

PileBucks' Interview with Dr. George Goble

By Sarah Milstead

In our last issue of PBI, I gave a brief capsule of my interview with Dr. George Gordon Goble, PhD, PE, M.ASCE. which remains a memorable experience for me. I was introduced to him at the IFCEE 09 in Orlando by Mohamed Hussein, Chair of the event. Mohamed has a gift for bringing people together in a relaxed and comfortable way. The conference atmosphere was charged with the excitement of bringing diverse associations, disciplines, countries and personalities together and it worked like a charm.



Pictured from left to right are Mohamed Hussein, GE, Engineer; past PCEA President Randy Dietel; past PCEA President Wayne Waters; and Dr. George Goble

Dr. Goble and his wife live in Longmont, Colorado. As I said before, I have to laugh because he would tell a fine story and then say, "Don't print that!" He and I were able to sit down for an informal interview that was pleasantly interrupted by the various people as well as friends that came up to speak with him. These welcomed interruptions were followed by a quick, "Now where was I..."

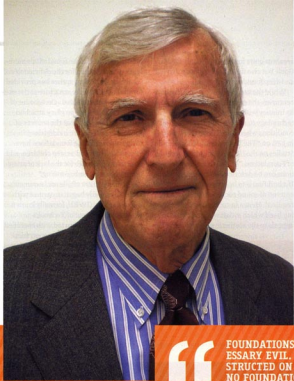
Some approached him with a reverence that was fascinating for me to observe. I know he would not like this pointed out as he is a down to earth

man. His close friends strolled by and bantered with him. He always stopped to offer them a compliment as well as a humorous byte of shared job experiences, or predicaments they narrowly escaped. In fact I would call Dr. Goble a good storyteller himself, somewhat like the Mark Twain of the West.

Dr. Goble is handsome, fit, and appears to be an outdoors man; an interesting mixture of academia, frontiersman and entrepreneur. He has a capricious nature about his accomplishments, and his successful, or not so successful follies. His first makeshift laboratory where he concentrated on testing and development

was a bit primitive to say the least. He told many stories in which I can only give a glimpse of including an early trip to Japan, where he was picked up by an unknown driver who took him up mountains only to arrive at his host's where refused to take his shoes off. Needless to say he laughed about not being asked back. I am also sure he would be more accommodating now.

I would also say that he is a maverick. He was born on a farm, homesteaded by his great grandfather, near Eagle, Idaho on September 11, 1929. He is a true man of the west, as were his great grandparents, who settled there at the time of the gold rush to serve and accommodate the growing population of fortune seekers. His connection with the land and soil is a profound one, shaped by a childhood spent in the west. He attended elementary school at a one room country school close to his family's home and high school in Meridian, Idaho. From there he went on to the University of Idaho where he received his B.S. in Civil Engineering in 1951. He credits his parents, William



Dr. Goble's experiences with the DOT and the main companies involved at the time, are historically interesting, giving perspective regarding the infrastructure of today's highways and the entrepreneurs who broke off to form their companies. Like them, Dr. Goble the academic, realized there was a lot more money and reward to pioneer some of the instruments he was working on with his grad students. Success did not come easy and the journey towards it brought him to many places and his involvement in many business ventures.

His career in the field of geotechnical engineering spans almost six decades. Yet there is nothing tired or weary in his demeanor or thinking; his observations are sharp, quick and relevant. He has influenced and impacted innumerable students and fellow engineers with his inventions, including pioneering Dynamic Testing over 40 years ago while at Case Western Reserve University, and his

W. and Beatrice Goble, with most inspiring his life stating that "Life was very difficult for them due to things beyond their control. The integrity and honor that they showed was an example for me."

As a young man, he naturally followed the "call to arms" of wartime, graduating college and serving two years as an Installations Officer, obtaining Captain's rank in the U.S. Air Force. Upon leaving the service he launched his professional career and encountered what he considers to be the most memorable experience he has had in his field, "My first engineering job after school, between 1953 and 1955, was as a bridge construction inspector for the Oregon DOT. One of my projects was a long deck truss bridge across the Umpqua River. After the erection I had to inspect the quality of the rivet installation. (Rivets have been replaced

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(Karl Terzaghi, writing in 1953 on "The Influence of Modern Soil Studies on the Design and Construction of Foundations.")

by bolts in modern steel construction.) I had to tap each rivet to assure that it was properly installed and to get to the rivets I had to walk on seven inch wide deck beams. There was no net and the bridge was 135 feet above the ground. I did it but I cannot imagine how!"

authoring of over 125 technical papers covering a myriad of topics including structural laboratory testing, dynamics and field testing of pile driving, and field testing of bridges, which have literally changed how business is conducted in the pile driving arena.

COVER STORY

While he obtained his Master of Science and his Ph.D., with a concentration in structural engineering and a minor in geotechnical engineering, from the University of Washington, he worked as a Structural Designer with Marshall, Barr and Associates in Seattle, Washington. Dr. Goble was also awarded a Fulbright to study at the Stuttgart Technische Hochschule, Stuttgart, Germany during 1957-58.

Dr. Goble started his research on the dynamics of pile driving when it was recommended to him by Dr. H. R. Nara after he arrived at CWRU. "I had to develop a research program and find the necessary funding", he said, "Nara suggested continuing his pile research." Focusing in this

area was quite fortuitous not only for Mr. Goble but also for the world of pile driving and deep foundations.

While the use of piles dates back many centuries, the geotechnical field was in its infancy with regards to having the technology to measure and quantify soil conditions when Karl Terzaghi, writing in 1931 on "The Influence of Modern Soil Studies on the Design and Construction of Foundations," stated that "Foundations can be described as a necessary evil. If a building is to be constructed on an outcrop of sound rock, no foundation is required. Hence in contrast to the building itself which satisfies specific needs, appeals to the aesthetic sense, and fills its

matter with pride, the foundations merely serve as a remedy for the deficiencies of whatever whimsical nature has provided for the support of the structure at the site which has been selected. On account of the fact that there is no glory attached to foundations, and that the sources of success or failures are hidden deep in the ground, building foundations have always been treated as step children; and their acts of revenge for the lack of attention can be very embarrassing."

The modern era of pile measurements and analysis only began in earnest with the research at CWRU, formally known as the Case Institute of Technology. Nara's research started with classified investigations on projectile penetration which was supported by the United States Department of Defense. When the CIT cancelled all classified research in the mid 1950's, Nara, who was the Director of the Project, assigned a research project to investigate the penetration of driven piles to one of his students.

In 1964, after promising results were

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THE EARTHQUAKE DESIGN WAS ONE OF THE FIRST TO USE THE DYNAMIC BEHAVIOR OF THE STRUCTURE TO ARRIVE AT THE FINAL DESIGN. IT HAS BEEN SUBJECTED TO THREE EARTHQUAKES WITH NO DAMAGE.”

-Dr. George Goble

achieved, Dr. Goble, in collaboration with Dr. Robert Scanlan, obtained funding for their first research project from the Ohio Department of Transportation and the Federal Highway Administration. The cumulative results of these innovative studies included a body of pioneering research and first of its kind measurement technology which made the practical application of stress wave theory to high strain pile analysis possible for the first time. Dr. Goble was awarded the Collingwood Prize of ASCE, given to the best paper by a young member in 1965 and the 5th Award of the Lincoln Arc Welding Foundation Professional Structural Design Competition of 1966.

After Dr. Scanlan's departure from Case Western Reserve University in 1966, Dr. Goble, who served as Chairman of the Civil Engineering Department there for a two year period beginning in 1975, continued the research on a variety of subjects affecting driven pile until he left Case in 1977 to become Department Chairman of Civil, Environmental and

Architectural Engineering at the University of Colorado, Boulder.

When asked which project that he worked on was the most challenging and why, Dr. Goble stated that "about 1965, I was retained by a consulting firm in Cleveland to do the earthquake design for the Anaheim Stadium. The project was design-build and the design firm had been retained by the construction contractor. When the contractor received the order to proceed, speed was the foremost consideration. My work expanded to include the design of the steel frames. I did a welded design and the connections were very complex. They had to be designed not only for strength but also for practical weld-ability. The structure was erected with only one minor problem. The earthquake design (while simple compared to modern design) was one of the first to use the dynamic behavior of the structure to arrive at the final design. It has been subjected to three earthquakes with no damage. The facility was expanded several years later with the addition of center

field stands. During the last earthquake, it was the addition I had nothing to do with that suffered some damage."

In 1983, he stepped down as Chairman but stayed on as Professor of Civil Engineering until his retirement in 1992, when he received the Emeritus rank. Since his retirement he has served as Adjunct Professor of Civil Engineering at Utah State University. Throughout his academic career he taught undergraduate courses in mechanics, structural analysis and structural design and at the graduate level he taught courses in structural design, experimental mechanics and structural optimization. Commencing in 1970 he began teaching professional education courses in dynamic pile testing and analysis, wave equation analysis and in deep foundation design.

Since then he has taught six to eight deep foundation design and installation courses each year, including last month at Dr. Goble founded Pile Dynamics, Inc in 1972 to commercialize the pile driving analyzer (PDA), a device he invented as

well as other measurement equipment for the pile driving industry. He says that "I had not thought of commercializing it. In 1972 the Federal Highway Administration asked me to build one for them. Case did not do such work but I was free to do it privately. It seemed to be a good idea from a liability consideration to incorporate. Our first sale outside the United States was in Sweden. How did I feel! I was happy to get the money - Pile Dynamics was in continual financial difficulties in the early years." The pile driving analyzer is now utilized in over 45 countries.

He was also a founder of Goble and Associates, Inc., Consulting Engineers, now GRL Engineers. Goble and Associates developed the WEAP (Wave Equational Analysis of Piles) computer program that modeled the pile driving process. This concept was developed by E.A.L. Smith in about 1950. It was proprietary to the Raymond Company. WEAP is a widely used program today by the pile driving industry. Dr. Goble

would have enjoyed meeting E.A.L. Smith because "He invented wave equation analysis and in the process broke a lot of new ground in computer usage and structural analysis."

In 1989, Dr Goble started yet another new venture, Bridge Diagnostics, Inc., a firm specializing in field testing and evaluation of bridges. Dr. Goble explains the why of founding it, stating that, "The basic concept behind the bridge testing firm came from the pile analysis concept. I found funding for the development of that concept from the Pennsylvania DOT. That project was followed by funding from a large Federal Highway Administration project (we tested 33 bridges in 11 states). We (with my graduate students) then founded Bridge Diagnostics to commercialize the concepts. The bridge analysis problem is much more difficult than the pile problem and the firm has grown very slowly. In the last year our business has finally grown more rapidly." In 2000, Dr. Goble founded George G. Goble Consulting Engineer,

LLC to advance his consulting interests, which are mostly in the deep foundations area. He says, "The businesses that I started grew very slowly. My most satisfying moment was when they became reasonably profitable."

Hopefully I've been able to shed some light on the pioneering Dr. George Goble, a founding member of the PDCA who also served on the organizations first board of directors. Among the distinguished honors he has received, include the ASCE Martin Kapp Award of 1988 and the Deep Foundations Institute Distinguished Service Award of 1998. In 2004, the Geotechnical Publication No.125, "Current Practices and Future Trends in Deep Foundations" was published in his honor by ASCE. He presented the Terzaghi Lecture of the Geo-Institute in 2007 and he is a member of the Academy of Geo-Professionals. What a privilege it has been for me to interview Dr. Goble. We at Pile Buck International wish him continued good health and success. ■