ISLAMIC WORLD ACADEMY OF SCIENCES

Newsletter

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THE IAS: TWENTY YEARS OF SERVICE TO HUMANITY THROUGH S&T

General Muhammad Zia Ul-Haq

Sound scientific knowledge is fundamental to addressing the critical issues – such as economic transformation and globalization, reduction of poverty, hunger, and disease, and the sustainable use of natural resources – facing the world today. National, regional and international science academies can and do marshal the world's best scientists to provide expert knowledge and advice to international bodies, such as the Organisation of the Islamic Conference (OIC) and the United Nations, charged with addressing these issues, and more immediately, to decision-makers at the national level.

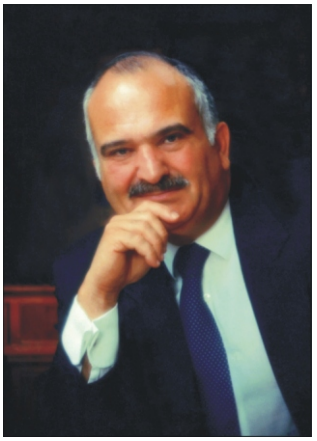
This year marks the 20th anniversary of one such academy: the Islamic World Academy of Sciences (formerly the Islamic Academy of Sciences), based in Amman, Jordan.

The decision to launch the IAS was taken at the 1984 Summit Conference of the OIC. The IAS was founded formally in 1986 with the patronage and support of Jordan and Pakistan, and under the inspired and farsighted leadership of the late Dr M. A. Kazi (FIAS Pakistan), IAS' Founding President, and the late Dr Ali Kettani (FIAS Morocco), IAS' Founding Secretary General. The Founding Fellows of the IAS numbered only 38, who shared a vision of independent non-political organisation that is mandated to help the *Ummah* realise socio-economic advancement through science and technology.

Prof. M. A. Kazi
FIAS Pakistan and IAS' Founding President

Today, the IAS boasts a membership of over 100 Fellows representing over 40 countries, who represent the scientific elite of the OIC and communities worldwide. The IAS also has three Nobel Laureates and a number of heads of state and top OIC business leaders among its select group of Honorary Fellows.

By highlighting scientific issues with top decision-makers and the public, the IAS has managed to influence science policy in many countries. It does this while closely guarding its treasured independence, and always deriving its authority to act from its 100 Fellows.



Prince El-Hassan Bin Talal

The IAS has over the years grown to become a principal propagandist for science and technology among OIC political decision making circles. It has moreover evolved into a decision support/analysis unit within the OIC, especially on matters related to science and technology, education, health and the environment.

The IAS has been successful in bridging the divide between the fans of science and its inimitable foes by convincing many heads of state within the OIC to pay more attention to science and technology and education, and to divert more resources to endeavours in these domains, and to empower executive decision-makers in their countries to do more to rise in international science, technology and education rankings. Indeed the IAS has been designated by many as the voice of science and technology in the Islamic world.

The realisation that it may not be able to secure the financial resources to implement fully its programme of action has never prevented the IAS from reaching out nationally, regionally and internationally, and from becoming involved in the majority of international science and technology activities that affect OIC countries.

Prof. Ali Kettani
FIAS Morocco and IAS' Founding Secretary General

The IAS' efforts to take its message to the various countries of the OIC has been best achieved by convening on approximately a yearly basis an international conference that addresses major theme(s) of relevance to the OIC, and developing countries in general. The 15th such conference was held in Ankara, Turkey during November 2006 on the theme of *Higher Education Excellence for Development in the Islamic World* (see Newsletter Vol. 20 No. 34).

The IAS, now on the verge of its 21st year, looks set to continue being a promoter of socio-economic development through science and technology, to continue lobbying for greater attention to these issues in the political agendas of OIC members, and indeed to attempt to bring humanity closer together. A new phase in the IAS' life is set to begin - a phase in which international collaboration takes precedence: collaboration with international bodies such as the OIC Secretariat, with the InterAcademy Panel and InterAcademy Council, as well as with the currently so few national academies of science in the Islamic World.

To our friends from OIC countries, we urge them to convey to their governments the IAS' willingness to assist and to act as science adviser in whatever S&T obstacles they face, to bring in specialists where necessary, and to steer through focussed S&T programmes.

Academies of sciences have an important role to play to help speed up development in their catchment areas. Their role can be a multi-faceted and a multi-layered one - from capacity building to acting as analysts and incubators for decision-making. Their role should not be under estimated.

Through them we also appeal for assistance, both moral and material. Supporting the IAS will enable it to implement more activities which will ultimately, inshallah, affect positively the science community in all our countries.

For academies of sciences to flourish, they need full independence and long-term financial security, and the status that they deserve. Only through making available such conditions may academies of sciences fully realise their potential as think tanks or brain reservoirs for their respective communities.

In Jordan, the IAS has enjoyed total support and freedom to operate and implement activities that fall within its mandate. Jordan has truly been a stable base from which we have reached out, often at times of political uncertainty, to our counterparts all over the world without undue hindrance. For that we are grateful to our host country.

Prof. Atta-ur Rahman (FIAS Pakistan) honoured by the Royal Society, London

Prof. Dr. Atta-ur-Rahman, Federal Minister and Chairman of the Higher Education Commission in Pakistan, has been elected as a Fellow of the Royal Society, London in recognition of his outstanding contributions in natural product chemistry. The honour was announced in a press release by the Royal Society from London.

The Fellowship is in recognition of his discovery of a very large number of bioactive substances from natural sources, his authorship of over 650 international publications including 93 books on organic chemistry, NMR spectroscopy and natural product chemistry (published mainly in USA, Europe and Japan), and over 450 research publications in leading science journals.

Prof. Atta-ur-Rahman signed the famous "Book" of the Society in London on 13 July 2006 – the Book was once signed by Darwin, Newton and others. This is historic, since he is the first person to be elected in recognition of research carried out within an Islamic country.

Prof. Atta is also editor in chief of 12 leading European chemistry journals. He has supervised 66 students towards their PhD degrees, which is the highest number of PhDs produced by any scientist in Pakistan. Prof. Atta-ur-Rahman is the President of the Pakistan Academy of Sciences and the President of the Network of Academies of Sciences of Islamic Countries (NASIC). He is Co-ordinator General of COMSTECH, and also an elected Fellow of the IAS.

Previous Fellows of the Royal Society from Pakistan include late Prof. Abdus Salam (elected for contributions in the UK), the late Prof. Saleemuzzaman Siddiqui (for contributions in India), and Prof. M. Akhtar (for contributions in the UK).

Two top Egyptian nuclear awards for Prof. Syed Mohammad Qaim (FIAS Germany)

The Egyptian Atomic Energy Authority has awarded Prof Qaim its prestigious Medal of Honour for furthering Egyptian research and development activities related primarily to the newly installed cyclotron in Cairo. The Egyptian Nuclear Physics Association has also awarded him its Medal and Certificate of Merit for the promotion of science in Egyptian universities.

These two awards are based on extensive co-operation between Germany and Egypt over the past 15 years in the field of nuclear applications. Some of these activities were financed under IAEA Programmes, while a major part was covered by Egyptian-German bilateral co-operation agreements.

Prof. Qaim is Chairman of the International Nuclear Data Committee, Institut für Nuklearchemie, Forschungszentrum, Jülich, Germany, and a Fellow of the IAS. He is a German national of Pakistani descent.

IAS-COMSTECH Ibrahim Memorial Award 2007

Call for Nominations

The Islamic World 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 countries that belong to the Organisation of the Islamic Conference (OIC).

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.

The Awardee will be invited to the end of year conference of the IAS, where he/she will be presented with a commemorative medal and/or shield, and a compilation of IAS literature. A token honorarium would also be presented. The travel expenses of Awardee would be covered from the Award Fund and by the IAS.

Deadline for receiving nominations is 30 September 2007.

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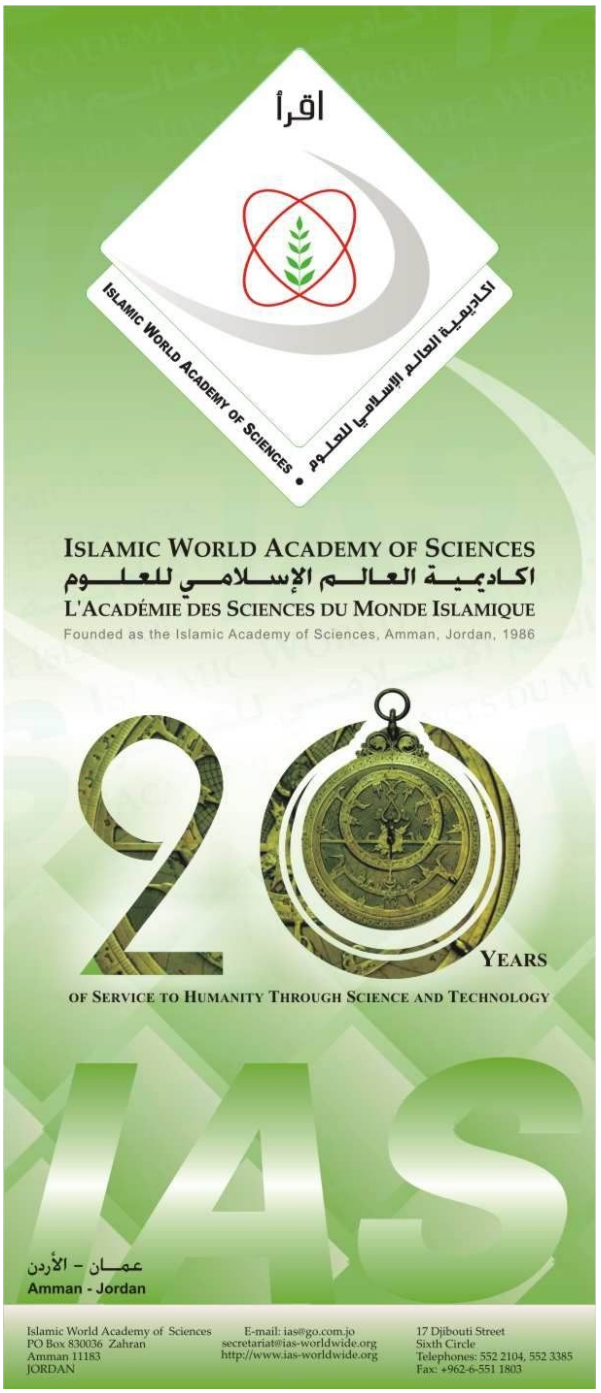
Useful web sites

Islamic World Academy of Sciences	www.ias-worldwide.org
COMSTECH	www.comstech.org.pk
Islamic Development Bank (IDB)	www.isdb.org
Medical Journal of the IAS	www.medicaljournal-ias.org
OICexchange	www.oicexchange.com
SESRTCIC	www.sesrtcic.org
ISESCO	www.isesco.org.ma

THE IAS: DEDICATED TO S&T FOR DEVELOPMENT IN TWENTY YEARS

IN PICTURES



EDITORIAL LETTER

Gauging Higher Education Excellence through University Ranking in the Islamic World: An Introduction

Worldwide, higher education is changing. Many higher education institutions and national systems of higher education are in a state of transition. It is both exciting and unsettling. New educational models and means of delivering educational programs and services are evolving at a swift rate. The quest for excellence is high in the hearts and minds of educationists. New elaborate quantitative (and qualitative) techniques such as university ranking methodologies are being developed to assist decision-makers to set priorities for research, for funding, and for research funding.

Complex challenges facing higher education systems include national regulation; addressing for example 'profit-making' private universities that are springing up in many countries, performance-based or research-driven funding for public universities, and increased calls for defining and reviewing of student learning; and for other types of public accountability.

At the international level, over the last 4 or 5 years, interest in gauging the level or standard of higher education institutes (mainly universities) has grown tremendously. Academics and the general public as well as policy and decision makers are becoming conscious of the fact that there may be many combinations of factors that can determine the standard or level of a university compared to other similar institutions of higher learning. Rankings are, more than ever, perceived as reflecting the subjectively apparent "quality," of universities on some combination of empirical statistics, or on surveys of educators, scholars, students, prospective students, or others. Such rankings are often consulted by prospective students in the university and college admissions process as well as by governments, funding agencies as well as the private sector for a variety of objectives.

The perception of a world-class university differs widely from one stakeholder to another. Indeed, world-class universities appear in many sizes, configurations, and locations. They may be large, such as the University of Michigan Ann Arbor with approximately 38,000 students; or they may also be small like Princeton University with only about 6,000 students. World-class universities can also be public or private, and are not confined to a single continent or country. Harvard University is in North America, Cambridge University is in Europe and the National University of Singapore in South East Asia.

Mindful of these realities, and since only very few universities in OIC countries are ranked among the world's 500 top universities (according to the Shanghai Jiao Tong University Survey of 2005 and the Times Higher Education Supplement, 2005), the Islamic World Academy of Sciences (IAS) organised a scientific conference on the subject in Malaysia during 2005 and another on a Higher Education Excellence in Ankara (Turkey) during November 2006 in association with Bilkent University.

The various stakeholders, as well as the IAS, hope to ultimately identify a number of 'leading' universities in OIC countries that could be supported and assisted in coming up in world rankings, over a specific period of time in what has been termed a 'quick-win' approach.

The challenge, as outlined in the IAS 2006 Ankara Declaration, was taken up by the OIC General Secretariat and the Islamic Development Bank as well as the Statistical, Economic and Social Research and Training Centre for Islamic Countries.

SESRTCIC, which the main statistics agency of the Organisation of the Islamic Conference, was commissioned to start an initial effort to collate, quantify, and analyse data on universities in the OIC and propose a 'base-line' ranking of the universities in OIC countries based on the data available.

Furthermore, SESRTCIC developed a standard all-encompassing questionnaire which was recently proposed to and studied at a specialized seminar on the subject which was hosted by Iran in Tehran; April 2007.

Of the major recommendations of the seminar has been a call to all OIC countries to introduce a national ranking system for their national universities; and to universities in OIC countries to respond to the questionnaire once received and to provide the most accurate and up-to-date information.

Of the interesting facts to be highlighted in the report, as far as Jordan is concerned, is the fact that (tentatively) 2 Jordanian universities; the University of Jordan and Jordan University of Science and Technology appear in the survey among the top 100 universities of the OIC. In the table showing the universities ranked by a composite index of indicators, JUST is ranked 42nd and the University of Jordan is ranked 51st. This is certainly encouraging for both universities, and for Jordan. It is thought that the actual ranking of both universities may be even higher once a number of further indicators – including those related to budgets and costs etc.. – are introduced.

This study is the outcome of a serious yet preliminary effort on the part of SESRTCIC. It is by no means as complete as the stakeholders would wish it to be. Only through sound scientific analysis of the data collated from the questionnaire that will soon be circulated to all OIC universities would we be able to arrive a comprehensive objective ranking of OIC universities.

Moneef R. Zou'bi, Director General, IAS

Prof. Wiranto Arismunandar (Indonesia)

Prof. Arismunandar was born in 1933 in Semarang, Indonesia.

He graduated as a Mechanical Engineer from the University of Indonesia (1959), obtained his MSc in Mechanical Engineering from Purdue University USA (1960), and did post-graduate studies at Stanford University as a Research Associate, Department of Mechanical Engineering (1961-1962).

He is a former President of the Institute of Technology Bandung (ITP) (1988-1997), and a former Vice-Chairman of the Indonesian National Institute of Aeronautics and Space (LAPAN) (1978-1989). He was a member of the People's Consultative Council of the Republic of Indonesia (1992-1997), member of the Consultative Board of the Indonesian Islamic Council, Senior Scientist for the Indonesian Agency for the Assessment and Application of Technology, and Advisor for Technology of the Indonesian Aircraft Industry (since 1979). He is member of the following bodies: National Energy Committee, National Telecommunication Council, Society of Indonesian Engineers, World Energy Conference, Indonesian National Committee, American Institute of Aeronautics and Astronautics, the American Society of Mechanical Engineers, and the Indonesian Space Society. In addition, Professor Arismunandar has been a consultant for the Indonesian National Atomic Energy Agency. He was Minister of Education and Culture of the Republic of Indonesia (1998).

He has presented over 100 papers at international conferences and has published 13 books. He is Chief Editor of "TEKNOLOGI" Magazine. He has been awarded the Satyalancana Dwidya Sistha medal of merit four times, the Satyalancana Karya Satya 1st Class medal (1990), and the Satyalancana Karya Satya for 30 years of service, and Bintang Jasa Utama (1998).

Prof. Arismunandar is a Founding Fellow of the IAS.

Prof. Mehmet Ergin (Turkey)

Prof Ergin was born in 1936 in Yozgat Turkey.

He was educated in the Department of Chemical Engineering, Faculty of Science of Ankara University and in the Department of Chemistry of Glasgow University Scotland where he obtained his PhD in 1969.

He was Research Assistant in the Department of Chemistry, Glasgow University, while pursuing his studies for his PhD degree. He started his career as a Researcher in the Prime Minister's Atomic Energy Commission's Laboratory; then performed research and training at the laboratories of the Vienna-based International Atomic Energy Agency (IAEA) and was from 1963 to 1966 the Acting Director for the Atomic Energy Commission's laboratory for Nuclear Chemistry.

He was Lecturer at the Department of Chemistry, and then Assistant Professor, Faculty of Science, at Hacettepe University (Turkey) before being appointed Executive Secretary of the Turkish Scientific and Research Council (TUBITAK) in 1974. Later, Prof. Ergin was promoted to full Professor of Physical Chemistry in the Faculty of Engineering, Hacettepe University, and Deputy Secretary General for Planning and Coordination, TUBITAK (1985-1987). He was appointed President of TUBITAK (1987-1990).

Prof. Ergin is a past president of the Turkish Atomic Energy Commission, and is a former member of the Board of Trustees of Fatih University, Istanbul.

Along with his research and teaching activities, Prof. Ergin has administered a number of TUBITAK and NATO supported projects and has written several scientific articles, communications and reports. He also has published and edited many books.

Prof. Ergin is a Founding Fellow of the IAS, was its Vice-President (1986-1990, 1990-1994 and 1994-1999), and was elected Secretary General (1999).

Prof. Idriss Khalil (Morocco)

Prof. Khalil was born in 1939 in El Jadida, Morocco.

He was educated at Rabat University, (1958-1959), and completed a BSc (1962) and a Higher Studies Diploma Sc. (1964) at the University of Bordeaux (France), his PhD at Nancy University (France) (1968), and a State Doctorate in Mathematical Sciences at Paris University (1972).

He started his career in 1963-1965 as an Assistant at Bordeaux University, and was successively: Assistant, Senior Lecturer, then Professor at Rabat University. He was also a junior lecturer at Nancy University (1968-1970), Assistant Researcher at the French National Center for Scientific Research (1968-1972), Dean of the Faculty of Sciences at Rabat University (1974-1985) and over the period 1979-1985 was Professor at Nancy University, MIT (USA), Ecole Polytechnique (France) and Paris-Sud University.

Prof. Khalil is the author of over 40 publications on Mathematics and Epistemics in international reviews.

He is a founding member of the African Association for the Advancement of Science and Technology (1978), editor of the mathematics journal "Afrika Mathematika" (1979), corresponding member of the International Association for Peace (PUGWASH) (1979), member of the Royal Academy of Morocco (1982), and member of the Association of French National Order Members

Dr Khalil has been awarded the following medals: Chevalier des Palmes Academiques (France, 1979); Chevalier de L'Ordre National du Merite (France, 1982); Chevalier de L'Ordre du Trone (Morocco, 1982).

Prof. Khalil is a former Minister of Education and Higher Education in the government of Morocco

Prof. Khalil is.a Founding Fellow of the IAS.

Prof. Naeem Ahmad Khan (Pakistan)

Prof. Khan was born in 1928 in Hoshiarpur (East Punjab, British India). His academic qualifications comprise BA (Hons) from St. Stephen's College, Delhi (1946), MA from Sind University (1950), MSc from Karachi University (1955), and PhD from the University of Manchester (1958). He worked as a post-doctoral Fellow at the Atomic Energy Research Establishment, Harwell, England (1961-1962).

Prof. Khan joined the India Meteorological Department in 1946 and upon the foundation of the Islamic Republic of Pakistan transferred to the Pakistan Meteorological Department. In 1961 he joined the Pakistan Atomic Energy Commission as Senior Scientific Officer, and was promoted to Principal Scientific Officer (1967), Chief Scientific Officer (1970) and Chief Scientist (1986). In 1969 he joined the Pakistan Institute of Nuclear Science and Technology (PINSTECH) as Director. In 1970, he joined the Pakistan Atomic Energy Commission (PAEC) as Director of Training and International Affairs, and then served as Secretary. After some time as Director Researcher at PAEC Headquarters, he returned to PINSTECH again as Director (1977).

In 1984 he was appointed Chairman, Pakistan Council of Scientific and Industrial Research (PCSIR), and in 1989 he was appointed Advisor (Technical) in COMSTECH where he served until 1996.

Dr Khan has more than 103 scientific publications, 69 scientific reports and 28 general articles to his credit. Dr Khan has taught post-graduate courses in Physics at Karachi and Punjab Universities.

He is a Fellow of the Physical Society, London (1958), the Institute of Physics, London (1968), and the Pakistan Academy of Sciences (PAS) (1986) where he served as Treasurer for two terms and Vice-President for one term. The PAS awarded him its Open Gold for Physics in 1992 in recognition of his contribution to the field.

Prof. Khan is a Founding Fellow of the IAS.

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

The government of Jordan hosts the IAS at Amman, where the Secretariat started functioning in 1987.

The IAS General Assembly decided to rename the IAS as the "Islamic World Academy of Sciences" in March 2005.

The main objectives of the IAS are:

- *To serve as a consultative organisation for the Ummah and for institutions in the field of science and technology;*
- *To initiate science and technology programmes of benefit to the socio-economic development of Islamic countries;*
- *To promote research on major problems facing 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 achievement to centres of excellence in all science and technology disciplines.*

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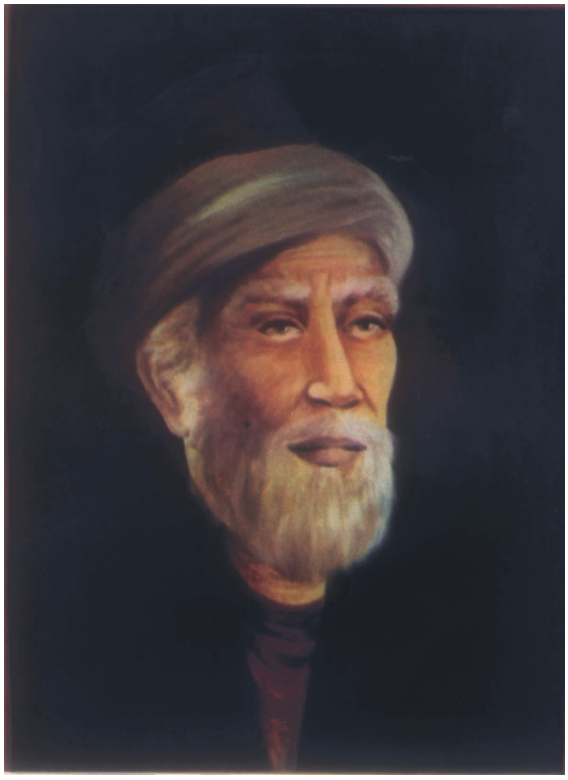
Muslim Scholars

ABU RAIHAN AL-BIRUNI

(973-1048AD, 394-469H)



Abu Raihan Mohammad Ibn Ahmad al-Biruni was one of the well-known figures associated with the court of Sultan Mahmood Ghaznawi, who was one of the famous Muslim kings of the 11th century AD (6th century H). Al-Biruni was a versatile scholar and scientist who had equal facility in physics, metaphysics, mathematics, geography and history.

Born in the town of Khewa near Khawarizm (present-day Uzbekistan) in 973AD/394H, he was a contemporary of the well-known physician Ibn Sina. At an early age fame of his scholarship spread and when Sultan Ghaznawi conquered his homeland he took al-Biruni along with him in several journeys to India. He thus had the opportunity to travel all over India during a period of 20 years. He learnt Hindu philosophy, mathematics, geography and religion from the Pandits to whom he taught Greek, Arabic science and philosophy. He died in 1048 AD/469H at the age of 75, after having spent 40 years gathering knowledge and making his own original contributions to it.

He recorded observations of his travels through India in his well-known book *Kitab al-Hind* (History and Geography of India) which gives a detailed account of the historical and social conditions of the sub-continent. At the end of this book he makes a mention of having translated two Sanskrit books into Arabic - one called *Sakaya,* which deals with the creation of things and their types, and the second, *Patanjal* dealing with what happens after the spirit leaves the body. His descriptions of India were so complete that even the *Aein-i-Akbari* written by Abu-Al-Fadl during the reign of Akbar, 600 years later, owes a great deal to al-Biruni's book. He observed that the Indus valley must be considered as an ancient sea basin filled with alluvials.

On his return from India, al-Biruni wrote his famous book *Qanun-i-Masoodi (al-Qanun al-Mas'udi, fi al-Hai'a wa al-Nujum)* (Astronomy and Trigonometry), which he dedicated to Sultan Masood. The book discusses several theorems of astronomy, trigonometry, solar, lunar, and planetary motions and relative topics. In another well-known book *al-Athar al-Baqia* (Ancient History and Geography) he attempted a connected account of the ancient history of nations and related geographical knowledge. In this book, he discussed the rotation of the earth and gave correct values for the latitudes and longitudes of various places. In it he also made considerable contributions to several aspects of physical and economic geography.

His other scientific contributions include an accurate determination of the densities of 18 different stones. He also wrote the *Kitab-al-Saidana,* which is an extensive *Materia Medica* that combines the then existing Arabic knowledge on the subject with Indian medicine. His book *Kitab-al-Jamahir* (Precious Stones) dealt with the properties of various precious stones. He was also an astrologer and is reputed to have astonished people by the accuracy of his predictions. He gave a clear account of Hindu numerals, elaborating the principle of position. Summation of a geometric progression apropos of the game of chess led to the number:

$$16^{16}-1=18,44,6,744,073,709,551,619.$$

He developed a method for trisection of an angle and other problems that cannot be solved with a ruler and compass alone. Al-Biruni discussed, centuries before the rest of the world, the question whether the earth rotates around its axis or not, and was *the first in history* to undertake experiments related to astronomical phenomena. His scientific method, taken together with that of other Muslim scientists such as Ibn al-Haitham, laid the early foundations for modern science. He ascertained, centuries before Albert Einstein, that as compared with the speed of sound, the speed of light is immense. He explained the working of natural springs and artesian wells by the hydrostatic principle of communicating vessels. His investigations included description of various physical abnormalities, including that known as "Siamese" twins. He observed that flowers have 3, 4, 5, 6 or 8 petals, but never 7 or 9.

Apart from *Kitab-al-Hind*, *al-Qanun al-Masudi*, *al-Athar al-Baqia*, *Kitab al-Saidana* and *Kitab al-Jamahir* mentioned above, another of his books, *al-Tafhim-li-Awail Sina'at al-Tanjim,* gives a summary of mathematics and astronomy.

He has been considered as one of the very greatest scholars of all times. His critical spirit, love of truth, and scientific approach were combined with a sense of toleration. His enthusiasm for knowledge may be judged from his claim that the phrase "*Allah is Omniscient"* does not justify ignorance.

(Taken from: "Personalities Noble", National Science Council of Pakistan, ed. Hakim Mohammad Said; 2nd Revised Edition (English and Arabic) publ. Islamic World Academy of Sciences 2000).