavior has been compared with that of South Patagonia in South America, which is a territory with a polar climate. The radioecological sensitivity of the Antarctic ecosystem to fallout radiocaesium seems to be higher than in the Patagonic polar region.

Current Task Group members include those from states with Arctic/Antarctic territory but also members with a general interest in this subject. Current members are from Germany, Poland, Ukraine, UK, USA, Norway, Iceland, USA, Chile, Canada and the IAEA. (Last update: 7 March 2003).

Application of Radioecology to other Contaminants (AROC)
(Task Group leader: tbd, previously Gilbert Desmet)

The Task Group was launched during the IUR-SETAC Meeting on the Application of Radioecology to Other Contaminants (AROC), held in Antwerp (Belgium), February 2002. The aim is to bring together experts involved in experimental research and model development in closely related areas of environmental chemistry and toxicology. Pollution science combines a multitude of highly specialised disciplines and the Task Group attempts to bridge the gap between radioecology and other areas of environmental contamination and toxicology through identification of synergies:

- how can radioecology contribute to the improvement of our understanding of environmental contaminants in general,
- how can radioecology consider and adopt tools and techniques used in other branches of environmental contamination and toxicology.

The Task Group is particularly interested in attracting the interest of specialised scientists from different disciplines as well as user groups in the world of environmental engineering and decision making. Symposia organised in Antwerp and Kiev in 2002. (Last update: January 2003).

Philosophy, ethics and policy
(Task Group leader: Deborah Oughton, deborah.oughton@ikb.nlh.no)

The main aim of this Task Group is to provide a forum for IUR members to discuss a variety of issues concerned with the interaction of scientific research and policy making. The Group"s area of interest covers philosophical questions such as the relationship and demarcation between «fact and value», the role of ethical and value judgements on decision-making and risk perception and communication.

Over the past 18 months, the main focus has been on issues concerned with protection of the environment from ionising radiation, including legal, cultural and ethical aspects of environmental protection. Together with the Task Group on «Exposure and effects in biota», this has included co-arrangement of the Oslo Consensus Conference (download the consensus statement at www.iur-uir.org) at which a number of ethical and philosophical issues influencing radiation protection were discussed. Topic covered the philosophical aspects of risk, psychology and risk perception, public participation and stakeholder issues. In addition to the co-chairs Per Strand and Deborah Oughton, a number of IUR representatives from both Task Groups attented the meeting (including future board members George Hunter, François Bréchignac and Rudolf Alexhakin and Ethics Task Group members Graham Smith and Lars Persson). Since that meeting, we are pleased to welcome Gennady Polikarpov, Pier Danesi and Natalia Tereshenko as Task Group members.

The next Task Group meeting has been scheduled to coincide with the forthcoming Stockholm Conference on «Protection of the Environment « (6-10 october 2003). IUR members are encouraged to express their interest in attending the meeting and to suggest discussion subjects and future work. Possible topical issues might include Risk and Scientific Uncertainty, Communication, Stakeholder Involvement, and the organisation of a further consensus conference. (Last update: April 2003).

Radioecology and waste
(Task Group Leader: Rodolfo Avila, rodolfo.avila@facilia.se)

The Task Group has been launched during the Workshop «Mobility in Biosphere of Iodine, Technetium, Selenium and Uranium» co-organized by IUR and ANDRA in Nancy (France), April 2002. The participantss gathered around a consensus on the high priority for radioecology to tackle the problem of the mamangement of high level radioactive waste. The objective is to promote cooperation in this field through oranizing workshop focused on the behaviour or key radionuclides.

The first workshop of the IUR Task Force «Radioecology and Waste» was held in Merlewood, U.K, between the 27th and 28th of February 2003. Nineteen scientists attended the workshop, which was organised by Brenda Howard, Rodolfo Avila and Elisabeth Leclerc-Cessac.

The workshop was focused on three key radionuclides in radioactive waste management: ^{237}Np, ^{14}C and ^{36}Cl. A half-day session was dedicated to each radionuclide, each of which started with a general review presented by Elis Holm for ^{237}Np, Mike Thorne for ^{14}C and Valery Kashparov for ^{36}Cl. Presentations were also made by Kath Morris (^{237}Np), Dan Galeriu, Nick Ostle, Christian Tamponnet and Linda Kumblad (^{14}C) and Daniel Ashworth (^{36}Cl). Each session concluded with a discussion about the long-term transfer of these radionuclides in terrestrial and aquatic environments.

Interaction matrices were used as an aid for keeping the discussions focused. The participants agreed that the Task Group will further develop these matrices and use them as a way of presenting, in a synthesized way, the views of the group on for instance the relevance of different processes, the status of knowledge, etc.

The participants also discussed how the Task Group will work in the future and how it will interact with the project BIOPROTA. Elisabeth Leclerc-Cessac, who is the BIOPROTA coordinator, presented an overview of the project and outlined a strategy for cooperation with the Task Group. The general opinion of the group was that cooperation would be beneficial for both groups since it establishes a direct link between scientists and implementers (typically assessment modellers). BIOPROTA will provide the group with formulations of relevant practical problems that require a scientific solution, while the Task Group will propose possible solutions.

The members of the Task Group present at the meeting agreed on the following action plan:

- To further develop the interaction matrices discussed during the workshop in consultation with SKB, Nirex and other relevant organisations.

- To prepare a list of existing relevant radioecological and ecological models for the three radionuclides and compile existing literature through enquiries to the broader IUR membership.

- To analyse the database of the US registry of workers exposure to transuranic elements with the aim of obtaining information relevant for ^{237}Np and other actinides.

- To prepare a text outlining the view of the group on the use of concentration factors for ^{14}C.

- To suggest possible experimental studies for improving knowledge of ^{36}Cl behaviour in terrestrial environments.

- To carry out a second workshop, possibly in Madrid in the beginning of November 2003, to progress the work carried out since this workshop. (Last update: May 2003).

Specication
(Task Group leader: Brit Salbu, brit.salbu@ikb.nlh.no)

The main objective of this new Task Group is to strengthen the competence internationally on environmental impact assessment. This is to be achieved based on using adequate techniques to characterize radionuclides species, linking and quantifying radionuclides species to sources and release scenarios, linking and quantifying radionuclides species to environmental airborne, marine or freshwater transport processes including models, identifying and quantifying radionuclides species and transformation processes influencing mobility and bioavailability of radionuclides, relating the distribution of different radionuclide species to external doses, and relating radionuclides species to internal redistribution within organisms to improve dose estimates for biota. A first workshop has been held in Monaco, September 2002. (Last update: April 2003).

Task Groups not currently active

Mediterranean Fruit Radioecology

The activity of this Task Group has been closely associated to the IAEA BIOMASS Programme that was recently ended. Although there is still a need to complete radioecological data base, and to expand to better knowledge on radionuclides transfer to fruits in all climatic conditions, the reduced present activity in this field does not justify today the maintenance of an IUR Task Group. (Contact for past activity: Franca Carini, radlab@pc.unicatt.it).

However, this may be reconsidered in the light of a new action currently undertaken by IAEA to start an international programme on "Environmental Modelling for Radiation Safety (EMRAS) that would follow up BIOMASS. (Contact: Mikhail Balonov, m.balonov@iaea.org)

Soil-to-Plant Transfer

In collaboration with the European Society for Nuclear Applications (ESNA).

Current areas of reflection

A number of ideas are continuously circulating in the radioecological community and its neighbour disciplines, as promoted by scientific actors, user groups, or IUR members, or stimulated by actual environmental events. From time to time, a critical mass of participating actors is reached which justifies the creation of a dedicated Task Group which IUR supports in compliance with its role to promote and stimulate innovation as well as scientific advancement.

For each topic emerging, a list of interested persons is maintained in order to favour an easy exchange of information, and the reaching of the critical mass.

Integrated Rehabilitation of Contaminated Areas.

A research on the Chernobyl accident and other accidental situations and application of countermeasures and rehabilitation practices has led to remarkable achievements. They include the further evaluation of long-term effect both of the accident itself and of the impact of the countermeasures taken on affected ecosystems.

Many outstanding reports and scientific papers have been produced. Little effort yet has been made to really extract the generic findings from all this precious research and to «translate» this information in a structure that is legible and useful for different levels of user. These levels are spanning the interested non-radioecological researcher, the environmental engineer and manager, the local authority and land-user, and eventually the political decision-maker and funding organisations. There is also still an open challenge to comparing different economic and socio-cultural situations for a further extraction and use of the so-called Chernobyl results!

Creation of a Task Group dealing with the intelligent assessment of the results of all rehabilitation practices and techniques applied seems thence to be self-evident and an urgent matter to be structured and published. (Contact: Gabi Voigt, g.voigt@iaea.org).

Natural Radiation/T.E. NORM
Maria Belli, Hildegarde Vandenhove, Galina Lazorenko, Jose Godoy,...

Tropical ecosystems
Didier Louvat, Terry Hamilton, Miguel Prendes,...

Report on IUR participation at the World Summit on Substainable Development, 26th August - 4th July, 2002, Johannesburg

Six months ago, more than 100 Heads of State met at the Johannesburg World Summit with a mandate to renew commitments to sustainable development and to set concrete targets and timetables to further the practical implementation of principles agreed at the 1992 Rio Earth Summit. IUR was one of the 900 plus NGO organisations accredited to take part in the World Summit.

Summit Aims

Despite the achievements of the Earth Summit—including the 27 principles of the Rio Declaration, a Programme of Action for Sustainable Development (Agenda 21) and the Convention on Biological Diversity—it is generally acknowledged that there has been a major gap in the implementation of Agenda 21. Globally, the past ten years has seen increasing poverty, little major change in unsustainable and inequitable patterns of consumption and production, and a fragmented approach to sustainable development. Hence there was a strong awareness that the World Summit needed to progress from problem definition and agreements on high-level principles, to practical solutions and binding mechanisms needed to establish all three pillars of sustainability: economic, social and environmental development. In fact, while Rio emphasised the environmental aspects of sustainable development, the principle focus at Johannesburg was social and economic aspects.

Poverty, health and globalization were amongst the most important issues under debate. Despite the broad agenda (or maybe because of it), many felt the Summit doomed before it started. So, why was the IUR there and what were the main outcomes of the Summit?

Relevance to IUR

First, the IUR supports the overall goals of sustainable development and protection of the environment (see the IUR statement), and as the major global forum on the subject, participation demonstrated the IUR's commitment in the area. Second, as a largely scientific organisation the IUR wanted to promote the role of science in policy making, stressing that, in addition to economic and social factors, sustainable development needs consider the available scientific knowledge, as well as a reasonable understanding of the limitations and uncertainties in that knowledge. In this respect, the recent work of IUR on Environmental Radiological Protection was presented at one of the many «parallel» or «side-event» conferences at the Summit (Science, Technology and Sustainable Development). Financial support for the travel and subsistence costs of the two IUR representatives (Deborah Oughton and Ingrid Bay) was provided by grants from the Norwegian Ethics Programme and the Norwegian Radiation Protection Authority.

IUR spent most time attending the main summit negotiations, where the draft text of the «Plan of Implementation», as put together at the four previous PrepCom meetings, was to be finalised before being put to the Heads of State. The success or failure of the Summit

was seen by participants to rest primarily on the agreement achieved in this Plan of Implementation. The main areas of debate being the actual targets and time-tables specified within, as well as considerable discussion on the applicability and relevance of certain Rio Principles, notably the Precautionary Principle (Principle 15), Public Participation and Access to Information (Principle 10) and the notion of «Common but differentiated responsibilities» (Principle 7).

Main Outcomes

In addition to a general reaffirmation of a commitment to sustainable development and a strengthening in understanding the link between poverty, human health and the sustainable use of natural resources, specific targets agreed upon included:

- to halve, by the year 2015, the proportion of the world's people whose income is less than $1 a day and the proportion of people who suffer from hunger;
- to halve, by the year 2015, the proportion of people without access to safe drinking water and basic sanitation;
- to reduce, by 2015, mortality rates for infants and children under 5 by two thirds, and maternal mortality rates by three quarters, of the prevailing rate in 2000;
- to reduce HIV prevalence among young men and women aged 15-24 by 25 per cent in the most affected countries by 2005 and globally by 2010, as well as combat malaria, tuberculosis and other diseases; and
- to aim, by 2020, to use and produce chemicals in ways that do not lead to significant adverse effects on human health and the environment.

Regarding conservation and biodiversity, the main targeted commitments were:

- to achieve by 2010 a significant reduction in the current rate of loss of biological diversity;
- to maintain or restore depleted fish stocks to levels that can produce the maximum sustainable yield by 2015;
- to establish a representative network of marine protected areas by 2012 and
- to encourage the application, by 2010, of the ecosystem approach for the sustainable development of the oceans.

While retaining a target for biodiversity, this agreement was widely seen to be somewhat of a compromise, since previous agreements were aimed at «stopping and reversing the current alarming biodiversity loss». Other acknowledged failures were the lack of targets on renewable energy and the continued prevarication surrounding measures to counteract global warming and the Kyoto Protocol (although Canada and Russia did agree to ratify the Protocol). The initial proposed target to increase the share of modern renewable energy in the world's energy supply to 10% by 2010, was being replaced by the half-hearted agreement to «Diversify energy supply and substantially increase the global share of renewable energy sources in order to increase its contribution to total energy supply.» The discussion did spark an interesting side-debate on the role of atomic energy, which, if not renewable, has often been classified as «sustainable». While IUR remains neutral on the political aspects of nuclear power use, the issue is pertinent as it illustrates the important role IUR has in providing independent scientific advice and helping to ensure that any decisions and debates as to the sustainability, benefits and costs of nuclear power should be based on the best available scientific knowledge. Finally, the Summit also saw some 280 Type-II partnerships between governments, business and civil society (with $235 million in resources).

Time will tell whether the targets will be reached and the Summit make any difference on the ecological state of the planet. In the meantime, it is hoped that IUR and its members will continue to support the spirit and aims of sustainable development in all its forms and guises.

www.johannesburgsummit.org (main summit site)
www.earthsummit2002.org («Stakeholder Forum» Site)
www.iisd.ca/linkages/2002/wssd/
(International Institutefor Sustainable Development)
(Contact: Deborah Oughton,
deborah.oughton@ikb.nlh.no).

The XXXI Kleshkovsky annual radioecological readings

On 4 December 2002, the XXXI Klechkovsky Annual Radioecological Readings were held in the Russian Institute of Agricultural Radiology and Agroecology (Obninsk, Russia). V.M.Klechkovsky (1900-1972) is one of the founders of agricultural radioecology who has greatly contributed to the study of radionuclide migration via the soil-plant-animal-agricultural products chain. The Readings were attended by 60 specialists from Russia and the CIS countries. The International Union of Radioecology was one of the co-organizers of the Readings.

R.M. Alexakhin gave a report on the history of agricultural radioecology as a branch of this science ant its current state-of-the-art. The report of E.V. Spirin concerned dosimetry of agricultural plants and animals. It described the formation of internal irradiation doses to animals

under combined exposure (external irradiation and radionuclide uptake with fodder). Experimental and estimated data were presented on the formation of absorbed doses in plants on fields under radioactive fallout.

A.S. Filipas reported on the impact of radioactive fallout after the Chernobyl accident on agricultural plants and successional changes in plant communities 15 years after the accident.

The materials presented are of great importance for the rehabilitation of agricultural lands affected by the Chernobyl accident.

French-German initiative for Chernobyl Radioecology project - Main results

Gérard Deville-Cavelin (IRSN - France - e-mail: gerard.deville-cavelin@irsn.fr), Harald Biesold (GRS – Germany - e-mail: bie@grs.de).

Ten years after the Chernobyl accident, IRSN and GRS decided to start actions for evaluating the consequences of the release of large amounts of radionuclides in the environment. The French-German Initiative for Chernobyl includes a «Radioecology Project» for the evaluation of the radioecological consequences of the accident, a «Shelter» project, and a «Health consequences» project. According to the general agreement between IRSN for France, GRS for Germany, supported by the French and German electricity providers, and the Chernobyl Centre for Ukraine, the Radioecology Project started at the end of 1998 and its purpose is to collect, validate and secure existing data by establishing data bases for further uses.

The chosen topics were the radionuclide transfers from soil to plants and to animals, the transfers by surface runoff and in an aquatic environment, the transfer in an urban environment, waste disposals and waste management, countermeasures and their efficiency in urban, agricultural and natural environments. The data collected have been gathered in a common database called REDAC (**R**adio**E**cological **D**atabase **A**fter **C**hernobyl) and a web site will be opened in order to inform the public and mass media about the general content of REDAC.

Tens of thousands values of transfer coefficients, runoff values, countermeasures efficiency and other significant values are gathered and organised in REDAC. It is possible to get an overlook at the results by consulting the web-site located in Chernobyl Centre in Kiev, at: (http://www.fgi.icc.gov.ua)

Ozersk Conference - Report

In late 2002, a scientific conference of radioecologists was held in Ozersk (production association «Mayak») devoted to the 45th anniversary of the accident.

Fourty-five years elapsed since one of the heaviest radiation accidents at a nuclear enterprise of the USSR – chemical plant «Mayak» (reactor-radiochemical production). As a result of a thermal nuclear explosion in a reservoir – storage facility for radioactive wastes – 74 PBq of medium and long-lived fission products (about 5% ^{90}Sr + ^{90}Y) were released into the environment with the formation of an extensive contaminated area, «East Urals Radioactive Trace», EURT. Unique comprehensive radioecological investigations were initiated in this area on the radionuclide migration in different natural environments, and on the effects of ionizing radiations on natural and cultivated ecosystems, which have been poorly published either in USSR or english-speaking Journals. Full Proceedings of this conference have been published (in Russian) and a selection of papers published in a special issue of the journal «Problems of Radiation Safety» (in Russian).
(Contact: Rudolf Alexakhin, riar@obninsk.ru)

IUR sponsors two Russian scientists to present radioecological results at ICOBTE, Uppsala, 15-19 June 2003

Bioavailability of Radiostrontium in Soil: Paramaterization Through Modelling Approach

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(konoplev@obninsk.com)

Introduction

A key component in the estimation of food chain contamination by a radionuclide is the evaluation of a soil-to-plant transfer factor (TF), which is the ratio of the activity concentration in the plant to that in the soil. The values of TF determined experimentally in different conditions for a particular plant can differ by hundreds or thousands of times (IAEA, 1994). Therefore, using a plant-average TF leads to a considerable uncertainty in the prediction of food contamination by radionuclide. For the best evaluation of TFs it's necessary to develop mechanistic models that predict radionuclide uptake by plants. An equilibrium model that predicts the radiocaesium transfer to forest plants (Konoplev et al., 1997*)* from soil parameters has recently been developed. A similar approach could be used for radiostrontium uptake.

Model development

The conceptual model of radiostrontium soil-to-plant transfer includes 3 compartments: the soil, the soil solution, and the plant. The model takes into account ion exchange sorption-desorption processes in the soil and ion exchange at the root exchange complex (REC). The most accepted mechanism for Ca (Sr) uptake is passive movement through the volume of the cell wall, where ions are in equilibrium between the soil solution and the REC.

The proposed model of radiostrontium soil-to-plant transfer is based on the following assumptions:

(a) only the exchangeable portion of Sr inventory in the soil is involved in the immediate exchange with the soil solution;

(b) Sr^{2+} is taken up by the plant from the soil solution, and its concentration in the plant is a linear function of the radionuclide loading in the root exchange complex;

(c) Ca^{2+} is the main competitive cation for Sr^{2+}.

As a result it was derived that ^{90}Sr uptake from soil to plant is described by a linear function of *the bioavailability factor* (A):

$$TF\ (^{90}Sr) = B \cdot A \qquad (1)$$

where

$$A = a_{ex}/Ca_{ex} \qquad (2)$$

and B is a plant species dependent characteristic. Thus the bioavailability factor ^{90}Sr is the combination of two soil parameters: the portion of exchangeable form of ^{90}Sr (a_{ex}) characterising the fixation ability of the soil and the content of exchangeable calcium.

Materials and methods

The model was tested using the radiostrontium uptake data for barley and lupine in a laboratory pot trial. Barley and lupine were grown for 14 days on ten soils artificially contaminated by ^{90}Sr. Soils were sampled from the arable horizons (0-20 cm) at locations situated in different soil-climatic zones of the European part of Russia. Soils were sown one year after contamination. Soil weight per pot varied between 375 and 500 g, 4 pots per soil. The exchangeable Ca and ^{90}Sr were determined in 1M NH_4OAc soil extract (S/L 1:10) using atomic absorption spectrophotometry and beta counting respectively.

Results and discussion

^{90}Sr exchangeability in soils under study ranged from 0.6 to 0.9; the exchangeable Ca ranged from 5.2 to 40.5 cmol kg^{-1}. The bioavailability factors for soils were calculated using eqn (2). The dependence of the ^{90}Sr TF on the bioavailability factor is plotted in Fig.1. It can be seen that this dependence is quite well described by a linear function. The slope of the line is the plant species constant B from eqn (1). It is defined empirically for the mature plant. A good agreement between the theoretical and the experimental relationships indicates that the model proposed can be used for obtaining site-specific TF of radiostrontium to plants.

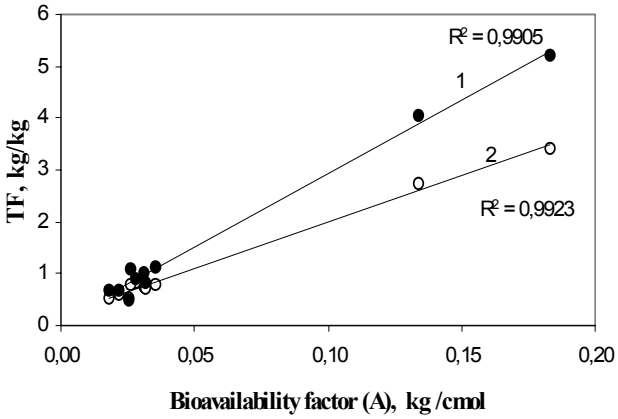

Fig. 1*. ^{90}Sr TF for barley (1) and lupine (2) as a function of the bioavailability factor (A)*

Conclusions

A mechanistic model of radiostrontium soil-to-plant-transfer is proposed. It is shown that the transfer factor (TF) should be a linear function of the bioavailability factor A, which is given by the ratio of exchangeable radiostrontium and exchangeable calcium. The parameterization was tested against the pot trial data on soil-to-plant transfer for a wide range of Russian agricultural soils, and satisfactory agreement was achieved. The approach can be used in radioecological GIS to map radiostrontium soil-to-plant transfer factor.

References

IAEA (1994). IAEA Technical Reports series No. 364: Handbook of parameter values for the prediction of radionuclide transfer in temperate environments. IAEA, Vienna, 1994, 74 pages.

Konoplev A.V., Drissner J., Klemt E., Konopleva I.V., Miller R., Zibold G. (1997) Characterisation of soil in terms of radiocaesium availability to plants. In Proceedings of the XXVII Annual ESNA/IUR Meeting, Gerzabek M.H., ed., Seibersdorf, FZS, 1997, pp. 163-169.

Bioavailability of thorium for wheat grown in different media

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[2]Laboratory Pierre Sue, CEA-CNRS, 91191,Gif sur Yvette Cedex, France

Introduction

The interest in the behaviour of natural radioactive elements in terrestrial and aqueous systems has been demonstrated in many scientific publications. However, the role of actinides in metabolic processes in plants is not yet clearly understood. Among other radio-nuclides, little attention was given to thorium. The levels of Th content in native plants are usually near to detection limit of many analytical techniques used for determination of Th in plant material. In this regard all predictions concerning the Th uptake are rather problematical. In particular, it is rather difficult to predict the actual uptake of Th by plants in the case when Th concentration in the environment is slightly increased. The purpose of this research was to study the ability of wheat to uptake Th from different media (soil and water culture solutions) and to assess possible variations in Th content in the media where the plants were grown.

Materials and methods

The experiments were performed in a naturally illuminated greenhouse. Seeds of wheat *Tricum vulgare (vill) Horst* were germinated for six days on a moist filter paper. The germinated seedlings were divided into four equal parts and transferred to pots filled with soil and jars filled with doubly distilled water, spring water and nutrient solution of Hoagland. One part of the pots with soil and jars with water was supplemented with thorium nitrate (50 $\mu g\ kg^{-1}$ of Th was added to the water media and 75 $mg\ kg^{-1}$ of Th was added to the soil), the other part of the pots and jars served as a control. The plants and soils were sampled three times – within 2, 4 and 7 days after sowing. Instrumental neutron activation analysis, inductively coupled plasma with mass spectrometry and liquid ion chromatography were used to determine concentrations of 37 elements in different parts of the wheat seedlings as well as in the growth media. A multivariate statistical treatment of experimental results was carried out in order to reach a better understanding of bioaccumulation of thorium and other elements and to provide the way of estimating a contribution of specific factors that may have an effect on element interactions at the border plant root/ surrounding medium.

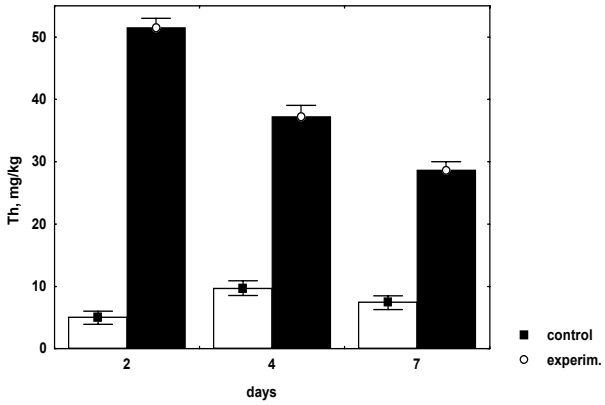

***Fig.1**. Variations in Th concentration in control and experimental soil within two, four and seven days after addition of Th to the experimental soil.*

Results

An addition of Th to the media led to a significant increase of Th content both in leaves and, especially, in roots of the experimental plants. The most noticeable increase was found in the plants grown in doubly distilled water. It seems that deficiency in all elements in the medium was a contributory factor for an enhanced uptake of Th in the case when concentration of Th in the medium was increased. However, the bioaccumulation of Th has not affected biomass of the plants. After seven days, length of the leaves of wheat seedlings in all experiments and in control was comparable. This indicates that Th is not very toxic for the plants at this concentration level. Fig.1

illustrates dynamics in Th content in the soils. In the course of the experiment concentration of Th in artificially contaminated soil decreased ~1.7 times. It is important that Th content in roots of the plants grown in the soil increased approximately to the same level as it was in the soil. Therefore, we may suggest that the decrease of Th concentration in the soil resulted solely from an uptake of Th by the plants. A similar dynamics in Th concentration was observed in an experiment with wheat seedlings grown in water (Fig.2). With time concentration of Th both in roots and in leaves of the plants increased, while Th content in the water decreased. It is interesting that the level of decrease of Th concentration in water was about the same as the level of increase of Th content in leaves of the experimental plants. Thus, Th was transferred from growth medium to upper plant parts.

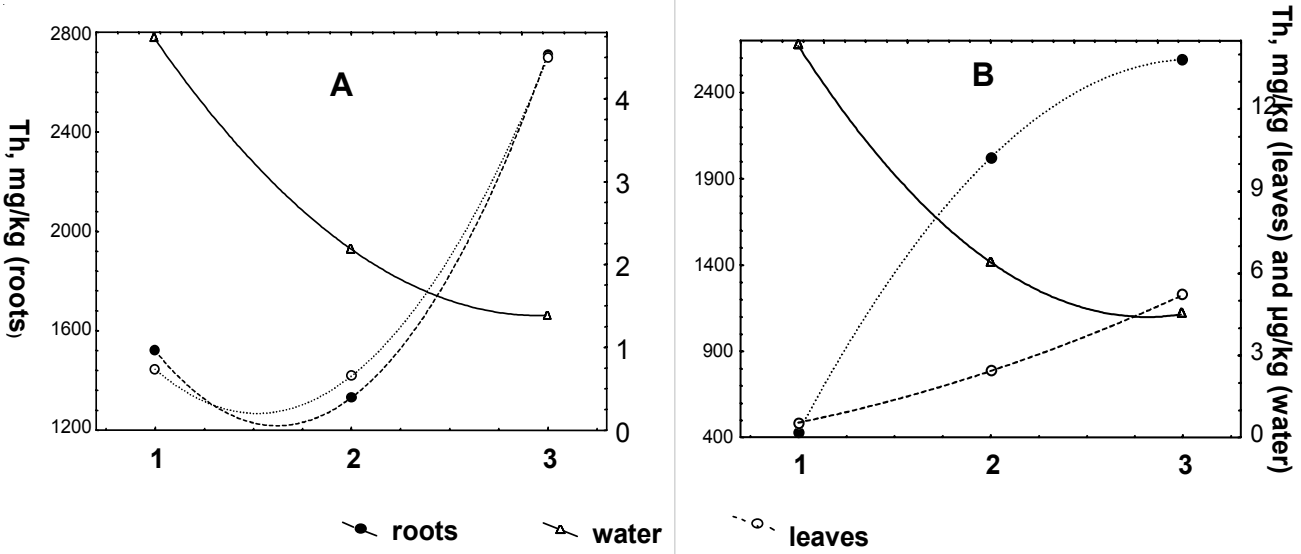

Fig.2. *Variations in Th concentrations in different parts of plants grown in spring water (A) and doubly distilled water (B)*

Announcements

Meetings and workshops

XXVIth IUR General Assembly

The next General Assembly will be held during the Stockholm Conference on Protection of the Environment, 6-10 October, 2003. Practical details will be provided in due time.

Workshop of the Task Group « Protection of the Environment»

The Task Group members and all interested IUR members will gather for a Workshop to be held as a side event of the Stockholm Conference on Protection of the Environment. Recently, the Task Group has published a Technical report presenting the «Current status and Future Work» (http://iur-uir.org/Publications/IURreport03.doc) and the IUR Board of Council has elaborated a Statement on the issue. It is expected that presentations and discussion of the most recent scientific achievements and results will be arranged prior to the conference starting Friday 3rd or Saturday 4th october 2003. More details will be provided in due time.

Workshop of the Task Group «Philosophy, Ethics and Policy»

The next Task Group meeting has been scheduled to coincide with the forthcoming Stockholm meeting on Protection of the Environment (6-10 October 2003). IUR members are encouraged to express their interest in attending the meeting and to suggest discussion subjects and future work. Possible topical issues might include Risk and Scientific Uncertainty, Communication, Stakeholder Involvement, and the organisation of a further consensus conference.

XXXIIth Kleshkovsky Annual Radioecological Readings

The next Annual Radioecological Readings to the memory of V.M.Klechkovsky will be held in Obninsk, October 2003, and organized by the IUR, the Russian Academy of Agricultural Sciences, the Russian Institute of Agricultural Radiology and Agroecology and the Russian Nuclear Society. The topic of the Readings will be «Radioactive contaminants vs non-radioactive pollutants: achievements and non-solved problems».

Forthcoming Conferences

International Conference on the Biogeochemistry of Trace Elements (ICOBTE)

Symposium on the chemistry, bioavailability and recycling within biota: Towards an integrated approach in mobility assessment. (Sponsored by IUR).
Uppsala, Sweden, 15-19 June, 2003. (Organising Committee: Y. Thiry, M. Gerzabek & S. Staunton). Contact: S. Staunton.
(staunton@ensam.inra.fr)
(www-conference.slu.se/7thICOBTE/uppsala/)

Third International Conference on Contaminants in the Soil Environment in the Australasia - Pacific Region - Risk Based Land Management: a cost effective tool for contaminated land.

Originally, 24 - 29 August, 2003, date delayed due to SARS. Beijing, China. Contact: Yongguan Zhu,
(ygzhu@mail.rcees.ac.cn)
(www.conference.ac.cn/scrap.html)

Radiation Safety Problems in the Caspian Region
NATO Science Program, Advanced Research Workshop (ARW), Baku, Azerbaijan, 11-14 September 2003.

The objective of this ARW is to exchange information and experience in the field of securing of radiation safety of biosphere, development of international cooperation for solving of regional radiological problems. The main topics will be Radiation Environmental Monitoring, Natural and Artificial Sources of Radioactivity in Caspian Region, Radiotherapy and Radiodiagnostics, Radiation Safety Problems in the Oil Industry, Problems of Burial of Radioactive Wastes in the Caspian Countries, New Methods and Technics of Dosimetry of Ionizing Radiation, Environmental Impact of Electromagnetic field, Radar Stations, NGO movement for Radiation safety of the Caspian region.

Local organizer: Dr. Islam Mustafaev, Head of Laboratory «Energy Saving Radiation Processes», Institute of Radiation Problems, Azerbaijan National Academy of Sciences, 370143, Baku, Azerbaijan.
Deadline for abstract (up to 250 words) submission : March 31, 2003.
(imustafaev@iatp.baku.az)

International Conference on the Protection of the Environment from the Effects of Ionizing Radiation.
Organised by IAEA in collaboration with UNSCEAR, EC, IUR and SSI. Stockholm, Sweden, 6-10 October, 2003.
(http://www.iaea.org/worldatom/meetings)

Announcements

IRPA 11- International Radiation Protection Association.
23-28 May 2004, Madrid Spain.
(www.irpa11.com)

ECORAD 2004: The scientific basis for environment protection against radioactivity.
Organised by IRSN in collaboration with IUR and ICRP. 6–10 September, 2004, Aix en Provence, France. (http://www.irsn-dpre.com/ecorad)

Congress objectives
Under strong social pressure driven by current environmental concerns, all environmentalists are called to construct scientific knowledge, concepts and principles suitable to ensure acceptable mastering of ecological risk. Environment Protection against radioactivity is certainly the new challenge for radioecology. Originally, radioecology has evolved with the primary goal of assessing the impact of radioactivity on man, and as such, was focused on transfer to man through the environment. Now, following a trend that is already underway for other toxicants, the environment itself is also considered as a target requiring protection.

As compared to the past, this new focus of radioecology is even more «science demanding», particularly for basic understanding in biology and ecology. In addition to the knowledge on acute effects of high «doses» of radioactivity on small human critical groups, it is needed to know what happens to large ecosystems when loaded with small, but long-lasting, amounts of radiotoxicants. In addition to «simple» direct transfer, it is needed to take into account complex interaction processes and cycling that may lead to the redistribution of radionuclides, and eventually to their bioconcentration. In addition to «classical» situations like external irradiation, inhalation and wounding, it is necessary to study more thoroughly the effects of internal contamination following trophic chains. In addition to the most studied physical transfer and dispersion phenomena, it is mandatory to clarify how the many differentiating processes at work in the biosphere are acting on bioavailability, a feature that is overlooked in the current homogeneous approach of simplistic models.

For all these reasons, today's radioecology has to deepen its roots in the main stream of environment protection and the most advanced, or actively evolving, associated set of sciences. Practical implications of radioecology are huge. International organisations are already thinking of future regulations. It is hence of paramount importance to ground a strong scientific basis such as to avoid the development of inappropriate regulations. This congress will therefore be devoted to reviewing the state of the art on all aspects of radioactivity interactions with the environment and to promoting innovative research approaches.

In following its predecessor event, ECORAD 2004 will be a science-oriented congress. It will offer a meeting place for fruitful exchanges across the radioecology community and all environmental specialists sharing the same concerns. Regulators, stakeholders and all users of radioecology are welcome.

Recent Journals, Books, Reports

Radiological Protection of the Environment: The Path Forward to a New Policy? Workshop Proceedings, Taormina, Sicily, Italy, 12-14 February 2002 Language: English , Printed: 7.1.03, Published: 07-JAN-03 , 248 pages. NEA#03629, ISBN: 92-64-09969-7, OECD. www.nea.fr/html/pub/welcome.html

In order to support the ongoing discussions of the international community of radiological protection experts, these proceedings try to answer the questions: Is there an international rationale behind the wish to protect the environment from radiation? Do we have enough scientific information to develop and define a broadly accepted policy? What are the characteristics of the process for developing a system or radiological protection of the environment?

These proceedings comprise the views of a broad range of invited speakers, including policy makers, regulators, radiological protection and environmental protection professionals, industry, social scientists and representatives of both non-governmental and intergovernmental organisations.

Protection of the Environment from Ionising Radiation
Proceedings of the SPEIR3 International Symposium on the Protection of the Environment from Ionising Radiation Darwin, Australia, 22-26 July 2002. C&S Papers Series No. 17. IAEA-CSP-17/P, 102 figures; 2003, ISBN 92-0-103603-5, English.
http://www-pub.iaea.org/MTCD/publications/PubDetails.asp?pubId=6816

Radioecology -Radioactivity & Ecosystems. The effect of Radiation on Biocoenoses.
An update on RadionuclidesTransfer in the Food Web. Van der Stricht & Kirchmann, editors, June 2001.
Purchase on request at: iur@irsn.fr

Proceedings of the Radiation Protection in the 21st Century: Ethical, Philosophical and Environmental Issues, held at the Norwegian Academy of Sciences and Letters, Oslo, 22-25 October, 2001. P. Strand & D. Oughton, eds., NRPA, 2002, ISBN82-90362-16-1.

Announcements

Sedimentary Processes: Quantification Using Radionuclides. Edited by J. Carroll, I. Lerche, Elsevier, 2003.

Modelling Radioactivity in the Environment. Edited by E.M.Scott, Elsevier, 2003.

Doctoral Thesis: Soil processes affecting the bioavailability of radiocaesium, by Nadia Waegeneers, Catholic University of Leuven, August 2002, 150 pages.

New Journal: International Journal of Low Radiation, Interscience Publication. Editor in Chief: A. Maïsseu. The main focus of the Journal is on health and biological effects that occur at radiation levels comparable to those encountered in the natural environment. (www.wonuc.org/lowrad/ijlr.htm)

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Submissions to the Newsletter

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