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EDITORIAL PAGE

In memory of Prof. Abdus Salam - The Nobel Laureate

By Prof. Dr. Muzahed Uddin Ahmed
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Most people know Dr. Abdus Salam as a great Physicist, and the first Muslim scientist ever to get a Nobel Prize. His contributions towards Theoretical Physics make him stand in the line of Copernicus, Galileo, Newton, Maxwell, Faraday, and Einstein, but his conviction in the Unity of the Creator, and his passion for religion, distinct him from the rest. There are many other aspects of his personality which generally escape the eyes of common people.

Dr. Salam believed that science is the shared creation and joint heritage of all mankind. It is not a product of the North. Its benefits and usage should be shared by the whole world alike. This was the second biggest passion of his life after physics. He says, "The second (passion) has been to stress the importance of science transfer for developing countries. After building up the Theoretical Physics Department at Imperial College, London, I have spent 20 years fighting the battle of stressing the necessity of science transfer for developing countries."

People usually describe him as a Man of Science, or a Man of two worlds, referring to his passion for science, and his heart of a poet. However, his love for Islam can be well judged by the fact that none of his speeches, addresses, or essays were ever without quotes from the Holy Quran. He longed to bring back the past traditions glory of the Islamic world when they led the world in the fields of science and technology.

He dedicated his life to the principle of unity - the unity of Nature and the unity of Mankind. The disparity between North and South-referring to those regions of the globe roughly representing the developed and developing nations haunted him. He traveled extensively between continents, convincing the developed nations to help eradicate hunger and poverty in the poor countries by uplifting them with the transfer of technology and science. He would visit the poor countries convincing them to give the deserving attention towards science and technology to come out of the vicious circle of poverty and subjugation. This was the valiant struggle he fought all his life.

Dr. Salam, often referred to as the lonely scientist of the South, achieved many distinctions in his early life. He was born in Jhang, Pakistan in 1926. At the age of 14 he scored highest marks ever recorded in the Matriculation examination of the Punjab University in Pakistan. Though he was always noted for his deep seriousness and devotion, however, his sense of humour could also be well noted from the following description of his early school days and the state of science in Pakistan. "When I was at

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school in about 1936, I remember the teacher giving us a lecture on the basic forces in nature. He began with gravity. Of course we had all heard of gravity. Then he went on to say, electricity. Now there is a force called electricity, but it does not live in our town Jhang, it lives in the capital town of Lahore, a hundred miles to the east. He had just heard of the nuclear force and he said, That only exists in Europe."

Dr.. Salam's father, himself a civil servant, wanted him to become a civil servant too, since it was a very respectable job. However, an accident happened which turned the treads of Dr.. Salam's life in a different direction, the accident of the Second World War. The civil service examination was discontinued because of war. Having completed his MA in mathematics, Dr.. Salam was offered a unique scholarship to study Mathematics further at Cambridge.

In Cambridge, Dr.. Salam took the part II mathematical tripos and part II physic and came out a Wrangler-a first class degree. The Cambridge tradition was that those with first class continued in experimental work, while seconds and thirds were transferred to theory. "But for experimental work you need qualities I totally lack - patience, an ability" to make things work - I knew I couldn't do it. Impossible. I just hadn't got the patience.

Dr. Salam found his way into some problems in quantum electrodynamics, then a subject in the throes of birth (now the most accurate theory known). His supervisor gave him an important problem to solve. Dr. Salam took the challenge and solved it, getting rid of infinities from meson theories. This was his Ph.D. thesis.

Dr. Salam returned to what was now Pakistan and to his old university of the Punjab in Lahore as a Professor. There was no tradition of conducting any research work, there were no journals. Dr. Salam's salary was GB £700 a year, not enough to subscribe any periodicals. There were no conference. The nearest physicist to Dr. Salam was in Bombay, who was in another country.

The head of Dr. Salam's institution told him that though he knew he had conducted some research, he could forget about it. He offered Dr. Salam a choice of three jobs; bursar, warden of a hall of residence, or college accountant or president of the football (soccer) club. He chose the football club.

Dr. Salam was totally devastated by the attitude of the society against research work. All Dr. Salam aspired was a conducive environment where scientists could share their views, discuss them, talk about them. Dr. Salam feared, if he stayed in Lahore, his work will deteriorate. Dr. Salam had to make a choice, physics or Pakistan. He returned to Cambridge. He started as a lecturer at Cambridge, soon he was offered a professorship at Imperial College, London, where he started the department of theoretical physics. He was also elected the youngest Fellow of Britain's most select association of scientists, the Royal Society.

In the late 50s, Dr. Salam began to work on a theory in physics, which is called the unification theory. Maxwell and Faraday had done similar work on electricity and magnetism a century ago and came up with their unification in the form of electromagnetic force. Einstein tried until the end of his life to unify electromagnetism with

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gravitation, but, like everyone since, failed to do so. Dr. Salam started working on a different aspect of the same problem. He addressed the problem of unifying the weak nuclear force and the electromagnetic force. He succeeded. In 1979, together with Steven Weinberg and Sheldon Glashow, he was awarded the Nobel Prize for Physics. Their work was mathematical and theoretical, but predicated that certain, as yet undiscovered, particles should exist. It was only in 1983, under the cosmic conditions created in the huge particle accelerator at Centre for European Nuclear Research (CERN) that these particles were detected, and the theory was finally confirmed. Since then, Dr. Salam made a huge contribution to science and physics. He wrote around 250 research papers. The awards and the recognition awarded to him need several pages just to be listed. Many countries have awarded him special awards in recognition of his endeavours to bring science and technology to the poor countries.

In 1955, he was asked to serve as a scientific secretary at the first Atoms for Peace Conference convened by the UN in Geneva, Switzerland. This was a very important event for Dr. Salam. He sensed that the united scientific community of the world has the potential to work great wonders for the benefit of mankind. The same realisation led him to conceive the International Center for Theoretical Physics (ICTP) in Trieste as a place where men from all countries could work alongside some of the most distinguished minds of physics. This was an attempt to remove the loneliness of the scientists of the developing countries, to which, he himself once became a victim. As a delegate from Pakistan, he proposed its creation to the International Atomic Energy Agency (IAEA) in 1960, and he was himself appointed its first director in 1964. Advanced countries, such as France, Great Britain, the Soviet Union, and the United States, were cool to the idea at first, but they could not resist the enthusiastic support from developing countries that rallied behind Dr. Salam. The Italian government provided the greater share of the money for the Center's first four years, donated temporary premises and began work on a fine new building at the coastal resort of Miramare.

The success of ICTP can be estimated from the fact that more than 2,500 physicist come annually both from developing and developed countries, including some from Italy, the host country. As an anti-brain-drain device, it receives of the order of 150 associates a year (these are first-class men and women from developing countries who are given six-year appointments and who come to the Center (at its expense) three times, for periods of up to three months, during these six years). There are additionally 264 institutions in the developing world which are federated to the Center and are empowered to send their members to the Center.

Initially, ICTP was established only to focus on Theoretical Physics, but soon, it shifted away from fundamental physics to physics which was more relevant to the needs of the developing countries, for example, physics of the condensed matter with the hope that if there are teachers in the universities who have worked, for example, in solid state physics, then the next generation at least will have an orientation which is much more industrial. Thus, the Center started stressing research in physics of solids, plasma physics, physics of oceans and the Earth, applicable mathematics; physics of technology, of natural resources, together with physics on the frontier.

Dr. Salam, now an international figure, struggled to review the past Islamic excellence and leadership in the field of science and technology. The attitude of Islamic world towards science bemoaned him. He again and again reminded them of the importance of acquiring scientific knowledge. In a speech delivered by Dr. Salam at a symposium in Istanbul in 1986, he said, "I have asked the question why 1/8th of the Auqaf Funds in our countries should not be devoted to science, in keeping with the emphasis on sciences in the Holy Book of Islam. Let us make no mistake about it; in contrast to 250 verses which are legislative, some 750 verses of the Holy Quran - almost one eighth of it - exhort the believers to study nature-to-reflect, to make the best use of reason and to make the scientific enterprise an integral part of the community's life. I have been asking Muslim divines in India and Pakistan if they were devoting one out of every eight of their Friday sermons to stressing these aspects of sciences."

Dr. Salam's interest in physics and science was not confined to the modern age alone. He had done extensive study of the past history of the Islamic world and the role played by Muslim scientists in the development of science. He would often remind Muslims of the supremacy of Islamic sciences from AD 750 to AD 1100. He would often quote George Sarton in this context. "George Sarton, in his monumental five-volume A history of Science, chose to divide his story of achievement of sciences into ages, each age lasting half a century. With each half century, he associated one central figure. From AD 750 to AD 1100 - 350 years continuously-it is the unbroken succession of the Ages of Jabir, Khwarizmi, Razi, Masudi, Wafa, Biruni and Avicenna, and then Omar Khayam - Arabs, Turks, Afghans, and Persians."

Dr. Salam was very much cognizant of the relationship between faith and poverty as depicted by Islam. In 1961, addressing a conference in Dhaka on technology. He said that poverty raised not merely material but also spiritual issues. He reminded them the saying of the Holy Prophet, may peace and Blessings of Allah be upon him, "It is near that poverty may become synonymous with kufr (infidelity)." He addressed them with all the vehemence at his command and wanted to see this saying of the Prophet Muhammad, peace be upon him, on the door of every religious seminary in Pakistan. He said that there may be other criteria of kufr as well, but in the conditions of the twentieth century, in his opinion, the most relevant criterion of kufr was the passive toleration of poverty without the national will to eradicate it. Dr. Salam's lectures to the Islamic world did not comprise of only exhortation based on Islamic teachings. He would also present extensive research on the economies of many recently modernised countries and the strategies they adapted. His lectures and essays would be full of charts, tables, comparisons of the allocation of funds for science, number of scientists, number of students, expenditures in the fields of education, defence, health, natural resources, and other topics in Muslim countries as compared to the developed countries.

This, "Servant of Peace," which is also the literal translation of his name, Dr. Salam, fought all his life to bring peace to the world by the removal of poverty, and unjust distribution of wealth. He believed this disparity was a cause of great turmoil and unrest of the past and the present. For achieving this goal, he used all the faculties given to him by God Almighty including his Excellency in

physics.

At the end, I would like to quote a few passages, which give us some more glimpses into his beliefs, and his love for religion which he often referred to as a very personal thing.

Once asked, if he finds the same sublimity in music, which he finds in the theories of physics, Dr. Salam said, "I would not say that I find the same sublimity. I find the same sublimity in reading or listening to the Quran, because there I find, for example, after you have been listening to it for half an hour, you suddenly got caught in elevating fashion." Einstein was Jewish only because he subscribed to the ostensibly "cultural aspects" of the Jewish faith, rather than any "fundamentalist" belief in the teachings. Unlike Einstein, Dr. Salam was a firm believer in God and Islam. His dedication to science did not cause any revulsion to religion or to God. In his own words, "I have myself never seen any dichotomy between my faith and my science - since faith was predicated for me by the timeless spiritual message of Islam, on matters on which physics is silent and will remain so... There are other good reasons why I am a believer. Maybe Einstein was oblivious to such a need, but personally I do have faith in the efficacy of prayer at times of distress. My greatest desire before I die is that Allah in His Bounty may grant me the mystical vision - so that I too can partake first hand of what was vouchsafed to the Seers in the past."

This 'servant of peace' departed from this world in November 1996 after a long illness in London. May God have Mercy on his soul.

(Dr. Muzahed Uddin Ahmed is professor, Bangladesh Agricultural University, Mymensingh)

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