A New Direction for Climate Change?

At the end of this month climate change negotiations resume, this time in Durban. For those whose primary concern is the health and environmental effects of ground-level pollutants - rather than climate change itself - this meeting will be of more than usual significance.

The central challenge confronting climate ministers and officials is how to close the gap between the level of CO2 mitigation to which countries have so far collectively committed themselves - and the level of reduction required to keep global temperature increases by 2050 at less than the 2 degrees required to avoid potentially catastrophic climate shifts. Unfortunately there seems little prospect that further CO2 mitigation at the level required - at least within the necessary timescale - will be forthcoming. If there is to be any success in tackling climate change, policy must now look elsewhere.

Over the last three years the air quality community - largely at the initiative of IUAPPA and the Global Atmospheric Pollution Forum - has increasingly argued that within the time available the only source of the necessary further reductions in global warming potential is action on ‘short-lived climate forcers’ - black carbon, methane and ozone. Together these contribute almost as much in terms of climate forcing as does CO2, but their shorter residence time in the atmosphere means that mitigation measures can take effect much more quickly. On their own they will not solve the climate problem - more action on CO2 is needed and must start now - but they could buy the time needed for other measures to take effect.

What discussions in Durban may show is that action on the short-lived forcers is now the only game which can offer the outcome - as well as offering major benefits in human health and crop yield, which for many countries in the developing world represent as severe a problem as climate change.

The September meeting in Paris was important for showing that such action is not only urgently needed - it is feasible and cost-effective and can be delivered through a small number of measures where there is already proven and effective technology. And in Durban in two weeks’ time a further report from UNEP, for which SEI again provided the Secretariat and for which the Director-General was one of the lead authors - will show how through national action programmes, with supportive systems at regional and global scale, the necessary progress is realistic and deliverable.

From next month it seems likely that the challenge for the Air Pollution Community in its engagement with climate change will therefore move on. With the science, technology and economic assessments all in place, the focus now moves to the regulators and policy-makers, and those in industry, consultancies and government who could deliver the necessary and urgent changes.
Ethanol - A Clean and Sustainable Transport Fuel?

14 to 16 May 2012, Sao Paulo

A continuing goal of international atmospheric policy is a road transport fuel which is clean and sustainable - and which is not confined to a niche market but capable of rapid and large-scale diffusion through mass markets. The widespread production and use of ethanol in Brazil, both on its own and as an admixture with conventional petrol or diesel, is the most important evidence so far that, in the medium term, this goal may now be achievable.

But what are the environmental implications - for ecosystems and landscapes - and for food security? Are the emissions as clean as claimed? And is the fuel economic and capable of rapid and widespread introduction?

These are some of the issues which will be explored in the next international seminar in IUAPPA's seminar series on Reducing the Impact of Transport on the Atmosphere and Environment of Cities.

To be held in Sao Paulo from 14 to 16 May, the seminar follows exploratory meetings held with Ethanol producers and distributors in August 2011. In addition to presentations on the latest research findings both on ethanol and other alternative fuels, the programme will include visits to farms and production facilities in the state of Sao Paulo, which has the highest concentration of such facilities in the world; and discussions with key interests involved in production, manufacture and distribution of the fuel.

Because of the constraints of the field trip, the programme is limited to 60 participants. Members of the Union will be given priority, but are asked to notify their interest in participating to the Secretariat (iuappa@btinternet.com) as soon as possible.

2012 Annual Meeting

AIR QUALITY MANAGEMENT AT URBAN, REGIONAL AND GLOBAL SCALES
4th International Conference and IUAPPA Regional Meeting

Plans are now well advanced for the Union’s 2012 Annual Meeting which will be held 4 to 7 September, in Istanbul, under the leadership of Selahattin Incecik.

Key dates are:

- deadline for submission of abstracts - 15 February
- notification of acceptance of abstracts - 15 April
- final date for early registration - 15 June

Main topics will include air quality modelling, air quality management, indoor air pollution, health effects, impacts on forests and vegetation, aerosols, and risk management.

Deadline for submission of abstracts - 15 February

Special themes will include shipping emissions and air pollution in the Mediterranean. Major sessions will also further explore the Union’s current policy priorities developed at the IUAPPA Vancouver World Congress in 2010 and further elaborated in our 2011 meeting in Paris.

IUAPPA’s input to the Scientific Advisory Committee will be co-ordinated by Immediate Past President, Alan Gertler.
The Union’s 2010 Vancouver World Congress Declaration pointed to the need for a paradigm shift in the approach to air quality policy and its relation to the wider global environment. This year’s Annual Conference, hosted by APPA in Paris jointly with EFCA, charted a clear way forward for the Union and its partners in the three areas which the Vancouver Declaration had highlighted:

- Air Pollution and Climate Change
- Eco-system Services and Bio-diversity in their interactions with air and climate
- International Co-operation on air Pollution

Here Jean-Marie Rambaud, IUAPPA’s Treasurer and APPA Vice-President, summarises the conclusions and sets out the way forward.

With some 25 invited speakers, the conference proved a significant landmark, by bringing together, within a common framework, consideration of nitrogen, air pollution, climate change, ecosystem services and biodiversity. It has thus provided an effective basis for the work now needed to draw the connections between the multiple factors that influence the fragile equilibriums of our one atmosphere. The summary below highlights the main conclusions in each area, and points to some of the important links between them.

**Air Pollution and Climate Change**

The UNEP/WMO assessment of black carbon and tropospheric ozone has clearly demonstrated the co-benefits for climate, health and food security of addressing short lived climate forcers.

Examples were given that a small number of emission reduction measures for methane and black carbon using current technologies already in use in different regions around the world, in the areas of transport, residential, industry and agriculture, could immediately lead to significant benefits to health, crop yields and near-term climate change mitigation.

Much wider and more rapid implementation is nevertheless required to achieve the full benefits of SLCFs reduction, and despite these near term benefits, reducing warming in the longer term will also require action now to reduce CO2 emissions.

Though the issues could be addressed within the framework of global climate agreements, the local and regional character of the pollutants and their impacts points rather to tackling them through regional agreements, such as the CLRTAP, which has taken the lead by integrating Black Carbon into the revision of the Gothenburg Protocol. Other such regional agreements are being developed or encouraged, notably by the Global Atmospheric Pollution Forum.

At smaller geographic scales, local governments have available a range of levers for securing the benefits of integrated climate change-pollution strategies. As examples from France, the UK and elsewhere showed, progress is being made, though at a slow pace due to institutional and organisational barriers which now need to be addressed.

**Eco-system Services and Bio-diversity in their Interactions with Air and Climate**

The UN’s new strategic plan for biodiversity points to the need to reduce pollution to levels that are not detrimental to ecosystem function and biodiversity, but this will require progress in the monitoring and assessment of impacts, notably from air pollution and climate change.

Acidification and eutrophication have been successfully addressed by the LRTAP Convention, through the management of critical loads; the direct effects of ozone on vegetation have been clearly demonstrated; and the indirect effects of atmospheric deposition and its consequences on ecosystems are now quite well known, notably as a result of the European Nitrogen Assessment. However, Dry Nitrogen deposition requires better characterisation, and there are significant threats from ammonia, where there has been little progress in reducing emissions. The Habitats Directive is not adequately protecting Natura 2000 sites from atmospheric nitrogen pollution, as measures designed to protect large areas may not be sufficient for local protection.

Although the pressures on biodiversity are clearly leading to losses, it is difficult to disentangle the impacts from air pollution from the other pressures of habitat disturbance, land use change and pollution from all sources.

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There are still considerable practical difficulties in placing economic values on ecosystems and biodiversity values in public decision making, so it would probably be more profitable to focus on the economics of polluting sources. Often values ascribed to biodiversity loss are trivial compared to values attached to detriment of human health, and biodiversity concerns rank low in public priorities.

It seems urgent therefore to develop ways of assessing the long-term costs of eco-system and biodiversity loss and to develop instruments that make socially desirable investments attractive to market actors.

### International Co-operation on Air Pollution

At present, there is no policy framework for regulating regional/hemispheric pollutants, no effective strategies to link climate and air pollution; and indeed, outside UNECE, no effective use of integrated multi-pollutant approaches to mitigation. We also lack a ‘global voice’ for air pollution to enable interaction with other global environmental action, and sufficient awareness and co-operation at a technical level between air pollution organizations at the international scale.

For an effective global/hemispheric approach there is a need for three essential components: a data/information coordination mechanism, an assessment process, and a negotiating platform. However building blocks for them are in place and the co-benefits that could accrue from co-ordinated international action on SLCF mitigation could provide the impetus for the emergence of more effective global atmospheric policy systems. In developing countries health and crops may be stronger driving forces for this than climate change (and progress is also easier to record).

Co-ordination of existing regional air quality agreements is needed to tackle the global issues such as SLCFs and can be achieved without legally binding agreements but it will be important to sustain existing sub-regional and regional approaches. Even global approaches, such as TF HTAP, need to take account of regional dimensions.

Scientific grouping of information networks is the first step in the overall global/hemispheric process and is the basis for future policy development. The work of HTAP is important here, but we need to look at existing regional and global players (such as UNEP, WMO, TF HTAP, EMEP, Asian and African networks, initiatives in Latin America) to see how wider progress can be made in developing a strategic vision and commonly accepted principles for global atmospheric management.

Scientific assessment and development of subsequent policy options would be a natural follow-on to the development of the data/information network. The GAP Forum could provide useful guidance on necessary links and ways forward in this process.

Presenting short-term and long-term benefits effectively would help convince policy-makers to take action. Awareness—raising for the general public and involvement of NGOs (public interest groups as well as industry) and other stakeholders could be an important driver.

Objectives could be reached through various channels, including partnerships and co-operative programmes among regions, though it will be necessary to recognise that priority pollutants are likely to differ between regions.

### EFCA Symposium

**What are the right metrics for Particulate Matter?**

EFCA’s third symposium on Ultrafine particles was conducted on 26 and 27 May 2011 in Brussels. The series, under the continuous chairmanship of GUS president and KIT Program Director Karl-Friedrich Ziegahn since 2007, now provides a very informative mix of contributions which adds to the general body of knowledge as well as a number of review papers by experts who try to construct consistent pictures which explain all observations within one of the sub-themes. In Brussels, time seemed ripe to consider a next step in the legislation on particulate matter (PM).

The key message of UFP-3 is that progressive knowledge has enabled scientists to provide a more robust basis for health protection against PM exposure. Various policies up to the present time have delivered major improvements with respect to particulate matter. There is now convincing evidence that adequate protection of public health against exposure to fine particles requires limit values which are source-specific. The imperfection of present PM-regulation in the EU and elsewhere may be largely overcome by introducing regulation for an additional, traffic-specific component of PM. Considering health risk evaluations, implementation criteria and traffic-specificity, black carbon particles (BCP) seems to be the most suitable component. A long history of BCP-monitoring by several different methods makes implementation feasible. The recent focus on BC (or CB, Carbon Black) as a climate forcer supports its candidacy.

Additional information is available at EFCA’s website, www.efca.net. A CD with all presentations can be ordered from KIT, please e-mail to b.mathes@kit.edu.

Joop van Ham, secretary-general EFCA; info@efca.net
Reducing Pollution in Straightened Times

As often happened in somewhat straightened times, the global recession, and the still-fragile recovery have made us all look anew at our priorities. It would be nice to replace old with new but we may need a period in which bank balances are returned to better health before we do so. Industries worldwide, faced with decisions about renewal may chose to delay. This has environmental implications as renewal of power plant, industrial machinery and vehicles is one of the main mechanisms by which pollution emissions are reduced. As higher emissions standards spread, because of regulations or technological progress or a combination of both, the turnover of equipment ensures that they take effect as new displaces old. Delaying the replacement cycle slows progress towards a cleaner environment.

However, there are opportunities in the improvement of existing stocks of equipment. There are opportunities both for a cleaner environment and for strengthening the environmental industries. In particular, there is now a considerable range of emission control equipment that is available but not assimilated into the older parts of the world’s equipment stock. If this is to see extended life, there is no time like the present to bring it up to less polluting standards.

Of course, once we are past the worst of the recession, things will pick up rapidly. The IEA has just published figures to show that, after a pause in 2009 (the global financial crises) emission of greenhouse gases rose by the largest yearly total ever in 2010. No doubt much of this came from older plant working harder, and this also means record levels of regulated pollutants, SO2, NOx, VOCs and the rest were emitted.

Eventually, however, plant and vehicle owners will want to re-equip. If there is to be a pause before they do so, however, regulators could also take the opportunity to reassess emission standards to make sure they truly represent the best the environmental industries have to offer. This does not, of course, have to be unduly costly; much of the innovation in environmental technology is about delivering more cost effective solutions.

Part of this will certainly be technological advance and more efficient processes. Part of the cost efficiency, however, will come from realising opportunities for controlling pollutants jointly. At the Vancouver World Congress, we heard much about the improvements that could be made in cost effectiveness if policies for air pollution and climate change could be combined. The control of particulate matter, for example, provides an opportunity for tackling PM as a threat to health and black carbon, highlighted in a recent report coordinated by the Stockholm Environment Institute for UNEP as a major short-term agent of climate change forcing (http://www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf).

In the case of coal, solutions for the environmental down side are urgently needed. In many parts of the world this remains the only viable fuel for power generation in the medium term. For some countries, coal is also the most economical option for domestic heating, too. Following the decision by the German government to close its nuclear power plant in the light of the accident in Fukushima in Japan, there may now be more coal required to fill the gap in generation, and other countries are eyeing the German example.

Environmental controls have long been a part of coal-fired plant in some countries, notably Germany, with impressive emission reduction rates. However, there is new emission control technology and advanced means of coal combustion that have never been put into widespread practice. Advanced flue gas desulphurisation equipment has been demonstrated to remove over 99% of SO2 at lower cost than conventional limestone/gypsum processes. Selective Catalytic reduction technologies for removing NOx are now well established but although costs have fallen they are still not universal, even on large coal fired plant. There are also combined processes, optimised for removal of SO2, NOx and particulate matter, with benefits both to air quality and control of climate change. Results from trials of coal gasification and combined cycle (CGCC) technologies demonstrate the feasibility of clean and efficient energy production but the low costs associated with conventional coal keep them out of the market.

At the other end of the scale, delegates at the IUAPPA regional Conference in South Africa in 2009 heard about a campaign to reduce emissions from coal stoves in people’s houses simply by modifying the way the fire was laid and lit (http://www.airshed.co.za/archive/Domestic%20smoke%20reduction%20NACA%202005.pdf)

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Cleaning up diesel also offers some exciting new possibilities. Delegates to the recent EFCA symposium on ultrafine particles, held in Brussels in May, will have heard that evidence of health impacts of particles continues to accumulate and that numbers of particles in a given volume of air is a major factor. There are technologies available, in the form of diesel particulate filters, that reduce both the weight of particles and the number of particles in diesel exhaust, reducing health impacts and also, by reducing the black carbon fraction in the exhaust, controlling the short term impacts of diesel exhaust on global warming. There are also combined systems for particulate and NOx control.

Since even the newer parts of the diesel fleet do not currently carry exhaust filters there is considerable scope for reducing health impacts and impacts on global warming through retrofit. The SEI report shows that, for OECD countries, diesel is the largest single source of black carbon and that much of this comes from off road vehicles and machinery. We heard in Vancouver about measures that can ensure retrofit, including “clean air zones” and “low emission zones”. In the UK, the London Government has produced a Good Practice Guidance, providing for retrofit of filters to diesel machinery on construction sites. Time for implementation and enforcement, particularly if machinery life is to be extended as a result of the recession!

On a more global scale of travel, shipping remains a hugely important means of transport. During the recession there was a slowdown, but as the recovery begins there are signs of a rapid increase in shipping. Until recently, however, the atmospheric emissions from shipping were largely unregulated with the result that SO2 NOx and particles from ships have major pollution sources. Now the IMO (International Maritime Organisation) has agreed international standards for sulphur content of marine fuel oil that will have a major impact on emissions. Current marine fuel oil contains about 2.8% sulphur. The controls require that ships within ECAs (Emission Control Areas) should, as from 2010 use fuel with a maximum of 1% sulphur. From 2015 this falls to 0.1% sulphur. As an alternative, ship owners can fit exhaust scrubbing equipment to produce an equivalent emission quality.

The opportunities this provides for the emission control industries are significant. Costs of compliance with IMO standards by using low sulphur fuels will be considerable, estimated at over $30 billion a year for shipping in the European ECA. Costs of exhaust scrubbing equipment is estimated to be considerably less than this and the association of equipment manufacturers www.egcsa.com expects there to be strong growth in this sector. The commercial opportunity is there to be sure, but there are also environmental opportunities. Exhaust scrubbers also control particulate matter, reducing the impacts of shipping on health and on global warming. They can also provide a “cleaner” exhaust, reducing the costs of further emission reduction, for example, SCR (selective catalytic reduction) units for NOx control.

There are therefore many opportunities in a post-recession world for better environmental controls, improving prospects for a cleaner environment and a contribution to control of global warming. The opportunities are also there for the environmental industries. There are new pollution abatement technologies available for application to new equipment and retrofit options for old. What is urgently needed is a much closer dialogue between suppliers of environmental solutions and those who make and implement environmental legislation so that these opportunities can be realised.

World Atlas of Atmospheric Pollution - Available at Discount Rates -


Provides a global overview of atmospheric pollution in the 21st century and its impact on our environment - long-range transport; climate change; ozone depletion; environmental and health effects; future trends and MUCH MORE.

144 full colour pages, with over 150 maps, photographs and illustrations.

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One of the most important outcomes of the Rio Earth Conference of 1992 was the recognition of the interdependence of the compartments of the environment and especially between the geosphere as a whole and the biosphere. In fact our earth is shaped fundamentally by the life it supports. Most obviously, the rocks that make up much of our land started as the shells of marine organisms. However, living organisms also played a major role in producing the atmosphere we have now, with sufficient oxygen for our needs but not so much that there are continual fires raging around the globe. The regulation of the atmosphere is a major achievement of life and provides a good entry point to the idea that nature provides considerable benefits for humankind. In general the benefits from nature are fundamental to our survival, in terms of the provision of food and materials, purification of water and protection against flood and storm.

These benefits, which have become known as ecosystem services have an enormous value for us and maintaining them is crucial to our survival. However, as we were reminded at the IUAPPA Paris meeting this year, many ecosystems services depend critically on biodiversity (see also the EASAC, European Academies Science Advisory Council, report on Ecosystem Services and Biodiversity in Europe at www.easac.org) and biodiversity is under threat world-wide. We were reminded that rates of extinction are running at levels that threatened that continued flow of ecosystem services. Work at the Swedish Resilience Centre, (www.stockholmresiliencecentre.org) one critical Planetary Boundaries, within which it is safe for us to live, suggests that we are now in grave danger of stepping beyond the limit for biodiversity loss with grave consequences for future generations.

At the Paris meeting the pressures on biodiversity from human activity were outlined by Robert Hoft, of the CBD Secretariat. He explained that a recent estimate of the impacts of biodiversity loss, made by the TEEB (The Economics of Ecosystems and Biodiversity) research program (www.teeeweb.org) suggested that they exceeded some trillions of dollars annually. He also said that environmental pollution played a large part, with air pollution as a major factor.

We have also learned more about the mechanisms of interaction between biodiversity and air pollution. The impacts of acid rain, originating in air pollution from conversion of fossil fuels to energy in factories, power stations and transport systems, on natural ecosystems is well documented. A global assortment of regional networks has begun to reduce the levels of acid rain, however, and there are clear signs of recovery in lakes and forests. However, we heard in Paris from both Mark Sutton, of the UK Natural Environment Research Council and Roland Bobbink, of the University of Utrecht in The Netherlands, that there is increasing evidence that air-borne nitrogen pollution, arising from both fossil fuels and from the use of fertilisers in agriculture is causing great harm to natural ecosystems. A key mechanism is eutrophication, whereby excessive levels of fertilisation cause harm through changing the structure of ecosystems, with consequences for their functions in providing ecosystem services.

There are also impacts of ecosystem change on the ambient environment. EASAC suggested a new ecosystem services of “environmental quality regulation”, noting the role of trees and green spaces in reducing urban air pollution and the urban heat island. Biodiversity loss increases the fragility of these important ecosystems, with consequences for air quality and urban wellbeing.

Biodiversity and air quality, then, are closely linked, with air pollution a threat to biodiversity and, through the impacts this has on ecosystem services, impacting both on human wellbeing and on air quality.

Remedies, however, are not so easily found. The panel discussion at the Paris Conference illustrated the difficulty of developing well-targeted solutions to the problems of biodiversity loss and air pollution impacts. In particular, we were reminded that, in many countries, biodiversity was not a hot topic of concern by itself, though where the link could be made to other topics that were of concern, health for example, there was a better chance of leveraging political action.

Despite the very large costs calculated for loss of biodiversity at a global level, we were warned by economists in Paris that application of economic analysis to problems of biodiversity loss on a local level had proved costly and, apart from some well publicised examples, generally ineffective in driving decisions.

At an international level, action appears equally elusive at present. As Robert Hoft reminded us, pressures on the world’s ecosystems and the biodiversity they contain is increasing on a wide range of measures. However, he also suggested some possible green shoots: an Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), a similar enterprise to the IPCC, is about to start work and the Nagoya meeting of the parties to the CBD produced some solid progress towards an international recognition of the value of ecosystem services and the role of biodiversity in securing them.

In recognition of the importance of air pollution as a pressure on biodiversity, Robert Hoft suggested that a closer cooperation between IUAPPA and the CBD, in the form, perhaps, of a memorandum of understanding, would be a highly effective means of advancing joint action for
The International Board met on 1 October in Paris. Discussion of a number of issues benefited from earlier consideration and development by the Executive Committee, which met twice by teleconference earlier in the year. This note records the main decisions.

Opening the meeting the President, Hanlie Liebenberg Enslin, thanked APPA for their hospitality - and for the hard work that had gone into the organisation of the highly successful conference which had concluded the previous day.

**Membership and Structure of the Union** Following the approval by postal ballot of amendments to the Union’s Statutes, principally in relation to the membership and structure of the Union, the Board approved proposals previously considered by the Executive Committee for their implementation and in particular for extending the membership base through wider associate and supporter membership. National member organisations were asked to nominate representatives who would work with the Secretariat and Executive Committee to develop membership within their countries.

The Board recognised however that although the principle of the changes to the Statutes had been very strongly endorsed in the ballot, there remained some aspects of the amendments where the language and implications might need detailed review and further clarification. A sub-committee was appointed to look further at this and to report back to the next meeting of the Board.

**World Congresses and Regional Conferences** The Board noted with appreciation that there were several expressions of interest for hosting the World Congress in 2016. The Director-General was asked to seek final proposals from members by April next year with a view to the Board reaching a final decision on the basis of assessment and recommendations by the Executive Committee.

The Board welcomed a report from the President on progress in the preparation of the 2013 World Congress in Cape Town. They welcomed in particular a proposal to widen the base and representativeness of the meeting by inviting other national, African and global environmental bodies to be associated with the Congress and participate in it in a number of innovative ways.

The Board then confirmed the programme for 2012, involving in particular an important international seminar on Ethanol and Cleaner Fuels in Brazil in May and a full regional conference in Istanbul in September.

**Finance and Administration** The Board noted that, in common with immediately preceding years, there had again been a small surplus in the income and expenditure account. The Treasurer warned however that the financial challenges facing many member organisations - in common with other NGOs - meant that this was unlikely to be sustained this year. It was important therefore that the Union continued to explore other sources of income to be able to sustain and expand its work.

**Policy Development** There was satisfaction that significant progress was being achieved in the three main policy areas on which the Union had recently been focussing and which had been reflected in the Vancouver Declaration. In particular there were important developments in international co-operation on air pollution, particularly at the regional and hemispheric scale, which the Union had been urging for some time. It was also clear that the excellent workshop prepared by APPA on Air Pollution and Biodiversity would provide a firm and effective basis for the Union to develop work in this area.

Finally, on policy, the Board noted that there were major and very encouraging developments on the integration of climate and air pollution policy - and in particular on the potential role of short-lived climate forcers in climate mitigation, clean air and food security. In significant part these derived from the seminal conference sponsored by IUAPPA and the Global Forum in September 2008 and the conclusions and recommendations from that meeting. While rapid progress was being made this was an urgent and challenging issue and there was clear recognition among members that it was important that IUAPPA continue its strong support for further progress - in both science and policy - in this area.

The 2012 meeting of the International Board will be held on a date to be confirmed in September in Istanbul.