

## Review of “Cosmic Anger” by Gordon Fraser

Mark Alford, Jan 2009

Until I read Gordon Fraser’s book, I knew Abdus Salam only as an illustrious name from the golden years of particle physics. Like most physicists I knew that the electroweak sector of the standard model is called “Weinberg-Salam theory”. I have visited Salam’s enduring creation, the International Centre for Theoretical Physics in Trieste, and I was aware that it was part of his lifelong effort to nurture science in less-developed countries. And of course I knew that Salam was one of the few Muslims to achieve the highest recognition in contemporary science, the Nobel prize.

All these aspects of his life are fascinating, and, as I learned from Fraser’s meticulously researched book, the last part is the saddest and least well known. Salam was a deeply religious man, but he was rejected by his native Pakistan, even to the point of having his tombstone there officially defaced, because he was an adherent of the minority Ahmadiyya Muslim Community. Ahmadis believe that their founder, Mirza Ghulam Ahmad (1835-1908) was an all-encompassing messiah: the Mujaddid (divine reformer) of his century, the second coming of Jesus, and the Mahdi, all rolled in to one. Like Mormons in relation to orthodox Christians, Ahmadis are viewed with suspicion, and sometimes with violent hostility, by orthodox Muslims. Fraser describes the world in which Salam grew up, detailing the political and religious history of the region, and tracing the sinking fortunes of the Ahmadis in Pakistan, who through the 1960s and 1970s were officially declared non-Muslims, forbidden to use Muslim prayers, and prevented from performing the Hajj pilgrimage to Mecca. Where some Western physicists may regard Salam’s receipt of the Nobel prize as being influenced by pro-Muslim political correctness in Stockholm, Fraser points out that many Islamicists regard it as the opposite: a conspiracy to undermine Islam by pouring honors on a heretical sect.

Fraser follows Salam’s trajectory through particle physics in the 1950s, 60s, and 70s. He describes the research conundrums of the time, and Salam’s contributions and collaborations. He traces the origins and career of every physicist who impinged on Salam’s life, sometimes at great length. One revealing episode in Salam’s career was the difficulty he faced in promulgating his concept of the link between parity violation and the massless neutrino. In 1956 Lee and Yang hypothesized that the weak interaction might violate

parity, and Salam quickly realized that this would be entirely natural if the neutrino were exactly massless. But the weight of the physics establishment was against parity violation. Salam first went to Peierls, who dismissed the idea, then to Pauli, the “universally acknowledged Chief Justice of Physics”, who insisted that “I do not believe that the Lord is a weak left-hander, and I am ready to bet a very large sum that the experiments will give symmetric results.”

The fact that so many eminent physicists regarded parity violation as ugly and unappealing teaches us a strong lesson about nature’s obedience to our aesthetic prejudices: beauty is not always the same as truth. Fraser paints this episode as a major setback for Salam, describing his paper on massless neutrinos, which was admittedly delayed by Pauli’s discouragement, as being “*eventually* published...in January 1957” [my emphasis]. But it is not clear what was so bad about that publication date: the experimental discovery of parity violation was announced in that same month, and it was another two months before competitive papers by Lee and Yang and Landau were published.

Fraser’s biography shows us the fast tempo of Salam’s life: his “furious inventiveness” in developing new theories of particle physics, his tireless traveling and lobbying to create the International Centre for Theoretical Physics at Trieste, his unsuccessful campaign to become the director general of UNESCO, and his efforts to develop scientific skills and infrastructure in Pakistan and other Islamic countries. Although Salam the physicist and Salam the shrewd politician are vividly portrayed, somehow Salam as a person remains inaccessible. After spending many pages on background material such as the history of Pakistan and detailed biographies of Salam’s colleagues, Fraser barely mentions Salam’s personal life. This is surprising because Salam had (for a physicist) an extremely unusual family: he was an open bigamist, maintaining two parallel wives and families. The first was Amtul Hafeez Begum, whom he married in the Punjab in 1949, and by whom he had five children between 1950 and 1960. The other wife was Louise Johnson, whom he met in London in 1962 and married in 1968, and by whom he had one son in 1974. The two families both accompanied him to Stockholm for his Nobel prize award, but the book hardly touches on their role in Salam’s life or his role in theirs.

Not many Nobel-level physicists have such a strong religious identity as Salam did. Fraser describes Salam’s constant efforts to excite an interest in scientific research among the leaders of Islamic nations, but does not try

to explore his religious ideas in any depth. Salam himself puts forward his convictions in his book “Renaissance of Sciences in Islamic Countries” (edited by H. Dalafi and M. Hassan, World Scientific, 1994). These transcripts of talks given in Kuwait, Bahrain, Dubai, Turkey, and Pakistan are studded with Arabic quotations from the Koran, and communicate his sincere self-identification as a devout Muslim, and his absolute certainty that science was an integral part of Islam. For the most part these talks take for granted an Islamic outlook, but in one chapter, “Scientific thinking: between the secularization and the transcendent”, Salam offers to speak about why he is a believer. I was very interested to see how he would connect his scientific approach with his religious views, which included the belief that an itinerant 19th century Indian preacher was the promised messiah of Christianity and Islam. Unfortunately, he never really delivers on this promise. He claims that “the spirit of wonder” is the hallmark of true science and spends the rest of the chapter skipping between examples of scientific thinking. In the end he simply asserts that he has never seen any contradiction between science and the timeless spiritual message of Islam. One of his footnotes states that “one of the most difficult questions which the self-consistent [non-religious] scientist has to answer is—‘Why this decree?’”, but he never applies this question to his religious beliefs.

In the final chapter, Fraser enumerates Salam’s three great goals: to make fundamental discoveries in science, to improve scientific research and opportunities in developing countries, and to raise the level of science in Islamic countries. Fraser gives a lukewarm verdict on the first, noting that Salam’s main contributions did not help our knowledge move forward any faster than it would have without him. For the second, Fraser points to the International Centre for Theoretical Physics in Trieste as a resounding success. For the third, there is no question: Salam failed to persuade Islamic countries to make a substantial investment in resources for scientific research. Fraser attributes this failure to Salam’s status as an Ahmadi heretic. Salam himself blamed Islam’s priestly class, dismissing them as “nearly illiterate men”. But Islam’s strained relationship with science and freedom of thought eludes any simple characterization, and remains one of the great problems in the modern world. One hopes that Salam may someday be remembered as one of the pioneers in resolving it.