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Cement & Concrete Composites 22 (2000) vii–ix

Cement & Concrete Composites

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Editorial

Finally, I beg your indulgence in a bit of imagery:
Let us think of research and the writing of papers as the spinning of threads. By themselves the threads may be weak and useless, but when woven with other threads representing experience and common sense, they help to form a strong fabric of knowledge. Thus equipped, we may deal intelligently and wisely with our daily problems, and we may open the door to new paths of progress.

T.C. Powers, 1947

I do not know whether Joe Cabrera ever read T.C. Powers' paper [1] "Some observations on using theoretical research", but it reflects the approach that he took to research: [2] he did not make a critical distinction between so-called "practical" and "theoretical" research, he adopted a flexible, interdisciplinary approach to solving problems and advancing knowledge. Joe's early career was, certainly, very practical: he was an Engineer (1959–1963) and eventually Head of Construction (1963–1965) with the Bolivian Development Corporation (during this time he designed the highest and longest runway in the world at La Paz [3]). Yet only three years after coming to Leeds in 1966 he had co-authored with Smalley a paper in Nature [4], which showed possibly the first scanning electron micrographs of clay soil to appear in a primary scientific journal [5]. The following year the same authors published the first scanning electron micrographs of loess soils [6], and soon afterwards published a new theory [7] to explain the strange properties of certain post-glacial soils found in Canada and Scandinavia (the so-called "quickclays"), which is now widely accepted [5]. In the same year as the theory on quickclays, Joe published a paper on earthmoving equipment [8], and he maintained this practice of pursuing both practical and fundamental studies through the rest of his life. His published work is a fine testament to this approach. Whilst it is not possible to discuss Joe's work in any detail in this Editorial – he published more than 200 papers and supervised over 65 Ph.D. students – the following selection illustrates the nature and diversity of his studies: work on, of course, the characterization of soils and soil stabilization [4,6,9,10]; the design of new testing equipment [11–14]; on bituminous composites [15–18]; on other pavement materials and the performance of pavements [19–21]; on the use of waste materials in civil engineering, especially pulverized fuel ash [22–28]; on various aspects of concrete technology, including the mix design and performance of concretes with different mineral and chemical admixtures, the repair of concrete, and the corrosion of steel in reinforced concrete [29–41]; and on cement science [42–45].

Joe's belief in the effectiveness of an interdisciplinary approach to research eventually led him to establish the Civil Engineering Materials Unit (CEMU) in the University of Leeds in 1992. His legacy is a well-staffed Unit with well-equipped laboratories with activities ranging from cement and concrete science, through concrete technology, bituminous composites, masonry, timber, and stabilized soils. The Unit is certainly interdisciplinary with work occurring at interfaces between chemistry, materials, structures, geotechnics, transport engineering, and construction management. This Special Issue contains eight papers – on very diverse subjects – from workers involved with CEMU; it is in memory of Joe Cabrera.

[1] It is now over fifty years since Powers and Brownyard's classic and very long paper, "Studies of the Physical Properties of Hardened Cement Paste", was published in the American Concrete Institute Journal in nine parts between October 1946 and April 1947 [1]. The practical value of work such as theirs – termed by some "theoretical research" – was at the time questioned by some of the Institute's members. This led the Institute's Secretary to suggest to Powers that he point out the practical significance, if any, of the work. Powers' presented his response to the ACI's 43rd Annual Convention on 25 February 1947 [2]. He considered it a mistake to contrast theoretical research with practical research: in the few minutes available to him he attempted to demonstrate that work such as his and Brownyard's was both practical and useful, and not just at some remote date. He noted that there was a tendency to use research papers like a handbook: seeking the answers to questions by looking up a figure, or a formula, or reading a summary of test results. He maintained that so-called theoretical research could not be used profitably in this way. Instead, such work should be studied until it became a part of one's working knowledge.

[2] Whilst a bit long, I can imagine this quotation slowly moving across his computer screen; Joe was in the habit of placing a thought for the morning on his screen saver.

0958-9465/00/$ - see front matter
PII: S0958-9465(00)00036-6

The papers in this issue were all reviewed anonymously to the high standard expected of a primary journal; I thank the reviewers for their efforts.

Joe Cabrera made many significant achievements in research. He was also a most remarkable man: remarkable for his breadth of knowledge, for his strength of character, for his love of his family, and above all, for his kindness.

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