

ISLAMIC ACADEMY OF SCIENCES

Newsletter



January - March 2002

Volume 16

Number 26

Mohammed VI patronises IAS Conference on Biotechnology and Genetic Engineering



Under the patronage of His Majesty King Mohammed VI, the king of Morocco, the Islamic Academy of Sciences convened its eleventh international conference under the title *Biotechnology and Genetic Engineering for Development in the Islamic World*, during 22-26 October 2001.

The conference, which was held at the Academy of Morocco Building was an open activity in which over 120 participants representing over 25 countries participated. It was organised and sponsored by the following organisations:

- Islamic Academy of Sciences (IAS), Amman, Jordan;
- Academy of the Kingdom of Morocco;
- OIC Ministerial Committee on Scientific and Technological Co-operation (COMSTECH), Islamabad, Pakistan;

- Islamic Development Bank, Jeddah, Saudi Arabia;
- OPEC Fund for International Development, Vienna, Austria;
- Islamic Education, Scientific and Cultural Organisation (ISESCO), Rabat, Morocco;
- United Nations Educational, Scientific and Cultural Organisation (UNESCO);
- Faculty of Medicine and Pharmacy, University of Mohammed V, Rabat, Morocco; and
- International Institute of Higher Education in Morocco (IIHEM), Rabat, Morocco.

The main objectives of the conference were:

- (a) To appraise some contemporary concepts in Biotechnology with the aim of disseminating them in OIC and developing countries;
- (b) To define some R&D areas of importance in BT, and develop innovative proposals for future activities in BT;
- (c) To assess the impact of recent advances in GE on medical research dedicated to combating disease;
- (d) To assess the status of GE research in the Islamic World, with particular reference to countries with extensive experience in this field;
- (e) To formulate an Islamic scientific stand where possible on BT and GE off-shoot issues;
- (f) To define a role for governments in BT and GE research in terms of priorities, regulation, funding, private-public sector collaboration;

(Continued on page 6)

IAS Patrons send messages to BT Conference

As is customary on such occasions, the patrons of the Islamic Academy of Sciences sent messages to the Eleventh IAS Conference on Biotechnology and Genetic Engineering. The message of HE the President of the Islamic Republic of Pakistan was delivered by Dr M A Mahesar, and the message of HRH Prince Al-Hassan Ibn Talal, was read out at the opening session of the conference by HE Dr Adnan Badran, IAS Treasurer, and President of Philadelphia University, Jordan.

The messages of both patrons are given below in their entirety for both, together with the statement of IAS President, represent valuable documents that address the topic of Biotechnology and Genetic Engineering.

H E the President of the Islamic Republic of Pakistan

"As one of the Patrons of the Islamic Academy of Sciences, I am pleased to greet you on the Eleventh Annual Conference of the Islamic Academy of Sciences. I thank His Majesty King Mohammed VI and his government for hosting this important event in Rabat and generously supporting the activities of the Islamic Academy of Sciences.

The theme chosen for the Academy's Eleventh Conference "Biotechnology and Genetic Engineering" represents one of the most important areas of science in the new millennium.

(Continued on page 6)

IAS General Assembly meets at Rabat

The General Assembly of the Islamic Academy of Sciences held its twelfth meeting at the Academy of Morocco Building in Rabat on Wednesday 24 October 2001. The meeting was chaired by Dr Abdel Salam Majali, IAS President, and attended by around 50 Academy Fellows, some of whom were attending for the first time, as well as Moneef Zou'bi, Director General, IAS.

At the start of the meeting, a number of newly elected Fellows were invited to receive their Fellowship certificates by the Academy President, and sign the charter book of the Academy.

Academy Fellows then proceeded to discuss a number of agenda items including the report of the IAS Secretariat on the activities undertaken by the Academy Secretariat since the previous meeting.

The Director General presented the IAS Secretariat report which detailed activities undertaken during the previous year including the fund raising campaign embarked upon by the President and the Secretariat to generate income for the Waqf of the IAS, as well as for the IAS programme budget.

The DG also briefed the General Assembly on the work of the science and organising committees responsible for organising the 2001 conference, and the untiring efforts of both committees to ensure that both the academic content of the conference as well as the logistical details of it were of international standard.

The General Assembly reviewed and ratified the various Statements of Accounts that were presented by Dr Adnan Badran, IAS Treasurer, who presented the main features of the Academy's financial details in his presentation.

The General Assembly deliberated for some time over a proposal submitted by the Council which was entitled, "Culture of Science Initiative." This is a long term activity by the Academy that aims to raise public awareness of science and science and technology issues, and generate support for scientists and science institutions in OIC countries.

New Academy Fellows elected

At its Rabat meeting, the General Assembly of the Islamic Academy of Sciences ratified the results of the 2001 Fellowship elections. The elections resulted in 8 candidates obtaining the required number of votes, thus becoming the newly elected Fellows of the Islamic Academy of Sciences.

The eight newly elected IAS Fellows are:

1. Prof. Qurashi Mohammed Ali	Sudan/Medicine/Anatomy.
2. Prof. Huda Saleh Mehdi Ammash	Iraq/Biology/Microbiology.
3. Prof. Ibrahim Gamil Badran	Egypt/Medicine/Surgery.
4. Prof. Mamadou Daffe	Mali/Biochemistry.
5. Prof. Ugur Dilmen	Turkey/Medicine.
6. Prof. Iqbal Parker	South Africa/Biochemistry.
7. Prof. Muthana Shanshal	Iraq/Chemistry.
8. Prof. Ahmed H Zewail	Egypt/Chemistry.

With the 2001 Fellowship elections over, the number of IAS Fellows stands at present at 95.

The Editorial Board congratulates the new members of the IAS on their election and wishes them success in the service of the Islamic Academy of Sciences.

IAS Council convenes Twenty Seventh Meeting

Alongside the eleventh conference of the Academy held in Rabat (October 2001), the IAS Council convened its twenty seventh meeting at the Rabat Hilton Hotel, under the chairmanship of Dr Abdel Salam Majali, IAS President.

The Council discussed a wide range of issues including Academy finances, Academy conferences, activities and programmes of the IAS, Academy Publications and visibility.

The Secretary General presented a number of ideas on how to increase the visibility of the Academy, and establish further contacts with countries and organisations.

The Council explored ways and means of generating additional funds for the Waqf of the Academy to enable it to implement more activities and programmes. The President presented a number of ideas on this matter and also briefed the Council on the contacts established with Qatar and Saudi Arabia, the latter being a country which he will visit after the conference.

The Council also deliberated for some considerable time on possible themes that the IAS could address at its future conferences. Some ideas were presented by the IAS Treasurer on how the quality and standard of conference papers could in the future be improved.

The General Assembly approved the short list of candidates nominated by the IAS Council to be elected as new Fellows of the IAS.

The General Assembly commended the fund raising campaign that the Academy President and Secretariat were pursuing to raise funds for the Waqf of the Academy as well as for the activities budget.

The House also deliberated for some considerable time on the type of activities that the IAS should address and reviewed a short list of possible themes that the IAS could address at its future conferences.

Academy organises academic book fair

As part of the number of fresh activities that the IAS is implementing within its new Culture of Science Initiative, the IAS organised a specialised book fair at the Academy of Morocco building in Rabat (Morocco), during 22-26 October 2001.

The fair which was a side activity to the eleventh IAS Biotechnology conference, included valuable exhibits from more than 30 universities from countries such as Jordan, Saudi Arabia, Syria, Bahrain, the United Arab Emirates, Oman, Qatar, Egypt as well as Tunisia and Morocco.

The IAS has long realised that the exchange of books and scientific publications between OIC countries was very limited and that there was almost complete lack of awareness on the part of academicians, scientists and technologists in one OIC country with the scientific output of their counterparts in even neighbouring countries.

The fair also aimed to highlight the effort that some countries are making in producing school textbooks in their national language.

The book fair was inaugurated by His Excellency Prof. Najib Zerwaili, Minister of Higher Education in Morocco.

The IAS, in collaboration with the Academy of Morocco, arranged to present the various books exhibited to the library of the Academy of Morocco, as well as the libraries of colleges and universities in Rabat.

The universities, organizations and institutions that participated in the book fair are listed below:

- Zarqa Private University, Jordan.
- University of Science and Technology, Jordan.
- University of Jordan, Jordan.
- Philadelphia University, Jordan.
- Talal Abu Ghazaleh International, Jordan.
- Applied Science University, Jordan.
- Al Zaytoonah University, Jordan.
- Association of Engineers, Jordan.
- Al-Hashimiyyeh University, Jordan.
- Centre of Muslim Contribution to Civilisation, Qatar.
- Yarmouk University, Jordan.
- Ministry of Education, Jordan.
- Al-Baath University, Syria.
- Bahrain Centre for Research and Studies, Bahrain.
- Zagazig University, Egypt.

EDITORIAL LETTER

Biotechnology for the future

The growing technology gap between the industrialised countries and the developing world is one of the most pressing international policy issues. Critics of globalisation use this gap to argue that market integration will not necessarily help developing countries to improve the performance of developing economies. Others have argued that globalisation will marginalize developing countries. So far, much of the concern over the widening technological gap has focused on what is popularly known as the "digital divide". This phrase has become a cliché and is used to capture a wide variety of limitations inherent in the current structure of the global economy. But behind the rhetoric lies the more fundamental issue of how to mobilise the world's scientific and technological knowledge to contribute to the welfare of the developing world.

The 2001 IAS conference aims to examine the widening biotechnological gap between developed and developing countries. This "genetic divide" is likely to have far-reaching consequences for the developing countries because of the radical nature of biotechnology and its implications for agriculture, human health and environmental management. Unlike the information revolution, advances in biotechnology have the potential to alter the patterns of food production and distribution in fundamental ways. Competence in the life sciences will become a prerequisite for meeting basic human needs.

Rapid technological change is erasing many natural, economic and political boundaries, and a tendency towards greater economic integration is evolving. Points of friction are however arising that are associated with technological competition and the need to preserve the dominant agricultural production paradigms. Sovereign domains (from the personal to the national) are being challenged by the forces of technological innovation and global market integration.

Advances in information technology and genetics are replacing natural resources as the dominant forces in shaping the world economy. The so-called new economy is an expression of the recognition of the role of knowledge in economic growth with the life sciences playing a key role in the transformation processes. The prospects of the new economy are also being accompanied by growing apprehension and anxiety over the impacts of new technologies on society, environment and human health. This is vividly demonstrated by the current debates about agricultural biotechnology.

Not unlike previous technologies, biotechnology is being developed largely for industrialised country markets. There is a real danger that industrialised country needs will shape the technological curve of biotechnology in ways that will exclude many developing countries from its benefits. The choice of crops, traits, products and regulatory requirements could serve to restrict the technology in specific niches. Indeed, the emerging biotechnology governance regime provides a new framework through which a wide range of restrictive measures could be promoted.

Other obstacles that have been talked about include the ever shrinking public funding for research and development, in particular in agriculture and biotechnology, which has been replaced by the private sector. The importance of the private sector in research and development is also reflected in its increasing role as the driving force behind the biotechnology revolution.

Moneef R Zou'bi
Director General, IAS

- Helwan University, Egypt.
- University of Qatar, Qatar.
- Emirates University, Dubai.
- OIC Standing Committee on Scientific and Technological Co-operation (COMSTECH), Pakistan.
- Arab League Educational Scientific and Cultural Organisation, (ALECSO), Tunisia.
- King Fahd University for Petroleum and Minerals, Saudi Arabia.
- Arab Organisation of Agricultural Development,
- King Saud University, Saudi Arabia.
- King Faisal University, Saudi Arabia.

IAS Rabat Declaration on Biotechnology and Genetic Engineering For Development in the Islamic World

Adopted in Rabat (Morocco), on the
8 Sha'aban 1422
24 October 2001

PREAMBLE

WHEREAS Allah (God) Subhanahu-Wa-Ta'ala has created Man in the best of forms, provided him with the abilities and resources to improve his well-being, endowed him with reason, dignified and honoured him, and granted mankind the inheritance of life and resources of nature;

WHEREAS Allah has made the pursuit of knowledge an absolute obligation and its acquisition a source of pride and dignity, and has urged human beings to seek, utilise and disseminate it for the benefit of humanity;

WHEREAS the teachings of Islam emphasize the importance of the well-being of man, and underline the fact that Man's relationship to the universe and to his fellow-man must be one of stewardship and complementarity, respectively, and never one of mastery;

WHEREAS the Holy Quran is replete with numerous references to biological sciences;

WHEREAS Muslim contribution to the establishment and advancement of biological sciences throughout the period of Islamic renaissance has been significant;

WHEREAS Islam promotes a needed ecological balance between all living beings and their life-sustaining environment;

WHEREAS the Islamic Value-System provides a unique Code of Ethics, which should govern our outlook on contemporary Genetic Engineering issues, such as Cloning and Organ Transplants;

WHEREAS Biotechnology and Genetic Engineering have now become areas at the forefront of basic and applied research

and are continuously reaching new levels in advancement and complexity;

AND WHEREAS the majority of OIC and developing countries have not mapped out a stand on the science or ethical features of Biotechnology and Genetic Engineering and are lagging behind in these areas;

NOW, THEREFORE, the Islamic Academy of Sciences:

(a) **REALISING** that the applications of biotechnology could have far-reaching effect and favourable impact in the developing countries, many of which suffer from large and rapidly increasing populations, chronic food-shortages and malnutrition, poor health, and profound environmental problems;

(b) **ACKNOWLEDGING** that Biotechnology and Genetic Engineering are areas where rapid and meaningful advancement can readily be made by OIC countries, especially in attaining food security, promoting the pharmaceutical industry;

(c) **APPRECIATING** the activities being carried out by many governments, academic institutions, and non-governmental organisations in the fields of Biotechnology and Genetic Engineering, especially in Agriculture;

(d) **ACKNOWLEDGING** that advancement in Biotechnology and Genetic Engineering underlines the importance of investment in basic sciences, which are the backbone of sustainable S&T advancement, especially as there is very little biotechnological R & D in the developing countries;

(e) **ACKNOWLEDGING** the significance of the sequencing of the human genome, an event compared to man's landing on the moon and described as an historic milestone in the history of science that will enhance research in human biology focused on diseases such as Cancer, Alzheimer, Diabetes and Cardiovascular disorders; and

(f) **TAKING INTO CONSIDERATION** the Universal Declaration on the Genome and Human Rights, adopted by the General Conference of UNESCO in 1997, which is the first worldwide instrument in the field of biology, medicine, and genetics;

MOREOVER

(a) **OBSERVING WITH CONCERN** the lack of a long-term Biotechnology policy at the national level in most OIC member countries;

(b) **NOTING WITH CONCERN** the limited number of enrolled students and quality-graduates in Biotechnology-related disciplines, as well as the poor level of instruction at most institutions;

(c) **BEING CONCERNED** at the lack of adequate infrastructure for BT - research available in most OIC countries, to sustain this growing sector;

(d) **NOTING WITH CONCERN** the absence of co-ordination between the various agencies involved in Biotechnological research and application;

(e) **NOTING** the lack of up-to-date curricula in Biotechnology for all stages of the educational process, as well as the shortage of suitably

qualified and motivated teaching staff;

(f) **NOTING WITH CONCERN** that the major breakthroughs in molecular biology and genetic engineering have raised many serious legal, ethical and social questions;

(g) **COGNISANT** of the fact that genetic engineering has been defined as an unnatural insertion of a foreign sequence of genetic codes in the midst of the orderly sequence of genetic codes developed through millions of years, which is a profound intervention, with unpredictable consequences;

THE ISLAMIC ACADEMY OF SCIENCES MEETING, AT RABAT (MOROCCO) DURING OCTOBER 2001, CALLS UPON the international community to:

(i) **EXTEND**, in the spirit of co-operation, all possible help to developing countries in the area of technology-transfer, as well as debt relief to enable them to divert more resources to research in critical areas of Biotechnology;

(ii) **CONTINUE** to support research projects of importance in the developing countries;

(iii) **SET-UP** an appropriate mechanism for the protection of national genetic resources;

AND CALLS UPON the leaders and decision-makers of Islamic countries to:

(a) **RE-DEFINE** national developmental objectives in the area of science and technology, especially Biotechnology and Information Technology, in view of Globalization and free-trade arrangements that are being adopted by countries;

(b) **DEFINE** their BT strategies and, where possible, incorporate them into national S&T policies;

(c) **INTRODUCE** BT awareness programmes at various stages of the educational process;

(d) **INTRODUCE** appropriate legislation, including tax and customs-exemptions, to promote the various aspects of the pharmaceutical industry;

(e) **ESTABLISH** linkages and partnerships between OIC member countries, in Biotechnology and Genetic Engineering, to facilitate inter-country co-operation by governments, industry and academia;

(f) **ALLAY** fears that stringent patents and intellectual property rights, legislation and countries' accession to the World Trade Organisation (WTO) could cripple drug manufactures in OIC countries;

AND WOULD MOREOVER

(a) **ASSERT** that exploiting a technology, which may give rise to unexpected substances that could be damaging to health, before this risk has been carefully investigated, should be avoided;

(b) **ASSERT** that exploiting a technology that may have irreparable environmental effects, before it has been proven that the products do not cause significant harm to the environment, should be avoided;

(c) **ASSERT** that it is not appropriate to expose people and the environment to even the smallest hazard, considering that present genetically engineered products are of little value;

(d) **ASSERT** that it is not right to justify the exploitation of a potentially hazardous technology today because of a scientifically unfounded principle that it might generate useful products in the future;

(e) **ASSERT** that, if genetically engineered organisms are to gain greater acceptance, decisions that address concerns associated with the application of biotechnology to agriculture must be science-based;

AND FURTHER CALLS UPON the relevant OIC, and other, organisations to:

(a) **ENCOURAGE** and support OIC-based BT and pharmaceutical industrial ventures;

(b) **DEVELOP** databases of BT and GE human resources in OIC countries, to facilitate appraisal of national strengths and weaknesses;

(c) **SUPPORT** inter-disciplinary research and development in various fields related to BT and ensure the requisite development of human resources;

(d) **PROVIDE** funds as well as governmental support for diagnostic as well as curative medical applications of BT, Gene Therapy, etc.;

(e) **CONTINUE** to address developments in basic sciences and not to marginalize this backbone of S&T development;

(f) **ENCOURAGE** and promote the publication of quality research-material of OIC scientists especially in the area of Biotechnology in internationally renowned journals and on the Internet;

AND FURTHER PROPOSES

(i) **THE CREATION OF AN ISLAMIC BT FUND** to help poorer OIC countries to transfer Biotechnology know-how from other countries and develop and utilise it to achieve national food-security;

(ii) **THE ENFORCEMENT OF A MORATORIUM** on the release of genetically engineered organisms and on the use of Genetically Engineered (GE) foods, until sufficient knowledge has been acquired to make it possible to judge how far it is safe for human health and the environment to exploit this technology; and

(iii) **THE DEVELOPMENT OF A MULTI - DISCIPLINARY GROUP** of scientists, technologists and Islamic scholars to study the various facets of social and ethical issues emanating from the recommendations of this conference.

(Continued from page 1)

Mohammed VI patronises IAS Conference on BT

- (g) To establish paradigms that define the impact of developments in BT on the environment, agriculture; and
- (h) To facilitate the free exchange of views among experts on BT and GE;

In addition to an international keynote that overviewed the state of Biotechnology in developing countries, 2 other keynotes were presented. The first overviewed the changing role of science and technology as a key for development in the Islamic world. The second keynote addressed ethical issues related to Biotechnology.

In order to generate academic interaction among the participants, the conference was mostly divided up into roundtable discussions (four in all), in which short communications were followed by discussions on a number of important issues. The roundtables addressed the themes of Biotechnology and Food Security; Biotechnology and Education; National Biotechnology Scenarios and Ethics, Social Values and Biotechnology. The latter was a specialised session jointly organised by the IAS, COMSTECH and the Islamic Development Bank.

In the "Scenarios" session, speakers from Tunisia, Iraq, Morocco, Sudan and Malaysia were invited to present highlights of their national experiences in the BT sector. Emphasis was especially placed on the future courses of action that these countries will take in the field of BT and its applications.

At the conclusion of the conference, the Islamic Academy of Sciences adopted the IAS Rabat Declaration on Biotechnology and Genetic Engineering for Development in the Islamic World.

The declaration noted that the majority of OIC and developing countries have not mapped out a stand on the scientific or ethical features of Biotechnology and Genetic Engineering nor fully realised the favourable impact of Biotechnology and Genetic Engineering as means of achieving national food and pharmaceutical security.

It emphasised that BT can represent an area where rapid and meaningful advancement can readily be made by developing countries.

The declaration acknowledged the significance of sequencing the human genome and described it as a historical milestone which will lead to advanced research in combating diseases such as Alzheimer, Diabetes and Cardiovascular disorders.

The declaration emphasised the importance of addressing the link between ethics, social values and Biotechnology through specialised multi-disciplinary groups of scientists, technologists and Islamic scholars.

As part of the follow-up action to the conference, the Academy will circulate the IAS Rabat Declaration to concerned individuals and relevant agencies throughout the world, so that measures can be taken to implement the recommendations decided upon at the conference.

The Academy will also publish the complete proceedings of the conference in a quality volume that will be distributed internationally. Such a book, like all other published IAS proceedings, will become a valuable reference for experts that draw up and implement Biotechnology policies and/or are involved in Genetic Engineering applications.

Through IAS Fellows, personal contact and correspondence, the IAS will promote the ideas that were developed at the conference among the decision making circles of the Islamic World, and will provide whatever help it can to get the various recommendations implemented.

(Continued from page 1)

H E the President of the Islamic Republic of Pakistan

About half a century ago, when Watson and Crick discovered the structure of DNA no one imagined how rapidly genetic technology would develop. Today biotechnology and genetic engineering present challenges unprecedented in history. These new technologies enable researchers to redesign living organisms by moving genes across species. The results essentially are genetically modified organisms, capable of perpetuating in nature.

These revolutionary opportunities and breakthroughs have the potential to produce new micro-organisms, plants and animals and thus have far reaching economic benefits in agriculture,

environment, industry, and human health. Biotechnology now has the potential to cure diseases, prolong life and alleviate human suffering. However, these opportunities have given rise to a number of ethical, legal and social questions that need to be addressed and critically examined. For the Muslim World the real challenge is the need to undertake an in-depth analysis of the risks and benefits and to develop regulatory procedures and guidelines that will make these practices environmentally safe. It is indeed important to appreciate that biotechnology is already a multibillion-dollar industry and in agriculture alone, more than 75 million acres of genetically modified crops are now being sown worldwide. It is estimated that 30,000 products in U.S. grocery stores are also genetically modified in some fashion. Its impact on society is therefore here to stay, and it is expected to be so enormous that further delay in realising its potentials and comprehending its pitfalls would be unwise and detrimental.

At the dawn of the Third Millennium, another serious question that confronts the *Ummah* is the tendency to view biotechnological developments as an issue threatening our ethical and religious notions. It is now up to our religious scholars and researchers to examine the ethical issues in the light of the teachings of Islam. Such efforts obviously need to be carried out in close co-operation with scientists. I am indeed pleased to learn that this august assembly is going to debate these important aspects and suggest ways that can be used as future strategies.

The role of Islamic Academy of Sciences in shaping future policies in scientific development of *Ummah* is indeed vital. As a think-tank and a brain trust of *Ummah*, the Islamic people look towards you for initiating debates on fundamental scientific issues confronting our age. I am confident that with the rich knowledge base that is available in the Islamic Academy of Sciences, it would be possible for you to critically analyse all aspects of biotechnology and propose an effective set of guidelines at the end of the conference.

Keeping in view the nature and significance of Biotechnology and Genetic Engineering, COMSTECH has always attached special importance to this essential field of scientific development. And, in spite of serious resource

difficulties. COMSTECH has managed to find means to support several programmes in biotechnology capacity building and organised several international symposia. As Chairman of COMSTECH and a Patron of the Islamic Academy of Sciences, it is obviously a matter of great personal pleasure for me to see that COMSTECH and IAS are working closely together, and pursuing a common goal of strengthening the science and technology infrastructure in the OIC member states. I am certain that these two organisations will continue to work together in this important area.

I sincerely hope that the Eleventh Conference of Islamic Academy of Sciences in Rabat will mark a new beginning and a new era in the scientific and technological development of the OIC region. May Allah give us the courage to boldly cope with all the challenges in accordance with the teachings of Islam and bless us with a true and genuine commitment to promote the cause of education, scientific research, technological advancement, and welfare of all the citizens of the OIC region."

HRH Prince Al-Hassan Ibn Talal

"It is a distinct pleasure for me to be able to take this opportunity to pay tribute to His Majesty King Mohammed VI for his generous patronage of this, the eleventh IAS Conference in Rabat. I would like to express my gratitude to the Academy of the Kingdom of Morocco, whose gracious patron is His Majesty the King himself, for hosting the conference. Let me, at the same time, extend my greetings to all participants of this distinguished scientific forum.

The Islamic Academy of Sciences is fifteen years old this very month. This might still be a little short of full maturity; but it is definitely the blissful beginning of puberty. It is the age when attempts are tirelessly made to reach out to new realms of imagination, creativity and constructive change. A great achievement is a labour of love triggered by a great imagination and pursued with much toil, persistence and devotion. How else can we understand the staggering achievements of – to mention one prominent example – our own civilisation in its heyday?

Over the past decade many conferences – local, pan-Arab, pan-Muslim, and Third-World – have been held on the topic of biotechnology and genetic engineering. Although these have been very useful in stimulating discussions and in familiarising workers with each other, very few practical results have emerged.

Surely, the deficit will be addressed during the sessions of this conference. As its mission statement avers, the purpose of the Islamic Academy of Science is "to provide an institutional set up for the utilisation of Science and Technology for the development of Islamic countries and humanity at large." I would like to underline the word utilisation. Since its inception in 1986, the IAS programme has addressed many contemporary issues facing the Islamic world, with a view of not only benefiting the Ummah, but also of benefiting all mankind by means of a well-informed, co-operative, pragmatic and humanitarian approach in scientific and technological development.

Many of us have already benefited over the years from the Academy's publications of previous conference proceedings. The IAS has so far discussed – among other topics – information technology; education; water in the Islamic world; health and nutrition; the environment; manpower; technology transfer; and S & T policy. In each case, the Academy has been concerned above all with the question of development – that is, with the practical measures which can be taken by individuals and organisations within the scientific community to maintain values alongside innovative changes, and to establish a culture of scientific education and creativity. In this respect, it was a great pleasure for me to attend the IAS launch of the Culture and Science Initiative earlier this year in March.

Biotechnology and genetic engineering carry great potential for economic and social development in the Islamic world. Of all emerging technologies, biotechnology has three obvious advantages:

- Low cost compared with IT, micro-technologies, and so forth;
- Availability of trainable manpower;
- Adaptability to division of labour even in a narrow field – not just between workers in different

laboratories, but between workers in different countries – resulting in a more economically viable system.

We are likely to identify a commercially viable field for which no more than a handful of individuals (researchers and technicians) would need to be trained in fewer than a dozen specialised techniques.

Biotechnology with genetic engineering is a diverse field. Not all of it needs to be introduced at one go. Nor is it required that the techniques used in the manufacture of one product be all practised in one place, so long as the final goal is clearly decided. Not the least advantage of the field is the co-operative approach between institutions and nations which will be required for effective sharing of information and resources. For example, producing marketable polypeptides requires the following steps:

- Isolation of the gene;
- Introduction of the gene into a suitable organism;
- Multiplication of the organism on a large scale;
- Isolation of the protein;
- Quality control and testing of the protein product;
- Packaging and marketing of the product.

Each of these six steps could take place in a different institution.

Information-sharing and resource-sharing will be dominant factors. Recently, it seems, scientists worldwide have begun to adopt a synthesising approach. For life-scientists especially, a brave new world is dawning – the world of structures and dynamics that lie between the cell and the atom. In this broadly-defined field, many disciplines have come to overlap and share information and techniques. Single polypeptides command the attention of – for example – protein crystallographers studying folding structure, geneticists investigating the finer function of the human genome, pharmaceutical research and development teams developing 'intelligent medicines', cytologists getting to grips with the complex and delicate ecosystem of the cell, medical researchers seeking the origins of degenerative disease, and plant scientists hoping to increase crop yields.



We are constantly astounded by the richness of Creation and by the fact that in biotechnology and genetic engineering we are now granted the privilege of taking up the conductor's baton to direct – if not the symphony of life – then at least, perhaps, a brief violin solo or two.

Here, I would like to quote from the preamble of the IAS Tunis Declaration on Information Technology for Development in the Islamic World. As we all know, this document originated in last year's dynamic conference on Information Technology. Quote:

Allah has made the pursuit of knowledge an absolute obligation and its acquisition a source of pride and dignity, and has urged human beings to seek, utilise and disseminate it for the benefit of humanity;

The teachings of Islam emphasise the importance of the well-being of man, and underline the fact that Man's relationship to the Universe and to his fellow-man must be one of stewardship and complementarity, respectively, and never one of mastery." (Unquote.)

As scientists it is our duty to pursue new knowledge and new technology. But as we are living organisms ourselves – and, I should add, non-governmental organisms at that – I would like to suggest that it is also our duty to think about how we may pursue wisdom in scientific endeavour. I have mentioned the issue of co-operation and sharing across institutional and national boundaries. We must also consider the issue of appropriateness – appropriateness of technology, appropriateness of application. For new techniques in themselves are no substitutes for the pragmatic and humanitarian application of information in a clearly-defined ethical context.

Bioethics must form a cornerstone of any involvement in biotechnology and genetic engineering. Let me say here too that in today's high-speed, information-rich age, to be credible in the world market one must take into account not only local imperatives but global factors. Multinational and transnational corporations are at the forefront of the biotech revolution. We seek investment and profit so that we may further research and development schemes which are highly necessary in our parts of the world. Yet economic imperatives, subject as they are to political whim, cannot on their own establish the consistent good practice which must prevail.

Scientific and technological developments have given human beings powers that threaten to far outstrip their collective good judgement. We need to identify those universal values to which we should all adhere and which will guide the biotech revolution into biotech evolution, and not devolution. It is time to consider the guidelines that will allow technology to progress according to a universally-recognised code of conduct which has the welfare of the human individual at its centre. Consequently, and bearing in mind the importance of pragmatics in the context of this pan-Islamic conference, I would suggest that policies rather than politics should dominate our discussions of any global ethic regarding investment and research in our field.

Perhaps we may take advantage of the opportunity that this very important and inclusive conference provides for us to consider the establishment of a virtual institution or 'invisible college' of biotechnology. The IAS Secretariat could possibly arrange for some peripheral meetings to take place that might select one or more narrow areas of biotechnology and identify the laboratories and companies which could establish such an invisible college. Such an organisation would require no new labs, personnel or buildings and relatively little effort and money. It could well become a model for Islamic co-operation in addition to (potentially) generating income.

Finally, I would like to say that I regret not being with you in person today to listen to you. But I do look forward to studying carefully your contributions, with the view of not only promoting new developments and collaborations in the field of biotechnology and genetic engineering, but also of pursuing a course which will lead to greater happiness and security – that is to say, the 'soft security' of human dignity – for the generations that are to come.

Prof. Najib Zerwaili
Minister of Education and
Scientific Research

In his opening remarks, Prof. Najib Zerwaili, the representative of Morocco, and Minister of Higher Education and Scientific Research, welcomed the participants, and expressed his hope that the conference would be successful.

Opening Statement of
Prof. Abdel Salam Majali
IAS President

May I at the outset request that we recite Al-Fatiha for our late friend, Prof. Ali Kettani, IAS Vice-President and Founding Fellow of the Academy.

Upon the gracious invitation of His Majesty King Mohammed VI, we convene again this year in a spirit of brotherly interaction to define our scientific outlook concerning important scientific themes that affect our lives, namely Biotechnology and Genetic Engineering. We are honoured to meet in this House of Knowledge, the Academy of Morocco, in this historical city, with the same open-minded spirit that the towering figures of our Islamic history had, to address issues important to our present and to our future.

The number and calibre of the persons gathered here reflect the admiration that the Islamic scientific community has for the Kingdom of Morocco, and its enlightened leader who represents an honourable ruling dynasty famous for its patronage and support of science and scientists.

The twentieth century has been called the century of matter. The twenty-first century will in all probability be that of life. Our knowledge of living beings and of the world around us has, in the space of a few decades, been shaken to its foundations by discoveries with far-reaching ramifications. For the first time, thanks to findings in genetics, neurobiology and embryology, humans have gained access to a knowledge of their own vital mechanisms.

Humans have also gained the power to transform the development processes of every species of living being, including their own. The impact of this new found power is immense and we have not yet gone into its depths.

Advances in medicine and biology and the cognitive and practical breakthroughs made possible by their association with other disciplines – Informatics, to name but one – now offer a hope of a better life. The development of gene therapies will enable us to treat or prevent hitherto incurable genetic diseases. Pharmacological progress and greater knowledge of immunity mechanisms have led to a series of qualitative leaps in the area of grafts and transplants. The development of the

neurosciences, robotics and medical imaging has opened up a new era of surgery. Progress is being made all the time in prenatal medicine, embryology and medically assisted procreation.

We can only wonder at the advances made since 1953, when the double helical structure of DNA was discovered in all its beauty. All this leads us to believe that humanity is on the way to ending the diseases and other scourges that have plagued it for thousands of years.

The progress of the biomedical sciences is raising unprecedented expectations but it is also a source of great complexity whenever the question of its moral legitimacy is raised.

Excellencies Ladies and Gentlemen

Islam contains plentiful constructive implications and lofty goals all of which emanate from the general denotation of the first Qur'anic word to be sent down as a heavenly revelation, "Read: in the name of thy Lord who Created, Created man from a clot. Read: And thy Lord is the Most Bounteous, Who taught by (the use of) the Pen, Taught man that which he knew not."

Science, knowledge and civilisation are the best aspirations a Muslim can have in search for which he beseeches help through the kind care of God. God whose help is sought for the achievement of the knowledge and learning pursued through reading. Learning and teaching are natural and even necessary for any human civilisation and progress. Thus Islam has accorded a high status to learning by making the latter a sort of worship and an article of faith.

Learning is a blessing bestowed by God on man through which he can discover the Creator's originality by means of the miraculous creation and wonderful dexterity. In this, there is an intimation to this living being, his nature, structure, distinctive qualities, qualifications, gifts and capacities. God has stressed these blessings through the talent of teachableness and learning. The Almighty has also emphasised them through the secrets of man's creation. He also singled man out by honouring him through His imperative injunction to man to read, alluding by that to benefits accruing from the pen without which no

religion can be established and no life can smoothly go on.

The Quran is replete with references to biological science. Some of them are related to the creation of man, to the species of animals or to the realm of plants. All of these give hints to scientific facts inherent in man's creation, which leads us to explanations that reveal to indications noted by science and confirmed by experimentation and tests.

Muslim contributions in a number of fields in biology are also significant, and indeed the contributions of early Muslim celebrities in this field are distinctive including those of Al-Razi, Al-Zahrawi, Ibn Sina, Ibn Al-Haytham, Ibn Zuhri and others.

In the aftermath of our countries gaining their independence and facing up to the realities of the modern world, the IAS, as well as a number of other OIC off-shoot organisations, were conceived during the late sixties onwards as a result of fundamental heart-searching on the part of some enlightened leaders. The realities of ignorance, disease, hunger and indeed of facing political crises emanating from our geo-strategic location, and what God has endowed us in terms of wealth in natural resources – became very evident.

This interest in science as a means for us as an Ummah to achieve progress has led to pose a number of interesting questions. For example, "Is everything that is technically feasible ethically acceptable?" As the potential of biology, medicine and genetics diversifies and new ways are found of putting this potential into practice, we are becoming increasingly aware of the inadequacy of our moral and philosophical reference points and the gaps in our institutional and legal frameworks. At the dawn of the twenty first century, the debate on cloning and, more recently, on the eventuality of research on embryonic stem cells showed that many societies feel the need to reflect on the ethical implications and to adopt a position. I wonder here whether we as the *Ummah* of *Aqeedah* have fully realised our potential?

Given its intellectual and ethical capability, the science community in the Islamic world has both the ability and the will to promote this dialogue, which is

more necessary than ever, and to see to its coordination. We can and must work out guidelines that enshrine universally shared ethical principles.

Moreover, we can prepare an international charter on the human genome through adopting the pragmatic approach that is based on the latest advances in genetics and its applications. In this mission, we should examine the ethical and legal implications of genetic screening and testing. We should address the issues of the confidentiality of genetic data, population genetics, the development of vegetable and animal biotechnologies. We should opt for the greatest possible transparency, and widely disseminate the findings of our work.

The Universal Declaration on the Genome and Human Rights, adopted by the General Conference of UNESCO in 1997, is the first worldwide instrument in the field of biology, medicine and genetics. Its chief virtue is that it strikes a balance between guaranteeing the observance of rights and fundamental freedoms and ensuring the freedom of research. By endorsing it in 1998, the UN General Assembly recognised the importance of setting out ethical principles for the application of science to human beings.

The statement in Article 1 of the Universal Declaration on the Human Genome and Human Rights that "in a symbolic sense [the human genome] is the heritage of humanity" set the touchstone for all subsequent applications of genomics – and the validity of this touchstone has not been diminished by our growing mastery of the vocabulary and subsequently the syntax of the genetic language.

This said, the rapid development of genetic engineering, especially since the 1970s, has led to a much wider range of patents. The extension of patentability to new sectors immediately provoked misgivings and tensions, to which the reactions varied widely, from country to country and from culture to culture, depending on the protagonists involved and the interests at stake.

Whatever protection is to be given to a discovery – and protection must, of course, be given – another sacrosanct

principle must apply to the use made of the meteoric progress in the sequencing of the human genome: free access to the raw data in question, a principle that is crucial to the dissemination of knowledge and knowledge-sharing.

On 14 March 2000, when human genome sequencing was nearing completion, the then President of the United States of America, Mr Bill Clinton, and the British Prime Minister, Mr Tony Blair, issued a joint statement calling for free access to human genome data. Calls followed from a numbers of circles stressing that it was both important and urgent that the international community as a whole should ensure free access to raw fundamental data on the human genome on the basis of the ethical principles set forth in the Universal Declaration on the Human Genome and Human Rights.

Moreover, the United Nations Millennium Declaration adopted on 8 September 2000 reasserted the need to ensure free access to information on the human genome sequence. I earnestly hope that this would eventually lead to solving some of the problems posed by the protection of gene-linked intellectual property.

Progress made in genome sequencing (and not only that of the human genome) opens up mind-boggling prospects in farming, medicine and industry. There is however a belief that the technology is not yet quite ready.

Public opinion, often ill-informed about such complex issues, is equally changeable. In short, the seeds of confusion are there and passions will be inflamed by the clash of convictions and interests.

I firmly believe that all the conditions are there for a radical review, a stocktaking, a dispassionate attempt to compare the competing opinions, policies and practices, especially amongst our OIC-member countries.

We have to present our clear scientific stand on these issues to world leaders. Our stand that is based on our beliefs and interests. Only through this would we ensure that no other stand is forced upon us in the future.

Excellencies

Ladies and Gentlemen

The world is living through unprecedented turmoil. The events of the last few weeks have produced a flood of

reactions that are directed against Islam, most of which are unjust, unrealistic and unjustified. Our mission now as the science leaders of the Ummah is to firstly address the world and project our pride in our Islamic civilisation and what it has achieved and how it contributed to the Western civilisations, for we belong to a civilisation that believes in dialogue. We are the sons of a civilisation the core of which is a divine message that promulgates respect for human life and human rights and most of all justice.

Our mission now is not close our doors but open up to the world and present our case and point out to despair generating conflicts in our world. We too need to activate our bilateral interaction, and jump-start our transitional thinking, in our quest to achieve food and water security, science security and ultimately national security.

We, in this world, cannot obtain good unless we have a wakeful conscience and unless we follow in the crystal clear paths of right that are free from fluctuation and confusion resulting from inducements, motives, affecting factors and propensities, would we again progress. We, the science leaders of the Ummah, have to promulgate a science policy for the Ummah and request our leaders to put it into action before it is too late.

I have every confidence that our meeting here will give our stand on this subject a considerable boost. I thank all of you wholeheartedly for agreeing to take part in this meeting, whether in the chair or from the floor, in a spirit of curiosity and open-mindedness and with the firm resolve to advance our exchanges.

I would like to thank His Majesty for cultivating science and scientists in this oasis of knowledge. He is after all the descendent of an honourable lineage that founded Islam in these blessed lands.

Opening Address by Prof. Abdelhafid Lahlaoui Chairman, Local Organising Committee

Allow me dear scientists to first and foremost welcome you to the land of Morocco. The land that has shepherd science and scientists, ever since its various states, kingdoms and peoples were engulfed by the flag of Islam, in testimony of the Almighty's words, *هل*

يستوي الذين يعلمون والذين لا يعلمون"،
وقوله "إنما يخشى الله من عباده العلماء"،
وقوله "يا معشر الجن والإنس إن استطعتم أن
تتقوا من أقطار السموات والأرض فأتقوا،
لا تتفنون إلا بسلطان".

I am honoured that this meeting is being held at this unique academic edifice, the pillar of which was constructed by His Late Majesty King Hassan II may Allah bless his soul, and the cornerstones of which were raised by the inheritor of the late king's secret, his son and successor His Majesty King Mohammed VI who is patronising this conference with the heart of a true believer who believes that genuine science is the gate to faith, and the mind of an alert open-minded person, who knows that the sublimity of nations is only measured by its contribution to the building of the edifice of human civilisation, and the actions of their sons in it and their influence in the direction it takes.

Ever since your Academy was founded in Amman during 1986, under the patronage of HRH Prince Hassan Ibn Talal, you have been striving and struggling. You have concerned yourselves with "Food Security in the Islamic World," at your Amman Conference in 1987. You have contemplated on "Science and Technology Policies for Self Reliance in the Islamic World," at Islamabad in 1988.

You have sought to arrive at the "New Technologies and the Development of the Muslim World," in Kuwait in 1989. You were interested in "Technology Transfer for Development in the Islamic World," in Antalya (Turkey) in 1990. You have realised that strength does not come except through "Science and Technology Manpower Development," in Amman in 1991, and through attention to the "Environment and Development in the Islamic World," in Kuala Lumpur in 1992. You been careful to address "Health, Nutrition and Development in the Islamic World," at Dakar (Senegal) in 1993. You have concerned yourselves with "Water in the Islamic World: An Imminent Crises," in Khartoum in 1994. You have realised the importance of "Science and Technology Education for Development in the Islamic World," in Tehran in 1999, and "Information Technology," in Tunis in 2000.

Whomsoever looks at these activities finds that you have addressed the most prominent of contemporary issues that affect Man today. Your objective from such specialised activities has been to preserve and protect the human being, his existence, his needs of food, water, health, clean environment, and indeed information. You have in this quest utilised active forces at the centre of which is Man himself both in mind and spirit. The force of the transfer of knowledge and technology and its control and the mastery of its tools. Your objective has been to serve the Islamic nation in a world over burdened with conflict for the sake of profit and not for spreading bliss. A world over burdened with haughtiness of invention for the sake of boasting and hegemony not for mercy or lenity.

You have saved for your efforts tools that are manifested in the establishment of your eminent Academy. This Academy that made from the planet a one homeland, and from science it made tenderness, and made from serving Man an objective. You have provided it with the material means to grow. It has developed relations with the effective agencies of nations in terms of policy, management and science. The Academy has provided the whole of humanity a compilation of scientific publications and academic periodicals, and modern communication tools that help attain science and help with it.

We meet today to discuss an important, dangerous and distinct science. To the extent that it holds such a promise for humanity, it also calls for contemplation and care. It is a science that looks into the most dangerous of subjects, into the secret of dangers, into the greatest manifestations of creation "Genes," a dangerous science in its contents and dimensions. Delving into its secrets can represent the peak of science that God Almighty has endowed in Man's brain today. The ability of Man to decipher all the unknowns of this science will surely change the face of the world.

We hope that this change will benefit Man and be to his good. "Biotechnology and Genetic Engineering" is a science that cannot be given a peculiar quality. It does not carry the colour of ideology. This is a quality of all true sciences. In spite of this, the track of many sciences, for many reasons, might be affected negatively or positively by emotions. While we are shaded by the spirit of Islam, and oblige the objectives of our Academy namely

enhancing the interaction between our scientists and the exchange of scientific concerns, as well as the preservation of the Islamic brain reservoir, we are too driven by this to action while paying our respect to the creation and realising that we cannot introduce changes in it, "No alteration to Allah's creation لا تبدل" "لخلق الله". These bases lead us to strive at a science that is beneficial to mankind in terms of mind and spirit. A science the promises extreme happiness, a science that has always been in front of our scientist forefathers' eyes. It is maybe for this reason that they were physicians, philosophers as well as religious scholars at the same time, for their objective was to heal the spirit as well as the body and the pleasing of God Almighty and the happiness of creatures.

You are among friends and you are in your country. You have from this country of yours, and your host, immense gratitude for the trouble you have taken, our love and our great welcome, from the top to the bottom. I, at the conclusion of my statement, would like to thank the Fellows (members) of the Academy who have exerted some effort in travelling numerous times and stayed up late on many occasions to organise this meeting and set out its programme and arrange its proceedings and planning every minute within it.

The tongue is speechless and cannot present its gratitude and eloquent praise to the high determination of the patron of this honourable kingdom, and the energiser of its scientific capabilities, the youthful King Mohammed VI, for what he has furnished to us in terms of

strong determination and comprehensive and generous patronage, that added status to the status of these eminent scientists. This is not strange for a young monarch who has inherited these virtues from his forefathers some of whom were religious scholars and historians. This is not strange as he is the son of a monarch who divided up his interest between politics and science until he was called the scholar of kings.

This was no strange matter too for after all he is the graduate of the most wellborn universities who has practised in the midst of international organisations. Indeed he is an experienced monarch. He followed the detailed arrangements of our meeting with diligence and granted us his complete attention and accorded our group his best favours. He made sure that you all are included in his affection, that you are in the hearts of this honourable kingdom.

It is the duty of scholars to show gratitude to their fellow scholars and that is why we have to thank Prof. Abbas Jirrari, advisor of His Majesty and member of the Academy of Morocco, for all the help he extended to us in our endeavour.

I would also like to thank the Permanent Secretary of the Kingdom of Morocco, Prof. Abdellatif Berbich for the generosity and patience with which he provided us with this everlasting house of science so that it shades us with its affection and science, so that we may all work for the same noble objectives namely serving our Islamic Ummah in its past and its present.

IAS delegates visit the historical city of Fez





Al-Khawarizmi International Prize goes Prof. Ali Abdullah Al- Daffa'

Dr Ali A Al-Daffa' was born in 1938 (1358 H) at Anayza (Gassim, Saudi Arabia). He obtained his BSc from the Stephen F Austin State University in 1967, then his MSc from East Texas State University in 1968. In 1972, He was awarded his PhD from Peabody College of Vanderbilt University (USA).

He joined King Fahd University of Petroleum and Minerals in Dhahran (Saudi Arabia) in 1972 as Assistant Professor and became Associate Professor in 1977. He was appointed Chairman of the Department of Mathematical Sciences, KFUPM, for the period 1974-1977, and then Dean of the College of Sciences (1977-1984). In 1980, he was promoted to Full Professor.

A visiting Professor at King Saud University, Riyadh (1979-1982), and at Harvard University, USA (1983). Prof. Daffa' was twice elected President of the Union of Arab Mathematicians and Physicists (1979-1981 and 1986-1988).

He is the author of 36 books on mathematics and the History of Sciences (32 in Arabic, 4 in English) and more than 250 articles in international and Saudi magazines.

IAS Fellows honoured



Mubarak Prize awarded to Prof. Mahmoud Hafez

Professor Mahmoud Hafez was born on January 10, 1912. He graduated from Cairo University and obtained a BSc in Zoology in 1935. He pursued higher studies on the taxonomy, biology and ecology of flies, first in England (1937), then in Egypt. He obtained his MSc degree in 1938 and a PhD in entomology in 1940. In 1940 he joined the University of Cambridge in England for two years, working on behaviour and sensory physiology of house flies under the guidance of professor V. B. Wigglesworth.

He was appointed associate professor in 1948, and professor and head of the Department of Entomology at Cairo University in 1953. In 1964 he became vice dean, and in 1966 Under-Secretary of State for Scientific Research. Presently, he is an emeritus professor of entomology at Cairo University. He has held this position since 1972. During the last fifty years, he has been engaged in the conducting and supervising of research on the biology, ecology, physiology and behaviour of several different species, including agricultural pests such as aphids, scale insects and mealy bugs, cotton leaf and boll worms, stored product insects, locusts; and desert insects such as tenebrionid beetles, nomopterids and myrmeleonids and grasshoppers. Information derived from these studies proved to be of significant value to applied entomologists.

For his remarkable contributions, he was awarded by the president of the republic the highest academy state prize and a golden medal in 1977; the Order of Merit in 1978; and the Order of Science and Arts in 1981. Also his excellence in his field has been recognised by professional associations at both national and international levels. He is the president of the National Research Council for Basic Sciences of the Academy of Scientific Research and Technology in Egypt; Chairman of the National Committee for Biological Sciences; Fellow and past president of the Egyptian Academy of Sciences; President of the Entomological Society of Egypt and of the Egyptian Society of Parasitology; member of the National Research Council for food and Agriculture in Egypt; President of the Egyptian Science Association; Member of the Higher Council for Education and Scientific Research and Technology in Egypt; Fellow of the Islamic Academy of Sciences (1988); Fellow of the African Academy of Sciences; Honorary member of the USSR Entomological Society; emeritus member of the Entomological Society of America; Fellow of the ICSU Committee on Teaching of Science; member of the Network of African Scientific Organisations; member of the International Union of Biological Sciences; member of the International Organisation for Biological Control; Fellow of the Third World Academy of Sciences.

Prof. Hafez was awarded in 1999 Mubarak Prize, the highest prize in basic science in Egypt.



IAS Ibrahim Memorial Award 2002

Call for Nominations

The Islamic Academy of Sciences, Amman, Jordan, has instituted an Award in the name of one its Founding Fellows, the late Prof. Muhammad Ibrahim (1911-1988), who was an eminent medical doctor of medicine from Bangladesh. Prof. Ibrahim dedicated a great deal of time and effort to medical research that proved to be of benefit and value in his country and internationally.

The purpose of this Award is to promote scientific research in the field of medicine and medical sciences in the various Organistaion of the Islamic Conference countries that belong to the Organisation of the Islamic Conference.

Faculties and Schools of Medicine at universities, Academies of Sciences and other learned societies as well as private sector institutions are invited to nominate young scientists and technologists working in the medical field, for this Award.

Deadline for receiving nominations is 15 June 2002.

IAS Ibrahim Memorial Award 2002

The Awardee would be invited to the end of year conference of the IAS, where he/she would be presented with a commemorative medal and/or shield, and a compilation of IAS literature.

Travel expenses of Awardee would be covered from the Award Fund and by the Academy.

A token honorarium of would be presented to the Awardee.

Contact IAS Secretariat

PO Box 830036, Amman 11183, Jordan

Telephone: (9626) 5522104 – Fax: (9626) 5511803

E-mail: ias@go.com.jo

الأكاديمية الإسلامية للعلوم

الأكاديمية الإسلامية للعلوم مؤسسة مستقلة، غير سياسية، غير حكومية، وغير ربحية، تضم زملاء (أعضاء) مؤسسون ومنتخبون يمثلون المجتمع العلمي الإسلامي المبدع في شتى مناطق ودول العالم. تهدف الأكاديمية إلى الارتقاء بمناخ العلوم والتكنولوجيا المختلفة في العالم الإسلامي. جاء تأسيس الأكاديمية بناء على توصية تقدمت بها اللجنة الدائمة للتعاون العلمي والتكنولوجي (COMSTEC) إلى مؤتمر القمة الإسلامي الرابع، الذي عقد في الدار البيضاء عام ١٩٨٤، حيث تم إقرار هذه التوصية. إثر دعوة من حكومة المملكة الأردنية الهاشمية وبرعاية كريمة من صاحب السمو الملكي الأمير الحسن بن طلال، عقد المؤتمر التأسيسي للأكاديمية في شهر تشرين أول (أكتوبر) ١٩٨٦، بمشاركة شخصيات بارزة من دول إسلامية مختلفة تمت دعوتهم من قبل المؤسسات المنظمة للمؤتمر ليكونوا زملاء مؤسسين للأكاديمية.

أما الأهداف الرئيسية للأكاديمية فهي:

- تقديم النصح والمشورة إلى الأمة الإسلامية ومؤسسات الدول الأعضاء في منظمة المؤتمر الإسلامي، حول أمور تتعلق بالعلوم والتكنولوجيا وتطبيقاتها.
- تنفيذ برامج ونشاطات علمية وتكنولوجية، وتشجيع التعاون بين الباحثين في البلدان الإسلامية المختلفة حول مشاريع ذات أهمية مشتركة.
- تشجيع ودعم البحث العلمي حول أهم المشاكل التي تواجه البلدان الإسلامية، وتحديد التكنولوجيات المستقبلية الملزمة لغايات تنبئها واستخدامها.
- صياغة مقاييس للإنجاز والتحصيل العلمي، ومنح الجوائز والأوسمة للإنجازات العلمية المتميزة، بغية تطوير مراكز الإبداع في فروع العلوم المختلفة وتحفيز المبدعين.

نشرة الأكاديمية الإسلامية للعلوم

نشرة دورية تصدرها الأمانة العامة للأكاديمية الإسلامية للعلوم، عمان، الأردن.

رئيس التحرير: المهندس منيف رافع الزعبي، مدير عام الأكاديمية الإسلامية للعلوم.

مساعد التحرير: ليلى جلال عارف، مسؤول برامج.

ترحب لجنة التحرير بكل المقالات، وخصوصاً القصيرة منها، ولجنة الحق في تقرير مدى ملائمة المقالات المقدمة للنشر وفقاً لتعليمات الأكاديمية.

العنوان البريدي	العنوان
الأكاديمية الإسلامية للعلوم	١٧ شارع جيبوتي - الدوار السادس
ص. ب. ٨٣٠٣٦	أم أذينة - عمان
عمان ١١١٨٣	تلفون: ٥٥٢٢١٠٤ - ٥٥٢٢٦ (٩٦٢٦)
المملكة الأردنية الهاشمية.	٥٥٢٣٣٨٥ - ٥٥٢٣٦ (٩٦٢٦)
	فاكس: ٥٥١١٨٠٣ - ٦ - ٩٦٢

البريد الإلكتروني:

secretariat@ias-worldwide.org

ias@go.com.jo

الموقع على الإنترنت: <http://www.ias-worldwide.org>

© IAS، جميع الحقوق محفوظة للأكاديمية الإسلامية للعلوم.



Professor Ishfaq Ahmad FIAS

Ishfaq Ahmad was born in Gurdaspur (India) on 3 November 1930. He was Chairman, Pakistan Atomic Energy Commission (1991-2001). He was awarded his MSc (Physics) from the University of the Punjab, Lahore, Pakistan, in 1951, and in 1958 was awarded a DSc (Physics), from the University of Montreal, Canada. He was a Senior Member, Pakistan Atomic Energy Commission (PAEC), 1988-1991. He has also been Chief Scientist at the PAEC since 1976.

Prof., Ishfaq served as Director, Pakistan Institute of Nuclear Science and Technology (PINSTECH), Islamabad, 1971-1976; Director, Atomic Energy Centre (AEC), Lahore, 1969-1971; and Secretary, Pakistan Atomic Energy Commission (PAEC), 1967-1969.

He was Post-Doctoral Fellow at both the Sorbonne, and at the Niels Bohr Institute of Theoretical Physics, Copenhagen (1961-1962). Prior to that Dr Ahmad was a also Post-Doctoral Fellow at the University of Montreal, and the University of Ottawa, Canada.

Prof. Ishfaq Ahmad was awarded an Honorary Doctorate by the Punjab University of Engineering and Technology, Lahore (2000). In the same year, he was elected a Fellow of the International Nuclear Energy Academy.

He is the recipient of the three highest official awards in Pakistan namely Sitara-i-Imtiaz, the Hilal-i-Imtiaz and the Nishan-i-Imtiaz, the last of which was awarded to him in 1998. He is affiliated with the Pakistan Council of Science and Technology, as well as the National Commission for Science and Technology.

He has over 40 major publications to his credit including a series of Pugwash conference proceedings.

He became a Fellow of the Pakistan Academy of Sciences in 1983 and was elected a Fellow of the Islamic Academy of Sciences in 2000.

Currently, Dr Ahmad is special advisor to the President of Pakistan with ministerial rank.



Professor Iftikhar Ahmad Malik FIAS

Professor Iftikhar Ahmad Malik was born on 18 February 1936.

He graduated from King Edward Medical College, Lahore (Pakistan) in 1958, qualified DCP (1963), MRCPATH (1968) and PhD (London) in (1971). He was conferred FCAP (1971), FRCPath (1981), FCPS (1987), FPAMS (1988), FRCP, Edinburgh (1993). He was elected "Fellow of the Pakistan Academy of Sciences" in 1990.

His awards include Sitara-i-Imtiaz (Military) (1981), PMRC Medal and Biomedical Research Prize (1986), Distinguished Services Medal (DSM) (USUHS), US Army (1988), Pakistan Medal in Medicine (1993), Hilal-i-Imtiaz (Civil) in Medicine (1993).

He was chief editor of the Pakistan Journal of Pathology and is member of the Editorial Advisory Board of the Tropical Doctor.

Formerly, he was professor of Pathology at the Army Medical College, AFM College, Commandant AFIP Rawalpindi (Pakistan), Chairman Medical Research Council (PMRC) and Advisor in Pathology to the Surgeon General, Pakistan Army.

Prof. Malik's works have been published widely and he has more than 390 research publications to his credit in the field of infectious, renal and neoplastic diseases. As chairman PMRC, he was principal investigator of the National Health Survey of Pakistan which was conducted by the PMRC in collaboration with the US.

Presently, he is the Dean Faculty of Pathology, College of Physicians and Surgeons, Pakistan, and Consultant to the WHO (EMRO). He is also the Dean of Health Sciences at the Margallah Institute of Health Sciences, Islamabad, Pakistan.

He was elected to the Fellowship of Islamic Academy of Sciences in 2000.



Prof. Amdulla Mehrabov FIAS

Prof. Amdulla Mehrabov was born in Georgia, former USSR, on 15 April 1952. He is of Azerbaijan nationality. He is married with three children.

Dr Mehrabov was awarded a Doctorate of Science from Tbilisi State University, Georgia, 1969; a PhD from Moscow State University, USSR, 1978 in Solid State Physics and a Master's degree in Physics from Baku State University, Azerbaijan, 1974.

He has been a visiting professor, Department of Metallurgical and Materials Engineering, Middle East Technical University (METU), Turkey, since 1992; Professor and Head of Department of Optics and Molecular Physics, Baku State University, Azerbaijan (1990-1996); Associate Professor at the same department, (1983-1990).

He was visiting researcher in Japan for one year (1984/1985), and a Fulbright Professor at the Department of Chemical and Nuclear Engineering, University of California at Santa Barbara, USA, for four months in 1991/1992.

Dr Mehrabov main fields of specialisation include Alloy-Design, Metal and Alloy Physics, Materials Science and Engineering and Effects of Radiation on Materials

Dr Mehrabov has over 92 publications, of which many were published in international journals.

Prof. Amdulla Mehrabov, Dept. Of Metallurgical and Materials Engineering, Middle East Technical University, 06531 Ankara, Turkey.



**Professor Muhammad Anwar
Waqar FIAS**

Prof. Muhammad Anwar Waqar was born in Batala, British India, in 1941. He is chairman of the Aga Khan University Hospital and Medical College.

He was awarded his BSc from Punjab University, Lahore, Pakistan, in 1963; MSc from the same university in 1964; and PhD, Flinders University, Australia (1973). 1972-1976, Dr Waqar was a Postdoctoral Fellow, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, USA.

In 1987, he became a Fellow of the Pakistan Academy of Medical Sciences, and in 1991, a Fellow of the Institute of Biology, London.

He was elected to the Corresponding Fellowship of the Third World Academy of Sciences in 1991. He is also the 1991 awardee of the Gold Medal in Chemistry of the Council of the Pakistan Academy of Sciences. Prof. Waqar was elected to the Fellowship of the Pakistan Institute of Chemists in 1994.

He is the Khawarizmi Prize laureate of 1991, awarded by the Iranian Research Organisation for Science and Technology (IROST).

He became a Fellow of the Pakistan Academy of Sciences in 1991, and in 1998 he was elected to the Fellowship of the World Academy of Art and Science (WAAS).

In 2000, he was awarded with the Civil Award Sitara-i-Imtiaz in recognition of services in the field of Chemistry.

Dr Waqar is a member of the Biochemical Society (London), Medical Research Society of Pakistan, and the Pakistan Genetics Society.

Dr Waqar is a veteran of more than 135 publications. He was elected a Fellow of the IAS in 2000.

Islamic Academy of Sciences (IAS)

The IAS is an independent, non-political, non-government and non-profit making organisation of distinguished scientists and technologists dedicated to the promotion of all aspects of science and technology in the Islamic world.

The establishment of the Islamic Academy of Sciences was recommended by the Organisation of the Islamic Conference Standing Committee on Scientific and Technological Co-operation (COMSTECH), and subsequently approved by the Fourth Islamic Summit held at Casablanca in 1984. The Founding Conference of the Academy was held in Jordan in October 1986.

The government of Jordan hosts the IAS at Amman where the headquarters of the Academy started functioning in 1987.

The main objectives of the Academy are:

- *To serve as a consultative organisations of the Islamic Ummah and institutions in the field of science and technology;*
- *To initiate science and technology programmes and formulate standards of scientific performance;*
- *To promote research on major problems facing the Islamic countries and to identify future technologies of relevance for possible adoption and utilisation; and*
- *To formulate standards of scientific performance and attainment, and to award prizes and honours for outstanding scientific achievements to centres of excellence in all science and technology disciplines.*

IAS Newsletter

Published in English by the Secretariat of the Islamic Academy of Sciences, Amman, Jordan.

Chief Editor: Moneef R Zou'bi, Director General, IAS.

Editorial Assistant: Lina Jalal, Programme Officer, IAS.

The Editorial Board welcomes all articles, particularly short ones, and would consider the appropriateness of any material submitted for publication in accordance with IAS's own regulations.

Postal Address:

**Islamic Academy of Sciences
PO Box 830036 Zahran
Amman 11183 – Jordan.**

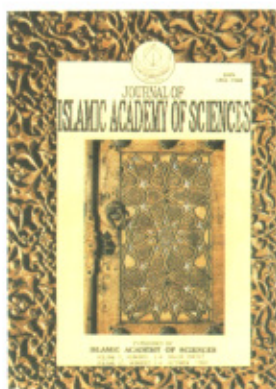
Address

**17 Djibouti Street-Sixth Circle
Telephone: 5522104, 5523385
Fax: 962-6-5511803**

E-mail: ias@go.com.jo secretariat@ias-worldwide.org

<http://www.ias-worldwide.org>

Copyright © IAS, 2002, All rights reserved.



New issue of IAS Journal on the web

The Medical Journal of the Islamic Academy of Sciences is one of the IAS's main publications. Originally launched as a general science Journal, it was recently re-launched as a specialised refereed medical publication.

The Journal, which looked after by Prof. Naci Bor - IAS Fellow from Turkey - receives medical articles from many OIC countries as well as from scientists who are based in Europe and America.

The Journal is published in both paper and electronic formats and has built up a wide readership since it was established in 1987.

The current issue of the Journal that appears on the web is Volume 12, Number 2. It contains five major articles: a Biochemistry paper by Nouri, Rahbani-Nobar, Argani and Rokh Forooz; a Cardiology article by Mohammed, Vijayaraghavan, Yousof, Abraham, Hayat and Cherain; and a Medical Education article by Musbah and Tanira; Yusof, Abdullah and Isa.

The Journal also includes two short communications by Zainal and Dasen as well as by Silberman and Freedman.

The Journal's new web address is www.medicaljournal-ias.org

The Journal's web page can also be viewed through a hyper-link through the Academy's web page.

The Journal's chief editor can be reached at the following address:

Prof. Naci Bor, Mithatpasa Caddesi 66/5, 06420 Yenisehir, Ankara, Turkey.

Muslim Scholars



ABU HAMID AL-GHAZALI (1058-1128 AD)

Abu Hamid Ibn Muhammad Ibn Muhammad al-Tusi al-Shafi'i al-Ghazali was born in 1058 AD in Khorasan, Iran. He had the opportunity of getting education in the prevalent curriculum at Nishapur and Baghdad. He acquired a high standard of scholarship in religion and philosophy and was honoured by his appointment as professor at the Nizamiyah University of Baghdad, which was recognised as one of the most reputed institutions of learning in the golden era of Muslim history.

He gave up his academic pursuits and worldly interests and became a wandering ascetic. This was a process (period) of mystical transformation. Later, he resumed his teaching duties. An era of solitary life, devoted to contemplation and writing then ensued, which led to the authorship of a number of everlasting books. He died in 1128 AD at Baghdad.

Ghazali's contribution lies in religion, philosophy and Sufism. A number of Muslim philosophers had been following and developing several viewpoints of Greek philosophy, including the Neo-platonic philosophy, and this was leading to conflict with several Islamic teachings. On the other hand, the movement of Sufism was assuming such excessive proportions as to avoid observance of obligatory prayers and duties of Islam. Based on his unquestionable scholarship and personal mystical experience, Ghazali sought to rectify these trends, both in philosophy and in Sufism.

In philosophy, Ghazali upheld the approach of mathematics and exact sciences as essentially correct. However, he adopted the techniques of Aristotelian logic and the Neo-platonic procedures and employed these very tools to lay bare the flaws and lacunas of the then prevalent Neo-platonic philosophy and to diminish the negative influences of Aristotelianism and excessive rationalism.

In religion, particularly mysticism, he cleansed the approach of Sufism of its excesses and re-established the authority of the orthodox religion. Yet, he stressed the importance of genuine Sufism, which he maintained was the path to attain the absolute truth.

He was a prolific writer. His immortal books include *Tahafut al-Falasifa* (The Incoherence of the Philosophers), *Ihya al-'Ulum al-Islamia* (The Revival of Religious Sciences), "The Beginning of Guidance and his autobiography," "Deliverance from Error." Some of his works were translated into European languages in the Middle Ages.

(Taken from: Personalities Noble, National Science Council of Pakistan, edited by Hakim Mohammad Said).

Second Revised Edition (English and Arabic). Published by the Islamic Academy of Sciences (2000).