



A. N. S. S. S.

HASSAN NASIEM SIDDIQUIE

(1934 - 1986)

Elected Fellow 1983

BIRTH, PARENTAGE AND CHILDHOOD

HASSAN NASIEM SIDDIQUIE was born on 20th July, 1934 at Bijnor in Uttar Pradesh. His mother Mrs Ahemadi Begam was the daughter of Mr Elyas Afindi a lawyer from a cultured and educated muslim family. His father Dr MA Siddiquie, son of an Engineer, belonged to a place called Sivhara in Nagina district in UP. By profession Dr MA Siddiquie was a Civil Surgeon in Hyderabad.

As a child HN Siddiquie had grown up in various places of AP viz Warangal, Adilabad and Hyderabad as his father's post was transferable. Hassan Nasiem Siddiquie's father passed away in 1954 leaving behind 6 sons and 2 daughters, the eldest being Hassan Nasiem of 20 years only.

FORMATIVE INFLUENCE ON THE YOUNG SCIENTIST

During his childhood, it was his father's dedication to his profession that inspired him most. But it was his father's untimely death which brought about a tremendous change in his personality. Being eldest, the responsibility fell on his shoulders that made him to learn to take quick and correct decisions. He had to guide and support all his brothers and sisters, in their education and selection of their career. Young Siddiquie had taken all these problems as a challenge and delivered the goods. This ongoing process developed a sense of responsibility and foresight in him which reflected later in his brilliant career.

Soon after getting his Master's degree, he joined Geological Survey of India. He often mentioned to his colleagues that he was influenced by Prof F Ahmad, Prof AG Jhingran, Dr DP Bahl, Dr MVN Murty & Dr D Lal. Those who worked with him, either his seniors or juniors in the GSI used to tell that "He is the first person to reach and last one to leave the office". He got an opportunity to work at the Institute of Oceanography of Academy of USSR on a UNESCO fellowship, when he was 30 years old. He never had any hesitation to admit that he became an admirer of the functioning of Soviet Oceanographers. This visit became a turning point in his career to become an accomplished Oceanographer of the country.

SCHOOL AND UNIVERSITY EDUCATION

Hassan Nasim Siddiqui had his early education in Adilabad. After clearing the higher secondary examination in 1949 from Government Higher Secondary School he joined Osmania University from where he passed ISC in 1951.

He joined the Aligarh Muslim University as an undergraduate student in the year 1952, and went on to complete the degree of Bachelor of Science with Geology, Botany and Chemistry in 1954 and Master of Science in Geology in 1956 securing a first division in both the examinations. He enrolled himself as a candidate for the award of PhD at the Aligarh Muslim University after he joined the National Institute of Oceanography (NIO), and carried out extensive work on sedimentology of the Indian Ocean. He was awarded the degree of Doctor of Philosophy on his extensive work on the geology of Lakshadweep Islands.

One of his Professors recalls that "Dr HN Siddiqui had left behind him a profound personal impression upon many of his former teachers of the Aligarh Muslim University, particularly those of the Geology Department, as a very resplendent well behaved and meritorious student in the course of his postgraduate as well as undergraduate studies at the University from 1952 to 1956. There is hardly any record of missing his classes around a year and he used to take extra-ordinary interest in his studies on geology from the first year BSc classes. He was the first student to leave his bed early every morning and get ready while attending geological field work under the guidance of his teachers. He had a unique faculty to grasp intricate problems of field geology and always took immense pains to solve them seeking little help from his teachers.

PROFESSIONAL CAREER

At GSI he embarked on his professional career in 1956 when he joined the Geological Survey of India. In the initial stage he worked in the Ground Water Exploration Division and Research Laboratories of the survey. He was also associated with the exploration of bentonite deposits of Barmer District, Rajasthan. After training at the Institute of Oceanology of the Academy of Science of USSR, he initiated offshore mineral exploration programme of the survey. He became a senior Geologist in 1966 and served on this position till 1973 in GSI when he moved to National Institute of Oceanography (NIO).

Dr Siddiqui joined the National Institute of Oceanography, Goa as Scientist E, (Assistant Director) and the Head of the Geological Oceanography Division in 1973. He became Scientist F and the Deputy Director in 1982. Subsequently he was appointed as Director of NIO in 1985, a post in which he continued till his death.

During his tenure at NIO, he co-ordinated the following important research activities as Project Co-ordinator :

(i) Geological and geophysical surveys to assess the petroleum and mineral prospects of the continental margins of India. (ii) Regional Geology and polymetallic nodule deposits in the Arabian Sea and Central Indian Basins, Indian Ocean. (iii) Co-ordinated a comprehensive programme for the studies on Polymetallic Nodules as a National priority project. Later this work culminated in India's recognition as a "Pioneer Investor" by United Nations Organization. (iv) Geochemistry of sediments of the continental margins of India. (v) Sediments of the western continental margin of India. (vi) Foraminifera as indicators of pollution in the Marine environment. (vii) Paleoclimatic studies on the nature of the summer monsoon over the Arabian Sea during the past 10,000 years.

As a Deputy Leader of the Expedition, he planned, organised and co-ordinated the marine sciences programmes for the Project Gangotri - the First Indian Expedition to the Antarctica.

He believed in applied work and lost no opportunity to apply his knowledge, expertise and infrastructure developed in applied oriented research. An opportunity arose in 1974 when ONGC wanted NIO to help them in survey and selection of pipeline route from Bombay High to Bombay and development of offshore oil fields. Dr Siddiquie took up the challenge and successfully completed this work. Subsequently ONGC and other marine based organizations entrusted all such work to NIO. Dr Siddiquie completed the following major work as a Project Coordinator :

Sponsoring Agency	Project
Oil and Natural Gas Commission	<p>Surveys for the development of Bombay Offshore Oil fields</p> <ul style="list-style-type: none"> i) Pipeline routes from Bombay to Bombay High, Bassein to Gujarat, BFL to Karanja and Butcher Island, and Direction Bank to Murud-Janjira and Bassein. ii) Bathymetric and shallow seismic surveys on the South Bombay High, South Bassein and Direction Bank. iii) Postlay surveys of the pipeline from Bombay High to Bombay. iv) Various surveys for drilling locations, shore approaches and lost well heads etc.
Oil India	Surveys off Mahanadi delta.

Port Trusts

Surveys for the development of Mormugao,
Visakhapatnam, Mangalore and Karwar Ports.

These sponsored projects form the first major surveys of their kind undertaken and completed by any Indian organisation. Based on these studies, the route of the important pipeline from Bombay High to Bombay was selected.

He travelled widely, attended scientific conferences, participated in oceanographic cruises and represented India as member of scientific delegation to the following countries: USSR, FRG, Holland, UK, France, Ceylon and French Somaliland (1972), Ethiopia, USA, Canada, Indonesia, Mauritius, Norway, Antarctica, Denmark, Thailand, Ceylon, Seychelles, Egypt, Portugal and Switzerland. His trip to USA was the last to attend the Second International Conference on Paleo-oceanography on an invitation from SCOR.

SUMMARY OF CONTRIBUTIONS

Siddiquie started work in Marine Geology at a time when research vessels were not available in India. Thus his earlier studies were unavoidably based on navigational charts, data and samples collected by foreign vessels in the Indian Ocean. Subsequently, he developed indigenous techniques and facilities to work at sea.

Siddiquie's studies of the sediments collected on board research vessels *Ob* and *Vityaz* from the Bay of Bengal are important contributions and are widely referred to in the literature. The Scripps Institution of Oceanography invited Siddiquie to participate in their prestigious & global "Deep Sea Drilling Project" in the Arabian Sea. His studies of Site 219 indicated that the Paleocene acidic tuffs represent a phase of Deccan Trap activity on the Laccadive Ridge before its subsidence and separation (Lower Eocene) from peninsular India. During the subsidence, phosphorite and manganese-rich sediments were deposited from upwelled waters.

Siddiquie and colleagues prepared a Bottom Sediment Map of the Seas bordering India (15,000 bottom notations and 3200 bottom samples). This is the first attempt in the country to prepare offshore geological map and depicts many interesting features of the continental margin and is of considerable value in planning offshore exploration. They also prepared a geomorphological map of the NW Continental margin based on the echograms from the Expedition of *INS Darshak*. The seamounts with a steep scarp on the slope probably indicate ancient volcanoes and fractures.

Siddiquie developed facilities for marine geological work and offshore mineral exploration from boats in shallow areas. He demonstrated the usefulness of mineralogical studies of a number of samples on a grid to decipher long term sediment transport. He also developed indigenous method and cheaper techniques for fluorescent tracer studies of sediment transport in coastal areas which are important for designing of coastal structures. His detailed studies of Lakshadweep indicated that the (i) cyclones from the east (forming storm beaches) and the sediments transported during the SW monsoon are important in the building of the Island on the E reefs of the lagoons, (ii) the high MgO in the sediments of the reef margin indicates its sources in the reef and (iii) submerged terraces on seaward reefs were formed during low sea level. The dates of storm beaches clustering between 3000 to 2000 years BP and 500 years BP to present indicate variation in the frequency of the storms. These also suggest that parts of the islands have grown by about 30m (eg Chetlat) in the last 2780 years and even to 100m (eg Minicoy) in 470 years. The total reserves of calcareous sediments to a depth of 2m are of the order of 1400 million tonnes. Similarly, he explored (bottom sampling, bathymetry, seismic profiling and magnetics) off Konkan Coast which indicate the extension of the ilmenite deposits to offshore and the reserves appear to be large. These form the first successful projects for offshore *surficial* mineral exploration in the country. Siddiquie was invited to review the *surficial* mineral deposits of the Continental Shelf at an International seminar at Orleans, France.

After the commissioning of *RV Gaveshani*, Siddiquie initiated integrated geological and geophysical surveys and covered the Western Continental Shelf. The studies indicated that (i) Deccan Traps are exposed on the seabed to a depth of about 15m off Bombay, (ii) the seabed in the Southern Gulf of Khambhat is covered by thick clays which thin out towards the north where the N-S and NNE-SSW sand banks are exposed and the intervening channels are filled with clays and (iii) the banks have been formed parallel to currents while the ripples and mega ripples (E-W to ENE-WSW) are formed in layers of mobile sand transverse to the currents, (iv) acoustic masking due to gases in sediments in an area of 2500 km² and (v) occurrence of amphibolites on the western shelf.

As an application of marine geological and geophysical studies to the development of offshore oil fields, Siddiquie and co-workers covered the entire spectrum from pre drilling to post construction surveys. The surveys initiated in 1976 involved accurate position fixing, bathymetry, side scan sonar, shallow seismic profiling followed by seabed sampling and analysis and interpretation of the data. The surveys in deeper areas were carried out on *RV Gaveshani* and in shallow areas on small boats. These included the surveys for the pipeline route from Bombay High to Bombay, Bombay Floating Light to Karanja, Bassein to Gujarat, its shore approaches and from Direction Bank to Murud and Janjira. The bathymetric and shallow seismic surveys of Bombay High, South Bassein and Direction Bank were carried out for designing and siting of platforms. These were followed by the post lay surveys of the Bombay High to Bombay pipeline.

Dr Siddiquie also supervised the surveys and advised on the route for effluent disposal pipeline for Bombay Municipal Corporation, Zuari Agro Chemicals, Kudremukh Iron Ore Co. Ballarpur Industries and Travancore Titanium Products and for the development of ports and harbours at Visakhapatnam, Mormugao, Mangalore, Karwar and Tuticorin.

First Indian Expedition to the Antarctica : As a Deputy Leader of the First Indian Expedition to Antarctica, he planned, organised and coordinated the Marine Sciences programme for the cruise for which Dr SZ Qasim was the Cruise Leader. With the successful landing and completion of marine research programmes, the country joined the select group of developed (and some Latin American) countries carrying out scientific work in the Antarctica. The marine surveys led to the discovery of Rift Valleys on the Antarctic Continental Margins.

Polymetallic Nodules in the Indian Ocean : Realising the importance of the polymetallic nodule deposits on the seabed, Siddiquie analysed the data and samples collected by other countries (1973) and identified areas for exploration. He initiated planning in 1977 and the first cruise for the exploration of polymetallic nodules was successfully organised on *RV Gaveshani* in 1981. The achievements has been recognised as a major landmark in India and abroad. This in turn led to the recognition of India as a Pioneer Investor along with France, Japan and the USSR and four other entities controlled by other countries *i.e.* USA, FRG and UK. As a result of this recognition and the need to identify a Pioneer Area before the end of 1982, the CSIR/DOD launched a vigorous programme for surveys for polymetallic nodules in the Indian Ocean. Siddiquie coordinated this programme in which a number of ships (*RV Gaveshani*, *ORV Sagar Kanya* and two chartered vessels) were deployed and more than 19 laboratories were involved in the analysis of the samples and data. Based on the results of these extensive surveys, the country (India) filed the claim for the Pioneer Area with the United Nations first in January 1984 and later in 1987 and India's claims were recognized for the development and a mine site in the Central Indian Ocean was allocated to India. Alas, he could not see it.

MEMBERSHIP OF SOCIETIES, AND HONOURS

Dr HN Siddiquie was a Fellow of the Geological Society of India, the National Academy of Sciences (1984) and the Indian National Science Academy (1983). He served as a Member of the IUGS (1983), IUGG (1984), Ocean Science and Technology Board (Govt. of India) and National Council of Science Museums. He became Fellow of the Association of Exploration Geo-physicists in 1982 and subsequently was elected as its Council Member (1985). He was selected as a member of editorial boards of the *Proc.*

Indian Acad. Sci. (Earth and Planetary Science, 1981) and the *Indian Jour. Mar. Sci.* (1984). He was also a member of the Research and Advisory Council of the National Geophysical Research Institute, Hyderabad. He was actively associated with many Academic Institutions. He served as a member of Board of Studies for Geology/Marine Sciences/Marine Geology of the Andhra, Cochin, Mangalore and Bombay Universities. He was the member of Executive Council of the Goa University and Member of the Planning Board of Kashmir University.

He was associated with various activities in the field of oceanography at International level. He was elected as a Vice-Chairman of the workshop on "Improved uses of Research Vessels" organised by IOC/UNESCO at Lisbon, Portugal (1984).

He was elected as vice-chairman on TEMA (Training, Education and Mutual Assistance) group to IOC/UNESCO for a two year term (1984-85). He also served as members of IOC-UNESCO Guiding Group of Experts for the Programme Ocean Science and Non-Living Resources (OSNLR), and SCOR, WG 82, Polar Deep Sea Environment.

The Shanti Swarup Bhatnagar Prize of the year 1978 in Earth Sciences was awarded to Dr HN Siddiquie for his significant contribution to the marine geology of the Bay of Bengal, the Arabian Sea and the preparation of sediment distribution map of the seas around India. The citation reads "His studies have shed new light on the origin of the Laccadive Ridge and its relation to the western continental margin of India. His success in locating and proving large resources of calcareous sediments in offshore areas of Laccadive Islands and in the delineation of the submarine oil pipeline route is of considerable importance in the context of proper utilisation of the offshore resources".

For his meritorious services as a scientist in the field of Oceanography he was conferred "Padma Shri" by the President of India in 1983.

PERSONAL LIFE

He had a wonderful sense of humour ever-since his student days. Once, while he was moving on a road under construction, in the field, accompanied by his class-fellows and guided by his teachers, he suddenly picked up a road building stone in his hand, broke it with hammer and began to examine the rock seriously. As soon as his teacher looked at him, he threw away the stone and remarked "this is the only way to draw your attention Sir, and see whether you are watching us or not". The teacher concerned smiled a bit and appreciated the joke.

He was always the first among the group of his class fellows to walk ahead of all others and to follow his teacher as closely as possible lest he might miss listening to his teacher's instructions and lessons while working in the field. Often, he used to surprise

his teachers by way of making some thought-provoking and searching queries, for example, "Why equal importance to teach geology in the class-room and in the field is not given in many of the Indian Universities?" "How can one become an adept field geologist and in how many years at the most?" "How a qualified geologist can help exploration and development of our country's vast hidden mineral resources?" and so on.

In fact, he was found to be a potential scientist, who was not only a versatile thinker but also had a scientific bend of mind right from the beginning of his student career.

On 5th January, 1969, HN Siddiquie was married to Ms Talat Siddiquie, a very elegant daughter of an educated Zamindar family from Shahajahanpur (UP). The old saying that behind every successful man there is a woman, was extremely true in case of Siddiquie. She had shared with pleasure the moral and all financial responsibilities of Dr Siddiquie. His wife had shouldered the complete household responsibilities to make him free to achieve his goals in academic field.

Dr Siddiquie was a very religious man but not an orthodox. He was a tea totaller and not addicted to any intoxication. He was known to his colleagues as a work alcoholic, who was an immediate source of inspiration to his younger colleagues, whom he frequently advised and encouraged to work hard. He was a sympathetic research guide with high standard and successfully guided 7 PhD students. Of these, he cleared 2 PhD thesis and a number of research papers from Geology Division of the National Institute of Oceanography during the few months time between his first and 2nd heart attack.

In his personal life he was very fond of old classical Indian Music. His favourite singer was late Begam Akhtar. Dr Siddiquie a tall, fair, attractive man was a regular jogger, his favourite hobby being gardening. Those who had an opportunity to see him in his house found him a very soft and affectionate man contrary to his impression as a tough administrator.

Though he was very conscious about fitness, but perhaps his continuous hard work and over enthusiasm costed him the first heart attack on 31st December, 1985 which in no way deferred him from his involvement in academic life. His lust for hard work even under physical stress will always be remembered.

A successful career ended on 14th November, 1986 when Dr Siddiquie breathed his last in the Goa Medical College. On that fateful day he attended office for full day and was worried about the welfare of a scientist who was injured in an accident on board and was on the way back to shore for treatment. At about 4 p.m. he complained of suffocation. He was shifted to Goa Medical College but he could not withstand the 2nd massive heart attack. He is survived by his wife, a daughter and two sons. His daughter was the eldest one and was only 16 years old at the time of his death. His love for work, sense of responsibility and belonging, honesty and above all his dynamic personality besides

his other attractive qualities, will long be remembered by his nearest and dearest one and also continue to inspire his younger colleagues and friends whom he had left behind.

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