

## Dinesh Shah

of Florida

DICK DALE AND JOHN O'CONNELL

*University of Florida*

*Gainesville, FL 32611*

**D**INESH SHAH IS A rebel, a philosopher, an investigator of science, a poet and a man of two worlds. His heritage is deep in 5,000 years of East Indian culture and his devotion is to a fledgling nation of only two centuries.

"I was rebellious in many respects," he says. "I didn't like some of the traditional values. I was greatly influenced by Mahatma Gandhi and his writings. Before Gandhi we were a society of many castes where only people of low caste did manual labor. Gandhi said manual labor was good for everyone.

"We had a low caste guy who cleaned our high school and I guess he just quit or something. The school was dirty so I told the principal that I would clean it if he gave me the money they paid before. He didn't see anything wrong with such an arrangement but it sent a shockwave through the school.

"I was known as a nonconformist! But no one had the nerve to question me. I was the top student. I took that job in the eighth grade and kept it for four years. My brother continued doing it."

Life for the Shah family wasn't easy. The breadwinner was ill for a long time prior to his death. Money was short and sacrifices had to be made. Tradition gave way to survival.

"We had our own home so we didn't have a rent problem. And, in India, the relatives pitch in and help. I know my mother felt bad. If you bought

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Besides being a keynote speaker on several occasions, he has won two outstanding paper awards at international meetings. Among his one hundred publications are two books he edited on enhanced oil recovery.

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something in the market, it was proper to engage a low caste to carry it to your home. I couldn't afford a porter.

"My mother said to come home by way of the back streets where no one would see me. I walked through the main street with my bundles on my shoulder."

College for the young Shah was, in his words, something of a miracle. With meager savings, help from relatives and acquaintances, and money from academic awards earned in high school, he went to the University of Bombay.

"There was a special boarding house there. Heavily subsidized. No frills but adequate and at about half the usual cost. Even with that, in six months my money was gone.

"I walked on the beach one day, trying to find a way to solve my problem. As I walked, I looked at the fine houses along the shore and, without knowing why, I moved closer and studied the names. These were homes of doctors, lawyers and professional people. I saw a name! An attorney who had been prominent in our pre-independence movement. And I pushed the bell."

The young man asked to speak to someone in the family and was ushered to an audience with the matriarch, a daughter-in-law of the late famous barrister.

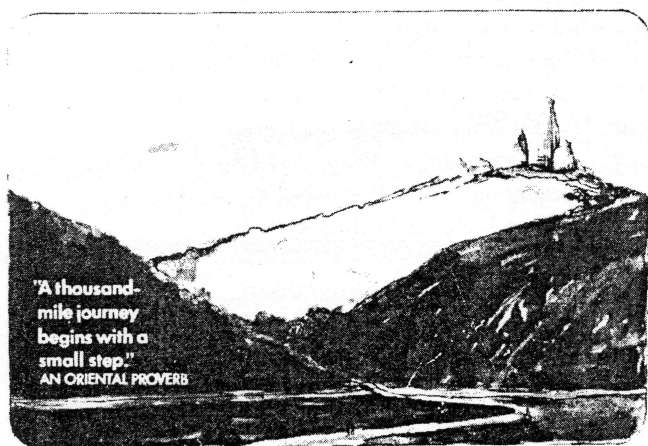
recognition accorded to this program is a reflection of his relentless efforts and dedication. In the summer of 1983, Dinesh was invited to present a three-day short course on enhanced oil recovery at the Imperial College, London. With frequent overseas visitors and students from various parts of the world, his research group exudes a spirit of international cooperation and harmony.

Dinesh introduced one undergraduate and two graduate courses on interfacial phenomena to chemical engineering curriculum which continue to attract not only students from chemical engineering but also from other engineering and basic science departments. He has offered special topic courses on membrane biophysics, biochemical engineering and enhanced oil recovery processes.

A treat to listen to, Dinesh has presented about one hundred papers at scientific meetings and two hundred seminars at academic institutions and industrial laboratories. The first slide of his numerous seminars (shown below) illustrates his approach to science and life. Besides being a keynote speaker on several occasions, he has won two outstanding paper awards at international meetings. Among his one hundred publications are two books he edited on enhanced oil recovery.

Dinesh's breadth of quality contributions is remarkable. The University of Florida has honored him with its highest awards in each area of teaching, research, and service, and the Federation of Asian Indians in North America has given him its "Outstanding Achievement Award".

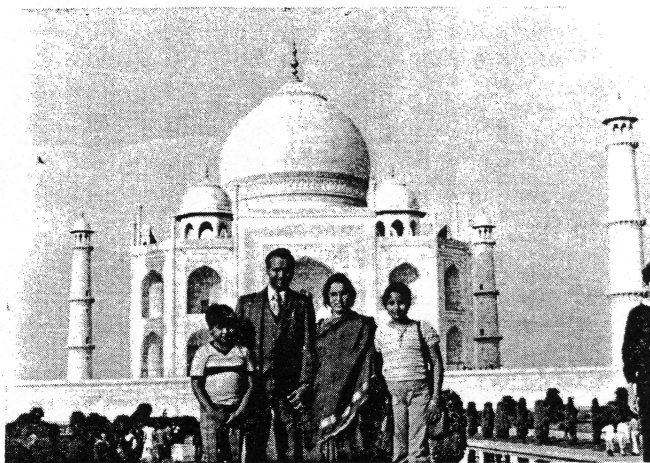
"I am going to be an academic for my lifetime. I could do other things but I wouldn't enjoy it. I like the freedom. And I like the personal interaction with the students. You feel you are shaping their careers. Essentially, you are expanding your



Traditional opening slide of Shah's speeches.

family. It's a great satisfaction". The common bond of love, affection and mutual respect between him and his students is maintained long after the students leave his laboratory.

Perhaps Dinesh's approach to teaching, research and education in general can be summarized by the last sentence of his seminars, a quotation from a poem by Tagore, which says "My



Shah and his family on a recent visit to India and the Taj Majal.

friend, drink my wine in my own cup to appreciate its sparkling bubbles."

And Dinesh understands the meaning of family and appreciates the support he receives from the family in all his endeavors. His wife Suvarna and two children are frequently seen at the chemical engineering department. Guests at their home often meet other relatives. And a delight for many visitors is seeing the costumed children dancing to drums tapped by their father.

Finally, there is always a verse. Deep thoughts written mostly in Gujarati. Poetic philosophy drafted en route in airplanes and in infrequent quiet moments. Some to be published soon in two languages that all in his two worlds may enjoy. Of his adopted country he speaks positively.

"I like the general philosophy here in terms of the appreciation of a person for his accomplishments. That you are judged without consideration of origin, race or creed.

"We see an occasional exception but by and large this is so. You are allowed to become what you want to become. You are the architect of your life. There are no traditions or laws to follow and obey!

"Wonderful!" □

"She listened while I told my story. That I needed work. Washing clothes, dishes, tutoring children. There were no children of the immediate family but there were children of the staff. The servants."

"Come every evening," she said, "and tutor the children. We will not pay you a salary but when you need money for anything just ask."

"I was overwhelmed! They were very wealthy, indeed. And they supported me all through my undergraduate studies. It was a miracle!"

"In college there were two ways I might have gone. Engineering or medicine. Cutting up frogs or other "living" things was opposed by religious sentiments and engineering appeared uninteresting. I settled for physics.

"But as time went on there was nothing exotic or mystical about physics and I became fascinated with a new area called biophysics. Physics applied to biological systems and processes. I thought that would be really good.

"That year the university started a graduate program in biophysics. I was in the first batch of four students who were selected and I spent two years at the Indian Cancer Research Center doing course work.

"When I moved to graduate study I expressed my thanks to my patron and said I could carry on alone. I had expanded my tutoring to college students and increased my earnings. My benefactor was delighted with my independence. We remained close friends.

"But in 1960 I applied for a doctoral fellowship at Columbia, in the United States, and was accepted. To go to America meant that someone must post a financial bond. A substantial figure. And, without hesitation, she accepted responsibility for my move to America. Much later, when I had earned my degree, I received a lovely letter of congratulations.

"When I first came to Columbia I was going to work in radiation biophysics. My first summer job, however, was with Professor J. H. Schulman in the school of mines. He was a pioneer in surface and colloid sciences. And I got hooked!

"This is a terrific thing! You can handle the molecule! You can measure the molecule! And you can feel them! You can see the effect of molecular film on the surface tension of water. I was really hooked!

"Fortunately, the professor was also on the advisory committee of the biophysics program. I took him as my supervisor for doctoral research.

"I was exposed to many things in his laboratory that have enabled me to work broadly on such things as oil recovery, coal dispersions, pharmaceutical microemulsions, contact lens solutions, membranes and anesthesiology. Working with such a man was my second miracle!"

Subsequently, Dinesh held a NRC-NASA Resident Research Associateship to conduct research on chemical evolution and the origin of life at the NASA Ames Research Laboratory. Later, he moved to the Biological Oceanography Division of Columbia University and investigated the dispersion of oil-spills, retardation of evaporation and



**Shah receives Outstanding Service Award from Wayne Chen, Dean of Engineering. Front row: John Biery, ChE Department Chairman (deceased), Shah, Dean Chen, K. S. Chan. Second row: Joseph Noronha, Wen-ching Hsieh, Michael Chiang, Shih-Yung Shiao.**

wave damping by thin films of surface active agents.

In 1970, he joined the University of Florida as an Assistant Professor and was promoted to Professor of *Chemical Engineering, Anesthesiology and Biophysics* in 1975. He has continued his research love of the areas of monomolecular films, foams, wettability and contact angle, microemulsions, liquid crystals, improved oil recovery, combustion of coal dispersions in oil and aqueous media, surfactant-polymer interaction, boundary lubrication and surface phenomena in magnetic media, membranes, lungs, vision and anesthesia.

The initiation of a multidisciplinary research program on enhanced oil recovery jointly with other colleagues in the department was a major milestone in his research career. The international



## BIOGRAPHICAL SKETCH OF PROFESSOR D.O. SHAH

At present, Dr. Shah is the first **Charles A. Stokes Professor of Chemical Engineering and Anesthesiology** and is the **Director** of the Center for Surface Science and Engineering at the University of Florida. He received his undergraduate training at the University of Bombay, and his doctoral degree from Columbia University in 1965 under the direction of the late Professor J. H. Schulman, a pioneer in Surface and Colloid Science. Thereafter, he was awarded a NRC-NASA Resident Research Associateship to conduct research on chemical evolution and the origin of life at NASA Ames Research Center.

In 1970, he joined the University of Florida as an Assistant Professor, and was promoted to the position of Associate Professor in 1972. He later became a Full Professor in 1975. He has continued his research in areas of monomolecular films, foams, wettability and contact angle, dispersions in oil and aqueous media, surfactant-polymer interactions, boundary lubrication, nanoparticles of superconductors and magnetic materials, and surface phenomena in membranes, lungs, vision, and anesthesia. Dr. Shah has edited seven books on enhanced oil recovery, surfactant solutions, as well as macro- and microemulsions. He has published over two hundred research papers and reviews, and has presented about two hundred fifty papers at scientific meetings. He has delivered over three hundred seminars at academic institutions and industrial laboratories. Dr. Shah has served as a consultant to more than 50 corporate laboratories during the past twenty-five years.

Dr. Shah received the University of Florida's "**Excellence in Teaching Award**" in 1972, the "**President's Scholar Award**" in 1975, the "**Outstanding Service Award**" in 1976, the "**Best Paper Award**" at the International Congress of Chemical Technology in 1978, **Visiting Professorship in Chemical Engineering and Petroleum Engineering** at the Institute for Energy Studies at Stanford University in 1979, and the "**Outstanding Achievement Award**" from the Federation of Asian Indians in North America in 1980. He was invited as the **keynote speaker** at the European Symposium on Enhanced Oil Recovery in Bournemouth, England, in 1981. Dr. Shah received the "**Perry Brothers-Mallinckrodt Award**" from the Society of Cosmetic Scientists in 1982 for the best paper presented at the annual scientific meeting. He was invited to teach a short course on "**Surfactants and Their Use in Enhanced Oil Recovery**" at Imperial College, London, in 1983, and to present the **keynote lecture** at the meeting of the International Society for Contact Lens Research, in Cambridge, England, in 1984. Dr. Shah was appointed **Director of the Center for Surface Science and Engineering** at the University of Florida in November, 1984. He received the University of Florida's highest honor "**Teacher/Scholar of the Year 1984-85 Award**" and the "**President's Medallion for Excellence in Teaching and Scholarship**" in May 1985. Dr. Shah served as the **chairman** of the Department of Chemical Engineering during 1987-1991. He received the "**Florida Scientist of the Year Award**" in April 1988, and was invited to visit India during September 1988 on a three-week lecture tour as the **United Nations (UNIDO) Consultant**. The AIChE Students Chapter presented to Dr. Shah the "**World-Class Chairman Award**" and the University of Florida College of Engineering honored him with a plaque for **meritorious service** as the chairman and for **globally recognized professional contributions** to the field of surface science in 1991. He received the "**Vishwa-Gurjari 1992 International Award**" for distinguished achievement. In October 1992, Dr. Shah received the "**Florida Blue Key Distinguished Faculty Award**" and was requested to be the **Grand Marshal** of the 1992 Homecoming Parade. The Florida Academy of Science honored Dr. Shah as the "**Distinguished Florida Scientist of 1993**". In July 1993, he was presented the "**Pride of India Award**" by Mr. A. Ansari, India's Ambassador to the United Nations, on behalf of Swami Narayan Sanstha of the U.S.A. Dr. Shah received the "**1994 Best Paper Award**" of the American Oil Chemists' Society for his research paper on the *Molecular Mechanism for Destabilization of Foams*. He was invited to present a **plenary lecture** in honor of Professor Heinz Hoffmann at Wolfgang-Ostwald Colloquium for Colloid and Surface Science at Bayreuth, Germany during June 23-24, 1995. He organized and hosted at the University of Florida an **International Symposium on Micelles, Microemulsions, and Monolayers: Quarter Century Progress and New Horizons** during August 27-30, 1995 which was attended by 300 researchers from 25 countries. During 1995, Dr. Shah was invited to present a two-day intensive **short course on foam making and foam breaking** at the Procter & Gamble Research Centers in Cincinnati (USA), Caracas (Venezuela), Newcastle (UK), Brussels (Belgium), Rome (Italy), Kobe (Japan), and Manila (Philippines). Dr. Shah has been invited to serve on the **Editorial Board** of the Journal of Colloid and Interface Science, January 1, 1996. In 1996, Dr. Shah was appointed as the first **Charles A. Stokes Professor of Chemical Engineering**. He was invited to present a **plenary lecture** at the 4<sup>th</sup> World Surfactants Congress in Barcelona, Spain and was also an **invited lecturer** at the 11<sup>th</sup> Surfactants in Solutions Conference in Jerusalem, Israel in June, 1996. He received the **Professorial Excellence Award** from the University of Florida in 1996.