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Editorial

Welcome to the 2022 edition of the *Australian Army Journal* (AAJ). This edition examines foundations of professional mastery and doctrine, and reinforces the proposition that how we think inevitably affects how we perform.

Like so many activities over the last two years, the COVID-19 pandemic constrained AAJ publication and the written output of prospective authors. As we emerge from pandemic conditions, the Journal is fortunate to have experienced a strong resurgence of interest. We look forward to resuming a regular pattern of AAJ publications in the New Year.

The AAJ has always been a forum for ideas and debate about land power. Reinforcing the value of informed debate and intellectual interchange, this edition introduces a new approach. Some papers are accompanied by commentary by subject matter experts within Army discussing the arguments and recommendations presented. This approach will be applied more widely in future editions enabling readers to see how ideas are received and absorbed by Army stakeholders who have a direct professional interest in the topics discussed.

Journal Articles

With a focus on joint integration, Mark Gilchrist asks: “Is the Australian Defence Force Joint Enough?” Gilchrist proposes that changes in Australia’s geostrategic environment risk outpacing the Australian Defence Force’s (ADF) joint capabilities. In order to ensure the ADF is able to fully realise the benefits of organisational change for enhanced multi-domain effect,

Gilchrist argues that the joint force must be underpinned by a joint culture that balances traditional service equities to achieve maximum warfighting advantage. He considers the design and implementation of joint warfighting concepts and command-and-control systems necessary to prepare for potential high-threat contingencies. This piece is accompanied by an Army commentary by Major General Chris Field highlighting the important link between thoughtful critique and continuous improvement in any organisation.

Mark Mankowski contributes further to the debate on how the ADF can maximise the effectiveness of contemporary joint operations. Drawing on the historical example of air-land integration during the Burma campaign of the Second World War, Mankowski presents three factors essential to effective joint operations. Firstly, he explains the vital role of cross-domain professionalisation within the ADF; secondly, he highlights the critical importance of the ongoing identification of issues that impede operational efficiency and unity of command during joint operations; and thirdly, he illustrates the importance of tactical commanders building strong relationships and being receptive to guidance that will drive joint integration. The lessons drawn from this historical example are distilled into succinct recommendations that are as relevant to contemporary joint operations as they were in July 1944.

Reflecting this edition's theme of adaptation to changing strategic circumstances, Nick Bosio emphasises the importance of agile and creative military decision-making. While technological advantage is important, Bosio contends that modernisation of equipment must be matched by commensurate growth in military thinking. He argues that a culture of deliberate professional gaming can enhance Army's intellectual performance in military planning, decision-making, and concepts for competition, conflict and war. Bosio outlines how humans think, and how games can help build new ways of thinking for professional creativity. He also offers suggestions for how professional gaming may be incorporated into military education.

Nicholas Mahr explores the concept of adaptation, arguing for clarification of Army's understanding of the 'adaptation cycle'. Mahr rejects simplistic notions that success in war comes from quick adaptation. Instead, he contends that rates of adaptation are relative, and that *superior* adaptation is the critical aspect. The employment of measures to slow the enemy's rate of adaptation is outlined through a discussion of 'decisive events' and 'emerging decisive events'. Using the Japanese attack on Pearl Harbor as an historical example,

Mahr demonstrates how an enemy's decision-making cycle can be slowed through the orchestration of concurrent dilemmas. This piece is accompanied by commentary from Major General Michael Krause.

Continuing a focus on clarifying military thinking, Mark Sargent invites the reader to consider what 'defeat' really means to battlefield success. Skilfully weaving historical examples to illustrate his arguments, Sargent explores Army's doctrinal emphasis on shattering an enemy's moral and physical cohesion as a prelude to their defeat, while drawing attention to a lack of explanation of how one may lead to the other, or of what each actually looks like. Sargent proposes a meaningful definition of defeat, offers a framework of defeat mechanisms, and exhorts Army to more effectively link planning actions to defeat of the enemy.

Drawing on his experiences and surveys of 3rd Brigade personnel, James Casey argues that the Australian Army's current planning processes place insufficient emphasis on the principles of surprise and deception. Citing doctrinal deficiencies, Casey reasons that a 'plan that is not founded upon the achievement of surprise delivers the enemy a course of action he has already war-gamed'. Over the course of the paper, Casey marshals evidence to support his contention, challenging Army to improve the way it plans for and implements surprise and deception in operational design, supporting this process by providing his own recommendations as to how these concepts can be improved.

In his timely paper, Leo Purdy provides a brief history of armoured vehicle-borne infantry. Through an assessment of the various ways in which such forces have been employed as part of larger battle groups, several vehicle platforms are discussed and placed within the context of their respective operating concepts. Amidst popular comment from the Russo-Ukraine war around the continued relevance of such capabilities and platforms, Purdy's paper offers insights into the ongoing utility of armoured vehicle-borne infantry to the joint force. Purdy's paper is accompanied by a commentary from Lieutenant Colonel Benjamin Howard that emphasises the importance of a replacement infantry fighting vehicle for the M113 as part of the ADF's modern and effective combined arms fighting system.

Book Reviews

The three book reviews in this edition provide insights into both the past and the future.

Peter Dean's review of *Semut: the Untold Story of a Secret Australian Operation in WWII Borneo* reveals a well-balanced history that provides an immersive and detailed exploration of the Semut II and III operations in Borneo in 1945. The Services Reconnaissance Department's (special forces) operatives and operations, the local Dayak people, and Japanese forces are skilfully interwoven to provide a meticulous account yet, Dean laments, lacks detailed analysis of the strategic and operational objectives.

Sonya Russell and Atonio Nagauna review the classic 1948 publication, *The History of the Fiji Military Forces 1939–1945*. Providing a narrative history that outlines Fijian forces' war preparations from the outbreak of hostilities in Europe in 1939 to Japan's surrender in 1945, the work is considered by the reviewers to be essential reading for those wishing to engage the Republic of Fiji Military Forces. As Army enhances its regional relationships within an increasingly contested South Pacific, this book offers insights for those keen to understand the genesis of Fiji's modern forces and its historical coalition relationships.

In contrast to the historical focus of the previous books, Albert Palazzo assesses the usefulness of *2034: a Novel of the Next World* in outlining a possible future scenario where great power rivalry has tipped over into conflict. The value of this novel is not, Palazzo advises, the tactics and weapons employed, but rather how the authors have highlighted how human values underpin the 'understanding and waging of war'. The exploration of these concepts, and the deep need to understand the culture of one's enemy, make this a title that Palazzo argues would be a valuable addition to the professional library of junior leaders.

Future Editions

As the editorial team look toward planning multiple editions for 2023, we extend an invitation to regular and casual AAJ readers to recommend themes. We welcome constructive comment on the journal's content, frequency of editions, balance of papers, book reviews, or any other issues that may improve the readership experience. Further, the AAJ encourages submissions from all ranks within Army and from across the wider Defence community. Please see the Call for Submissions on page 144.

Finally, the AARC and the AAJ Board wish to thank Brigadier Ian Langford (former Acting Head Land Capability) and Colonel David Beaumont (former Director, Australian Army Research Centre) for their stewardship and support for the AAJ, and for their steadfast encouragement of Army's collective cognitive development. Both officers have left a legacy of intellectual vigour that places Army in a stronger position to identify, debate and engage issues relevant to the profession of arms and the interests of its people. As the long history of the AAJ records, and as the themes of this edition remind us, land power professionals must persist in overcoming physical, moral, informational ***and*** intellectual barriers in order to prepare for the challenges of future land warfare.

Is the Australian Defence Force Joint Enough?

Mark Gilchrist

The traditional security benefits conferred by Australia's geography have been considerably reduced by the development of a Chinese long-range strike system capable of threatening Australian cities.[1] The myriad technologies that constitute this system can be applied across all domains and usually in combination. An understanding of these potential threats spurred assessments in the 2020 *Defence Strategic Update and Force Structure Plan* (FSP20) which signalled the requirement for greater Australian self-reliance.[2] This change has important implications for the Australian Defence Force (ADF)—most critically, the necessity to fight as a coherent joint force across multiple domains simultaneously at a scale unthinkable only a decade ago.

1 Malcolm Davis, 'Why Australia Needs a Long-Range Air Defence Capability', *The Strategist*, 26 February 2020, accessed 20 August 2020, at: https://www.aspistrategist.org.au/why-australia-needs-a-long-range-air-defence-capability/

2 Shmuel Shmuel, 'The American Way of War in the Twenty First Century: Three Inherent Challenges', Modern War Institute website, 30 June 2020, accessed 28 August 2020, at: https://mwi.usma.edu/american-way-war-twenty-first-century-three-inherent-challenges/; and Van Jackson, 'The Risks of Australia's Solo Deterrence Wager', *War on the Rocks*, 20 July 2020, accessed 28 August 2020, at: https://warontherocks.com/2020/07/the-risks-of-australias-solo-deterrence-wager/

The ADF has taken important steps towards becoming a force that is both joint by design and joined in execution.[3] Headquarters Joint Operations Command (HQJOC) is in the second decade of its existence, the ADF routinely employs Joint Task Forces, and the annual training cycle is now convened as a Joint Warfare Series. These are supported by a Joint Capabilities Group and joint Force Design and Integration Divisions. These significant reforms ensure 'jointery' has greater influence than at any time in the ADF's history. Nonetheless, the ADF remains an inherently tactical force, dominated by single-service cultures and most comfortable providing domain-specific force packages to coalition operations. This must change if the ADF is to harness the potential of its warfighting capabilities as an integrated joint force in an increasingly contested security environment.

Despite the important reforms mentioned above, the ADF is still developing the joint character required to fully realise the benefits of the organisational changes and integrate them for enhanced multi-domain effect. In short, the ADF is still not joint enough to shape, deter and respond to the threats that must be anticipated as a result of increasing geopolitical tensions in the Indo-Pacific. This article argues that further reform is necessary to ensure 'Joint' is the ADF's central organising principle in both word and deed. It argues that the joint force required by Australia's degrading security environment must be underpinned by the creation and indoctrination of a joint culture that necessarily impinges on traditional service equities to maximise warfighting advantage. This joint culture is, in turn, essential to successfully designing and implementing the joint warfighting concepts necessary to bring coherence to the joint force's preparedness for high-threat contingencies that may result from increased great power competition.[4] Finally, these concepts must be tested and refined through the ruthless application and primacy of a revamped joint command and control (JC2) system.

This article posits that the means for enhancing the ADF's joint outcomes are best understood as a hierarchical model (Figure 1) where culture provides the foundation for joint concepts and command and control to emerge as the higher-order activities of 'jointness'. Understanding the relationship

3 Tim McKenna and Tim McKay, 2017, *Australia's Joint Approach: Past, Present and Future*, Joint Studies Paper Series, No. 1 (Canberra: Defence Publishing Service), 1–2.

4 Oriana Skylar Mastro, 'The Taiwan Temptation: Why Beijing Might Resort to Force', *Foreign Affairs*, July/August 2021, accessed 8 June 2021, at: https://www.foreignaffairs.com/articles/china/2021-06-03/china-taiwan-war-temptation?

between the tiers in this proposed hierarchy of joint integration offers a means to translate *unity of purpose* in force design into *unity of effect* in execution through creating and sustaining a joint warfighting ethos across the ADF.

A triangle is used to visualise this hierarchy because it makes explicit that joint command and control is the pinnacle of joint competence. However, the skills, knowledge and behaviours required for joint command and control to function cannot be attained without improving the ADF's joint culture and concepts. As such, the model posits that the efficacy of the joint force is enhanced or undermined by the virtuous or vicious interactions of each tier: joint culture can be enhanced by the sustained application of effective concepts directed by visionary joint command and control, but the inverse is also true. Critically, joint concepts and joint command and control cannot function without robust joint culture as a baseline. This article concludes that the ADF's successful integration (or otherwise) of these factors will be most obvious at the operational level, emphasising the importance of HQJOC in the Australian context.

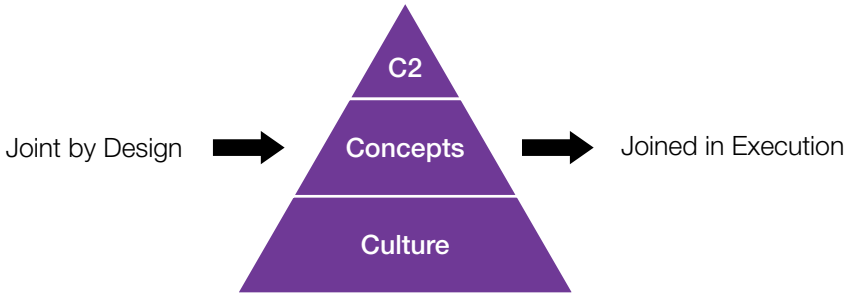

Figure 1. The hierarchy of joint integration

Joint Culture[5]

Recognising the multi-domain potential of the advanced capabilities flagged in FSP20 relies on the efficacy of ADF joint culture. The ADF's new mission is 'To apply military power in order to defend Australia and its national interests'. This is a joint mission requiring a joint warfighting culture.

5 A culture is a way of life for a group of people-the behaviours, beliefs, values and symbols that they accept, generally without thinking about them, that are passed along by communication and imitation from one generation to the next. Culture is expressed through habits, symbols, institutions, actions and activities - in this case joint warfighting. Adapted from Geert Hofstede, 1997, *Cultures and Organizations: Software of the Mind* (New York: McGraw Hill).

It is valuable, therefore, to understand why joint culture is important, as well as the obstacles that impede its development.[6]

'Joint' is a warfighting philosophy that enhances multi-domain outcomes by maximising the strengths and protecting the weaknesses of each domain owner's contribution. Successful joint warfighting requires a foundation built on domain-specific experience. Nonetheless, a joint approach aims to create new military options and effects by using and prioritising single-service capabilities in innovative ways to dislocate adversary expectations.[7] A joint culture must sit above single-service cultures as a means to embrace and encourage diversity of thought and experience to drive military innovation. Contemporary joint culture must also account for the contribution of the public service workforce who deliver many of the effects relied upon by the ADF to enable advanced capabilities to function.[8] This requires meaningful and sustained engagement between uniformed and civilian personnel at the tactical and operational levels to practise the employment of discrete capabilities (cyber, space, intelligence, health etc.) and build the trust necessary to effectively utilise them in a warfighting context. Service identity and culture will always be important, but a joint culture must predominate if the ADF is to integrate service and other government capabilities in less tribal ways.[9]

Achieving this requires the ADF to recognise the limitations of single-service bias and its detrimental impact on harnessing multi-domain potential. Service-specific cultures are highly effective in achieving single-domain mastery. They are akin to orchestras playing magnificent but well-established symphonies. Joint culture, in contrast, should take its lead from jazz by subverting established norms through the use of random combinations of capabilities and effects to create new and unexpected harmonies. An innovative joint culture must be unconstrained by service-specific bias and provide the transformational impetus to create multi-domain

6 McKenna and McKay, 2017, 76.

7 James Goldrick, 2010, 'Thoughts on JPME', *Australian Defence Force Journal*, no. 181: 8.

8 McKenna and McKay, 2017, 76.

9 S Rebecca Zimmerman, Kimberly Jackson, Natasha Lander, Colin Roberts, Dan Madden and Rebeca Orrie, 2019, *Movement and Maneuver: Culture and the Competition for Influence Among the U.S. Military Services* (Santa Monica, CA: RAND Corporation), accessed 18 August 2020, at: https://www.rand.org/pubs/research_reports/RR2270.html

'mash-ups' that dislocate an adversary's expectations and create surprise.[10] Robert Leonhard argues single-service bias creates 'protective'[11] rather than 'dislocative'[12] designs for battle. This results in armies, navies and air forces planning and training to defeat counterpart services rather than examining how to dislocate adversaries in different domains.[13] A joint culture, in contrast, should be focused on gaining asymmetric advantage through orchestrating the employment of single-service capabilities to achieve cross-domain effects.

Research indicates that despite the potential benefits, establishing and sustaining an overarching joint culture is not easy. Eric Dane highlights that domain expertise limits 'adapt[ability] to new rules and conditions' and 'when task conditions change … an expert's [habits] may be incommensurate with the altered nature of the situation'.[14] In short, as domain-specific expertise is acquired, flexibility can be lost and creativity stifled. Dane terms this 'cognitive entrenchment'. If domain experts can be slow to adapt to changing circumstances due to their depth of expertise, the challenge for recognising the potential of the joint force is capitalising on single-domain expertise before cognitive entrenchment takes hold.[15] Paradoxically, this means harnessing the best of single-service culture with the express intent of creating a joint version that reduces the influence of the parent cultures from which it was drawn. This is challenging when those charged with generating joint outcomes are generally domain-specific experts whose advancement is the result of demonstrated excellence within their parent service and to whom joint culture may offer an implicit challenge.[16]

Joint culture must, therefore, be supported and inculcated by enhanced joint literacy developed throughout a career. The Joint Professional Military

10 Joshua Cooper Ramo, 2009, *Age of the Unthinkable: Why the New World Disorder Constantly Surprises Us and What We Can Do About It* (New York: Little, Brown and Company), 128–129.

11 Pitting one's strengths against those of a like-domain counterpart.

12 Using one's strengths against the weakness of an unlike-domain counterpart.

13 Robert R Leonhard, 2017, *Fighting by Minutes: Time and the Art of War* (San Bernadino, CA: Praeger), 54–55.

14 Eric Dane, 2010, 'Reconsidering the Trade-Off Between Expertise and Flexibility: A Cognitive Entrenchment Perspective', *Academy of Management Review* 35, no. 4: 581, 585.

15 Ibid., 581, 585.

16 Ibid., 586; and Nathan P Freier and John H Schaus, 2020, 'INDOPACOM through 2030', *Parameters* 50, no. 2: 27–28.

Education (JPME) Continuum plays a crucial role but must be supported by continuous reinforcement and employment opportunities—something that is haphazard in the ADF's current approach to developing joint warfighting competence.[17] Moreover, while promotion is controlled by the services, domain-specific bias will continue to limit opportunities to grow joint-focused professionals. Therefore, a review of career management is likely to be as important as JPME for joint culture to take root.[18] This could see the ADF identify officers with an aptitude for joint operations and carefully manage them outside of service strictures to spearhead cultural change before cognitive entrenchment takes hold.[19]

This foreshadows the establishment of a warfighting-focused joint staff possessing the necessary military acumen, cultural fit and innovative approach required to enhance joint outcomes and ensure the permeation of joint culture throughout the ADF through careful career management. This idea draws inspiration from Moltke the Elder and his creation of the Prussian General Staff in the mid-19th century. This innovative staff created a comparative advantage for Prussia when competing against outdated models employed by peer armies. As Michael Howard explains:

> *[W]artime command and control [needs] greatly increased. In the French, Austrian, and British armies staff officers … became little more than military bureaucrats … Moltke, on the contrary, turned them into an élite, drawn from the most promising regimental officers, trained under his eye and alternating in their careers between staff and command posts of increasing responsibility.*[20]

In the Australian context, this cadre of joint staff would focus on ensuring the ADF is greater than the sum of its parts, rather than an inefficient aggregation of them. They may not be masters of parent service warfighting but would represent the cognitive agility (rather than entrenchment) required to synthesise domain-specific orthodoxy for asymmetric multi-domain effect. This should, at least initially, occur at the operational level where joint

17 Australian Defence College, 2019, *The Australian Joint Professional Military Education Continuum* (Canberra: Defence Publishing Service).

18 Richard Barrett and Steve Ditulio, 'One Defence Needs One Performance Report', *The Forge*, 3 June 2020, accessed 18 August 2020, at: https://theforge.defence.gov.au/publications/one-defence-needs-one-performance-report

19 Dane, 2010, 589.

20 Michael Howard, 2009, *War in European History* (Oxford: Oxford University Press), 101.

coordination is most critical—emphasising HQJOC's centrality to the emergence of joint culture throughout the ADF.

Joint experience enables joint culture to take root. Few, however, have the chance to serve in HQJOC or participate in the joint component of exercises like Talisman Sabre. Absent the muscle memory resulting from regular joint endeavours, individuals will understandably cohere around service tribalism.[21] The challenge, therefore, is scaling the ADF's limited joint experience across the force through other activities. Culture is essential to this by ensuring more ADF personnel are predisposed to joint outcomes and conversant with the latest joint concepts. This joint literacy would be greatly aided by the establishment of more mechanisms to facilitate professional discourse about joint warfighting. To complement service publications and the *Australian Journal of Defence and Strategic Studies*, the ADF would benefit from sponsoring a journal like the United States' *Joint Force Quarterly*. This publication is charged by the Chairman of the Joint Chiefs of Staff to 'inform and educate national security professionals on joint and integrated operations' and focuses on the operational employment of the joint force, rather than the strategic and political conditions that may require it to be deployed.[22] Incentivising and sustaining similar professional discourse for the ADF will be critical to developing the whole-of-force competence in joint multi-domain warfighting required to succeed in the contemporary operating environment.

Attempts to enhance joint culture must not, however, discount the importance of territorial feelings and behaviours associated with service identity. To do so is to overlook the importance of single-domain expertise to informing joint planning and execution.[23] Instead, the key for enhancing joint culture is ensuring collective ownership over new outcomes, enabled by transformation agents who represent their service lineage but are collaborative and innovative enough to avoid parochialism.[24]

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21 McKenna and McKay, 2017, 100.

22 Taken from the Joint Force Quarterly website, at: https://ndupress.ndu.edu/JFQ

23 Graham Brown, Thomas B Lawrence and Sandra L Robinson, 2005, 'Territoriality in Organisations', *Academy of Management Review* 30, vol. 3: 577.

24 Steven M Gray, Andrew P Knight and Markus Baer, 2020, 'On the Emergence of Collective Psychological Ownership in New Creative Teams', *Organization Science* 31, no. 1: 141.

Joint Concepts[25]

Australia lacks an executable joint warfighting concept. Currently, there is no baseline from which to test and adjust how the joint force will conduct multi-domain operations to defeat an adversary. Notwithstanding the significant changes to the ADF's capstone doctrine series, ADF joint doctrine remains largely procedural and lacks the operational detail required to visualise the application of joint resources in a contemporary conflict. This is a critical gap in our intellectual preparation for war and compels individual learning about others' joint experiences in an attempt to contextualise them for Australian circumstances. These efforts provide important perspectives to help shape joint operations, but even jazz musicians need a common reference point from which to build a harmony. What differentiates joint concepts from service or capability specific concepts is, therefore, the vision they offer for integrating and cohering silos of excellence to achieve asymmetric advantage through layering multi-domain effects.

The maritime, littoral geography and escalating tensions between powerful state actors that characterises the contemporary Indo-Pacific provides a powerful forcing function for joint conceptual development. Regardless of the challenges of this terrain and the accelerated fielding of advanced military capabilities, the Indo-Pacific offers great potential to explore the integration of joint capabilities. For example, only a joint concept can adequately consider how army and navy capabilities might disrupt adversary air forces to open temporal manoeuvre corridors for friendly air and cyber forces to operate. This type of analysis is the acme of joint warfighting: determining how the services can employ their capabilities to disrupt or dislocate a potential adversary's freedom of action in other domains to create opportunities or shield vulnerabilities. Meaningful visualisation and description of these actions is the realm of joint concepts—they articulate how the ADF will be joined in execution. The validity of these concepts will reflect the successful adoption (or otherwise) of the joint culture described above.

25 A description of how a joint force commander might plan, prepare, deploy, employ, sustain and redeploy a joint force. It guides the further development and integration of joint functional and service concepts into a joint capability, and articulates the measurable detail needed for experimentation and decision-making. As defined in *Dictionary of Military and Associated Terms* (US Department of Defense, 2005), accessed 7 September 2020, at: https://www.thefreedictionary.com/joint+concept

Concepts are theories for success in war. They provide options for solving new problems, drive future doctrine and overturn current orthodoxy through testing and experimentation. In so doing they change warfighting approaches through intellect rather than as a result of 'bloody empiricism'.[26] A useful historical precedent is the United States Navy's preparation for conflict in the Pacific prior to the Second World War. Here, the Navy's peacetime adaptation towards carrier-based warfare allowed it to overcome the decimation of its battleship fleet at Pearl Harbor. These preparations allowed the Navy to severely curtail Japanese blue-water ambitions and strategic flexibility at the Battle of Midway only six months later.[27] Carriers forced naval officers to think in terms of fighting a distant maritime war in the absence of the bases that traditionally enabled power projection at scale. The resulting design and testing of new operational concepts strengthened the capacity of the entire organisation to adapt to new circumstances.[28]

Many of these concepts and platforms matured during the Pacific campaign. Nonetheless, they were conceived of and embedded within the Navy's collective consciousness during the interwar period. This included annual war gaming at the Naval War College that led to consistent refinement of War Plan Orange—the United States' peacetime planning for conflict with Japan.[29]

While this is a single-service example, it drove the employment of America's joint capabilities within the Pacific Theatre and demonstrates the importance of Australia's joint force pre-empting rather than responding to changes in the character of war. It also reinforces that adaptation is best enabled by focusing on a real and defined threat scenario. This is a lesson of particular relevance to Australia's joint multi-domain concept development in light of the emergence of a Chinese long-range strike system capable of holding Australian infrastructure and ADF assets at risk at significant range.[30]

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26 Leonhard, 2017, xvii.

27 George Baer, 1994, 'The Early Offensive in the Pacific' and 'Pacific Command', in *One Hundred Years of Sea Power: The U.S. Navy*, 1890-1990 (Stanford, CA: Stanford University Press).

28 John T Kuehn, 2010, 'The U.S. Navy General Board and Naval Arms Limitation: 1922–1937', *The Journal of Military History* 74, no. 4: 1160.

29 Ibid., 1135–1137, 1160.

30 Malcolm Davis, 'China's Long-Range Missiles highlight RAAF's Strike Shortcomings', *The Strategist*, 4 June 2021, accessed 7 June 2021, at: https://www.aspistrategist.org.au/chinas-long-range-missiles-highlight-raafs-strike-shortcomings/

Australian concepts must recognise that multi-domain warfare is inherently joint but vulnerability exists in the seams where domain ownership is unclear or contested.[31] As David Deptula argues:

> *[S]ervices tend to develop capabilities in a stand-alone manner focused around their primary operating domain without an overarching construct to ensure joint … interoperability. This leads to strategies focused on deconfliction [rather than] the interdependence required to achieve force multiplying effects with available resources.*[32]

Interdependence is about recasting single-service orthodoxy to create joint concepts that allow the ADF to act differently by using extant means in new ways through asking different questions. Component-level planning seldom achieves this. A professionalised joint staff is the only place where these potential synergies, born of diverse backgrounds and experience across different capabilities, can be assembled conceptually.

An iterative process of concept development can drive joint force design and collaborative procurement by back-casting from how we envisage the joint force will execute the multi-domain fight.[33] These joint warfighting concepts, ideally endorsed by the Chiefs of Services Committee, can provide the services with clarity as to the role they are expected to play within specified scenarios. As the previous Commander of the United States Indo-Pacific Command argued, this drives explicit prioritisation of capabilities based on joint force need,[34] rather than a domain owner's preferred way of fighting. For example, clarity on the role of the land force through an endorsed joint concept could provide fresh impetus to review the need for a new armoured vehicle fleet when expanding investment in land-based anti-ship missiles and air defence capabilities might be a more important requirement for the

31 Ray Griggs, 'Building the Integrated Joint Force', *The Strategist*, 7 June 2017, accessed 20 August 2020, at: https://www.aspistrategist.org.au/building-integrated-joint-force/

32 David Deptula, 'Moving Further into the Information Age with Joint All-Domain Command and Control', *C4ISRNET*, 9 July 2020, accessed 25 August 2020, at: https://www.c4isrnet.com/opinion/2020/07/09/moving-further-into-the-information-age-with-joint-all-domain-command-and-control/

33 Itai Brun, 2010, 'The Second Lebanon War, 2006', in John Andreas Olsen (ed.), *A History of Air Warfare* (Lincoln, NE: University of Nebraska Press), 328–330.

34 Admiral Philip S Davidson, 'Transforming the Joint Force: A Warfighting Concept for Great Power Competition', speech delivered in San Diego, 3 March 2020, transcript on U.S. Indo-Pacific Command website, accessed 15 August 2020, at: https://www.pacom.mil/Media/Speeches-Testimony/Article/2101115/transforming-the-joint-force-a-warfighting-concept-for-great-power-competition/

joint force.[35] The absence of this agreed vision for how the ADF should fight ensures the joint force cannot coalesce around a common reference point, and reinforces the ongoing post-procurement integration challenges that result from stovepiped capability development.[36]

Joint Command and Control (JC2)[37]

Joint command and control is the core warfighting competency of a professional force. It requires a systemic approach that includes the people, processes, authorities and delegations, communications systems and infrastructure required to turn concepts into actions.[38] Effective joint culture and concepts are the basis for realising the potential of the joint force, but JC2 is the tangible means through which the ADF ensures it is joined in execution. The unified approach to command and control this implies will be critical in an era where technology offers the potential to visually represent a single warfighting environment. These visualisation tools blend traditional service-based approaches to battlespace understanding into a single, multi-domain picture within which a Commander is able to understand and act with enhanced agility.[39]

This portends profound changes to joint command and control if the ADF is to maximise the potential of the military capabilities envisaged in FSP20. Emerging technologies, including future strike capabilities, will require a tightly coupled JC2 system that synchronises ADF, whole-of-government and allied capabilities at machine speed to position them in the right space,

35 Michael Shoebridge, 'Setting Clear Priorities for the ADF Requires Ruthless Decisions on the Force We Build', *The Strategist*, 5 August 2021, accessed 26 August 2021, at: https://www.aspistrategist.org.au/setting-clear-priorities-for-the-adf-requires-ruthless-decisions-on-the-force-we-build/

36 McKenna and McKay, 2017, 63, 77.

37 The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating and controlling forces and operations in the accomplishment of the mission. From US Department of Defense, 2013, *Joint Publication 1: Doctrine for the Armed Forces of the United States* (25 March 2013) V-14, accessed 8 September 2020, at: https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp1_ch1.pdf?ver=2019-02-11-174350-967#page=126

38 US Department of the Army, 2019, *ADP 6-0: Mission Command: Command and Control of Army Forces* (Washington: Army Publishing Directorate, July 2019), 4-1, accessed 20 August 2020, at: https://fas.org/irp/doddir/army/adp6_0.pdf

39 Griggs, 2017.

at the right time, to enable the desired military effect. This demands unity of effort across domains. It also implies the centralisation of key authorities at the operational level and may require a theatre commander to direct certain tactical capabilities and actions to ensure synchronised delivery of military and non-military effects across multiple domains. This requires the flattening of coordination mechanisms between echelons rather than the decentralisation of effects delivery.[40]

Directive control, the precursor to what the ADF considers Mission Command, resulted from massed armies exceeding the ability of a single commander to understand and manage subordinate manoeuvre. Thus, a disaggregated approach became necessary. However, this could work against the tightly coupled multi-domain effects required to operate across highly contested, interconnected physical and virtual terrain.[41] Ironically, the modern quest for seamless, networked, stand-off combat power may reverse the disaggregation trend, increasing the importance of a centralised joint force commander directing activity from the operational level.[42] Today, a joint commander coordinating military actions across multiple domains is likely to have superior situational awareness to that of any subordinate, domain-specific commander. Yet, while the paradigm might be shifting, this is not the end of directive control. The challenge for the joint command and control system is to ensure shared understanding across distributed nodes so that subordinate commanders can access information that is (if imperfect) similar to that available to the joint commander, to facilitate unity of action.[43] This requires a redundant, survivable JC2 backbone that links theatre effects with tactical actions at critical points in time and space.

Accepting that communications may not be available at the point of engagement, the JC2 system must also be capable of orchestrating the desired effects in advance of the physical contest to enable execution in a denied environment. This does not reduce the requirement for joint

40 Leonhard, 2017, 229.

41 Ibid., 143–145, 154–157.

42 Trent J Lythgoe, 2020, 'Beyond Auftragstaktik: The Case Against Hyper-decentralised Command', *Joint Force Quarterly* 96, accessed 28 August 2020, at: https://ndupress.ndu.edu/Media/News/News-Article-View/Article/2076032/beyond-auftragstaktik-the-case-against-hyper-decentralized-command/

43 BA Friedman and Olivia A Garard, 'Technology-Enabled Mission Command', *War on the Rocks*, 9 April 2020, accessed 2 September 2020, at: https://warontherocks.com/2020/04/technology-enabled-mission-command-keeping-up-with-the-john-paul-joneses/

forces to act in a coordinated manner. Rather, it reinforces the importance of clear guidance to subordinate commanders about where to be, what must be achieved, at what time(s) to maintain synchronisation of effects delivery. Success will still rely on the initiative and flexibility of subordinate commanders, but their freedom of action may be constrained to optimise multi-domain outcomes.

The United States military is experimenting with Joint All Domain C2 (JADC2) to implement its warfighting concepts.[44] JADC2 'raises difficult questions regarding who has decision authority and risk acceptance' as it challenges traditional component command structures which 'tend to exacerbate … service and domain stovepipes … resistant to ceding control over their assets'.[45] These challenges are not unique to America. In Australia, component-style C2 still predominates based on the influence of the services. Unfortunately, the presumption of pervasive domain mastery inherent in this construct provides a disincentive for cross-service collaboration on military problems which are inherently multi-domain in nature.

For a small force this is problematic, particularly where joint concepts will demand a command and control system capable of synchronising and orchestrating capabilities across domains in real time to achieve the desired effects.[46] The experience of Combined Joint Task Force (CJTF) Mountain during Operation ANACONDA in 2002 is instructive here as it demonstrates how a component mindset can hinder a joint approach. Despite its title, the CJTF prepared and fought like a land component, failing to adequately consider how to integrate air-delivered effects to enable manoeuvre. When circumstance dictated that the best means to disrupt the enemy was by air, with land forces in support, the headquarters was ill-prepared to adopt the required approach, resulting in unnecessary friction and operational risk.[47] This provides a useful example of how traditional domain-specific approaches to command and control can inadvertently limit the employment of available joint resources.

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44 Congressional Research Service, 'Defence Capabilities: Joint All-Domain Command and Control (JADC2)', *In Focus*, 6 April 2020, accessed 25 August 2020, at: https://fas.org/sgp/crs/natsec/IF11493.pdf

45 Deptula, 2020.

46 Douglas O Creviston, 2020, 'Transforming DOD for Agile Multidomain Command and Control', *Joint Force Quarterly* 97, accessed 1 September 2020, at: https://www.whs.mil/News/News-Display/Article/2132958/transforming-dod-for-agile-multidomain-command-and-control/

47 Benjamin S Lambeth, 2010, 'Operation Enduring Freedom', in John Andreas Olsen (ed.), *A History of Air Warfare* (Lincoln, NE: University of Nebraska Press), 275–285.

The objective of a future JC2 system should be the ability to 'aggregate, reconfigure, and disaggregate' the joint force rapidly, without losing tempo.[48] JC2 is, therefore, an integrating function allowing speed of decision through flattened structures that achieve the optimal combination and synchronisation of effects.[49] Truly joint command and control requires trust in, and knowledge of, other services but cannot allow single domain biases to predominate. In the contemporary Australian context, rather than incentivising unified execution, the hybrid command and control model employed at HQJOC continues to entrench single-domain primacy by accommodating an unwillingness of the services to cede operational control. This suggests the absence of the joint culture described above. It also hints at a lack of maturity in the ADF's command and control system if components are unable to trust the operational headquarters or its subordinate JTFs to directly control all forces operating within a given operational area.[50] This is an inefficient approach the ADF can ill afford, where multiple layers of redundant command and control retard rather than enable tempo. This tension underscores the importance of getting the ADF's approach to joint command and control fit for purpose well in advance of conflict.

Finally, for the JC2 system to achieve decision advantage in environments that will continue to be dominated by friction, chaos and chance, an agile approach will obviously be necessary—but this agility relies on a supremely well-trained staff.[51] Therefore, success for JC2 is dependent on the ability to baseline the requirement and train it across the joint force to ensure consistency in approach and application.[52] For the ADF, the best place to define the requirement and adjust the design of the joint command and control framework is likely to be HQJOC. By designing JC2 based on the operational commander's needs as the joint force employer, a common approach can be incorporated vertically and horizontally throughout the ADF.

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48 US Department of Defense, 2012, *Capstone Concept for Joint Operations: Joint Force 2020* (Washington, 10 September 2012), 5, accessed 16 August 2020, at: https://www.airuniversity.af.edu/LinkClick.aspx?fileticket=TE0QBrSPdNA%3D&portalid=10

49 Leonhard, 2017, 150.

50 Andrew Balmaks, Justin Kelly and JP Smith, 2013, *Strategic Command and Control Lessons—Scoping Study* (Noetic Solutions), 15, accessed 12 August 2020, at: https://cupdf.com/document/final-report-department-of-defence-of-this-report-is-at-his-discretion-authors.html

51 Lythgoe, 2020.

52 Defence Science and Technology Group, 2020, *Agile Command and Control Factsheet* (Canberra: Defence Publishing Service, August), accessed 2 September 2020, at: https://www.dst.defence.gov.au/strategy/star-shots/agile-command-and-control

The success of this approach will, however, rely on the efficacy of the culture and concepts that underpin it.

Conclusion

The ADF is not joint enough for the challenges it is likely to face, but it can be. Ensuring the ADF is greater than the sum of its parts requires a paradigm shift with implications for training, doctrine, personnel management and warfighting philosophy. An integrated joint force must be built on a compelling joint culture that facilitates the design of optimal warfighting concepts and ensures execution is possible through visionary joint command and control.

The hierarchy of joint integration offers one possible conceptual model through which to enhance the ADF's multi-domain acumen. It provides a framework for consolidating the robust joint ethos required to ensure a force joint by design is unified in execution. The operational level presents the logical hub to maximise the benefits of this approach, acting as a nexus for enhancing multi-domain warfighting. This highlights the criticality of a well-resourced operational-level headquarters to ADF reform efforts. However, HQJOC's ability to inform joint concepts and execute through joint command and control relies on whole-of-ADF efforts to build the culture necessary for the joint force to thrive in an increasingly hostile geopolitical climate.

Ultimately, recognising the ADF's multi-domain potential requires greater acknowledgement of the limitations of traditional service-focused approaches, particularly by the services themselves. As a result, further reductions in single-service influence are likely to be necessary to ensure the absolute primacy of joint warfighting outcomes when developing the ADF's approach to cultural reform, concept development and command and control.

Army Commentary

Many themes in Lieutenant Colonel Gilchrist's paper are now reality for the ADF. These include the 2022 publication of Integrated Campaigning, the ADF's capstone concept, which guides the ADF to 'work with others to achieve more'. Importantly, *Integrated Campaigning* aspires for an ADF that is the same by default, separate by necessity, and, similar by exception.

In addition, in 2022, the ADF agreed a joint framework connecting policy and strategy with ADF concepts. This *Joint Concepts Framework* includes *Integrated Campaigning*. It then sequences the ADF Theatre Concept, ADF Functional Concepts and five domain concepts: maritime; land; air; space; and cyber. The planned paramount ADF Functional Concept, as an integrating system for the ADF, is command, control, communications, computers, intelligence, surveillance, reconnaissance, and electronic warfare (C4ISREW). Together, all concepts are designed to unify the ADF and enable Australian security.

Within these concepts is a codification of ADF guidance, including principles for ADF interoperability, mission engineering, mission threads and operational abilities. This guidance, connecting strategy and tactics, informs the design of ADF experimentation, capabilities, programs, sub-programs and projects. Finally, ADF guidance also interacts with operational art through campaign plans designed, developed and executed by Joint Operations Command.

LTCOL Mark Gilchrist's article is an excellent example of loyal dissent. This type of dissent, currently a topic of debate within the United States Marine Corps, is where service members can criticise their organisation while remaining loyal to the same organisation. The proof of LTCOL Gilchrist's loyal dissent is that so many of his ideas are now reality for the ADF.

Chris Field, DSC, AM, CSC
Major General

About the Author

Lieutenant Colonel Mark Gilchrist is an Australian Army officer with Joint Force experience at the tactical, operational and strategic levels of defence. LTCOL Gilchrist is a graduate of the Australian Command and Staff College (Joint) and an Art of War alumni.

Implications for Contemporary Defence Leaders of Air-Land Integration as Part of the Burma Campaign During the Second World War

[I]n Burma our Armies are advancing on the wings of the Allied Air Forces.[1]

Mark Mankowski

Introduction

The campaign in Burma during the Second World War provides an excellent case study of the vital importance of air power to the eventual defeat of a determined adversary. The quote above from Air Chief Marshal Keith Park highlights the interdependence of the land and air forces in Burma. Some have argued that this interdependence was the closest integration between the services achieved in any theatre of war.[2] Air power would not have been able to play its vital role without close integration with the land forces. This close cooperation and integration started from the humblest beginnings and was by no means inevitable. At the start of hostilities with the Imperial Japanese Army (IJA), Allied air power in South-East Asia was virtually non-existent.[3] Yet by late 1944 the Commonwealth and American air forces in Burma had participated in one of the war's most outstanding feats of air support for a land campaign.[4]

I have previously written that the roles of air power were vitally important to an ostensibly land campaign.[5] Air superiority provided the necessary

precondition to enable the other roles. There was significant innovation and adaptation in the air mobility role, which provided the solution to the Japanese tactics of encirclement. The strike and reconnaissance role worked in synergy. Air power was vital to the land forces, and its effective use during the campaign was attributable to the development of processes for close integration between the services.

The system or process for organising and executing tactical air support of land operations is now termed air-land integration (ALI). British Army doctrine highlights that ALI requires three key elements: an understanding of each component's capabilities and limitations, the knowledge of component doctrine and validation through joint training, and the development of strong relationships to engender cooperation and mutual trust.[6]

Henry Probert's book *The Forgotten Air Force* is a comprehensive study of air operations in Burma, but it does not identify the challenges of establishing effective ALI.[7] *The Forgotten Air Force* and other existing literature covers the final mechanisms and organisations for conducting ALI during the Burma Campaign; however, the literature does not discuss how ALI was established. Crucially, because the explanation of the process is missing, the challenges and solutions for effective ALI during this campaign were unknown. My subsequent research has established that there were three key factors that explained the achievement of ALI during the Burma Campaign.[8] The purpose of this essay is to explain why education, external inquiries and receptive commanders were key factors in achieving ALI in Burma. Based on these three key factors, the second purpose is to share the implications of this research for contemporary joint operations.

Key Factor One: Education

The first key factor in the development of close integration between the services in Burma was the recognition by the RAF that they needed to educate the Army on the capabilities and limitations of air power. This would enable the Army to employ effectively the most powerful weapons in the theatre. The services would not achieve ALI if the Army planned a campaign and then asked the RAF how it could contribute. The RAF identified this requirement for inter-service education from the disappointing results of the First Arakan Campaign (a map is provided at Appendix 1).

During this campaign, Major General Wilfrid Lloyd's 14th Indian Division was the main tactical formation under the operational command of Eastern Army Headquarters. Lieutenant General William Slim's XV Corps Headquarters only took operational control towards the end of the campaign on 14 April 1943.[9] For the RAF, Headquarters 224 Group moved from Calcutta to Chittagong on 14 December 1942 for the First Arakan Campaign and cooperated with XV Corps.[10] It was commanded by Air Commodore Alexander Gray, who succeeded Air Commodore Wilson on 2 January 1943.[11]

The campaign commenced on 19 November 1942 and by 17 December, Maungdaw was occupied. Maungdaw, on the west Arakan coast, was important as it provided a secure airfield to co-locate 14th Indian Division Headquarters with 28 Squadron (Tactical Reconnaissance or Tac/R) on 7 January 1943. The 28 Squadron detachment operated about 100 yards from Divisional Headquarters, and 'no time was wasted in getting information back to Army'.[12] The benefits of this co-location and the development of a habitual relationship are important to the later development of ALI. It was in early January 1943 that the fortunes of the Commonwealth forces started to turn. The Japanese built a defended position a mile north of Donbaik. This position was attacked no fewer than five times from 7 January until the final attempt on 18 March 1943, with the entire strength of 224 Group deployed in close support for the final attack.[13] Each formation attack was a direct frontal assault, with increasing air support, but they were beaten off by the IJA, unmolested in their bunkers.[14]

While there were a number of lessons for the RAF, such as the need for a dedicated close air support (CAS) aircraft type, the most important lesson was the need for joint planning from the inception of the design of a new operation. The early inclusion of the RAF in combined planning was vital to ALI. This was because the relevant Army commanders and staffs needed a thorough education on the importance of the preconditions of air superiority, the need for joint training and the requirement for secure airfields. Prior to the land campaign starting, the RAF needed sufficient time to wrest control of the skies from the Japanese. Only once the RAF had the degree of air control it required could all of the other roles, including reconnaissance, CAS, air transport and heavy bombing, be brought to bear. While the RAF was heavily committed to operations against the enemy air force, joint training would develop the procedures to effectively conduct CAS. Finally, the RAF was a sophisticated organisation with modern but

comparatively delicate equipment, operating in one of the most hostile environments in the world. The RAF required secure airfields during the advance to maintain its sophisticated aircraft within effective range of the front. The capture of these airfields was an important requirement. The RAF needed to educate Army senior officers on these requirements, and devised a Senior Army Commanders' Course.

The Air Force Headquarters (AHQ) India Senior Army Commanders' Course was supported by the Commander-in-Chief of India, Field Marshal Archibald Wavell, and it attracted attendance from across India and Ceylon. The course must have been important to General Headquarters India (GHQ), as it was held at the same time as the First Arakan Campaign was in danger of failing, during the last week of March 1943.[15] Of interest to this essay, attendees included Lieutenant General William Slim as Commander of XV Corps (Eastern Army) and Lieutenant General Philip Christison as Commander of XXXIII Corps (Southern Army), and the course was organised by Group Captain (later Air Commodore) Percy Bernard, 5th Earl of Bandon (shortened to Bandon for the rest of this essay).[16]

This course was important in educating Army officers, as modern doctrine was not yet available in March 1942.[17] The course consisted of a series of lectures on the various aspects of air power and a 'Subjects for Discussion' section on Army/Air matters, with topics generated by GHQ and AHQ India. This was clearly the most important part of the course, as a considerable amount of time was allocated to these discussions (almost four hours on the second day) and 17 pages of notes were typed up to provide the context prior to the event. These notes to support the 'Discussion on Subjects for Discussion on Army/Air Matters' are illuminating as they clearly set out the important features of air power that the RAF was trying to communicate to the Army.

The '*Discussion on Subjects*' notes, presented by Air Vice Marshal John Baldwin, the Deputy Air Officer Commander in Chief for India, stressed the importance of achieving air superiority by building the RAF's strength. Once air superiority was obtained, the RAF would be in a position to turn all its resources to supporting the Army. The 'by-products' of gaining air superiority were air defence, indirect air support, CAS, heavy bombing, photographic reconnaissance and tactical air transport.[18] This led to a discussion on the challenges of combined training. The RAF were fully engaged with the enemy air force, with both their bomber and fighter forces. The Army was in the process of rebuilding its forces, and joint training with

the RAF was gaining importance with GHQ. While the RAF argued that air operations must come first, they were aware of the 'heartening effect' on soldiers of seeing aircraft on exercises. The key to the issue was joint planning. If the officers from the RAF and the Army were involved in planning future operations from the beginning, air formations would be identified to cooperate with Army formations, which in turn would build habitual relationships (such as those between 28 Squadron and 14th Division) and assist with integration. Practical training would allow the shortcomings of Army Staffs in dealing with air power to come to light. As the notes succinctly state, 'when air staffs and commanders are there in the flesh, and when aircraft are waiting to be used, the issue is forced into prominence'.[19]

The AHQ India Senior Army Commanders' Course achieved the aims the RAF had set out for it. Senior and influential Army commanders had attended, and the RAF had skilfully educated the attendees on its capabilities and the limitations of air power by stressing the importance of achieving air superiority, conducting combined training, securing airfields and planning all future operations jointly. The next key issue for the development of effective ALI was the arrival of an influential external party with an interest in ALI.

Key Factor Two: External Inquiry Identifies Issue / Internal Committee Fixes Problem

The second key factor in the development of close integration between the services was an influential external party arriving into the theatre at exactly the same time as the retrained, re-equipped land forces were starting their offensive against the IJA in 1944. The 220 Military Mission, headed by Major General John Lethbridge, was dispatched by the British Chiefs of Staff to learn all that was possible about the war against Japan. The 'Lethbridge Mission' had already visited the South West Pacific Area (SWPA), where they were deeply impressed by the level of integration achieved by those forces.[20] By coincidence this was the same period in which XV Corps, as part of 14th Army, commenced their offensive against the IJA on the Arakan Coast of Burma. After the Lethbridge Mission visited the XV Corps headquarters, now commanded by Lieutenant General Philip Christison (attendee at the AHQ India Senior Army Commanders' Course), they observed that the air and land forces 'were not however, working together as smoothly and as satisfactorily as they were in NEW GUINEA'.[21]

Throughout 1943, efforts to bring Army and RAF commanders together in Burma were encouraged, but at this stage of the campaign, they were not ordered. The initial failures of XV Corps to secure the Razabil position during Operation JONATHAN led Christison or his staff to highlight to the Lethbridge Mission that a lack of artillery and air support was to blame. The lack of co-located commanders, incompatible personalities and friction over the use of tactical and heavy bombing were likely to have been factors in the criticisms made of the air support arrangements. The interview of Christison by the Lethbridge Mission highlighting his concerns was to have profound consequences for ALI in Burma.

A month after the visit to XV Corps Headquarters in the Arakan, Lethbridge had concluded his mission. He presented his observations to Lord Louis Mountbatten as the Supreme Allied Commander South East Asia (SACSEA) on 28 February 1944.[22] Lethbridge explained that his mission had been impressed by the successes in the South Pacific and South-West Pacific, which he attributed to mastery of the air and sea. He observed that the American fighting services 'had been welded into one'.[23] Mountbatten picked up on the integration of the American forces and enquired if Lethbridge's party would 'suggest any means for achieving greater integration on the land front'. The members of the mission recommended that the commander of the Air Group should be co-located with the commander of the Corps when a battle was in progress. The arrangements between IV Corps and 221 Group were highlighted as satisfactory (this was the relationship between Slim and his counterpart). It was stated that 224 Group's mobile headquarters was intended to achieve the same effect, but it was not recorded in the minutes what the actual effect was.

Over the next month Lethbridge's party worked on two reports. The first report, titled *220 Military Mission Report*, was published on 25 March 1944 and was 36 pages long.[24] The second report, also titled *220 Military Mission Report*, was published in April 1944 and comprised two volumes.[25] It is the first report that is of relevance to this essay (for ease, it will be referred to as the *Short Report*). At paragraphs 37 and 38 of the *Short Report*, Lethbridge makes the only critical comments in his entire report; they are based on ALI in Burma. It is worth quoting his comments completely to gain their full context:

> *With the necessity for, and the advantages of, integration of forces fresh in mind, it was disturbing to find in India an apparent disposition*

> *to accept proximity of staffs as adequate substitution for integration of staffs, and it was clear that the degree of unification already achieved by the American forces has not been appreciated. The general impression left on the Mission in respect of the Burma front was that the Army was fighting one war and the Air Force another, and that in consequence much precious effort was going to waste … It was only too evident that on this front the enemy was not being subject to the full impact of the resources in spite of the fine quality of the fighting force.* [26]

The phrase 'acceptance of proximity' related to the separation of the headquarters of XV Corps and 224 Group by 100 miles, and 'precious effort going to waste' related to the perceived lack of use of the RAF's heavy bombers in support of XV Corps. On 13 April 1944, the Short Report was in front of the British Chiefs of Staff Committee (COSC) at their 120th meeting. In the minutes for the meeting, reference was made to paragraph 37 of the *Short Report* and the contrast between the degree of inter-service integration which had been achieved in the Pacific theatre compared with Burma. The report identified that during fighting in the Second Arakan Campaign, 224 Group was charged with the air defence of Calcutta, in addition to the responsibilities of direct support to XV Corps. Even with 221 Group and IV Corps, 'there was evidence of some lack of cooperation between the two services. This point should be referred to SACSEA for his comment'.[27]

Lord Mountbatten was required by the COSC in London to comment on the *Short Report*. Mountbatten now needed to determine whether to refute the reports of problems with ALI or to agree with the contents and adapt how his subordinates cooperated with each other.[28] Despite the criticism of his command, Mountbatten chose to agree with the contents of the *Short Report* and adapt how his Air Force and Army subordinates cooperated, by directing combined planning and co-located headquarters. The interview with Lethbridge and the subsequent correspondence, led Mountbatten to task his staff to comment on the *Short Report*, in a memorandum to the COSC in London. This task drove two important innovations.

The first important innovation was the issue of *The Principles of Conjoint Land/Air Action Approved by the Supreme Allied Commander South East Asia* in June 1944 (shortened to the *Principles*).[29] On one page, Mountbatten set out his guidance on ALI. The *Principles* (see Appendix 2) innovatively used respected evidence from North-West Africa, which included the requirement

for joint headquarters and shared responsibility for landing grounds.[30] In essence the Army and the RAF were to be a joint force rather than one supporting the other.[31]

The second important innovation was SACSEA appointing an Inter-Service Committee to examine and report upon the methods of ALI on the 14th Army front, based on the guidance contained within the *Principles*. Importantly this committee was internal to the organisation, and its observations became recommendations that drove changes that improved ALI. Throughout the process, the committee was interested in identifying improvements to ALI rather than apportioning blame. The committee's visits were well received by the respective commanders and organisations. This work led to the Memorandum to address the Short Report's criticisms, which included requests to the COSC for manpower and signals equipment, officers experienced in Joint Composite Group/Army Headquarters, and the machinery of command and control for air supply. The COSC now shared some responsibility for resourcing closer inter-service cooperation in Burma. The impact of the Lethbridge Mission on ALI was not covered in the existing literature, but analysis of the archival material revealed that it was a key factor in the development of close integration between the services. The next key issue for the development of effective ALI was the receptiveness of the relevant commanders to drive integration within their formations.

Key Factor Three: Receptive Commanders Capable of Developing Strong Relationships

The final key factor in improving ALI in Burma was the receptiveness of the tactical commanders to the guidance to drive integration within their formations from late 1944 and their ability to develop strong relationships. The leaders in position in October 1944 had the personalities and experience that enabled their forces to fully embrace ALI. On the Central Front, Lieutenant General William Slim (General Officer Commanding (GOC) 14th Army) was a firm believer in the need for the RAF and the Army to act as one and consistently co-located his headquarters with that of the air commander. He formed a very strong relationship with Air Vice Marshal Stanley Vincent as Air Officer Commanding (AOC) 221 Group. Indeed, by May 1945 the policy produced by the 14th Army / 221 Group Combined Headquarters was adopted by Allied Land Forces South East Asia as the official directive

on ALI.[32] On the Arakan Front, Lieutenant General Philip Christison (GOC XV Corps) had been responsible for the observation that air and ground forces were not working smoothly and satisfactorily together that was reported by the Lethbridge Mission; however, by late 1944 he took active steps with his RAF counterpart, Air Commodore Paddy Bandon (AOC 224 Group), to form an integrated headquarters and they also developed a strong relationship.

Christison and Bandon had more obstacles to overcome to achieve effective ALI. Fortunately, Bandon had been responsible for the delivery of the AHQ India Senior Army Commanders' Course back in 1943 and he had the existing relationship from that course with Christison. Bandon's appointment in July 1944 gave him five months to sort out the challenges of co-locating two headquarters that were 100 miles apart and up to that point had no experience of working together. The interservice-committee had highlighted that the siting of a combined Corps / Group HQ would require a compromise location further back from the front than the Army Commander would prefer and further forward from the main airfields than the Air Commander would prefer. For the Army commander to maintain his command relationships, he would require the provision of additional communication aircraft.

As a first step, Christison was content to compromise on the location of his headquarters, to allow Bandon to come forward to Shalimar Camp near Cox's Bazaar. Bandon's staff had to tackle the twin problems of organising a mobile headquarters that was compatible with that of the Army and of gaining authority for the move. The release of the report of the inter-service committee in October 1944 provided the policy that led to the subsequent authority to form an Advance Headquarters with XV Corps. The joint attack on Letpan by XV Corps / 224 Group demonstrated that their headquarters was capable of managing complex combined operations (see Appendix 3).[33]

The principle that 'Army and Air Commanders at appropriate levels should work from a joint headquarters' was at last regarded as an essential element in successful ALI.[34] By the end of December 1944, two joint headquarters had been established: 14th Army / 221 Group, and XV Corps / 224 Group.[35] The Army and especially the RAF had come a long way from the first attempts at ALI in the First Arakan Campaign, when they seemed to be fighting separate wars. Now in Burma, 14th Army and XV Corps were advancing on the wings of 221 Group and 224 Group.[36] The leadership

of the Army and Air Force commanders was vital to setting the example of cooperation to their staffs and driving their headquarters together and developing close integration between the services.

Implications for Contemporary Joint Operations

This examination of the three key factors that explain the achievement of ALI as part of the Burma Campaign during the Second World War has validated the key elements of ALI: an understanding of each component's capabilities and limitations, the knowledge of component doctrine and validation through joint training, and the development of strong relationships. It has also revealed the following implications for contemporary military leaders:

a. **Have joint doctrine.** The *Principles* set out the senior commander's requirements for the land and air forces to operate together effectively. These are as relevant today as they were in July 1944.[37]
b. **Have co-located headquarters.** Strong relationships between air force and land commanders spring from a shared understanding of the capabilities and limitations peculiar to their Service. Strong relationships require the commanders to live and work together. Slim understood this important factor and always co-located his headquarters with that of his Air Force counterpart. Christison learned the value of co-location during the Third Arakan Campaign. Importantly, both the land and the air commanders need to be receptive to compromising their headquarters' location to achieve co-location.
c. **Conduct joint planning.** A co-located headquarters enables joint planning. Joint planning identifies the tasks and the resources required to achieve the respective plans. The early identification of the Army and Air Force resources and of their part in achieving joint objectives allows combined training, the establishment of air superiority and the identification of secure airfields as operational objectives.
d. **Use external organisations empowered to identify problems and internal organisations to fix them.** The Lethbridge Mission was not requested by Mountbatten and, whilst its terms of reference included 'make recommendations upon which necessary executive decisions can be based', its main purpose was 'to look at the effective and economic prosecution of the war against Japan'.[38] However, its observations on the standards of ALI within South

East Asia Command were useful for Mountbatten to highlight to his subordinates that there were problems. It would take the internal inter-service committee to find the solutions to the problems.

e. **Use evidence from other theatres.** Mountbatten's staff were able to develop the *Principles* in just over two weeks by innovatively adapting doctrine developed during the Mediterranean Campaign to the local environment. The use of quotations from respected commanders such as General Bernard Montgomery and Air Marshal 'Mary' Coningham prevented amendments to proven practices.

f. **Codify revised procedures into doctrine.** Every conflict will have its own character, and broad doctrine will not always fit the local circumstances. Procedures will require modification to fit the environment, the enemy and the forces available. All of the commanders identified in this essay codified local arrangements in doctrine.

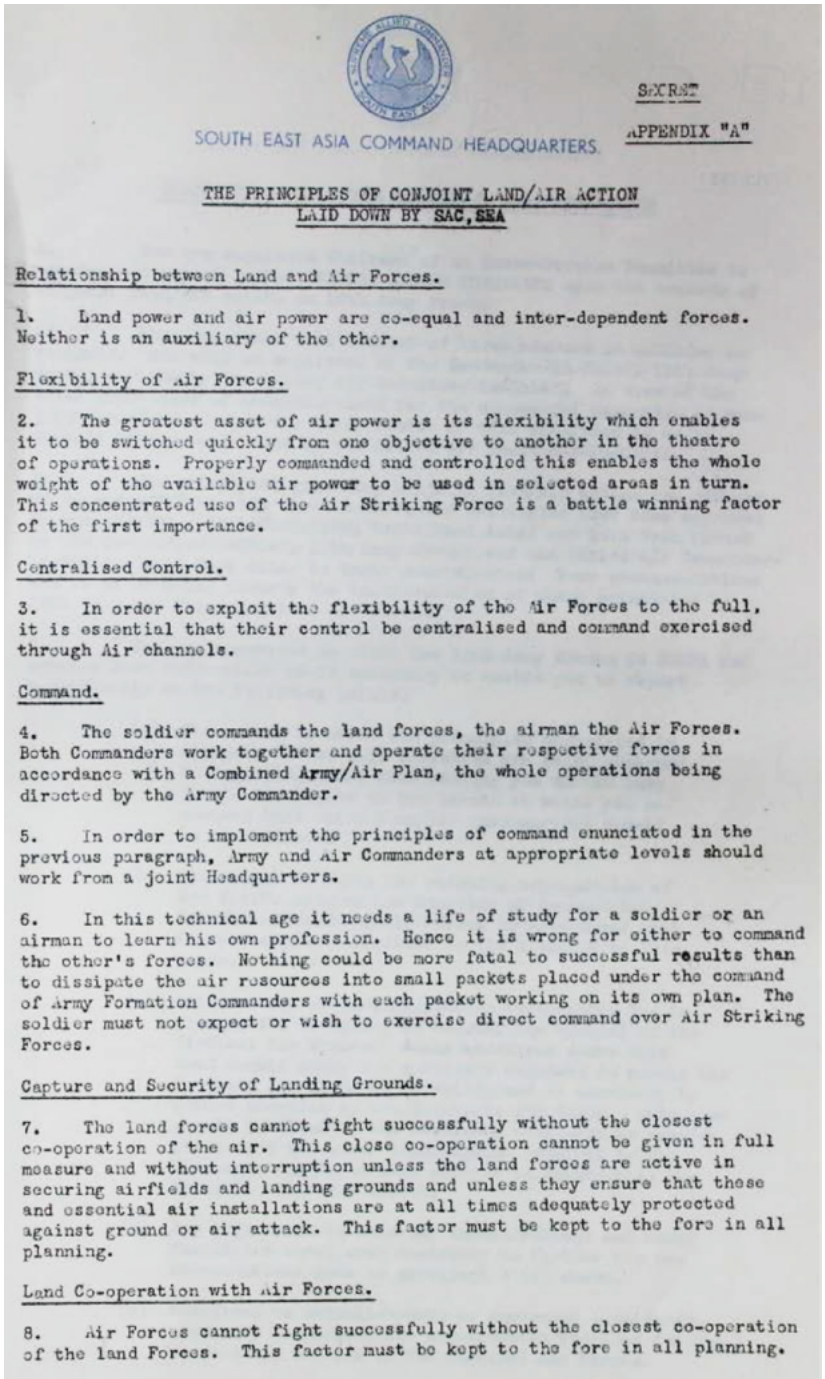
ALI was not inevitable in Burma during the Second World War. It required each of the key factors to achieve the high degree of interdependence that characterised operations in 1945. The adoption of joint planning, joint principles for integration and co-located headquarters will place future commanders in a better position to face a determined adversary from the start of a future conflict. If for reasons of inter-service friction these recommendations cannot be adopted, external reviews will help commanders identify problems for internal committees to fix. Adaptation of best practice from other theatres or from a recent conflict will provide a timely solution. Once relationships are strong, new procedures will need to be captured in doctrine.

About the Author

Colonel Mark Mankowski has held a range of leadership, operations and training appointments within Australia and overseas. Between 2003 and 2017, he held several operational command appointments in the Middle East. More recently, he commanded elements in support of Operation Bushfire Assist and COVID-19 Assist. COL Mankowski holds a Bachelor of Science, majoring in Chemistry, a Master of Arts in Military History and a Master of Military and Defence Studies (Advanced) with Honours. He is currently Colonel Effects at Headquarters 1st Division.

Appendix 1 – A Map of the First Arakan Campaign.[39]

Appendix 2 – The Principles of Joint Land/Air Action.[40]



SECRET

SOUTH EAST ASIA COMMAND HEADQUARTERS.

APPENDIX "A"

THE PRINCIPLES OF CONJOINT LAND/AIR ACTION
LAID DOWN BY SAC, SEA

Relationship between Land and Air Forces.

1. Land power and air power are co-equal and inter-dependent forces. Neither is an auxiliary of the other.

Flexibility of Air Forces.

2. The greatest asset of air power is its flexibility which enables it to be switched quickly from one objective to another in the theatre of operations. Properly commanded and controlled this enables the whole weight of the available air power to be used in selected areas in turn. This concentrated use of the Air Striking Force is a battle winning factor of the first importance.

Centralised Control.

3. In order to exploit the flexibility of the Air Forces to the full, it is essential that their control be centralised and command exercised through Air channels.

Command.

4. The soldier commands the land forces, the airman the Air Forces. Both Commanders work together and operate their respective forces in accordance with a Combined Army/Air Plan, the whole operations being directed by the Army Commander.

5. In order to implement the principles of command enunciated in the previous paragraph, Army and Air Commanders at appropriate levels should work from a joint Headquarters.

6. In this technical age it needs a life of study for a soldier or an airman to learn his own profession. Hence it is wrong for either to command the other's forces. Nothing could be more fatal to successful results than to dissipate the air resources into small packets placed under the command of Army Formation Commanders with each packet working on its own plan. The soldier must not expect or wish to exercise direct command over Air Striking Forces.

Capture and Security of Landing Grounds.

7. The land forces cannot fight successfully without the closest co-operation of the air. This close co-operation cannot be given in full measure and without interruption unless the land forces are active in securing airfields and landing grounds and unless they ensure that these and essential air installations are at all times adequately protected against ground or air attack. This factor must be kept to the fore in all planning.

Land Co-operation with Air Forces.

8. Air Forces cannot fight successfully without the closest co-operation of the land Forces. This factor must be kept to the fore in all planning.

Appendix 3 – Picture of the Combined Chiefs of Staff.[41]

AUSTRALIAN WAR MEMORIAL SUK14065

Description

Letpan, Burma, 1945. Some of the Combined Chiefs of Staff on the bridge of the motor launch which took them to the beach-head in the landings by the 15th India Corps at Letpan. They are, left to right: Air Commodore the Earl of Bandon, Commander of No. 224 Group RAF operating on the Arakan front; Lieutenant General F. A. M. Browning, Chief of staff, South East Asia; Lieutenant General A. P. F. Christison, Commander of XV Corps.

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13 Probert, 1995, 133. Support was provided by three Blenheim Squadrons (direct and indirect support), 28 Squadron (tactical reconnaissance support with Lysanders and then Hurricanes) and 177 Squadron equipped with Beaufighters for long-range indirect support.

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Gaming to Win: Enhancing Military Decision-Making

Nick Bosio

> *If a military force and its leaders have failed to prepare themselves and their forces with honesty, imagination, and a willingness to challenge fundamental concepts, then they will pay a dark price in the blood of their sailors, soldiers, marines, and airmen.*
>
> Williamson Murray, 'US Naval Strategy and Japan'[1]

> ***[W]hat** people think cannot be separated from the question of **how** they think.*
>
> Azar Gat, A History of Military Thought[2]

Introduction

Australia's geopolitical circumstances are changing.[3] The above quotations have an implied question for Australia: is the Australian Defence Force (ADF) also preparing for the changing environment? Many commentators focus on the need to change capabilities, equipment and structure to address this evolving environment. Often, such commentary lacks grounding in wider military theory, history, and strategic culture.[4] These statements have many similarities with the calls made by technology proponents of the interwar period.[5] Interestingly, the British Army of the interwar and early Second World War period was one of the most mechanised armies of the time.

Yet its military thinking had not matured.[6] An example was British armoured culture, which continued to favour cavalry-style charges as 'they could do the same when they had exchanged their horses for tanks'.[7] Such thinking highlights a critical point: the push for technological advantage is important, but such an advantage is wasted without commensurate growth in military thinking. The Germans' interwar developments, education and wargaming illustrate how such growth provides a military edge.[8] However, the German approach focused only on the tactical and operational levels of war.[9] A better example is the United States, whose approach to education, training and development produced a military that:[10]

> *… without a preponderance of resources, without superior aircraft or ships, and with a mixed assortment of experienced and inexperienced ground troops … challenged the Imperial Japanese war machine at the zenith of its power and [came] out on top[.]*[11]

Many scholars highlight how US interwar wargaming was a major contributing factor to US in-war success.[12] Such gaming helped develop a culture of 'learning-to-learn' within the US military. Gaming contributed to developing a US officer corps that accepted, integrated and used a wide range of views, alternative approaches and schools of thought to frame and solve the problems of war.[13] These dispositions are called a *pluralist habit of mind*. Such a habit of mind enables military professionals to adapt training and capability to meet changing circumstances.[14] Several scholars explain how wargaming provides 'a shared experience' that strengthens knowledge and builds these strong habits of mind.[15] Even as early as the 19th century, wargaming was seen to develop 'studious and industrious habits … essential and indispensable to those invested with high command'.[16] This article outlines how gaming helps grow these important habits by enhancing the mental skills that *underpin* decision-making, and expanding the mental models used ***in*** decision-making.

This article argues that a culture of *deliberate professional gaming* helps develop a military's intellectual edge. Deliberate professional gaming is where people actively choose to play and practise games to enhance professional development and education. A key element of such a culture is an acceptance of, and willingness to use, games. Wargaming is an example of professional military gaming. To explain how gaming supports the profession of arms and decision-making, the article first summarises the foundation of human decision-making: the heuristic. With this understanding,

the article identifies the similarities between human heuristics and the Military Appreciation Process (MAP). Recognising these similarities allows the article to highlight how gaming provides two cognitive outcomes. First, games can enhance the mental skills that underpin decision-making. Second, games can help build new mental models for military officers. New mental models help increase professional creativity in decision-making. Combined, both benefits enhance military planning and decision-making. Yet contemporary Western militaries rarely use gaming to enhance military thinking. Given the benefits games may provide, the article proposes that the military should adopt a culture of deliberate and professional gaming. To assist, the article suggests some approaches to introduce professional gaming within military education. As the scholars cited earlier indicate, gaming within education helps build a pluralist habit of mind and enhances military planning, decision-making, and thinking about competition, conflict and war.

Understanding Decision-Making: The Heuristic

Before discussing how gaming can enhance decision-making, it is first helpful to understand how humans make decisions. Studies indicate that human decision-making is founded on a range of specific mental tools known as 'heuristics'.[17] As part of a major study into heuristics led by Gerd Gigerenzer and Peter Todd, researchers identified how heuristics (sometimes referred to as intuition) are not designed for optimal decision-making.[18] Instead, these tools help produce practical solutions while also reducing cognitive load:[19]

> *In the real world, a good decision is less about finding the best alternative than finding one that works … our minds like our bodies have been shaped by evolution: we have inherited ways of thinking from those of our ancestors whose mental tools were best adapted for survival and reproduction. … our mental tools are fast and frugal. They allow us to make decisions based on very little information using simple rules … Although they apply to different sorts of problems, heuristics have a common structure, which arises from the way humans make decisions. First, we search the environment for information, or cues, upon which to base a choice. A heuristic contains rules that direct the search. Next, we must stop searching. It's pointless trying to find out everything there is to know about a nut*

> *or berry if we starve in the process. Heuristics contain a stopping rule, often ending the search after only a few cues have been considered. Finally, we must make a choice—eat, run, mate, attack.*[20]

The mental tool described above helps reduce cognitive load by leveraging human knowledge, experiences and memory.[21] The more experiences there are, the more options there are. This cognitive load reduction is essential, as high cognitive loading is energy intensive and can quickly tire a person. Research into heuristics explains how these mental tools process, evaluate, modify and determine the best course of action based on previous experiences and knowledge.[22] This research also highlights the broad framework these heuristics follow.

Generally, there are five steps to a heuristic (Figure 1).[23] Although each heuristic is used for different decision-making situations, they all follow this broad framework. As described above, the first step in the heuristic framework is collecting information from the senses. This information forms the environmental context. Leveraging this information, the framework attempts to figure out, or *frame*, what the problem is. This part of the process is vital for two reasons. First, defining the problem directs which specific heuristic should be actioned. Second, this problem frame guides the heuristic's search for past experiences and knowledge. Using this problem frame, heuristics start looking for previous experiences that have similarities to the current situation.[24] These experiences are summarised through a person's mental models.

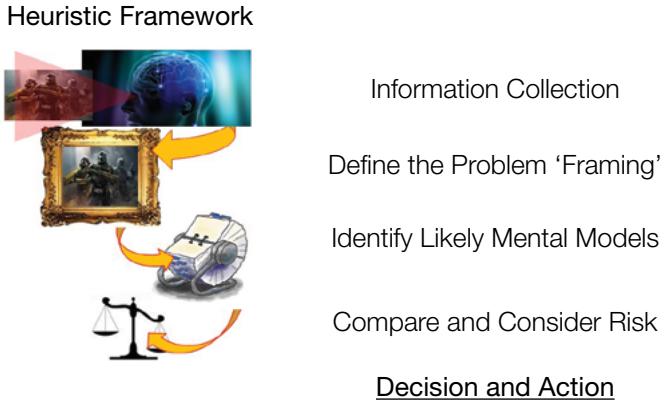

Figure 1. The Heuristic Framework Overview (pictures from image commons and clip art)

The third step of the heuristic framework is to match the current situation and problem frame to any relevant mental models the person holds. Mental models are 'deeply ingrained assumptions, generalisations, or even pictures or images that influence how' an individual (or a group) understands theories, concepts and the real world.[25] As this article discusses later, these mental models are based on previous physical or pedagogical experiences.[26] No matter where the experience comes from, mental models shape a person's knowledge of how things work, and their perceptions of why things operate in a particular manner.[27] As such, mental models directly influence decision-making.[28] Heuristics seek to find models that relate to the current problem frame.[29] In essence, the heuristic 'scrolls' through the mind's models much like a person would scroll through an old Rolodex.[30] It is worth noting that the number and breadth of mental models can also shape a person's *potential for creative decision-making*.[31] Once this step has selected a range of applicable mental models, the heuristic starts to compare and modify them for the situation at hand.

Using identified mental models, the heuristic commences the fourth step of the framework: comparison. The number of mental models identified depends on a range of factors, such as the heuristic in use, the situation, and the individual's knowledge. On average, heuristics select five to seven models to compare. Research highlights that human brains can simultaneously manage five to seven concepts. Each 'concept' represents a single idea: a person, an abstract theory, an identified obstacle on a route, a mental model.[32] Although this concept 'limit' has implications for other areas of human interaction—spans of command, deception, information management, military warfighting concept writing—within the heuristic, this limit helps focus problem-solving. Of course, the 'five-to-seven rule' assumes that a person holds more relevant experiences and mental models than this limit. Where a person's knowledge and experiences amount to less than five, the heuristic takes what mental models are available, even if that number is one.

Using the collected mental models, the heuristic compares each model to the current situation. In essence, the brain figures out the costs and benefits of the different solutions, and gauges the possible risk. It is worth noting that the mind already has a series of tools to gauge probability and likelihood.[33] Through this process, mental models are short-listed or discarded back to memory as required, leading to the final one or two mental models for consideration. These final models are then sent to the prefrontal cortex for the hard part: decision.

The decision step of the heuristic framework is the most energy-intensive aspect of the process. Based on the comparison, the frontal brain attempts to adjust the final few mental models to the situation. The closer the best-fitting mental models are to the situation, the less effort required and less energy expended. However, where there were few mental models for the heuristic to work with, the prefrontal cortex is required to modify the mental model significantly. In the worst case, where there are no mental models, the brain must build a solution to the problem from scratch.[34] Such brain activity is intensive and is why a person 'feels tired' after dealing with a significantly challenging problem for the first time. This is why a platoon-level tactical exercise without troops (TEWT)[35] is more tiring and demanding for a staff cadet[36] or lieutenant than for a major or lieutenant colonel: greater experience leads to more mental models and options for the heuristic and prefrontal cortex.[37] The ease of decision-making that comes with experience is not the only similarity between the heuristic and military planning.

Understanding Military Planning: A Heuristic Decision Cycle

Recent ADF doctrine acknowledges the link between the heuristic framework and how militaries plan.[38] The similarities between the heuristic framework and the MAP are seen in Figure 2.

Heuristic Framework	The MAP
Information Collection	Intelligence preparation of the operational Environment
Define the Problem 'Framing'	Mission Analysis
Identify Likely Mental Models	Course of Action Development
Compare and Consider Risk	Course of Action Analysis

Decision and Action

Figure 2. The Heuristic Framework and the Military Appreciation Process

Given the links seen in Figure 2, ADF doctrine (ADF-P-5) makes the following statements:[39]

- The MAP, as an activity of the mind, mimics the heuristic framework.
- Like the heuristic, the MAP provides a structured framework to think about, frame and solve problems.
- By mimicking the heuristic, the MAP slows the heuristic process, forcing military planners to write down and explain their mental models.
- Therefore, 'the MAP makes professional military thinking, driven by heuristics, explicit'.[40]

Scholars highlight that by making mental models and the heuristic process explicit, people can explain their assumptions and worldviews.[41] Such a process helps build shared understanding and better decision-making. It also helps planners test and adjust their mental models, leading to learning.[42] Of course, this assumes people use the planning process, even a modified one, and do not just 'situate the appreciation'!

The discussion on heuristics and planning allows one to infer that helping to build people's heuristics and mental models will enhance individual and collective military planning. The first step in enhancing military planning is to increase the capacity of the mental skills that underpin the heuristic: pattern identification, pattern matching, and risk analysis.

Enhancing Decision-Making Capacity: Exercising Mental Skills

In 2021, the US Marine Corps introduced chess as a part of their recruit and infantry training programs. Students played chess both as part of the course and as a pastime. The game was a hit (partly because all mobile phones were banned).[43] Furthermore, instructors were surprised by the increased mental development and decision-making skills of the Marine trainees, with one instructor saying:

> *These students are performing at a level [of] … senior Marines [who have] come back from their first deployment. Some of [the trainees] are able to make the same calls as team leaders in the Fleet Marine Force … [I]t's crazy to see them developing as students, because they're thinking about things instead of just being another guy in line.*[44]

In every chess game, players have a finite number of options to move their pieces. These options reduce in the later stages of the game. The player who can identify the patterns of likely moves, including their opponent's likely actions, and match those patterns with possible chess solutions is more likely to win. Chess is an illustrative example of how identifying and matching patterns is a crucial skill within heuristic decision-making.

There are many studies on the cognitive benefits of chess.[45] These studies indicate that *deliberately playing*—or actively choosing to play and practice—chess does, over time, increase a person's general problem-solving and critical thinking skills.[46] Specifically, studies highlight that playing chess enhances an individual's capacity to identify and match patterns.[47] Such enhancements speed up a person's capacity to frame a problem, identify likely mental models that may assist their decision-making, compare possible solutions, and assess risk. In effect, deliberately playing chess helps speed up a person's decision-making and mental capacity.[48] Here, chess acts as a vehicle to hone the brain's pattern identification and matching skills. However, chess is not the only game that can do this. There are a wide variety of games whose mechanics directly tap into, and enhance, the brain's pattern-matching potential. Such games are probably being played by soldiers, sailors and aviators at local game stores on Wednesday and Friday nights.[49]

Customisable card games, such as *Flesh and Blood* and *Magic: The Gathering*, require players to recognise patterns. Based purely on the opponent's played cards, a player must answer a series of questions. First, a player needs to estimate the likely cards in an opponent's deck. Next, the player should attempt to discern their opponent's game strategy, and what the opponent is likely to do next. Finally, the player must adjust their strategy to win the game. These questions can only be answered based on a player's knowledge and pattern identification and matching skills. This pattern identification and matching starts the moment the first card is played. Furthermore, unlike chess, drawing cards leads to a degree of randomness. Such randomness further tests and stresses a player's matching capacity. Stressing these skills is similar to exercising a muscle.[50] Increasing these mental skills also enhances the brain's capacity to calculate risk.

Military decision-making requires judgements on risk. Military risks are dynamic and changing. In such situations, it is often a military professional's knowledge and innate capacity to judge cost and benefit that informs decision-making.[51] Building on pattern identification and matching, the heuristic has a set of tools (specifically known as the availability heuristic) to assist with such risk analysis.[52] Yet it is difficult for the military to enhance such a skill. Although TEWTs and military courses allow officers to understand capabilities, these approaches rarely provide 'post-H-Hour' situations to enhance risk understanding and decision-making. Furthermore, military exercises and simulations can be expensive and time-consuming, and often include a range of perceived biases on 'blue force potential'.[53] However, much like pattern identification and matching, games can exercise the mental capacity needed to understand and assess risk, thereby enhancing these skills for general decision-making.[54] Games also cost less.

Gamers constantly make mental judgements on cost versus benefit. Discarding a card, sacrificing a piece, or throwing a squad token at the opponent to screen friendly forces in a wargame are all forms of cost-benefit analysis. In each case, the gamer has assessed that their longer-term plan outweighs the advantage they just awarded their opponent. Making such judgements is a key part of any competitive game. It is also important in 'cooperative games', such as *Pandemic, Castle Panic or Marvel Champions*. In these games, players work together to overcome the game's challenges. However, unlike competitive games, cooperative games provide a more exciting dynamic for risk analysis, understanding, and judgement:

a player's analysis affects themselves and the entire team. Furthermore, these games often allow for 'table talk', or a discussion between players on what to do next.[55] These discussions, coupled with the game's mechanics and theme, often create a more social and immersive experience for players. As academic research highlights, such immersive and social interactions create a better environment for skill learning and development.[56] Many of the games listed above are relatively quick—playable during a lunch break. They are also immersive, either through their high levels of competition or the cooperative theme. The quick playtime and immersive nature mean these games can provide multiple 'reps' of mental stimulation, growing mental skills in a similar fashion to a regiment's morning physical training sessions.

The above discussion highlights how deliberatively playing games can improve the mental skills that underpin human decision-making: pattern identification, pattern matching, and risk analysis. Developing these mental skills helps enhance a person's capacity to frame a problem, identify possible solutions, compare those solutions to the situation at hand, and understand the risks involved. However, the employment of these mental skills relies on a library of experiences. Military professionals rely on mental models when developing courses of action in planning, or making decisions during periods of stress and danger. Further, having a wide variety of mental models helps military professionals be more creative in their decision-making.[57] Therefore, speed in cognition is wasted without a wide array of mental models to call on. Luckily, games can also help build mental models.

Enhancing Decision-Making Knowledge: Growing Mental Models

Admiral Nimitz, commander of Allied forces in the Central Pacific during the Second World War, once stated:

> *The war with Japan had been enacted in the game rooms at the War College by so many people and in so many different ways that nothing that happened during the war was a surprise … except the kamikaze tactics toward the end of the war. We had not visualized these.* [58]

Ed Millar's seminal work *War Plan Orange* reinforces Nimitz's statement. War Plan Orange was the United States war plan to defeat Japan. Throughout the interwar period, the war plan informed a range of military

actions: capability development, exercises, and the wargame scenarios of the US Naval War College and Marine Corps War College.[59] Indirectly, War Plan Orange also influenced US Army War College war gaming. Army wargaming led to the vital Rainbow Plans: the US plans to defeat Germany and Japan.[60] The structure, development and use of these war plans is similar to today's warfighting concept development and usage. Much like the war plans, contemporary warfighting concepts (good and bad) provide a vision for military power and outline how it may be employed.[61] The US interwar wargaming was conducted in a free-rein and open manner. Scholarly research highlights how this free-play, or ***unrestricted***, wargaming, coupled with challenging and academically diverse education, informed US military officer thinking about, planning for, and conduct of the Second World War.[62] As Nimitz implies, these wargames helped shape the mental models held by US military officers.

An immersive and challenging situation is key to creating or changing mental models. A challenging situation can be a difficult undertaking, a situation that confronts previously held views and beliefs, or both.[63] The experiences necessary to modify or build new mental models occur in two ways. The first is physical, where a person directly experiences something and internalises it. Militarily, such experiences are often generated through existing training systems, exercises and courses. These experiences relate to knowledge of how to do something, or *procedural knowledge*.[64] The second method is to provide a challenging experience that simulates real-world experiences. Demanding education, such as that provided at a Staff or War College, can provide such experiences.[65] This style of experience often changes how a person views the world, modifying their understanding of why things work and what outcomes can be achieved. Such knowledge, known as *propositional knowledge*, directly influences a person's understanding of theory.[66] This style of knowledge also helps drive creativity in decision-making.

Creative decision-making is supported by having a wide variety of mental models. Such variety helps military professionals understand different ways of adapting theory to practice. This allows a person to modify procedural knowledge for the situation at hand. Militarily, the capacity to be creative—to change tactics, change procedures and think on the fly—is a critical part of achieving military advantage. Research indicates that deliberately playing games can provide the mentally challenging experiences necessary for new and varied mental models.[67]

A game is a representation of real-world concepts.[68] Games help create new ways to think and see things.[69] Until the mid-20th century, most Western militaries understood that games helped simulate real-world decision-making.[70] Wargames are an illustrative example. They allow military professionals to apply the theory of war, thereby building a better understanding of theory in practice. To achieve this outcome, games must provide an immersive experience.

To be immersive, a game requires four key elements. The first is that games should be real-time play between players.[71] Next, games should provide a useful representation of the type of decision-making required. Games do not have to perfectly represent the real world, only the key elements needed to simulate decision-making within an environmental context.[72] *Diplomacy* is a well-known game that simulates geopolitical thinking.[73] Yet games do not have to be 'wargame-like' to provide a benefit. For example, *Sheriff of Nottingham* is a fun and engaging game focused on bluffing and negotiation. Much like *Diplomacy*, the game may help people understand the decision-making and theories of mind necessary for successful information operations, negotiation, and diplomacy.[74] However, such games do not help in simulating resource management or combat decisions. The board games *Dune Imperium* and *The Expanse*, where players are one of the factions in each franchise, may provide stronger strategic decision-making experiences due to theme, abstract combat, and resource management.

Another requirement for an immersive game is for it to be pitched at an appropriate level: tactical, operational or strategic (and grand strategic). The games mentioned above may assist strategic thinking but would be poor representations of operational or tactical decision-making. Finally, games need to be 'free-play', or unrestricted in nature. Such games often have a scenario, starting forces/resources, and rules. However, each player's plan is not constrained beyond these starting limitations and may change throughout the game. These unrestricted wargames were the norm during the interwar period.[75] This unrestricted gameplay allows players to engage with, experience and learn from the decision-making 'simulation' that the game represents. For the military, such games are not limited to tactical wargames. Military theory is expansive, extending from strategic theory to tactical understanding.[76] Therefore, gaming should also be expansive. As already alluded to, the US military of the interwar period is an illustrative example of successfully employing wargames across the strategic, operational and tactical spectrum.[77]

During the interwar period, US strategic wargames focused on allowing students to develop their strategic thinking. Often these wargames looked more like a syndicate discussion over a map (Figure 3). Students would take sides, argue and debate their case, and the instructors would facilitate the discussion and decide who won. In modern parlance, this style of game is known as a *matrix game*, or syndicate game. In such games, one side takes action and argues their case. The other side then outlines any problems (or rebuts) and then states how they react. Each turn is adjudicated.[78] Such games appear similar to the MAP's Course of Action Analysis wargaming. However, the turns and decisions of players are unstructured. There is no 'plan' that must be 'tested', constraining player thinking. This style of gaming is still used today in many professional areas.[79] In the US interwar context, such games helped students understand strategy and place military operations within context.

Figure 3. Strategic War Gaming. US War College strategic wargame set-up (left) and contemporary versions of matrix games (right)[80]

Inter-war period US wargaming often linked operational and tactical games. The effects at the operational level would have flow-on effects in subsequent tactical games. Such flow could also go backwards. Operational wargames were typically tabletop games. They focused on campaigns, finding the enemy, and understanding the enemy's capabilities. Logistics management, fleet orders, and similar issues were all given abstract rules to help game management and facilitate decision-making. To create further uncertainty, instructors would draw playing cards and refer to a corresponding 'strategic effects' list. The ace of spades might represent another nation entering the

war, changing how students thought about the problems of war. Meanwhile, another card might represent economic changes affecting logistics. Dice created internal friction and uncertainty: Did the weather affect the fleet? Did the message get received in time?[81] In many ways, these games are similar to contemporary 'strategy' board games available at hobby stores, or the game *Assassin's Mace* used by the US Marine Corps to explore operational thinking.[82] Inter-war tactical wargames looked very similar to modern miniature wargaming. Miniatures represented ships, planes and land units; distances were measured; and movement and terrain rules were used (Figure 4).[83] These tactical wargames represented the science of war in action. Such games helped officers understand the realities of tactical decision-making, military capabilities, and different ways to tactically respond in combat.[84] However, the theory of war is not the only theory the profession of arms should understand.

Figure 4. Operational and tactical war gaming. Historical operational (left top) and tactical (bottom left) wargaming and contemporary US Marine Corps *Assassin's Mace* operational wargaming (right)[85]

Military theory often relates to other topics such as human nature (and philosophy), international relations, broad economics, and political power.[86] Yet it is difficult for military officers to experience such issues directly. Without some means of developing relevant experience, military professionals may, at best, only have a purely theoretical understanding of these topics. Worse, military officers may not develop experience in these other areas of national

power until they reach senior rank. The above discussion has implications for career management.[87] Nevertheless, gaming may provide an inexpensive and easily accessible way of building some experiences in these areas. A range of board games—fantasy, science fiction and historical—directly tap into the decision-making space seen within international relations, economics and politics. Some historical games relevant to contemporary great power contestation are:[88]

- ***Pericles***—a wargame that allows players to play out the diplomatic, economic and military actions that lead up to, and occur within, the Peloponnesian War[89]
- ***Churchill***—a game about coalition politics, economics, and military action. The game focuses on the Second World War and Churchill's attempts to influence the Allies into the 'Germany First' strategy
- ***Twilight Struggle***—a two-player game where players are the United States or the Soviet Union over the period 1950 through to 1989. Players use a range of national tools to influence the world and achieve dominance in the Cold War.

The above games do not model all geopolitical circumstances of the time. However, they are useful for several reasons. First, they are available through civilian game stores. As 'hobby games', they are designed to be played without a trained facilitator (or game master). Furthermore, these games provide helpful insights into the challenges and decisions required of national and military leaders. These games represent the fusion of economic, political, diplomatic and military power. They illustrate how military power may complement, or lead, other elements of national power—or may even conduct actions that are, in essence, diplomatic or economic. Such insights help challenge the often-held tactical view that the military's sole role is war.[90] Coupled with a challenging education program, these games broaden professional understanding of the 'art of the possible'.[91] Broadening military thinking builds a greater understanding of theory and practice, thereby enhancing creative decision-making.

The above discussion highlights how immersive games, played deliberately and as free play, can help military professionals practise real-world decision-making. As Figure 5 illustrates, ***exercises provide practice*** for military professionals in ***how*** to undertake an action. Meanwhile, ***gaming provides experience in*** creative military ***decision-making***.

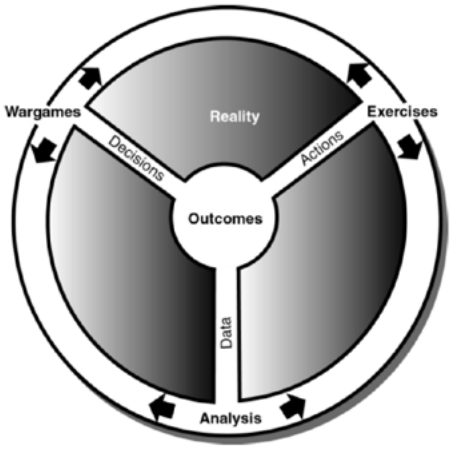

Figure 5. A cycle of innovation and development that links gaming, analysis (education and/or simulation) and exercises[92]

These decision-making experiences can modify existing, or build new, mental models. Therefore, games can help increase the number of experiences available to a military professional's heuristics and planning processes. It is these gaming-generated experiences that Nimitz directly cites as a key component of US victory in the Second World War. Currently the ADF relies almost exclusively on two episodic educational experiences to build strategic understanding: Staff Course and Higher Defence Course at the Australian War College.[93] Furthermore, the Australian Army relies heavily on TEWTs and course learning to build understanding of tactical (and, to a lesser degree, operational) theory. As Figure 5 indicates, such education (analysis) and exercises are important and should not be ignored. However, exercises like TEWTs are more akin to 'Tactical Plans Without Troops' than an experience to help change, build and grow the mental model library necessary for effective and creative decision-making.[94] Although research demonstrates the benefits of games, contemporary Western militaries still treat gaming as a curiosity.

Limiting Possible Military Thinking: Treating Gaming as a Fringe Activity

The last decade has seen a resurgence in civilian hobby gaming and Western military wargaming. Army's Forces Command recently released a directive to increase wargaming within the Australian Army. The directive seeks to develop a wargaming network that leverages like-minded individuals to assist in possible unit activities.[95] Additionally, the directive establishes an inter-brigade wargame competition and sports-like club system. This is a laudable step forward. Yet its limitations are stark when compared to the interwar US military's integration of unrestricted wargaming within education and training. Even ADF wargaming in the 1980s and early-1990s was more integrated than current practices.[96]

Except for a few notable institutions, most contemporary Western militaries have not formalised wargaming within their training and education systems.[97] Instead, such free-play unrestricted wargaming is often informal, characterised as an 'insurgency' or underground 'fight-club'.[98] Such imagery may be evocative, but is also damning in its implication: that gaming is a fringe element within Western militaries. Focusing on gaming as a club-like activity rather than an integral part of the profession makes it less likely that 'non-gamers' will seek to engage in the pursuit. The risk is that gaming will continue to appeal to those already interested in gaming. Meanwhile, the wider military will continue to view gaming as a recreational hobby that provides niche professional outcomes, much like adventure training. Western militaries must learn from their history to gain a creative cognitive edge.[99] The military should actively and *deliberately* play games as a part of its formal training, education, and unit professional development.

Deliberate play differs from the traditional gameplay most people experience during family holidays while growing up. Casual gaming can assist in mental decision-making. Nevertheless, a casual association with games does not generate the same cognitive benefits when compared to an active interest in, and pursuit of, gaming.[100] Scholars indicate that the cognitive benefits of gaming are best seen in two different (sometimes overlapping) groups. The first is 'hobby gamers', or people who actively pursue and play games in their free time. These hobby games often meet all the requirements discussed above for an immersive and engaging environment. The second group are professionals who integrate gaming into a professional education

system. A recent *Australian Army Journal* article entitled 'Moulding War's Thinking' outlines how wargaming can be integrated into promotion courses.[101] Such an investment requires a cultural change in how the ADF views gaming—transitioning from a fringe activity to a professional norm. Like any cultural or habit-of-mind change, the development of a professional gaming culture needs to be built early in a military career.[102]

Building a Professional Gaming Culture: A Campaign of Gaming

To inoculate a professional and deliberate gaming culture within Army and the ADF, it is necessary to start early: ab-initio training. The US Marine Corps' use of chess is a case study in successfully introducing gaming at recruit and initial employment training. Given how an officer's life revolves around decision-making, the Royal Military College—Duntroon (RMC-D) also offers an opportunity for Army to develop professional gaming within the officer corps. Such a culture can be developed through a 'crawl-walk-run' construct similar to that seen in many training environments. Sebastian Bae, a RAND Corporation analyst, highlights the importance of such a staged approach.[103] Bae discusses how introducing highly immersive games too early often leads to failure. Such failure occurs because gaming, though growing in broader society, is not mainstream. Therefore, most staff cadets have little to no immersive gaming experience. Additionally, a significant cultural shock always occurs early in any ab-initio training (or an educational course such as those at the Australian War College). It is easy to deduce why, when limited experience and cultural shock combine, the sudden use of games can lead to negative views on gaming.[104] Such negative views are likely to bias future gaming experiences. Gaming should be slowly introduced to overcome this vicious cycle.

A 'campaign of gaming' approach at RMC-D seeks to introduce the benefits of immersive games to all Army officers.[105] As with any cultural change, building acceptance early makes it more likely that Army officers will continue to use games for professional development throughout their careers. The focus audience should be RMC-D second-class. These students have moved from their basic military training (third-class), and are now growing their tactical and wider military thinking. This campaign of gaming approach is similar to any other training subject that runs throughout

second and first class. As such, the gaming 'subject' has four objectives. The first is to develop 'game awareness', or an appreciation for the utility of games as a learning tool. Next is developing an understanding of how to use games to assist conceptual learning (pedagogical experiences). Another objective is to explore opportunities to develop new mental models concerning military thinking. Finally, the subject seeks to enhance RMC-D's broader critical thinking curriculum.

The approach introduces gaming slowly over the first few months of second-class. Then, when most students are comfortable with the idea of gaming as a part of the military profession, games are used for professional development and benefit. To reinforce the professional nature of such deliberate gaming, each game should end with a post-game discussion that considers the value of both the game and the decision experiences within it. This approach builds understanding of *why* games have utility and *how* they can be used to grow professional knowledge and experience. Underpinning this approach are the following activities:[106]

1. ***Gaming and the Profession-of-Arms (lesson).*** This lesson that outlines the links between decision-making, heuristics, and how games enhance decision-making. It helps explain *why* the military should professionally and deliberately play games.
2. ***Gaming in the Military Profession—a Case Study (lesson).*** This lesson explores wargaming through a case study: US Navy and Army wargaming in the interwar period. The case study also looks at how wargaming helps develop successful military thinking *prior to war* in preparation *for war*.
3. ***Gaming Types and Ideas (Practical/Syndicate [or two]).*** This is a syndicate discussion(s) that uses one or two simple games to explore game mechanics, and how such mechanics help mental skills. The syndicate could also explore the psychology of human interactions using a social deduction game.[107]
4. ***How Games Model War (Practical/Syndicate [or two]).*** Using simple wargames, participants discuss how they model real-world military or political activity.[108]
5. ***Incorporation of Games (several practicals/syndicates).*** Post developing game awareness, this activity uses some games to illustrate different theoretical models of competition or conflict.

The historical games listed earlier may be relevant examples. Such syndicates should occur once or twice a month, over the second-class period, to build familiarisation and normalise gaming.

6. ***Integrate Games into Tactical Thinking (several gaming opportunities).*** As advocated in 'Moulding War's Thinking', tactical wargames should be played as a part of the first-class curriculum to complement and enhance TWETs and training.[109]

The first five activities help establish gaming as a norm within the profession of arms. These activities prepare staff cadets for the sixth activity: tactical wargaming to enhance mental models and creative decision-making. It is important to note that during the first five activities, games do not have to be played to completion. Playing a few rounds of a game will help students understand and realise the value of games. Professionally, what matters from a mental model and learning perspective is the post-game discussion. Furthermore, as the US Marine experience with chess highlights, if staff cadets wish to continue games in their free time, such a professional pastime should be encouraged (probably with directing staff role models). This approach can be adapted to support other military education courses and inculcate a joint professional gaming culture. For example, the approach could be included in the Australian Defence Force Academy (ADFA) military training component, possibly in the second and third years. The approach could be adapted to Australia's Staff Course and Higher Defence Course to help facilitate new mental models concerning strategic and operational thinking.[110] It is true that there are risks with this approach. One obvious risk is that current instructors have little or no exposure to gaming and its benefits. However, these risks can be overcome if Army leverages existing 'gaming enthusiasts' while gaming normalises within the wider officer corps. Furthermore, this approach would be enhanced by using a new professional wargaming system developed by the Australian Army: *Barrier to Entry*.[111]

Barrier to Entry straddles the strategic and operational levels of war in a similar fashion to the wargames of the interwar US military. Army currently uses the system to validate warfighting concepts. Yet it has the potential to be so much more. As a facilitated gaming system, *Barrier to Entry* captures the complexity of war and illustrates the importance of prewar and in-war actions. In this regard, *Barrier to Entry* lifts officer thinking out of the tactical, reinforcing the importance of broader military, economic and political theory to frame the problems of war. As a 'homegrown' professional gaming

system, it may help instil an Australian middle power context within the thinking of ADF officers.[112] At RMC-D (and ADFA), the game could be used to introduce such strategic and operational concepts to staff cadets after tactical wargaming. Such gaming allows cadets to explore strategic thinking and helps put their recent tactical learning within a wider context. However, *Barrier to Entry* should be used sparingly at RMC-D to not detract from junior officer tactical development. *Barrier to Entry*'s real impact is at the Australian War College. Here, the system directly complements operational and strategic education. Much like wargames in the US interwar period, *Barrier to Entry*, played during the final months of the Staff Course, can help students explore the expansive nature of military theory. Such opportunities help enhance military thinking.

Conclusion

This article outlines the military benefits of deliberate gaming. Deliberate gaming is where people actively choose to play and practise games. A key element of deliberate gaming within a professional context is the acceptance of, and willingness to use, games. The article explains the research that demonstrates how deliberately playing games helps increase the mental skills necessary for successful decision-making. This research also demonstrates how deliberately playing immersive games helps grow new mental models within military professionals. Several factors make games immersive. First, immersive games facilitate real-time player interactions. Next, these games provide a useful representation of the key elements of real-world decision-making. Immersive games also have an engaging theme. Many modern 'hobby games' meet these requirements, are readily available, and do not need external facilitators. The mental models developed through these immersive experiences directly influence and enhance military thinking, planning and creative decision-making. Nevertheless, contemporary Western militaries rarely incorporate gaming into training and education. Instead, many Western militaries, including the ADF, treat gaming as a fringe element—a curiosity more akin to a hobby rather than a serious military activity. Contemporary practice is in stark contrast to Western military history. Historically, Western militaries integrated gaming into education and training, and treated gaming as a professional pastime. To achieve the benefits of gaming, the article argues, Army, and the ADF more generally, need to re-establish a culture of professional gaming.

To change current culture, the article posits, gaming should be a part of RMC-D. Introducing games early in a military career helps grow a willingness to use games in a professional setting. Within RMC-D, gaming should be included as part of the second-class curriculum. The article presents a range of activities that would help grow staff cadet understanding of gaming and its military benefits. This approach would culminate in first-class with tactical wargames that build officer decision-making and tactical brilliance. The approach advocated within this article could be adapted to ADFA and the educational courses at the Australian War College: Staff Course and Higher Defence Course. Such adaptation would help build a joint culture and enable mid-ranking officers to develop a greater appreciation of operational and strategic thinking.

Gaming provides a means to cheaply and repeatedly provide immersive decision-making experiences that help grow mental models and develop strong habits of mind within military professionals. A wide array of mental models also enhances the potential for creative military decision-making. Future conflicts are likely to see the ADF lose the technological, material and mass advantages it held during the operations of the last four decades. Enhancing Army and ADF habits of mind and decision-making may be the intellectual edge needed during this time of strategic uncertainty and great power competition.

About the Author

Colonel Nick Bosio CSC has held a range of command and staff appointments across tactical, campaign and strategic posts, both within Australia and on operations. His experiences include roles as Chief of Campaign Plans for a 3-Star Coalition Headquarters, and Commanding Officer of the 6th Engineer Support Regiment. COL Bosio holds a Bachelor of Engineering and three Masters Degrees. He has been awarded a research doctorate focusing on military theory, military studies, and systems thinking. He is currently the Director of Military Strategic Plans.

Endnotes

1 Williamson Murray, 2014, 'US Naval Strategy and Japan', in Williamson Murray and Richard Hart Sinnreich (eds), *Successful Strategies: Triumphing in War and Peace from Antiquity to the Present* (Cambridge, UK: Cambridge University Press), 10.39–10.40.

2 Azar Gat, 2001, *A History of Military Thought: From the Enlightenment to the Cold War*, 1st edition (Oxford: Oxford University Press), 256.

3 This is detailed in several official and academic documents. For clarity, two sources are presented to provide examples of the analysis: John C Blaxland, 2019, *A Geostrategic SWOT Analysis for Australia*, The Centre of Gravity Series (Canberra: Australian National University); Department of Defence, 2020, 2020 Defence Strategic Update (Canberra: Commonwealth of Australia), 11–17.

4 A range of commentators, both within Australia and internationally, advocate for changes to Western military and ADF capabilities. Many of these commentators assert that new technologies mean forces must change. This is similar to the arguments made by revolution in military affairs (RMA) advocates. For discussion and summary, see Nicholas J Bosio, 2022, 'An Analysis of the Relationship between Contemporary Western Military Theory, Systems Thinking, and their Key Schools-of-Thought', PhD thesis, Australian National University, 128–133, at: http://hdl.handle.net/1885/260048. In many cases, such technologically driven strategic advice lacks historical, changing geostrategic or military theory context. During the writing of this article, Greg Sheridan published a series of articles in *The Australian* that are good illustrative examples of such Australian commentary. See Greg Sheridan, 'Nation Must Beef Up Military or Pass Molotov Cocktails', *The Australian*, 4 March 2022, at: https://www.theaustralian.com.au/inquirer/a-wakeup-call-for-the-west-we-need-to-beef-up-our-defence/news-story/5cd7a7370a205ed96cfc9ad540e032b8; Greg Sheridan, 'Defence Policy on the Never-Never', *The Australian*, 8 March 2022, at: https://www.theaustralian.com.au/world/defence-policy-on-the-nevernever/news-story/4702c8b3f2843e90f6f317d4e40d3f2f; Greg Sheridan, 'Albanese is Right to Target PM on Defence Failures', *The Australian*, 9 March 2022, at: https://www.theaustralian.com.au/world/defence-policy-on-the-nevernever/news-story/4702c8b3f2843e90f6f317d4e40d3f2f.

5 Throughout the interwar period, a range of commentators and theorists advocated for technological solutions to the problems of war. Examples of well-known theorists and commentators still studied in today's staff colleges include Douhet and Mitchell (air power advocates), Fuller and Liddell Hart (mechanised and air power advocates), and Tukhachevsky (air power and mechanised advocate). Such theorists, much like RMA theorists, often focused solely on tactical advantage, decisive battle, and an over-reliance on a specific technological solution that would provide rapid success—either within a single domain, or across multiple domains. For discussion of theorists and their technological and decisive battle emphasis, see Andrew Latham, 2002, 'Warfare Transformed: A Braudelian Perspective on the "Revolution in Military Affairs"', European Journal of International Relations 8, no. 2: 232–234; Theo Farrell and Terry Terriff (eds), 2002, *The Sources of Military Change: Culture, Politics, Technology* (London: Lynne Rienner Publishers), 12–16; HP Willmott and Michael B Barrett, 2010, *Clausewitz Reconsidered* (Santa Barbara, CA: Praeger Security International), 108–110, 73; Thomas Hippler, 2013, *Bombing the People—Giulio Douhet and the Foundations of Air-Power Strategy, 1884–1939* (New York, NY: Cambridge University Press), 250–253; Jan Angstrom and JJ Widen, 2015, *Contemporary Military Theory: The Dynamics of War* (New York, NY: Routledge), 98–101, 65–66, 66 (Table 9.1); Cathal J Nolan, 2017, *The Allure of Battle: A History of How Wars Have Been Won and Lost* (Oxford: Oxford University Press), 578–582.

6 French's analysis is detailed in his work *Raising Churchill's Army*. The issues of poor British doctrine and thinking, and their effect on operations against the Germans, are seen clearly in his analysis of the early periods of the North African campaign (1940–1941). David French, 2000, *Raising Churchill's Army: The British Army and the War against Germany, 1919–1945* (Oxford: Oxford University Press), 215–224.

7 Ibid., 21.

8 PJ McCarry, 1991, *This Is Not a Game: Wargaming for the Royal Australian Air Force* (Canberra: Air Power Studies Centre), 1–4; Williamson Murray, 2011, *War, Strategy, and Military Effectiveness*, Kobo eBook edition (New York, NY: Cambridge University Press), 7.15; Matthew B Caffrey Jr, 2019, *On Wargaming: How Wargames Have Shaped History and How They May Shape the Future*, The Newport Papers, vol. 43 (Newport, RI: United States Naval War College), 46.

9 Caffrey also outlines how Hitler directed the German military to not undertake any strategic wargames on possible political and economic responses by other nations. Caffrey, 2019, 43, 46.

10 Hopkins's analysis of the postwar commissions and reports also reinforces this. Several scholars cite the US military's interwar period cultural, educational and capability development as critical to their success in the Second World War. See Edward S Miller, 2007 (1991), *War Plan Orange: The U.S. Strategy to Defeat Japan, 1897–1945* (Annapolis, MD: Naval Institute Press), 323–330; Eliot A Cohen, 1994, 'The Strategy of Innocence? The United States, 1920–1945', in Williamson Murray, MacGregor Knox and Alvin Bernstein (eds), *The Making of Strategy: Rulers, States, and War* (Cambridge, UK: Cambridge University Press), 461–464; William B Hopkins, 2008, *The Pacific War: The Strategy, Politics, and Players that Won the War* (Minneapolis, MN: Zenith Press), 19–27, 342–344; MacGregor Knox and Williamson Murray (eds), 2001, *The Dynamics of Military Revolution* 1300–2050, 12th Kobo eBook edition (New York, NY: Cambridge University Press), 10.8; Williamson Murray and Allan R Millett, 2001, *A War to Be Won: Fighting the Second World War*, Kindle edition (Cambridge, MA: Belknap Press), 8020–8032 (Appendix 2); Williamson Murray, 2011, *Military Adaptation in War: With Fear of Change*, Kobo eBook edition (New York, NY: Cambridge University Press), 2.31; Murray, 2011, *War, Strategy, and Military Effectiveness*, 7.13–15; Murray, 2014, 'US Naval Strategy and Japan', 10.2–3, 10.12–13.

11 Sean M Judge, 2018, *The Turn of the Tide in the Pacific War: Strategic Initiative, Intelligence, and Command, 1941–1943*, eBook edition (Lawrence, KS: University Press of Kansas), 209–210.

12 See previous endnote for scholars. This point is also reinforced by Nimitz. See Donald C Winter, 2006, 'Remarks by Secretary of Navy,' remarks presented at the Naval War College's 2006 Current Strategy Forum, Newport, Rhode Island, USA, 13 June; Murray, 2014, 'US Naval Strategy and Japan', 10.39.

13 These dispositions underpin the definition of pluralist habit of mind. See Patrick Sullivan, 2014, *A New Writing Classroom: Listening, Motivation, and Habits of Mind*, ePub edition (Logan, UT: Utah State University Press), 152–153; Arthur L Costa and Bena Kallick, 2018, 'Habits of Mind: Strategies for Disciplined Choice Making', *The Systems Thinker*, at: https://thesystemsthinker.com/habits-of-mind-strategies-for-disciplined-choice-making/; Nicholas J Bosio, 2020, 'Moulding War's Thinking: Using Wargaming to Broaden Military Minds', Australian Army Journal XVI, no. 2: 35–38.

14 Bosio summarises the research and discussion of habits of mind across multiple disciplines, including the works of Cohen, Gole, Mansoor and Murray (all cited later) on military habits of mind. A pluralist habit of mind is defined as *having or using thinking dispositions that accept pluralism, are willing to consider alternative views, and can accept and integrate a wide range of schools of thought and worldviews*. Pluralism is a key part of military theory, and is defined as *the use of different paradigms or schools of*

thought, and their related theories and methodologies, to consider problems within a field of study, in this case military theory. Bosio, 2022, 'Relationship between Contemporary Western Military Theory, Systems Thinking', 56, 58–60, 223–227, 64–67.

15 The research and scholarly work relating to this is summarised by Bosio. Carse takes the concept of mental development through shared game experience further by placing it within a metaphysical context. See Bosio, 2020, 37–38; James P Carse, 1986, *Finite and Infinite Games* (New York, NY: The Free Press); John Lillard, 2016, *Playing War: Wargaming and U.S. Navy Preparations for World War II* (Lincoln, NE: Potomac Books), 137.

16 Anon., 1898, 'Foreign War Games', in *Selected Professional Papers Translated from European Military Publications* (Washington, DC: Government Publishing Office), 249.

17 Jim Storr, 2009, The Human Face of War (London: Continuum), 145–155. McLucas succinctly summarises the research in his first chapter. Although Storr refers to this mental decision-making as 'intuition', he places the concept of heuristics within the military context. Storr also references Klein. See Alan C McLucas, 2003, *Decision Making: Risk Management, Systems Thinking and Situation Awareness* (Canberra: Argos Press), 16–31.

18 Storr refers to these mental tools as intuition. Klein's work goes further, highlighting that intuition is derived from heuristic decision-making built on significant repetition of action and a large 'library' of mental models. See Storr, 2009, 148–149; Gary Klein, 1998, *Sources of Power: How People Make Decisions* (Cambridge, MA: MIT Press), 35–44.

19 Gigerenzer et al. provide extensive research into the use of heuristics in the book *Simple Heuristics That Make Us Smart*. This research is further supported by Klein's *Sources of Power*. Although Kahneman highlights concerns with heuristics and 'natural decision-making' (in *Thinking Fast and Slow*), even Kahneman's work reinforces the basic premise and preference for heuristics within decision-making. Specifics on heuristics and cognitive load are provided by Martignon and Laskey. For summary, see Laura Martignon and Kathryn B Laskey, 1999, 'Bayesian Benchmarks for Fast and Frugal Heuristics', in Gerd Gigerenzer, Peter M Todd and ABC Research Group (eds), *Simple Heuristics That Make Us Smart* (Oxford: Oxford University Press), 183, 86–87; Daniel Kahneman and Gary Klein, 2009, 'Conditions for Intuitive Expertise: A Failure to Disagree', *American Psychologist* 64, no. 6: 524–225.

20 Cited in McLucas, 2003, 18–19.

21 Gigerenzer and Todd summarise the research in the first chapter of *Simple Heuristics That Make Us Smart*. See Gerd Gigerenzer and Peter M Todd, 1999, 'Fast and Frugal Heuristics: The Adaptive Toolbox', in Gerd Gigerenzer, Peter M Todd and ABC Research Group (eds), *Simple Heuristics That Make Us Smart* (Oxford: Oxford University Press), 14–15.

22 Klein, 1998, 31–74 (chapters 4 and 5); Gigerenzer and Todd, 1999, 16–17; McLucas, 2003, 22.

23 This figure illustrates the summary of the heuristic process, as outlined by Gigerenzer and Todd and by Klein. See Gigerenzer and Todd, 1999, 18; Klein, 1998, 24–28.

24 These two steps are extensively covered in chapters 4 and 5 of Klein's *Sources of Power*, and Parts I and II of *Simple Heuristics That Make Us Smart*. Klein and Gigerenzer et al. summarise these requirements in their third and first chapters, respectively. See Klein, 1998, 15–30 (Chapter 3); Gigerenzer and Todd, 1999, 16.

25 The definition (and quotation) is from Senge. Though Storr does not refer to mental models, he recognises their importance in military decision-making with his discussion of 'fairly high-level precis or abstraction of the situation'. See Peter M Senge, 1990, *The Fifth Discipline*, Kobo ePub edition (London: Random House Business Books), 8; Storr, 2009, 146, 55.

26 Although many make this point, Storr's discussion on Rommel, Patton and other successful military commanders highlights the importance of pedagogical experience in mental model development. See Storr, 2009, 155.

27 This relates to the two types of knowledge: procedural and propositional knowledge. Procedural knowledge is knowledge of how and why. Propositional knowledge is knowledge of what and why. For a succinct summary, see Mick B Ryan, 2016, *The Ryan Review: A Study of Army's Education, Training and Doctrine Needs for the Future* (Canberra: Department of Defence), 48–49; Nicholas J Bosio, 2018, *Understanding War's Theory: What Military Theory Is, Where It Fits, and Who Influences It?*, Australian Army Occasional Paper—Conflict Theory and Strategy No. 001 (Canberra: Australian Army Research Centre), 11–14.

28 The following summarise and succinctly explain these links: Paul Davidson Reynolds, 1976, *A Primer in Theory Construction* (Indianapolis, IN: The Bobbs-Merrill Company), 21–43; Klein, 1998, 152–153, 261–69; Bosio, 2018, 11–14.

29 Klein, 1998, 24–28.

30 A rotating filing device often used to store business contacts.

31 Creativity in this case relates to a wide range of mental models that give different options to the heuristic. The need for broad mental models is outlined by both Klein and Storr. See Klein, 1998, 32–35; Storr, 2009, 143–153, 55.

32 See George A Miller, 1956, 'The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information', *The Psychological Review* 63, no. 2; Alan Baddeley, 1994, 'The Magical Number Seven: Still Magic After All These Years?' Psychological Review 101, no. 2: 356.

33 This tool is known as the 'availability heuristic', which is often used as a 'sub-heuristic' within decision-making situations. See Stephen J Hoch, 1984, 'Availability and Interference in Predictive Judgment', *Journal of Experimental Psychology* 10, no. 4: 658–660; Scott Plous, 1993, *The Psychology of Judgment and Decision Making* (New York, NY: McGraw-Hill Education), 121 (Chapter 11); Ralph Hertwig, Ulrich Hoffrage and Laura Martignon, 1999, 'Quick Estimation: Letting the Environment Do the Work', in Gerd Gigerenzer, Peter M Todd and ABC Research Group (eds), *Simple Heuristics That Make Us Smart* (Oxford: Oxford University Press), 213–218.

34 Klein explains these as 'typical and familiar' problems compared to 'complex' problems. Klein highlights the cognitive process, and by extension loading, of the two situations. See Klein, 1998, 24–28, 27 (Figure 3.2).

35 A TEWT is a map-based exercise where a military professional seeks to solve a tactical problem. The outcome of a TEWT is often a concept of operations (simplified military plan), and a series of map-based graphics that represent the different phases (stages) of the plan. TEWTs are static, in that they present a plan and do not 'play out' the post H-hour actions of the plan. A TEWT is often done at the physical location of the tactical problem to help develop an appreciation of terrain.

36 A staff cadet is the name given to a RMC-D officer candidate under ab-initio training.

37 This was a key deduction in Klein's work, and is reinforced by the joint analysis of Kahneman and Klein. Storr's discussion of military decision-making makes the same point. See Klein, 1998, 105–107; Kahneman and Klein, 2009, 515–517, 22–23; Storr, 2009, 147–148, 55.

38 Australian Defence Force, 2022, *ADF-P-5—Planning* (Canberra: Department of Defence), 10–12.

39 These statements summarise the discussion in ibid., 10–12, 56, 69–72, 77–78.

40 Ibid., 12.

41 Research into this is summarised by Peter B Checkland and Jim Scholes, 1990, *Soft Systems Methodology in Action* (Chichester, London: John Wiley and Sons), A9-A11; William Ives, Ben Torrey and Cindy Gordon, 2002, 'Knowledge Sharing Is a Human Behaviour', in Daryl Morey, Mark Maybury and Bhavani Thuraisingham (eds), *Knowledge Management: Classic Contemporary Works* (Cambridge, MA: The MIT Press), 121–124; McLucas, 2003, 14–16.

42 The theory of how mental models and knowledge transitions between people through the process of making mental models explicit, updated and then internalised is summarised by Takeuchi and Nonaka. Bosio also summarises the research within a military wargaming context. See Hirotaka Takeuchi and Ikujiro Nonaka, 2002, 'Classic Work: Theory of Organizational Knowledge Creation', in Daryl Morey, Mark Maybury and Bhavani Thuraisingham (eds), *Knowledge Management: Classic Contemporary Works* (Cambridge, MA: The MIT Press), 139–158; Bosio, 2020, 37–38.

43 Hope H Seck, 'Why These Infantry Marines Have a New Obsession with Chess', *Military.com*, 4 May 2021, at: https://www.military.com/daily-news/2021/05/04/why-these-infantry-marines-have-new-obsession-chess.html#:~:text=Chess%20also%20has%20served%20to,each%20other%20on%20the%20board.

44 Ibid.

45 Some websites provide useful summaries of the benefits (e.g. healthline, at: https://www.healthline.com/health/benefits-of-playing-chess#takeaway; and The Science Times, at https://www.sciencetimes.com/articles/27306/20200915/10-things-playing-chess-brain.htm). For a summary of the academic literature, see William M Bart, 2014, 'On the Effect of Chess Training on Scholastic Achievement', *Frontiers in Psychology* 5.

46 Grabner et al. summarise the research that indicates how playing chess casually may assist. However, the cognitive benefits are limited compared to deliberate playing and practising of chess. See Roland H Grabner, Elsbeth Stern and Aljoscha C Neubauer, 2007, 'Individual Differences in Chess Expertise: A Psychometric Investigation', *Acta Psychologica* 125, no. 3: 401–402.

47 Ramon Aciego, Lorena Garcia and Moises Betancort, 2012, 'The Benefits of Chess for the Intellectual and Social-Emotional Enrichment in Schoolchildren', *The Spanish Journal of Psychology* 15, no. 2: 558; Fariba Fattahi et al., 2015, 'Auditory Memory Function in Expert Chess Players', *Medical Journal of the Islamic Republic of Iran* 29: 5–6.

48 Fattahi et al. acknowledge the overall increase in mental capacity due to deliberate playing of chess. They also highlight the link between short, immediate and longer-term memory recall, 'buffer' capacity, and speed of cognition. See Fattahi et al., 2015, 5–7.

49 These two days are indicative. The author's local game store has a standing evening event for *Flesh and Blood and Magic* on these days, respectively.

50 The process of analysis and decision-making outlined here has been traced in a range of games and actions. Klein uses a similar process to build military decision-making capacity in US Marine squad leaders. Ballesteros et al. apply a similar processing form through a computer game system to build cognitive development within older adults. For summary and discussion, see Klein, 1998, 99–107; Mark Newman, 'Developing Life Skills Through Play', *Business Wire*, 17 December 2004, at: https://www.proquest.com/wire-feeds/developing-life-skills-through-play-tradingcard/docview/445534541/se-2?accountid=8330; Beth Casper, 'Cognitive Calisthenics', *Statesman Journal*, 3 January 2005, at: https://www.proquest.com/newspapers/cognitivecalisthenics/docview/440034509/se-2?accountid=8330; Soledad Ballesteros et al., 2015, 'A Randomized Controlled Trial of Brain Training with Non-Action Video Games in Older Adults: Results of the 3-Month Follow-Up', *Frontiers in Aging Neuroscience* 7: 7–10.

51 Klein notes this preference in decision-making. The previously cited McLucas summary also outlines the cognitive research in this area. See Klein, 1998, 99–100.

52 See previous discussion under 'Understanding Decision-Making: The Heuristic'.

53 Scholars have identified the potential bias that is often contained within Western military exercises and simulations. The works of Murray and Cohen are notable in this area. Bosio summarises these concerns in relation to the lead-up to the Iraq War, which has several similarities to contemporary exercise focus and design. See Murray, 2011, *Military Adaptation in War*; Murray, 2011, *War, Strategy, and Military Effectiveness*; Eliot A Cohen and John Gooch, 2006, *Military Misfortunes: The Anatomy of Failure in War* (New York, NY: Free Press); Bosio, 2022, 'Relationship between Contemporary Western Military Theory, Systems Thinking', 231–367 (Chapter 8).

54 Scholarship on chess, discussed earlier, highlights these links. Kahneman and Klein highlight similar cognitive development with respect to intuitive judgement. See Kahneman and Klein, 2009, 520–521.

55 It is noted that competitive games can also generate a similar feel through 'trash talk', where one player attempts to psychologically undermine the opponent.

56 The immersive nature of gaming, and how it assists in learning, is explored in wider literature, which often views a game as 'a voluntary activity, separate from the real life, creating an imaginary or immersive world'. See Sara I de Freitas, 2006, 'Using Games and Simulations for Supporting Learning', *Learning, Media and Technology* 31, no. 4: 344; Lillard, 2016, 137.

57 Although this is explained by Klein and by Gigerenzer et al., Storr's analysis links the need for a library of mental models to the military context. See Storr, 2009, 148–149, 55–56.

58 Reportedly stated in a private letter to the President of the Naval War College after the Second World War. Cited by Secretary of Navy, Donald Winter. See Winter, 2006, 1.

59 Cohen, 1994, 441–442, 62–63; Henry G Gole, 2003, *The Road to Rainbow: Army Planning for Global War, 1934–1940* (Annapolis, MD: Naval Institute Press), 141–149; Peter R Mansoor, 2014, 'US Grand Strategy in the Second World War', in Williamson Murray and Richard Hart Sinnreich (eds), *Successful Strategies: Triumphing in War and Peace from Antiquity to the Present* (Cambridge, UK: Cambridge University Press), 11.2–6.

60 Cohen, 1994, 462; Gole, 2003, 154–156; Mansoor, 2014, 11.4–6, 11.16, 11.46–47.

61 Ján Spišák, 2013, 'Military Concepts—A Background for Future Capabilities Development', *Economics and Management*, no. 1: 75–76; Christopher R Smith, 2018, 'On Future Thinking and Innovation: How Military Concept Writing Can Unwittingly Suppress Innovation', *Australian Army Journal* XIV, no. 1: 123–124; Bosio, 2022, 'Relationship between Contemporary Western Military Theory, Systems Thinking', 133, 299.

62 Miller discusses how War Plan Orange and its wargaming became an analogy that influenced thinking and supported real-time Second World War planning. Both Gole and Mansoor highlight how the Rainbow Plans informed both US grand strategy and coalition thinking. Bosio indicates how wargames helped influence US military thinking over the interwar period. See Edward S Miller, 2007, 337–345; Gole, 2003, 141–149; Hopkins, 2008, 27; Mansoor, 2014, 11.46–47; Bosio, 2020, 36–38.

63 There is significant research in this area, covering education, leadership, business and psychology. Kahneman, Klein, and Gigerenzer et al. identify these issues. McLucas also provides a succinct summary of both cognitive science and psychological research. For a summary of the research into mental model changes through gaming and scenario planning, see Margaret B Glick et al., 2012, 'Effects of Scenario Planning on Participant Mental Models', *European Journal of Training and Development* 36, no. 5: 488–491.

64 See Endnote 27.

65 Murray's analysis of military education from the interwar period to the 1990s reinforces this point. Murray's points are echoed by other scholars, including Mansoor, Storr and Davidson. Cimbala and Willmott and Barrett imply it in their analysis. The works of these war studies scholars highlight that training provides procedural knowledge, while challenging education reinforces military propositional knowledge. The Australian Army's Ryan Review also references the relevant research. See Murray, 2011, *War, Strategy, and Military Effectiveness*, 3.10–12; Mansoor, 2014, 11.48; Storr, 2009, 155–156; Janine Davidson, 2010, *Lifting the Fog of Peace*: *How Americans Learned to Fight Modern War* (Ann Arbor, MI: University of Michigan Press), 198–199; Stephen J Cimbala, 2001, *Clausewitz and Chaos: Friction in War and Military Policy* (Westport, CT: Praeger), 198–199; Willmott and Barrett, 2010, 163–76; Ryan, 2016, 25 (Fn 32), 33–34.

66 See Endnote 27.

67 In a contemporary military context, this relates to Felker's conclusion. Caffrey explains the utility of wargaming in a military context. This is similar to wider research that indicates how human interaction in games can modify mental models through exploratory learning, or 'a mode of learning whereby learning takes place through exploring environments, lived and real experiences, with tutorial or peer support' (de Freitas, 2006, 344). For a summary of current analysis of analogue and digital games for learning development, see Katie Salen (ed.), 2008, *The Ecology of Games: Connecting Youth, Games, and Learning* (Cambridge, MA: MIT Press). See also Craig Felker, 2007, *Testing American Sea Power: U.S. Navy Strategic Exercises, 1923–1940*, ePub edition, vol. 107 (College Station, TX: Texas A&M University Press), 137; Caffrey, 2019, 43, 277–289; Glick et al., 2012; Vicki Phillips and Zoran Popović, 2012, 'More than Child's Play: Games Have Potential Learning and Assessment Tools', *The Phi Delta Kappan* 94, no. 2: 27–30.

68 Bosio summarises this point. The statement is also derived from the gaming literature as outlined by Caffrey and by de Freitas. McCreight also outlines the key elements that relate to games as a useful representation. See Bosio, 2020, 28–29; Caffrey, 2019, 43, 261–264; de Freitas, 2006, 344; R McCreight, 2012, 'Scenario Development: Using Geopolitical Wargames and Strategic Simulations', *Environment Systems and Decisions* 33, no. 1: 30.

69 See Endnote 67 for research areas. Wheaton and Brown make a similar point by describing how games can be used to form conceptual metaphors that help explain complex strategic problems. See Kristan J Wheaton and Jason C Brown, 'The Games We Play: Understanding Strategic Culture through Games', Modern War Institute website, 23 March 2022, at: https://mwi.usma.edu/the-games-we-play-understanding-strategic-culture-through-games/?linkId=157643580&fbclid=IwAR1qy6rxeBGIcaJ0wKC7EQ1zE6TOzVZVollKFLfZZi_hGh7suCJejy1fSDM.

70 Nineteenth century military research discusses this. Caffrey, McGrady, Fielder and other scholars summarise the modern research in this area. See Anon., 1898, 261–265; Caffrey, 2019, 43, 11–17; Ed McGrady, 'Getting the Story Right about Wargaming', *War on the Rocks*, 8 November 2019, at: https://warontherocks.com/2019/11/getting-the-story-right-about-wargaming/; James Fielder, 'Reflections on Teaching Wargame Design', *War on the Rocks*, 1 January 2020, at: https://warontherocks.com/2020/01/reflections-on-teaching-wargame-design/; Soenke Marahrens, 'Assessing the Impact of a Kriegsspiel 2.0 in Modern Leadership and Command Training', *Divergent Options*, 17 May 2021, at: https://divergentoptions.org/2021/05/17/assessing-the-impact-of-a-kriegsspiel-2-0-in-modern-leadership-and-command-training/.

71 Research into solitaire games remains limited. However, video game research into single-person games suggests that they help produce procedural knowledge, but not necessarily propositional knowledge. Research into strategic solitaire games (e.g. *Dune Imperium*, one-player *Pandemic*) has not occurred at the time of writing.

72 This is based on the definition of a model and simulation game. See McCreight, 2012, 30; Caffrey, 2019, 43, 262–264; Bosio, 2020, 28–29.

73 How Diplomacy may assist politicians and diplomats is described in Haoran Un, 'Diplomacy: The Most Evil Board Game Ever Made', *Lifehacker AU*, 10 November 2017, at: https://www.lifehacker.com.au/2017/11/diplomacy-the-most-evil-board-game-ever-made/; David Klion, 'The Game that Ruins Friendships and Shapes Careers', *Foreign Policy*, 23 October 2020, at: https://foreignpolicy.com/2020/10/23/the-game-that-ruins-friendships-and-shapes-careers/

74 A *theory of mind* is the capacity for one person to determine what another may be thinking based on their own experiences and understanding. Broadening experiences helps broaden one's theory of mind.

75 Bosio summarises the research into free-play and outlines the difference between an 'optimisation' wargame as used in Course of Action Analysis, and an unrestricted wargame. See Bosio, 2020, 29–30, 33, 35–36.

76 Bosio, 2018, 35–37; Bosio, 2022, 'Relationship between Contemporary Western Military Theory, Systems Thinking', 33–39.

77 The level of extent of US military wargames is discussed by Bosio (2020), Cohen (1994), Gole (2003), Mansoor (2014) and Murray (2011, 2014).

78 Lillard's extensive research, already cited, outlines the games at all levels and their broad mechanics.

79 Some illustrative examples are seen in McCreight, 2012; Rex Brynen, 'Review: Matrix Games for Modern Wargaming', *PAXsims*, 20 September 2014, at: https://paxsims.wordpress.com/2014/09/20/review-matrix-games-for-modern-wargaming/; Defence Science and Technology Laboratory, 2021, 'Dstl Wargames the Power of Influence', UK Government, accessed 18 March 2022, at: https://www.gov.uk/government/news/dstl-wargames-the-power-of-influence

80 Images from various sources. Left: Caffrey, 2019, 43; top right: Brynen, 2014; bottom right: Defence Science and Technology Laboratory, 2021.

81 Both Lillard and Felker, previously cited, provide explanations of war gaming that today would be classed as 'operational wargaming'.

82 James Lacey, 'How Does the Next Great Power Conflict Play Out? Lessons from a Wargame', *War on the Rocks*, 22 April 2019, at: https://warontherocks.com/2019/04/how-does-the-next-great-power-conflict-play-out-lessons-from-a-wargame/; McGrady, 2019; Mitch Reed, 'The Operational Wargame Series: The Best Game Not in Stores Now', *No Dice No Glory*, 23 June 2021, at: https://nodicenoglory.com/2021/06/23/the-operational-wargame-series-the-best-game-not-in-stores-now/

83 Both Lillard and Felker, previously cited, provide explanations on war gaming that today would be classed as 'tactical wargaming'.

84 McGrady, 2019; Marahrens, 2021; Paul Kearney and Sebastian J Bae, 'Use Wargaming to Sharpen the Tactical Edge', *War Room—US Army War College*, 8 March 2021, at: https://warroom.armywarcollege.edu/wargaming-room/tactical-edge/amp/?fbclid=IwAR1lg7paUhbTg5h-5VDLpgyMkJPFZ1w-gC4ozs75vzNQPeppWgL2dqJK2bw

85 Images from various sources. Top left: US Naval War College, 2016, *US Naval War College Academic Catalog* (Newport, RI: US Navy), 2; bottom left: Jeff McAleer, 'Abandon Ship! A Review of Fletcher Pratt's Naval Wargame: War gaming with Model Ships 1900–1945', *The Gaming Gang*, 7 January 2012, at: https://thegaminggang.com/our_reviews/abandon-ship-a-review-of-fletcher-pratts-naval-wargame-wargaming-with-model-ships-1900-1945/; top right: Reed, 2021; bottom right: Lacey, 2019.

86 Bosio, 2018, 19–27.

87 The need to broaden career management at a more junior officer level is outlined in Nicholas J Bosio, 'Integrated Campaigning (Part 2): Developing Our People for Integrated Campaigning', *The Cove*, 4 April 2022, at: https://cove.army.gov.au/article/integrated-campaigning-part-2-developing-our-people-integrated-campaigning

88 The author thanks Darren Huxley and David Goyne for the game suggestions and summaries.

89 This war is documented by Thucydides and occurred between the two Greek great powers of Athens, a sea power, and Sparta, a land power. The analysis of this war leads to the 'Thucydides Trap'.

90 This viewpoint is an extension of the contemporary Western military focus on decisive battle. Nolan provides extensive discussion in his book *The Allure of Battle*. Bosio summarises the scholarship. Nolan, 2017, 533–535; Bosio, 2022, 'Relationship between Contemporary Western Military Theory, Systems Thinking', 128–133, 55–58.

91 Gupta, a game designer, highlights the key differences between learning history and playing through historical situations. The discussion also highlights the synergy achieved through these two actions. See Ananda Gupta, 2020, 'Wargame Design Decisions in Twilight Struggle and Elsewhere', *The Forge*, at: https://theforge.defence.gov.au/wargaming/wargame-design-decisions-twilight-struggle-and-elsewhere

92 Mark Gorak, 2016, 'Introduction', *CSIAC Journal of Cyber Security and Information Systems* 4, no. 3: 6.

93 Ryan, 2016, 25 (Fn 32), 33–34.

94 The author thanks Darren Huxley for the phrase 'tactical plans without troops'. However, the author also acknowledges that TPWTs is not as catchy as TEWTs.

95 Similar activities have been attempted by sub-unit and unit commanders in the past. For illustrative purposes, see Mark Mankowski, 'War Games and Battlefield Intuition: A Better Way to Faster Decisions?', *Land Power Forum*, 6 August 2015, at: https://researchcentre.army.gov.au/library/land-power-forum/war-games-and-battlefield-intuition-better-way-faster-decisions; Mark Mankowski, 'Putting the Human Adversary into Professional Military Education', *The Cove*, 1 March 2017, at: https://cove.army.gov.au/article/putting-human-adversary-professional-military-education

96 McCarry, 1991, 10–12.

97 It is recognised that select US military institutions, including US Army and Navy war colleges and the US Air Force Academy, have integrated gaming within their course structure. However, these are exceptions to the wider rule.

98 Oli Elliott, 'UK Fight Club: Iron Sharpens Iron', *Wavell Room—Contemporary British Military Thought*, 27 August 2020, at: https://wavellroom.com/2020/08/27/uk-fight-club-iron-sharpens-iron/; Fielder, Wargaming2020; David Hill, 'Reinvigorating Wargaming—Time to Establish "Fight Club"', *The Cove*, 26 June, 2020, at: https://cove.army.gov.au/article/reinvigorating-wargaming-time-establish-fight-club; Kearney and Bae, 2021Wargaming.

99 Anon., 1898, 72–73, 244–58; McCarry, 1991, 1–4; Caffrey, 2019, 43, 11–23.

100 For a summary of this research, see Grabner, Stern and Neubauer, 2007, 401–403.

101 For summary of research, discussion and analysis, see Bosio, 2020, 35–38.

102 Bosio, 2015; Bosio, 2020, 38.

103 Sebastian J Bae, 2020, 'Establishing a Wargaming Insurgency at the University', *The Forge*, at: https://theforge.defence.gov.au/wargaming/establishing-wargaming-insurgency-university

104 These courses include the Australian Command and Staff Course (old Staff College) and Higher Defence Course (old War College).

105 The author thanks Darren Huxley for his support in developing (and editing) this approach.

106 A compressed and modified version of this program was run at the Australian Command and Staff College in November 2022. Many of the lessons/discussions listed have also been presented to the Australian Command and Staff College, Army Majors Course, and Joint WO Course by the author.

107 Some illustrative games for pattern matching may include chess or *Star Realms* (simple deck-builder card game). The psychology of human interactions is best seen in social deduction games like *Resistance or Secret Hitler.*

108 Some illustrative games for this may include *13 Days*, which simulates the 13 days of the Cuban Missile Crisis; *Blitzkrieg*, a very simple strategic wargame that represents the Second World War at the highest level; *Air, Sea, Land*, which is a simplified operational wargame using cards. There are also science fiction and fantasy equivalents.

109 Bosio, 2020, 39.

110 It is noted that in 2021, the Australian Command and Staff Course started to develop a gaming culture. See Phil Baldoni and Mark Mankowski, 2022, 'Let the War (Games) Begin!', *The Forge*, at: https://theforge.defence.gov.au/publications/let-war-games-begin

111 This system has been developed by Army and the Defence Science and Technology Group. The system supports the Land Force Design Directorate within the Future Land Warfare Branch of AHQ.

112 Australia's military context is outlined in the ADF's capstone concept, *Integrated Campaigning*. See Nicholas J Bosio, 'Integrated Campaigning (Part 1): What It Looks like Tactically, Operationally, and Strategically', *The Cove*, 21 March 2022, at: https://cove.army.gov.au/article/integrated-campaigning-part-1-what-it-looks-tactically-operationally-and-strategically

Defeat an Enemy's Adaptation—The 'Emergent Decisive Event'

Nicholas Mahr

Introduction

Change is a constant in war. But the chaos of constant change can be minimised by the act of planning. Doctrine advises that, to be effective, planning must facilitate movement through the adaptation cycle more quickly than the enemy.[1] This proposition is often mistaken for implying that success in war demands only quick adaptation. This conclusion is a misconception that tends to unnecessarily constrain military thinking. Rather, success in war is dependent on the achievement of *superior* adaptation. Thus, adaptation in the context of battle against an adversary is relative. One side's adaptive cycle is considered superior when the opponent's is relatively slower. It follows, then, that while increasing the speed of adaptation is useful, commanders may also achieve superior adaptation by simply slowing down the speed of the enemy's.

This paper explores the concept of adaptation and the role of military planning in its achievement. The analysis does not refute that current doctrine allows for planning measures that have the purpose of slowing an enemy's capacity to adapt; nor does it seek to replace the nesting of task and purpose across battlespace operating systems. Indeed, much of the conceptual framework discussed in this paper will be self-evident to many experienced commanders. Rather, it deliberately links many of these concepts to provide commanders

with an additional tactical manoeuvre tool to aid the proactive slowing of an enemy's capacity to react in battle. First, it outlines the criticality of adaptation in war, identifies the link between adaptation and manoeuvre warfare, and summarises current planning measures that slow an enemy's adaptation. The paper then demonstrates the shortcomings of the contingency plan as a *reactive* method to respond to change, before contrasting it with the Emergent Decisive Event (EDE), a *proactive* method to more deliberately bring about a superior adaptive cycle. To illustrate the relevance of the EDE, the paper concludes with a short case study of Pearl Harbor and the effective employment of the EDE by the Imperial Japanese 'Carrier Striking Task Force'.

Adaptation, Manoeuvre Warfare, and Superiority

Adaptation in battle is essential as it is the method by which a force can effectively respond to wide-ranging threats.[2] Throughout history, the force that adapts better to changing conditions is usually the force that prevails over its adversary. Historical examples are plentiful: Mehmed demonstrated the potency of adaptive warfare when he moved his fleet overland to bypass Byzantium harbour defences during the siege of Constantinople;[3] Napoleon did so with his counterattack on a weakened Allied centre at the Battle of Austerlitz;[4] and the combined French and British forces achieved superior adaptation over the Germans with their rally and counter during the first battle of the Marne.[5] The US Joint Special Operations Task Force relearned the relevance of adaptation in 2004 against a less trained, ill-equipped but interconnected al-Qaeda, challenging the US commanders to rethink their structures, planning and processes in order to achieve decision superiority.

Adaptation is also inherent in manoeuvre warfare. The commander's attempt to create a 'turbulent and rapidly deteriorating situation' for the enemy is dependent on the ability to 'change physical and non-physical circumstances more rapidly than the enemy can adapt'.[6] A survey of manoeuvre warfare's tenets provides further evidence that they are connected to the concept of relative adaptation superiority:

- **Combined arms teams.** This tenet provides the commander with the capacity to balance the vulnerability of components of the force against the strengths of the enemy's.[7] Such versatility poses a dilemma for an enemy commander by slowing decision-making and adaptation, as to

target a weakness of one part of the friendly force's combined arms team would expose the enemy to the strength of another.[8]

- **Orchestration.** This tenet requires the deliberate arrangement of physical and non-physical actions to ensure their unified contribution to the mission. In doing so, orchestration enables simultaneity (or concurrent action) throughout the mission space, thereby negatively affecting the enemy's decision-making capacity.[9] Orchestration slows the enemy's ability to adapt as it struggles to respond to multiple friendly-force actions working in unison. The commander's simultaneous actions are akin to taking two unified moves on the chessboard for the enemy's single move.
- **Mission command.** This tenet encourages initiative in subordinate commanders to achieve a mission within the context of friction and uncertainty. In turn, mission command allows for faster decision-making and adaptation at each level of command.[10]
- **Focus all actions on the centre of gravity.** This tenet targets enemy vulnerabilities and avoids enemy strengths, all within the context of a centre of gravity that itself will change as opponents interact.

The tenets of manoeuvre warfare are designed, in part, to account for the unpredictability of a free-thinking enemy. When prepared and planned for in the relative safety of the headquarters, they are intended both to slow the enemy's capacity for decision-making and to increase the speed achievable by the friendly force. And yet, when executed in the chaos of battle, the challenges inherent in achieving this outcome cannot be exaggerated. As opponents interact, order progresses towards disorder, making plans less relevant. These interactions of opposing forces produce a complex adaptive system – one with components that adapt and learn.[11] The behaviour of such a system is the outcome of a multitude of individual decisions made by the system's opposing forces.[12] In such an environment, it becomes increasingly important that the commander learn and adapt more quickly than the enemy. Certainly, the slavish application of linear decisions made in planning without due consideration for how the other components of the system will react inevitably render the commander's plan ineffective. Any effort to undermine an enemy's centre of gravity will quickly lose relevance as the enemy responds by protecting its vulnerabilities and countering in turn. Therefore, the commander's diligent focus not just on the tenets of manoeuvre warfare but also on how the centre of gravity and system itself will adapt is a principal concern.

The development of contingency plans is generally viewed as the most appropriate method to counter the uncertainty of an adaptive system. Generated in advance of the need to act, these contingencies are often articulated as 'branches' to the main line of operation (LOO)—a chronological sequence that illustrates the order in which Decisive Events (DEs) will be achieved by military effort.[13] Generally an outcome of the war game, the purpose of the branch is to increase options for decision-making and to support adaptation in the face of enemy action. Regrettably, contingency plans are inherently reactive, which is a characteristic inconsistent with manoeuvre warfare's enduring requirement to achieve superior adaptation.

The Branch

Branches are intended to provide flexibility, and thereby to support the retention of the initiative in the face of possible enemy reactions.[14] But, their shortfall is that they generally rely on an enemy action and are thus a reactionary instrument. This is because branches attempt to balance the need for proactive adaptation against the risk of incorrectly predicting the enemy's reaction. If the prediction is wrong and the 'indicator' that informs the decision to execute the branch is not observed, the branch becomes irrelevant and the commander can safely avoid applying military power and resources to the plan.

Importantly, the branch requires a 'sensor' to do this observing, and in turn report the presence of an indicator to the commander. Further, a suitable force needs to be prepared to execute the branch. Consequently, while proficient teams may achieve faster adaptation in the execution of the branch, the process that allows the branch to be activated is contingent on enemy activity. This does not mean that the branch is irrelevant—but it is reactive. As such, branches are at odds with the objective of manoeuvre theory, which seeks to create a 'turbulent and rapidly deteriorating situation' for an enemy.[15]

Moreover, a branch generally creates only a consecutive dilemma for the enemy. Therefore, branches do not afford the commander the opportunity for simultaneity, by which the enemy's decision-making capacity may be overwhelmed.[16] Figure 1 is a representation of a LOO comprising two consecutive DEs leading to the commander's decision point (CDP). The LOO is linear, whereby DE 1 and DE 2 are achieved in turn before the CDP, which may require the commander to commit to the branch and

execute DE 4. While this LOO may achieve simultaneity through actions that do not amount to DEs, because of its linear nature this planning method is not fully consistent with tenets of manoeuvre warfare. A more deliberate and decisive attempt to orchestrate the events on the LOO would better achieve superior adaptation.

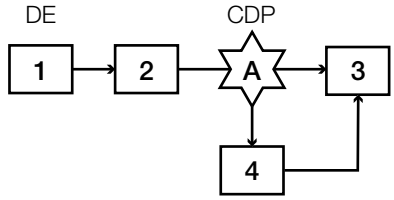

Figure 1. LOO with consecutive DEs and branch

The Emergent Decisive Event (EDE)

In contrast to the traditional linear planning method outlined above, introduction of the EDE during planning allows the commander to apply the tenets of manoeuvre warfare to a plan in a complementary but more proactive manner than the branch. In doing so, relative speed of adaptation is increased as the enemy's decision-making capacity is deliberately slowed. The term 'EDE' is coined here to bring into sharper focus the benefits of orchestrating tactical actions in order to slow an enemy's decision-making capacity. As mentioned, many of the underlying concepts will be familiar. This paper deliberately links them into a useful planning tool to assist planners and commanders alike.

The application of the EDE tool forces military planners to anticipate and plan to defeat the enemy's most rational response to the achievement of a DE, as near as possible to the point in time at which the enemy would choose to implement this response. In doing so, this tool elicits the rapidly deteriorating situation sought by manoeuvre warfare, as the enemy's most valid response to a decisive action on the battlefield is itself now defeated. This should not be confused with a supporting effort or nested task. While both are related to orchestration, the EDE is distinguished by its analysis of the enemy's reaction, and its direct relation to the DE.

The author provides the following definition of an EDE:

> *An emergent decisive event is a decisive event that disrupts or dislocates the enemy's most rational and adaptive response to a friendly achievement of a decisive event, and is executed at the point in time which the enemy would most likely choose to implement it. The emergent decisive event is thereby inextricably linked to the decisive event the enemy is likely to target and is orchestrated as such.*

EDEs take their name from the complex adaptive system they are attempting to gain advantage over—the 'emergence' being the unpredictable outcome of a series of interdependent actions in a system.[17] The EDE is the event necessary to undermine the enemy response to the execution of the DE, having assessed the sum of previous decisions made by that enemy. An EDE is intended to be orchestrated with the DE it supports—that is, it is arranged in unified contribution to the mission.[18] Therefore, an EDE is predicated on the commander's understanding of the probable enemy response to the execution of the nested DE. Should the EDE fail, the DE may also fail, and a CDP will be necessary to finally enact a branch, accompanied by a different DE.

Given that an EDE is likely to require the apportionment of critical resources by the commander, it is impractical to leave its formulation to the 'course of action analysis' step of the military appreciation process. While enemy reactions to friendly actions are best scrutinised during this stage of planning, by then forces will likely have been assigned and few will be available to support execution of the EDE. Rather, EDEs should be drafted when course of action concepts are initially developed, synchronised during 'course of action development', and then tested in 'course of action analysis'. The application of centre-of-gravity analysis, which evolves within a complex adaptive system, will assist the commander to develop the initial EDE concepts.

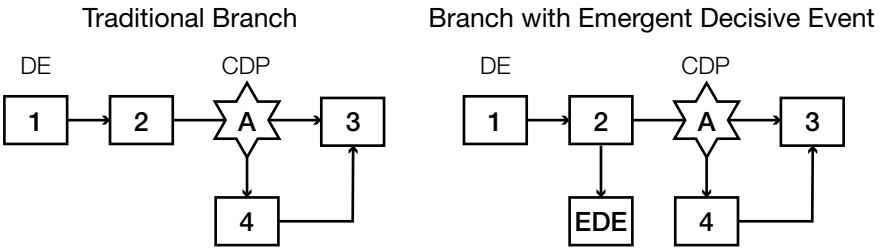

Figure 2. A traditional LOO at left, and the inclusion of the EDE at right

Figure 2 illustrates the difference between a standard LOO and one incorporating an EDE. The example on the left shows the branch enacted by CDP A, likely associated with a condition that DE 2 was unsuccessful. Conversely, in the example on the right, DE 2 is supported and orchestrated with an EDE, reducing the likelihood that the branch will be required.

Using the approach on the right, the EDE offers options to defeat the enemy's probable response to DE 2, and reduces the likely need to execute a reactive CDP. It also creates an additional dilemma for the enemy commander, whose first reaction to DE 2 has failed, and who is now required to conceive and implement another action in a rapid and chaotic fashion. All the while, friendly forces have continued to retain the initiative and shape the battlespace in their favour.

First Pillar: An EDE is intended to be orchestrated with the DE it supports.

The need for simultaneity, or near simultaneity, between EDE and DE is paramount. In the example above, the commander will attempt to achieve this simultaneity by generating two dilemmas the enemy will be challenged to overcome. Doing so aims to paralyse the enemy's capacity to achieve effective command and control through the creation of divergent multiple problems that produce an incoherent enemy response.[19] The enemy must believe that its response to the DE is a viable strategy at the time. If the EDE is executed too early, the enemy will adjust its response to the DE. If the EDE is executed too late, it will be irrelevant to the friendly LOO. Therefore the EDE should be executed as near as possible to the time of the DE and likely enemy response, in order to create the desired simultaneity in effect.

Second Pillar: The enemy must believe their response to the DE is a viable strategy at the time, and therefore the EDE should be executed as near as possible to the time of the DE.

To appreciate the value of the EDE, it is instructive to consider what could happen if it is not integrated into a LOO. Utilising the figure above, assume it is identified that the enemy would most likely undermine DE 2 with offensive support on friendly forces. Any reactive contingency by the commander to counter the enemy's indirect fire inherently accepts some level of disruption from the enemy guns until the associated CDP is enacted. The delay is also likely to cause the friendly force to lose initiative and the enemy to gain decision superiority, at least temporarily. A far better option would be for

the commander to execute an EDE that prevents the hostile battery from engaging in the first place.

Extending the example, while the traditional branch could achieve the same end state as the LOO with the incorporated EDE, there are some critical differences. Where the EDE likely dislocates or disrupts the hostile battery before it engages, the branch can only do so afterwards, potentially creating a dilemma for the friendly commander. As it occurs at the same time as DE 2, the commander's use of the EDE also allows for the creation of two simultaneous dilemmas for the enemy (i.e. by destroying the enemy guns when DE 2 is executed). By contrast, the traditional branch achieves the same dilemmas consecutively, and only after another CDP determines which linear branch to follow. Thus, the EDE slows the enemy's capacity to adapt, whereas the traditional branch fails to do so. Of most concern, the traditional branch risks the friendly commander's decision superiority and initiative.

While the benefit of integrating EDEs has now been established, the challenge remains in accurately forecasting how an enemy will respond to a DE so that planners can develop an effective EDE. McCrystal argues that, in a complex system, accurate predictions are unachievable given the sheer volume of interactions that occur within that system.[20] But his assertion that 'adaptive systems become more complex the longer the involved elements interact'[21] provides commanders with clues as to where to prioritise the application of military power and intelligence effort when developing the EDE. In the same way that it is easier to predict tomorrow's weather than next year's, a commander should anticipate that the accuracy of forecasts concerning enemy decision-making will decrease the longer that battle endures. For this reason, the commander should mitigate the risk of miscalculation by utilising EDEs for only the initial DEs on a LOO.

Limiting the application of EDEs in this way does not remove the challenge of accurately predicting enemy responses, but it does reduce the risk. By modestly forecasting how the enemy will evolve within the complex adaptive system in which it resides, early in the LOO, it is possible to formulate EDEs that characterise how the enemy will likely act at the time of DE execution. In the context of the example provided above, the enemy is most likely to react in accordance with its doctrine and usual behaviour, applied to the circumstances it faces on the battlefield. An enemy that disrupts attacks against its defensive position with offensive support, because that

is what its doctrine states and that is how it has fought in previous wars, will probably do so in our example. However, if we apply the context that the enemy's guns were destroyed in the deep battle, then perhaps the most likely response to attacks against its defensive position is to trigger the commitment of the enemy commander's reserve. If this were the assessment, then the nested EDE could disrupt or dislocate this enemy's reserve at the same time as the attack. Provided these assessments occur before the complexities and chaos of battle grow too great, the risk is likely to be more tolerable.

Third Pillar: A commander should mitigate risk of miscalculation by utilising EDEs for only the initial DEs on a LOO, where the risk is likely to increase commensurately with the duration of the operation.

However, in circumstances where the risk of incorrectly predicting the enemy response is still too high to justify dedication of a friendly-force element to execute the EDE, the commander has the option of adjusting the defeat mechanism so that it still has utility to the overall mission. In the example provided above, a demonstration by friendly forces against the enemy's reserve may well achieve physical dislocation, but so would a feint, with the added benefit of causing enemy attrition. In other words, while the commander cannot be certain how the enemy will act, depending on the circumstances lethal and tangible impacts on the enemy could be prioritised. This will increase the overall effectiveness of the EDE in the face of a miscalculation of the enemy's response.

Historical Example of EDE Composition and Effectiveness—The Battle of Pearl Harbor

Perhaps the most compelling example of the achievement of simultaneous dilemmas is provided by Thompson's captivating version of Imperial Japan's air attack on Pearl Harbor. The case study clearly illustrates how effectively the Imperial Japanese 'Carrier Striking Task Force', under command of Vice Admiral Nagumo, adhered to the planning pillars of the EDE concept as defined in this paper. The example demonstrates how the expectation of defeat was created in the mind of the US Commander Pacific Fleet, Admiral Kimmel, through the generation of an EDE.

Ultimately, Nagumo was able to successfully predict Kimmel's most likely response to the attack on Pearl Harbor in 1941 and used this assessment

to his advantage, thereby slowing Kimmel's decision-making by creating simultaneous dilemmas. The successful way in which EDEs were applied is evident in the following narrative about the battle:

> *At 7.53am, Fuchida called out to his radio operator to transmit the code words 'Tora! Tora! Tora!'—'Tiger! Tiger! Tiger!'—to confirm that despite all of the uncertainties the element of surprise had been achieved ... Fuchida pulled the trigger on his flare gun to signal the fighter pilots to take control of the air while Lieutenant-Commander Shigeharu Murata's slow moving torpedo-bombers made their first strike on Battleship Row.*
>
> *At 7.57am, the commander of Patrol Wing 2, Lieutenant Commander Logan Ramsay, was standing in the Operations centre on Ford Island when he saw a plane diving over the station … Within the space of five minutes, aircraft at the army air bases of Hickam and Wheeler Fields, the naval air stations at Ford Island and Kaneohe Bay and the marine air base at Ewa had all been dealt mortal blows to prevent interference with the main business of the morning: the merciless torpedo-and-bomb attacks on the great leviathans of Battleship Row.*
>
> *Kimmel radioed a message to every ship in the Pacific Fleet and to Admiral Stark in Washington: 'Hostilities with Japan commenced with air raid on Pearl Harbor.' Five minutes later he instructed Logan Ramsey at Patrol Wing 2: 'Locate enemy force', with the intention of taking the fight to the Japanese carriers. By then, however, Ramsey had only a handful of aircraft capable of getting airborne.*[22]

When viewed through the lens of military planning and execution, it is evident that the pillars of the EDE were successfully applied by Nagumo at Pearl Harbor in the following ways.

First Pillar: An EDE is intended to be orchestrated with the DE it supports. Nagumo was primarily focused on Battleship Row, and the destruction of the ships moored there. But the attack on the airfields occurred almost simultaneously with the naval bombardment, which denied Kimmel the opportunity to use his most likely reaction force. If the attack on Battleship Row had been a DE defined as 'at 7.53 am, functionally dislocate battleship manoeuvrability through torpedo-bomber attack while in dock', then the nested EDE could have been 'at 8.03 am, disrupt fighter aircraft

based on Oahu with air-ground attack in order to support dislocation of battleships'. Conversely, had Nagumo instead planned for fighters to escort the torpedo-bombers, only to be diverted to the airfields if US fighters were observed launching (in accordance with a traditional and reactive branch), it is likely the attack on Battleship Row would have been less effective.

Second Pillar: The EDE should be executed as near as possible to the time of the DE it supports. Nagumo was able to achieve near-simultaneous dilemmas that Kimmel had to contend with through sequencing the attack on US airfields to occur approximately five minutes after the torpedo bombers commenced their attack on Battleship Row. Kimmel believed a fighter response was a viable strategy in response to the attack on the naval vessels, as evidenced by his order to launch fighters. However, he was yet to find out that his strategy was invalid and that he was now dealing with two dilemmas. If Nagumo had executed his strike on US airfields earlier in the day (creating consecutive rather than simultaneous dilemmas, as per a linear LOO), Kimmel would have likely responded differently to the attack on Battleship Row (assuming such an option was available to him).

Third Pillar: A commander should utilise EDEs for only the initial DEs on a LOO. If Nagumo had created another EDE for execution later in the attack on Pearl Harbor, the rapidly evolving situation would have likely made it irrelevant when the time to execute arrived. Indeed, predictions regarding US responses much later along the LOO would be at the mercy of chaos and chance. Under such circumstances, Nagumo would have been better served enacting the reactive branch at this point, rather than assigning valuable resources to an EDE that would likely become irrelevant.

In all, the case study demonstrates how Nagumo and his 'Carrier Striking Task Force' were able to create a simultaneous dilemma that effectively undermined Kimmel's most probable response to the former's DE. Having slowed Kimmel's capacity to adapt relative to his own adaptive cycle, Nagumo created an expectation of defeat in his opponent. The outcome was inevitable:

> *[A] spent machine-gun bullet smashed the glass and struck him lightly on the chest, leaving a black smudge on his spotless white tunic. Kimmel picked up the bullet and told an aide, 'It would have been merciful had it killed me'.*[23]

Conclusion

In planning, a military's emphasis on achieving quick adaptation alone unnecessarily constrains analysis. While this planning priority remains valid, relative adaptation superiority can be realised by orchestrating concurrent dilemmas for the enemy to contend with. This outcome can be achieved by generating an EDE that aims to dislocate or disrupt an enemy's reaction to a DE. The EDE stands in contrast to the traditionally reactive branch developed during course of action analysis—these branches often being used to contend with the complexities that emerge in an evolving battlespace. The EDE also generates simultaneous dilemmas, whereas a branch only achieves them consecutively. The key distinguishing feature of an EDE is that it slows the enemy's capacity to adapt. It does this by generating the opportunity for the friendly force to engage in deliberate, proactive manoeuvre that does not depend on conditions set by the enemy. To be successful, however, the EDE must be employed with consideration for the pillars mentioned above. By integrating the EDE into planning, the commander has the opportunity to achieve relative decision superiority. While acknowledging that many of the underlying concepts discussed here will be familiar to commanders, this article links them to deliberately achieve relative adaptation superiority. As history shows, by doing so, the turbulent and rapidly deteriorating situation sought by manoeuvre warfare can be achieved.

Army Commentary

Major Nicholas Mahr's piece on Emergent Decisive Event planning is worthy of consideration by any tactician. It is soundly based in good tactics as it addresses a most valuable goal for both combatants: seizing and maintaining the initiative by continuous action. The author argues correctly that too often in tactics we become objective focused rather than enemy focused, and often do not consider in sufficient detail an enemy response. We tend to react to an enemy response once it materialises rather than anticipating and pre-empting it by acting before it manifests. Instead of a constant action–reaction–counter-action cycle, MAJ Mahr argues for continuous action by a friendly force to compel an enemy to be constantly reacting. This approach is soundly based in manoeuvre theory and is also

a sound and effective way to combat centralised fires-based theories of combat. When constant anticipation is coupled with constant action, the battlespace is always fluid, defeating efforts to understand it and then use a distant system to respond.

MAJ Mahr proposes that as we plan Decisive Events we also plan an attendant Emergent Decisive Event to complement the Decisive Event. This is where further analysis is warranted, as the very mechanistic and predictive nature of Decisive Event planning is itself at odds with the fluid nature of combat that MAJ Mahr proposes. I sense the author has either consciously or unconsciously identified this inherent contradiction when he sensibly warns that his concept does not work too far after the initial contact. He is right but has identified the wrong problem—the problem is Decisive Event planning itself. If instead MAJ Mahr were simply to argue that every action on the battlespace should anticipate an enemy reaction and put forces in motion to proactively pre-empt rather than reactively counter the enemy reaction, then I think his idea would still be retained but in a much simpler and more practical way, and would be a concept that continually holds true as an action unfolds.

Michael Krause AM
Major General

About the Author

Major Nicholas Mahr joined the Australian Army in 2010 and commissioned from the Royal Military College - Duntroon is an Artillery Officer. His professional interests include the study of strategy, tactics and counter fires. MAJ Mahr currently serves as Battery Commander of 105th Battery, 1st Regiment, Royal Australian Artillery.

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Understanding Defeat

Mark Sargent

Introduction

Understanding defeat is vital to understanding the Australian Army approach to warfare. *Land Warfare Doctrine 1* states that the Army denies and defeats threats to Australia and its interests.[1] While the 2020 Defence Strategic Update modified the terminology somewhat,[2] to defeat an enemy is still central to the Army's purpose. Yet, despite its importance, doctrine is strangely quiet on exactly what defeat is, and how it relates to other warfighting concepts.

For example, doctrine exhorts commanders and staffs to employ defeat mechanisms, yet does not explain what these mechanisms are or how they go about achieving defeat. Doctrine tells us that we must focus all efforts on the centre of gravity to defeat the enemy, but does not describe the relationship between centre of gravity and defeat. Doctrine tells us to shatter the enemy's moral and physical cohesion, without explaining what cohesion is or why shattering it is of benefit. It is difficult, therefore, for a commander or planner to reconcile all these concepts to develop a plan that links tactical action on the ground to the enemy's defeat.

The aim of this article is to provide a framework for defeat. It seeks to fill the gaps in doctrine, provide context, and to link disparate concepts into one coherent whole. The article will first look at defeat itself, by defining it in useful terms and discussing its temporary and compounding nature. It will then bridge the gap to defeat mechanisms by introducing the components

of defeat, as well as defining the relationship with the centre of gravity. It will conclude by discussing defeat mechanisms, and suggesting a hierarchy for their employment.

Defining Defeat

Australian Defence Force—Philosophical—3 Campaigns and Operations defines defeat as 'to diminish the effectiveness of an individual, group or organisation to the extent that it is either unable or unwilling to continue its activities or at least cannot fulfil their intentions'.[3] The US Army provides a similar definition, which is 'defeat is to render a force incapable of achieving its objectives'.[4] Both of these phrases define defeat in terms of the enemy's objectives—the enemy is defeated when it cannot accomplish *its* objectives. However, this is a flawed definition of defeat, as it is not the achievement of the enemy's objectives that is our concern, but the achievement of our own.

Consider, for example, the fate of the French Maginot Line in World War Two. Built to defend the border with Germany, the Maginot Line was a formidable series of fortifications extending from the Swiss to the Belgian border. However, the Germans wisely avoided this strength, and bypassed the Maginot Line by penetrating through the Ardennes Forrest, encircling the British and French mobile forces in Belgium. The French were forced to capitulate without the Germans having to directly assault the Maginot Line. By the current definition, therefore, the Maginot Line and its garrison remained undefeated, as they remained capable of their mission—defending the German border—until the armistice. By any reasonable standard, however, the Maginot Line was defeated, as it was unable to prevent the Germans from achieving their mission of defeating the French Army.[5] Defining defeat in terms of the enemy's mission, therefore, is flawed.

US military analyst Brett A Friedman hints at an alternative definition of defeat. In his introduction to tactics, he states:

> *[W]hatever the mission, the tactician must confront an enemy that will attempt to prevent the accomplishment of that mission. To accomplish the mission, the tactician will have to defeat this opponent in some manner.*[6]

This statement highlights that the current definition of defeat is backwards. Defeating the enemy is not preventing it from achieving *its* mission; it is preventing it from being able to prevent the success of the *friendly* mission. Put in the context of a commander or staff developing a plan to achieve a mission, no other definition of defeat makes sense. Why fight an enemy that is not going to prevent you from accomplishing your mission? Why fight an enemy more than is necessary for you to accomplish your mission? Defeat, therefore, might be defined as 'to render a force incapable of preventing the success of the friendly mission'.

However, this too is an incomplete definition, as it invites a circular logic trap for missions focused on the enemy. For example, if our mission is to destroy an enemy force, this definition would imply that to defeat this enemy force we must prevent it from being able to prevent us destroying it. While this sounds like a good idea for a skit between General Melchett and Captain Blackadder, it has very little value to the commander or staff. In this case, it is the *purpose* of the friendly operation that defines defeat, not the mission. For example, our mission might be to destroy the enemy counterattack force for the purpose of preventing interference with an attack by the main body. In this instance, to defeat the counterattack force we must render it incapable of preventing the success of the friendly purpose (a successful attack by the main body). A complete definition of defeat, therefore, is 'to render a force incapable of preventing the success of the friendly mission or purpose'.

The Temporary and Compounding Nature of Defeat

Before moving on to the components of defeat, it is necessary to explore the temporary and compounding nature of defeat. Firstly, defeat is almost always temporary. The Romans described by Tacitus may have been able to inflict permanent defeat ('they make a desert, they call it peace'[7]), but that is very rarely the case in the modern world. Given time, any defeated force will regenerate its combat power and capability. A destroyed tank battalion will, given enough time, replace its equipment and personnel casualties. A routed force will, given enough time, regain its cohesion and will to fight. Defeat therefore has a temporal aspect that is often overlooked. When developing a plan to defeat the enemy, it is necessary to appreciate for how long the enemy must be defeated (prevented from interfering with the friendly mission or purpose). This temporal aspect may determine how that defeat is achieved.

For example, a destroyed tank battalion will be defeated for longer than a tank battalion that is merely dislocated. As will be discussed again later, this temporal aspect may determine which defeat mechanism is most appropriate.

Secondly, defeat compounds. Small defeats compound into later and larger defeats. This compounding effect occurs both 'vertically' and 'horizontally'. Vertically refers to the idea that defeat compounds upwards from lower levels of command to higher levels of command. Thus, the defeat of a battalion contributes to the defeat of the brigade of which it is a part. This is not to say that every battalion must individually be defeated for the brigade as a whole to be defeated, only that defeat compounds upwards. Horizontally refers to the idea that defeat of the current enemy contributes to the defeat of the next enemy that is fought in sequence.

The Battle of Waterloo provides an example of the compounding nature of defeat. As the battle unfolded, the Allies were successful in a number of actions throughout the day that compounded towards the final defeat of Napoleon. In succession, the Allies were successful in holding Hougoumont, defeating d'Erlon's infantry attack, defeating Ney's cavalry attack, capturing Plancenoit and defeating the culminating attack by the Imperial Guard. Each action built on the one that preceded it towards the final defeat of Napoleon. Thus the defeat of d'Erlon's infantry attack contributed both to the defeat of Ney's cavalry attack that followed (compounded horizontally) and to the defeat of Napoleon's army as a whole (compounded vertically).

The Battle of Waterloo also provides an example of the temporary nature of defeat. In accordance with his tactic of the central position, Napoleon sought first to defeat the Prussian army at Ligny before turning his army to defeat the Anglo-Dutch army at Waterloo. However, due to some indifferent generalship by Grouchy, the Prussians were able to regain their cohesion in time to assist Wellington at Waterloo and were decisive in the defeat of Napoleon. Thus it was Napoleon who was unable to account for the temporary nature of defeat. Napoleon was unable to defeat the Prussians *for long enough* for his victory at Ligny to compound into victory at Waterloo.[8]

From this example we can understand the importance of the control of sequence in war. Indeed, in *Fighting by Minutes*, Robert Leonhard states that 'victory in warfare is linked inextricably with the positive control of sequence'.[9] The aim of campaign planning is sequencing successful actions which compound both vertically and horizontally towards the

achievement of the strategic goal. However, the gap between the actions must not be such that the enemy defeated in early engagements is able (due to the temporary nature of defeat) to regain its combat power prior to later engagements. This situation reinforces, for example, the importance of a pursuit following a successful engagement to keep pressure on the enemy during gaps in sequence. Understanding defeat is critical to the control of sequence and tempo.

The Components of Defeat

Now that we understand the meaning of defeat, how do we go about achieving it? Here the discussion normally turns immediately to defeat mechanisms, where, despite significant gaps in modern Australian doctrine, the literature is very rich. However, what is rarely described is exactly how defeat mechanisms achieve defeat. Why does dislocating an enemy lead to its defeat? What about disruption? What is needed is something to explain how those mechanisms work. I will call this 'something' the components of defeat.

In his discussion of defeat mechanisms, Major Douglas J DeLancey of the US Army provides a starting point. He offers that 'when an enemy has lost the physical means or the will to fight, he is defeated'.[10] This provides us two components of defeat: means and will. Means is simple to understand. It is the physical resources, such as weapons, vehicles, aircraft and soldiers, needed for the enemy to prevent the success of the friendly mission or purpose. Will is easy to understand in an intuitive sense, but much more difficult to define. A definition of will by Wayne Michael Hall, in his book *The Power of Will in International Conflict*, runs to 66 words.[11] Helpfully, British Army doctrine states that will has two components: intent and resolve.[12] Intent is thwarted when the enemy no longer believe its aim to be achievable. Resolve is the enemy's strength of will, which is overcome when it is demoralised and no longer has the desire to continue. Therefore, when the enemy no longer has the means or the will (intent or resolve) to prevent the success of the friendly mission or purpose, it is defeated.

Cohesion

Is there a third component? *Australian Defence Force—Philosophical—3 Campaigns and Operations* defines manoeuvre warfare as 'the shattering,

or at least disruption, of the adversary's cohesion and will to fight, rather than concentrating on destruction of adversary materiel or the holding of territory'.[13] This definition includes both means and will as components of defeat, and also introduces the concept of cohesion. Like defeat, cohesion is a term often used but rarely defined. In fact, in researching this article I was unable to find a single definition of cohesion (used in this context) in any doctrine, book or article. Clearly, however, it is hard to shatter an enemy's cohesion without knowing what it is. Understanding cohesion, therefore, is vital in understanding defeat.

Cohesion can be thought of as the bridge between means and will. Cohesion is what allows an enemy's will to leverage its means to achieve the desired end state. Without cohesion, no matter the strength of its will or the capability of its means, an enemy force would have no combat power. Cohesion is what allows combined arms teams to work together, and enables the synchronisation and orchestration of a force. Cohesion is physical, moral and cognitive. Physical cohesion is having the right capabilities at the right place at the right time to achieve the desired effects. For example, an enemy with its artillery out of range of the desired targets would lack physical cohesion. An enemy force that runs out of fuel for its tanks would lack physical cohesion. An enemy with combat forces spread over too great an area to mass decisively would lack physical cohesion.

Moral cohesion is the component most closely linked with the common definition of the word cohesion ('the act or state of cohering, uniting or sticking together'[14]). It is closely linked to the concepts of both morale and will. Moral cohesion is the force that binds individuals into teams, allows them to withstand adversity and loss, and provides them the imperative to exercise initiative and exploit opportunity. For example, an enemy force that consisted of inexperienced soldiers led by unfamiliar leaders would lack moral cohesion. An enemy force that believed it lacked the support of the home population or did not believe in the righteousness of its cause would lack moral cohesion. By way of illustration, a non-military example of moral cohesion is the ball-tampering scandal involving the Australian men's cricket team in 2018. After being caught, despite having the same Australian players opposing the same South African players, the Australian team performance dropped significantly. The Australian team were easily defeated as they had lost their moral cohesion.

Cognitive cohesion is related to an enemy's ability to gather and process information, develop and communicate plans, make timely decisions and adapt to changing circumstances. Essentially, if it happens as part of a staff or inside a command post, it is related to cognitive cohesion. For example, an enemy force that lacked information about the enemy, the terrain, or itself would lack cognitive cohesion. An enemy force that is overwhelmed by information and cannot develop a coherent plan would lack cognitive cohesion. An enemy force that makes poor decisions, late decisions, or no decisions at all would lack cognitive cohesion. The popular expression to 'get inside the enemy's OODA loop'[15] is an example of attempting to degrade cognitive cohesion.

All the elements of cohesion overlap and interrelate, as shown in Figure 1 below. A lack of cognitive cohesion, with a force unable to develop a coherent plan, may result in a lack of physical cohesion, with the force not having the right capabilities at the right place at the right time to be effective. This lack of cognitive and physical cohesion may lead to a lack of moral cohesion, with soldiers losing confidence in their leadership and the effectiveness of their team.

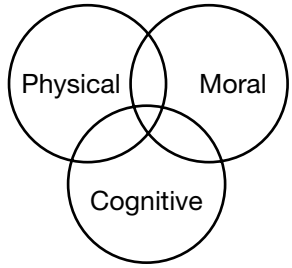

Figure 1. The overlapping and interrelated nature of cohesion

All that remains in discussing cohesion, therefore, is to propose a definition. Noting how broad and intangible the concept is, this is very difficult (which is perhaps why it is not defined elsewhere). However, the aim of this article requires that at least an attempt be made. Therefore a proposed definition is:

> *Cohesion is the largely intangible factor that enables a force to employ its physical strength to achieve its desired end. It is necessary for the different components of a force to work in a coordinated manner towards a common goal. Cohesion has physical, moral and cognitive components. Degrading cohesion degrades combat power; increasing cohesion increases combat power.*[16]

Why Not Just Defeat Will?

Manoeuvre theory is the Australian Army's philosophical approach to warfare, and defeating will is central to this philosophy. *Land Warfare Doctrine 1: The Fundamentals of Land Power* states that manoeuvre's 'essence lies in defeating the enemy's will to fight … rather than destroying his forces',[17] adding that 'the primary objective of manoeuvre is to defeat the enemy's will to fight'.[18] Why then are there three components of defeat? Why do we not focus all efforts on defeating the enemy's will alone? There are a number of reasons. Firstly, it is difficult to distinguish what to attack to influence will directly. For example, it is extraordinarily difficult, particularly at the tactical level, to identify a centre of gravity that undermines the enemy's will to fight. Most attempts to do so lead to an ephemeral, intangible centre of gravity from which meaningful critical vulnerabilities cannot be derived.[19] If, as the tenet requires, we focus all actions on the centre of gravity, how can we attack will directly if we cannot make it the focus of the centre of gravity construct?

Secondly, attacking will directly often requires capabilities and assets that do not exist at all levels of command, and the use of these assets often requires more time and command authority than the circumstances allow. For example, information operations are often cited as a means of attacking will,[20] yet most levels of command do not have the capability to wage effective information operations and do not have the ability to measure the effectiveness of information operations; nor do their missions provide enough time for information operations to be decisive.

Thirdly, the enemy's will, and the threshold at which it will break, is difficult to quantify, which can lead to miscalculation. The 2022 Russian invasion of Ukraine provides a recent example. On 24 February 2022, Russia invaded Ukraine over a wide frontage, from Kyiv in the north to Kherson in the south. The invasion force sacrificed security to facilitate a rapid penetration to points of strategic and political significance. Large-scale air and missile attacks, on targets throughout the length and breadth of Ukraine, were combined with the invasion. While it is perhaps too early to reach concrete conclusions, it is likely that the Russians intended this sudden and massive attack to quickly break the Ukrainian will to resist. The Russians can perhaps be forgiven for their hubris, as even Western intelligence agencies expected Ukraine to capitulate in a matter of days. However, as we now know, the Ukrainian will was not broken and they ferociously defended their nation. The Russian invasion force,

optimised as it was for a 'shock and awe' style attack, was not prepared for a prolonged campaign. The Ukrainians were therefore able to inflict significant defeats on the Russian forces, which simultaneously undermined the Russian and bolstered the Ukrainian will to fight. The initial Russian invasion failed—all due to a miscalculation as to the will of the Ukrainians.[21]

If it is difficult to attack will directly, it may be attacked indirectly. How to do this? Will can be attacked indirectly by attacking the other components of defeat—means and cohesion. This is because there is a relationship between *means*, *cohesion* and *will*. Degrading *cohesion* also degrades *will*. Degrading *means* degrades both *cohesion* and *will*. For example, we might choose to attack an enemy tank company (a component of its means), which forms the counterattack force as part of the enemy's defensive plan. Destroying this counterattack force will degrade the enemy's physical cohesion, as a key capability is no longer in the correct place at the correct time. Cognitive cohesion will also be degraded, as the defensive plan is no longer appropriate and will have to be quickly adapted by the commander and staff. This reduction in means and degradation of cohesion will also result in a reduction of the defenders' will to fight. Knowing there is no longer a counterattack force coming to aid them if they become decisively engaged, they will be more likely to break from their positions rather than continue to fight.

To sum up this section, *means*, *cohesion* and *will* are what the enemy needs to be able to prevent the success of the friendly plan or purpose. Therefore *means*, *cohesion* and *will* are the components of defeat. Remove one and the enemy is defeated. Defeating *will* is the preferred method to achieve defeat; however, attacking *will* directly is difficult. Therefore, *will* must often be attacked indirectly, through attacking *means* and *cohesion*. In this framework, all actions to defeat the enemy are aimed ultimately at defeating *will*, thus aligning with manoeuvre theory. This framework is illustrated in Figure 2 below. The relative weight of the arrows represents the strength of the relationship between the components.

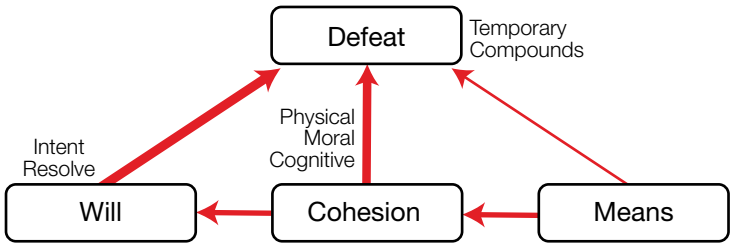

Figure 2. The components of defeat

Relationship with Centre of Gravity

The tenets of manoeuvre direct us to focus all actions on the enemy's centre of gravity. However, what doctrine does not tell us is *how* focusing all actions on the enemy's centre of gravity leads to its defeat. It is outside the scope of this article to discuss centre of gravity theory in detail; however, it is necessary to define the relationship between centre of gravity and defeat. To do this I will use the description of centre of gravity provided in legacy doctrine. While more recent joint doctrine has refined the description, the legacy description better illustrates the relationship with the framework for defeat.

Land Warfare Doctrine 1: The Fundamentals of Land Power defines centre of gravity as the 'characteristics, capabilities or localities from which a nation, an alliance, a military force or other grouping derives its freedom of action, physical strength or will to fight'.[22] This definition has a nice symmetry with the components of defeat previously discussed (means, cohesion and will). Physical strength is an obvious analogue of means, and will to fight speaks for itself. Freedom of action, in this context, can be thought of as the practical expression of cohesion. A force with cohesion has freedom of action; a force without freedom of action lacks cohesion. The centre of gravity construct, therefore, tells us what characteristics, capabilities or localities provides the enemy the means, cohesion and will to prevent the success of the friendly plan. Thus, the critical vulnerabilities identified in the centre of gravity construct tell us ***what*** to target to defeat the enemy's means, cohesion and will.

This is the link between the centre of gravity and defeat, and why focusing all actions on the enemy centre of gravity leads to its defeat. The centre of gravity analysis quantifies the components of means, cohesion and will such that they can be precisely targeted. From this we can also understand more about the centre of gravity construct itself, and that not all critical vulnerabilities are created equal. For example, we know that degrading will is the preferred approach to defeating the enemy. Therefore, when identifying vulnerabilities, we should first seek to identify those that undermine the enemy's will. We should next seek to identify vulnerabilities that undermine the enemy's cohesion. Only then should we look for vulnerabilities that undermine the enemy's means. Such a prioritisation better enables us to identify the best mechanism to quickly defeat the enemy.

Defeat Mechanisms

Now that we understand the components of defeat, we can turn our attention to defeat mechanisms themselves. Unhelpfully, Australian doctrine does not provide a definition of defeat mechanism. In its place, the US Army definition will suffice: 'the method through which friendly forces accomplish their mission against enemy opposition'.[23] This definition nests nicely with the definition of defeat proposed in this article as it frames defeat mechanisms in terms of the accomplishment of the friendly mission. As previously discussed, the centre of gravity construct tells us *what* to attack to degrade the enemy's means, cohesion or will. The defeat mechanism provides us the *how*—that is, the mechanism by which we attack critical vulnerabilities to degrade means, cohesion or will to defeat the enemy. It is with defeat mechanisms that the intellectual framework so far described turns into physical action on the ground.

There is no one accepted list of defeat mechanisms. Leonhard gives us *pre-emption*, *dislocation* and *disruption*.[24] US Army doctrine gives us *destruction*, *dislocation*, *disintegration* and *isolation*.[25] Delbruck gives us *annihilation* and *exhaustion*.[26] British Army doctrine gives us *surprise*, *pre-emption*, *dislocation*, *disruption* and *destruction*.[27] Wass de Czege gives us *attrition*, *dislocation* and *disintegration*.[28] Australian Army doctrine does not contain a list of defeat mechanisms; however, various parts of doctrine refers to *pre-emption*, *dislocation*, *disruption* and *destruction*.[29] There is no need for a definitive list of defeat mechanisms, as it would artificially limit creativity. However, it is the defeat mechanisms of *pre-emption*, *dislocation*, *disruption* and *destruction* that will be explored here.

Pre-emption is the first and most powerful defeat mechanism. Pre-emption is acting before the enemy to seize or remove an opportunity. Thus, possible enemy courses of action are negated as the opportunity to implement them no longer exists. Pre-emption can be considered a special category of defeat mechanism, as successful pre-emption does not so much defeat the enemy as make defeat unnecessary. However, relating pre-emption back to the categories of defeat, we can say that pre-emption is aimed at defeating will. Specifically, it targets the *intent* component of will, as the enemy will believe its aim to be no longer achievable. This is why pre-emption is the most powerful defeat mechanism—it is the one that acts most directly on defeating the enemy's will.

Dislocation is the second defeat mechanism. *Australian Defence Force—Philosophical—3 Campaigns and Operations* defines dislocation as 'action to render an adversary's strength irrelevant'.[30] Leonhard identifies four types of dislocation—positional, temporal, functional and moral.[31] The types of dislocation (with positional dislocation changed to physical dislocation) were defined in obsolete versions of doctrine, but do not appear in current versions.[32] However, physical dislocation is causing the enemy strength to be in the wrong place. This can be achieved by moving the enemy strength away from the decisive point, or by moving the decisive point away from the enemy strength. Temporal dislocation is manipulating time and tempo such that the enemy cannot bring its strength to bear in time. Temporal dislocation is what powers the principle of war of surprise. Functional dislocation is causing the enemy to have the wrong type of strength for the current problem. Obliging the enemy to fight a mobile campaign with dismounted forces would be an example of functional dislocation. Moral dislocation is exploiting a force's ethics, laws and political considerations such that it cannot employ its strength. Operating from an area filled with non-combatants, knowing that rules of engagement will prevent effective fire, is an example of moral dislocation.

Linking dislocation back to the components of defeat, dislocation primarily targets the enemy's cohesion. It does not take a great leap of imagination to understand that physically dislocating the enemy leads to degrading physical cohesion, or that morally dislocating the enemy leads to degrading moral cohesion. Essentially, dislocation denies the enemy the physical, moral or cognitive cohesion needed to employ its strength effectively. As dislocation does not involve a direct attack, it does not have any effect on means (which is what distinguishes it from disruption, discussed next). However, dislocation, particularly moral dislocation, also has some small effect directly against the enemy's will.

Disruption and destruction are similar and will be tackled together. *Australian Defence Force—Philosophical—3 Campaigns and Operations* defines disruption as 'a direct attack that neutralises or selectively destroys key elements of the adversary's capabilities'.[33] It defines destruction as 'sufficient damage of an enemy state or non-state adversary that it is unable to return to conflict'.[34] Disruption and destruction can be confused as they both involve a direct attack. What then is the difference?

The key difference is that destruction attacks the enemy's strength directly, while disruption attacks the enemy's strength indirectly through vulnerabilities. For example, we might identify an enemy's strength to be its tank company. Destruction would attack this strength directly. This would see the tanks themselves targeted and destroyed. Disruption would attack this strength indirectly by targeting the vulnerabilities identified for that tank company. For example, we might destroy command links to prevent the tank company from receiving coherent orders. We might destroy fuel trucks to prevent the tanks from being able to manoeuvre. We might destroy ground-based air defence assets so that the enemy commander will not deploy the tanks, fearing air attack. Clearly, disruption is reliant on having completed a centre of gravity analysis to determine vulnerabilities.

Destruction, then, works entirely against the component of means. Destruction takes away from the enemy the means to interfere with the friendly plan. Disruption, on the other hand, works primarily against the component of cohesion. Disruption attacks those things that are needed for the enemy to employ its means. Put another way, disruption attacks those things that provide the enemy force its cohesion. Disruption has no effect directly against the enemy's will. However, as disruption involves a direct attack, it also has some effect on the enemy's means.

To summarise, defeat mechanisms are the method (the how) by which we target identified vulnerabilities (the what) to degrade the components (means, cohesion and will) to defeat the enemy. The defeat mechanisms explored here are pre-emption, dislocation, disruption and destruction. Pre-emption works entirely against will, dislocation primarily against cohesion and secondly against will, disruption primarily against cohesion and secondly against means, and destruction entirely against means. Figure 3 below illustrates the complete framework for defeat. The relative weight of the arrows represents the strength of the relationship.

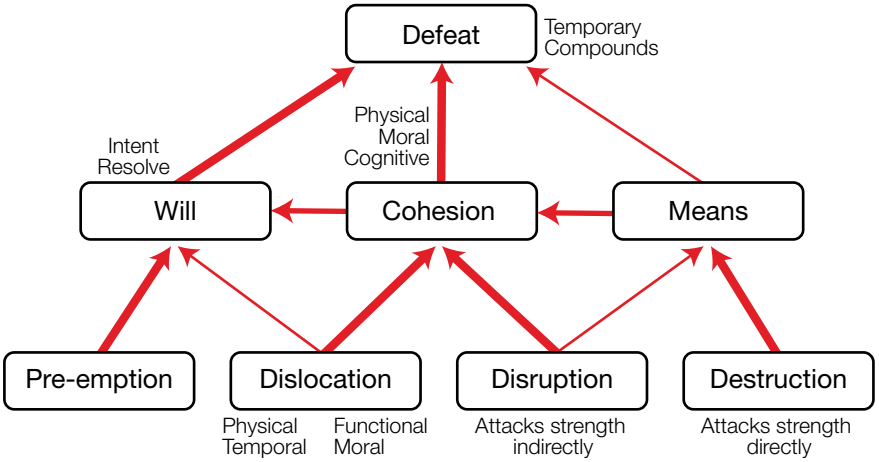

Figure 3. The completed framework for defeat

Is Destruction a Defeat Mechanism?

Destruction is often rejected as a defeat mechanism, either because it is viewed only as an effect that contributes to the other defeat mechanisms, or because it is viewed as inherently attritionist in nature, which is the antithesis of manoeuvre warfare. However, to be complete any framework for defeat must include destruction as a defeat mechanism and have practical value in application. The current definition of disruption ('a direct attack that neutralises or selectively destroys key elements of the adversary's capabilities') requires that, for disruption to be applied at a higher echelon, destruction will likely have to be applied at a lower echelon. For example, for a brigade to apply disruption as a defeat mechanism, it will likely have to task a battalion to destroy something. The battalion, therefore, will likely employ destruction as a defeat mechanism to achieve its mission. Not including destruction as a defeat mechanism would imply that we would never seek to destroy an enemy's strength, at any echelon. While this might sound appropriate to the theoretician, such a framework would have very little value to the practitioner who must work within the practical realities of the battlefield.

In addition, under this framework for defeat, we use the mechanism of destruction not only to destroy the enemy's means but ultimately to defeat its will. British Army doctrine lays this out clearly: 'attacking and destroying physical capabilities is therefore required by the manoeuvrist approach as a

means to an end of defeating the enemy's will to fight'.[35] Thus, destruction is not inherently attritionist in nature and is a necessary part of manoeuvre warfare.

Is There a Hierarchy of Defeat Mechanisms?

Is there a hierarchy of defeat mechanisms? Should we prefer to use one rather than the others? Leonhard provides the hierarchy as pre-emption, dislocation, and disruption.[36] In accordance with the previous section, we can add destruction to this hierarchy after disruption. Based on the framework so far established, this order intuitively makes sense. If the primary objective of manoeuvre is to break the enemy's will, we should therefore prefer the mechanisms that attack will most directly. Logically, Leonhard's order (with destruction added) makes sense. As pre-emption acts only against will, it is the most preferred. As destruction attacks will the most indirectly, it is the least preferred.

However, there is another way to look at the hierarchy of defeat mechanisms. Earlier it was identified that defeat is temporary and that defeat compounds. Much of the art of war involves sequencing actions to compound defeat both horizontally and vertically, without providing the enemy the time to recover from its defeats. However, every action against the enemy costs resources. Those resources could be fuel, time, casualties or political will. Any resources expended now at the current enemy cannot be expended later at the next one. Therefore, we should seek to defeat the enemy with the least expenditure of resources, to retain as many resources as possible for the next action in sequence. Defeat mechanisms, therefore, should be preferred based on their efficiency—the amount of resources needed to be successful.

Using this logic, the order suggested by Leonhard cannot be the answer in all circumstances, as the most efficient defeat mechanism will change based on the circumstances of the mission. It was established earlier that defeat is temporary and that, when developing a plan, commanders and staffs must appreciate for how *long* the enemy must be defeated for it to achieve its mission. This temporal factor might determine which is the most efficient defeat mechanism. Revisiting the earlier example, a destroyed tank battalion will be defeated for longer than a tank battalion that is merely dislocated. In this instance, destroying the tank battalion may require less resources than seeking to keep the battalion dislocated for the entire length of the mission. In this situation, destruction might be the most efficient defeat mechanism and

therefore the most preferred. Whatever the circumstances of the mission, it is vital to employ defeat mechanisms based on their efficiency, as this is what enables us to better control sequence in war.

Conclusion

Understanding defeat is vital to understanding the Australian Army approach to warfare. Yet current Army doctrine does not define defeat, or the components and mechanisms that achieve defeat, in a useful way that aids this understanding. This is a recent oversight, as legacy doctrine *did* include adequate descriptions of many of these concepts. This article has proposed a framework for defeat that fills the gaps in contemporary doctrine and links disparate concepts into one coherent whole.

It is recommended that *Land Warfare Doctrine 1: The Fundamentals of Land Power* is updated to include a framework for defeat that defines and describes the concepts and terms discussed in this article. In addition, subordinate doctrine, such as *Land Warfare Doctrine 3-0-3: Formation Tactics*, should be updated to include how tactical tasks and techniques support the achievement of defeat mechanisms and thus contribute ultimately to the enemy's defeat. Such an update would provide commanders and staffs the intellectual framework to develop plans that link tactical action on the ground to the enemy's defeat, thus fulfilling the Army's purpose.

About the Author

Major Mark Sargent is a Cavalry officer, with regimental service at the 2nd Cavalry Regiment and B Squadron 3rd/4th Cavalry Regiment, in addition to numerous training appointments in Australia and the United States. He has operational experience in Iraq and Afghanistan. MAJ Sargent is currently the Officer Instructor – Armour at Combat Command Wing, Combined Arms Training Centre.

Endnotes

1 Australian Army, 2017, *Land Warfare Doctrine 1: The Fundamentals of Land Power* (Canberra: Commonwealth of Australia), 19.

2 The 2020 Defence Strategic Update states three new defence objectives—to shape Australia's strategic environment; to deter actions against Australia's interests; and to respond with credible military force, when required. Implied in responding with credible military force is the need to defeat adversaries. Department of Defence, 2020, *2020 Defence Strategic Update* (Canberra: Commonwealth of Australia), 25.

3 Poor syntax in the original. Department of Defence, 2021, *Australian Defence Force—Philosophical—3 Campaigns and Operations* (Canberra: Australian Defence Force), 117.

4 Department of the Army, 2019, *Army Doctrine Publication 3-0: Operations* (Washington DC: Department of the Army), 2-4.

5 This paragraph is drawn from Robert A Doughty, 2014, *The Breaking Point: Sedan and the Fall of France, 1940* (Mechanicsburg: Stackpole Books).

6 Brett A Friedman, 2017, *On Tactics* (Annapolis: Naval Institute Press), 16.

7 Cornelius Tacitus, 2015, *The Germany and the Agricola of Tacitus: The Oxford Translation Revised, with Notes* (CreateSpace Independent Publishing Platform).

8 These two paragraphs are drawn from Gordon Corrigan, 2014, *Waterloo: A New History* (New York: Pegasus Books).

9 Robert R Leonhard, 2017, *Fighting by Minutes: Time and the Art of War* (independently published), 130.

10 DJ DeLancey, 2001, *Adopting the Brigadier General (Retired) Huba Wass de Czege Model of Defeat Mechanisms Based on Historical Evidence and Current Need* (Fort Leavenworth: School of Advanced Military Studies), 10.

11 'The appearance of one's desire, volition, life force—empowered by potency of resolve and willingness to sacrifice, that when yoked with strength of motive and appropriate capabilities, provides action sufficient to accomplish or satisfy an aim, goal, objective, strategy and thereby imposing one's desires over and gaining the acquiescence of a resisting entity or understanding the phenomenon sufficiently to resist such attempts from another human entity.' Wayne Michael Hall, 2018, *The Power of Will in International Conflict* (Praeger Security International).

12 British Ministry of Defence, 2017, *Army Doctrine Publication: Land Operations* (Warminster: Ministry of Defence), 5-4.

13 Department of Defence, 2021, 12.

14 *Macquarie Dictionary Online*, 2021, Macquarie Dictionary Publishers.

15 Observe, Orient, Decide, Act—a decision cycle developed by military strategist and United States Air Force Colonel John Boyd.

16 There is an interesting parallel between the elements of cohesion (physical, cognitive and moral) and the components of fighting power (physical, intellectual and moral).

17 Australian Army, 2017, 31.

18 Ibid. 33.

19 Aaron P Jackson, 2017, 'Center of Gravity Analysis "Down Under": The Australian Defence Force's New Approach', *Joint Force Quarterly* 84: 84.

20 Information operations: 'The operational level planning and execution of integrated, coordinated and synchronised kinetic and non-kinetic actions against the capability, *will* and understanding of target systems.' There is a symmetry between this definition and the components of defeat. Department of Defence, 2016, *Australian Defence Force Publication 3.13.1: Information Operations Procedures* (Canberra: Australian Defence Force), 1-3.

21 This paragraph is drawn from Brian M Jenkins, 'The Will to Fight, Lessons from Ukraine', *The RAND Blog*, Rand Corporation, 29 March 2022.

22 Australian Army, 2017, 34.

23 Department of the Army, 2019, 2-4.

24 Robert R Leonhard, 1991, *The Art of Maneuver* (New York: Ballantine Books), 61.

25 Department of the Army, 2019, 2-4.

26 Hans Delbruck, 1985, *History of the Art of War within the Framework of Political History IV* (Westport: Greenwood Press).

27 British Ministry of Defence, 2017, 5-4.

28 De Lancey, 2001, 20.

29 *Land Warfare Doctrine 1: The Fundamentals of Land Power* lists dislocation, disruption and destruction as means of defeating the enemy's centre of gravity. *Australian Defence Force Publication 3.0: Campaigns and Operations* includes pre-emption as an effect that can be generated at the operational level. While neither document refers specifically to defeat mechanisms, the terms are used in that context.

30 Department of Defence, 2021, 75.

31 Robert R Leonhard, 1998, *The Principles of War for the Information Age* (Novato: Presidio Press), 65.

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33 Department of Defence, 2021, 75.

34 Ibid., 117.

35 British Ministry of Defence, 2017, 5-4.

36 Leonhard, 1991, 79–80.

Ignorant Amateurs: Remediating the Surprise and Deception Knowledge Deficit

James Casey

The Australian Army's understanding and employment of both surprise and deception are poor. This is despite both concepts being used extensively and to devastating effect in contemporary conflicts. It is telling that the effective use of surprise and deception almost invariably occurs when playing the enemy as the opposing force during major exercises, when the aversion to risk and imprisonment by doctrine is temporarily suspended. This deficiency is due in no small part to the lack of education and development in our training continuum, beginning for officers at Duntroon. Regrettably, when a concept is poorly understood and rarely exercised it inevitably becomes impossible to teach without conscientious study. This is a dangerous situation; neither students nor instructors understand that a plan will conform to the enemy's expectations if it does not incorporate surprise and deception. This situation is intolerable for a professional army. As British military theorist Major General John Fuller wrote, 'As long as we remain amateurs we shall be surprised, sometimes by the substance of the enemy, but more often by the shadows of our ignorance'.[1]

Surprise and deception may be correlated, but one does not necessarily precede, or rely on, the other. There are occasions when we can deceive without causing surprise, and when we can surprise without deceit. This article will explore why surprise and deception are so poorly understood and employed in the Australian Army, before explaining concepts central

to achieving surprise. The discussion will be followed by a section linking surprise to deception and outlining how the two concepts can be employed in military planning. Finally, the article makes recommendations to support the development of Army's understanding of surprise and deception.

This paper is a result of the author's experiences in training and operations over more than a decade. The author does not contend that surprise is absent entirely from Army, only that surprise is neglected in Army's institutional and professional thinking. Accordingly, it is focused on commanders and staff at the tactical levels of command. However, the discussion of surprise and deception is relevant across the joint force and at the operational level.

The Problem

The Army's definitive source of tactical wisdom describes surprise as something we seek to impose upon the adversary while guarding ourselves from the same.[2] Although there is reference in training to decision cycles such as Boyd's OODA Loop (Observe, Orient, Decide, Act), subsequent exploration of the topic of surprise is, in practice, limited by the knowledge of the instructor.[3] This assertion is consistent with the author's experience during his own career development. Specifically, when the student body of his Combat Officers Advanced Course expressed the view that widespread ignorance of the operating principle of surprise amounted to a collective weakness within Army, the concept was explained as a jaw-dropping moment of indecision. Beyond this, however, the staff were at a loss to explain how one might achieve it. As a result, the author completed the course remaining ignorant as to what surprise 'is' and how it is best achieved.

Even when advocating for surprise and deception as an integral part of brigade planning, the author was unable to articulate *what* surprise was and *how* it could be achieved. After types of surprise were broached by Major General Michael Krause during a 3rd Brigade sub-unit commanders' tactics week in 2014, a search of doctrine for more information proved fruitless. This situation posed a significant challenge: how could an experienced combat officer be unable to articulate ends, ways and means of such a crucial principle of war? A survey of 12 combat corps sub-unit commanders and senior captains, selected at random from the 3rd Brigade in the wake of the tactics week in 2014, revealed a common shortcoming. This revelation inspired the author's further study.

The achievement of surprise—and its partner, deception—is highly beneficial to any military plan directed against an adversary. Surprise that is planned creates uncertainty at least, and ideally an atmosphere of chaos from which order proves illusory—clearly unfavourable circumstances for an adversary. Having planned for and achieved surprise (or, far less likely, having achieved surprise by chance), the cunning commander benefits from the more desirable environment that accompanies being able to operate in circumstances of relative certainty for which they are actually prepared. A review of literature by celebrated strategists reinforces the emphasis placed on the concept of surprise. For example, the Chinese strategist Sun Tzu provided that '[h]e will win who, prepared himself, waits to take the enemy unprepared'[4] and 'all warfare is based on deception'.[5] Napoleon asserted that '[t]he strength of an army … is estimated by multiplying the mass by the rapidity; a rapid march augments the morale of an army, and increases all the chances of victory'.[6] Clausewitz famously declared that 'surprise lies at the foundation of all undertakings without exception, only in very different degrees according to the nature of the undertaking and other circumstances'. He named 'secrecy and rapidity' as the cornerstone of surprising the enemy, outlining the effects of shattering morale and imposing confusion on one's adversary in addition to achieving unexpected gains.[7] There is, as Luckie cites, a long list of learned strategists over history who echo the same or similar sentiments over centuries.[8]

Looking to contemporary military doctrine beyond the Australian Army, the United States Marine Corps has a 200-page pamphlet dedicated to exploring the concept of surprise. Admittedly, while this document emphasises the importance of surprise to victory and outlines case studies where surprise has been employed successfully, it does not provide a theoretical framework for understanding ways and means.[9] Similarly, the United States Army's combined arms doctrine on offence and defence provides only three paragraphs on surprise. It provides no framework but contains a cursory explanation of what surprise achieves and methods of achieving it.[10] While United States doctrine is readily available, it is reasonable to deduce from the cited historical literature that similar treatments exist across armies, not just those of the West. However, a survey of the Australian Army's manoeuvre doctrine illustrates that our existing theoretical exploration of surprise provides the most cursory insight into the *ends* we seek to achieve, and categorically fails to explore the *ways and means*.[11]

Examination of Australian Army doctrine clearly identifies a gap in the theoretical treatment given to surprise as a principle of war: our doctrine is almost entirely silent on the matter. Within Army's capstone doctrine on warfare, *Land Warfare Doctrine 1: The Fundamentals of Land Warfare*, the word 'surprise' appears only six times—four of those occasions being in the explanation of surprise as a principle of war. While the pamphlet does link surprise to deception, it limits discussion to circumstances in which surprise achieves disproportionate results, without further examination of how or why. Disappointingly, Army's principal philosophical treatise of manoeuvre theory, *Land Warfare Doctrine 3-0: Operations*, mentions surprise only four times—three of those occasions being in the same paragraph, with one being the paragraph title. There is no further exploration of the concept. Interestingly, *Land Warfare Doctrine 3-0-3: Formation Tactics* has surprise appear 35 times, but on each occasion surprise is discussed simply as a condition to inflict upon an adversary while avoiding the reverse. A single example on basic considerations for the attack fleetingly mentions method, but there is no exploration of ends, ways or means. While *Land Warfare Doctrine 5-0: Planning*, mentions surprise once, it refers only to the relevance of surprise to manoeuvre theory, without further exploration. There is no discussion on surprise as a foundation upon which to plan. *Land Warfare Doctrine 5-1-4: The Military Appreciation Process* (11 times); *Land Warfare Doctrine 3-3-7: Employment of Infantry* (five times); *Land Warfare Doctrine 3-3-4: Employment of Armour* (11 times); and *Land Warfare Procedures—General 3-3-2: Deception* (23 times) all mention surprise, but all refer to the concept as something to employ or guard against, without further exploration. *Australian Defence Force—Philosophical—3 Operations* is similarly mute. Despite surprise being identified as pivotal to Special Forces operations, *Australian Defence Force—Integration—3 Special Operations* is similarly lacking in its exploration of surprise, only going so far as to associate it with speed. Despite the self-evident value of surprise, our doctrine, instruction, and practice fail to adequately respect it. This failure manifests itself in an almost exclusive reliance on achieving surprise by chance, rather than by design.

This summary provides a snapshot of the limited nature of Army's understanding of surprise. Our philosophical doctrine does not provide a framework for understanding the concept, and the most relevant procedural pamphlets do not explore methods for practical application of such a framework. It is concerning that our doctrine neglects a principle of war

that the great military theorists consider so ***essential*** in military planning.[12] This situation contrasts with the way which deception is treated in our doctrine. It has its own pamphlet which explores the concept in depth. It is noteworthy that the prominence of surprise and deception in Western military theory has waxed and waned—a clear example being between the American Civil War and the Second World War.[13] Luckie describes how, with the emergence of philosophers such as JFC Fuller, the interwar period reinvigorated within the United States Army the concept of surprise as a psychological effect to erode cohesion (in the tradition of Clausewitz and Sun Tzu). He also describes an ebb and flow in how surprise was discussed by military practitioners during the Cold War, reflecting changes in the level of confidence of the United States in its strategic environment.[14] While isolated to the United States, the wider philosophical dedication to the nuclear and proxy wars of the Cold War and War on Terror eras are reflected in United States Army doctrine that characterises surprise as 'sudden changes in scope, type or intensity' of limited and cold wars.[15]

Exploring Surprise

Surprise is a disorientating effect caused when reality does not conform to expectations; the more drastic the difference, the greater the intensity of surprise.[16] Surprise occurs either because the circumstance was unanticipated, or because it was anticipated but one is unprepared to respond effectively. Surprise compels the enemy command system to divert from the pre-existing plan and to commence a decision cycle in response; each affected command must depart from the original plan to design, communicate and execute a new one. The achievement of surprise goes beyond forcing an opponent to react to the anticipated; contingencies such as 'on order' and 'be prepared to' responses are examples of anticipated reactions and cannot be classed as unexpected. It is surprise that allows the initiative to be retained, obtained, or seized from the enemy. The incorporation of surprise as the basis for course of action development lies at the foundation of manoeuvre theory because it involves designing a situation that deteriorates for the enemy more quickly than their system can cope with. If surprise is imposed at every echelon of an enemy formation, each commander is forced to undertake a decision cycle to adapt their plan in response. At the same time, each commander's subordinates and superiors are similarly reacting to their own surprise, adapting their plans,

and attempting to communicate both the unfolding situation and their amended plans. In this situation, the opponent's command and control system becomes saturated with new directions, sometimes conflicting and counter-intuitive, creating confusion as the system overloads. The desired result is to dislocate the enemy commanders, at each echelon, from both their superior and subordinate plans for battle. Against adversaries with rigid command structures, or those who do not effectively employ mission command, achieving this effect can be decisive incredibly early in an action.

Surprise is neither a supporting concept nor an afterthought that can be appended after a course of action concept is built and tested; it must be a foundational and deliberate element of the planning process. Chiefly, achieving surprise must be an attitude that pervades the culture of a headquarters and must be explicit in the commander's vision and guidance. Any plan that does not explicitly seek to achieve surprise must be discarded on the grounds that it almost certainly conforms to the enemy's design for battle and relies on chance alone to create asymmetry by imposing upon the enemy a decision cycle in completely unforeseen circumstances. A plan without surprise is one the enemy has almost certainly war-gamed in whole or in part. The imperative is more compelling when we turn to historical data, such as that explored by Franklin:

> *Out of 59 battles fought [surveyed between 1914 and 1967] without any initial surprise, only 2% exceeded its general's expectations, while 60% ended in abject failure. Conversely, out of 50 battles where surprise was intense (rated 3 or more on a 0–5 scale), 34% far exceeded their objectives and only 2% ended in defeat.*[17]

Ends, Ways and Means

The Australian Army understands how manoeuvre theory aims to undermine and overwhelm an enemy's command system. However, in defining surprise too simply we inadequately describe the ***ends*** we seek to achieve. Surprise has two primary forms (ends): moral and material.[18] Moral surprise is achieved when the enemy is caught completely unaware and unprepared by the unexpected.[19] It is the astonishing, confusion-inducing action that renders void, in whole or in significant part, the enemy's design for battle. It is the most intense type of surprise and, because of its scale, can usually only be achieved once across the echelons in any single action. Material surprise

is achieved when the enemy is aware or prepared but is unable to react effectively. While material surprise may not render the enemy plan for battle void, it nevertheless requires a commander's assessment and intervention to respond adequately. Importantly, material surprise can be regenerated even after its initial impact is lost. Material surprise can be achieved with or without moral surprise; if moral surprise cannot be achieved or is lost, material surprise can still be achieved within the same action. Material surprise can also be achieved—and is used to best effect—at multiple echelons in an action, and in a combination of varieties which will be discussed below.[20] A simple metaphor frames the two: a boxer expects to be hit but may not be prepared for a kidney punch—material surprise; a boxer is completely unprepared to be punched by the referee—moral surprise.

We can consider surprise as having six varieties (ways).[21] First is *intention*: the enemy is unaware of or does not wholly anticipate the intentions with which you manoeuvre your force. Simple options such as attack or defence, selection of objectives, or employment of specific capabilities—which are not expected—can lead an enemy to err in the preparation of their forces. Second is *time*: the enemy is unprepared or does not anticipate when you arrive, typically when forces project more quickly than expected. Third is *place*: the enemy does not anticipate the place at which you appear. This concept of place can be tied closely to intention; however, when surprise of time and surprise of place are used in concert, the effects of both are magnified. Fourth is *force*: the enemy is presented with a greater amount of combat power than is anticipated. This force does not have to be a physical unit but can equally be an effect. Fifth is *method*: the enemy does not anticipate how your forces are grouped, arrayed or employed; that is, the tactics and techniques usually used are altered. This can be reflected in the tactics used, such as bypassing instead of attacking the composition of forces, or in how they are employed, such as using artillery in a direct fire, support by fire role. Sixth is *technology*: the introduction of new technology the enemy cannot immediately counter. This is the most difficult form of surprise to achieve at the lowest levels of command, and it is unique in that—once it is employed—the enemy system adapts to render the advantage void in a relatively short period of time. Examples include the machine gun in the First World War, and the use by insurgents more recently of different types of triggers for Improvised Explosive Devices. For each variety of surprise, the capabilities, techniques, and tactics form the means to employ them; they are limited only by the resources available and the imagination of the commander.

Surprise is most effective when multiple varieties are used concurrently, or sequentially in a single action. Commanders should plan to employ at least one variety of surprise at each echelon of an operation, thus surprising the enemy at every echelon and every opportunity. Planning to employ types and varieties of surprise requires the enemy's perception of the situation to differ from reality long enough for that difference to be exploited. Unless additional measures are employed, achieving surprise is contingent on the enemy being kept uncertain; this is both unrealistic and an unnecessary gamble. A more efficient approach is to project a situation that differs from the reality and shape the enemy's perceptions to compel action, or inaction, that is to our benefit—that is, to deceive them.

Incorporating Deception

Sir Winston Churchill, speaking to Joseph Stalin, described deception as the 'bodyguard' of surprise.[22] Relative to surprise, deception is a more familiar but similarly misunderstood concept. What is not well grasped is ***why*** we attempt to deceive the enemy and how to do it. Often a deception plan involves concealing or misrepresenting strengths or dispositions, seeking to create or increase uncertainty to that end alone. This approach demonstrates a lack of understanding of the purpose of deception, despite the Army's doctrinal publication *Deception* exploring the subject in substantial detail.

A successful deception makes the enemy act to their detriment by presenting a perceived situation of our design, forcing a reaction that creates opportunities for exploitation. However, deception is not merely misrepresenting reality or creating uncertainty—after all, war is characterised by uncertainty. Uncertainty is exceedingly difficult to quantify and attempting to create uncertainty for its own sake fosters unpredictable outcomes, resulting in a waste of resources to no discernible effect. Instead, true deception reduces the enemy's uncertainty by creating or reinforcing a false understanding of the situation that compels the enemy to conform to our designs and reduces their freedom of action when confronted with reality.[23] This is markedly more advantageous, measurable and efficient.

The effective employment of deception requires the understanding and deliberate leveraging of cognitive biases. Deception is best applied when the inherent biases of the enemy are used against them. Four significant biases

are relatively easy to exploit and present opportunities for deceit. Firstly, 'anchoring bias' favours initial information despite subsequent information contradicting, or altering the context of, the initial information. Anchoring bias may lead a commander to focus on the contents of an initial report, and disregard or discount subsequent reports that modify or contradict the original information.[24] Secondly, 'availability bias' favours information that is readily accessible, on hand or recalled easily, such as using irrelevant or outdated experience to direct a course of action, despite expertise or the situation requiring otherwise.[25] Thirdly, 'self-serving bias' enhances one's inflated belief in oneself or the team, including the individual's or team's ability to overcome the capacity of an opponent, or the environmental conditions. Self-serving bias may equate to believing one's rank confers more relevant experience than actually exists, or that the amount of staff effort expended will translate into decision superiority.[26] Fourthly, 'confirmation bias' is the tendency to seek out information that validates past decisions or opinions, such as accepting information confirming an assumption as reliable but interrogating or dismissing differing information.[27] In many respects, this is the most dangerous bias because information that is believed or assumed escapes criticism, whereas other information is doubted or disregarded.

In creating courses of action, planners must create a plan that exploits the enemy's cognitive biases by *appearing* to conform to a likely course of action; supports that appearance with *convincing and believable* deception measures and techniques; compels the enemy to act *to their detriment* and our advantage; and deliberately seeks to achieve moral and material surprise. This can be difficult to achieve when under pressure, with limited resources, or where the appetite for risk restricts options necessary for a successful deceit. In particular, risk aversion can be institutionally ingrained because many capabilities (such as artillery and electronic warfare) cannot accurately be replicated in training. An example of availability bias is that our planners are commonly reluctant to employ capabilities they do not understand and instead favour those within their realm of understanding. Consequently, these capabilities are institutionally misrepresented and perpetually misunderstood in exercise planning and conduct. The result is an institutional aversion to risk based on a lack of knowledge. This situation must be addressed through education, boldness, and an appreciation of calculated risk.

The Way Forward

Despite surprise and deception being poorly understood and applied within the Australian Army, there is opportunity to rectify this shortcoming. Army should institutionalise an understanding of surprise by updating doctrine to explore the philosophy of surprise more coherently. This need not be a standalone publication; adequately taught, the subject matter is neither complex nor intellectually burdensome. Instead, the principles of surprise and deception could be included as a chapter or section in one of several appropriate pamphlets—for example, *Operations* or *Deception*, the latter of which is well written and, at only four chapters in length, could readily and usefully be augmented. In the interim, directed reading could be disseminated by Forces Command or Army Headquarters. Major Charles Franklin's monograph *Tactical Surprise: Beyond Platitudes* is available online from the US Defense Technical Information Center[28] and is an excellent start point. It is recommended for junior officers, non-commissioned officers and instructors. At 40 double-spaced pages, it is easy to digest and explores both surprise and deception at a level of detail that is directly relevant to military planning. Either alternatively or subsequently, a doctrine note could be raised to facilitate awareness of the subject matter and enable it to be understood and taught in training establishments. Such an approach would afford added legitimacy to the subject matter across the Joint Force. Beyond these measures, existing doctrine, aides-mémoire, and handbooks that discuss surprise should be amended where appropriate to define, refer to, or at least list the types and modes of surprise.

The emphasis on the principles of surprise denoted by these proposed doctrinal amendments, and their supporting communications, will give licence to training institutions to adequately teach and incorporate surprise more substantively into assessments throughout Army. The subject can be quickly and easily produced as a video resource and provided as part of online reading packs for career courses, or for personal study using *The Cove* or similar means. As a matter of urgency, and to address the dearth of training guidance, Army should institutionalise the fundamental requirement of surprise in all military planning, requiring the rejection of courses of action that do not provide ways and means with which to achieve surprise. At every headquarters level, commanders and planners must be rapidly indoctrinated with the lore that a plan that is not founded upon the achievement of surprise delivers the enemy a course of action they have

already war-gamed. Amending doctrine, particularly the Military Appreciation Process, to include this requirement when testing course of action concepts is one way to achieve this outcome. It is essential that the imperative of surprise is not just isolated to manoeuvre warfare, though that is often where it is most relevant. Where synchronisation does not allow supporting concepts to achieve surprise independently, arrangements must be nested within a broader plan to achieve surprise.

Conclusion

In an increasingly uncertain strategic environment, Army needs to embrace surprise and deception in planning at an institutional level. While the circumstances of recent operations by the Army's conventional forces have accommodated the status quo, contemporary state-sponsored conflicts have demonstrated that our next adversary is highly unlikely to be so forgiving. The proper acknowledgment of surprise and deception as fundamental to military planning needs to be addressed with urgency.

Surprise is a combat multiplier that has been recognised for centuries as the key to military success, arguably the decisive factor. It is closely related to deception, in that the latter is most effectively employed to facilitate or amplify the former. In contemporary operational theatres, we observe surprise and deception providing marked advantages across the levels of conflict. To diminish its importance is both dangerous and negligent. Although we can observe contemporary examples of surprise and deception, Army needs a conceptual framework to understand surprise (in particular) so that personnel at all levels can understand not only the ends but also the ways and means of employing this important principle of war. Such a framework will guide the incorporation of surprise and deception into planning across the spectrum of competition and conflict.

Planning to achieve moral or material surprise—and employing single or combined varieties of surprise at each echelon—is fundamental to imposing surprise upon the enemy. Understanding an enemy's perceptions and biases, exploiting those biases by appearing to conform to expectations, making that appearance convincing and believable, and then causing the enemy to act to their detriment for our exploitation is the 'golden path' to achieving victory on the battlefield. A plan that has at its core a sound plan to deceive and surprise the enemy is unlikely to have been war-

gamed by the enemy. Therefore, it is more likely to catch them unaware or unprepared, thus awarding the cunning commander both the initiative and a marked advantage at the commencement of the action. For the surprised commander, it immediately degrades the operational situation, requiring that they compensate and respond before the situation deteriorates further. There can be no better reason for the Australian Army to correct the existing deficit in our knowledge of, and our attitudes towards, surprise and deception in planning.

About the Author

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Motorised, Mechanised and Armoured Infantry: A Short History of the Development of Armoured Vehicle-Borne Infantry and Its Relevance to the Australian Army Today

Leo Purdy

Introduction

Project Land 400 Phase 3 aims to introduce into service an infantry fighting vehicle (IFV). This will replace Army's aged armoured personnel carrier (APC) capability, which has been in service since 1965. The IFV acquisition provides Army's infantry with enhanced firepower, mobility and protection to enable them to fight, win and survive close combat in the contemporary threat environment. However, discourse on the acquisition has often suffered from a poor and incomplete understanding of the differences between IFVs, APCs and other armoured fighting vehicles (AFVs). Equally, it is evident that the differences between the different types of infantry forces which operate AFVs and the approaches which guide their employment are also not well understood. Therefore, to inform discussion on this important project, it is necessary to examine the development of the IFV as well as the types of infantry forces which operate IFVs.

This article provides a short history of the development of armoured vehicle-borne infantry over the course of the 20th century, encompassing motorised,

mechanised and armoured infantry types. Complementing this analysis, it examines the vehicle technologies which were developed to equip these forces over this period. It also explores the different philosophies which underpin these infantry force types in the 21st century and it concludes by considering which approach may best suit Army as it introduces the IFV into service.

Infantry Mobility and Firepower

Throughout history efforts have been undertaken to enhance the mobility of the traditionally foot-borne infantry arm. These included mounting infantry on horses, mules, camels and wagons. This approach was driven by the need to deploy infantry faster and further as well as to lessen the effects of fatigue on them. The late 16th century Dragoons are an early modern example. They rode to battle on horseback, dismounted in a secure area where the horses were held, and then fought on foot. While dragoons were more mobile than other infantry, they did not fight mounted or perform scouting or security tasks, these being the purview of the cavalry.[1] One of the last examples of horse-mounted infantry prior to the widespread adoption of the combustion engine in the early 20th century was the British Army's Mounted Infantry. These were infantry temporarily provided enhanced mobility to travel to the battlefield, who then dismounted to employ firepower. Unlike British irregular Mounted Rifles or regular Cavalry, Mounted Infantry were neither trained nor equipped to fight mounted. The zenith of Mounted Infantry in the British Army was the Second Boer War, where their mobility afforded them a distinct advantage over foot infantry.[2]

Prior to this the maturation of the steam engine in the mid-1800s provided the means to deploy large bodies of troops and materiel. Where rail and stations existed, this provided the ability to transport infantry quickly over long distances to a theatre of war greatly improving their strategic mobility and reducing march distances to the front.[3] It was during the First World War that motorised wheeled vehicles powered by the internal combustion engine, such as cars, trucks and buses, were first employed to move infantry in significant numbers. Motorised transport supplemented the use of railways by moving infantry from stations closer to the front, further reducing distances travelled on foot. However, motorised transport did not improve their mobility on the battlefield, with the infantry forced to fight across fire-swept ground on foot.

Infantry firepower also evolved during the war. Rapid-fire and high-explosive weapons gradually devolved from brigade and battalion levels and were integrated into platoons and sections. Machine guns, automatic rifles, mortars and grenades enabled infantry sections to employ the basic tactic of one element providing static fire support to prevent an enemy from moving and firing, while another mobile element moved to close with them. This provided the ability to defeat entrenched defenders through the combination of suppressing fires and high-explosive destructive firepower.[4] By the war's end, infantry tactics incorporating fire and movement at the section level had eclipsed the massed infantry linear tactics which the war had begun with. Importantly, the application of fire and movement—the most elementary form of manoeuvre—remains fundamental to minor tactics today and underpins the integration of infantry and armoured vehicles.

After years of relatively static attritional trench fighting, particularly on the Western Front, the last months of the war saw the resumption of mobile warfare. Notably, the Battle of Amiens (1918) demonstrated the potential of tracked mechanised forces, such as tanks, to increase the tempo of battle.[5] Tanks provided the infantry a means to quickly breach tactical obstacles such as wire and provided supressing fire support to cover their movement as well as destroying enemy strong points. Tanks also conserved the infantry force by physically protecting them. The tank was also developed into an artillery gun carrier, specialised engineer variants and supply transports,[6] serving as a portent of the potential of mechanisation. However, at the end of the war exactly how mobility and firepower could be combined to best enhance the infantry arm remained unclear.

Motorised Infantry

Following the war technological advances resulted in tank-equipped forces (collectively termed armour) becoming better protected, more reliable and faster. The latter drove the need for the infantry, and other arms and services, to become more mobile to keep pace and reap the benefits of operating together. An initial step undertaken was the permanent provision of unprotected trucks and utility vehicles to mobilise the infantry, creating a new type of force—*Motorised Infantry*. Conceptually similar to horse-borne mounted infantry, motorised infantry moved mounted, but dismounted in a safe area to then close with the enemy and fight on foot.[7] Trucks could

transport large sections of infantry with additional ammunition, stores and equipment. Thus, the chief benefits of this type of force were significant improvements to the infantry's operational mobility (the speed and range at which they could be deployed) and their endurance, given their immediate access to supplies and a lessening in fatigue from the reduction in distances marched on foot. However, while infantry could move further and faster once motorised, they were primarily road-bound whilst mounted. Consequently, their ability to move with armour off-road remained limited.

During the Second World War motorisation and mechanisation of Western militaries accelerated greatly. The war demonstrated that the cooperative combined-arms use of infantry and armour was essential during close combat, negating previous views that either could or should operate alone. Infantry-armour tactics were mutually supporting; one element provided intimate protection and the other intimate support in return. However, in order to achieve such mutual support during mobile operations, the infantry required mobility commensurate with that of armour. Early combat experience illustrated the limitations of motorised infantry, such as British *Motor Battalions* and German *Schützen* (Rifle) units. Both forces possessed limited off-road tactical mobility (typified by speed, turn, gap crossing and climbing abilities) and were vulnerable to small-arms and artillery fire. This negated their ability to move and fight at the tempo of mechanised, generally tracked, armoured forces. Conversely, when armour was slowed to the pace of dismounted infantry it became increasingly vulnerable to anti-armour weapons. To overcome this, the infantry required a vehicle which had greater off-road mobility and improved protection.[8]

Combatants on both sides turned to open-topped, lightly armed and armoured transports. Examples such as the half-tracked German *Sonderkraftfahrzeug* (Sd.Kfz.) 251 and the US M3 Personnel Carrier, as well as the full-tracked British Universal Carrier, provided considerable advances in off-road mobility and some protection from small-arms fire and shell fragments. German *Panzergrenadier* and US *Armored Infantry* units thus equipped were able to operate more closely with armour before dismounting to fight on foot. Furthermore, Panzergrenadiers displayed a preference to remain mounted for as long as possible, and even to fight mounted in order to maintain the tempo of operations.[9] However, the limited protection and the mobility differential between half- and full-tracked vehicles remained a barrier to infantry-armour cooperation. Consequently, late in the war Allied

armies began to 'mount' infantry in armoured personnel carriers (APCs) temporarily. These early APCs, nicknamed 'Kangaroos', were expedients created by repurposing obsolete self-propelled artillery and tanks to carry an infantry section. These vehicles were grouped into specially created APC regiments operated by the Canadian and British armoured corps. Wartime experience demonstrated the value of APCs, as they enabled much closer cooperation with armour, as the infantry could move cross-country at the same speed and dismount closer to tanks. Furthermore, the enhanced protection of the APC greatly reduced infantry casualties. While the level of vehicle integration within the infantry was minimal under these arrangements, the potential of equipping infantry with their own AFVs was evident.[10]

Mechanised Infantry

In the 1950s both the US and Britain experimented with this '*mounted infantry'* model, creating APC organisations to transport infantry. However, these proved to be short-lived as the benefits of infantry with organic mobility proved superior. By the early 1960s both armies had created *Mechanised Infantry* forces. Akin to motorised infantry, mechanised infantry were permanently provided with vehicles to transport them to battle. Doctrinally, mechanised infantry moved mounted in their APCs, dismounted once contact was made, or outside effective anti-armour fire in an assault, to then move and fight on foot alongside tanks. The APCs, with relatively light armour and limited armament, did not fight alongside the infantry and tanks, instead providing supporting fire from a distance or withdrawing out of contact until required to move the infantry again.[11] Consequently, mechanised infantry forces contained relatively large sections of 10–12 soldiers to provide the maximum amount of dismounted supressing fire to enable fire and movement in close combat. This philosophy was important as it underpinned the design of APCs.

From the mid-1940s numerous wheeled and tracked APC designs were developed to varying levels of success. These included the US M39, M75, M59 and M113, the British FV 432, the French AMX-VCI, the Austrian Saurer 4K and the Soviet BTR-50 and BTR-60 APCs. These were designed as transport vehicles, 'battle taxis' to deliver the infantry to the edge of battle to then fight on foot; not to deliver them into close combat or to fight mounted. The emphasis on delivering a large infantry section required considerable

internal volume to accommodate them. The desire for improved mobility also encouraged designs that were amphibious and air portable. Consequently, the combination of these design factors required compromises in APC firepower and protection.[12] The weapons fitted were generally adequate for self-defence only and had limited utility in covering friendly vehicle movement or fighting other AFVs. Protection was limited to shell fragments and small-arms fire, leaving these vehicles vulnerable to heavy machine guns, mines and basic shaped charge anti-armour weapons. Furthermore, the infantry had limited, if any, ability to fight or observe from under armour, relegating them to the status of passengers.[13] This meant that infantry troops needed only a basic familiarity and generalist skill base to ride in APCs, dismount and fight on foot. Based on this thinking, the capacity to transport a section of infantry became the key design requirement. This upset the traditional AFV design theory paradigm, often termed the 'Iron Triangle' of firepower, protection and mobility, with troop-carrying capacity added to these criteria as shown in Figure 1.

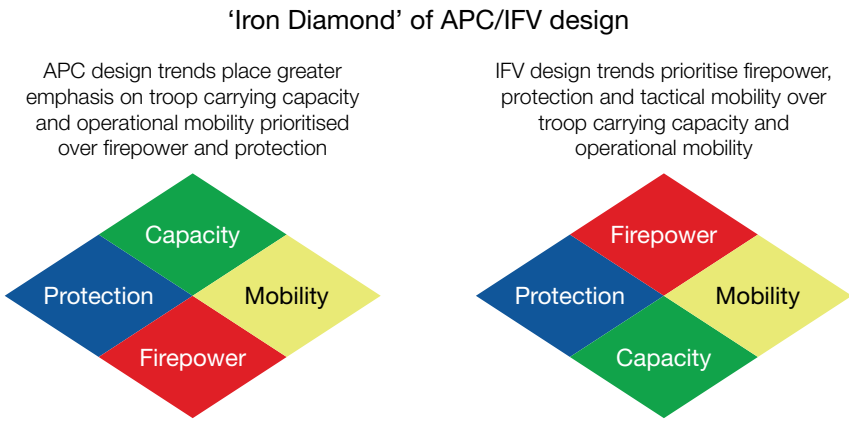

Figure 1. The Iron Diamond of APC/IFV design[14]

Armoured Infantry

The combat experiences of Germany, the Soviet Union and the US led to a desire to improve the ability of infantry to fight mounted. This was compounded by the prospect of fighting over ground potentially contaminated by chemical, biological, radiological and nuclear (CBRN) weapons. Given its experience of the Second World War, the German Bundeswehr re-established its Panzergrenadier arm in 1956.

The Panzergrenadier (PzGren), literally *Armoured Infantry*, operated differently to US and British mechanised infantry doctrines. The PzGren approach required infantry with specialised training and equipment to move and fight in as close cooperation as possible with tanks during mounted and dismounted action, in offence and defence.[15] In practice this meant moving mounted alongside tanks, fighting mounted from the vehicles through hatches and firing ports, and fighting dismounted alongside tanks and their own vehicles. While traditional infantry tasks were maintained, PzGren methods concentrated less on positional or terrain-focused approaches and more on mobile methods and anti-armour tasks. Also reflective of wartime experience, the PzGren could be employed as an independent entity, offering a medium-weight alternative to heavier armoured or lighter infantry forces.[16]

To implement this doctrine the PzGren required a vehicle tailored to this role with capabilities beyond those of an APC. The first attempt was the Schützenpanzer 12-3 (SPz), designed in the late 1950s. Arguably the 'proto' IFV, the SPz incorporated capabilities which evolved it into a vehicle that infantry could fight with, rather than simply a transport in which they were passengers.[17] It was relatively heavily armoured and fielded a 20 mm auto-cannon to support its infantry and fight other AFVs. However, it only carried five infantry, who could fight from open hatches but not from under armour. The SPz and contemporaries such as the Swedish *Pansarbandvagn* 301, French AMX-VCI and US XM734 represented transitional designs incorporating aspects of both APCs and IFVs. These designs were superseded by the Soviet BMP-1 in 1966. Arguably the first 'true' IFV, the BMP-1 embodied much of the contemporary thinking on armoured vehicle-borne infantry and represented a significant evolution in infantry firepower, protection and mobility. The BMP-1 provided Soviet infantry with increased mobility to accompany tanks and delivered heavy direct fire support from a low-pressure cannon, an anti-tank guided missile (ATGM) and numerous machine guns. It was protected from small-arms fire and from artillery fragmentation, and featured radiation shielding. It carried a smaller section of eight infantry with a crew of three. Notably the infantry could fight from within the vehicle or dismount and fight on foot. For the Soviets this provided a vehicle which enabled their infantry to move in concert with tanks, across potentially contaminated ground, and could contribute to combat rather than simply deliver infantry to the fight.[18]

Subsequent IFV designs, such as the German Marder, French AMX-10, Dutch YPR765 and Soviet BMD, reflected the ascendance of firepower and protection over mobility and capacity in design. IFV armaments typically included auto-cannon with calibres of 20mm or larger, ATGM, machine guns and grenade launchers. These provided the ability to sustain high rates of fire to supress or neutralise infantry behind cover, protect vehicles when moving tactically and destroy other AFVs. The ability of infantry to observe and fight under armour was enhanced by the use of episcopes/periscopes, electro-optics and hatches, as well as the adoption of firing ports in the sides of the vehicles. Likewise, protection increased with frontal arc armour designed to defeat auto-cannon projectiles, complemented by all-round defence against heavy machine gun and shell fragments. Furthermore, the CBRN threat resulted in the incorporation of air filtration/overpressure systems, increased shielding and development of specialised protective clothing and techniques. To cope with design changes, larger, more powerful engines and improved suspension were needed to ensure IFVs could accompany tanks across country. However, the cost of this was often capacity, leading to a reduction in the size of the sections that could be carried.[19] Thus, while infantry gained advantages in firepower, mobility and protection, the ability to carry them was reduced, which triggered changes to how infantry-armour fought and the ratios in which they fought together. Examples of early APC and IFV designs are shown in Figure 2.

Sd.Kfz. 251 PC, (1939)

M113 APC, United States (1960)

SPz 12-3 proto IFV, West Germany (1959)

BMP-1 IFV, Soviet Union (1966)

Figure 2. Examples of early APCs and IFVs[20]

For the US and British armies, the introduction of viable IFVs took much longer. While the introduction of the M113 in US service in 1960 (and in Australia in 1965) provided a substantial improvement over earlier APC models, experience in Korea and the early stages of the war in Vietnam highlighted several limitations inherent to the APC approach. These included a lack of firepower, limited protection against hand-held anti-armour weapons and the inability of infantry passengers to fight while mounted in the vehicle. Consequently, the US Army began to develop what they termed a 'Mechanized Infantry Combat Vehicle' in the early 1960s. However, its development was hindered by a range of requirement definition and resource related issues. Early attempts such as the XM701, XM734 and XM765 were derivative of the M113 and suffered from limitations in this design. A new design, XM723, suffered a protracted and painful gestation before it finally emerged as the M2 Bradley in 1979.[21] It replaced the M113 APC in US Army Mechanised Infantry units, although this vehicle was retained in certain support roles. Initially the doctrine introduced with the Bradley indicated a shift away from a generalist mechanised infantry mindset towards a specialist armoured infantry approach. However, the tension between these approaches has resulted in frequent changes in squad size and infantry trade models and in modifications to vehicle design, as well as ongoing professional debate. [22]

Comparatively, with the emergence of the BMP-1 the British Army also undertook a program to introduce an IFV commencing in 1967, termed the Mechanised Combat Vehicle 80. It also underwent a lengthy development, ultimately resulting in the FV510 Warrior in 1987. These equipped British Armoured Infantry Battalions, with Mechanised Infantry Battalions retaining the FV432 APC, a vehicle analogous to the M113. Accompanying the IFV was the adoption of a doctrine of all-arms battle groups charged with conducting highly mobile offensive actions. In previous British approaches, APCs performed the 'battlefield taxi' role, transporting troops close to action, where they would disembark to fight on foot—essentially as they had done in the Second World War. The new concept envisaged IFVs and tanks operating in mutual support, reinforced by the concentrated firepower of artillery and aircraft. Equipped with an IFV, the infantry could now move rapidly onto the objective before dismounting to assault at close quarters. Importantly, IFVs accompanied their infantry after they dismounted, providing them fire support and the ability to rapidly remount and move to subsequent objectives.[23]

In the early 2020s, both the US and British armies are replacing these legacy IFV fleets. After two abortive attempts—Future Combat System (cancelled 2009) and Ground Combat Vehicle (cancelled 2014)—the US aims to replace the Bradley under the auspices of the Optionally Manned Fighting Vehicle (OMFV) program. After a false start OMFV has now selected five companies to participate in a concept design phase prior to building prototypes, testing and final selection in 2027.[24] Likewise, the aged M113 APC fleet is steadily being replaced by a heavier, more protected vehicle. The US opted for the Bradley-derived Armored Multi-Purpose Vehicle (AMPV), to fill APC and support roles in their armoured formations.

The UK has been forced down a different path. The UK Ministry of Defence opted in 2021 to cancel their Warrior IFV upgrade program, instead replacing it with the wheeled Boxer Mechanised Infantry Vehicle around 2025. However, it should be noted that this was a decision based on cost rather than capability. The British Army acknowledged that the Boxer, an APC, is a different capability to the Warrior and does not 'recreate' the IFV capability, although it continues to investigate what might be done to 'make it more IFV-like'.[25] In conjunction with force structure changes, the FV432 is also being replaced by the Boxer, which provides improved operational mobility and protection. There are clear economies of scale in standardising on the Boxer, which may make immediate financial sense for the UK. While the Boxer is very capable, it remains to be seen if it can compensate for the loss of the close combat capabilities of the Warrior, even when coupled with other capabilities such as artillery, helicopters and drones.

Globally, many other nations/companies continue to develop or modernise IFVs and APCs. A key driver for this is the need to increase vehicle and personnel survivability as the proliferation and lethality of anti-armour weapons increases. IFV examples include the Austrian/Spanish ASCOD, Chinese ZBD-04, German Puma and Lynx, Japanese Type 89, Indian Abhay, Italian Dardo, Russian T-15, Singaporean Hunter, South Korean K21, Swedish Combat Vehicle-90, Turkish Tulpar and US Griffin III. Likewise, APCs are steadily being upgraded or replaced in service by heavier, more protected vehicles. Late-model tracked APCs include the Israeli Namer, Russian Kurganets-25 and US AMPV; wheeled designs include the US Stryker, Russian K-16 Bumerang, Italian Super AV, Finnish Patria and German/Dutch Boxer. Late-model APC designs continue to prioritise capacity, mobility and protection over firepower.

Furthermore, the lines between APCs and IFVs have become blurred by another category of AFV, variously labelled as *Infantry Carrier Vehicles or Infantry Combat Vehicles* (ICVs). As a hybrid of the two, ICV designs often feature IFV levels of armament coupled with the operational mobility and capacity of wheeled APCs, often incurring penalties in weight, size or protection. Consequently, many contemporary wheeled APCs are increasingly offered as ICVs through the addition of a turret, manned or otherwise. A short survey includes the Canadian Light Armoured Vehicle 6.0, French Véhicule Blindé de Combat d'Infanterie, Israeli Eitan, Italian Freccia, New Zealand NZLAV, Singaporean Terrex, Taiwanese CM-32 Clouded Leopard, Russian K-17 Bumerang and US Stryker Dragoon. While arguments may be made that that these are simply wheeled IFVs, their typical employment aligns with a generalist approach rather than specialist methods, making a simple categorisation difficult.[26]

Similarly, the line between armoured trucks/utility vehicles and wheeled APCs has blurred with the evolution of Mine Resistant Ambush Protected vehicles (MRAPs) and Protected Mobility Vehicles (PMVs). Notable examples include the Australian Bushmaster and Hawkei, the US Mine Resistant Ambush Protected All-Terrain Vehicle and Light Combat Tactical All-Terrain Vehicle, and the UK Husky and Foxhound. While not AFVs, as they are not specifically designed for sustained close combat, protected vehicles prioritise defence against mines, improvised explosive devices and small-arms fire. They are generally equipped with defensive armament, although larger remotely operated weapons are emergent. MRAPs/PMVs often equip contemporary motorised infantry forces or serve as an expedient way to provide better mobility to traditional light or 'foot' infantry forces when required. Given the global efforts to update and/or acquire IFVs, APCs, ICVs and MRAPs/PMVs, it is evident that armies view the requirement for infantry firepower, mobility and protection as important and enduring. Armoured vehicles therefore remain essential tools of motorised, mechanised and armoured infantry in the 21st century. Figure 3 shows examples of contemporary vehicles.

Bushmaster PMV-M, Australia (2005)

Boxer APC, Germany-Netherlands (2009)

CV-90 IFV, Sweden (1993)

M1296 Dragoon ICV, United States (2017)

Figure 3. Examples of contemporary PMV, APC, IFV and ICV designs[27]

Motorised, Mechanised and Armoured Infantry Philosophies

The philosophies underpinning motorised, mechanised and armoured infantry remain relevant to contemporary military forces. However, to those outside of the military the differences between them may appear indistinct. It is a neat, and oversimplified, generalisation to categorise motorised infantry as universally equipped with trucks or PMVs, mechanised infantry with APCs and armoured infantry with IFVs—this is not always so. While it is generally accurate that forces which align with an armoured infantry approach are equipped with tracked IFVs, certain armies which operate IFVs employ mechanised infantry methods and others equipped with ICVs or APCs employ them in IFV-like ways. Thus, while AFV technology is important, the way in which infantry forces are employed is definitive. Two distinct philosophies have emerged which guide contemporary armoured vehicle-borne infantry: one soldier-centric and the other vehicle-centric.[28]

The soldier-centric approach views the vehicle primarily as a transport for the infantry section. The vehicle transports the section to a dismount location, such as a forming-up point or short of the objective outside effective enemy weapon range; it then withdraws and remains on call to remount them once the objective is secured—the 'battle taxi' approach. The infantry section fight dismounted and are reliant on the fire teams within

the section to provide both the base of fire and the assault elements when conducting manoeuvre. This method requires less integration between infantry and their vehicle, requiring only a generalist training approach. This method is generally employed by motorised and mechanised infantry forces which deploy standard-size infantry sections requiring the lift capacities of PMVs and APCs.

The vehicle-centric approach interprets the vehicle as an integral part of the infantry section providing transportation *and* firepower. This enables the infantry to fight mounted employing the vehicle's armament and to fight dismounted employing the vehicle with the fire teams. The vehicle transports the infantry to a dismount point just short of, at or beyond the objective and fights with them. It provides intimate support to the fire teams, providing the base of fire for them to move and assault—in effect the section's 'gun group'. Conversely, the fire teams provide intimate protection to the vehicle, clearing enemy threats, particularly anti-armour weapons, in close terrain. The infantry-vehicle relationship is symbiotic and is highly integrated, requiring specialised tactics, techniques and procedures (TTP) to exploit the benefits offered by the vehicle's capabilities. This integration is underscored by combined-arms training at the lowest levels. This mindset is reflective of armoured infantry forces which employ smaller infantry sections tailored to their IFV.

These philosophies are demonstrated in modern Western militaries. The mechanised infantry approach is typified by US, French and Canadian forces. In contrast, British, German, Swedish, Finnish and Danish forces favour the armoured infantry pattern.[29] The New Zealand Army utilises a mounted infantry methodology, with its armoured corps providing mobility to the infantry. However, these philosophies are not monolithic. Debate continues, particularly in the US, concerning the integration of IFVs and infantry, the focus of training, squad sizes and vehicle design requirements.[30] In contrast, there appears greater consensus within armies which have adapted infantry organisations and their employment to integrate with IFVs under the armoured infantry approach. Notably, Britain's transition to the Boxer APC from an IFV, will likely spur a review of its armoured infantry approach.[31]

In comparison the Australian Army currently fields both mechanised and motorised infantry types within its combat brigades. Both are vehicle borne and share a common basis in training, yet they operate differently. However, in the near future Army plans to replace the M113AS4 APC of the

mechanised infantry with an IFV capability. Given the philosophies discussed above, the question arises: what doctrinal approach will accompany the introduction of the IFV capability? Does Army retain its current mechanised infantry concept or does it adopt an armoured infantry approach?

In the case of the former, is the IFV simply a vehicle replacement for the mechanised infantry? If so, can this be achieved without major modification to infantry structures, trade models and mechanised TTP? A generalist approach across both motorised and mechanised infantry certainly has value in achieving common battalion structures, a singular trade model and centralised training. It arguably offers greater flexibility in terms of employment, avoiding the creation of specialised requirements and posting restrictions. However, given the significant improvements in firepower, mobility, protection and communications that the IFV provides (which differ greatly from the APC and even more from the PMV), this approach risks coupling modern technology with incongruent thinking. Gunnery training, mounted TTP development and maintenance regimes may require significantly greater emphasis given the complexity of the IFV. Consequently, the benefits of a generalist approach must be weighed against the ability to maximise the potential offered by the new capability.

Conversely, what changes would be needed under an armoured infantry philosophy? A specialist approach may require a split in infantry trade models, such as separate motorised and armoured infantry streams, akin to the armour-cavalry dynamic, which shares a common initial training base and subsequent specialisation. Equally, the capabilities of the IFV may warrant a review of the extant mechanised infantry battalion's organisation, employment and sustainment. Given the wide number of potential IFV operators, its introduction is likely to affect more than just the infantry corps, with command and control, combat support and combat service support functions across combat brigades also impacted. Critically, the concept of how armoured infantry fight in conjunction with armour, cavalry and motorised infantry within a combined-arms setting merits examination. The impact upon the force, in terms of doctrine development, training, logistic support, facilities, capability management and development, is also likely to be significant. Therefore, in order to make this decision and maximise the potential of IFV-equipped infantry, it is important that the costs and benefits to organisation, employment and sustainment are well understood.

Figure 4. Land 400 Phase 3 contenders: AS21 Redback IFV from Hanwha Defence Australia and KF41 Lynx IFV offered by Rheinmetall Defence Australia[32]

Conclusion

The need for armoured vehicle-borne infantry was driven by the conditions faced during the First World War. Over the course of the 20th century the dynamic relationship between philosophy and technology resulted in the development of motorised, mechanised and armoured infantry types. In 21st century Western militaries two distinct philosophies guide these force types. One is soldier-centric which views the armoured vehicle primarily as a transport for the infantry, enabling dismounted action through the provision of enhanced mobility while under the protection of armour. This approach requires less integration between infantry and the vehicle and is most applicable to generalist mechanised infantry force types. The other is vehicle-centric, viewing the infantry and their vehicle as one entity. The vehicle and the infantry operate in a mutually supporting manner to fight mounted and dismounted together. The vehicle is essential to the infantry section as it provides them firepower, mobility and protection in close combat. This approach is highly integrated and likely warrants a specialist armoured infantry force to maximise the capabilities of the IFV-infantry team.

Two primary design trends were identified which guide APC and IFV designs. In general terms, APC designs prioritise infantry-carrying capacity, whereas IFV designs prioritise firepower. These priorities reflect the different ways, or philosophies, which guide their employment. In general terms, armies which favour mechanised and motorised approaches employ infantry generalists fighting dismounted and operating APCs/MRAPs/PMVs primarily as transports. In contrast, armies which employ armoured infantry reflect a preference for infantry specialists moving and fighting, both mounted and dismounted, in close concert with IFVs.

Given this historical context, it may be necessary for Army to examine whether a mechanised infantry or armoured infantry philosophy is the best fit as it introduces a modern IFV over the coming decade. The introduction of an IFV may warrant the adoption of a specialised armoured infantry approach to maximise the benefits this combination provides Army. Conversely, a generalist mechanised infantry approach may be more applicable if commonality across the infantry arm is sought. Both approaches have merit and both pose challenges. A perspective on the US Army's conversion from an APC-based infantry force to an IFV-borne one 40 years ago suggests that the answer may require careful and critical analysis.

> *The (M-2) IFV is not an improved Armored Personnel Carrier (APC); it is truly a fighting vehicle. This is a new dimension infantrymen must master. The fundamentals of current tactical doctrine remain essentially unchanged. They must, however, be modified to capitalize on the IFV's capabilities. The more conservative thinkers will tend to regard the IFV as an improved APC or 'battle taxi.' The other extreme will think of the IFV as a light tank. The correct role of the IFV is in between these Two Extremes …*[33]

Finally, for some both inside and outside the military, the philosophies underpinning motorised, mechanised and armoured infantry and the differences between different types of AFVs are unclear. Consequently, this poses challenges for Army to communicate the need for armoured vehicles, particularly when faced with ill-informed and adverse commentary. To overcome this challenge, Army may benefit from explaining its philosophy for the IFV in a way accessible to government, Defence and public audiences.

Army Commentary

The delivery of the Infantry Fighting Vehicle under Land 400 Phase 3 will enable Army to realise a highly capable Land Force and the Combined Arms Fighting System. The Combined Arms Fighting System has an output far superior than the sum of its parts. It comprises infantry fighting vehicles, tanks, combat engineering vehicles, self-propelled howitzers, combat reconnaissance vehicles and helicopters. It is supported by air and missile defence, surveillance systems and an enabling logistics chain. Realising the full capability potential of this system requires replacement of the M113 platform which was first introduced into service in 1965. This platform is obsolete and no longer fit-for-purpose in response to prevalent threats in our region.

This article highlights that treating the Infantry Fighting Vehicle as a simple 'replacement' is not sufficient. This reality is recognised in project Land 400 Phase 3. This Phase will enable structures and systems to be put in place which realise the full capabilities of the Infantry Fighting Vehicle through an Armoured Infantry approach.

As Army continues a path of constant development, the author provides a commendable contribution to understanding Army's past, and highlighting some of the key areas Army will see change over the coming years.

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Endnotes

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14 Image created by author.

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27 Images created by author from open sources.

28 See P Kasurak, 2020, *Canada's Mechanized Infantry: The Evolution of a Combat Arm, 1920–2012*, (Vancouver: University of British Columbia Press), 4–5 for further discussion on these two philosophies.

29 Ibid.

30 This topic has been the subject of frequent debate, illustrating the ongoing tension over infantry and IFV integration and organisation. In addition to the sources raised in endnote XV, useful examples of this debate are provided in Held et al., 2013; and R Van Wie and T Keyes, 'Mechanized Infantry Experience and Lethality: An Empirical Analysis', *Infantry*, Summer 2019, 15–19.

31 Lye, 2021.

32 Image sourced from the Department of Defence image gallery, accessed 10 January 2022, at: http://images.defence.gov.au/20210312adf8588365_7224.jpg

33 C Lee, 2004, *The Challenges in Training of the Mechanized Infantry Units of the Republic of Korea Army in Transitioning from the Armored Personnel Carrier (K200) to Infantry Fighting Vehicle (K21)*, Master's thesis (Fort Leavenworth: United States Army Command and General Staff College), 9.

Book Reviews

Semut: The Untold Story of a Secret Australian Operation in WWII Borneo

Christine Helliwell (Australia: Penguin Random House, 2021, ISBN 9780143790020, 512 pp)

Reviewed by Peter J Dean

We read books with predetermined ideas and biases. I approached Christine Helliwell's book *Semut: The Untold Story of a Secret Australian Operation in WWII Borneo* firmly cloaked in the regalia of my academic background as a specialist in Australian strategy and military operations. As well as studying the Borneo campaigns closely, I have walked the battlefields at Tarakan, Brunei Bay and Balikpapan, and I have trekked into the interior of Borneo where part of the SEMUT operations were undertaken in collaboration with the local Dayak people. So I approached this work with a combination of professional interest and trepidation.

My professional interest was driven by the nature of the SEMUT operations, their relationship to the broader Australian operations in Borneo during 1945, and the rudimentary nature of Australia's Special Forces operations at the time. For those of us working in this field, it is an interesting and potentially important operation that has traditionally been seen as peripheral to the larger conventional operations undertaken by the 9th Australian Division in the area. Despite the allure of the 'special' nature of these operations—

Special Forces being an area of military history that, for good or ill, is now deeply ingrained in the nation's understanding of our more recent military history—they have been devoid of any close or authoritative study.

My excitement was driven not only by the release of another book on the Pacific War but also by the fact that this work had chosen a fascinating section of the Australian operations in Borneo during 1945. For too long, Australia's military operations in the Pacific War, apart from the Kokoda Trail, have lived in what Peter Stanley once described as a 'Green Hole'—as mysterious and unknown as the jungle that surrounded them.

The year 1945 is a particularly interesting and important one in Australia's military history. Yet the events of that year are neither well known nor well understood. They also remain controversial. For instance, the well-known British military historian Max Hastings has claimed that Australia's military efforts in 1945 represented a case of 'bludging'. Hastings's hyperbolic assertions have been systemically rebuffed, but the operations in New Guinea and the South Pacific have often been derided as nothing more than 'mopping up', and the Borneo operations putatively undertaken for uncertain strategic reasons.

A number of key features are immediately apparent. Semut is written for a popular audience—one of a plethora of books in this genre that many academics of Australian history at various universities lament (often rightly) as poor history, with little analysis and adding nothing new. Indeed, the cover endorsement comes from one of the doyens of this genre: Paul Ham. It is written by a non-military historian. My confidence in Helliwell's academic credentials was tempered by her training as an anthropologist, her (self-described) ignorance of military history at the start of the project, her deep and seemingly overly emotional connection to the subject matter, and the use of 'untold' in the subtitle of the book.

Yet Helliwell's passion for, and deep understanding of, Borneo and its indigenous people, based on her decades of anthropological work, shine through. She has backed up this experience with an almost equal dedication to pursuing the most remote historical sources; this gives the work an outstanding foundation. Helliwell brings to life the remarkable story of the efforts of a handful of Australian, British and New Zealand soldiers of the Services Reconnaissance Department (SRD) to recruit and train the local Dayak people to fight a guerrilla campaign against the occupying Japanese forces in the prelude to the Australian invasion of the area in June 1945.

Through the author's anthropological training, the Dayak people inject themselves into the text, which is not the case in conventional military histories. Semut chronicles the courageous exploits of the SRD but also weaves in the true partnership with the Dayak people. Helliwell brings to life their customs, culture and local politics, as well as their relationship to the British Empire, the Japanese occupation and the SRD mission.

Despite the author's obvious personal connection to Borneo and its Dayak people, she strives to achieve a level of objectivity as she describes their critical role in this fascinating history. The book details in equal measure the heroism of the SRD soldiers and the embryonic nature of Australian special operations at the time: outlining the difficulties, the limited planning and logistics, the lack of reinforcements, and the scarcity of equipment. Written in a lively style, Semut maps out some clear villains among the Japanese, elements of the Australian high command, and some of the personalities of the SRD commanders, and offsets these with the courage of the SRD operatives and the local guerrillas.

While on balance this is a fine book, it does have limitations. It is overlong in its focus on minutiae. It is 70 pages before we get an introduction to the SRD and the operations background. It devotes too much time to covering almost every detail of background and planning, as well as recounting almost every encounter of the SRD with every long house in Borneo—no small feat given the limitations of the source material.

Helliwell is brilliant at evoking the lives of the Dayak people and their leaders, the SRD operations and their tensions, risks, successes and failures, but she could have done so in a more focused manner. While the focus improves as the work progresses, and while Helliwell achieves a fine rhythm in Part III, it does recount elements of the narrative that could easily have been covered more succinctly.

More frustratingly, the book eschews a detailed analysis of the strategic and operational outcomes of the two SEMUT operations that it covers—something we must await in the second volume. As it struggles to link the tactical action of the SRD in Borneo to the focus of Australian and Allied strategy, at times the book also reveals a lack of understanding of the limitations that such operations have on broader national strategy. I was left wondering whether, for all the amazing feats of the Dayak people and the SRD, it would have been better had this operation not been undertaken.

Overall, Semut is a fine piece of work. Passionate yet largely balanced, it brings to life the people, places and events of operations SEMUT II and III. It is a highly readable and compelling narrative. It strives to be an accessible and engaging history for public consumption. Christine Helliwell has produced a detailed and authoritative study.

About the Reviewer

Professor Peter J. Dean PhD SFHEA has an extensive background in military and defence studies. He is the Director, Foreign Policy and Defence at the United States Studies Centre at the University of Sydney. Previously he was the University of Western Australia's (UWA) first Chair of Defence Studies and the inaugural director of the UWA Defence and Security Institute. Professor Dean has authored numerous books and articles on the US-Australian alliance, Australian defence policy and military operations.

Book Reviews

The History of the Fiji Military Forces 1939–1945

R A Howlett (London: Published by the Crown Agents for the Colonies on Behalf of the Government of Fiji, 1948, 267 pp)

Reviewed by Sonya Russell and Atonio Nagauna

In the years since former Prime Minister Morrison's 'Pacific Step-up' foreign policy shift, the Australian Army has enhanced its engagement with security forces across the Pacific. As engagement continues and combined operational deployments become regular, *The History of the Fiji Military Forces 1939–1945* is essential reading for any personnel seeking to engage with the Republic of Fiji Military Forces (RFMF). It is an excellent introduction for readers wishing to understand the genesis of the modern RFMF, its early operational experiences, and the Pacific campaign from the perspective of Pacific islanders.

When the news came of the attack on distant Pearl Harbor in December 1941, the entire brigade of the then Fiji Defence Forces was bunkered down overnight, trialling defensive positions under war conditions across the islands. Blocked from service in the European theatre, Fiji had nonetheless spent two years diligently preparing for conflict. As the threat in the Pacific crystallised and the nation went into full emergency procedures, it was with the knowledge that the war had come to Fiji. Over the following four years,

the renamed Fiji Military Forces hosted military forces from New Zealand and the United States using Fiji as a launch point, before joining the fight themselves, specialising as jungle reconnaissance forces, commandos and ships labour as Allied forces worked their way north from Florida Island to Bougainville.

Compiled from official records and diaries, Lieutenant RA Howlett's 1948 book was one of several published shortly after the end of the war detailing the service of Fijian forces. Like Sergeant Colin Larsen (*Pacific Commandos*) and Lieutenant Colonel Oliver Gillespie (*The Pacific*), Howlett served in the New Zealand forces associated with the Fijians. His work, however, is the only one that focuses on the entirety of the Fiji Military Forces and their wartime service. Asesela Ravuvu's later work *Fijians at War* gives a greater voice to Fijians in the narrative but is derivative of Howlett's publication.

The History of The Fiji Military Forces 1939–1945 recounts the formation of Fiji's forces under New Zealand command and their combat service alongside US forces until the gradual demobilisation of units following Japan's surrender. Howlett structures the work into two parts: a chronological description and brief unit histories. The current structure of the Republic of Fiji Military Forces can be traced to this configuration. A small number of black-and-white photos are included throughout, as well as a pull-out map of Bougainville Island.

It is in the chronological narrative that Howlett's publication truly shines. Focused on the deployment of the Pacific Commando units and then the expeditionary 1st and 3rd Infantry battalions into the Solomon and Bougainville campaigns, Howlett narrates a fast-paced journey with emphasis on tactical exchanges. The 1st Battalion's Ibu operation and retreat from Kameli Outpost and the 3rd Battalion's Mawaraka actions, during which Corporal Sefanaia Sukanaivalu was awarded his Victoria Cross, are highlights.

As a New Zealander serving with the Fiji Military Forces 1st Battalion, Howlett rightly acknowledges the critical role New Zealand contributed to the defence of Fiji and the development of the Fiji Military Forces. Unfortunately the book can focus too keenly on New Zealand personnel serving as officers, to the detriment of the over 6,000 Fijians who served. Few Fijians are named throughout the narrative.

A product of its time, *The History of the Fiji Military Forces 1939–1945* does not seek to analyse the Fijians' service through any critical eye.

The language can border on flowery. Howlett does not contextualise the Fijian efforts within the wider Pacific campaign; but the book does not suffer for it, instead showing the Fijian Military Forces operations as but one snippet of the multitude occurring throughout the war. He also only touches on the social and political dimensions occurring on the home front—for example, unsympathetically describing the requested mass discharge of the Indian platoon, 2nd (Territorial) Battalion due to pay inequality in 1941. This approach disregards the complexity of ethno-relations in the then colony.

In a curious departure from accepted history, Howlett claims that the Fijians, as a people, had little martial tradition prior to the war. The effusive, and at times florid, praise he heaps upon the military prowess of the Fiji Military Forces as soldiers loyal to the Empire likely contributed to the growing argument that the wartime service of Fiji should provide greater indigenous social, political and economic rights.

Despite these shortcomings, *The History of The Fiji Military Forces 1939–1945* is the only comprehensive and contemporaneous account of Fiji's World War II service. It is essential reading for those wishing to understand the military history, structure and martial values of Australia's Pacific partner.

About the Reviewers

Major Atonio Nagauna is an Infantry officer in the Republic of Fiji Military Forces. He has deployed to peacekeeping missions in Iraq, Egypt and Occupied Golan. He is a graduate of the Royal Military College (Duntroon) and the Australian Command and Staff Course. He holds a Master of Defence and Military Studies from ANU and a Master of Training and Development from Griffith University. Major Nagauna is currently Second-in-Command Third Battalion Fiji Infantry Regiment.

Ms Sonya Russell is a career public servant with the Australian Department of Defence. She was the International Policy Liaison Officer to Headquarters Joint Operations Command in 2017 and Policy Advisor on Operation HIGHROAD in Afghanistan from late 2017 to 2018. She posted to Port Moresby as the inaugural Strategic Policy Advisor to Papua New Guinea's Department of Defence. Ms Russell is currently the Director of International Policy Division's Pacific East section.

Book Reviews

2034: A Novel of the Next World War

Elliot Ackerman and James Stavridis (US: Penguin Press, 2021, ISBN 9781984881274, 303 pp)

Reviewed by Albert Palazzo

In 1978 the retired British general Sir John Hackett published an account of a fictional war between the United States and the Soviet Union. For me, reading it is a distant memory, but at the time it formed a part of my foundation as a scholar of war. The Cold War was ongoing, and growing up in New York City nuclear annihilation was always a prospect, especially if the leaders of either country miscalculated the odds of any martial adventure. *The Third World War: August 1985*, as Hackett's book was titled, saw the world go to the brink of nuclear destruction as conventional operations gave way to a limited exchange that resulted in the incineration of Birmingham and Minsk, and the Soviet Union's collapse. Hackett wrote the book as a cautionary tale, as well as to encourage Western Europeans and Americans to strengthen their nations' conventional forces.

Forty-three years on I have the pleasure, and sorrow, to read another book on a future fictional war. In *2034: A Novel of the Next World War*, Elliot Ackerman and Admiral James Stavridis (ret), consider a violent resolution to the escalating tension that exists between a stronger and more confident China and a still-proud United States that is reluctant to accept, or even

understand, that the world has changed. One does not need to have read Shakespeare to recognise that tragedy is the only outcome of such a combination of emotion with military power. And indeed tragedy is what happens, particularly for the cities that are levelled as the combatants justify escalation across the nuclear threshold in a fool's quest for victory.

Ackerman and Stavridis share with Hackett some motivations for writing their book. *2034* is a timely reminder that nuclear weapons cannot be used without the risk of the end of human civilisation. In present-day security discussions the limits imposed on war by the onset of the atomic age, which Bernard Brodie identified in the 1946 book *The Absolute Weapon*, seem to have been forgotten by military professionals and their civilian masters. The result is war drums beaten with increased fervour but diminished responsibility.

For the military practitioner, the takeaways from *2034* are not to be found amongst the tactics employed by the combatants. None would be of any surprise to contemporary students of war, although cyber does feature more centrally. Rather, what draws the authors' attention is the timeless human values that sit at the heart of all conflict and remain critical to the understanding and waging of war. It is in the exploration of these themes, and the need to recognise and learn, that the book's value lies. Hubris and miscalculation are exhibited by both the United States and China, as is the need to make decisions in an environment of uncertainty, no matter the scope of the combatants' enhanced sensor and data-crunching capabilities. Personality and ambition also feature at key decision points, in the negative and positive senses. Lastly, Ackerman and Stavridis make clear the need for commanders and staffs to have a deep, penetrative understanding of your opponent's culture, as well as your own, if you are to anticipate your enemy's actions and to mask your own.

As this is a work of fiction, the authors are able to highlight traits that are difficult to express in works of history, such as the need for commanders to have imagination. It is not enough to follow doctrine and military planning processes when making your plans or attempting to anticipate your opponent's intentions. Genius comes from the ability to imagine the possibilities that are outside the staff process, for it is there that decisive success lies.

For those whose job it is to wage war, fiction offers another path to professional fulfilment. Fiction's usefulness should not be discounted, and it has the benefit of being easier to master than *On War*. It has a part to play in the mix of one's military reading and professional eduction. *2034* can admirably serve as a seminar for junior officers who may need motivation to accept the importance of self-education for the benefit of their careers as well as the lives of those they command. Ackerman and Stavridis have written a useful, action-packed book that is highly accessible and relevant, and I recommend its inclusion on military reading lists.

About the Reviewer

Dr Albert Palazzo is an Adjunct Professor in the School of Humanities and Social Sciences at UNSW-Canberra. Previously, he was the long-serving Director of War Studies in the Australian Army Research Centre. Dr Palazzo has published widely on Australian military history as well as the future character of war. His current research focus is on the potential of the Strategic Defensive to serve as the basis of Australia's defence policy.

Call for Submissions for Autumn Edition of the Australian Army Journal

The Australian Army Journal (AAJ) focuses on the presentation of contested and evidence-based research and analysis. The Australian Army Research Centre (AARC) is looking for well written, scholarly AAJ submissions on topics related to Army, with a particular focus on the priority research topics identified in the Army Futures Research Framework (https://researchcentre.army.gov.au/library/army-futures-research-framework-2022-23). The next edition of the AAJ will be published in autumn 2023.

The AARC welcomes submissions from professionals of all ranks and experience. Articles should comprise structured arguments that lead to logical conclusions or recommendations that can help posture Army for future land warfare challenges in the short, medium and long term. The AARC is particularly interested in AAJ submissions that:

a. deliver analysis based on tactical or operational level experience
b. provide a perspective on issues that challenges orthodox views
c. place the lessons of historical experience in a contemporary context

Process

Authors work with the AARC's editorial team in a process of iterative review. Initially, submissions are assessed for suitability by the AARC Editorial Director and/or Managing Editor, with selected articles then subjected to a double blind review by an academic and a subject matter expert. Articles deemed appropriate for further consideration are presented to the Editorial

Advisory Board for consideration. The Director General, Future Land Warfare is the ultimate publication authority for all AAJ content.

Please note that the AARC cannot accept articles which have been published elsewhere or are currently under consideration for publication with another journal.

Word length (including endnotes)

- Journal articles can be between 4,000-6,000 words in length
- Book reviews can be any length up to 1000 words

Author biography

A 100 word (approx.) biography should be included with a summary of your educational history and professional experience.

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The deadline for submissions to the Autumn edition of the AAJ is 30 April 2023.

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Guidance on formatting and style is available in the Submission Guidelines for AARC Publications (https://researchcentre.army.gov.au/about-us/contribute/aarc-publications-advice-contributors).

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The AARC cannot accept articles that have been published elsewhere or are currently under consideration for publication in other formats.

Word length (including endnotes)

Occasional Paper submissions are generally over 20,000 words in length.

Author biography

A 100 word (approx.) biography should be included with a summary of your educational history and professional experience.

Paper abstract

A paper abstract should be included. The purpose of the abstract is to summarise the major aspects of a paper. A good abstract will also encourage a reader to read the entire piece. For this reason it should be an engagingly written piece of prose between 200 and 500 words that is not simply a rewrite of the introduction in shorter form.

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Guidance on formatting and style is available in the Submission Guidelines for AARC Publications (https://researchcentre.army.gov.au/about-us/contribute/aarc-publications-advice-contributors).

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