

IAP HOLDS FIFTH GENERAL ASSEMBLY

THE INTERACADEMY PANEL ON INTERNATIONAL ISSUES (IAP) HELD ITS FIFTH GENERAL ASSEMBLY AND THIRD GENERAL CONFERENCE IN ALEXANDRIA, EGYPT, FROM 1-5 DECEMBER 2006. THE MAJOR THEME OF THE THE CONFERENCE WAS 'THE UNITY OF SCIENCE'. MORE THAN 100 SCIENTISTS FROM 60 COUNTRIES ATTENDED THE EVENT.

"The linkage between science and economic growth is undeniable," stated Chen Zhu, vice president of the Chinese Academy of Sciences (CAS) and IAP co-chair, "and over the past few years, there has been a great deal of discussion about the central role that science must play in efforts to promote sustainable economic growth."

"But science," he continued, "not only serves as an instrument for advancing the well-being of people; it is also an intellectual pursuit that reflects both a fundamental and universal aspect of our humanity. The boundaries between basic and applied science have become increasingly blurred in recent years, and that trend is likely to accelerate in the future."



"For all of these reasons," noted Chen Zhu, "IAP concluded that this was an opportune time for our organization to emphasize the critical importance of the unity of science."

"Progress in all facets of knowledge," added Yves Quéré, outgoing IAP co-chair, "has revealed a profound sense of unity not only within all fields of science but also between science and other areas of inquiry. For example, no one would contend that knowledge in a single scientific discipline holds the key to our understanding of climate change, and no one would argue that science alone can solve the problem. The same is true for issues related to the conservation of biodiversity, halting the spread of infectious diseases, or developing alternative sources of energy. As the challenges we face become more com-



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plex and more global in scope, the need to bridge the divide between basic and applied science and between the natural and social sciences becomes ever more acute. This concern served as the major theme of our conference in Alexandria.

Speakers at the opening session of the conference included not only Chen Zhu and Quéré but H.E. Hani Helai, Egypt's minister of higher education and research; Gérard de Puymege, UNESCO culture programme specialist in Cairo; Ismail Serageldin, director, *Bibliotheca Alexandrina*; and Mohamed H.A. Hassan, executive director, TWAS, and president, African Academy of Sciences.

Each speaker noted that the unity of science was by no means a new concept. As Serageldin observed, in the ancient Alexandria library, which was the global centre of knowledge and discovery for some six centuries, learning was based on studies that drew inspiration from spheres of thought ranging from astronomy to medicine to philosophy.

Yet, the speakers also observed that the melding of disciplines has never been more significant than today.

They pointed to the way in which new insights into physics, chemistry and biology were enhancing our understanding of genetics and how interdisciplinary explorations of computer science, mathematics and physics have changed the way in which we communicate through the creation and widespread use of the internet.

As Chen Zhu noted: "The frontiers of scientific research have never been more exciting or dynamic. This has not only energized the global scientific community. It has encouraged developing countries to recognize the critical role that science can play in their efforts to promote both knowledge and sustainable economic growth."

The speakers agreed that for the full potential of science to be realized, two important trends would have to continue: first, investments in all facets of science, both basic and applied, would have to be maintained and, in fact, increased, especially in poor countries; and, second, developing countries would have to pursue initiatives designed to increase their scientific capacity.

The opening speakers congratulated IAP for the role that it has played in both of these efforts, and they called on IAP to find new ways to pursue its goals with more vigour and effectiveness in the future.

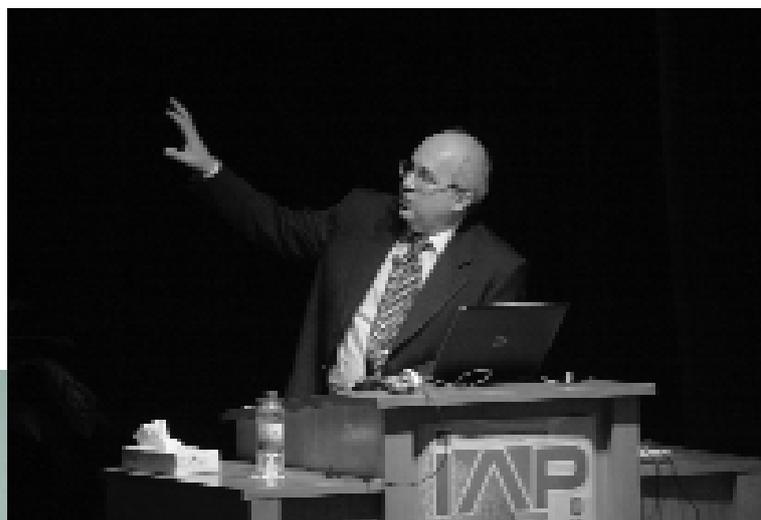
The talks that followed the opening remarks were divided into five main sessions, largely tracking the overall theme of the conference, ‘the unity of science’, as well as placing a spotlight on the basic sciences: biology, chemistry, mathematics and physics. There was also a session examining the relationship between science and society.

Here’s a sampling of the presenters and their presentations.

Jean-Pierre Kahane, professor emeritus, *Université de Paris-Sud* in Orsay, France, spoke about the unique ‘unifying’ role of mathematics as the language of science. Ashok Jhunjhunwala, professor of electrical engineering at the Indian Institute of Technology in Chennai, examined how new information and communication technologies were levelling the playing field for knowledge, not only between nations but among their citizens. David Gross, Nobel Laureate (Physics, 2004), director and Frederick W. Gluck chair in theoretical physics at the Kavli Institute, University of California, Santa Barbara, USA, analysed how physics has served as a unifying source of insight for science through its focus on nature’s fundamental elements

and forces. Zhang Jie, director general of the Bureau of Basic Sciences, Institute of Physics, Chinese Academy of Sciences, Beijing, spoke about the broad applications of intense lasers for nuclear science, energy and diagnostics. Teresa Lago, professor of astronomy, University of Porto, Portugal, highlighted the increasing levels of cross-disciplinary cooperation – and thus unification – in astronomy that has enhanced our understanding of the origins of the universe and the counter-intuitive behaviour of subatomic particles.

Chris Rapley, director, British Antarctic Survey, Cambridge, UK, focused on growing evidence of climate change in Earth’s polar regions and the way in which scientists are using this evidence to learn more about the behaviour of our global climate. Such efforts, he noted, will undoubtedly have important implications for national and international efforts to



combat and adapt to global warming. Bruce Alberts, professor of biochemistry and biophysics, University of California, San Francisco, USA, examined the rapid pace of change in biology over his 40-year career. Alberts noted: “While we have successfully developed a catalogue of cellular pieces, we still have a long way to go to understand how they all work together to make living things.” Hu Zhihong, general director, Wuhan Institute of Virology, Chinese Academy of Sciences, explored recent developments in microbiology, noting that such research could have significant implications for issues related to agricultural productivity and public health.

Kurt Lambeck, professor of geophysics at Australian National University, spoke about the forgotten discoveries of the Greek mathematician, geographer and astronomer Eratosthenes, who, while conducting research at the original *Bibliotheca Alexandrina*, accurately determined the circumference of the Earth more than 1,500 years before Copernicus. He noted that the work of Eratosthenes and other scientists and scholars in Alexandria at that time clearly exemplified the universality of science. Keiko Takahashi, group leader, Earth Simulator Centre, Japan Agency for Marine-Earth Science and Technology, set her analytical lens not on the past but on the future of the earth sciences. She suggested that advances in comput-

er simulations would provide the most detailed knowledge of the Earth in history, illustrating in vivid and insightful detail how the Earth serves as a common stage for all of humanity.

Turning to the relationship between science and society, Johanna Sengers, fellow emeritus, National Institute of Standards and Technology, USA, and Manjula Sharma, lecturer in physics, University of Sydney, Australia, each explored the increasing role of women in science and why the global scientific community needed to continue to foster gender equality. This, they said, is especially true regarding the integration of more women into science academies. Pieter Drenth, professor emeritus, Free University Amsterdam, spoke about the need for the scientific community to become more actively engaged in their societies and to re-establish a relationship of trust and respect with the public. Many countries, he noted, have made progress in drawing science closer to their societies. This has been especially true in terms of the public’s growing awareness of science as a critical source of knowledge that is essential for sustainable economic development. Nevertheless, Drenth said that science still remains a largely alien subject for much of the public,

something that many people keep at bay because of scientific ignorance and more pressing daily concerns.

Édouard Brézin, professor of physics at the *École Normale Supérieure* and president of the French Academy of Sciences, gave the concluding talk, ‘A Synthesis: Where Does Science Go?’

Brézin asserted that a deep and expanding understanding of science is necessary for addressing our most serious problems, for a better understanding of our universe and for enhancing knowledge about ourselves. Unfortunately, he added: “Our fellow citizens are increasingly scared and reluctant to accept scientific explanations and contributions.” To address this problem, Brézin

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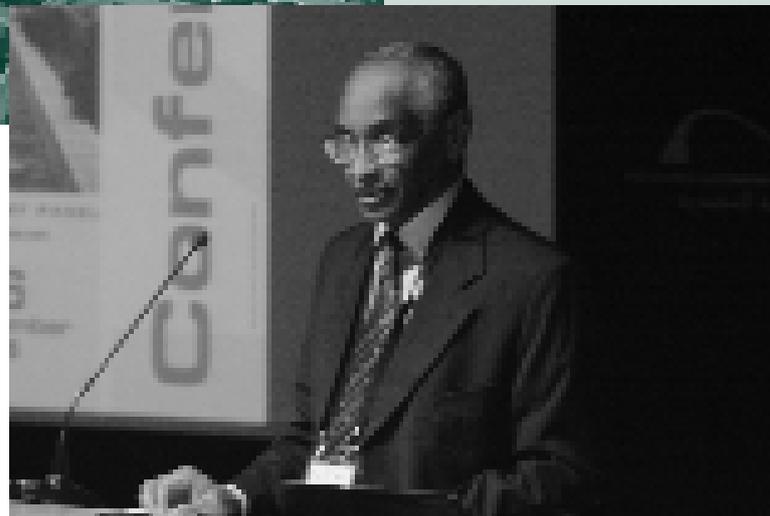


urged scientists to make science “a treasure of humankind that concerns everyone.” He also called for supporting life-long science education “to advance rational thinking and to form mature citizens.”

NEW TEAM

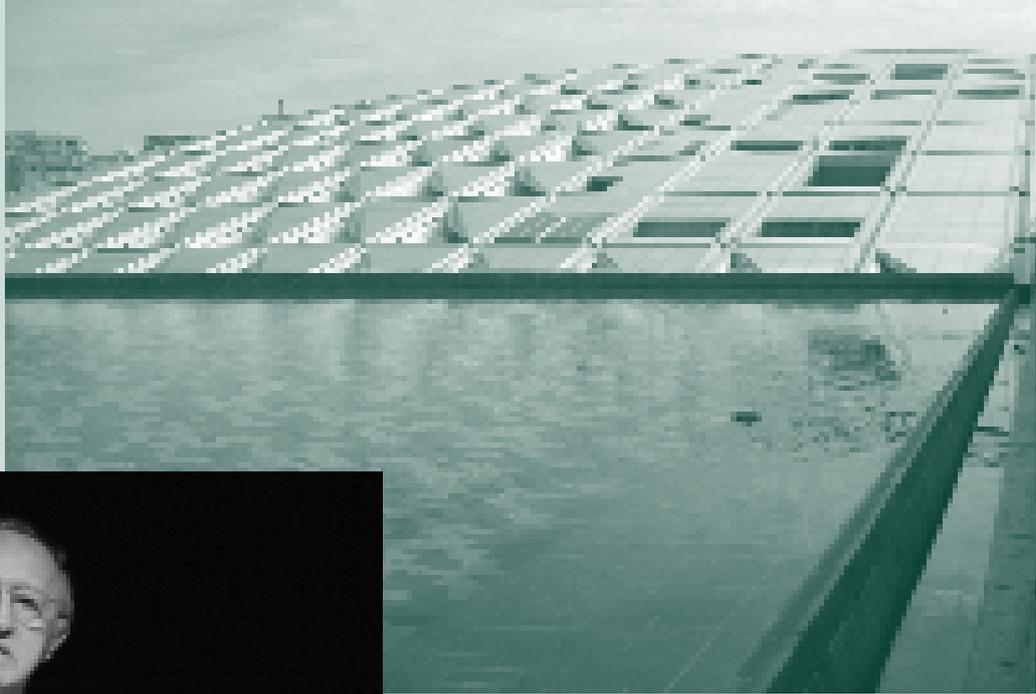
In addition to the conference, IAP held its 5th General Assembly, which took place 4-5 December 2006. Decisions rendered at the assembly will shape IAP over the next three years. Highlights included:

- The farewell address of Yves Quéré, who has served as the co-chair of IAP for the past six years. Quéré outlined the progress IAP has made in fulfilling its objectives to help member academies work together to advise citizens and public officials on the scientific aspects of critical global issues. He focused particular attention on IAP’s efforts in helping to forge regional networks of science academies and its contribution to launching academies in nations where they did not exist. IAP member academies extended a hearty, well-deserved “thank you” to Quéré. They not only wished him success in his future endeavours but also looked forward to drawing on his enormous skills and experience in the future (see Commentary, p. 7).
- Election of Howard Alper as new co-chair of the IAP executive board. Alper is visiting executive at the International Development Research Centre (IDRC) and distinguished university professor at the University of Ottawa, Canada. He is a former president and current



foreign secretary of the Academies of the Arts, Humanities and Sciences of Canada (RSC).

- Election of four new member academies to IAP: the Islamic World Academy of Sciences; the Serbian Academy of Sciences and Arts; the Tanzania Academy of Sciences; and the Zimbabwe Academy of Sciences. IAP’s membership now stands at 94.
- Election of 11 members of the executive committee for 2007-2009: the Australian Academy of Science; the Bangladesh Academy of Sciences; the Brazilian Academy of Sciences; the Cuban Academy of Sciences; the Academy of Scientific Research and Technology, Egypt; the Union of German Academies of Sciences and Humanities; the Science Council of Japan; the Academy of Sciences Malaysia; the Royal Netherlands Academy of Arts and Sciences; the *Académie des Sciences et Techniques du Sénégal* and the Royal Society, UK. Academies that have completed their terms of office and will be leaving the executive committee include: the Indian National Sci-



ence Academy; the Nigerian Academy of Sciences; the *Accademia Nazionale dei Lincei*, Italy; the Royal Swedish Academy of Sciences; and the US National Academy of Sciences.

- New observing institutions: the InterAmerican Network of Academies of Sciences (IANAS) and the Inter-Academy Medical Panel (IAMP). These institutions join the following international and regional organizations that also have observer status: the International Council for Science (ICSU); the Network of African Science Academies (NASAC); the Federation of Asian Scientific Academies and Societies (FASAS); the Caribbean Scientific Union (CSU); the European Academies' Science Advisory Council (EASAC); the All European Academies (ALLEA); the Association of Academies of Sciences in Asia (AASA); and the InterAcademy Council (IAC). TWAS, which hosts IAP and provides administrative and communications support for the organization, will continue to serve as an ex officio member.

- Approval of IAP's *Strategic Plan 2007-2009*, which calls for empowering member academies (through statements, initiatives and programmes) and strengthening

the organization (through fundraising and increasing international awareness). "A primary focus of the strategic plan," noted Chen Zhu, "is to help member academies become more prominent institutions within their nations, especially in their relationship with governments. Another goal of the strategic plan is to seek funding sources, beyond the generous contribution made by the Italian government, to help ensure a stable and successful future."

- Endorsement of a communiqué in support of the Israel-Palestine Science Organization (IPSO), especially its work in promoting peace through scientific cooperation.

PROGRESS REVIEWED

Participants at the IAP General Assembly also reviewed and assessed IAP's major programmes: capacity building for young academies (led by TWAS); science education of children (led by the Chilean Academy of Sciences); health education of women (led by the French Academy of Sciences); and water research and management (led by the Brazilian Academy of Sciences).

- *Capacity building*. "One of IAP's primary goals," noted Mohamed Hassan, speaking for the lead academy of this programme, "has been to help build the capacities of science academies, especially young academies in developing countries." Through small grants and institutional exchange programmes, IAP has helped fledgling academies, especially in sub-Saharan Africa and the Islamic region, to strengthen their administrative struc-

ture and, more importantly, increase their influence within their nations by gaining the skills that are necessary to provide independent advice to governments on critical science-related national and global issues. “One of IAP’s most important actions has been to create and strengthen regional networks of science academies in Africa, the Americas, Asia, the Caribbean and the members states of the Organization of the Islamic Conference (OIC),” said Hassan. “These regional organizations have emerged as important networks in their own right. On the one hand, they have helped to raise public awareness of issues of particular concern to the region and, on the other hand, they have disseminated information about the importance of science academies to national and regional leaders, ultimately shedding positive light on the work of IAP” Eduardo Krieger, president of the Brazilian Academy of Sciences and former co-chair of IAP’s executive committee, added that the networks created and supported under this programme will “play an important role in the implementation of the IAP strategic plan.”

- *Science education.* This programme was launched to spur reforms in science education through fostering hands-on inquiry-based learning, especially in primary and secondary schools. Its recent activities have included: the launch of an interactive electronic portal (in cooperation with the International Council for Science, ICSU), highlighting ‘best practices’ in science education and providing opportunities for science educators and students to exchange ideas and experiences; creation of a working group on international collaboration in the evaluation of Inquiry Based Science Education (IBSE) in cooperation with other international organizations; sponsorship of a regional symposium with the Network of African Scientific Academies (NASAC) on science teaching in Africa, hosted by the Senegalese Academy of Sciences and attended by representatives from six African countries; and

the organization of a meeting in Santiago, Chile, examining regional science education issues held in partnership with the InterAmerican Network of Academies of Sciences (IANAS). M. Shamsher Ali, president of the Bangladesh Academy of Sciences, praised “the diversity of this programme”, which he said “spans all continents and is of global interest.” He added that “the programme’s innovative focus on inquiry-based teaching should serve as a model for future efforts to promote science education.”

- *Health.* IAP has collaborated with the InterAcademy Medical Panel (IAMP) to examine ways of improving the health of mothers and children, especially in developing countries. The programme is designed to raise awareness among women about the unique health challenges that they face and to encourage public health officials and researchers to pay particular attention to these challenges. Two of the project’s most noteworthy activities have been: the creation of a website (www.whep.info) and the launch of a pilot project, supported by the World Bank, focusing on the Senegal River basin. André Capron, foreign secretary, French Academy of Sciences, noted: “Health education in the Senegal Basin largely depends on the relationship that people, particularly women and children, have

Networks will play an important role in the implementation of IAP’s strategic plan.



with water. Some 80 percent of all diseases in developing countries are due to a lack of access to safe drinking water.” Capron went on to say that education and training programmes in developing countries must recognize that “women are at the heart of all domestic usages of water” and that this reality “must be reflected in each nation’s water policies and programmes.” In 2005, the French Academy of Sciences began collecting information from IAP members on the state of health education among children aged 6 to 15 and convened a workshop in Paris attended by more than 50 participants. The workshop concluded with a call for a comprehensive global review of existing basic health education systems that would place special attention on sub-Saharan Africa.

- *Water.* This IAP programme promotes science-based solutions for improving access to safe drinking water and for mitigating major sources of pollution in fresh-

water systems. Recent activities have included IAP’s European regional workshop on water resources and management, two regional water workshops in South Africa and Brazil, and a workshop on water security in China. An international symposium on groundwater sustainability was also organized in Alicante, Spain, in early 2006 with the support of UNESCO’s Division of Water. The symposium, attended by nearly 250 participants from 50 countries, examined the pros and cons of intensive groundwater use. It concluded with the ‘Alicante Declaration’, calling for “more responsible use, management and governance of groundwater.”

In addition to its major thematic programmes, IAP has launched four other initiatives devoted to an examination of codes of conduct on biosecurity (led by the Royal Netherlands Academy of Arts and Sciences); access to scientific information (led by the US National Academy of Sciences); natural disaster mitigation (led by the Chinese Academy of Sciences); and public attitudes and concerns towards genetically modified organisms (led by the Union of German Academies of Sciences and Humanities).

IAP has published 11 statements, ranging from its first statement on the global challenges resulting





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from incessant population growth, issued in 1994, to a statement issued late last year that presented a consensus membership position voicing unequivocal support for the teaching of evolution. The statements, which have received broad international coverage, have helped to shape policy debates on critical science-based issues both in the national arena and within international organizations.

“It has been a full agenda that has had increasing impact within nations and across the globe,” noted Chen Zhu. “We hope we can build on the momentum that our programmes and initiatives have generated as we move forward.”

COMMON RESOURCE, COMMON HERITAGE

As Edouard Brézin noted in his opening talk: “Scientists must specialize to be able to create.” But he added: “Science will only flourish if it is a common resource for everyone.”

Science not only helps us understand who we are and sheds light on the universe in which we live. It provides a schematic for building fundamental tools

used to combat such critical issues as poverty and inequality, environmental degradation and public health. It also plays a key role in wealth creation and innovation and is a critical, irreplaceable element of human civilization. As the Nobel Laureate Abdus Salam and the founder of both the International Centre of Theoretical Physics (ICTP) and TWAS noted: “Science is the common heritage of all humankind.”

This is the spirit that drove both the creation of IAP and the early years of its development.

Today’s world presents unprecedented opportunities and challenges that make the work of IAP and other international scientific organizations so essential and so promising. Problems – whether related to science, society or both – are now global in scope and can only be solved through global cooperation.

‘Unity in science’ was the overarching theme of IAP’s 5th General Assembly and 3rd General Meeting, and unity of science – and society – will remain the major concepts driving IAP’s worthy agenda as it seeks to fulfil its promise in the years ahead. ■