

## Professor Ramnath Narayan Swamy



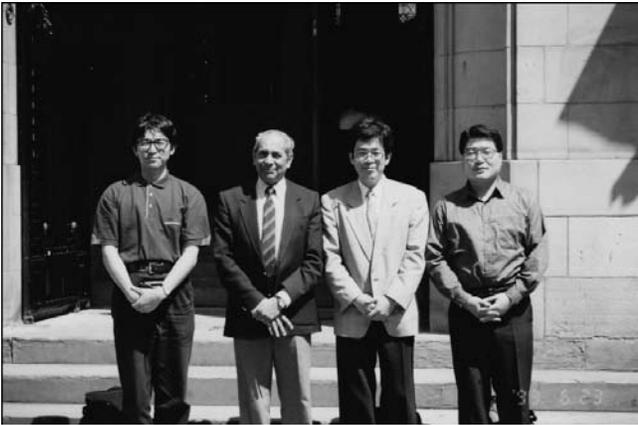
### Towards a sustainable and resilient concrete technology through holistic design

A famous Professor from Leeds University, UK, recently stated that "To write a chapter on the contributions of Professor R.N.Swamy, BEng, MEng, PhD, CEng, FICE, FStructE, FACI, FASCE, or Narayan as he is universally known, would be an easy task but composing a brief biographical sketch is nigh on impossible. For over forty years his published works have been a barometer of the strengths, weaknesses, opportunities and threats in the field of concrete and concrete structures. During the times when research funding for concrete in UK Universities was limited, Narayan managed to attract a large number of dedicated researchers to work with him at the Department of Civil and Structural Engineering of the University of Sheffield. Whereas the city of Sheffield is firmly linked with the steel industry, the work of Narayan at the University made Sheffield one of the established centres of excellence in concrete research".

This enabled the Concrete Research Group at Sheffield to initiate some pioneering research on some of the major deterioration processes that have affected the durability of concrete, and created much debate, argument and clashes of views amongst the international community. These research activities included topics such as the use of high alumina cement, alkali-aggregate reactivity, delayed ettringite formation, and more recently, on the

new form of sulphate attack, namely, that of Thaumasite formation in concretes containing limestone aggregates and/or fines. A significant emphasis of these research studies at Sheffield was to interrelate microstructural and micro-mechanical phenomena with the behaviour of full scale structural elements and their in-situ field performance. These studies of the interactive performance in real environments of concrete materials and concrete structures were aimed to ensure their long-term sustainable and durable service life performance.

These research activities enabled the Group to establish research collaboration at an international level with both Universities and/or industry. These research partners came from various parts of the world – such as Japan, China, Taiwan, Malaysia, Sri Lanka, Iraq, Italy, Greece, Brazil, Canada, the States, and so on. This international interaction enabled the Sheffield Group to tackle a much wider range of research topics such as corrosion and corrosion control/protection, punching shear mechanisms, fibre cement composites, environmentally friendly and low energy building materials, use of natural fibres and so on. Such international collaboration made research very exciting and adventurous and gave the team a greater vision and understanding of the problems involved in civil engineering infrastructure



Professor Swamy at the University of Sheffield, UK with some students from Japan.

development. This collaboration also enabled the group to produce sustainable and cost-effective solutions to engineering challenges. Two such challenges are worth mentioning. A highway concrete bridge near Sheffield – prestressed in two directions – and designed for a live load of 100 tonnes was required to carry a commercial load of 400 tonnes – the solution was simple – rebuild the bridge ???!!! – but the team ended up with the plate bonding technology of strengthening structures – the first of its kind applied to bridges. Another challenge required the development of an efficient, reliable and cost-effective protective coating system for concrete to prevent the penetration of air, water, chlorides and other aggressive ions into concrete, and thus to protect and rehabilitate the structure from further damage and deterioration, and thereby extend its durable service life. The Group has spent some 25 years of study in developing such a coating system !.

To quote the famous Professor again – “Narayan is best known to many as the Founding Editor of the Journal Cement and Concrete Composites. The older generation will remember that he was the Founding Editor of its predecessor, The International Journal of Cement Composites and Lightweight Concrete. Through these activities Narayan has made a major contribution to this important area of concrete research. Similarly, he has provided an invaluable service in keeping engineers and researchers informed regarding recent developments through his series of books on Cement and Concrete Composites, specially edited Theme Issues of the Journal devoted to particular research areas, and numerous other publications” .

Professor R.N. Swamy has been a very active member of the various national Professional Institutions, and also in ACI and RILEM. He has also been active in several international technical committees and in local Community Relations Committees. Many Universities and professional bodies in and out-side the UK have always recognised and appreciated the many contributions of Professor Swamy. He is a recipient of the prestigious George Stephenson Gold Medal of the Institution of Civil Engineers, UK; the ACI Design Practice Award; the ACI/Concrete Research Council Robert E Phileo Award; the Construction Institute /ASCE Best Paper Award, and the ACI/CANMET Awards for outstanding contributions on Durability and Supplementary Cementing Materials. He is an Honorary Life Member of the ACI and the “R.N Swamy Symposium” at the 5th CANMET/ACI International Conference is a fitting tribute to his outstanding contributions to concrete technology during his lifelong career in the forefront of concrete research, practice and education. In receiving these Awards, Professor Swamy has always dedicated them to the large number of researchers who have worked with him and to whom he is eternally indebted.

Finally – to quote the famous Professor again – “Narayan’s intellectual ability, integrity and honesty combined with his dedication to research and communicating his results to others are known through his published papers, books and editorial work. For those who have the benefit of knowing him also as a person have an added advantage. His caring attitude towards research students, his gentlemanly conduct of PhD examinations, his kind comments and encouragement which accompanied reviewer’s comments on papers submitted to his journals have been appreciated by many. His warm, friendly personality combined with his words of encouragement are qualities which are few and far between. He has the rare ability of generating excitement and inspiration in those around him. He has managed this humanistic approach despite the stresses and strains of having to 'climb mountains' time and again against all odds. The contributions of Narayan Swamy can be summed up in a parody of the well known verse by Longfellow, as follows :

*The career of Narayan does remind us  
We can make our lives sublime,  
And, departing, leave behind us  
Footprints on the sands of time "*

