

Remembering William “Bill” McGuire (1920-2013)

Transcripts of Tributes for the Memorial Gathering on September 7, 2013

School of Civil and Environmental Engineering, Cornell University

The Master of Ceremonies read excerpts from these tributes during the memorial gathering. The full text of each tribute is collected here in the order in which the tributes were read.

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Remembrances of Bill McGuire
Arthur H. Nilson, Professor Emeritus of Structural Engineering
School of CEE, Cornell University

For memorial gathering on September 7, 2013

It is appropriate that I should send in a few comments on this occasion, because I have almost certainly known Bill McGuire longer than anyone present. I had just returned to Cornell from work in an architectural engineering office in Connecticut in the fall of 1954, on a quest for a master's degree. Bill had only recently arrived from a position with Jackson and Moreland Engineers in Boston, a first-rank design firm, to accept a teaching position in what was known at that time as "George Winter's Group." I found myself taking a course in structural analysis and design under Bill. It was a refreshing change of pace from the sort of instruction that was found in Civil Engineering at Cornell a decade before, when I had been an undergraduate here. Bill was a nice looking young guy with a crew haircut, not only knowledgeable and with hands-on experience but enthusiastic about passing on to us his understanding of structural behavior.

To appreciate the changes that were taking place at that time, it is necessary to look back a few years before that. There were a few "stars" on the faculty, but looking over an old photo from my files, I see a group of "grand old men," mostly all close to retirement age. No research was being done, and there were few graduate students. At that point in time, the Dean of Engineering, S. C. Hollister, had the foresight to bring in George Winter. George set about building the structures group from the ground up, bringing in Bill McGuire and others to revitalize things, and eventually to form a separate Department of Structural Engineering. Bill was an early and central part of that group, which was to become one of the top three or four notable centers for structural engineering instruction and research in the US, eventually gaining a reputation for excellence that was acknowledged worldwide.

I was particularly fortunate to join the faculty here in 1956 and had the pleasure of having Bill as a colleague for the next thirty-five years. We each taught a variety of structures courses over the years, but I recall that early on, Bill and I were called in and sat down with George Winter. This was probably an intimidating event for both of us, because George was, to say the least, a dominant figure. After a brief discussion we agreed that Bill would do steel and I would do concrete, and our professional directions were set from that point on.

Key faculty members such as Gordon Fisher, Paul Bijlaard and Floyd Slate were added in just a few short years. Lots of things flowed: undergrad and grad courses, sponsored research, many publications and many textbooks. It was an exciting time. Good research was done. Undergrads, graduate students and more structures and materials faculty were attracted to CEE and the growth of the department continued. Always Bill was at the center of things.

I won't attempt to summarize Bill's honors, awards, appointments to national committees and numerous awards. These are a matter of record and have been dealt with by others. However I would like to bring special attention to his textbook and reference volume *Steel Structures*.

Truly monumental (almost 2 1/2 inches thick by actual measurement), it was one of a kind. I recall one point in my own career when I was doing some large-scale steel testing in Thurston Lab and had to check out the safety of heavily loaded 3-inch diameter round steel pins. I scratched my head for a long time over this, looking for research and analysis that might be helpful dealing with the stress concentrations that were involved. There was only one book in all the references I searched that dealt with this in specific terms, and it was in Bill's book that I found my answers.

Speaking of that book, (and I can't absolutely vouch for this) I was told that Bill wrote the entire manuscript in pen and ink on lined yellow paper! This was long before the age of PCs and word processing of course. But while most of us were won over to IBM typewriters, whiteout fluid and scotch tape, Bill said that he liked to collect his thoughts staring at that yellow pad.

There is one aspect of Bill's professional life that deserves special mention, and that is the lasting influence of the period he spent in actual hands-on practice in that top Boston design office. The perspectives gained with real-world problems were of great influence in his choice of research topics, in decided what was important and what was not so important. Throughout his career he moved with great success between high level practical consulting and the highest level of research, for example the design of the Arecibo radio telescope installation on the one hand and the nonlinear torsional flexural analysis of structures on the other. This duality followed through his entire professional life, each activity enhancing the other and leading to great results on both sides.

In thinking back on Bill's life as a member of the Structures group and the CEE faculty, the most important thing I feel is to recognize the achievements of the many, many students who passed through his classes or did research under him, and later went on to make major contributions in academia or structural design or construction. This would include noted academics, researchers, and designers, some of who are here today. I think that in Bill's view this would eclipse all the awards, appointments, medals and honors he received over the years. Bill was proud of his students. He maintained close relations with many over the years, although they were widely scattered, both here and overseas. He consulted with them on important projects, advised on special problems and continued to play an important part in their lives long after they had left Cornell.

To close I would like only to say that it was my greatest privilege to serve on the faculty with Bill for almost four decades. The experience was inspiring and instrumental in giving direction to my own professional life, and I will be forever grateful for that experience.

Memorial Statement for Bill McGuire

Robert G. Sexsmith, Professor Emeritus, University of British Columbia

Former faculty colleague, Cornell CEE

For memorial gathering on September 7, 2013

I was unable to come in person to this gathering, but am honored to have this opportunity to say a few words about Bill, through another's voice.

My first meeting with Bill was upon my arrival at Cornell as a new young starting faculty member with the Structural Department. He and all the others were welcoming and supportive, and he can be remembered as a man with a fine sense of humor, with a desire to help in many ways. Very soon that fall term he invited me to accompany him on a road trip to a Structural Steel conference in Albany. Over a few days he ensured that I met numerous people in the steel industry, both business and academic, and as a Canadian who had never been to the Eastern USA, his easy and friendly manner quickly came through as I learned about NY State politics and geography, and much about Ithaca and Cornell as well.

Others here will relate details of his many contributions and honors, so I shall simply mention how important his book, *Steel Structures*, is to anyone in this field. The book provides a most thorough bridge between basic theory, practical simplifications and approximations, to development of the various expressions that appear in the design standards. Without this book, design engineers are faced with standards that they use that are often far removed from the basic principles, and the tendency to use the standards as a “cookbook” can be strong. When McGuire's *Steel Structures* is available, there is no excuse for a designer to not understand the connection to the basics.

His easy manner and ready smile will be missed by all who have known him.

Memorial Statement for Bill McGuire

**Steven J. Fenves, NAE, University Professor Emeritus of Civil & Environmental
Engineering, Carnegie Mellon University**

For memorial gathering on September 7, 2013

Please convey to the attendees our regrets for not being able to attend this Memorial Gathering for Bill McGuire. Norma and I met Barbara and Bill while I was on sabbatical leave at Cornell. Bill and I subsequently served nearly 40 years together on the AISC Committee on Specifications. Bill was a vigorous supporter of the then-new LRFD Specification, and passionately argued for the removal of antiquated provisions and for the introduction of more rigorous analyses. But he always argued – in public as well as private – with his usual warmth, humor and charm. He made no enemies.

My most intense interaction with Bill was on ELRFD, intended to be the electronic version of the Specification (it never became operational due to property disputes over portions of computer code that were to be incorporated). I drafted the logic in tabular form, and Bill was charged to fill the blanks where the specification was silent. The dedication, thoroughness, and tenacity that he brought to this task absolutely bowled me over. That is how I understood that he brought these same qualities to everything he did, such as working out, **by hand**, every assignment in his book on *Matrix Structural Analysis*.

Bill has left a deep impression on everyone whom he had met. I consider myself fortunate for being considered his friend.

An Appreciation of Bill McGuire
Anthony R. Ingraffea, Dwight C. Baum Professor of Engineering
School of CEE, Cornell University
For memorial gathering on September 7, 2013

“Uhhum...Uhhum...Harruummppff...”

Anybody who ever worked with Bill knew that his clearing his throat with that characteristic sound was a “tell,” as sure as a poker player scratching his chin. That throat-clearing sound was telling the listener to “clear your thinking.” Bill was always polite, but he was always alert to sloppy thinking, and one was well advised to take the throaty hint.

My two best recollections of Bill and his clearing of my thinking center around “McGuire and Gallagher” and Arecibo.

I had the honor and onus of being the very first to use McGuire and Gallagher, *Matrix Structural Analysis*, in a course at Cornell in the Spring of 1978. “Honor,” hell, I was scared witless, by both of those guys at my tender non-tenured age; “onus” because Bill expected me to tell him all the things that needed fixing and to add to the solutions manual. I was happy to have some really smart students in that class. Anybody here know what a contragradient operation is? I still don’t.

We know that Bill loved the Arecibo structure. Not many know how many times he saved it from an early demise. Three times in the last 20 years Bill was called to the rescue, twice in emergency conditions, and I again had the honor of working with him on those cases. What I added to these hectic situations was much less than I got back: a path to good judgment. Here is what I observed in Bill in each case: Stop and think, think harder, connect the pathology dots, identify stop-gap measure, more time to think, start over, different trail, listen, mine experience, aha!: here is the problem, and here is the fix. Now, whenever I have a difficult choice to make, I thank Bill for that critical item in the path to good judgment: taking the time, regardless of the apparent pressures, to clear thinking.

Tribute for Bill McGuire

Bill Baker, NAE, Structural and Civil Engineering Partner, SOM

For memorial gathering on September 7, 2013

I never attended Cornell, but I was a student of Professor Bill McGuire. How can this be? It is because he provided a vision and a philosophy that taught the profession how to think about structural systems in general and structural steel systems in particular. He clarified our thinking and enabled us to achieve greater things. The issues involved are highly technical and, in part, concern the nonlinear behavior of structures where an incremental change in load results in a disproportionate change in the structural response. If structural behavior is nonlinear, so is life. Most people pass through this world and the effects of their existence quickly attenuate after they pass on. A small number of people are different. Their effects on our world are disproportionate. Bill McGuire belongs to this second group; through his students and his philosophy, his influence continues to expand at an ever-increasing rate.

After I began professional practice, I got to meet and know Bill McGuire. I always addressed him as “Professor” because he was my teacher.

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September 7, 2013

Dear Professor Abel,

In Memory of Professor William McGuire PE

Having only arrived at Cornell as an undergraduate in 1990, I did not have the privilege of studying the art of structural engineering under Professor McGuire in class. However, in many more profound ways I have enjoyed the pleasure of his influence and kindness throughout my professional engineering career. Indeed, I would not have been able to later continue my graduate studies at Cornell had I not received the academic scholarship which bears his name. But it was upon my frequent return visits to campus, either as a recruiter or as an engineering consultant to the University, that I really came to know the kind, gentle, and very generous man Bill McGuire truly was.


At one point my firm was asked to review renovation measures being proposed for all the Cornell campus bridges, including Professor McGuire's beloved Fall Creek Gorge suspension bridge. When I approached Professor McGuire about this, he happily invited me to a personal tour of the bridge, pointing out the subtle nuances of its construction as he recounted anecdotes of how the design came together half a century ago. It was fascinating to learn firsthand the intricate ins and outs of the same storied structure I once crossed as a young student. After our visit, he invited me back to his home (truly hallowed ground for any student of structural engineering!) where he gave me his personal copy of his original handwritten engineering calculations of the bridge. And, with my hands trembling at the significance of this gesture, I received the documents with reverence.

Professor McGuire was a giant of a man in the structural engineering profession. His book, "Matrix Structural Analysis," still adorns my desk, as it does the desks of countless engineering professionals who have come before me. He remained active in the profession throughout his life, even asking me to review a keynote paper he once gave on structural stability as recently as 2005. But what I came to realize was that the greatness of the man lay not only in his vast knowledge, but in the kind and generous manner in which he bestowed that wisdom to others.

I will miss our nostalgic chats over brunch at the Country Club of Ithaca, or over breakfast joined by his former student and my own graduate advisor, Professor Teoman Peköz at the Statler. I will cherish these fond memories of the man we rightly celebrate today.

I am very sorry that personal circumstances prevent my attendance at today's memorial to Professor McGuire. To his family and other loved ones, please accept my most sincere condolences for the passing of this great man. He will be missed.

With kind regards,

A handwritten signature in black ink, appearing to read "Patrick S. McCafferty". The signature is stylized with large, flowing loops and a prominent "P" at the beginning.

Patrick S McCafferty PE, LEED AP
Associate Principal | Structural Engineering Practice Leader – Arup Boston