Inventor of sonar ignored by history

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Robert Boyle could hardly have foreseen that he would come up with the most important military innovation of the First World War. And yet his story becomes, in the words of historian Rod McLeod, one of the most "fascinating and completely neglected" in the U of A's history annals.

Boyle was trained in the fledgling field of radioactivity and earned McGill University's first doctorate in science under Ernest Rutherford. But when he was recruited by U of A founding president Henry Marshall Tory in 1912 to run the physics department, Boyle found the university ill-equipped for his primary area of research and turned his attention to acoustics.

Then war broke out. The Germans were using submarines as weapons, and the allied forces were desperately searching for ways to detect them.

"Everybody starts working on this because the German submarines are sinking hundreds of allied ships," said McLeod. "The French are working on it, the Brits are working on it and the Americans are working on it."

The British admiralty set up a Board of Inventions and Research in the hopes of putting a speedy end to the war. Rutherford was on the BIR panel and asked his former PhD student to join the research team in England, which was investigating a variety of potential detection methods.

"He's put in charge of what they think is the least promising (line of

inquiry)," said McLeod, author of the forthcoming book, All True Things: A History of the University of Alberta, 1908 - 2008.

Exploring the use of sound to detect objects underwater was a hot topic, at least since the sinking of the Titanic in 1912. A number of researchers, including the French physicist Paul Langevin, had worked out the theoretical principles for sonar, but getting a detection device to actually work on a warship proved daunting.

Working closely with Langevin, Boyle and his group managed to produce working ultrasonic quartz transducers by 1917. These were installed on warships just a few months before the end of the war. "It turns out Boyle is the one who actually comes up with the first working model of sonar, beating out the other groups," said McLeod.

The innovation didn't come soon enough to make a difference in that conflict, but it laid the foundation for sonar detection in the years to come. As great as the discovery was, however, and perhaps partly because it was shrouded in secrecy at the time, Boyle "received no credit for his work even within his own university," writes McLeod.

"Robert Boyle has at least as good a claim as any other individual to be the inventor of sonar. He took out no patents, as Langevin did, and because of the secrecy imposed on the invention by the Royal Navy in the 1920s, he published no papers on it."

And yet, "it had a greater impact on the subsequent military history of the 20th century than any other piece of military/scientific research carried out by either side during that conflict," writes Macleod. "It stands out as the most important new piece of military equipment developed by any Canadian scientist during the First World War."

Boyle was not to be seduced by a career in the military, however. He

turned down an offer from the British admiralty to work for twice his U of A salary and ended up back at the university, where two years later he became dean of the recently established Faculty of Applied Science.

Source: University of Alberta