

Some personal reflections on the origin of TWAS and the evolution of its mission

M. Akhtar

Department of Biochemistry, Medical and Biological Sciences Building, University of Southampton, Bassett Crescent East, Southampton SO16 7PX, UK

Before TWAS

The name of TWAS will always remain intimately linked to that of its founder, Muhammad Abdus Salam, who without doubt was one of the most significant physicists of the twentieth century. He could have been awarded the 1957 physics Nobel Prize with Lee and Yang for his contributions to the so-called parity laws. Having been deprived of this mighty distinction the same year, he was elected to the Royal Society at the age of 33 as its youngest ever Fellow. He then had to wait for 12 years to share with Glashow and Weinberg the 1979 Nobel Prize for their contributions to the unification of four forces. These are outstandingly brilliant scientific achievements, yet as a member of the Nobel Committee of the Royal Swedish Academy once candidly pointed out, discoveries in science are like the discovery of the Americas, if Columbus had not done it, sooner or later, someone else would have. As is implicit in the narrative of the opening sentences, what Abdus Salam discovered was also discovered by others. However, Abdus Salam and Abdus Salam alone could have performed two other spectacular feats, for which he has secured for himself a uniquely distinctive international status.

The first of these feats is the establishment of the International Centre for Theoretical Physics, which now bears his name as its prefix. At the age of 38 most scientists with promise and ability of Abdul Salam will be single-mindedly dedicated to the exploration of the limits of their disciplines, not allowing any other activity to interfere with this obsession. Abdus Salam, acutely aware of the professional isolation he had suffered, after returning from Cambridge to the Chair of Mathematics at the University of Punjab at Lahore, was determined to find an escape route for those younger scientists who came from similar under privileged societies. It beggars belief that in search of a solution, a scholar with very little experience of realpolitik would set out to twist the arms of UNESCO and of the Italian government to establish a centre where young people from poor countries

would come for short visits to quench their intellectual thirst. The rest is history which has been well narrated by others and authoritatively recorded in recent publications from the Abdus Salam International Centre for Theoretical Physics.

By the middle 1970s the Institute at Trieste had acquired a world-wide reputation and become a monument to the genius of Abdus Salam. However, more than most around him, Abdus Salam knew that scientists of the Third World needed something more than an occasional visit to a centre of excellence. They needed a research environment in their own countries, not just to foster the development of theoretical physics but also of other subjects which collectively make up the natural sciences. The award of the 1979 Nobel Prize was just the tonic Abdus Salam needed. Now was the time for him to shake the lethargic rulers of the Third World, and quite understandably he chose the oil-rich Islamic countries as his initial target. He was hoping to use his unique position as the only Muslim Nobel Laureate to cajole the Arab rulers to make substantial contributions to the cause of science. Whatever Abdus Salam undertook, his sights were set high – exceptionally high. The following passage from a lecture he delivered in 1980 in Bahrain¹, to mark the founding of the Gulf University, is illustrative of the historic context in which he would encapsulate his appeal, reminding the Muslims of their glorious past one moment and, in the next, not afraid to shame them for their neglect of science today:

‘And finally, I wish to appeal to those responsible for our affairs and funding this University and other projects I have spoken about. Science is important because of the underlying understanding it provides of the world around us and of Allah’s design; it is important because of the material benefits its discoveries can give us and finally because of its universality. It is a vehicle of co-operation of all mankind and in particular for the Arab and Islamic nations. We owe a debt to international science, which in all self-respect, we must discharge. However, the scientific enterprise cannot flourish without your generous patronage as in the past centuries of Islam. I am now living and working in a small city of one-quarter of one million inhabitants. In this is a

e-mail: M.Akhtar@soton.ac.uk

bank – Cassa di Risparmio – which donated 1.5 million dollars for the building in which the International Centre which I created is housed. The city has now pledged from its regional sources, 40 million dollars for the proposed UNIDO Centre for Biotechnology. I feel amazed at their perceptiveness, their love of science and eventually of technology. Shall our cities and banks not rival this example? The international norms of one to two per cent of GNP I have been speaking about would mean *no more than two to four billion dollars annually for the Arab and the same for the rest of the Islamic world on research and development* [my italics].’

This is a measure of Abdus Salam’s vision that he was not asking for thousands or millions but billions of dollars – mind it, this goal was set 20 years ago. The Arab rulers gave him respect in abundance but no more! The final episode in this connection was a meeting he arranged in Vienna of ‘Muslim’ scientists to form a body on the lines of the ‘Club of Rome’ and named as ‘Umat-ulilm fil Islam’. The meeting was to be held in Vienna on Monday 28 September 1981 and expected to be attended by more than 50 delegates. The hope was that the meeting would be generously funded by an oil-producing country. Abdus Salam was very keen that I should attend the meeting, and I accepted his invitation with hesitation. When I arrived in the UNIDO headquarters at Vienna, the venue for the meeting, I discovered that only 3 or 4 other individuals had turned up for the meeting – most of these happened to be in Vienna on other official visits. His vision of re-implanting science in the lands of Ibn Sina, Al-Khwarizmi and other Muslim giants of the past had been given a body blow.

The creation of TWAS

Abdus Salam never forgot his origin and in the light of his own experience in Lahore, remained deeply conscious of the isolation and neglect suffered by scientists in the poor countries. He desperately wanted to do something to remedy the situation and it would seem that the meeting of the Pontifical Academy held in Rome on 6 October was to be a decisive moment in the creation of TWAS. The famous Indian physicist and my good friend Menon recalls².

‘I still remember an autumn day in 1981, some 17 years after ICTP had been launched, meeting Salam for breakfast at a meeting (of the Pontifical Academy) to discuss problems of development in the Third World and the role that indigenous scientists may play in efforts to promote a better way of life for their citizens. We knew there were developing countries like China and India that had academies of sciences in which native-born scientists could come together as a community to exchange ideas, address problems of mutual concern

and honour their most prestigious colleagues. But we also knew this was the exception not the rule. So, we decided to create an organisation where any scientist from any developing country could become a fellow and participate in activities with their colleagues. That place (organisation) you all know is the Third World Academy of Sciences (TWAS)...’

I was one of twenty-eight scientists who, having satisfied the election criteria was invited to become the Founding Fellow of the Academy. Since its creation in 1981, TWAS has operated with an annual budget of about 2 million US dollars per annum, donated primarily by the Italian government. Given the modest level of funding, the achievements of TWAS are truly monumental. Of these, the most significant and unique, in my view, has been to bring together scientists from countries as remote as Chile is from China. TWAS can boast to have fostered a sense of kinship amongst individuals from diverse cultures and background and helped them to work single mindedly for the sole aim of bridging the scientific and technological gap between the rich and the poor countries. No other international organization can match this claim. In this mission TWAS’s main function has been to act as pressure group to persuade the governments of the South to make the necessary commitment to scientific research. The assumption here is that the collective voice of scientists from over 75 countries is likely to be more effective than the voice of single individual in a remote land. Abdus Salam’s last years were devoted to the missionary task of going from country to country meeting the heads of states and other influential government officials to extract the pledge that their government will allocate 1% of GNP to scientific research. To obtain this commitment Abdus Salam would use every trick under the sun; he would flatter them, twist their arm, needle them and if everything failed, hit them below the belt – of course in a gentlemanly fashion. It needs recording that he had very little effect on the policies of his own motherland, Pakistan, which he dearly loved. But there were leaders who were keen to please Abdul Salam and through their emissaries would send him the good news of the intent of their government to allocate the required 1% to science. The gesture would bring a broad grin on Abdul Salam’s face and was certain to receive his regal approval.

Even greater challenges

The conventional activities expected of scientific academies are, the election of fellows, recognition of young talent and rewarding outstanding achievements through the award of prizes and medals. TWAS executes these tasks at a level and in a manner which is rivalled by only a few distinguished academies in the world. However, another chapter in the activities of TWAS is being

opened by the new challenges posed by globalization which is subjecting the developing countries to new pressures. The most significant pressure concerns the rules of the World Trade Organization (WTO) which require countries to open their markets to international competition. This is a bizarre situation since the countries which are at the forefront of forcing this policy have for decades nurtured their industries, by state subsidies and protectionist legislation, to reach the present state of maturity. These advanced countries are now keen, nay over-exuberant, to deprive the developing world the same right which they had enjoyed during the period of their own development. The WTO is advocating the type of competition the poor countries can well do without – the policies will create a few winners at the expense of many losers. Most of the winners are likely to be countries which are already powerful – it is only in fairy tales that David triumphs over Goliath!

A direct consequence of globalization is the commercial pressure on consumers to a premature, and in many cases unnecessary, use of modern technology. It can be argued that, to a limited extent, commercial interests have always provided the stimulus for scientific inventions. However, in the past it was possible to strike a balance between commercial exploitation of scientific knowledge and regarding it as a cherished heritage of humankind which was freely accessible to whosoever cared to search through the scientific literature. Those who contributed richly to the great discoveries of the twentieth century – such as vaccination, antibiotics, insulin corticoids, steroid hormones and organ transplant – hardly benefited financially from their endeavours.

Two powerful factors have changed all this and are creating a dangerous situation, particularly for the less developed countries. These are, the universal acceptance of the free-market philosophy as the political creed of our time and the influence of the multinational companies. The tenets of free-market are being enforced on almost all walks of life resulting in a situation in which even the most respectable scientists are ‘bending’ their researches towards commercial application. The collusion between the scientists and the multinationals

is leading to the marketing of expensive alternatives, with new-look labels to appeal to modernity snobs, which often are no more than the me-too versions of existing products. Several of the recombinant DNA-based diagnostic kits fall in this category. The most worrying feature of this trend, however, is the commercial onslaught on agriculture, where farmers around the globe are being lured to use new seeds and agrochemicals whose production and distribution is strictly controlled by multinationals, most of which belong to a hand-full of advanced countries. The power of these organizations is so great that they have been able to market products about which very little, if any, information can be found in the peer-reviewed open literature.

The choice of appropriate technology to meet the needs of the developing world is an immensely important task which needs cooperation between politicians and highly trained local scientific experts, of impeccable integrity. In a modest way, TWAS has begun to address these issues by sensitizing the Third World countries to vigilance against the commercial pressure to accept unproven new technologies and in particular the Intellectual Property Rights (IPR) when applied to living forms. In the final analysis, IPR will suit only those who have the scientific know-how, the legal experience and the financial backing. In this connection TWAS has championed the cause that ‘all agricultural life forms should be legislated to belong to all the humanity and excluded from the intellectual property claim’³.

The issues raised above will need to be tackled courageously, since these will be strongly challenged by the western commercial lobby and indeed by local vested interests as is highlighted by the lively debate, on the merits (or otherwise) of genetically modified cotton seeds, in the columns of this journal⁴.

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1. Abdul Salam, in *Ideals and Realities* (eds Hassan, Z. and Lai, C. H.), World Scientific, Singapore, 1984, p. 290.
 2. Menon, M. G. K., in *TWAS Proceeding of 6th General Conference*, 1997, pp. 47–50.
 3. Akhtar, M., *TWAS Newslett.*, July–September 1997, pp. 4–5; and July–September 2000, pp. 4–6.
 4. Correspondence in *Current Science*, 2001, **80**, 321–326.
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