Luncheon Speaker
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Bletchley Park: Enigma, Ultra, and the Making of Colossus

Presenter: Dave Saums

The development of what has become known as "signals intelligence" traces back to crude beginnings during World War I, in the United Kingdom. As the dark clouds of political and military moves began to turn into signs of impending winter storms in the late 1930s, efforts were made in the UK, France, and in Poland to begin to more seriously decipher diplomatic and military codes being used by the German government. Similar code-breaking activities were taking shape in the United States in very crude form, and in Germany and Japan. In Poland, a small team of so-called codebreakers had focused on the Enigma code being used by the German government for both diplomatic and military purposes and that team made a striking decision that had enormous implications for the outcome of World War II. The British government, having set up a rudimentary codebreaking office twenty years earlier, moved very slowly to develop a more focused effort to break these diplomatic codes. As September 1939 turned the world again to war, the need for tools and methods to crack both diplomatic and military codes became absolutely critical. A small staff was assigned and this small team moved into an old Victorian family estate in Bletchley Park, less than an hour from London by train. The "Special Relationship" that still exists today between the United Kingdom and the United States grew directly from these seeds of human activity and cooperation. For those who have seen the 2015 movie, The Imitation Game, with Benedict Cumberbatch and Kiera Knightley, this story will begin to sound familiar. The movie gave a very realistic interpretation of those actual events and focused on the story of Alan Turing, an Englishman who is often credited with being one of the fathers of modern computer systems. In reality, the development of mechanical, automated tools to sort huge incoming streams of coded German military and diplomatic message led to what are known as "Turing machines" and, as the volume of data became simply overwhelming, an engineer working for the British Post Office designed and built the first machine dubbed "Colossus" – what is now credited in the computing world as the first digital computing machine, preceding the "Eniac" in the United States by two years.

This presentation will outline the breaking of the German Enigma code (which became a series of different codes, used by different armed forces services), which produced what as titled as top-secret "Ultra" information about German military plans, locations of ships and submarines and battle groups, and how these first mechanized codebreaking machines were devised. There is much more to this story:

- The extraordinary contributions of thousands of young British women, aged eighteen to mid-twenties, for the entire codebreaking effort at Bletchley Park and across the globe;
- The mechanics of the German Enigma machines and the spread of highly complex diplomatic and military codes;

- The establishment of the British codebreaking operation at Bletchley Park, where more than ten thousand British, Canadian, and American citizens and military personnel worked in this desperate race to decode thousands of incoming messages per day;
- How the breaking of Enigma was used in the battle against and sinking of the German battleship Bismarck in one of the great sea battles of modern warfare;
- The value of codebreaking to saving the United Kingdom from starvation in the Battle of the Atlantic, with the ultimate defeat of the German U-boat submarine menace;
- The use of Enigma in the greatest tank battle in history, the Battle of Kursk, where thousands of German and Soviet tanks fought in gruesome conditions on the Russian plains;
- The development of codebreaking machinery that led to the "Turing machines" (known as "Bombe" machines) and then to "Colossus" – and the construction of hundreds of these machines in the UK by the British Telegraph Company and in the United States by NCR;
- The fact that of the more than ten thousand people employed at Bletchley Park and connected outstations across the globe, none spoke of the details of what had happened in codebreaking until the mid-1970s, preserving the secret.

This presentation will focus on the technologies employed and short descriptions of hardware developed, as precursors to the modern age of digital computing – but will also illustrate the human contributions to preventing the destruction of the modern democratic world in the 1940s. The connections to technology in today's world rose from what would otherwise have been the ashes of defeat.

Bletchley Park today is an astounding museum of both technical detail and human achievement – the opening chapters in what has become the computing world that we live in today.

Dave Saums has thirty-nine years of technical marketing, product development, and business development experience with advanced thermal materials, thermal components, and twophase liquid cooling systems.
Dave has operated a consulting firm focused on thermal materials and components for fourteen years, in addition to twenty-five years' experience with thermal component and materials manufacturers.