



Pakistan Journal of History & Philosophy of Science



Vol 18: No 1 & 2

Jan – Dec 2012

PAKISTAN JOURNAL OF HISTORY & PHILOSOPHY OF SCIENCE

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Published by

Pakistan Academy of Sciences

Price: Rs. 500.00 or US \$ 6.00 per issue, post free

Annual: Rs.1000.00 or US \$ 12.00 per volume, post free

PAKISTAN JOURNAL OF HISTORY & PHILOSOPHY OF SCIENCE

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Iqbal's Reconstructions of Religious Thought in Islam

*By Dr. M. H. Qazi

Iqbal's Reconstructions of Religious Thought in Islam is a kind of paradigm shift in the history of Islamic thought. The lectures delivered in Madras and at Aligarh Muslim University by Allama Iqbal were written at a time when the Muslim nations were under the yoke of western servitude. The lament of Iqbal on this count is evident both from his poetry and prose. The lectures were delivered with succinct intention of changing the mind set of Muslims all over the World. It was a kind of a reminder to the Muslims that they have ceased to march with time in periods of almost explosive advancement of knowledge in arts and sciences.

Even today, in spite of the resurgence of Islam, the real spirit of religion remains elusive. This has caused a serious misunderstanding of the very genesis of the teachings of Islam with the followers of other religions, giving rise to an inadvertent notion of clash of civilizations (Huntington, 1990)¹.

Although a huge number of publications on Iqbal have appeared in the last five decades, yet the real message of Iqbal has not been able to find adequate space in the intellectual crevices of the common man, especially the emerging youth. It becomes increasingly important that the message of Iqbal is given the importance it deserves in reconstructing the social fabric of Muslim societies in the 21st century. The Dr. M.H.Qazi has deeply studied the spirit and context of the poet's letters; His work will be published in present and other volumes of this journal.

Iqbal predicted that

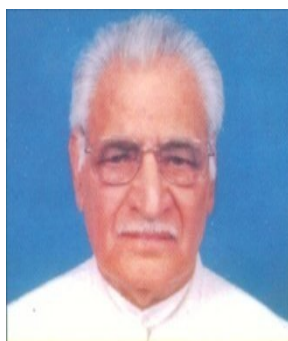
"The day is not far off when religion and science may discover hitherto unsuspected natural harmonies. It may, however, be remembered that there is no such thing as finality in Muslim thinking. As knowledge advances and fresh avenues of thought are opened, other views and probably sounder views than those set forth in these lectures are possible. Our duty is to carefully watch the progress of human thought and to maintain an independent critical attitude towards it".

Taking lead from these views of Iqbal, an attempt has been made by the author to collect current evidences from science, philosophy, psychology and biology to fortify the arguments of Iqbal in the most difficult area of 'Inner Religious Experience'.

*The views expressed by the author in this write up are not owned by the Administration, Editor and Publisher of *Pakistan Journal of History and Philosophy of Science*

Such an attempt entails the encompassing host of related issues such as

• the nature of soul, • the survival of soul after death, • the freedom of ego, • the mind-body dualism which originated with Descartes' declaration: "I think therefore I am" • the nature of serial time in juxtaposition to Divine time and Divine space,	• the relationship of consciousness and ego, that is, how in the unity of life, higher consciousness carves out a path for unfolding the nature of ego • the nexus of thought and being • the genesis of man's relation with the universe, and • the opposing claims of dualities and monistic materialists (reductionists).
--	---



Dr. Qazi is an eminent scientist, teacher and researcher of Pakistan who has held top positions at various universities in Pakistan. His presence on numerous national committees, commissions and conferences has greatly contributed towards the cause of advancement in the realm of science and technology, science education with focus on research and the creation of a climate for a seeking knowledge described as Islamic heritage.

Dr. Qazi undaunted by the strains and stresses of advanced years of age, maintains his active interest in scientific research and guidance and presides over a Chartered University in the Private Sector, dedicated to the cause of higher learning. He is the recipient of Two National Civil Awards of a High Order in recognition of his services spread over half a century, i.e. Tamga-e-Imtiaz and Sitara-i-Imtiaz.

The researcher hidden in Dr. Qazi has not restricted his work to any one discipline and his quest for knowledge knows no frontiers. The present work is a proof positive, if one is needed, of this statement; it is also an exhortation to all scientists and researchers to explore new horizons.

Importance of Vital Statistics in Economic Planning

*Dr. N.S. Akhter , Ahmed Murad & Dr. M.S. Akhter

Introduction:

The compilation of Vital Statistics of the nation form the basis of any economic planning. The objectives of agencies such as population planning, and mother and child welfare association cannot be achieved without close cooperation with different allied agencies, most important of which are Cooperation of Provincial, Municipal and Town hall health departments. In order to collect reliable and accurate statistics most agencies rely on epidemiological studies which must be based upon accurate and systematic observation and recording of clearly definable facts in a known population or a representative sample of it.

Population Size:

The WHO definition for live and stillbirth is not used by all countries, which makes international comparisons difficult. The statistical results are also influenced by the size of the populations studied. The variation which can occur from year to year can sometime provide an estimate of the variation due to chance.

In Pakistan the death certificate is filled with briefest possible information, and the doctor who fills the certificate is also not familiar with the importance of this vital information.

In any case, the death certificates are issued only in cases of hospital deaths. According to recent census, out of 45% female population 72% per cent lived in the rural areas. The statistics obtained from such areas are not very reliable and accurate.

Reliability of Data for Comparison:

The statistical criteria which are necessary to ensure a reasonable comparability include countries which have reached a high state of development in the collection of statistics and use similar definitions. It will be meaningless to compare statistics of Pakistan with that of Canada, USA or Sweden, but these can be easily compared with countries such as India and Nigeria which have more or less similar situations.

Birth and Death rates:

Birth Rate is the number of live births in a year divided by number of total population in the country and multiplied by one thousand (Fig 1.3) shows crude birth rate in Pakistan. The crude birth rate in Pakistan at present is around 24.81 per 1000. In a population of nearly 180 million people, there are 25.1 million births every year.

Infant Mortality –

It is generally agreed now that as maternal deaths are so rare events in childbirth perinatal and infant mortality rates are of greater significance than maternal mortality rates in assessing the standards of care. Most countries vary in the extent to which they comply with the WHO definitions of live and stillbirth.

(WHO refers Live birth as the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life - e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles - whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born)

As for WHO in Pakistan there is no text or reference manuscript at Government or private level, which could provide accepted definitions of these important subjects? A couple of publications produced by some physicians in this country have also failed to deal with this subject. In the United States, however, we count any infant exhibiting any sign of life as alive, no matter the month of gestation or the size of the fetus. In other European countries, they define the month of gestation and the size of the fetus before they count it as a live birth. The effect of this deficiency is very damaging as regards collection of vital statistics. A baby may not be considered to be born alive unless it is still living at the time of the registration of the birth.

The Soviet Union classification, any infant that is born before 28 weeks gestation and weighs less than 1,000 grams and is less than 35 centimeters long is not considered a live birth unless the infant lives for seven days and then dies. In France, Czech Republic, Ireland, Netherlands and Poland, the fetus must be at least 22 weeks and/or weigh 500 grams, if not, it is not a live birth and not counted as a part of the infant mortality rate.

Causes of Death in General Population

Two-thirds of the world's neonatal deaths occur in just 10 countries, mostly in Asia. Pakistan is number three among these countries. With an estimated 298 000 neonatal deaths annually and a reported neonatal mortality rate of 49 per 1000 live births, Pakistan accounts for 7% of global neonatal deaths. Infection (36%), preterm birth (28%) and birth asphyxia (23%) account for 87% of neonatal deaths worldwide. Appendix V provides list of causes of death-in Pakistan. Complication of pregnancy and child birth constitute 7% of total deaths, while congenital anomaly, birth injuries, difficult labor and perinatal mortality. Constitute 7.3 per cent of total deaths.

In Pakistan nearly 23.6 per cent women are marriageable, as compared to the west where marriages are contracted at relatively younger age. This Society in general is very conservative and religious; therefore contraceptive methods are not accepted and practiced by great majority. These women acquire high parity status with shorter interval between pregnancies, their nutritional stores and general health is taxed adversely by the demands of child bearing and mother hood. The risks associated with pregnancy and deliveries are considerably increased in women of younger age and high parity. Woman under the age of twenty and parity five or more are particularly susceptible to statistical complication.

General Fertility Rate: 127.6, Total Fertility Rate: 3.9 Births at Non-Medical places 76.2 Infant Mortality: Rate 63.26, Neonatal Mortality Rate: 42 Post Neonatal Mortality Rate: 28.

According to the last UNICEF report 30,000 women die every year in Pakistan as a result of child birth. This gives a maternal mortality rate of 2.6 per 1000 births or 260 per 100,000 births. The need for reducing this alarmingly high maternal mortality rate urgently cannot be stressed more strongly. Deaths due to other cause Heart disease, Cancer Violence and Accidents are equally important for the economic planners.

Fertility Rate

The fertility rate is the number of births per 1000 women between the ages of 15 and 44 years (inclusive), calculated on a yearly basis. It is a more accurate means of comparing the reproductive behavior of different population groups than the birth rate (number of births per 1000 total population). The latest fertility rate in USA is 2.06.

Average Life Expectancy

The life expectancy at birth is a useful indicator of health status of the people in a country; this is also commonly used for international comparison. The present average life expectancy in Pakistani woman is around 67.9 years, in men it is higher.

The life expectancy in female of Pakistan in the peak reproductive years is improved; it was 61 years, few years ago as compared to 69.9 years. At 35 to 39 years of age both male and female have a similar life expectancy. This is considerably low when compared with figures available from the advanced countries.

Maternal and child health care:

Some of most important health problems facing mothers and infants are related to cumulative effects of malnutrition, infection, unregulated fertility, poor socio-economic conditions, poor health and social services for which there are no short term solutions available. The emphasis on maternal education is not a part on any development plan of Pakistan. This is most unfortunate. There is urgent need to review this plan and introduce teaching of social, nutritional and -preventive aspects of infant care to all the child bearing women.

Registration of Births and Deaths in Pakistan

Pakistan contains Urban and Rural areas, therefore births and deaths are carried out separately. In rural areas, the registration of births and deaths is completed under the basic Democracies Order 1959, under this order head of the house hold is required to get the birth or death registered within 4 days of its occurrence at Union Council or to report it to the Chowkidar who will get it registered at the Office of the Union Council, and send a copy of record every month to District Health Officer concerned. In Urban areas, the registration of birth and deaths is carried out under the Municipal Administration order 1960.

The event is reported for its registration by the head of the household. In case of births the midwife is also required to report the birth to the registration office. Under this system the District Health Officer receives a copy of entries in the birth and death register from the Municipal Committee, Town Committees and Cantonment Boards every week and from Union Councils every month. These copies are sent to the Divisional Health Directorates of the provinces.

The monthly birth and death returns are compiled for Urban and Rural areas in their statistical sections. In each province as a whole a statement is prepared in Provincial Health Directorates annually. The final statements are then forwarded by Provincial Health Directorates to the Director General Health, Government of Pakistan.

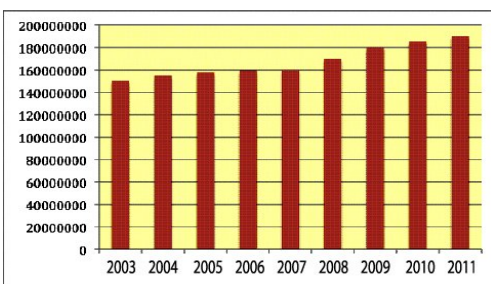


Fig 1.1: Shows trend in Pakistan Population growth

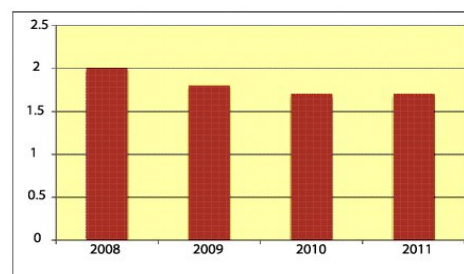


Fig 1.2 Shows Population growth rate

Year of study	Maternal Mortality	Infant Mortality	Total Fertility	Life expectancy at birth
	Rate 1000	Rate 1000	Rate 1000	Rate 1000
1970	180.4	105	7	54
1990	130.4	101	6.1	61
2009	89.1	71	3.9	67

Fig: Shows trends in mortality rates

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Going small: From an idea to technological development

*Rabia Nazir

Abstract

Nanotechnology sprouts with an idea of Richard Feynman and since then had passed through many stages to reach a place where it carries a potential to spring any country's future. With its small size, nanomaterials show properties that are different from their bulk counterparts. These properties can be tailored to find potential applications in the various fields of life like medicines, agriculture, cosmetics, energy, environment etc.

Keywords: Nanotechnology, properties, application

Introduction

Nanotechnology — a new revolution in 21st century, deals with small structures having dimensions of billionth of meter as affirmed by prefix nano (10^{-9} m) [1]. Getting small has not just contributed to reduction in size that approached near the molecular and atomic level but also contributed to more functionality and tailored physical properties [2]. In general, nanotechnology caters all areas of life and can be understood as a technology of design, fabrication and applications of nanostructures and nanomaterials that have at least one dimension falling between 1 to 100nm [3]. In addition, it also deals with fundamental understanding of physical properties and phenomena, referred as nanoscience [2, 4].

Nanotechnology: (a big idea)

Though the term “Nanotechnology” is new to the era but the existence of nanomaterials in this world is not new. Nature carries a lot more examples of objects and processes that take place at nanoscale, mollusks shell, formation of DNA helix and proteins within the body are absolute true examples of that [1, 4]. The term was first introduced by Eric Drexler in *Engines of Creation* (1986) to illustrate the “manipulation of individual atoms and molecules to build structures to complex, atomic specifications” [5] but long before that the idea was given by Nobel prize winner, Richard Feynman (known as Father of Nanotechnology) in his famous lecture *There 's Plenty of Room at the Bottom* (1959) (latter on written on nanoscale Fig. 1) where he suggested that things can be maneuvered atom by atom [6]. The concept of it was further expanded by a question “Why cannot we write the entire 24 volumes of the Encyclopedia Britannica on the head of a pin?” and it was not earlier than year 1990, when the question was really answered by the creation of a world's smallest logo i.e. word IBM was written by 35 individual Xenon atoms (Fig. 2) [7].

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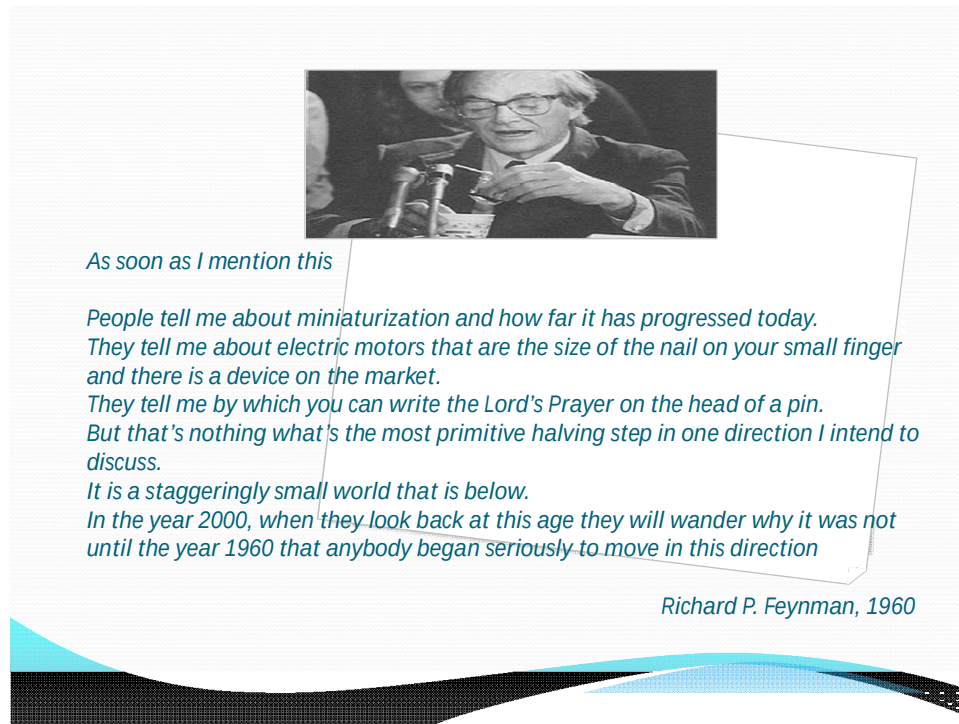


Figure 1: Richard Feynman's founding speech of nanotechnology written on nanoscale[3]

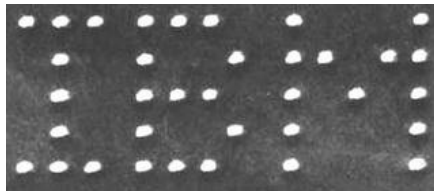


Figure 2: IBM logo- world's smallest logo written by Xenon atoms

Now, nanotechnology has become a broad and multidisciplinary field of research with emerging applications in almost every field of life.

Size-dependent properties of nanomaterials

The nano world is full of surprises and potential. In this realm, the disciplinary boundaries between chemistry, molecular biology, materials science and condensed matter physics dissolve as scientists struggle to understand new and sometimes unexpected properties [1]. Nanomaterials possess a large fraction of surface atoms per unit volume and the number of surface atoms increases as the size decreases that on other hand will increase the surface energy [2] while with decrease in neighboring atoms density of states can vary considerably [8]. Many of the reasons can contribute to the properties of nanomaterials different from that of the bulk counterpart. These can be 1) large fraction of surface atoms, (ii) large surface energy, (m) spatial confinement, and (iv) reduced imperfections [2]. The properties that significantly get affected with decrease in particle size are melting point, mechanical properties and optical properties (Fig. 3)

Nanotechnology can be perceived as a process of miniaturization that is still enjoying its infancy age [6] and need to be much more researched to exploit its full potential that this field is capable of. Owing to its deep down prospective where properties can be tailored and exploited to create new features and functions [2, 9], this field has fascinated both scientists and industrialists to bring new revolutions in the areas of medicine, cosmetics, electronics, energy, agriculture and so on (Fig. 4). Such technological developments will offer better build, smaller, safer and smarter products for general purpose.

Nanotechnology in medicine

Our normal body functions take place at nanoscale — natural scale and it is the scale where diseases need to be tackled and finally surmounted [3]. Thus treating the body at single-cell level allows many of the treatments to be carried out without imparting negative impacts to the rest of body. Rapid and novel progress in the field of health care has really marked new paradigm shift resulting in development of improved and targeted drugs, artificial implants, nanosurgical tools, cancer treatment, imaging, therapeutic, diagnostic etc.

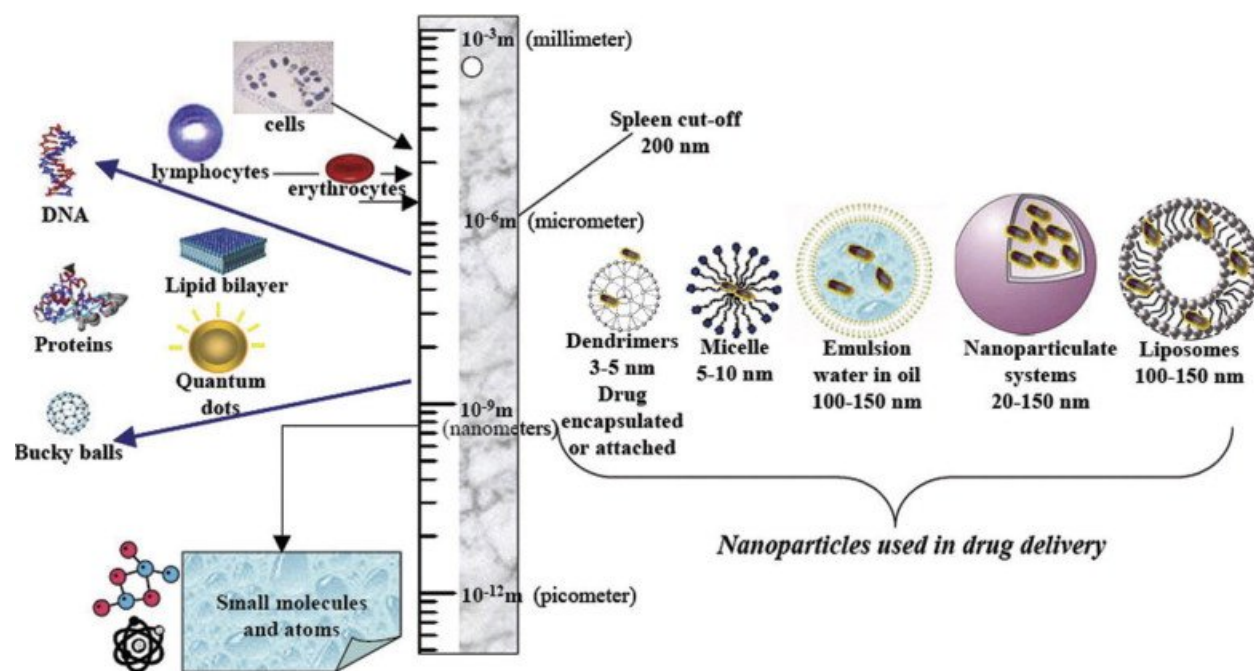


Figure 5: Nanoparticle system for drug delivery applications [10]

Targeted drug delivery with aid of nanotools (e. g. nanorobots) and nanosensors to a specific point in body where its action is required had not only reduced the therapeutic amount of drug required to combat the disease but has also reduced the side effects associated with the use of these medicines and improved efficacy [3]. Targeted drug delivery is the most explored and advanced field of nanomedicines (Fig. 5) that had helped in treatment of tumor, cancer, leishmaniasis, diabetes, cardiovascular, Alzheimer's and Parkinson's diseases etc [11-14]. *Nanosurgery*, another useful application of nanotechnology in medicines, favors the surgical procedures to be carried out at cellular level with high degree of accuracy and non-invasiveness [15, 16]. This is carried out with help of nanorobots fitted with surgical tools that are injected into the blood stream of patient. Until today this apparent fiction had worked wonders by successfully

operating the cancerous cells in different parts of body, cut dendrites from a single neuron, incision less brain surgery, spinal lesions using CyberKnife [17, 18] etc.

Nanotechnology in cosmetics

Nanotechnology has also made progressive advancement in the field of cosmetics and all together have altered the older perspective of cosmetics - “product to camouflage imperfections in personal appearance” to cosmeceutical — “products that cure and heal” [19]. One of the few earlier usages of nanoparticles (titanium oxide and zinc oxide) is in emulsions of sunscreens and anti-ageing creams to make them more effective and stable [20]. Owing to the very small size, nanoparticles can penetrate deeper in the skin and can help in early absorption and repair of cells. Further modifications can be done to enhance internal reflections of light and creation of wide variety of makeup colours [21]. The area of nanocosmetics is still juvenile and there is considerable apprehension about its safety as topical use of nanoparticles leads to direct penetration in the body [22, 23].

Nanotechnology in agriculture and food industry

Nanotechnology has proved its potential in revolutionizing the agriculture and food industry with its smart innovations that have modified the whole chain from farm to kitchen (Fig. 6). The development of slow release fertilizers (nanofertilizers) and pesticides (nanopesticides) has gained a lot of recognition in past few years [24]. These nanocapsules had helped in safe and effective administration of these chemicals hence increasing the balance between rate of release and rate of uptake by the plant thus avoiding the leaching of these chemicals in the soil that otherwise would cause adverse effect [25]. In cases where soil is either infected or prone to infection by soil microorganisms, nanosensors have played a remarkable role in diagnosis. These nanobiosensors have also helped in detection of contaminants, pests, nutrient content, pesticides level, crop growth etc. Recent advances in the field of nanosensors have enabled detection of DNA and proteins in plants helping in discovery of abnormalities, mineral deficiency, specie detection [26]. Nanoseed varieties with in-built pesticides are another classic contribution of the nanotechnology [27].

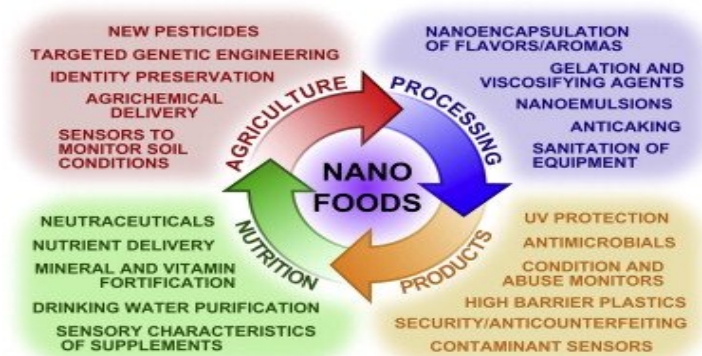


Figure 6: Revolutionization of food and agri industry by nanotechnology [28]

Nanotechnology has also emerged as an attractive technological innovation in the food industry by aiding in animal production, fish farming and food safety. Nano-encapsulation techniques have made it possible to maneuver the nutritional value of food according to requirements. Nano food packaging is another growing area that has enabled the improved quality, durability and shelf life of packed foods. Development of *smart packaging* and *smart fridges* containing biosensors and silver nanoparticles has enabled the detection of pathogens and food safety, respectively [27, 29] (Fig. 7).



Figure 7: An hour glass shaped sensor for determining the spoiling of meat, as the meats get rotten the sensor changes colour from white to black completely covering the bar code so it cannot be scanned.

Nanotechnology in environment

There are three main areas of advances in environmental nanotechnology:

- 1) Sensors
- 2) Treatment
- 3) Remediation.

Detection of pollutants level can be done with help of nanosensors either by continuous measurement or as lab-on chip. These sensors can be utilized for monitoring the level of pollutants released during a process [30]. Organics, biological pathogens, heavy metals, gases etc. can be detected with help of these sensors that are either based on nanoparticles, nanotubes or nanostructures [31]. Carbon nanotubes (CNT) owing to their high surface area and good catalytic activity offers much improved biosensors that are used in detection of various compounds e.g. organophosphorous pesticides, phenolic compounds, gases etc. [32]. Similarly, functionalized nanoparticles help in detection of heavy and other metals' ions like Pb (II), Cd(II), Co(III), Cr(III), Fe(III), Ni(II), Zn(II), Hg(II), Li(I), K(I), Ca(II), and so on with enhanced selectivity and sensitivity [33]. Development of nanosensors for monitoring of different gases in the environment have played a remarkable role in determination of pollutants and other gases in the atmosphere with near the point sources or non-point source [31].

Environment polluted with toxic, bioaccumulative and persistent pollutants is posing much harm to the living flora and fauna. Nanosorbents provide better kinetics and surface for adsorption of pollutants and capturing particles as a result of which these nanosorbents are effectively used in treatment of drinking as well as waste water e.g. volatile organic carbons have been effectively adsorbed on the CNT [34]. Nanocatalyst because of their extreme reactivity and high surface area played a marvelous role in degradation of harmful organic molecules like pesticides, phenols, dyes, chlorinated compounds [35] etc. Nanofilters, having pore size between 0.5-1nm and able to reject contaminants with diameter as small as 0.01 μm , are applied to lower the turbidity, total dissolved solids and hardness, remove heavy metals, large organic molecules(dyes, pesticides) and even

microbes (viruses, bacteria) [3 6]. Nanofiltration process is carried out at low pressure than reverse osmosis, a famous and most popular technique used for purification of water, enabling energy saving [37].

Decontamination of groundwater using nanoparticles is one of the most prominent emerging technology [38] and for this purpose various metal nanoparticles especially iron either as zero valent ion or in oxide forms gains the most attention because of its exceptionally good results (Fig. 8) [35, 39]. These nano iron based technologies have not only shown their potential in water remediation but also proven themselves effect in healing the current status of soil [40].

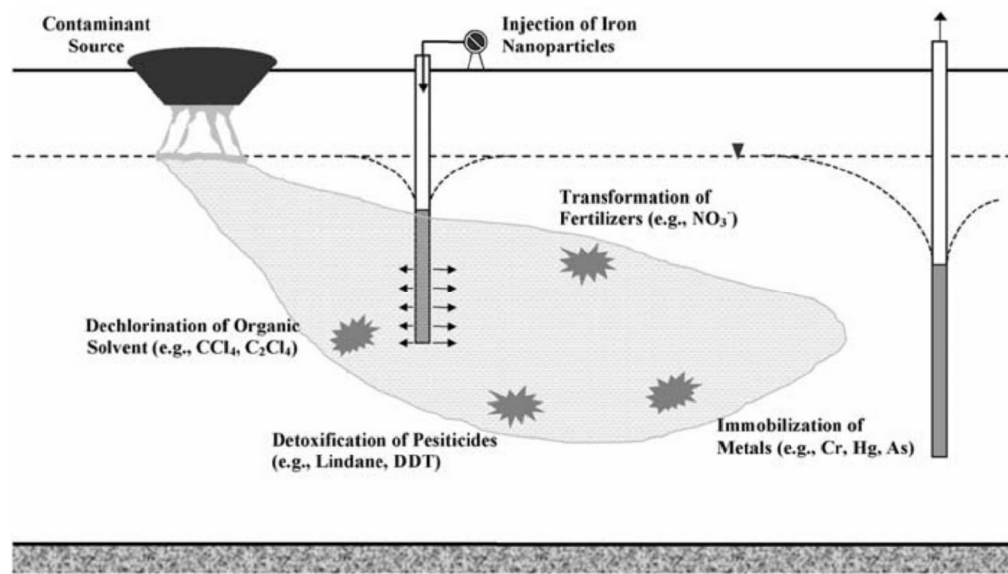


Figure 8: Iron nanoparticles for ground and waste _water remediation

NT in energy sector

Nanotechnology has the potential of addressing the current energy crises faced by human now-a-days along with provision of clean, secure and sustainable energy future (Fig. 9)[41].

There are many fields in which nanotechnology had shown advancement like photovoltaic' hydrogen production, fuel cells, thermoelectricity and so on. Green fabrication is another step forward towards sustainable energy where processes are less energy intensive besides saves a lot of energy [41, 42].

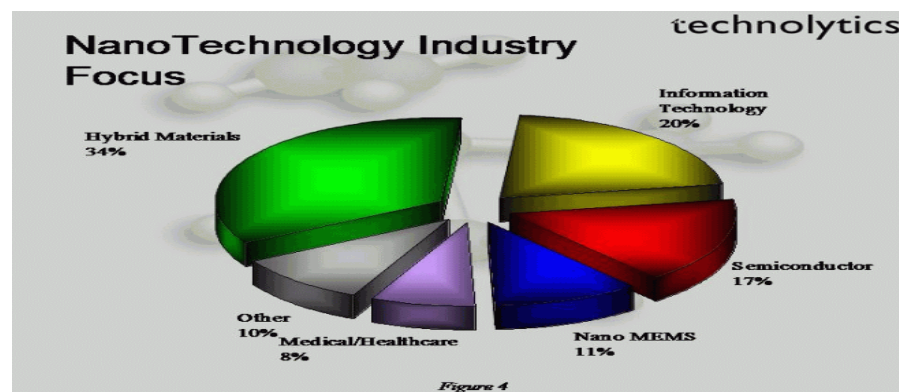


Figure 9: Areas of energy where nanotechnology has shown its potential

Conclusion

Nanotechnology, the science and technology of small things, has travelled the era tin" more than two decades now -beginning with the ideological framework of the Richard Feynman. Passing through these years the field started its journey with the basic research and now has travelled to the era of technological advancements marked by focused research and development.

Sprouting with the day to day discoveries in almost every field of life, nanotechnology had proven itself a beneficiary of the society. With its tailored properties it has improved and is still in process of helping and revolutionizing many sectors like medicines, agriculture, energy, environment, food, cosmetics etc. Though. Nanotechnology has blossomed itself into a really advance field but there is still plenty of room at the bottom to investigate and explore: to realize the true potential this technology carries within.

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Screening *Mangifera Indica* Leaf Extracts against Dental caries Bacteria

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ABSTRACT:

The present study focused on evaluating the antibacterial effect of *Mangifera indica* against dental caries forming bacteria. Medicinal plants have proven to be an effective and safe alternative to synthetic medicines. The antibacterial activity of *Mangifera indica* was checked with aqueous, methanolic, hexane and ethyl acetate against *Streptococcus viridans*, *Streptococcus mutans*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Bacillus subtilis*. The largest zone of inhibition was obtained with the hexane extract of (24mm) against *Pseudomonas aeruginosa*. Minimum Inhibitory Concentration (MIC) of extract was also determined against the selected microorganisms showing zone of inhibition > 8mm. The study concluded that the leaves of *Mangifera indica* possessed very good antibacterial activity against dental caries causing microorganisms and can be used as a potential source for making a phytomedicine used to cure dental caries.

KEYWORDS: Dental caries, antibacterial, methanol, hexane, ethyl acetate extract

INTRODUCTION:

Dental caries, a multifactorial human disease that has affected populations all over the world [1] and often epidemic among poor in developing countries [2]. Bacterial plaque plays the key role in the pathogenesis of this disease. It is usually formed as protected but stagnant surfaces which are at greater risk of disease. Highest Susceptibility for caries lie in the age group of 20-40 years and among them female is more susceptible than males [3]. Teeth affected with dental caries is a source of infection and if left untreated will gradually lead to tooth loss, which in turn causes difficulties in chewing and aesthetic problems [4]. Whether the caries lesion will stay same, will progress or reverse is determined by the balance between pathological factors and protective factors [5]. Plants have played very important role in treatments of infectious disease caused by many pathogenic microbes for centuries [6]. Development of resistant bacterial strains against antibiotics necessitated the need to search for new antibacterial agents [7]. According to survey conducted by WHO, 2001 herbal medicine serve the health need of almost 80 % of world's population specially the millions of people living in rural areas of developing countries.

Mangifera indica belongs to the family Anacardiaceae. There are about sixty genera and six hundred species. They are mainly tropical trees and shrubs. It is widely used as a source of food, medicines and timber. The leaves and flowers are refrigerant, styptic, vulnerary and constipating. The genus *Mangifera* originates from the Asia [9] It is the largest fruit-tree in the world (up to 40m) and an average circumference of twelve to fourteen feet sometimes reaching twenty.

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The plant is well known for its pharmacological properties. In our study, we investigated the antibacterial activity of four different solvent extracts of *Mangifera indica* on dental caries causing bacteria.

MATERIALS AND METHODS:

Preparation of Plant Extract:

The plant was collected from different areas of Rawalpindi, Lahore and Islamabad and was further confirmed in the Department of Botany, Quaid-i-Azam University, Islamabad Pakistan and a sample specimen was deposited in the herbarium library of the university. Leaves were thoroughly washed with distilled water and left for drying in shade for five days. 500gm of air dried, powdered material was then extracted with Hexane, methanol, ethyl acetate and water by cold maceration method for 72 hours and then it was filtered using Whatman No.1 filter paper [10] it was further evaporated in rotary evaporator under vacuum at 40°C using Heidolph, VE-II rota evaporator [11]. After evaporation, extracts were stored in freezer at 4°C until further use.

Bacterial strains and Media:

Dental caries causing bacteria *Streptococcus mutans* ATCC25175, *Streptococcus salivarius* ATCC13419, *E. coli* ATCC10536 were procured from Microbiologics Lahore, Pakistan and *Pseudomonas aeruginosa*, *Bacillus subtilis*, *Staphylococcus aureus*, and were procured from the University of Veterinary and Animal Sciences, Lahore, Pakistan. These were then sub cultured on Nutrient agar and Brain Heart plates and incubated aerobically at 37°C for 24 hours.

Antimicrobial assay:

Antimicrobial activity was determined using agar well diffusion method [12]. Pure isolates of microbes were sub cultured and normal saline (0.85%) was prepared of 24 hours old culture under aseptic conditions, with density of each microbial suspension was adjusted to that of 10⁶ Colony Forming Unit CFU/ml standardized by 0.5 McFarland standard. The crude extract fractions were dissolved in 20% (V/V) solution (gt Dimethyl sulfoxide DMSO (Fluka, Madrid, Spain) in normal saline [13]. Agar plates were prepared and 100ul of inoculum of each test microbe was spread with the help of sterile glass spreader on agar plates and was allowed to dry and with help of sterile cork borer wells measuring 6mm in diameter were made. A 80ul of each extract was then poured in the wells and plates were incubated at 37°C for 24 hours [14-16]. DMSO was used as negative control and ciprofloxacin (Sigma-Aldrich, Germany) was used as positive control. If the zones of inhibition were greater than 6mm the antimicrobial activity was recorded [17]. The experiments were performed in duplicates and mean values of the diameter of inhibition zones with $\pm$ standard deviation were calculated [18].

Minimum Inhibitory Concentration (MIC):

Minimum Inhibitory Concentration (MIC) is defined as the lowest concentration of a compound /drug/extract that completely inhibits the growth of the microorganism in 24 hours [17]. MIC for the extracts was determined by modified agar well diffusion method [19]. Two fold serial dilutions of extracts -were prepared to get the decreasing concentration range of 4mg/ml. 100 ul of each dilution was then introduced into wells in the specific media agar plates with inoculum (10⁶ CFU/ml) of the test microbial strain. All test plates were incubated aerobically at 37°C for 24 hrs and observed for zone of inhibition.

Phytochemical analysis:

Extracts were subjected to qualitative test for the presences of alkaloids, flavonoids, tannins and saponins by the method defined by [19, 20-23]

RESULTS AND DISCUSSIONS

In present study four different extracts of leaves of *M.indica* were evaluated for their potential antibacterial activity and phytochemical screening against 6 available pathogenic bacteria that cause dental caries in rural parts of developing countries' medicinal plants they are the primary source of medicines [24] and almost 75% of new drugs originate from natural sources[25].

The results of antibacterial assay of four different leaves extracts of *Mangifera indica* have been shown in Table 1 indicating the positive activity against all the tested oral bacteria. The maximum Zone of inhibition was observed in hexane extract (24mm) against *Pseudomonas aeruginosa*. The MIC of the extracts against the test pathogens are presented in Table 2.

The antibacterial activity on the agar plates varied in different solvents. The positive control (ciprofloxacin) produced significantly sized inhibition Zone against the test bacteria. However, the negative control produced no observable inhibitory effect. The leaves of *Mangifera indica* were also rich in flavonoids, alkaloids, saponins and tannins, which give the antibacterial activity on the leaf extract (Table 3).

No activity. Values, including the diameter of the well (6 mm), are means of three replicates $\pm$ standard deviation. Ciprofloxacin (positive control), DMSO (negative control)

The methanol, hexane, aqueous and ethyl acetate extract proved to be active against all the bacterial strains. Phytoconstituents have been found to inhibit bacteria, fungi, viruses and pests as reported by [26]. Among the extracts tested, the hexane extract exerted highest activity on bacterial pathogen as compared to methanol, ethyl acetate and aqueous extracts. At 250mg/ml a zone of 24mm was observed against *Paeruginosa* and 20mm against *Bacillus subtilis*, followed by 20mm zone of inhibition of aqueous extract against *E. coli* (Table 1) whereas at the same concentration the methanol extracts, exerted highest activity against *P. aeruginosa* with diameter zone of inhibition of 18mm and 16mm against *S. aureus* and *E. coli*. The least activity (12mm) was recorded by the ethyl acetate extract against *S. aureus*, *P. aeruginosa*, *S. aureus* at 250mg/ml.

The difference in activities that was observed among the solvents in this study may be linked with the presences of resins, fatty acids and pigments which had been reported to be able to block the active ingredients in the extracts preventing them from reaching bacterial cell wall [27].

The positive results obtained in the present study indicate the broad spectrum of activity against both gram positive and gram negative bacteria thus can be used to source antibiotic substances for drug development to treat bacterial infections. Further identification and purification of bio active compound/s and toxicological investigations of the plant extracts should be carried out with a view to developing novel drugs for human consumption.

Plants that have antimicrobial compounds present in them have remarkable potential to be used for therapeutic purposes without any undesirable effects that are usually observed in synthetic compounds[28].

CONCLUSION:

This study evaluated the antibacterial potential of selected species of *Mangifera indica* against dental caries causing bacteria. The results obtained in the present study suggest another potential application of leaves of *M. indica* for treatment of dental caries, further purification and toxicological studies of the plant and its in vivo trials should be carried out for the development of a phytomedicine to act against dental caries causing microbes.

Table 1

Antibacterial activity of leaf extracts against dental caries causing oral pathogens by agar well diffusion method

Name of Plant	Conc/mg	Streptococcus Salivariuss	Streptococcus Mutans	Pseudomonas aeruginosa	Escherichia coli	Staphylococcus aureus	Bacillus Subtilis
Mangifera Indica	Aqueous	-	-	16 ±0.707	20 ± 0.707	14 ± 0.494	14 ± 1.484
	Methanol 20 %	12 ±1.272	15 ±0.707	15 ±1.414		14 ± 1.414	14 ± 1.414
	60 %	-	16 ±1.142	18 ±1.414	16 ±1.414	12 ± 1.06	10 ± 1.414
	Hexane 20%	-	12 ±1.142	-	-	12 ± 0.707	12 ± 0.494
	60%	17 ± 0.282	15.8 ± 0.212	24 ± 0.494	15 ± 0.707	18 ± 0.707	20 ± 1.130
	Ethyl acetate 20%	12 ± 0.707	14 ± 0.707	12 ± 0.707	-	-	12 ± 0.707
	60%	16 ±0.494	12 ±0.707	12 ±0.707	-	12 ±0.707	15 ±1.41
Ciprofloxacin		28mm	26mm	22mm	22mm	25mm	30mm
Dimethyl sulfoxide (DMSO)	-	-	-	-	-	-	-

Table 2: Minimum Inhibitory concentration (mg/ml) of extract against dental caries causing microorganisms

Microorganism	Mangifera indica		
	Hexane	Methanol	Ethylacetate
<i>Streptococcus mutans</i>	20	4	100
<i>Streptococcus salivariuss</i>	20	4	20
<i>Bacillus subtilis</i>	-	4	100

<i>Staphylococcus aureus</i>	100	12	100
<i>Pseudomonas aeruginosa</i>	12	20	20
<i>E. coli</i>	20	4	20

Table 3**Phytochemical analysis of leaves of *Mangifera* 90**

Name of test	Methanolic extract	Ethyl acetate extract
Test for saponins	+	+
Test for tannins	+	++
Test for alkaloids	++	-
Test for flavonoids	+	+

+: present, -: Absent

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Muslim Contributions in Innovations in Science in the Past Century

(A call for awakening)

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Introduction: The past glories can act as role models or provide incentives for progress, only as it will be clear from the following text. The Islamic period in history is traditionally dated from the mid-7th century to the mid-13th century at which Muslim rulers established one of the largest empires. During this period the Islamic world contributed to agriculture, the arts, economics, industry, law, literature, navigation, philosophy, sciences, sociology, and technology, both by preserving earlier traditions and by adding innovations of their own. The Muslim world became a major intellectual centre for science, philosophy, medicine and education. The question which every Muslim should be asking himself or herself is the logic of clinging to our past and lag behind other nations.

Translation Movement: In Baghdad (Present IRAQ) Muslims established the "House of Wisdom", where scholars, both Muslim and non-Muslim, sought to gather and translate the world's knowledge into Arabic in the Translation Movement. Many classic works of antiquity that would otherwise have been forgotten were translated into Arabic and later in turn translated into Turkish, Sindhi, Persian, Hebrew and Latin. Knowledge was synthesized from works originating in ancient Mesopotamia, Ancient Rome, China, India, Persia, Ancient Egypt, North Africa, Ancient Greece and Byzantine civilizations. What would have happened if these works were not translated at that time? Is the present Muslim scholar going through scientific works reported in languages other than English if not he must do that. Only English language literature would not be enough for scientific progress.

Muslim intellectual centers: Rival Muslim dynasties such as the Fatimid's of Egypt and the Umayyad of al-Andalus were other intellectual centers with cities such as Cairo and Córdoba rivaling Baghdad. The haphazard increase in intellectual centers in the Muslim world has occurred but no single country can boast about having the best facility working for the wellbeing of all mankind.

The birth of Universal Civilization: The Islamic empire was the first "truly universal civilization," which brought together for the first time "peoples as diverse as the Chinese, the Indians, the people of the Middle East and North Africa, black Africans, and white Europeans."

Past Islamic Works: Many medieval Muslim thinkers pursued humanistic, rational and scientific discourses in their search for knowledge, meaning and values. A wide range of Islamic writings on love, poetry, history and philosophical theology show that medieval Islamic thought was open to the humanistic ideas of individualism, occasional secularism, skepticism and liberalism.

Religious freedom, though society was still controlled under Islamic values, helped create cross-cultural networks by attracting Muslim, Christian and Jewish intellectuals and thereby helped spawn the greatest period of philosophical creativity in the middle Ages from the 8th to 13th centuries. The past century has seen the explosion of scientific research never seen before but there is hardly any share of Muslim scientists.

Present Islamic Works;

Unfortunately the share of Muslim scholars is insignificant when compared with contributions from the non Muslim scholars. Most Muslim Scholars are happy in their self created glorious world of achievements under the guise of publications numbers citations and impact factor. They have damaged the most in scientific field in almost all Muslim countries. The real innovator and researcher is baffled with such useless and wasteful list of achievements. In Pakistan one scientist boasts about publishing 600 books and thousands of articles but cannot mention one drug or article created for the betterment of mankind the other countries have similar leaders .

Freedom of Speech: Another reason the Islamic world flourished during this period was an early emphasis on freedom of speech, as summarized by al-Hashimi (a cousin of Caliph al-Ma'mun) in the following letter to one of the religious opponents he was attempting to convert through reason:

"Bring forward all the arguments you wish and say whatever you please and speak your mind freely. Now that you are safe and free to say whatever you please appoint some arbitrator who will impartially judge between us and lean only towards the truth and be free from the sovereignty of passion and that arbitrator shall be Reason, whereby God makes us responsible for our own rewards and punishments. Herein I have dealt justly with you and have given you full security and am ready to accept whatever decision Reason may give for me or against me. For "There is no compulsion in religion" (Qur'an 2:256) and I have only invited you to accept our faith willingly and of your own accord and have pointed out the hideousness of your present belief. Peace is upon you and the blessings of God!"

Freedom of speech and expression in present century especially in recent past has been severely abused, In my view it is mainly due to misunderstood the meaning of free and freedom, First of all there is nothing free in the whole universe let alone mankind and his habitat on the planet. For speech we are dependent on structure and movement of tongue, vocal cords, the nerves which control the opening and closure of vocal cards, intact brain and in it functioning speech center. Knowledge of alphabets and phonetics is used to make any kind of speech. What to say and when to say is also controlled by our self restraints and discipline, culture, education level, and place where we are going to speak, speech in privacy in front of the mirror is different from speech in place of learning, business and worship. How easy we have made the slogan of freedom of speech. In fact our lips, lungs,, air in the lungs and movement of vocal cords is regulating our speech. Now if the expression of speech should be free so let us singly take this for discussion, even this commodity is also dependent on place, circumstances, situation, subject and motive or intention. We can easily insult other human being and abuse his faith on the pretext of freedom of speech. unfortunately this has become a standard of free speech in the western world and is rapidly spreading in the rest of the world We are sure it was not meant by the Al-Hashmi's summery. Freedom of speech for a person can easily become hurdle for the other person and usurp his or her right to freedom. It is the cultural religious and social conduct which has been and can continue to determine boundaries under which freedom can be practiced judiciously and in befitting manner otherwise it will be no more freedom in its real sense.

Early proto-environmentalist treatises were written in Arabic by al-Kindi, al-Razi, Ibn Al-Jazzar, al-Tamimi, al-Masihi, Avicenna, Ali ibnRidwan, Abd-el-latif, and Ibn al-Nafis. Their works covered a number of subjects related to pollution such as air pollution, water pollution, soil contamination, and municipal solid waste mishandling. Cordoba, al-Andalus also had the first waste containers and waste disposal facilities for litter collection. We feel sorry for the present state of affairs in the entire Muslim World. There is hardly one country where freedom of speech is practiced.

Scientific Institutions: A number of important educational and scientific institutions previously unknown in the ancient world have their origins in the early Islamic world, with the most notable examples being: the public hospital (which replaced healing temples and sleep temples) and psychiatric hospital, the public library and lending library, the academic degree-granting university and the astronomical observatory as a research institute as opposed to a private observation post as was the case in ancient times). There is some awakening in the Muslim world for establishing scientific institutions of excellence but co-ordination amongst such institutions is severely lacking.

Universities: The first universities which issued diplomas were the Bimaristan medical university-hospitals of the medieval Islamic world, where medical diplomas were issued to students of Islamic medicine who were qualified to be practicing doctors of medicine from the 9th century. The Guinness Book of World Records recognizes the University of Al Karaouine in Fez, Morocco as the oldest degree-granting university in the world with its founding in 859 CE. Al-Azhar University, founded in Cairo, Egypt in the 975 CE, offered a variety of academic degrees, including postgraduate degrees, and is often considered the first full-fledged university. The origins of the doctorate also dates back to the *ijazatattadriswa 'l-ifttd* ("license to teach and issue legal opinions") in the medieval Madrasahs which taught Islamic law. Muslim world still lags behind in making its universities, the seat of Research and Innovations.

Libraries: The library of Tripoli is said to have had as many as three million books before it was destroyed by Crusaders. The number of important and original medieval Arabic works on the mathematical sciences far exceeds the combined total of medieval Latin and Greek works of comparable significance, although only a small fraction of the surviving Arabic scientific works have been studied in modern times.

"The results of the Arab scholars' literary activities are reflected in the enormous amount of works (about some hundred thousand) and manuscripts (not less than 5 million) which were current... These figures are so imposing that only the printed epoch presents comparable materials"

A number of distinct features of the modern library were introduced in the Islamic world, where libraries not only served as a collection of manuscripts as was the case in ancient libraries, but also as a public library and lending library, a centre for the instruction and spread of sciences and ideas, a place for meetings and discussions, and sometimes as a lodging for scholars or boarding school for pupils. The concept of the library catalogue was also introduced in medieval Islamic libraries, where books were organized into specific genres and categories.

Legal institutions introduced in Islamic law include the trust and charitable trust (Waqf), the agency and aval (Hawala), and the lawsuit and medical peer review.

Muslim Scholars: During the Islamic Golden Age, polymath scholars with a wide breadth of knowledge in different fields were more common than scholars who specialized in any single field of learning. Notable medieval Muslim polymaths included al-Biruni, al-Jahiz, al-Kindi, IbnSina (Latinized: Avicenna), al-Idrisi, IbnBajjah, IbnZuhr, IbnTufail, IbnRushd (Latinized: Averroes), al-Suyuti, JābiribnHayyān, Abbas IbnFirnas, Ibn al-Haytham (Latinized: Alhazen or Alhacen), Ibn al-Nafis, IbnKhaldun, al-Khwarizmi, al-Masudi, al-Muqaddasi, and Nasir al-Din al-Tusi. With early access to world literature through internet the electronic or e libraries are just beginning to emerge in the Muslim World.

The whole list of Muslim Scholars who developed something new for the benefit of mankind is negligible. In the entire Islamic world (57) countries there are only 500 universities including Pakistan emphasis on research and innovation is severely lacking in those universities in fact the Private sector universities are mostly money making houses playing havoc with standards of education unlike USA where there are 5758 universities with high standards found at Harvard, MIT, Stanford and Yale. Innovations from Private Universities are much more than state run universities. Similarly in India there are 8407 universities, beginning to catch up with the developed world. Increase in number of universities with low standards and increase in number of PHD is proving counter productive and quite harmful. The real achievers are being buried deeper and deeper with such yardsticks adopted to benefit few.. Developing countries such as Pakistan should get rid of such standards as soon as possible if progress of any kind is to be made to catch up with the developed world.

Inventions and Innovations: There appears to be a complete halt in inventions and innovations by the present Muslim Scholars. Early scientific methods were developed in the Islamic world, where significant progress in methodology was made, especially in the works of Ibn al-Haytham (Alhazen) in the 11th century, who is considered a pioneer of experimental physics, which some place in the experimental tradition of Ptolemy. Others see his use of experimentation and quantification to distinguish between competing scientific theories as an innovation in scientific method. Ibn al-Haytham (Alhazen) wrote the *Book of Optics*, in which he significantly reformed the field of optics, empirically proved that vision occurred because of light rays entering the eye, and invented the camera obscura to demonstrate the physical nature of light rays.

Ibn al-Haytham has also been described as the "first scientist" for his development of the scientific method, and his pioneering work on the psychology of visual perception is considered a precursor to psychophysics and experimental psychology although this is still the matter of debate.

A significant number of inventions were produced by medieval Muslim engineers and inventors, such as Abbas Ibn Firnas, the Banū Mūsā, Taqī al-Dīn, and most notably al-Jazari.

Some of the inventions journalist Paul Valley has stated to have come from the Islamic Golden Age include the camera obscura, coffee, soap bar, tooth paste, shampoo, distilled alcohol, uric acid, nitric acid, alembic, valve, reciprocating suction piston pump, mechanized water clocks, quilting, surgical catgut, vertical-axle windmill, inoculation, cryptanalysis, frequency analysis, three-course meal, stained glass and quartz glass, Persian carpet, and celestial globe.

Movers of Current History: Albert Einstein, Sigmund Freud, Karl Marx, Paul Samuelson, Milton Friedman are all non muslims, people like Quaid-e-Azam, Allama Muhammad Iqbal, Sir Syed Ahmad Khan, Shah Faisal of Saudi Arabia are only few Muslims who helped significantly the current history especially in politics and philosophy most contributors are again from the non muslim world.

Current Medical Milestones: In this field also the non muslim scholars have contributed as in Vaccinating Needle (Benjamin Ruben), Polio Vaccine (Jonas Salk), Leukaemia Drug (Gertrude Elion), Hepatitis B (Baruch Blumberg), Syphilis Drug (Paul Ehrlich), Neuro muscular: (Elie Metchnikoff), Endocrinology: (Andrew Schally), Cognitive therapy: (Aaron Beck), Contraceptive Pill (Gregory Pincus), Understanding of Human Eye (G. Wald), Embryology (Stanley Cohen), Kidney Dialysis (Willem Kloffcame)

Nobel Prize Winners: If this prize is taken as highest standard of scientific achievement again non muslim emerge on the front line. In the past 105 years out of 14 Million non muslims, 180 scientists have won Nobel prizes and out of 1.5 Billion Muslims only 3 Nobel winners in science. A large number of Noble Prize winners remain non muslims till this date.

Recent Inventions that changed History: Micro- Processing Chip (Stanley Mezor), Nuclear Chain Reactor (Leo Sziland), Optical Fibre Cable(Peter Schultz), Traffic Lights(Charles Adler), Stainless Steel(Benno Strauss), Sound Movies(Isador Kisee), Telephone Microphone (Emile Berliner), Video Tape Recorder(Charles Ginsburg). Almost all of these scientists are non Muslims. In recent times the Muslim contributors are very few indeed.

Influential Global Business: Polo(Ralph Lauren, Coca Cola, Levi's Jeans (Levi Strauss),Sawbuck's (Howard Schultz), Google (Sergey Brin), Dell Computers (Michael Dell) Oracle (Larry),DKNY (Donna Karan)Baskin & Robbins (Irv Robbins) Dunkin Donuts (Bill Rosenberg), again these entrepreneurs are non muslims.This may well be due to enormous influence of western media which projects and advertises their own products and the people behind those products.

Influential Intellectuals/ Politicians: Henry Kissinger(US Sec of State),Richard Levin, (President Yale University), Alan Greenspan (US Federal Reserve),Joseph Lieberman Madeleine Albright (US Sec of State, Casper Weinberger(US Sec of Defence), Maxim Litvinov(USSR Foreign Minister), David Marshal(Singapore Chief Minister), Isaacs Isaacs, (Gov-Gen Australia) Benjamin Disraeli, (British Statesman), YevgenyPrimakov, (Russian PM), Barry Goldwater, (US Politician), Jorge Sampaio, (President Portugal), Herb Gray, (Canadian Deputy – PM), Pierre Mendes, (French PM), Michael Howard, (British Home Sec), Bruno Kriesky, Austrian Chancellor, Robert Rubin(US Sec of Treasury)Nelson Mandella, Castro & Gandhi are non muslims. A few Muslims like Quaid-e-Azam, Allama Mohammad Iqbal& Shah Faisal are not enough. It is fault of the Muslim World who kept her doors closed to the powerful electronic media in their countries.

Global Media Influential: Wolf Blitzer (CNN), Walters (ABC News), Eugene Meyer (Washington Post), Henry Grunwald (Time Magazine), Katherine Graham(Washington Post), Joseph Lelyeld (New York Times), Max Frankel(New York Times)There are some great media professionals in the Muslim world too but their names are hardly ever mentioned in the global media influentials.

Global Philanthropists: In this field too we hear about George Soros, Walter Annenberg who are both non Muslims. Eidhi and few more people like him are just few in the Muslim world.

Noble Laureates of the Muslim World:

Egypt:Anwar al-Sadat awarded Nobel Peace Prize in 1978.Naguib Mahfouz awarded Nobel Prize in Literature in 1988.Ahmed Zewail awarded Nobel Prize in Chemistry in 1999.Mohamed El Baradei awarded Nobel Peace Prize was jointly to El Baradei and IAEA in 2005.**Palestine:** Yasser Arafat awarded Nobel Peace Prize jointly to Shimon Peresand Yitzhak Rabin in 1994.**Yeman:** Tawakel Karman awarded Nobel Peace Prize jointly to Ellen Johnson Sir leafand Leymah Gbowee in 2011
Iran: ShirinEbadi awarded Nobel Peace Prize in 2003**Turkey:** OrhanPamuk awarded Nobel Prize in Literature in 2006. **Pakistan:** Abdus Salam awarded Nobel Prize in Physics in 1979.**826** Noble Laureates were awarded to other countries.

Causes of Muslims decline:

Here are some reasons. They have lost the capacity to produce knowledge: In the entire Muslim World (57 Countries) there are 500 universities, in USA alone 5,758 universities and in India alone 8,407 universities. Not one university in the entire Islamic World features in the Top 500 Ranking Universities of the World. Literacy in the Christian world is 90 per cent while Literacy in the Muslim world is 40%. 98 per cent in Christian countries has completed their primary education, while 50% in Muslim countries has completed primary education. Similarly 40% in Christian countries attended university while in Muslim countries a dismal 2% attended university. Muslim majority countries have 230 scientists per one million Muslims while the USA has 5000 scientists per one million. The Christian world has 1000 technicians per million while Entire Arab World has only 50 technicians per million. Muslim World spends on research/development only 0.2% of GDP and Christian World spend 5 % of GDP.

Conclusions:

The single most important factor which stands out tall is lack of education and innovation pursuit in Science and Culture. Geographic distribution of religious populations on the planet shows that it is not the number which matters but the hard work, devotion and commitment to knowledge.

No doubt the faith and cultural values are a strength in itself but the strength of knowledge especially science is very important for human well being. A close look on the achievers in the past one century clearly shows that amongst the followers of different religions. Our Jewish fellow human beings have achieved the most both in education science, inventions and innovations. One cannot help but admire their hard work and dedication to science. Other followers like Muslims Christians, Hindus and Bhuddhists are far behind. They should learn from the Jewish Scholars and Scientists. They learned from Muslim Scholars in the past.

It was strength of knowledge, Science and innovation along with their faith in God and advice taken from the Devine book Holy Quran which made them the strongest nation on earth for almost eight centuries. This was closely tied to the level of their superiority in knowledge and understanding of science. Numerous ills of the societies were corrected by sheer help of knowledge. in the Islamic golden age. Glory of the past repeated hundreds of times will remain a matter of the past It is the present which matters and unless the Muslims catch up with the rapidly moving innovative ventures for the betterment of all mankind their dream of leading the world once again will continue to remain unfulfilled.

Suggestions:

Muslim World is failing to diffuse knowledge and apply knowledge. They must educate themselves and their children, promote education, and never compromise on standards. They are the World's biggest and strongest nation, all they need is to identify and explore their past victory is with knowledge, creativity, and innovation. Work, work, and work in pursuit of Science, Research and innovations are the only road to success. There is no short cut in this competitive world, where religious and non religious rituals festivals protests take up more than 100 days out of 365 days in a year, how can Muslims run faster and lead other nations.

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COMPANDIUM OF THE FELLOWS, PAST AND PRESENT, OF THE PAKISTAN ACADEMY OF SCIENCES PART II: AWARDS, MEDALS, PRIZES FOR SCIENTIFIC RESEARCH

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INTRODUCTION:

In continuation of an earlier report, under the heading marked as part', the present article provides information concerning the awards, medals, prizes for scientific research given by the Pakistan Academy of Sciences till 2011. This activity is a part of the Aims and Objectives of the Academy and it awards Gold Medals and Prizes in about fifteen fields of science and technology to Pakistani scientists who have made original research contributions. Nominations for the awards are made by the Fellows of the Academy, Universities and R&D organizations. The nominations are evaluated by Expert Committees constituted by the Council of the Academy. So far almost (228) scientists have been given these awards, Gold Medals and Prizes in the following areas:

- | | | |
|----------------|----------------------------|---------------------------|
| • Agriculture | • Computer Sciences / | • Medical Sciences |
| • Biochemistry | Information Technology | • Molecular Biology |
| • Biology | • Earth Sciences | • Pharmaceutical Sciences |
| • Botany | • Engineering & Technology | • Physics |
| • Chemistry | • Mathematics | • Zoology |

The data concerning the nomenclature, type of the award/ prize along with the total number of recipient scientists is tabulated in Table-1, while the data related to details of the type of the award/ prize the recipient scientist, the area of specialization and the year is provided in Table-2

It will be noticed from the tables 1&2 that in addition to PAS, Dr. Riazi-ud-din Siddiqui cash prize and medal and the TWAS cash prize are also awarded to scientists less than 40 years of age in recognition of their achievements / contributions while all other awards are open and any scientist is welcome to compete.

Another interesting observation on the data is that in the total of the recipient scientists (228), 147 belong to the physical sciences (including 12 in computer sciences). The rest 81 represent the bio-sciences i.e., about 63% and 37% (or 1.7: 1 ratio) respectively. Since the awards/ prizes have now become a regular annual event of the Academy, therefore, the list needs to be up-dated may be every five years. The dissemination of such knowledge will not only add to the information of the public at large but also certainly help the young scientists to emulate the example and exploit their potential to help the country to benefit from the local talent.

Table-1 Nomenclature / type of the awards/ prizes along with the total recipient scientists.

PAS open Gold Medals	113
PAS Gold Medals (under 40 years)	17
PAS/ Infaq Foundation Agha Hassan Abdi Gold Medals	33
PAS/ Infaq Foundation Agha Hassan Abdi Prize for the Best Scientist of the year Gold Medal and Rs. 200,000/-	5
Dr. M. Riazullah Siddiqi Cash Prize and Gold Medal (under 40 years)	17
TWAS cash prize (under 40 years)	20
Dr. M.N. Azam Prize for Pakistani Scientists in computer sciences (software)	8
PAS/COMSTECH Gold Medals in Computer Sciences(IT)	3
Prof. Atta-ur-Rehman Medal/Prize	4
Distinguished scientist of the year	5
Meritorious services award (special medal)	2
World Science Day for Peace and Development Award	1
Total	228

Gold Medals and Prizes Awarded in Physical and Biological Sciences

Physical Sciences

147

Biological Sciences

81

The ratio between the physical and biological sciences works out to be approximately 1.7:11 respectively.

Acknowledgements

The help and cooperation extended by the staff of the Pakistan Academy of Sciences (PAS), Islamabad is gratefully acknowledged.

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2. Year Book. 2008-2009, Pakistan Academy of Sciences. Islamabad.

Table-2: PAS Gold Medals/Prizes Awarded, the Type of Award, the Scientist, the Area of Specialization and the Year

PAS Open Gold Medals

Sr.No.	Receipient Scientist	Area of Specialization	Year of Award
1	Prof. Mukarram Hussain Khudker Dacca University	Physical Sciences	1967
2	Prof. Afzal Hussain Qadri Karachi University	Biological Sciences	1968
3	Prof. Kamaluddin Ahmad Dacca University	Physical Sciences	1969
4	Mohammad Abdul Ghani C.B.C	Biological Sciences	1970
5	Dr. M.M. Qurashi PCSIR	Physical Sciences	1971
6	Prof. Majeed Ahmad Islamabad University	Biological Sciences	1972
7	Dr. M.K. Bhatti PCSIR	Physical Sciences	1973
8	Prof. M.I.D Chughtai Punjab University	Biological Sciences	1974
9	Mr. M. Aslam PCSIR	Technology	1974
10	Dr. M. Aslam Khan DESTO	Physical Sciences	1975
11	Dr. S. Riaz Ali Shah PCSIR	Engineering & Technology	1975
12	Dr. A.H. Chotani PCSIR	Technology	1976
13	Dr. Riazuddin PAEC	Physical Sciences(Shared)	1978
14	Dr. Fayyazuddin Quaid-e-Azam University	Physical Sciences (Shared)	1978
15	Dr. Muzaffar Ahmad Punjab University	Biological Sciences	1979
16	Dr. M. Safdar Punjab University	Technology	1979
17	Dr. Mahboob Ali Punjab University	Agriculture	1979
18	Dr. Fazal Ahmad Faruqi PCSIR	Engineering & Technology	1980

19	Dr. S.A. Qurashi Ayub Agric. Institute	Agriculture	1980
20	Prof. Iqbal Hussain Shah Peshawar University	Energy	1980
21	Dr. S.M.H. Bukhari Ministry of Water & Power	Water Management	1980
22	Prof. M. Ata-ur-Rehman JPMC	Biological Sciences	1981
23	Dr. Hesham Ul Haque Central CC Karachi	Agriculture & Allied Subjects	1982/83
24	Dr. Atta-ur-Rehman PCSIR	Physical Sciences	1982/83
25	Dr. M. Arshad Ali Baig	Engineering & Technology	1982/83
26	Prof. Imtiaz Ahmad Karachi University	Biological Sciences	1985
27	Dr. Arshad Mohammad Khan PAEC	Energy	1985
28	Dr. Nazir Ahmad PIHR Lahore	Water Management	1985
29	Prof. Ghulam Murtaza Quaid-e-Azam University	Physics(Shared)	1985
30	Prof. Viqar ud Din Ahmad Karachi University	Chemistry(Shared)	1985
31	Dr. Arshad Mehdi PCSIR	Engineering & Technology	1987
32	Prof. N.M. Awan (Late) UET Lahore	Water Management	1987
33	Dr. Iqbal Hussain Qureshi PAEC	Physical Sciences	1988
34	Dr. Khushnood Ahmad Siddiqui ARC Tandojam	Agriculture	1988
35	Dr. M.S. Bukhari (Late) DESTO	Engineering & Technology	1988
36	Dr. Abdul Qadeer Khan KRL Rawalpindi	Engineering & Technology	1989
37	Dr. Sayyed Irtifaq Ali Karachi University	Biological Sciences	1989
38	Dr. Abdul Wahab Khan FAO	Agriculture	1989

39	Dr. N. M. Butt PAEC	Physical Sciences	1990
40	Dr. A. D Choudhry Agriculture University, Faisalabad	Engineering & Technology	1990
41	Dr. Mushtaq Ahmad IRI Lahore	Water Management	1990
42	Dr. Agha Khan Mohiyuddin IBC Rawalpindi	Agriculture	1990
43	Dr. Shah Mohammad Agriculture University, Faisalabad	Earth Sciences	1990
44	Dr. S.S.M. Naqvi NIAB Faisalabad	Biological Sciences	1991
45	Dr. M. Shabbir PAEC	Engineering & Technology	1991
46	Dr. Izhar-ul-Haq WAPDA, Lahore	Water Management	1991
47	Dr. M.A. Bajwa PARC	Agriculture(Shared)	1991
48	Dr. M. Hanif Qazi PARC	Agriculture(Shared)	1991
49	Dr. Naeem Ahmad Khan COMSTECH	Physics	1992
50	Dr. M. Anwar Waqar Agha Khan University	Chemistry	1992
51	Mr. Bashiruddin Mahmood PAEC	Engineering & Technology (Shared)	1992
52	Dr. Ghulam Kibria BCCI Karachi	Engineering & Technology (Shared)	1992
53	Dr. Nisar Ahmad PCSIR	Energy	1992
54	Dr. M. Zafar Iqbal Quaid-e-Azam University	Physics (Shared)	1993
55	Dr. Saleem Asghar Quaid-e-Azam University	Mathematics (Shared)	1993
56	Dr. Kauser A Malik NIBGE Faisalabad	Botany (Shared)	1993
57	Maj. Gen. (Retd) Iftikhar A. Malik A.F.I.P Rawalpindi	Medicine(Shared)	1993
58	Dr. Shoukat Hameed Khan PINSTECH	Engineering & Technology	1993

59	Dr. Mohammad Zafar Iqbal Punjab University	Chemistry	1993
60	Dr. Darakhshan J. Haleem Karachi University	Biochemistry	1996
61	Dr. Ihsan Ilahi Peshawar University	Botany	1996
62	Dr. M. Maqsood 243-A, Shadman-1, Lahore	Medical Sciences	1996
63	Dr. Nisar Ahmad Applied Physics Division, PINSTECH	Engineering & Technology	1996
64	Dr. Ghulam Jilani International Institute of Biological Control, Satelite Town, Rawalpindi	Agriculture	1996
65	Dr. M. Qasim Jan Peshawar University	Earth Sciences	1996
66	Dr. Asghar Qadir Quaid-e-Azam University	Mathematics	1996
67	Dr. M. Yar Khawar Sindh University, Jamshoro	Chemistry	1996
68	Dr. M. Afzal Quaid-e-Azam University	Chemistry	1997
69	Dr. M Zakaria Butt Government College Lahore	Physics	1997
70	Dr. Muhammad Ashraf B.Zakaria University	Botany	1997
71	Col. Dr. M. Aslam Army Medical College Rawalpindi	Medical Sciences	1997
72	Dr. Aijaz Karim PINSTECH	Engineering & Technology	1997
73	Mr. Ali hamza Kazmi Geological Survey of Pakistan, DHA.	Earth Sciences	1997
74	Dr. Jamil Ahmad Qurashi University of Agriculture, Faisalabad	Biochemistry	1999
75	Dr. Muhammad Nawaz Choudhry Punjab University	Earth Sciences	2001
76	Dr. M. Asif Khan Peshawar University	Earth Sciences	2002
77	Dr. Atiya Abbasi HEJ, University of Karachi	Biochemistry	2002
78	Dr. Azra Khanum	Biochemistry	2003

	Arid Agriculture University, Rawalpindi		
79	Dr. Khalid Muhammad Khan HEJ, University of Karachi	Chemistry	2004
80	Prof. Dr. Ahmad Saeen Gomal University	Biochemistry	2004
81	Dr. Hamid Saleem PINSTECH	Physics	2004
82	Dr. Muhammad Ayub Quaid-e-Azam University	Mathematics	2004
83	Mohammad Qaisar University of Karachi	Botany	2004
84	Dr. Maqsood A Chotani DHA Karachi	Medical Sciences	2004
85	Emgg. Dr. Riazuddin Abro OLC, Hyderabad	Engineering & Technology	2004
86	Dr. Muhammad Bashir National Agriculture Research Centre	Agriculture	2004
87	Dr. Sabira Begum HEJ, Research Institute of Chemistry	Chemistry	2005
88	Dr. Sheikh Ahmad Saeed University of Karachi	Biochemistry	2005
89	Dr. Bilquees Gull University of Karachi	Botany	2005
90	Dr. M. Sarwar Khan NIBGE Faisalabad	Agriculture	2005
91	Prof. Dr. Tahir Shah University of Peshawar	Earth Sciences	2005
92	Dr. Wasim Ahmad Quaid-e-Azam University	Biochemistry	2006
93	Dr. M. Zakaullah Quaid-e-Azam University	Physics	2006
94	Dr. Tasawar Hayat Quaid-e-Azam University	Mathematics	2006
95	Dr. M. Yasin Ashraf NIAB Faisalabad	Botany	2006
96	Dr. Azhar Mubarik Army Medical College, RAwalpindi	Medical Sciences	2006
97	Dr. Muhammad Abid GIK Institute of Sciences & Technology	Engineering & Technology	2006

98	Dr. Muhammad Sarwar University of Agriculture, Faisalabad	Agriculture	2006
99	Dr. Muhammad Kaleem Abbasi University of Azad Jammu & Kashmir	Earth Sciences	2006
100	Dr. Muhammad Shaiq Ali University of Karachi	Chemistry	2007
101	Dr. Amir Jamil University of Agriculture, Faisalabad	Biochemistry	2007
102	Dr. Zafar Iqbal Dr. AQ Khan Research Labs. Rwp	Physics	2007
103	Dr. Dilshad Ahmad Khan Army Medical College, Rawalpindi	Medical Sciences	2007
104	Dr. Muhammad Sayab University of Peshawar	Earth Sciences	2007
105	Prof. Dr. Ismat Beg LUMS, Lahore	Mathematics	2008
106	Dr. Muhammad Iqbal PCSIR Labs. Complex, Lahore	Botany	2008
107	Mr. Aziz Ahmad Qureshi PAEC Islamabad	Earth Sciences	2008
108	Dr. Bushra Mirza Quaid-e-Azam University, Islamabad	Biochemistry	2008
109	Prof. Dr. M. Mansoor Ahmad M.A. Jinnah University Islamabad	Engineering & Technology	2008
110	Prof. Dr. Zafar Iqbal University of Agriculture, Faisalabad	Agriculture	2008
111	Dr. Zaheer ul Haq University of Karachi	Chemistry	2008
112	Dr. Sohail Nadeem Quaid-e-Azam University, Islamabad	Mathematics	2008
113	Dr. Masood Khan Quaid-e-Azam University, Islamabad	Mathematics	2008

PAS Gold Medals (Less than 40 Years)

114	Dr. Riazuddin Islamabad University	Physical Sciences	1968
115	Dr. Mrs. Nasima M. Tirmizi Karachi University	Biological Sciences	1969
116	Dr. Mrs. Bilqees Mujib Karachi University	Biological Sciences	1971
117	Dr. Viqaruddin Ahmad Karachi University	Physical Sciences	1972

118	Dr. Hameed Ahmad Khan PAEC Islamabad	Physical Sciences	1974
119	Dr. M. Ijaz PAEC	Biological Sciences	1975
120	Dr. Atta-ur-Rehman H.E.J., Karachi University	Physical Sciences	1976
121	Dr. Qasim Jan Peshawar University	Physical Sciences	1979
122	Dr. S. Riazuddin Punjab University	Biological Sciences	1980
123	Dr. Arif Ali Zaidi Quaid-e-Azam University	Biological Sciences	1982/83
124	Dr. FAzal-e-Aleem Punjab University	Physical Sciences	1985
125	Dr. Khalid Parvez Lone Punjab University	Biological Sciences	1986
126	Dr. M. Aslam Baig Quaid-e-Azam University	Physical Sciences	1987
127	Dr. Sohail Zuberi Quaid-e-Azam University	Physical Sciences	1989
128	Dr. Muhammad Ashraf BUZ University, Multan	Biological Sciences	1990
129	Dr. S. Kamaluddin Urdu Science College, Karachi	Biological Sciences	1992
130	Mr. Shoaib Ismail Karachi University	Biological Sciences	1993

PAS/ Infaq Foundation Agha Hasan Abidi Gold Medals

131	Dr. Hameed Ahmad Khan PINSTECH	Physical Sciences	1995
132	Dr. Syed Moosa Hasany PINSTECH	Chemical Sciences	1995
133	Dr. M Perwaiz Iqbal Agha Khan University	Biological Sciences	1995
134	Dr. Anwar-ul-Haq KRL	Engineering Sciences	1995
135	Dr. Abdul Malik HEJ, University of Karachi	Chemistry	1998
136	Dr. Kamaluddin Ahmad Quaid-e-Azam University	Physics	1998
137	Dr. Naseer Shahzad Quaid-e-Azam University	Mathematics	1998
138	Dr. S Naimul Hasan Naqvi Karachi University	Zoology	1998
139	Dr. Waheed-uz-Zaman Tariq AFIP, Rawalpindi	Medical Sciences	1998

140	Dr. Anjum Tauqir Dr A. Q Khan Research Labs	Engineering Sciences	1998
141	Dr. Habib-ur-Rehman AJK University	Chemistry	1999
142	Dr. M. Ajmal khan University of Karachi	Botany	1999
143	Dr. Anwar-ul-Hassan Gilani Agha Khan University, Karachi	Medical Sciences	1999
144	Dr. Fazal A Khalid GIK Institute of Engg.Sci & Tech	Engineering & Technology	1999
145	Dr. Iftikhar Ahmad PARC, Islamabad	Agriculture	1999
146	Dr. Mrs, Asghari Maqsood Quaid-e-Azam University	Physics	2000
147	Dr.Qaiser Mushtaq Quaid-e-Azam University	Mathematics	2000
148	Dr. Muhammad Javed University of Agriculture, Faisalabad	Zoology	2000
149	Dr. Muhammad Perwaiz Iqbal Agha Khan University	Medical Sciences	2000
150	Dr. M. Ramzan Sabayo Mehran University	Engineering & Tech.	2000
151	Dr. Zahid Hussain Chohan Islamia University, Bahawlpur	Chemistry	2001
152	Dr. Muhammad Ali BZU, Multan	Zoology	2001
153	Dr. S.M. Saifullah Karachi University	Botany	2001
154	Dr. Muhammad Yunas Khan Islamabad	Medical Sciences	2001
155	Dr. Muhammad Afzaal Malik NUST, Rawalpindi	Engineering & Technology	2001
156	Dr.Muhammad Arshad University of Agriculture, Faisalabad	Agriculture	2001
157	Dr. Mrs. Tahseen Aman PCSIR, Lahore	Chemistry	2002
158	Dr. M. Zahid Quaid-e-Azam University	Mathematics	2002
159	Dr. Aleem Ahmad Khan BZU, Multan	Zoology	2002
160	Col. Abdul Khaliq Naveed Army Medical College, Rawalpindi	Medical Sciences	2002
161	Dr. Muhammad Akram Kahlown PCSWR, Islamabad	Engineering & Tech.	2000
162	Dr. Sayed Manzoor Alam Nuclear Institute of Agriculture, Tandojam	Agriculture	2002

**PAS/ Infaq Foundation Agha Hasan Abidi Prize for Best Scientist of the Year
(Gold Medal and Rs. 200,000/-)**

163	Prof. Dr. Atta-ur-Rehman HEJ, University of Karachi.	Chemistry	1998
164	Prof. Dr. Abdul Raouf GIK, Topi	Engineering & Technology	1998
165	Dr. Sayed Qasim Mehdi KRL Rawalpindi	Biotech & Genetic Engineering	1999
166	Dr. Riaz Hussain Qureshi University of Agriculture, Faisalabad	Agriculture	2000
167	Dr. Riazuddin Quaid-e-Azam University	Physics	2001

Dr. M. Riazuddin Siddiqui Cash Prize & Gold Medals (under 40 years)

168	Dr. Qaiser Mushtaq Quaid-e-Azam University	Mathematics	1991
169	Dr. Muhammad Iqbal Choudhary	Chemistry	1992
170	Dr. Hamid Saleem PINSTECH	Physics	1993
171	Dr. Muhammad Sarfaraz Punjab University	Mathematics	1994
172	Dr. Muhammad Javed Akhtar PINSTECH	Chemistry	1995
173	Dr. Arshad Majid Mirza Quaid-e-Azam University	Physics (Shared)	1996
174	Dr. Muhammad Arshad PINSTECH	Physics (Shared)	1996
175	Dr. Muhammad Ayub Quaid-e-Azam University	Mathematics	1997
176	Dr. Muhammad Masoom Yasinzai University of Balochistan, Quetta.	Biochemistry	1998
177	Dr. Tasawar Hayat Quaid-e-Azam University	Mathematics	1999
178	Dr. M. Shaiq Ali HEJ, Karachi University	Chemistry	2001
179	Dr. Shahid Qamar PIES, Islamabad	Physics	2001
180	Dr. Muhammad Sharif Punjab University	Mathematics	2002
181	Dr. Amir Saeed Bhatti Quaid-e-Azam University	Chemistry	2001
182	Dr. Arif Mumtaz Quaid-e-Azam University	Physics	2004
183	Dr. M. Raheel Mohyuddin	Mathematics	2005

	Quaid-e-Azam University		
184	Dr. Farzana Shaheen Quaid-e-Azam University	Chemistry	2006

TWAS Cash Prize (under 40 years)

185	Dr. Qaiser Mushtaq Quaid-e-Azam University	Mathematics (Shared)	1993
186	Dr. Syed Khurshid Hussain Quaid-e-Azam University	Physics (Shared)	1993
187	Dr. Muhammad Iqbal Choudhry HEJ, Karachi University	Chemistry	1994
188	Dr. Muhammad Iqbal PCSIR	Biology (Shared)	1995
189	Dr. Bakhtiar Hussain Shah Agha Khan University	Biology (Shared)	1995
190	Dr. Khalid Jamil PSO, PINSTECH, Nilore	Physics	1996
191	Dr. M. Shaiq Ali HEJ, Karachi University	Chemistry	1997
192	Dr. Rehana Asghar University of Balochistan, Quetta	Botany (Shared)	1998
193	Dr. M. Shahab Quaid-e-Azam University	Biology (Shared)	1998
194	Dr. Arshad Amjad Mirza Quaid-e-Azam University	Physics (Shared)	1999
195	Dr. Shahid Manzoor SSO. PINSTECH Nilore	Physics (Shared)	1999
196	Dr. Tasawar Hayat Quaid-e-Azam University	Mathematics	2000
197	Dr. Amir Azam Khan GIK, TOPI	Chemistry	2001
198	Dr. Amir Jamil Agr. University, Faisalabad	Biology	2002
199	Dr. Farhan Saif Quaid-e-Azam University	Physics	2003
200	Dr. Ghulam Shabbir GIK, TOPI	Mathematics	2004
201	Dr. Shazia Anjum HEJ, Univeristy of Karachi	Chemistry	2005
202	Dr. Zubair Ahmad University of Punjab	Biology	2006
203	Dr. Muhammad Sabieh Anwar LUMS	Physics	2007
204	Dr. Masood Khan Quaid-e-Azam University	Mathematics	2008

Dr. M.N Azam Prize for Pakistani Scientists in Computer Science(Software)

205	Dr. Muhammad Yaqoob SSO, PCSIR Karachi	Computer Science (Software)	1998
206	Dr. Muhammad Mahboob PAEC, Islamabad	Computer Science (Software)	1999
207	Mr. Ghulam Mustafa PAEC, Islamabad	Computer Science (Software)	2000
208	Dr. Salma Iqbal AQ Khan Research Labs.	Computer Science (Software)	2001
209	Dr. Sarmad Hussain Punjab University	Computer Science (Software)	2002
210	Mr. Zaheer Aziz International Islamic University	Computer Science (Software)	2003
211	Mr. Ali Nasir NESCOM, Islamabad	Computer Science (Software)	2004
212	Mr. Ahsan Abdullah National University of Computer & Engineering Sciences, Islamabad	Computer Science (Software)	2005

PAS/ CMSTECH Gold Medals in Computer Science (IT)

213	Dr. Imdad Ali Ismaili Sindh University, Jamshoro	Information Technology	2003
214	Prof. Dr. Arshad Ali NUST, Rawalpindi	Computer/ IT	2004
215	Dr. Hafiz Farooq Ahmad NUST, Rawalpindi	Computer/ IT	2005

Prof Atta-ur Rehman Medal/ Prize

216	Prof. Dr. Nighat Afza PCSIR, Karachi	Chemistry	2004
217	Dr. Muhammad Iqbal Bhangar University of Sindh, Jamshoro	Chemistry	2005
218	Dr. Irshad Hussain Genetic Engg. NIBGE	Chemistry	2007
219	Dr. Zaheer-ul- Haq University of Karachi	Chemistry	2008

Distinguished Scientist of Year Award

220	Dr. Sheikh Riazuddin CEMB	Biology	2004
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221	Dr. Sheikh Riazuddin CEMB	Biology	2004
222	Prof. Dr . M. Salim Akhtar University of South Asia, Lahore	Medical Sciences	2005
223	Prof. Dr. Arshad Ali NUST, Rawalpindi	Computer/IT	2006
224	Dr. Muhammad Anwar Waqar University of Karachi	Biochemistry	2007
225	Prof. Dr. M. Ajmal Khan University of Karachi	Botany	2008

Meritorious Service Award (Special Medal)

226	Dr. Abdul Qadeer Khan KRL Rawalpindi		1998
227	Dr. Ishfaq Ahmad PAEC Islamabad		1998

World Science Day for Peace and Development Award

228	Dr. A. Qadeer Khan Advisor to the Prime Minister Islamabad		2002
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ERRATA

The references and the data concerning the years 2005 to 2012 were not included in the table-1 of the article “Compendium of the Fellows, Past and Present, of the Pakistan Academy of Sciences” that appeared in this journal, vol. 17, No. 2 (July-December 2011) due to some unavoidable administrative reasons and is provided now:

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4. Prof. Dr. Ikramul Haq, S.I.
5. Prof. Dr. M. Ajmal Khan, S.I.

References

1. Shafiq Ahmad Khan, Shireen Taj and G.H.R. Baluch, 1996. "Aspects of Publications of Some Recognized Pakistani Scientists". Proc. Acad. Sci., 33, 105.
2. Year Book, 2008-2009, Pakistan Academy of Sciences. Islamabad.
3. Shafiq Ahmad Khan and M.M. Qurashi. 2011. "Historical Variations in the Specialized Subjects of the Elected Fellows of the Pakistan Academy of Sciences". "Proceedings Pak.Acd.Sci., 2011. 48(4); 251.
4. Shafiq Ahmad Khan, 2010. "Aspects of Publications of Some Recognized Pakistani Scientists". Part II. Proc.Acad.Sci. 47, 171.



OBITUARY

(1930-2012)

DR. PIR NASIR-UD-DAULA

Born February 7, 1930, Garhi Shah Daula, Gujrat (Punjab), Pakistan, of established Pakistani family with feudal and religious credentials – descendants of the revered saint-engineer Hadrat Shah Daula Darayae, Gujrati, Punjabi. Pir Nasiruddaula, known in scientific and some humanistic publications simply as P. Nasir, grew to be an exceptional scholar and young adventurer.

His Mother, Zubeda Khanum, was married to Pir Naziruddaula and soon after her marriage she was forced to leave her home and came back to live with her parents where she gave birth to Pir Nasir. Pir Nasir was brought up in his maternal uncles Diwan Khana, in particular his maternal grandmother and one of the uncles Hakim Pir Rashidduala dotted on him. Pir Nasir rolled in abundance so much so that he never had to suffer for want of anything.

After a distinguished academic career in Pakistan, during which he was awarded a Gold Medal in M.Sc (Zoology) from the Government College, Lahore, he proceeded to the UK where he completed his Ph.D in Parasitology at the Birmingham University, Birmingham, in a record two and half year's time in 1958. The title of his thesis was "The Trematode Parasites of *Limnaea stagnalis* (L) from Edgbaston Pool with descriptions of the complete life cycles of three of them" in two volumes. For a short time, he continued as a post-doctoral research fellow at the same university. Thereafter he proceeded to the USA where he also worked as a post-doctoral research fellow. He returned to Pakistan in 1962 to serve his fatherland. However, he was painfully disappointed only to land a non-scientific job as an Officer on Special Duty. A nine month's stay in Pakistan, hectic efforts notwithstanding, he failed to find a suitable opening. He was offered a job in Venezuela (South America) where unlimited research facilities were promised. Finally he spent twenty seven years teaching and working on research projects in Venezuela, where he retired as a full professor of Parasitology. He then returned to his roots in Gujrat in 1990. He leaves behind a daughter who was born to his wife, the daughter of his uncle, Pir Rashiddulla.

Pir Nasir had many friends from all sections of the society. He made many friends during his stay in Islamia College. With a lot of funds available, Pir was a very good host who paid the bills and provided all types of entertainment as well. He was welcome in any gathering of friends, his presence meant endless laughter and jokes. He used to speak a mixture of Urdu and Punjabi which alone brought laughter. Other side of Pir's personality was a very serious student.

His humanistic clever books had the element of research and hard work. One of his books, "Faceless Enemy" was published by Exposition Press of Florida, USA. Another book story of Hazrat Shah Adula saint the engineer was the result of years of research. His other books on autobiography were of more than 1200 pages.

His scientific books which on cercariae made him authority on this aspect of Parasitology. Internationally he attended various conferences and delivered lecture in most countries of the world. Pir Nasir contributed over 10 scientific research papers and supervised 35 graduate and five post

graduate thesis at the Venezuela Multiversity Oriental University in specialized field of Parasitology mostly diagnostic trematodes.

The following books are a living proof of what has been said above.

Books: (Humanistic)

1. Nasir,P.1985. Faceless Enemy, A true story of injustice: An Account of Unsolved Conspiracy. Florida. Fort Lauderdale, Pampano Beach, Exposition Press of Florida, USA, 207pp.
2. Nasir, P.1992. Asrar e sadaf (author's urdu poetry), Gujrat, Ghazia Publishers Pakistan, 219 pp.
3. Nasir,P.1994. Soltanat, The Saga of a Desperate Warrior, Gujrat, Ghazia Publishers, Pakistan, 219pp.
4. Nasir, P.1996. Jadid Karamatnama, Aike Mard-e-Qalandar ki Dastan e Hayat (Urdu Biography), Gujrat: Ghazia Publishers, Pakistan, 288pp.
5. Nasir, P.1997. Dear Editor, Compilation of Letters to Editor, Gujrat: Ghazia Publishers, Pakistan, XXXX+223pp.
6. Nasir, P.(editor) 2002. Karam Elahi's Wadi-e-Qaf (urdu), Gujrat: Ghazia Publishers, Pakistan, XV+235pp.
7. Nasir, P.2004. Zindagi Mearay Dinon Mein (urdu), Semi Autobiography, Gujrat: Ghazia Publishers, Pakistan, XXVII+1208pp.
8. Nasir, P.2005. The Story of Shah Abdullah, Saint the Engineer, Gujrat: Ghazia Publishers, Pakistan, 327pp.
9. Nasir, P.2006. Yeh Us Zamane Ki Baten Hain (Urdu Poetry) Gujrat: Ghazia Publishers, Pakistan, 231pp.
10. Nasir, P.2007. Haseen-e-Iram (Urdu), Gujrat: Ghazia Publishers, Pakistan, 279pp.
11. Nasir, P.2008. Zindagi Yuk Turfa Tamasha, Gujrat: Ghazia Publishers, Pakistan, 1288pp.

Scientific

- Nasir,P.1964, British Freshwater Cercariae, Gumana; Multiversity Oriental University, Venezuela, XIV+345 pp.
- Nasir,P.1986, North American Freshwater Xiphocercarial, Cumana, Multiversity Oriental University, Venezuela, X+233 pp.
- Nasir,P.1991, Compilation of Parasitological Works in Scientific Journals. Cumana; Multiversity Oriental University, Venezuela, 6+821 pp.
- Nasir,P.1992, Multiple Diagrams of Freshwater Cercariae and Legend, Gumana; Multiversity Oriental University, Venezuela, 61 pl with 489 diagrams.

Dr. Nasiruddaula was a straight forward honest, well read and well traveled human being who was very witty also and thus had many friends and admirers. In his death, the country has lost a renowned scientist and his colleagues a very very dear friend. May the Almighty rest his soul in peace (amin).

Dr. Shafiq Ahmad Khan

Dr. S. Riaz Ali Shah

The Trematode Parasites of *Limnaea stagnalis* (L) from Edgbaston Pool with descriptions of the complete life cycles of three of them Two volumes.