ISLAMIC WORLD ACADEMY OF SCIENCES

Newsletter

June-August 2011 Volume 25 Number 40

THE IAS– IAB INTERNATIONAL SYMPOSIUM 2010

8 - 9 DECEMBER 2010
SHAH ALAM CONVENTION CENTRE, SELANGOR, MALAYSIA

Knowledge Society for the Innovation Economy:
Higher Education, Research and Innovation as the Knowledge Nexus for Sustainable Socio-Economic Transformation

Opening Session of the 2010 IAS-IAB Symposium, Shah Alam, Malaysia.

Under the patronage of HRH the Sultan of Selangor, the IAS convened a special symposium in Shah Alam (near Kuala Lumpur), Malaysia; on 8-9 December 2010 on the topic of "Knowledge Society for the Innovation Economy." This activity was organized by the IAS and the International Islamic Academy of Life Sciences and Biotechnology (IIALSB) together with the University of Industry of Selangor (UNISEL). The Islamic Development Bank (IDB) and the OPEC Fund for International Development (OFID) were the sponsors of the event.

The symposium examined the interaction between Education, Research and Innovation. This so-called Knowledge Triangle is the key driver of growth as well as a knowledge-based society, today.

The symposium, which came as follow-up action to the 17th IAS Science Conference on 'Towards a Knowledge Society in the Islamic World' which was held at the same venue in 2009, aimed to bring together international experts who are active in research to specifically discuss the current progress of nanotechnology, biotechnology and health technology. Around 200 participants attended the symposium including approximately 20 IAS Fellows and invited speakers from outside Malaysia, as well as academicians, decision-makers, scientists, researchers, presidents/representatives of academies of sciences.

Of the speakers invited by the IAS to participate in the symposium was Dr Adnan Mjalli who is an internationally recognized expert in drug discovery and development of new medicines in the pharmaceutical and biotechnology industry in the US. Dr Mjalli is the founder, Chairman of the Board, President & CEO of TransTech Pharma, Inc., a drug discovery and development company.

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Dr Mjalli earned his PhD in medicinal chemistry in 1989 from the University of Exeter, UK. His postdoctoral work was carried out at the University of Rochester. He has held various positions of increasing responsibility in research and senior management at several pharmaceutical and biotechnology companies including Merck & Co., Inc. and Ontogen Corporation. He is the author of more than 40 scientific papers, four book chapters and an inventor on more than 700 patents and patent applications.

Another invited speaker was Prof. Munir Nayfeh from the physics faculty at the University of Illinois. In the past few years, Professor Nayfeh has pursued two separate lines of research: (1) A theoretical program focusing on the role of classical chaotic dynamics in hydrogen atoms rendered essentially one-dimensional in the presence of very strong electrical fields; and (2) An experimental program called "writing with atoms," in which the spatial selectivity of the electric field in a scanning tunneling microscope (STM) is combined with the frequency (energy) selectivity of a laser to deposit fine patterns with nearly atomic resolution on a variety of substrates at room temperature.

As an expatriate scientist, Prof. Nayfeh has been energetically involved in a number of research projects in Jordan and Saudi Arabia, and has made a serious effort to transfer his wide international experience to the countries of the region. He was elected a Fellow of the Islamic World Academy of Sciences in 2009.

Professor Abdallah Daar also spoke at the symposium. He is Professor of Public Health Sciences and of Surgery at the University of Toronto, Canada, and Senior Scientist and co-director of the McLaughlin-Rotman Centre Program on Life Sciences and Global Health, and Director of Ethics and Policy at the McLaughlin Centre for Molecular Medicine. After attending medical school in London, England; he went to the University of Oxford where he did postgraduate clinical training in surgery and also in internal medicine, and then earned a doctorate in transplant immunology/ immunogenetics and a fellowship in transplantation.

He was a clinical lecturer in Oxford for several years before going to the Middle East to help start two medical schools. He was the foundation Chair of Surgery in Oman for a decade before moving to the University of Toronto in 2001. He is a Fellow of the Royal Society of Canada, the Canadian Academy of Health Sciences, the New York Academy of Sciences and a Senior Fellow of Massey College, University of Toronto, and a member of the Ethics Committee of the Human Genome Organization. Prof. Daar also holds the official world record for performing the youngest cadaveric donor kidney transplant.

Prof. Daar is of Omani and Canadian nationalities however he has East African roots. He was elected a Fellow of the Islamic World Academy of Sciences in 2009.

Prof. Abdalllah Daar FIAS (Oman/ Canada).

Prof. Ameenah Gurib-Fakim, another invited speaker at the symposium, graduated from the University of Surrey in 1983 with a BSc in Chemistry then with a PhD in Organic Chemistry from the University of Exeter in the UK in 1987. She joined the University of Mauritius as a lecturer in 1987 and now holds a chair in Organic chemistry.

She has worked at the Mauritius Research Council in Mauritius as Manager for Research and Development and has been Dean of the Faculty of Science and is presently the Deputy Vice Chancellor for Teaching and Learning at the UoM.

In the course of her career, she ran many projects funded by international agencies such as the UN, European Union, Canadian International Development Agency amongst others, and has participated in the recent agricultural assessment of Mauritius spearheaded by the World Bank.

Prof. Gurib-Fakim is an advisor to the International Foundation for Science in Sweden and member of the Scientific Advisory Committee of IPICS, Uppsala University, Sweden; a member of the Expert Panel of the Special Programme of the UNICEF/UNDP/World Bank/WHO on 'Infectious diseases,' and is also the founding member and Chair of the African Association of Medicinal Plants Standards (AAMPS) and has co-edited the first African Pharmacopeia in 2010.

Elected as a Fellow of the Linnaean Society of London and of the Islamic World Academy of Sciences in 2009, she won the l'Oreal-Unesco Prize for Women in Science for Africa in 2007, the National Economic and Social Council Prize for Mauritius in 2007 as well as the Special Prize of the CTA/NEPAD/AGRA/RUFORUM for 'African Women in Science' as well as the African Union Award for 'Women in Science' for the Eastern African Region in September 2009.

Prof. Ameenah Gurib-Fakim (Mauritius) receiving her Certificate of IAS Fellowship.

Prof. Munir Nayfeh (USA) receiving his Certificate of IAS Fellowship.

Dr Adnan Mjalli (USA) receiving his Certificate of IAS Honorary Fellowship.

Joint G8 science academies' statement on Health of Women and Children

Magnitude and Importance of the Problem

Local Capacity

The health of families, communities and economies is inextricably tied to the health of women – yet every 100 seconds, a woman dies in pregnancy or childbirth somewhere in the world. Mother and child outcomes are closely linked. **Reducing maternal mortality is critical and is also a priority for improving child health.**

There are less than 4 years left to meet the United Nations Millennium Development Goals (MDGs). The fourth and fifth are critical to this document.

Millennium Development Goals 2015
Goal 4: Reduce under five child mortality by two-thirds
Goal 5: Reduce maternal mortality by three-quarters

There has been some progress in global child health. Since 1990, deaths of children under five have declined. However it is estimated that 8.8 million children still die each year - more than 1000 every hour.

Progress to reduce deaths in pregnancy and childbirth by 75 per cent by 2015 has been similarly limited and the goal remains a distant target. Over 99% of the women who die do so in the developing world.

Specific Health and Disparity Issues

Maternal Mortality and Morbidity

The risk of a woman dying as a result of pregnancy or childbirth during her lifetime is one in seven in the poorest parts of the world compared with about one in 30,000 in Northern Europe. Maternal deaths cluster around labour, delivery, and the immediate postpartum period, with hemorrhage being the main medical cause of death; more than 80% are preventable.

For every death in pregnancy and childbirth there are 16.5 cases of significant maternal illness or disability; maternal chronic ill-health seriously affects the health and quality of life of surviving children, who often depend on their mothers for food and support.

Perinatal and Neonatal Death

Each year, 3.2 million babies are stillborn and 4 million die in the first month of life – 99% of neonatal deaths occur in developing countries. Neonatal deaths comprise 38% of deaths in those younger than 5 years, and are the main barrier to MDG 4. Major immediate causes of death in the first month of life are preterm birth, asphyxia and infections. Proven, low cost interventions, including prenatal care, skilled care at delivery and community based postnatal care could decrease neonatal mortality by more than one half. Three-quarters of these deaths could be prevented at an additional cost of US$1 per head.

Family Planning

Family planning improves maternal health by reducing unintended pregnancies and abortions, and impacts positively on resource availability. Inadequate spacing of children exacerbates major nutritional disorders and increases child mortality by precluding adequate nutrition during gestation. Provision of effective contraception for approximately 200 million women who have none would prevent 23 million unplanned births, 22 million induced abortions and 14,000 pregnancy-related maternal deaths each year. Quality education for women will improve family planning and child care.

Every year, 42 million pregnancies are terminated, of which about 50% are considered illegal under national legislation, performed by unskilled providers or take place in unhygienic conditions. Severe complications result; there are around 70,000 maternal deaths, more than 3 million reproductive tract infections, and almost 1.7 million cases of secondary infertility. Unsafe abortion accounts for 13% of maternal deaths.

Child Illnesses

Of 8.8 million children under the age of five that die each year, main causes of death from 1 month to five years are pneumonia, diarrhea, malaria, measles and HIV. These deaths are preventable with low-cost, evidence-based public health interventions, such as good nutrition and immunization. Still more deaths would be prevented by simple treatment when children are sick: for example anti-malarials, antibiotics, oral and rehydration therapy.

Maternal and Child undernutrition

The attribution of about one-half of child deaths and more than 10% of global disease burden to maternal and child undernutrition demonstrates the huge importance of these risk factors to health goals. Malnutrition in mothers accounts for substantial neonatal mortality and intrauterine malnutrition leads to adult disease: diabetes, hypertension, and dyslipidaemia.

HIV and AIDS

AIDS-related deaths remain a leading cause of premature death globally. Untreated pregnant women infected by HIV have a 30% chance of infecting their child. Without treatment, more than 50% of HIV infected children die before two years of age.

Gender Issues and Women's Rights

The failure to meet MDGs 4 & 5 is inextricably linked with poor progress in promoting gender equality and empowerment of women. Regions with high maternal death rates are characterized by disenfranchisement and marginalization of women. Gender inequality is propagated by a lack of access to education (reflected in low literacy rates) and thus an absence of women in positions that set opinion or policy.

Deficiencies in Knowledge Translation

Meaningful progress requires resources in two key areas: knowledge translation and implementation research. Evidence- based policy making has had a limited impact on maternal and child health policy and program development. The reasons for this are many: a lack of highly-qualified national researchers in the developing countries, a lack of high quality research programs and a severe paucity of research funding in maternal and child health issues. There is also too little research into how interventions or programs can be successfully implemented, and then successfully transferred to other areas.

Recommendations for the G8 Summit

Risks to maternal and child health are not confined to the developing world; vulnerable populations, wherever they exist, need to be targets of interventions that are generally simple and accessible, do not involve specialized technology and are cost-effective.

Intensified effort to improving maternal and child health is essential to attaining Millenium Development Goals 4 & 5.

- Funding for maternal and child health must increase.
  Governments and other organizations need to increase resources. Donors need to increase financial contributions in low-income countries to help fill the resource gap. There should be no user fees for basic health services such asdelivery care. Immunization of children should be universal.
- Health facilities and staffing need strengthening. Increased access to prenatal, midwifery, essential obstetric and newborn care must remain the cornerstone of safer motherhood programs. Skilled emergency obstetric care must be accessible to all women who experience complications; research into most effective methods of delivering such care is needed. Support for community facilities should emphasize maternal and child health and also nutrition. Health workforce strategies need to include plans to build a cadre of skilled birth attendants and community health workers to care for pregnant women and children. Developing countries should establish incentive programs to retain clinical staff trained internally and repatriate former staff. Developed countries should be discouraged from actively recruiting trained individuals in healthcare from developing countries and encouraged to form health education partnerships.
- Strategies to improve maternal health should facilitate access to contraception services and measures to reduce unsafe abortion. Up to 40% of maternal and child deaths could be averted by providing access to these services.
  The use of modern contraceptives, sex education and appropriate child spacing should be fostered. Greater access to family planning would reduce population growth and impact favorably on resource availability. Accessible family planning services should be integrated with HIV/AIDS prevention services. Governments and inter/ nongovernmental organizations must deal openly with unsafe abortions, and ensure appropriate and accessible treatment of women who develop complications.
- Initiatives to strengthen the health of women and children should be more effectively coordinated. The community shaping global political priority for the health of Women and Children has been fragmented. G8 Governments should work with international agencies to facilitate regional coordination mechanisms for women and children's health the main focus of which is achievement of MDGs 4 & 5.
- Policies which protect women and children from all forms of abuse, injury, exploitation and violence must be promoted. Harmful practices such as female genital mutilation should be eradicated. Misuse of technology of prenatal sex determination for aborting female fetuses should be condemned.
- Maternal and child health research needs strengthening, especially in knowledge translation. There is a lack of research into how interventions or programs including translational and communication strategies can be successfully implemented, and then successfully transferred to other areas. Capacity building including interdisciplinary centres of, health science and innovation should be encouraged in all regions. Health information and education programs are needed to disseminate acquired knowledge; this will require enhanced organizational infrastructure

EDITORIAL LETTER

What is wrong with Arab STI?

Moneef R. Zou'bi/ DG-IAS

Arab countries have been aware of the importance of STI for socio-economic development for at least four decades. Many Arab countries have had a core STI system for as long. However, little has changed in terms of the impact of science and the scientific enterprise on achieving socioeconomic development or generating new knowledge.

The challenges facing Arab countries in S&T are enormous. However, they can be overcome with vision, commitment and hard work. The huge strides made by countries that two or three decades ago were at the same level of development as Arab states, including Brazil, China, India, Ireland, Mexico and the Republic of Korea, show that it is possible.

Although Arab decision-makers have been increasing expenditure on education, there is still little political patronage of science and the scientific endeavour, despite a legacy of creativity and innovation. Lack of expenditure on R&D is a major cause of the poor output of the Arab STI system but it is not the only quandary. The lack of a science culture in turn leads to a lack of appreciation for science. So why do Arab decision-makers seem more concerned with education than STI? Can it be that education is viewed as a necessity, whereas STI is considered a luxury? Basic education empowers citizens to read, comprehend basic mathematics and make a living. However, basic education is not sufficient to create wealth, to address concerns of food, water and energy security, to provide better health services and better infrastructure. For that, science is required.

The major contemporary problems Arab countries face which require scientific or technological solutions are well known. Despite this, the purpose of scientific research remains unclear. Research undertaken by the higher education sector, although important, often serves purely academic purposes.

Appreciation for S&T is also an almost alien concept in the mindset of the Arab private sector, which has always been strong in trading goods and services rather than manufacturing. Even in instances where funding has been no object, the private sector has been unable to produce a critical mass of knowledge workers to utilize these resources to meet national objectives, add to the national and global pool of knowledge or produce patents leading to products and services.

Another factor stalling change in Arab countries has historically been the top-down approach to governance. This places political leaders in a position where they have to assume the role of championing science for the scientific enterprise to blossom.

Prof. Ameenah Gurib-Fakim
(Mauritius)

Ameenah Gurib-Fakim graduated from the University of Surrey in 1983 with a BSc in Chemistry then with a PhD in Organic Chemistry from the University of Exeter in the UK in 1987. She joined the University of Mauritius as a lecturer in 1987 and has held the chair of Organic chemistry. She also worked at the Mauritius Research Council in Mauritius as Manager for Research and Development and has been Dean of the Faculty of Science and Deputy Vice Chancellor for Teaching and Learning at the UoM.

In the course of her career, she ran many projects funded by international agencies such as the UN, European Union, Canadian International Development Agency amongst others.

She has served as an advisor to the International Foundation for Science in Sweden and member of the Scientific Advisory Committee of IPICS, Uppsala University in Sweden. She was also a member of the Expert Panel of the Special Programme of the UNICEF/UNDP/World Bank/WHO on 'Infectious diseases,' as well as the founding member and Chair of the African Association of Medicinal Plants Standards (AAMPS) and has co-edited the first African Pharmacopeia in 2010.

Her main line of research has been in the study and validation of herbal knowledge and medicinal plants. She has co-edited the 'Medicinal Plants' Volume of the PROTA series in collaboration with the University of Wageningen in the Netherlands and has supervised many MPhil/PhD students and published over 20 books and numerous scientific papers in the area.

Elected as a Fellow of the Linnaean Society of London and of the Islamic World Academy of Sciences in Jordan, she won the l'Oreal-Unesco Prize for Women in Science for Africa in 2007, the National Economic and Social Council Prize for Mauritius in 2007 as well as the Special Prize of the CTA/NEPAD/ AGRA/RUFORUM for 'African Women in Science' in 2009, and the African Union Award for 'Women in Science' for the Eastern African Region also in 2009. She has been elevated to the Order of the Commander of the Star and Key of the Indian Ocean by the Government of Mauritius in 2008 and to the Order of the 'Chevalier de l'Ordre des Palmes Academiques' by the Government of France in 2009.

Prof. Gurib-Fakim was elected as a Fellow of the IAS in 2009.

Prof. Robert Nigmatulin
(Bashkortostan/ Tatarstan/ Russia)

Robert Nigmatulin, Academician and Member of the Presidium of the Russian Academy of Sciences (RAS), took up the post of Director of the P.P. Shirshov Institute of Oceanology, RAS, in 2006 being a specialist in physics and mathematics, ecology, energetics and economics.

Prior to joining the Institute of Oceanology Dr Nigmatulin was President of Ufa (Bashkortostan) Branch of RAS in 1993-2006 and Deputy of the State Duma of the Federal Assembly of Russia, Chairman of the Highest Ecology Council in 1999-2003.

Dr Nigmatulin was born in Moscow in 1940. He graduated from the Bauman Technical University in 1963 and from the Lomonosov University of Moscow in 1965. He received his PhD in Physics and Mathematics from the Lomonosov University in 1967 and a DSc in Physics and Mathematics from the same University in 1971. He became Full Member (Academician) of RAS in 1991. He was a Visiting Scholar and Professor at the Center of Multiphase Research, Rensselaer Polytechnic Institute, Troy, NY, USA, 1993-2000, Visiting Professor at the University of Pierre and Marie Curie, Sorbonne, Paris, France in 1993 and 1996-1998 and Visiting Professor at the Isaac Newton Institute, Cambridge, UK, 2000.

Dr. Nigmatulin's scientific interests lie in applied mathematics; mechanics and thermophysics of multiphase systems, in particular, liquid-gas flows; theory of combustion and explosion; nuclear energetics, chemical and petroleum technologies; hydrodynamics, heat and mass transfer processes in oceanology; economic theory. Dr. Nigmatulin is author of 10 books, more than 200 scientific publications, including 20 patents. He has published several dozen articles on social and political life and has done numerous TV/radio appearances on the issues of ecology, economics and state. Dr. Nigmatulin is member of the editorial boards of a number of international and national journals, including International Journal of Multiphase Flow (Pergamon Press), International Journal of Heat and Mass Transfer (Pergamon Press), Transport in Porous Media (Kluwer Academic Publishers), Thermodynamics and Fluid Mechanics (Kluwer Academic Publishers), Multiphase Science and Technology (Begell House Inc.), Applied Mechanics and Technological Physics – PMTF (Russia, Nauka) and is Editor-in-Chief of the journal Okeanologia (Russian Academy of Sciences). Dr. Nigmatulin has served on scientific organising committees of numerous international conferences held in different countries of the world and has taken an active part as an invited plenary lecturer in international scientific meetings.

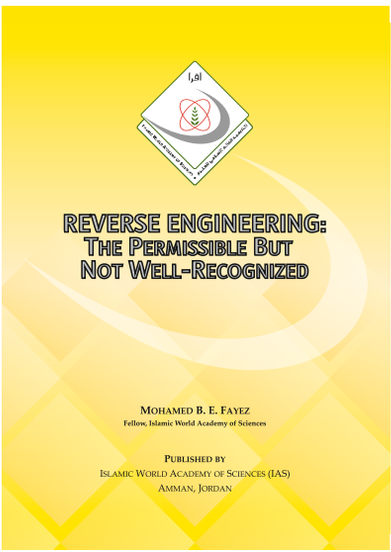
Prof. Nigmatulin was elected as a Fellow of the IAS in 2009.

The Late Prof. Mohamed B. E. Fayez (Egypt)

It is with a sense of sadness and sorrow that the President and the Director General of the Islamic World Academy of Sciences (IAS) in Amman, Jordan; announce the passing away of the eminent Egyption scientist: Prof. Mohamed B. E. Fayez, Fellow of the Islamic World Academy of Sciences. Prof. Fayez passed away in Cairo on Saturday 17 September 2011. He was 84.

Prof. Fayez will be greatly missed by his colleagues and fellow scientists in Egypt and the Islamic World. *"Ina Lillah Wa Ina Ilaihi Raj'oon."*

NEW IAS PUBLICATION



The topic of this book relates to scientific research and the development of the relevant results to the level that enables their useful application. In this context, reverse engineering is seen as an effort by scientific researchers, in a research and development institution, to learn for their own benefit the facts that lie behind the commercial success of a certain product. This book, in part, compliments the earlier publication of the IAS also by the Prof. Mohamed B. E. Fayez (Egypt) which was entitled; "Intellectual Property Rights: An Introduction to Scientists and Technologists," and published by the IAS in 2005.

What is the IAS?

The IAS is an independent, non-political, non-government and non-profit making learned society 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, from where the IAS Headquarters 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 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.*

IAS Newsletter

Published in English by the IAS Secretariat, Amman, Jordan.

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The IAS welcomes the submission of short articles for publication in the Newsletter (publication however is at the IAS' discretion).

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Publication sponsored by:

Jordan Phosphate Mines Company,
Amman, Jordan.

IAS - N40 - 12

New issue of IAS Journal in print and on the web

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

The journal, which is edited and published by Prof. Naci Bor, Prof. Sinasi Ozsoylu and Prof. Ugur Dilmen - IAS Fellows 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 19, Number 4. It carries five major articles: a Pediatric Hematology article by Ş. Özsoylu; a Neonatology and Public Health article by G. Demirel and U. Dilmen; a Neonatology article by N. N. Hameed and F. S. Hussein; a Pharmacognosia article by N. M. Ammar, M. S. Hefnawy, D. A. Mohamed, N. E. Khamis, A. H. Afifi and T. J. Mabry; a Paediatric Surgery article by Y. Yilmaz, G. Demirel and H. Ö. Ulu; a Clinical Images article by M. Y. Öncel, H. G. Kanmaz, E. Çalisici, Y. Yilmaz, F. E. Canploat and Ş. S. Oguz.

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

ABU MARWAN IBN ZUHR*
(1091-1161 AD)

Abu Marwan Abd al-Malik Ibn Zuhr was born in Seville in 1091 or 1094 AD. After completing his education and specialising in medicine, he entered the service of Almoravides (Al-Murabatun), but after their defeat by the Al-Mohades (Al-Muwahadun), he served under 'Abd al-Mu'min, the first Muwahid ruler. He died in Seville in 1161 or 1162 AD. As confirmed by George Sarton, he was not a Jew, but an orthodox Muslim.

Ibn Zuhr was one of the greatest physicians and clinicians of the Muslim golden era and has been held by some historians of science as the greatest of them. Contrary to the general practice of the Muslim scholars of that era, he confined his work to only one field: medicine. This enabled him to produce works of everlasting fame.

As a physician, he made several discoveries and breakthroughs. He described correctly, for the first time, scabies, the itch mite and may thus be regarded as the first parasitologist. Likewise, he prescribed tracheotomy and direct feeding through the gullet and rectum in the cases where normal feeding was *not* possible. He also gave clinical descriptions of mediastinal tumours, intestinal phthisis, inflammation of the middle ear, pericarditis, etc.

His contribution was chiefly contained in the monumental works written by him. Out of those, however, only three are extant. *Kitab al-Taisir fi al-Mudawat wa al-Tadbir* (Book of Simplification concerning Therapeutics and Diet), written at the request of Ibn Rushd (Averroes), is the most important work of Ibn Zuhr. It describes several of Ibn Zuhr's original contributions. The book gives in detail pathological conditions, followed by therapy. His *Kitab al-Iqtisad fi Islah al-Anfus wa al-Ajsad* (Book of the Middle Course concerning the Reformation of Souls and Bodies) gives a summary of diseases, therapeutics and hygiene written specially for the benefit of the layman. Its initial part is a valuable discourse on psychology. *Kitab al-Aghthiya* (Book on Foodstuffs) describes different types of food and drugs and their effects on health.

Ibn Zuhr in his works lays stress on observation and experiment and his contribution greatly influenced the medical science for several centuries both in the East and in the West. His books were translated into Latin and Hebrew and remained popular in Europe as late as the eighteenth century.

* *Hakim Mohammad Said (Editor), 2000. Personalities Noble, National Science Council of Pakistan. Second Revised Edition (English and Arabic). Published by the Islamic World Academy of Sciences.*