# In Memory of S. Twareque Ali

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**Abstract.** We remember a valued colleague and dear friend, S. Twareque Ali, who passed away unexpectedly in January 2016.



S. Twareque Ali in Białowieża.

### 1. Remembering Twareque

Syed Twareque Ali, whom we all knew as Twareque, was born in 1942, and died in January 2016. This brief tribute is the second one I have prepared for him in a short period of time. With each sentence I reflect again on

his extraordinary personality, his remarkable career – and, of course, on the profound influence he had in my life. Twareque was more than a colleague – he was a close friend, a confidant, and a teacher in the deepest sense.

When I remember Twareque, the first thing that comes to mind is his laughter. He found humor in his early changes of nationality: born in the British Empire, a subject of George VI, Emperor of India, he lived in preindependence India, became a citizen of Pakistan, and then of Bangladesh – all without moving from home. Eventually he became a Canadian citizen, residing with his family in Montreal for many years.

Twareque's laughter was a balm. In times of sadness or disappointment, he was a source of optimism to all around him. His positive view of life was rooted in deep, almost unconsciously-held wisdom. Although he personally experienced profound nostalgia for those lost to him, he knew how to live with joy. He could laugh at himself, never taking difficulties too seriously.

And he loved to tell silly, inappropriate jokes – which, of course, cannot be repeated publicly. He introduced me to the clever novels by David Lodge, *Changing Places*, and *Small World*, which satirize the academic world mercilessly. In Lodge's characters, Twareque and I saw plenty of similarities to academic researchers we both knew in real life – especially, to ourselves.

Twareque was fluent in several languages, a true "citizen of the world." He loved poetry, reciting lengthy passages from memory in English, German, Italian, or Bengali. In Omar Khayyam's *Rubaiyat*, translated by Edward Fitzgerald, he found verses that spoke to him. These are among them:

> Come, fill the Cup, and in the Fire of Spring The Winter Garment of Repentance fling: The Bird of Time has but a little way To fly–and Lo! the Bird is on the Wing.

A Book of Verses underneath the Bough,

A Jug of Wine, a Loaf of Bread–and Thou

Beside me singing in the Wilderness Oh, Wilderness were Paradise enow!

•••

...

The Moving Finger writes, and, having writ, Moves on; nor all your Piety nor Wit Shall lure it back to cancel half a Line.

Nor all your Tears wash out a Word of it.

#### 2. A short scientific biography

Twareque obtained his M.Sc. in 1966 in Dhaka (which is now in Bangladesh). He received his Ph.D. from the University of Rochester, New York, USA, in 1973, where he studied with Gérard Emch. Professor Emch remained an inspiration to him for the rest of his life, and Twareque expressed his continuing

gratitude. In 2007, together with Kalyan Sinha, he edited a volume in honor of Emch's 70th birthday [1]; and in 2015, he organized a memorial session for Emch at the 34th Workshop on Geometric Methods in Physics in Białowieża.

After earning his doctorate, Twareque held several research positions: at the International Centre for Theoretical Physics (ICTP) in Trieste, Italy; at the University of Toronto and at the University of Prince Edward Island in Canada; and at the Technical University of Clausthal, Germany in the Arnold Sommerfeld Institute for Mathematical Physics with H.-D. Doebner. He joined the mathematics faculty of Concordia University in Montreal as an assistant professor in 1981, becoming an associate professor in 1983 and a full professor in 1990.

During his career as a mathematical physicist, Twareque achieved wide recognition for his scientific achievements. He was known for his studies of quantization methods, coherent states and symmetries, and wavelet analysis. A short account cannot do justice to his accomplishments; the reader is referred for more detail to two published obituaries from which I have drawn [2, 3], and asked to forgive the many omissions. I cannot do better than to quote the summary in another tribute I wrote [4]:

"During the 1980s, Twareque worked on measurement problems in phase space, and on stochastic, Galilean, and Einsteinian quantum mechanics [5,6] Then he began to study coherent states for the Galilei and Poincaré groups, and collaborated with Stephan de Bièvre on quantization on homogeneous spaces for semidirect product groups.

"There followed his extensive, long-term, and indeed famous collaboration with Jean-Pierre Antoine and Jean Pierre Gazeau, focusing on square integrable group representations, continuous frames in Hilbert space, coherent states, and wavelets. Their joint work culminating in publication of the second edition of their book in 2014 – a veritable treasure trove of mathematical and physical ideas [7–10].

"Twareque's work on quantization methods and their meaning is exemplified by the important review he wrote with M. Engliš [11], and his work on reproducing kernel methods with F. Bagarello and Gazeau [12]."

Twareque's contributions of time and effort helped bring a number of scientific conference series to international prominence. Foremost among these was the Workshop on Geometric Methods in Physics (WGMP) in Białowieża (organized by Anatol Odzijewicz). Twareque attended virtually every meeting from 1991 to 2015, where we would see each other each summer. He was a long-time member of the local organizing committee, and co-edited the *Proceedings* volumes. Other conference series to which he contributed generously of his energy included the University of Havana International Workshops in Cuba (organized by Reinaldo Rodriguez Ramos), and the Contemporary Problems in Mathematical Physics (Copromaph) series in Cotonou, Benin (organized by M. Norbert Houkonnou).

He was also an active member of the Standing Committee of the International Colloquium on Group Theoretical Methods in Physics (ICGTMP) series. Twareque and his wife Fauzia came together to the 29th meeting of ICGTMP in Tianjin, China in 2012. She attended the special session where Twareque (to his surprise) was honored on the occasion of his 70th birthday. Their son Nabeel, of whom always spoke with great pride, practices pediatric medicine in Montreal.

Twareque was a deep thinker, who sought transcendence through ideas and imagination. The truths of science and the elegance of mathematics in the quantum domain were part of the mysterious beauty for which he longed – a longing shared by many great scientists, a longing that we, too, share.



S. Twareque Ali in thought at WGMP XXXIII, July 2, 2014. Photograph by G. A. Goldin.

As profoundly as Twareque cared about understanding the meanings of scientific ideas, he cared equally about inspiring his students to succeed. He helped them with personal as well as professional issues. As Anna Krasowska and Renata Deptula, two of his more recent students who came from Poland to work with him, wrote [2], "If anything in our lives became too complicated it was a clear sign we needed to talk to Dr. Ali. Every meeting with him provided a big dose of encouragement and new energy, never accompanied with any criticism or judgment." This was Twareque's gift – to understand, to inspire, to give of himself.

Twareque died suddenly and unexpectedly January 24, 2016 in Malaysia, after participating actively in the 8th Expository Quantum Lecture Series (EqualS8) – indeed, doing the kind of thing he loved most.

#### 3. Concluding thoughts

Twareque believed passionately in world peace, in service to humanity, and in international cooperation. He understood the broad sweep of history. His tradition was Islam, as mine is Judaism, and although neither of us adhered to all the rituals of our traditions, we shared an interest in their history, their commonalities, and their contributions to world culture. We even researched correspondences between the roots of words in Arabic and Hebrew. On a first visit to Israel for a conference in 1993, we visited Jerusalem together. Twareque did much to aid the less privileged and less fortunate – in the best of our traditions, often anonymously.

Often one closes a retrospective on someone's life with a sunset, marking the ending of day and the beginning of night. My choice for Twareque is different. He is someone who joined a scientific mind with a spiritual heart, and for Twareque, the park and the forest in Białowieża were at the center of his spirituality. So I imagine him looking at us, even now, and marveling at the beauty of heavenly clouds reflected in the water.



Reflection of the heavens in Białowieża Park, July 4, 2013. Photograph by G. A. Goldin.

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