

## BOOK REVIEW

**Grant T. Hammond, *The Mind of War: John Boyd and American Security*, Smithsonian Institution Press, Washington, 2001.**

Reviewed by David Goyne

Probably most readers will have heard of the OODA (Observation—Orientation—Decision—Action) loop or 'Boyd Cycle' as a concept to describe the sequence of decision and action within military operations. Some will probably be aware that this concept was developed by John Boyd, a United States Air Force officer, to explain his finding that the USAF's less manoeuvrable and slower climbing F86 Sabre fighter aircraft still managed to consistently defeat Chinese Mig 15s during air-to-air combat over Korea. Yet few will know enough of the life, career and thoughts of John Boyd to assess his place as a military thinker and strategist of the 20<sup>th</sup> century.

Colin S. Gray, the strategic theorist, leaves no doubt of his assessment when he describes Boyd's work as able to:

*"... apply to the operational, strategic, and political levels of war, as well as to tactics for aerial dogfights. Boyd's theory claims that the key to success in conflict is to operate inside the opponent's decision cycle. ... The OODA loop may appear too humble to merit categorization as a grand theory, but that is what it is. It has an elegant simplicity, an extensive domain of applicability, and contains a high quality of insight about strategic essentials, such that its author well merits honourable mention as an outstanding general theorist of strategy"*[1]

It should, therefore, be cause for considerable interest when a biography is written to explain John Boyd's life and work. In this case, the author Dr Grant T. Hammond is the Director of the Centre for Strategy and Technology [2] at the Air War College, Air University, United States Air Force. Dr Hammond first met John Boyd in 1991 when the latter presented a briefing on his theories at the Air War College. Hammond had gone along sceptical of another one of 'the seemingly endless array of colonels and general officers that someone thought had something significant to say' and went away convinced that he had encountered 'no ordinary mind'. [3] From this chance meeting Dr Hammond was drawn into Boyd's wide circle of contacts, becoming almost a disciple. It is from this background that Hammond writes this biography.

Boyd had a fascinating life, achieving considerable success in four spheres of his life's work, but never being fully accepted by the organisation that he belonged to, the United States Air Force, and, despite his talents, never rising above the relatively modest rank of Colonel.

The first stage of his life was as a fighter pilot, qualifying as a pilot in time to fly fighter jets in the closing stages of the Korean War and then on into peace time service. In this field he first made an indelible impression at the USAF Fighter Weapons School at Nellis Air Force Base as an instructor and tactician. At that time he was known as '40 Second Boyd' because of a standing \$40 bet that within forty seconds he could turn a position of disadvantage into a winning position against any other pilot in a mock dogfight. Here he channelled his experience and study as a fighter pilot into the *Aerial Attack Study* monograph. This book summed up Boyd's expertise on air-to-air combat into one authoritative source for training future fighter pilots. This book underpins the fighter tactics used up to this day by the USAF and most other air forces in the world.[4]

The second stage of Boyd's career was at USAF Systems Command where he developed an intuitive understanding of the performance differential between different types of fighter aircraft into a theory that could plot and predict the envelope of performance of any fighter aircraft. Equally importantly, this assessment could be displayed graphically in an easily understood and compared form. The book describes Boyd's 'a-ha' moment, whilst when drinking beer and eating hamburgers with fellow engineering students, he realised that air combat could be considered as a trade-off between energy states to give manoeuvrability. As Hammond has it 'nearly all of Boyd's major insights seem to be associated with bars and scribbling on cocktail napkins and tablecloths.' [5] Working in conjunction with Tom Christie, a mathematician at USAF Systems Command, and using stolen computer time, Boyd conducted the calculations to validate his initial insight into a rigorous theory. This was 'the first quantitative global analysis by which one could accurately compare one aircraft against another throughout their performance envelope.' [6] A frightening implication of Boyd and Christie's work was that it showed that Soviet fighters were certainly more manoeuvrable and, in many ways, more capable than US fighters.

His work on energy manoeuvrability theory lead John Boyd to his next assignment in the F-X Project for a new USAF fighter, the aircraft that eventually became the F15. Boyd, working through the operational requirements team, orchestrated the changes in the design of the F15 that made it over from a heavy, unmanoeuvrable two-seat multi-role aircraft into a highly manoeuvrable, one-seat fighter, with an unprecedented power-to-weight ratio, and dedicated to air superiority.

Not content to rest on the laurels for his work on the F15, Boyd had a vision for a radically different fighter aircraft—lighter, far more manoeuvrable, cheaper and simpler allowing

<sup>1</sup> Colin S. Gray, *Modern Strategy*, Oxford University Press, Oxford UK, 1999, p. 91.

<sup>2</sup> <http://www.au.af.mil/au/awc/awcgate/awccsat.htm>.

<sup>3</sup> Grant T. Hammond, *The Mind of War: John Boyd and American Security*, Smithsonian Institute Press, Washington, 2001, p. vii.

<sup>4</sup> *ibid*, p.45.

<sup>5</sup> *ibid*, p.53.

<sup>6</sup> *ibid*, p. 59.