

## Editorial

**Dr. Ayman Al Haj Daoud**

Palestine Academy for Science and Technology has defined Science as a dynamic, collaborative human activity that uses distinctive ways of valuing, thinking and working to understand natural phenomena, while technology as a systematic knowledge of a particular art. The success of a technology depends upon the society in which it is developed. Once a technology is discovered, it must be applied. Learning about science enables the determination of priorities for research and the direction and development of science and technology.

Science education should empower people to be questioning, reflective and critical thinkers. It does this by giving them particular ways of looking at the world and by emphasizing the importance of evidence in forming conclusions. Science education develops people's confidence to initiate and manage change to meet personal, vocational and societal needs. Science education assists people to be active citizens by providing the understandings they need to be informed contributors to debates about sensitive, moral, ethical and environmental issues. It is important that the Palestinian people appreciate and understand how the study of science presents them with opportunities for responsible decision making in their local, national and global communities.

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### New Logo for PALAST

The Academy has recently changed its old logo to a new one. The new logo reflects the Academy vision as an umbrella scientific institution for S&T institutions in Palestine, it also reflects the Academy main objective as to promote S&T in Palestine. We would appreciate any comment on the new logo.

## The Role of the Academy

**Sami Musallam, PhD, Jericho**  
Deputy Minister at the Presidency

The Palestine Academy for Science and Technology has been a new welcome experience on the Palestinian field. The Academy has and can play a very important role with many functions.

The Academy can and should provide a new atmosphere for scientific and academic cooperation and exchange among similarly minded institutions in Palestine. I think, since its establishment, it has provided this atmosphere and feeling of belongingness to the scientific world and work. This role has given it many factions among which are the following:-

- 1- It can provide a platform for those "who do not have" to receive assistance and cooperation from "those who have." Those "who do not have" include those who lack the financial resources to establish or hire people for scientific research. The Academy can help in this regard. It can assist in directing institutions to donors.
- 2- The Academy can work as a crucible where all efforts converge. It should not replace or and carry out the functions and work of any institution. The efforts should converge in the Academy for exchange of ideas, expertise, scholarships and fellowships, and financial resources.
- 3- The Academy can and should work in the publication field. A newsletter can carry the message of the Academy and a number of news items.

This is important. Equally, it not, more important is to have within the framework and function of the publications department of the Academy a scientific journal, published on a quarterly or annual basis, and a publishing house for scientific books. In addition for being a platform for solid scientific research, it will also be a platform for young scientists where they can publish their research papers and theses.

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In this essence, the Academy considers S&T as the butter and bread for the survival of the Palestinian community and not merely an option. To achieve and maintain a high standard of living for the Palestinian community, social, legal and economic structures and processes that support S&T must be built and sustained. Knowledge, competencies, abilities and skills that are required of innovative products and services must be developed and continually updated. Currently, the building and sustaining of relationships between the Palestinian community and other communities is more important since it allows Palestinians a productive interaction in addition to attaining mutual benefits. This must be done through a long-term process across all spans of generations within a human rights context and a national, regional and international stability.

In line to the above definition and concept to science, the Academy has released two booklets entitled: "Environmental Concepts for Environment Awareness" and "Projects" in Arabic language, which would be a good guide to schoolteachers, simultaneously with the issuance of this second issue, volume 3 of its Newsletter. The booklet entitled "Projects", is the outcome of the program entitled "Social Mobilization Program in the Field of Environmental, Cultural and Education" which involved eight schools from private, government and UNRWA sectors under the supervision of the Academy. The presented material in this booklet entails detailed explanation of environmental projects that have been developed by the Palestinian school children in Ramallah district representing the former schools. Thanks to the United Nations Development Programme (UNDP) who funded this program.

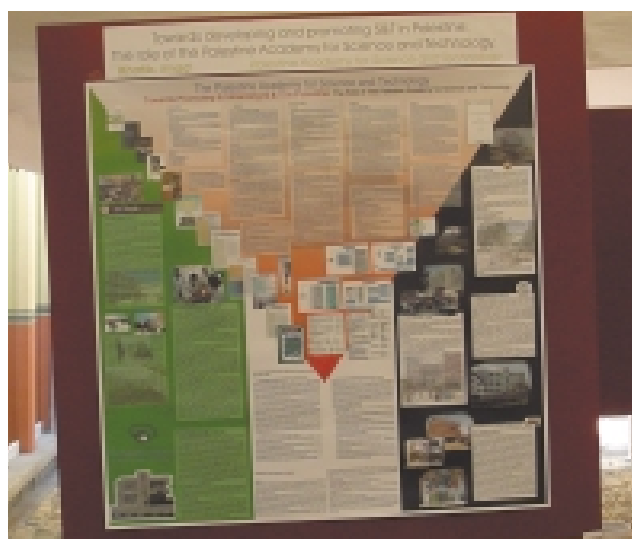
As well, in this new newsletter and the forthcoming issues, we will shed light on the Arab and Muslim scholars who contributed in the development, promotion and application of science in all fields of life ranging from health to astronomy. This would help in the recognition and the appreciation of the rich contribution of the ancient Arab and Muslim culture to the various branches of Science and Technology that served as the basis for the development of modern science and technology.

# Palestine Academy

## IAP General Assembly Conference

The Academy has participated in IAP General Assembly in the conference on Science for Society, which was held in Mexico City from 1-5 December at the premises of the Mexican Academy of Science. During the conference several initiatives proposed by IAP members were discussed including cooperation with scientific bodies such as TWAS, IAC, etc. The Academy has submitted a proposal for the building of capacities of the member academies. The Academy here also presented a poster entitled "Towards developing and promoting S&T in Palestine: The role of the Palestine Academy for Science and Technology" in the poster session, which was held with participation from most of the InterAcademies Panel (IAP) members. The Academy poster reflect the science and Technology system in Palestine with emphasizes on Academic institution and the role of the Academy towards developing the science and technology.

The InterAcademy Panel on International Issues (IAP), a global



network of science academies, has approved five statements on a wide-range of topics that address critical science-related issues facing the world today. The statements, which are intended to influence policy makers both in individual countries and international organizations, were released on the final day of the conference. The topics covered in the separate statements include: science and the media; science education of children; the health of mothers and children in developing countries; capacity building of young academies; and access to scientific information.

*The election of the co-chairs and the IAP Executive Committee for the period 2004-2006 resulted in the following:*

### **IAP New co-chairs:**

Professor Yves Quere, Academie des Sciences, France

Professor Chen Zhu, Chinese Academy of Sciences (CAS)

# Cooperative Initiatives

## Members:

Bangladesh Academy of Sciences, Bangladesh  
Brazil Academy of Sciences, Barzil  
Cuban Academy of Sciences, Cuba  
Indian National Science Academy (INAS), India  
Nigerian Academy of Sciences, Nigeria  
Academie des Science et Techniques du Senegal (ASTS), Senegal  
Academia Nazionale dei Lincei, Italy  
Science Council of Japan (SCJ), Japan  
The Royal Netherlands Academy of Arts and Sciences (KNAW), The Netherlands  
Royal Swedish Academy of Sciences (RSAS)  
National Academy of Sciences (NAS), USA  
The Secretariat of IAP is at the premises of the Third World Academy of Sciences (TWAS).  
The Academy wishes for the newly elected co-chairs and EC members all successes.

## Environment awareness Project

Eight different environment projects were finished at the end of Aug. 2003. These projects deal with different environment issues - like awareness, recycles, reuse and so on- were supported by UNDP and coordinated by the Academy for Science and Technology.

On 29 Oct. Palestine Academy for Science and Technology arranged an exhibit at city-inn hotel in Ramallah, where schools design their own corners to show their projects.

## The projects are:

### First Project :

Al Beirh Al Jadedih Boys school : The school established a school garden where they plant Herbs and they are using gray water in the school for irrigation.

### Second Project :

Four schools - Beitonia Boys school, Aziz Shahien Girls



school, Al- Ama'ri UN Boys school and Luthern School ,worked with paper recycling, where they collect old newsletters and with simple way they made cardboard and recycled paper. So they participate in some ways in solving the problem of solid waste.

### Third Project :

Al- Ama'ri UN Boys school and Beitonia Boys school collected old and used olive oil and used it in making a traditional type of soap , which is typical to Palestine.



### Fourth Project :

Al - Ama'ri UN Girls school and Al Ahliyyah College and Lutheran School and St. Joseph school worked with awareness issue , Al - Ama'ri UN Girls school were trained to perform a show talking about environment , Al Ahliyyah College



produced magazine " Generation For the Protection of Nature " ,st. Joseph produced a C.D about different environment issues.

# Education and Scientific Research in Water Science and Technology at Birzeit University

## Achievements and Constraints

**Rashed M.Y. Al-Sa'ed, Ph.D.**

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Education, scientific research, and training in the fields of water science and technology are essential components to enhance economical development and achieve sustainable environmental protection in Palestine (Al-Sa'ed, 2003). In this regard, two major questions have been raised. What are the scientific and technological achievements made so far in Palestine and what are the major constraints of scientific research in the field of water science and technology? This short communication is an attempt to answer these crucial questions on the local level. For this purpose, brief excerpts from a paper prepared by the author on "Promotion of ecological sanitation in Palestine with special emphasis on education, training, research and development" will be utilized.

The Palestinian education and research in general and in environmental science and technology in particular are underdeveloped. Based on a study made by the Ministry of Planning and International Cooperation (MOPIC, 1999), applied research projects comprised only 5% of the total research projects carried out by R&D centers in Palestine, where 70% of governmental institutions suffered from qualified staff of executing scientific research. The Palestine Academy for Science and Technology (PALAST) published a study on the reality, challenges, and means of activation and advancement of scientific research in Palestine (2002). The water and environment sector was among the major national research priorities, where more than 50% of the research units and departments of the Palestinian institutions under study had opted for R&D in the field of water and environment.

Emerging from the need for a multidisciplinary research institute in the field of environmental science and technology, active water and sanitation research plans based on Palestinian oriented problems were developed. As a result, several short training courses, capacity building developmental projects and the M.Sc. programs in Water Engineering and Water Science and Technology formed the fruitful nucleus of the newly established (2001) Institute for Water Studies (IWS) at Birzeit University. The M.Sc. program in Water Engineering offers two specializations, one in sanitary engineering, and another in hydrology and water

resources management. The M.Sc. programs are under the umbrella of the IWS, where the teaching staff members are from the Institute and from the faculties of Engineering and Science. During the last five years (1999-2003), forty M.Sc. students graduated from the M.Sc. program in Water Engineering (Hydrology and Sanitary Engineering). The alumni of the M.Sc. program came from governmental, non-governmental, and private sector, where all are working and four of them are pursuing their PhDs.

The research topics of M.Sc. students focused on Palestinian problem solving issues with special emphasis on aerobic, anaerobic, and (post)-treatment of domestic and municipal wastewater as well as on reclamation and reuse of treated effluent. Applied M.Sc. research topics were selected in an attempt to solve Palestinian water and sanitation problems in close cooperation with municipalities, Palestinian Water Authority, industrial enterprises, non-governmental organizations (NGOs), and schools. Research cooperation initiatives were made and encouraged at both national and international levels. The newly established M.Sc. program in Water Science and Technology and the envisaged M.Sc. program in Environmental Engineering and Science will secure the initiated multidisciplinary approach to enhance the quality of environmental education and research. This approach has been clearly indicated by Hilal (2003) to abate conventional discipline boundaries behind hampered advancements of science and technology.

As a product of two water developmental projects on capacity building (WASCAPAL & WASTEVAL), two of three PhD students have finalized successfully their degrees in environmental engineering. The research themes of environmental engineering have a closed loop nature; where pre-treatment, main bioprocesses, post-treatment, reclamation, and reuse of biosolids and treated effluent formed the main research fields of wastewater science and technology. The existing M.Sc. courses were reviewed and adapted, staff involvement in undergraduate courses teaching, all this stimulated the interests and provided knowledge in water science and technology. The Institutes' staff members have published several scientific papers in specialized conferences and refereed journals in their respective research fields.

Several local and international studies have investigated reasons and constraints that hampered the advancement of education and scientific research (Yahya and Salamin, 1997; Alha, et al., 2000; Gurtierrez-Martin, 2002; Halileh and Giacaman, 2002; Al-Sa'ed, 2003). The major constraints include lack of financial resources, inadequate professional staff, bad political situation, lack of cooperation between industrial sector and research institutions (MOPIC, 1999; PAST, 2002). However, in addition to these, the following problems and constraints faced, while implementing water developmental projects by the Institute for Water Studies (IWS) at Birzeit University, can be mentioned:

- Inefficient project management policy at the university top management levels
- Assignment of inadequate and field foreign staff as research project managers
- Negative impact of funding agencies and the associated forced technical influence
- Absence of incentive measures for qualified and active researchers
- Ignorance of acknowledgement and respect neglect of individual attempts
- Internal and inter-departmental destructive professional competition
- Lack of cooperation intention from individual public and national institutions
- Dominance of personal mode and interests of professionals in national institutions
- Lack of knowledge, interest, motivation, and qualified staff in the industrial sector.

The IWS at Birzeit University has overcome some of the above-mentioned problems and constraints. However, lot of efforts has to be made in order to overcome the rest. Guiding economical and social principles with respect to curriculum design, political stability, and networking should be developed to overcome the negative impacts of the prevailing bad political situation (Figure 1). An integrated and effective networking efforts among environmental education and applied academic research, national and public institutions, and industrial sector form a challenge, if we envisage sustainable education and scientific research within the fields of water and environment sector.

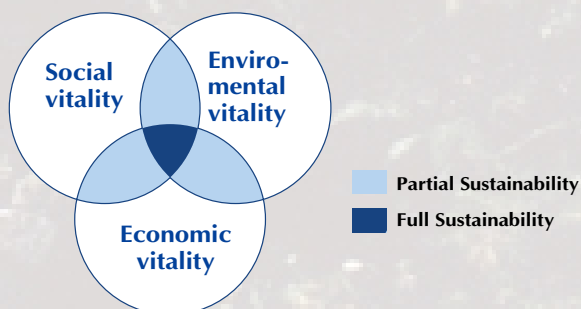


Fig 1: Guiding principles for R & D in water science and technology ( AL Sa'ed 2003)

### Fifth Project :

Beitonia Boys school Collected Orange peel which can be used for treatment of some gastrointestinal infections. In the exhibit, Many schools, institutions and organizations were invited to the exhibit, media were their too. The visitors were impressed by the projects, some of them said that such simple and good projects promote and activate other schools to start taking environment issues and protection in consideration.



At the end of the exhibit, Al-Amari UNRWA (UN) girls school performed a show with traditional dance talking about environment pollution and how we can prevent it.

### SMITE Follow Up

The Academy has held an awareness workshop for the SMITE end users and stakeholders at Claridge hotel in cooperation with the owner of the Claridge hotel, Mr. Awadeh. During the workshop presentation describing the project activities and expected outcomes and benefits were presented. It should be noted here that an awareness campaign was planned to take place during October 2003 in which partners from Greece, Germany and Denmark including technical staff will be presenting the project activities during campaign. The campaign was postponed because of the ongoing political crises.

### GLOWA Follow Up

The Academy has participated in the first GLOWA JR-II meeting which was held in Potsdam last 00000. The Academy has presented the activities relevant to WPI which deals with climate change modeling. Two new German partners, PIK of Potsdam University and IFU of Forschung Zentrum Karlsruhe, have both joined WPI team. This was a very positive development for the project. Both Dr. Gerstengarbe from PIK and Dr. Kunstmann will enrich and help much in carrying out the project activities.

- 4- The Academy has a standing council composed of all the concerned and interested distinguished figures in Palestine. I think its high time to activate this Council. I would like to suggest that the Academy has a right to engage each and every member of the Council, of one percent (1%) of its annual budget as a financial contribution to help the Academy carry out its work in providing various kinds of assistance to scientists to do research work and to have that published. In the final analysis this will be in their own academic and scientific interest.
- 5- Such contributions will also help the Academy start a very needed project namely the "Science Fund." This will help the Academy manage and disperse grants for scientific research and publish the results where necessary.
- 6- The Academy has to locate the industrial sectors and businesses that favor scientific research and other needs in order to get their support, assistance and cooperation. The industry is a fundamental funder of scientific research which in turn reflects the level of development of the various countries.
- 7- The Academy could be the place of membership for almost all distinguished Palestinian scientists who are also willing to make the Academy their home.

Therefore, I see a great role for the Academy in the coming weeks, months and years in Palestine. The interaction with the Academy is in the interest of the scientific, academic and business communities. We have to converge our efforts in order to achieve our goals using our scarce financial recourse to be managed by our rich human resources. I am happy to be associated with the Academy.



### The Arab American University at Jenin

The College of Arts and Sciences attended "the 11th Annual International Conference on Conflict Resolution in St. Petersburg-Russia and presented a paper on the Palestinian-Israeli Conflict Resolution. Also Dr. Raed AlKowni, participated in the 14th meeting of the International Council for the Study of Virus and Virus-Linked Diseases of Grapevine (ICVG) on Sep 2003, with three papers on molecular characterization of a new virus that infects grapevine. In other news Dr. Samira Barghouthi at College of Arts and Sciences received a DAAD research visit for two months. She conducted research dealing with the thermodynamics of fluidized bed combustion of methane at the Institute of Environmental Engineering, University of Rostock. In other news Students from College of Arts and Sciences received training in France during August 2003 majoring in Biology and Biotechnology. Other news Dr. Jaber Masalha, presented a paper, "Local Drought Resistant Crop-Varieties and Inter-cropping Combining Water Use Efficiency and Nature Conservation, at the GLOWA-Jordan River Conference that was held at Potsdam University in Germany Sep 2003.

In other news Dr. Bilal Ghareeb & Artist Mohammad Sabane prepared a scientific comic book, entitled "Story of Ajeeb-Ghareeb (DNA, the Universal Life Molecule)". This comic book (printed in Arabic) targets school students, university students, parents, science and religion teachers in the Arab world. 4000 copies are already printed and will be distributed to schools and universities in Palestine.

The Faculty of Administrative and Financial Sciences, presented a paper on "Islamic Banks in Palestine: an Initial Assessment" at the Conference of International Islamic Banking: From Money Lenders to International Banks. The conference was held in Prato-Italy, organized by Monash University- Malaysian campus.

The Faculty of Law, attended a meeting of International experts and Legal Advisers on International Humanitarian Law (IHL). The meeting was held in Geneva by the International Committee of the Red Cross Sep. 2003.

The College of Information Technology attended and presented a paper at "The International Conference on Wireless and Optical Communications, Calgary, Canada".

One member of the Faculty of Allied Health Science, Department of Occupational Therapy received training in the UK at the Royal Edinburgh Hospital during the summer. In addition, he participated in a workshop of World Health Organization, WHO. The workshop focused on Community Mental Health in Ramallah. He also attended a workshop of Appropriate Paper Based Technology that was held at Bethlehem Hospital.

## Islamic University

A Workshop was held at IUG to evaluate Project Managers Training Program carried out by Deanery of Community Service and Continuing Education from 3 May to 30 July. trainees from NGOs participated in the project funded by TAMKEEN.

In other news IUG participates in Sustainable Water Management in Mediterranean Coastal Aquifers: Recharge Assessment and Modeling (SWIMED) project that carried out by universities from Spain, Cyprus, Italy, France, Switzerland, Tunisia, Morocco and Palestine. The duration of the project is 36 months starting from January 2003. In the project, flow and seawater intrusion with variable density will be described to predict seawater intrusion behaviour and long term effects of artificial recharge in aquifers. In other news The International Conference of Engineering and City Development (ICECD) starts on 22nd Sept. with the opening ceremony. More than 60 papers, which are of practical and scientific nature, from around 20 countries was presented during the conference. The papers cover Construction Industry, Environment, Preservation of Heritage, Infrastructure, Regulations and Legal Issues, Urban Planning and other topics. Two parallel sessions are held simultaneously in IUG Conference building.

An International Exhibition for Engineering industries and information Technology is held concurrently with the conference. Also, a French Exhibition of Old Nablus City is opened by the French Consul in Palestine.

In a ceremony held at The Conference Building, IUG and Gaza Municipality celebrated the graduation of 40 employees from the municipality in two courses held at Community Service and Continuing Education Deanery. The two courses included writing reports, letters, proposals and fund raising in English. The courses were funded by Norway through Holocaust Cultural Center in Gaza.

In other news the Business Unit at Faculty of Commerce organized a symposium entitled "Industrial Cities Role in Supporting Private Sector". They stressed the importance of the subject in infrastructure, also they referred to political situation and obstacles.

In other news, the Business Unit at Faculty of Commerce organized a workshop entitled "A Strategy for Private Sector Development in the West Bank & Gaza", this workshop shade light on specific issues that deal with economical and social development.

Dr Samir Yaseen, Faculty of Science, participated in 3rd conference on "Using Nuclear Techniques in Environmental Studies" held at Yarmouk University in Jordan from 16-18 September. Dr Yaseen presented a paper entitled "Measuring Radon Gas in Gaza". Also Professor M. Shabat, Vice President for Administrative Affairs and Professor of Physics, participated in a conference held in Ostava City in Czech from 11-15 August. Professor Shabat presented three research papers.

In other news Dr Hatem Alaydy, Assistant Professor on Computer Engineering, participated in Arab Conference for IT Technology held in Egypt from 20-24 December, Dr Alaydy presented a paper

entitled "Speech Compression Using Wavelets". He attended different sessions in the field of distance and e learning and the participants discussed certificate accreditation.

## An-Najah National University

The Scientific Centers of An-Najah National University organized a conference on their role at An-Najah. The conference resulted in recommendations stressing the importance of building and strengthening ties between university scientific centers and local NGOs and public institutions as well as private sector. Twelve centers participated in the conference of the Scientific. Each center introduced its goals and activities through a short documentary and presentation by the director. In other news An-Najah University won several Abdul Hameed Shoman Foundation Prizes for Arab Researchers in the fields of energy and industrial medicine, and economy, as well as the applied science prize.

In other news An-Najah established three new centers in 2002-2003; Measurement and Evaluation Center; Opinion and Survey Studies center; and Continuing Education Center.

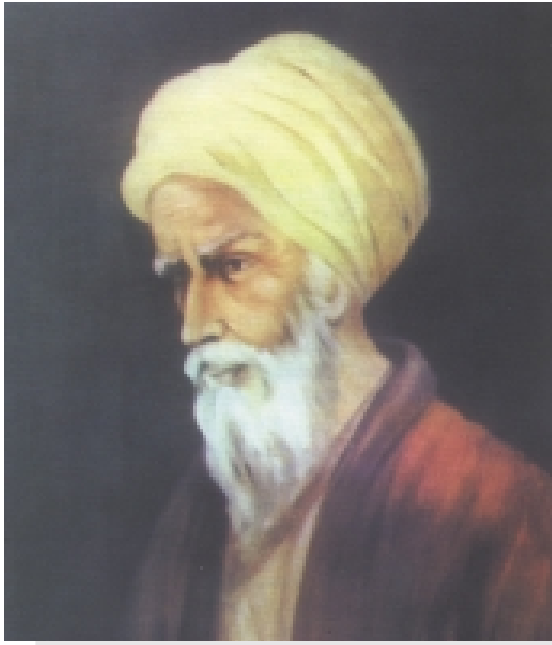
Members of the Earth Sciences and Seismic Engineering Center participated in a number of local and international activities including a seminar on the future of engineering training in the new century in Amman, Jordan; an international summit for experts in Earthquake Engineering in Beirut, Lebanon; and a conference on the Reduction of Earthquake Danger, in Damascus, Syria. In other news delegations from An-Najah participated in the Fifth Conference of Pharmacy Colleges in the Arab World in Amman, Jordan, as well the 38th International Conference of Pure Chemistry in Brisbane, Australia.

In other news An-Najah National University established a Faculty of Information Technology, An-Najah further strengthened its IT facilities by opening the Information Technology Unit in cooperation with SUN Microsystems, an American computer firm, which will serve the Department of Computer Engineering, the IT faculty and the Science Faculty as well as offering training programs to the community.

## Hebron University

Two postgraduate programs were started by the faculty of Agriculture, namely, an M.Sc. in plant production and an M.Sc. Natural Agricultural Resources and its Sustainable Management. The faculty of agriculture has participated in a workshop entitled "integrated protection" organized by the ministry of agriculture and presented a paper on IPM Concepts & Definition. The faculty participated with the Ministry of Education and Higher Education in preparing and reviewing the outline of the suggested Agriculture curriculum. The University has signed a protocol with USAID for supporting two projects in the field of using a biological protection. The university faculty members participated in the international meeting for water harvesting committee held in Turkey.





### Abu Ali Hassan Ibn Al-Haitham

(965-1040 AD)

Abu Ali Hassan Ibn Al-haitham was one of the most eminent physicists, whose contributions to optics and the scientific methods are outstanding. Known in the west as Alhazen, Ibn al-haitham was born in 965 AD in Basra, and was educated in Basra and Baghdad. Thereafter, he went to Egypt, where he was asked to find ways of controlling the flood of the Nile. Being unsuccessful in this, he feigned madness until the death of Caliph Al-Hakim. He also traveled to Spain and, during this period, he had ample time for his scientific pursuits, which included optics, mathematics, physics, medicine and development of scientific methods on each of which he has left several outstanding books.

He made a thorough examination of the passage of light through various media and discovered the laws of refraction. He also carried out the first experiments on the dispersion

of light into its constituent colours. His book Kitab Al-Manathir was translated into Latin in the Middle-Ages, as also his book dealing with the colours of sunset. He dealt at length with the theory of various physical phenomena like shadows, eclipses, the rainbow, and speculated on the physical nature of light. He is first to describe accurately the various parts of the eye and give a scientific explanation of the process of vision. He also attempted to explain binocular vision, and gave a correct explanation of the apparent increase in size of the sun and the noon when near the horizon. He is known for the earlier use of the camera obscura. He contradicted Ptolemy's and Euclid's theory of vision that objects are seen by rays of light emanating from the eyes. According to him the rays originate in the object of vision and not in the eye. Through these extensive researches on optics, he has been considered as the father of modern optics.

In his book Mizan Al-Hikmah, Ibn Al-Haitham discussed the density of the atmosphere and developed a relation between it and the height. He also studied atmospheric refraction. He discovered that the twilight only ceases or begins when the sun is  $19^\circ$  below the horizon and attempted to measure the height of the atmosphere on that basis. He also discussed the theories of attraction between masses, and it seems that he was aware of the magnitude of acceleration due to gravity.

His contribution to mathematics and physics was extensive. In mathematics, he developed analytical geometry by establishing linkage between algebra and geometry. He studied the mechanics of motion of a body and was the first to maintain that a body moves perpetually unless an external force stops it or changes its direction of motion. This would seem equivalent to the first law of motion.

Ibn Al-Haitham's influence on physical sciences in general, and optics in particular, has been held in high esteem and, in fact, it ushered in a new era in optical research, both in theory and practice.

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