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David Edgerton, *Britain's War Machine: Weapons, Resources, and Experts in the Second World War*. New York: Oxford Univ. Press, 2011. Pp. xvii, 445. ISBN 978-0-19-983267-5.

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According to David Edgerton (Imperial College London), the prevailing image of Great Britain during the twentieth century is of a state in continual decline as it failed to match the increasing power of its various industrial and military rivals across the globe. To correct this (in his view) misreading of Britain's position in the world, he has written several books that examine how the British grappled with issues of modernity and warfare during the twentieth century.<sup>1</sup> In his most recent and provocative offering, *Britain's War Machine*, he writes that "for all the mountains of writing that implied otherwise, Britain has been one of a handful of great scientific, industrial and military powers of the twentieth century and its history needs to be written with that firmly in mind" (7). By placing the "military and experts and machines into a narrative from which they have been studiously excluded" (6), Edgerton's account of the Second World War reveals

a Britain that was a first-class power, confident, with good reason, in its capacity to wage a devastating war of machines. It had enough resources to spare, was wealthy enough to make mistakes, and could fight as it chose to rather than had to. It tells of plenty and power rather than scarcity and sacrifice. It tells of a great power which thought of war not in martial but in material terms, as befitted an industrial giant which remained at the heart of the world's trade. (2)

Edgerton's compelling revisionist take on Britain's performance in the Second World War successfully challenges the mythology that has enveloped the subject, but its overall impact is weakened by an idiosyncratic approach and some unsubstantiated claims.

The book has three major themes. The first concerns Britain's economic and industrial power and its superiority vis-à-vis the Germans. While this claim is not entirely novel, Edgerton effectively describes the pervasive confidence of Britain's leaders and general public. He shows that the foundation of Britain's power was its unparalleled position as the hub of a global trading system serviced by a large and extremely modern merchant fleet: Britain "could import food rather than growing it, it could import oil rather than go to the costly trouble of making it from coal, and it could, if necessary, import manufactures, from tanks to tractors, on a vast scale" (55). British shipping—and that of other nations that supplied the Isles during the war—allowed London to focus on the expensive and sophisticated weapons a wealthy, advanced society needed to wage war. Imported Argentinean beef and American oil freed up British resources for the production of bombers and battleships.

Edgerton's analysis of shipping typifies his approach throughout the book: he describes in detail the characteristics of the merchant ships, including their size, maximum cargoes, and technological sophistication (refrigeration was critical for the transporting of beef, cheese, and other foodstuffs). He also makes clear the role of global armament manufacturing in the British war effort; to cite one example, while over two million Lee-Enfield rifles were made in Britain, factories in Canada, the United States, Australia, and India produced an additional three million during the conflict. This clearly debunks the popular myth of Britain struggling "alone" against the Third Reich in 1940.

Edgerton's second major theme concerns Great Britain's own military power. While acknowledging its weakness compared with continental powers in terms of a mass infantry army, he instead stresses the roles of the Royal Navy and Royal Air Force (RAF) in ensuring Britain's first-rank status throughout the war. He also certainly takes delight in describing the two complex weapons systems that, he believes, secured Brit-

1. See *England and the Aeroplane: An Essay on a Militant and Technological Nation* (NY: Palgrave Macmillan, 1991); *Warfare State: Britain, 1920-1970* (NY: Cambridge U Pr, 2006); and *The Shock of the Old: Technology and Global History since 1900* (NY: Oxford U Pr, 2007).

ain's technological superiority: battleships and bombers. The building and maintaining of battleships consumed tremendous resources: the engines of the HMS *King George V*, for example, generated the power of a contemporary power station, burning small-tanker-loads of fuel. The steel that armored the ship equaled that needed for "many thousands of tanks" (213). Construction of such a vessel cost as much as a new armaments factory.

As in naval technology, the British took an initial lead in constructing four-engine bombers before the Americans surpassed them. Their pre-war work on powerful engines gave the British an overwhelming advantage over the Germans, as the latter pitted just over one thousand of these bombers against fifteen thousand under British control. In both the air and naval spheres, the capital poured into these projects reflected British wealth and technological know how. In the field, too, Britain deployed the most mechanized army in the world. As Edgerton is not the first serious researcher to observe, during operations in Northwest Europe, the British Army enjoyed an armor-to-infantry formation ratio of 1:1, as compared to 1:4 for the Germans.

An effective use of global supply and technologically advanced armaments production were results of Edgerton's third primary theme: the triumph of science, experts, and technocrats in the wartime British state. The leaders of Churchill's administration constantly strove to produce war-winning technologies and had the resources needed to succeed. Developments like radar, rockets, the Liberty Ship, and penicillin attest to an enormous intellectual effort by people in government, the military, universities, and private firms in pursuit of victory. But "invention in war and peace is necessarily a story mostly of failure" (235) and Edgerton details problems with various aircraft prototypes and other "gadgets." These failures, however, reinforce his central contention: that Britain was both technologically innovative and wealthy enough to survive these mishaps and continue on the road to victory.

Edgerton convincingly rehearses Britain's success in fighting a uniquely "British" war by exploiting its own and its allies' resources. At times, however, he ventures into speculative territory: "There arises an intriguing counterfactual question: could the British Empire in alliance with the USSR, have defeated Nazi Germany and Italy? Given that this is how the war was being fought, with the British anticipating victory, the answer could be yes. Indeed if the war had been one of tank and aircraft production Britain alone would have stood a good chance of beating Germany" (75).

This is a difficult position to maintain. That the British *thought* they could win does not mean they would have won. Certainly some German political and military leaders believed in victory as late as mid-1944. And Edgerton himself notes that British confidence was based on faulty assumptions about German economic and industrial potential. His final supposition regarding production is extremely problematic. Merely manufacturing machines is fruitless if those machines are not used effectively in battle. The RAF was more than a match for the Luftwaffe thanks in part to tremendous support from the United States. The effective use of armor in a combined-arms setting proved difficult for the British Army to master, however: despite Edgerton's strenuous attempts to prove the superiority of British tanks over their German counterparts—a claim most specialists would concur with, contingent upon the date in question—smaller German forces, with fewer tanks, often defeated the British Army in battle early on in the war.

Edgerton's overall premise has a major weakness. Great Britain's status as a major military power and industrial state during the war was contingent on two things: the first was massive American financial and material support. "The principles of division of labour and of comparative advantage were applied and the British Empire gave up an independent supply and action in the name of increasing the overall efficiency of the war effort" (280). The second contingency concerned the German-Soviet war. Edgerton admits that Britain participated only "marginally" in "by far the most important" theater of the Second World War. But he ignores the Red Army's horrific sacrifices of men and material on the Eastern Front, where it first tied down and then destroyed the bulk of the German Army. The British could afford to husband manpower to toil in armament factories and produce world-class weapons because the Wehrmacht was heavily engaged in the east. This is an important reason behind the British ability to maintain a 1:1 infantry-to-armor ratio in 1944: without Soviet—or American—infantry, such an advantage simply would not have been possible.

Though Edgerton writes that Britain “won *its* war, and it won it because it was rich and powerful, because it could depend on the rest of the world and on vast numbers of machines” (298), he underestimates the contributions of other states that provided its continental swords.

The enthusiasm for detail here at times devolves into tedious listing of names, universities attended, and business interests. The book is also loosely organized: subsections within chapters are often only tenuously linked to each other. Other topics—particularly armor development—are scattered throughout the text. The volume does, however, contain many useful charts, graphs, and maps clarifying Britain’s industrial, military, and economic position in the world.

Despite its faults, *Britain’s War Machine* astutely challenges many worn out shibboleths regarding Great Britain and the Second World War. Edgerton reveals a particularly “British” and modern way of waging war by investing in advanced infrastructure, utilizing experts and technocrats to develop innovative weaponry in quantity, and dividing labor both internally and among one’s allies. His attention to Britain’s scientific and technological achievements and the “premature military modernists” (2) within its leadership and their relevance particularly to naval and air operations constitutes a significant revision of our understanding of British power during the decisive struggle of the twentieth century.