

Have you stopped to think about what happened about 100 years ago? From time to time, I diverge from my primary responsibility of reading your manuscripts to think about where this journal, as your publication medium, fits into the bigger arena of scientific and engineering knowledge. My mind drifts back to the events of about 100 years ago, to the time period just a few years before the turn of the century, i.e., to the 1895 to 1897 time frame.

Some of you, who are real American history buffs, will immediately think of Teddy Roosevelt, the Rough Riders, "Remember the Maine," and all those symbols of a war that we in the United States call the Spanish-American War. But for others of you, the details of American history are not so important. You think of other events in the 1895 to 1897 time frame that are much more important. These are the events about which I am thinking.

In the autumn of 1895, the German scientist Roentgen discovered x-rays and, in so doing, made an invisible world visible to us. Almost immediately after his discovery, the medical community saw the application possibilities of Professor Roentgen's discovery and started using x-rays in medical diagnoses.

Metallurgists were a bit slower to get started, but there was just no holding them back in their use of x-rays. Today, x-rays are used all the time in radiology to look for cracks and internal flaws in all sorts of hardware. Also, the phenomenon of coherent scattering (called x-ray diffraction analysis) is used to determine the crystal structures of all sorts of crystalline materials. Just stop and think of how often metallurgists use the results of x-ray diffraction analyses in their work. That phenomenon is just 100 years old.

In 1896, the French scientist Henri Becquerel discovered radioactivity in a uranium ore and, in so doing, ushered in the "atomic age". In my opinion, the various programs in nuclear and atomic energy did more to open up the field of materials science and engineering than any other discovery. At the turn of the century, the Periodic Chart of the Elements was restricted, as far as the metallurgist was concerned, to iron alloys, brasses/bronzes, and some aluminum alloys. Now metallurgists think of almost every element every day!

One of the most exotic elements to come out of the "radioactivity research" was the first artificial element, namely, plutonium. All the fundamental work on it was performed under the direction of Dr. Glenn T. Seaborg during the heat of World War II and was classified.

Do you know who published the first open unclassified book on plutonium? It was ASM International! The proceedings of a conference held back in the 1950s were published as an ASM book. It remains the authoritative book on plutonium and its alloys. It contains numerous phase diagrams.

Other events took place in the same time frame. The electron was discovered and characterized. Quantum theory (Max Planck) was discovered. Metallurgists started to look carefully at microstructures and think in terms of phase equilibria.

I try to keep my eyes open to the possibility that your papers will contain the germ of another fundamentally new concept and understanding of matter.



*John R. Ogren*

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