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Review of "The Secret History of RDX: The Super-Explosive that Helped Win World War II" by Colin F. Baxter

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Colin F. Baxter. *The Secret History of RDX: The Super-Explosive that Helped Win World War II*. Lexington: University Press of Kentucky, 2018. Pp. 241.

Colin F. Baxter's *The Secret History of RDX: The Super-Explosive that Helped Win World War II* is a book with much promise, but it does not reach its potential. An emeritus professor in the Department of History at East Tennessee State University, Baxter's book touches on a variety of important topics in the history of science and technology during the Second World War. The book's focus is on the development, production and use of RDX (Research Department eXplosive or Royal Demolition eXplosive), a new type of explosive that was significantly more powerful than TNT. In doing so, Baxter shines important light onto an understudied topic with significant ramifications for the Allied war effort. His goal is to explore what he calls "the history of the Middle" by connecting high-level decision-making "at the top" with the experiences of those people "at the bottom" who carried out the orders and brought RDX into operational existence (p. 2). Historians interested in military affairs, science and technology and war economies are the book's target audience.

Baxter's account provides a good general history of RDX, which is known by several names worldwide, including hexogen and cyclonite. RDX was first discovered in 1898 in Germany, but its early usage was limited by its volatility, so it was not produced industrially until the 1930s and 1940s. Prior to the Second World War, British explosive specialists and chemists in the Research Department at the Woolwich Arsenal (hence the codename) found a way to stabilise it with beeswax and a pilot plant was set up at Waltham Abbey early in the war. A larger specialized factory was established at the Bridgwater Royal Ordnance Factory, but British production remained modest and was hampered by German aerial bombings during the Blitz and Battle of Britain. Therefore, plans were made to move RDX production to Canada, where Canadian scientists at McGill University pioneered a method for a more effective synthesis of RDX and another pilot plant was built in Shawinigan, Quebec. The whole project was funded by Canada's Department of Munitions and Supply and operated by Shawinigan Chemical Company and, after the Americans entered the war, the Canadian plant provided expertise and essential supplies to their pilot plant at Wexler Bend in mid-1942.

Chemically, RDX is classified as a nitramine and it is often combined with TNT or other high explosives, plasticizers and desensitizers to create more powerful explosive mixtures such as Torpex and Composition B. Bombs, artillery shells and torpedoes were filled with RDX-mixtures, thereby augmenting Allied arsenals with more powerful weapons for naval warfare and strategic bombing, especially once American production kicked into high-gear at Holston Ordnance Works near Kingsport, Tennessee. By 1945, America had produced a whopping 434,000 tons of RDX, far outstripping every other world-power by an overwhelming margin. At its peak, Holston produced approximately 340 tons of RDX per day (p. 74).

The Secret History of RDX succeeds in demonstrating much of this history, though not without some problems. In the first case, there are significant issues with content integration and narrative coherence, which makes the book difficult to follow. The transitions between chapters are jarring and lack any logical progression. Not only does this result in repetition and overlap, but Baxter resets the chronology at the beginning of almost every chapter. In other words, some chapters cover the whole war effort from 1939 to 1945, while the next one might start in 1943 and the following one in 1940. The book's organization makes little chronological sense and does not scaffold subjects logically.

The history and development of RDX was a cooperative endeavour that entwined Allied scientific research, defence policies, resource allocation, industrial production, technological development and combat operations. However, Baxter fails to offer much nuance and thematic integration here. For instance, his decision to cover an inherently international subject with chapters largely segregated by different Allied nations was surely the book's greatest problem. In effect, rather than progressing chronologically and thematically, to align the history of RDX with narratives integrating British, American and Canadian developments simultaneously, Baxter divides most of his chapters by country. As a result, this obscures the depth of Allied cooperation in science and technology, while presenting each RDX program as an *independent* entity rather than *interdependent* entities. Additionally, this organizational structure downplays Canada's contributions in favour of American and British foci. Most Canadian content is relegated to a single chapter, despite

the fact that Canada and the US cooperated closely on most munition procurement programs.¹

The Secret History of RDX also has little to say about the thousands of workers inside the Holston factory. Rather than a comprehensive, chapter-length account, they receive only short passages scattered throughout the book. Although most employees were white men, many women worked in the production facilities and their contributions certainly warranted greater coverage, particularly given the associated dangers they encountered and the amount of scholarship on the subject. Indeed, the book would have greatly benefitted from a more robust engagement with the work of Penny Summerfield, Penny Colman, Mari A. Williams and Jennifer Stephen, amongst others.² Baxter does state that the job was dangerous and mentions some of the medical treatments and safety measures, but then goes on to contradict himself stating that “RDX itself was not a serious health hazard” (p. 91) even though some scientific studies on chronic exposure in lab rats and rabbits found that it “did cause serious problems” (p. 91). Neither statement is corroborated with a footnote, which is problematic considering the vast scientific literature on the topic and the fact that the American Environmental Protection Agency has classified RDX as a possible human carcinogen. When inhaled, ingested or absorbed through the skin, it can cause organ damage and is known to adversely effect the nervous system and cause seizures, nausea and vomiting.³

By overlooking the environmental and ecological impacts of munitions production, Baxter misses an opportunity to connect the history of RDX to emerging trends in the historiography. Recent publications on militarized landscapes, munitions production and the

¹ For those readers interested in learning more about RDX and Canada, I suggest referring to Donald Avery’s *Science at War: Canadian Scientists and Allied Military Technology during the Second World War* (Toronto: University of Toronto Press, 1998).

² Penny Summerfield, *Women Workers in the Second World War: Production and Patriarchy in Conflict* (London: Routledge, 2014, 1984); Penny Colman, *Rosie the Riveter: Women Working on the Homefront in World War II* (New York: Crown, 1995); Mari A. Williams, *A Forgotten Army: The Female Munition Workers of South Wales, 1939-1945* (Cardiff: University of Wales Press, 2002); Jennifer Stephen, *Pick One Intelligent Girl: Employability, Domesticity, and the Gendering of Canada’s Welfare State, 1939-1947* (Toronto: University of Toronto Press, 2007).

³ *Handbook on the Management of Ordnance and Explosives at Closed, Transferring, and Transferred Ranges and Other Sides* (Washington, DC: Environmental Protection Agency, 2002), Chapter 3, 24.

home front by various scholars, such as Rachel Woodward, Ryan Edgington, Matthew Evenden and Gerard J. Fitzgerald, have opened up new avenues of exploration into the impact of warfare on the environment.⁴ Unfortunately, *The Secret History of RDX* does not engage with any of this literature. For instance, in Chapter 9, Baxter briefly discusses some incredible statistics about Holston. The plant consumed a staggering 447 million gallons of water everyday (sourced from the nearby Holston River) and its steam plants burned 65 tons of coal per hour to power the entire facility (p. 88). The plant was also built on almost 7,000 acres of farmland outside Kingsport that was expropriated by the government and Tennessee Eastman Company, displacing some inhabitants, while the massive factory brought an influx of workers to the area: Kingsport's population surged from 14,000 to 51,000 almost overnight (p. 92). As a result, there were huge deficits in infrastructure and housing, all of which required immediate expansion and urbanization. Thus, militarization caused a cascading array of permanent changes to the region, as industrial development, demographic shifts and extensive air, soil and water pollution reshaped environments and landscapes. All of these subjects escape Baxter's narrative – there is not even a map provided of Holston or the Kingsport area.

The Secret History of RDX explores a topic of great importance but its approach and organization are lacking. This limits its overall contributions and impact for military historians.

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⁴ Rachel Woodward, *Military Geographies* (Oxford: Blackwell Publishing, 2004); Ryan H. Edgington, *Range Wars: The Environmental Contest for White Sands Missile Range* (Lincoln: University of Nebraska Press, 2014); Matthew Evenden, *Allied Power: Mobilizing Hydro-electricity during Canada's Second World War* (Toronto: University of Toronto Press, 2015); *Hydro-electricity during Canada's Second World War* (University of Toronto Press, 2015); Gerard J. Fitzgerald, "The Chemist's War: Edgewood Arsenal, the First World War, and the Birth of a Militarized Environment," in Richard Tucker, et al., eds., *Environmental Histories of the First World War* (Cambridge: Cambridge University Press, 2018).