Editors’ Message: the Hydrogeologist Time Capsule — archival video recordings of influential hydrogeologists

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If we look back through history, we can all recall scientists and engineers who have made a material difference to the society in which we live. Hydrogeology is no exception. From Henry Darcy to Charles Vernon Theis, from William Smith to Thomas Chrowder Chamberlin, from Jacob Bear to József Tóth, the many achievements of our hydrogeologic ancestors form the very basis for the work we do today as groundwater scientists, engineers, and professionals. But how well do we really know these people and their achievements? It is probably true that we usually know the technical details of the work of these individuals. However, rarely have we gained insights into them as people—to better understand their personal motivations, aspirations, and living philosophies. It is interesting to ponder, even momentarily, upon questions like: What were they like as people? What motivated them? What lead them to make their discoveries? What thoughts did they have about the state of science in their time? What visions did they have for the future of hydrogeology? Science is after all more than just a collection of theories, equations, experiments and journal papers, it is also vitally about people—the scientist who makes a discovery, the hydrogeologist who has a vision or an idea, the inspirational leader who makes a tangible difference to a community, the student who works with a professor in a vibrant research team where science and discovery are infectious.

How do we get answers to these often non-technical and perhaps seemingly personal questions? Sometimes, if we are lucky enough, we might find an occasional answer in an original monograph or paper. However, this is usually very unlikely because journal papers and archival records are most often technical documents that do not reveal answers to these fundamental questions. In some cases, we may be able to find either biographical, or even better, autobiographical information—but there are few of these that are widely available.

One compelling example can be used to illustrate why searching for our historical roots and getting to know the scientists behind hydrogeologic science is important. Every hydrogeologist, geoscientist and engineer knows Darcy’s Law. For many of us, Darcy’s Law brings to mind his frequently used equation, a column filled with sand, a bundle of manometer tubes, and some flow-rate calculations in aquifers. Discovered in 1856, Darcy’s Law is now hydrogeologic mantra. However, until very recently, we did not know very much about Darcy’s life and the process of his discovery. One often wondered: Did he stumble onto his law? Did he know he had discovered something deeply profound about nature? Did he die not knowing? We did not even know what he looked like, or why his name was spelt Henry Darcy and not Henri d’Arcy. Recently, we have begun to exhibit curiosity about Darcy’s life and science (Freeze 1994; Sharp and Simmons 2005; Simmons 2007). These and other accounts reveal that Darcy was a selfless citizen who was deeply inspired to make a change in this world by building the impressive water distribution system for his native town of Dijon in France. His work transformed a city rid with filth and squalor to one whose water supply was second best only to Rome in Europe by 1840. He waived all fees, which would have amounted to near US $1.5M in today’s currency. Darcy’s life and science has been brought to life through the discovery of old portraits, letters and archival records. Critically, we also learn of the important details of the process of his scientific discovery. We now know with certainty that Darcy suspected his law before he did his now famous column experiments in the unnamed hospital courtyard in Dijon in 1856 (Simmons 2007). He knew his discovery was significant, but he was not surprised by it. Imagine if we could have asked Darcy about his life as an engineer, why research was important to him, and how it was that he came to make a number of major scientific and engineering contributions (outlined in Simmons 2007). Imagine if we could have asked Darcy about the day he plotted his experimental data from his column experiments to find that his experimental data fell...
on a straight line—that very moment when he discovered that the flow rate of water through sand was linearly proportional to the head gradient across the sand layer, something he had already foreseen based on his earlier research work on water flow in pipes. Imagine hearing answers to these questions in Darcy’s own words. If only technology in that French Renaissance period had permitted us the opportunity to capture live footage of Darcy. Like Darcy, many other opportunities to capture distinguished and influential hydrogeologists have already been missed.

We cannot change the past but we, as a community of hydrogeologists, can change the future. We can make a conscious decision and effort to make visual and sound records of the reminiscences of some important and influential hydrogeologists of our time. We do have the capability to preserve their thoughts about their careers, their lives, their discoveries, their legacies, and messages for future generations.

This Editors’ Message announces that we have begun a project to accomplish the above goals. Indeed, we now have the possibility of hearing from eminent groundwater hydrologists personally, in their own words and visually. We have the possibility that every hydrogeologist, student, professor and consultant, across the world can listen, we have the possibility of hearing from eminent groundwater hydrologists, personally, in their own words and visually. If only the issue of pump tests, but also the parameterisation of aquifers. We see firsthand his visionary ability to predict many of the important issues that face us today in hydrogeology such as contaminant transport and dispersion. The interview makes it abundantly clear that Theis was a man whose thinking was well ahead of his time. To watch Theis talk with Bredehoeft about his work and life is an extraordinary experience. We hope that hydrogeologists across the world will enjoy the interview, learn something from it and get to know Theis a little better. We also hope that the new availability of the interview online supports educational uses and that teachers will employ it in their courses; one can easily imagine using the video to bring pump-test theory to life by bringing C.V. Theis into a classroom.

The second set of videos already available on the Time Capsule web site was prepared by Alex Cheng and his colleagues at the University of Southern Mississippi and the University of Memphis, USA. Two videos were produced. One is an interview of Jacob Bear by a group of faculty members and students. The other is a lecture in which Jacob Bear presents his views on the past and a vision for the future of transport in porous media. One of the particularly interesting aspects in those videos is the description of the links between fundamental research, applied engineering problems, and teaching that interact deeply in Jacob Bear’s works and motivations. Other video recordings currently in production include Paul Witherspoon, interviewed by R. Allan Freeze, and József Tóth. Indeed, József Tóth was interviewed in October 2007 at the Geological Society of America conference in Denver by Ben Rostron (University of
Alberta, Canada) and taped by Craig Simmons. József Tóth remarked on the Hydrogeologist Time Capsule upon completing this momentous interview:

This is an extremely creative idea and an exceptionally important one. The time has come to more deeply understand how our science was born and has grown, to hear from influential groundwater scientists first hand about their life’s work, and for us, as scientists, to share our reflections and future visions with both current and future generations. I am extremely honoured and humbled to have been invited to contribute to this project and to have had the opportunity to discuss my life story and my scientific legacy on tape. I encourage the international scientific community to support this new project in the strongest possible terms.

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