to be tested at full yield. Nor did the scientists assembled in the desert to watch that first test apply suntan lotion to protect themselves from "the radiation blast". It was the high-intensity light from the nuclear fireball that concerned them.

More egregiously, Farmelo misses what is in my view a crucial part of the post-war negotiations between the United States and Britain over uranium supplies. The United States was at that time believed, for reasons I have never understood, to have only modest domestic sources of uranium ore. The two countries had agreed during wartime that they would share the rich ore resources of the Belgian Congo equally. By late 1947, Britain was approaching bankruptcy, a congressional debate neared on the Marshall Plan and several conservative US senators had been outraged to learn that Britain still had a veto over any US use of atomic bombs. The administration of President Harry Truman demanded changes: Britain would give up its veto as well as its share of the Belgian Congo ore; the United States, in return, would continue to aid its wartime ally economically. It was this ore grab — formalized in a *modus vivendi* of 7 January 1948 — not bureaucratic dithering, that delayed the British bomb.

*Churchill's Bomb* is colourful but incomplete, focused more on Churchill than on the bomb. It is a useful adjunct to what is still the best series on the British bomb, Margaret Gowing's official history *Britain and Atomic Energy 1939–1945* (Macmillan, 1964) and its successor volumes. ■

**Richard Rhodes** *is the author of the Pulitzer-prizewinning* The Making of the Atomic Bomb *and three further volumes of nuclear history.*
*e-mail: rhodes.today@comcast.net*

MILITARY SCIENCE

# Fight in flight

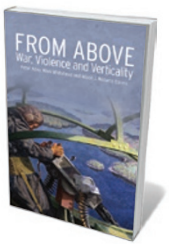
**Ann Finkbeiner** ponders a chronicle of airborne war.

To see farther, go higher: from horseback, hilltop and tower in the eighteenth century to balloons in the nineteenth, aeroplanes and satellites in the twentieth and robotic drones in the twenty-first. With each step up in height and technology comes a broader view of enemy territory and a greater personal distance from it. What to make of this?

In *From Above*, the view from higher up translates into a greater power to acquire and rule, to control and to kill. The 13 authors in this collection of essays, edited by Peter Adey, Mark Whitehead and Alison Williams, are academic humanists and social scientists linked by an interest in how human interaction with geography has shaped warfare.

The essays, which are divided into three categories, are often built around case studies and begin with the view from the sky. As captured in drawings, photographs and film for much of the past century, images taken from above tend to be visually confusing and must be interpreted and even manipulated. The imaging of large swathes of territory requires the formation of photomosaics, in which photographs taken at different times, heights and angles are stitched together. The slight sense of unreality inherent in the view from above, many of the authors argue, contributes to an emotional distance; the result is that conquering or killing becomes easier.

Meanwhile, warfare itself has changed: war is now fought not by vast, easily bombable armies but by small groups of insurgents who are hard to spot from the air. In the Vietnam War, for instance, seismic and acoustic sensors on the ground were used to locate insurgents. When triggered, the sensors signalled to distant computers that calculated, then sent, the enemy's coordinates to high-flying bombers. That war, writes geographer Derek Gregory (quoting from an article by Paul Dickson and John Rothchild), was a "lethal pinball machine" that — fast-forward to the wars in Iraq and Afghanistan — became a network of surveillance and targeting drones run by people who commute to work. The more distant the killing, the more impersonal, and the more the exercise resembles a video game.




**From Above: War, Violence and Verticality**
EDITED BY PETER ADEY, MARK WHITEHEAD AND ALISON J. WILLIAMS
*Hurst: 2013.*

The second group of essays focuses on the responses of those on the ground to being viewed from above — the immediate reaction being concealment. In the Second World War, for example, when the United Kingdom wanted to camouflage its industry and infrastructure from German bombers, people learned to think of the landscape as seen from the air. The Home Office even ran an unsuccessful experiment in which oil tanks were disguised with green and brown paints of differing reflectivity to harmonize with the British landscape. Another on-the-ground reaction is to spy on the sky. One international group of people practises a "peculiar version of amateur astronomy". Using little more than good binoculars, stopwatches, star charts and Kepler's laws of planetary motion, they track highly classified reconnaissance satellites. The satellites are usually reflective, so although no government admits to their existence, they are trackable. Their orbits reveal where they are going and a little of what they are doing — including when they fall out of the sky.

The third set of essays covers interaction between the sky and ground. Bombers are frightening because of their purpose, so their very presence in the sky is intimidating: one aim of bombing runs has always been to undermine morale. The 2003 campaign in the US war with Iraq was explicitly called Shock and Awe because it aimed to sap the Iraqi will to fight. The interaction between air and ground is most easily seen in the use of unmanned surveillance drones. Each drone needs four people to guide it and to keep track of its technologies and communications — which they do from many miles away. Drones return vast amounts of information. If aerial views began with a person climbing a hill and then climbing back down to analyse what was seen, then drones almost seem to conflate person, view and action.

*From Above* is written by academics for academics. The case studies are fascinating, but the sentences are often opaque. (In one example, an author discusses the 'weaponization' of the cinema, writing that it has "particular capacities for movement whose influences on specific ideas of global escalation make them into logistics of perception or the escalation of the modern technical beyond".) Thus, the ideas and connections between them are frustratingly hard to understand.

I think the book's main message is that the aerial view confers a remoteness that enables violence. Implicit throughout, as stated in the introduction, is the judgement that in spite of the "spectacle and beauty" of the aerial view, "we must be careful not to celebrate it". Since the first stone tools, technologies have had dual uses, both civilizing and military, and we should remember that duality. ■

**Ann Finkbeiner** *is a freelance writer in Baltimore, Maryland, and author of* The Jasons.
*anniekf@gmail.com*