

1989

# The War of Invention: Scientific Development, 1914-1918

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understand its present state and its potential in the near future.

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Hartcup, Guy. *The War of Invention: Scientific Developments, 1914-1918*. Brassey's Defense Publishers, Ltd., 1988. 226pp. \$43

The reader may ask, "Why do I want to know about old technology and the first generation of what may be considered *standard* weapons?" The answer lies in the aphorism that President Harry S. Truman was so fond of quoting, "The only thing new is the history that you don't know." Throughout this generally readable book are depicted problems and solutions that may rise again should the world ever again be plunged into prolonged military and economic warfare. I find the lessons particularly interesting in light of my association with the Global War Games at the Naval War College, and as a result of my long-held belief that technology can be a strategically decisive element.

Technology is the application of scientific, technical, and industrial principles. Guy Hartcup recounts the ways that talented individuals on both sides used initiative and imagination under the extreme urgencies of war to solve operational problems. The author takes pains to point out that each idea was tested and reduced to industrial practice so that the fruits of the inventions were available in quantity and in time. In

several of the vignettes, the "inventor" is seen as triumphing over mindless military bureaucracies that were unable to grasp the technical dimensions of either problems or their solutions. The more things change, the more they stay the same.

World War I is often ignored in the education of the modern military or civilian national security professional. This is a mistake in my opinion. There are myriads of traps and pitfalls just waiting for the most powerful industrialized countries in the world to step into in 1989. For example, in recounting the unsatisfactory state of British naval gun-laying at Jutland and in other encounters, part of the difficulty was the quality of optical glass for range finders. The author notes, "The British glass industry had become so dependent upon German and French imports that it had declined into a comatose condition and was absolutely stagnant. . . ." The reader may want to ponder the similar state of American computer chip, steel, and automobile manufacture.

Parenthetically I might add that the impact of the concatenation of shortfalls in naval weapons led to missed opportunities to inflict serious losses on the German Fleet at Jutland. Such shortcomings did not end then: remember the U.S. submarine torpedoes that failed to explode in World War II.

Those of us who were educated in science and engineering in the immediate post-World War II epoch will find interesting Hartcup's accounts of contributions to World

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War I made by the authors of our textbooks and leaders of the atomic age. Bohr, Summerfeld, Haldane, J. J. Thompson, Weizmann, Lindeman, Lanchester, and dozens of others march through these pages.

Those of us who have worked in the international defense research and development arena may also find interesting these portrayals of World War I activities of the National Research Council in the United States and several of the British laboratories and "stone frigates" such as H.M.S. *Vernon*.

In his concluding statements, Hartcup states that "by 1918 there were few weapons or instruments of war, including remedies for wounds and disease that had not been the concern of civilian scientists or technologists in or out of uniform. The value of civilian collaboration lay far less in *inventions* than in the extension of the boundaries of science for specific applications." He goes on to quote an American, J. S. Ames: "The knowledge required . . . is that of the scientific investigator, the man who by his own laboratory investigations has added to our store of knowledge." This is as true in 1989 as it was in 1918.

Another point that I hope we do not lose sight of in peacetime budget battles is the necessity for operational ties and mutual respect between scientists and the military. In World War I, it was said that much scientific work was rendered futile by the lack of interest of the naval authorities. There is also the observation that "the process of

appointing someone who *knows nothing* to supervise the work of someone who *does* seems to have been at the bottom of a great many of our misfortunes. . . ." Where have we heard that before?

*The War of Invention* is a useful adjunct to the library of one concerned with mobilization in an industrial and economic sense. The examples from World War I have altogether too many analogues in 1989 to be disregarded as dated. In all honesty, the author does not give equal treatment to the French, American, Russian, or German industrial scientific efforts. Comparing and contrasting the German and Austrian industrial organizations and processes would have been useful. However, I think there is enough data for us to conclude that the spirit of scientific and intellectual freedom that is the hallmark of American, British, and French science and engineering is the prerequisite to successfully apply science, industry, and technology to meet wartime needs in a timely way and in sufficient quantities.

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Vano, Gerard S. *Canada: The Strategic and Military Pawn*. New York: Praeger, 1988. 163pp. \$35.95

The dominion of the north, according to Gerard Vano, was not so much part of a North Atlantic triangle as a British-Canadian axis, and it did not so much evolve from