Innovative within the Paradigm: The Evolution of the Australian Defence Force's Joint Operational Art

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Beginning in 2008, several articles argued that the Australian Defence Force (ADF) had paid little attention to revising its operational art in light of recent experiences, and that the ADF had been slow to respond to conceptual evolution within key allied militaries, the United States in particular. Recently the ADF has reviewed its conceptualisation of operational art, updating it to better suit contemporary operational requirements. This article summarises the critical articles and US developments before detailing the ADF's revised approach to operational art. It also briefly highlights possible areas for future conceptual evolution. It is concluded that the ADF's revised approach to operational art will greatly benefit the ADF's operational conduct, yet it is also a step in an intellectual journey rather than a destination.

Since the turn of the twenty-first century Australia's military operations have been characterised by variety, encompassing a mix of unconventional wars, multinational peace operations, humanitarian operations and disaster relief. Concurrently the ADF has needed to maintain an ability to respond to conventional threats. To conduct such a wide variety of operations the ADF routinely conducts detailed operational planning. It does this by employing operational art, which is defined as "the skilful employment of military forces to attain strategic goals through the design, organisation, sequencing and direction of campaigns and operations".[2] Conducting operational art is the acme of military command at the operational level, although success also requires comprehensive staff work and rigorous planning. The ADF's joint operational planning process, which encapsulates its preferred approach to operational art, is called the Joint Military Appreciation Process (JMAP).[3]

Beginning in 2008, the ADF's practice of operational art and related doctrine was the subject of five articles that asserted that this practice was suboptimal. Concurrently, the practice of operational art by Australia's key

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[1] The views expressed in this paper are the author's own and are not necessarily those of the Australian Department of Defence, or any part thereof.
[2] The following notes accompany this definition: "1. Operational art translates strategic into operational and ultimately tactical actions. 2. It requires a commander to: a. identify the military conditions or end state that constitute the strategic objective; b. decide the operational objectives that must be achieved to reach the desired end state; c. order a sequence of actions that lead to fulfilment of the operational objectives; d. apply the military resources allocated to sustain the desired sequence of actions". Australian Defence Force, Australian Defence Force Publication (ADFP) 5.0.1—*Joint Military Appreciation Process*, 2nd ed., Amendment List 2 (Canberra: Defence Publishing Service, 2016), p. 1.4.
[3] Ibid.

allies, especially the United States, began evolving at an increased pace as a result of the wars in Afghanistan and Iraq. According to those who have criticised ADF practice of operational art, the ADF had overlooked these evolutions, bringing about a situation characterised by a mix of domestic intellectual stagnation and international disconnection between the ADF and key allied militaries.

Recently, the ADF completed a review of the doctrine publication that contains the JMAP and by doing so comprehensively updated its conceptualisation of operational art, incorporating the lessons of several recent operations to ensure that this update met contemporary operational requirements. This article examines this review, summarising the articles written about the ADF's previous practice of operational art and the major aspects of the recent evolution of operational art in the US military. It subsequently details the nature of the new edition of the JMAP doctrine and the approach to operational art that it encapsulates. This approach is well suited to Australia's contemporary circumstances and requirements, including the need for interoperability with key allies, the US military in particular.

Finally, this article argues that despite the benefits the recent changes yield, the ADF's approach to operational art and the JMAP remain within the same paradigm as previous approaches. This paradigm, which is elaborated in the final section of this article, is characterised by a linear approach to operational art and planning. It assumes the existence of clear and determinable linkages between strategic objectives, a desired operational end state, operational objectives and tactical actions, and to a great extent it relies on the existence of linear cause-and-effect relationships within the operational environment. The limits of this paradigm reveal the limits of the ADF's revised approach to operational art and suggest where additional improvements could potentially be made in the future. As a result it is concluded that while the ADF's revised approach to operational art is an innovative and necessary evolution that will greatly benefit the ADF's operational conduct, it is also a step in an intellectual journey rather than a destination.

Discussion of Operational Art in the ADF

In the last eight years, five articles have included criticism of the ADF's practice of operational art. Although this does not sound like very many, it is noteworthy because Australian military officers and Defence staff—as Albert Palazzo has so poignantly emphasised—tend to shy away from publishing their opinions.[4] So five articles by ADF officers and Defence staff is

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[4] Albert Palazzo, 'The Future of War Debate in Australia: Why Has There Not Been One? Has the Need for One Now Arrived?', Working Paper No. 140 (Canberra: Land Warfare Studies Centre, August 2012).

significant, and merely the presence of such criticism suggests that the ADF's practice of operational art warranted review. Overall, these articles highlighted six areas where ADF doctrine for operational art could be refined:

1. **Functionality.** The functional conceptualisation of operational art needed to be further developed (that is, the conceiving of operational art in terms of functionality rather than scale), which should be specifically designed to Australia's strategic and operational circumstances.

2. **Objectives.** There was a need to better develop linkages between operational objectives and strategic objectives in a way that would allow operational flexibility in response to changes in the strategic situation.

3. **Centre of gravity analysis.** An evaluation of the role and understanding of centre of gravity analysis was clearly required, although the articles' recommendations ranged from updating the concept while maintaining its centrality, through to removing it from ADF doctrine altogether.

4. **Operational design.** There was a need to assess conceptual developments that had occurred overseas, especially within the US military, and to adapt any developments that would be appropriate for Australian use. In particular, 'design' and 'operational design' needed to be thoroughly evaluated.

5. **Campaigns and operations.** A clearer delineation was required of the difference between campaign planning/design and operational planning/design.

6. **Flexibility.** The ADF's operational planning process needed to be more flexible so as to accommodate the high degree of uncertainty and change evident in recent operations.

In the first article, published in 2008, Professor Michael Evans asserted that "essential debates on the role of operational art in the battlespace of the 21st century that have occurred within the US, British and Canadian militaries over the past decade have not … been formally evident within the contemporary [ADF]".[5] He went on to highlight that Australia's historical experience of war has led to "a high degree of tactical excellence on one hand and a tradition of inexperience at the operational level of war on the other". He accordingly argued that "the ADF continues to lack a firm conceptual foundation for the development of higher command beyond the traditional Australian strategy-tactics interface".

In Evans' assessment, the ADF's approach to operational art evolved in two stages. In the late 1980s and 1990s, operational art was developed solely in

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[5] Michael Evans, 'The Closing of the Australian Military Mind: The ADF and Operational Art', *Security Challenges,* vol. 4, no. 2 (Winter 2008), p. 105.

preparation for the conventional defence of Australia—the least likely scenario facing Australian military planners. In the second period, following 1999, Evans contended that the ADF's operational concepts became imbued with a 'technology bias' that sidelined cognitive needs and "created a number of weaknesses in the current warfighting posture". As a result, Evans argued that "conceptual thinking is rooted in technology, rather than the anatomy of war, and fails to reflect the likely reality of armed conflict over the next decade or more".[6]

Evans advocated the development of an approach to operational art that would be suitable for regional missions, where Australia is the lead nation, and global missions where Australia is part of a multinational alliance. He stressed the importance of achieving balance between interoperability with major allies, flexibility and being "reflective of middle-power geopolitical reality". He called for the development of better campaign planning tools that more clearly link operational objectives to strategic objectives, and emphasised the need for improved joint professional military education as a key facilitator of the successful practice of operational art. Finally, he called for ADF joint doctrine to be updated to reflect a 'functional approach' to operational art, which he defined as conceiving of operations "in terms of *function* rather than in terms of *locus* and *size*".[7]

Four replies debating Evans' article, along with a rejoinder, were published in the same journal. The four replies were authored by a retired member of each Service and by a retired senior public servant (notably none were presently-serving members of the ADF).[8] This is the only example known to this author of the ADF's operational art being publicly debated during the past decade. The responses reached a variety of conclusions, from substantial agreement with Evans to complete disagreement. It is noteworthy that much of the debate focused on Evans' proposed reforms to military education rather than the approach to ADF operational art.

Although all the participants in the debate acknowledged that further analysis and development was desirable, it was almost three years before such analysis emerged. This took the form of two papers by serving ADF officers (then Lieutenant Colonels). In the first, Trent Scott acknowledged that ADF practice and understanding of operational art had substantially evolved since Evans' article, due to the consolidation of Headquarters Joint Operations Command (HQJOC) as an operational level headquarters and the publication of a provisional edition of Australian Defence Doctrine Publication

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[6] Ibid., pp. 121-2. It is noteworthy that since the publication of this article, Antoine Bousquet has made a compelling argument that the technology bias has not been limited to the ADF but has been widespread within Western militaries: Antoine Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (London: Hurst and Co., 2009).
[7] Evans, 'The Closing of the Australian Military Mind', pp. 125-6. Original emphasis.
[8] Jim Molan, Ray Funnell, Chris Barrie, Ross Thomas and Michael Evans, 'Debate: The ADF and Operational Art', *Security Challenges*, vol. 4, no. 2 (Winter 2008), pp. 133-46.

(ADDP) 5.0—*Joint Planning* in 2006.[9]   However, Scott asserted that these steps were not enough, echoing Evans' contention that ADF operational art was conceptually weak and characterised by an intellectually restrictive framework. Importantly, Scott was critical not only of ADF practice but also its doctrine, asserting that:

> Unfortunately … contemporary ADF operational art and our current approach to campaign planning, as codified in doctrine, is derived from a way of warfare which is growing increasingly irrelevant, does not reflect operational reality, and fails to account for the non-linear and uncertain nature of war.[10]

The 'way of warfare' to which Scott referred is large-scale conventional conflict as envisioned during the Cold War. He additionally singled out 'centre of gravity' and 'effects-based approach to operations' for additional criticism, referring to both as flawed concepts. Scott made three broad recommendations. First, he called for an overhaul of Australia's military education system to better focus on teaching excellence in operational art. Second, he emphasised the need to ensure the ADF's operational art is relevant to Australia's circumstances, highlighting areas for doctrinal reform to:

> [E]mphasise the essential requirement to get the operational approach right, present a holistic understanding of war, elevate functionality over location, be human-centric and not techno-centric, and acknowledge Australia's geostrategic reality.[11]

Third, Scott advocated 'operational design'—which he defined as "applying critical and creative thinking to understand, visualise and describe complex, ill-structured problems and develop approaches to solve them"—as a methodology to help the ADF create a better understanding of the contemporary operational environment. Importantly, Scott was strongly influenced by US Army 'design methodology', advocating insertion of an essentially unaltered version of the US Army's design methodology into ADF doctrine.

The second paper was published a few months later. In it, Christopher Smith took a narrower focus, seeking "to see whether the Australian Army ought to adopt the US Army [operational design] methodology within its own doctrine", although he also extended several areas of his study to the ADF jointly.[12] He identified three constraints on the ADF's practice of operational art. First was a tendency to conflate operations with campaigns. Second was the codification of levels of conflict and declaration of the Chief of Joint

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[9] Trent Scott, *The Lost Operational Art: Invigorating Campaigning into the Australian Defence Force* (Canberra: Land Warfare Studies Centre, February 2011), pp. 1-3.
[10] Ibid., p. 13.
[11] Ibid., pp. 13-14.
[12] Christopher Smith, *Design and Planning of Campaigns and Operations in the Twenty-First Century* (Canberra: Land Warfare Studies Centre, April 2011), p. 1.

Operations (CJOPS) as an operational level commander, which "create[s] an artificial layer of 'strategy' between CJOPS (the supreme commander) and the statesmen".

In Smith's view, "[t]his layer of bureaucracy and process disconnects the statesman from the execution of the campaign". Third was "the doctrinal expression of strategy and operational art as a system of prescribed responsibilities, jurisdictions, processes, activities, documents and forums" that stifled institutional thinking about strategy and operational art by shifting the emphasis of (doctrine-based) joint professional military education to the need to understand bureaucratic processes above all else.[13]

Although he refrained from explicit recommendations, Smith nevertheless highlighted several areas where existing doctrine could be enhanced. These included mistaking design for planning, and observing that the JMAP was ill-suited to solving complex problems. Smith's understanding of 'design' was similar to Scott's, although he relied less on US Army doctrine. He emphasised the need for operational designers and planners to remain flexible; to develop and continually update a thorough understanding of the situation; to maintain an openness to learning; and to think critically about all aspects of operational design and planning.

In August 2012, an Australian Strategic Policy Institute report by Hugh Smith and Anthony Bergin examined the state of joint professional military education in Australia. It called for reform to the ADF's understanding and practice of operational art.[14] One of its recommendations was that the ADF should introduce a short, high-level course focusing exclusively on operational art, although it did not make any specific recommendations regarding changes to doctrine.

Professor Evans authored the final noteworthy article addressing operational art in the ADF, published in mid-2012.[15] Evans honed in on one specific aspect of operational art: centre of gravity analysis. In light of the intellectual debate in the United States since the mid-2000s, linked to the US military's shift to 'operational design', Evans made four recommendations, emphasising that centre of gravity analysis remains highly relevant and advocating the introduction of a US-style approach to operational design.

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[13] Ibid., pp. 51-52.
[14] Hugh Smith and Anthony Bergin, *Educating for the Profession of Arms in Australia*, Special Report No. 48 (Canberra: Australian Strategic Policy Institute, August 2012), esp. pp. 28-9.
[15] Michael Evans, 'Centre of Gravity Analysis in Joint Military Planning and Design: Implications and Recommendations for the Australian Defence Force', *Security Challenges*, vol. 8, no. 2 (Winter 2012), pp. 81-104.

Innovations Abroad

At the same time as the discussion of the ADF's operational art, the US military was undergoing a period of innovation, with a particular catalyst being the wars in Afghanistan and Iraq.[16] The best known example of this innovation was the 2006 edition of the US Army/US Marine Corps *Counterinsurgency* field manual, which established an alternative operational approach, subsequently implemented during 'the surge' in Iraq in 2007.[17] While the US military has since sidelined much of the counterinsurgency thinking this manual contained,[18] it has kept some of the key tools and further developed them in subsequent publications, notably 'operational design', which is defined in the latest edition of US *Joint Publication (JP) 5-0—Joint Operation Planning* as:

> Operational design supports operational art with a general methodology using elements of operational design for understanding the situation and the problem. The methodology helps the [Joint Force Commander] and staff to understand conceptually the broad solutions for attaining mission accomplishment and to reduce the uncertainty of a complex operational environment. Additionally, it supports a recursive and ongoing dialogue concerning the nature of the problem and an operational approach to achieve the desired end states.[19]

On closer scrutiny, it is evident that several of the elements of operational design in this publication—such as determining termination conditions and the military end-state, conducting centre of gravity analysis, determining decisive points and arranging operations—pre-date it and were discussed under the heading of 'operational art' in previous publications.[20] Despite this overlap, there were nevertheless some important innovations, with two being particularly noteworthy.

The first was the formation of a linkage between operational design and developing an understanding of the situation and problem. Unlike its predecessors, this edition included a more detailed discussion of the importance of developing a sound understanding of the operational environment and defining the problem facing the joint force, emphasising that this was essential to ensure that operational planning would be able to address the 'right' problem. Although this may sound somewhat intuitive, it was actually a significant departure from previous editions, which had

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[16] For example, see: Philipp Rotmann, David Tohn and Jaron Wharton, 'Learning Under Fire: Progress and Dissent in the US Military', *Survival*, vol. 51, no. 4 (August-September 2009), pp. 31-48.

[17] Thomas E. Ricks, *The Gamble: General Petraeus and the Untold Story of the American Surge in Iraq, 2006-2008* (New York: Allen Lane, 2009).

[18] Fred Kaplan, 'The End of the Age of Petraeus: The Rise and Fall of Counterinsurgency', *Foreign Affairs*, vol. 92, no. 1 (January/February 2013), pp. 75-90.

[19] US Department of Defense, *Joint Publication (JP) 5-0—Joint Operation Planning* (Washington, DC: Department of Defense, August 2011), p. III-2.

[20] These elements of design are listed in *JP 5-0—Joint Operation Planning*, p. III-18 and elaborated in ch. 3.

implicitly assumed that the nature of the operational environment and problem would be readily evident.

The second was the more prominent use of language associated with complex adaptive systems theory. For example, the latest edition of *JP 5-0—Joint Operation Planning* asserts that "operational design requires the commander to encourage discourse and leverage dialogue and collaboration to identify and solve complex, ill-defined problems". Even though such language was not accompanied by an explanation of the underlying fundamentals of complex adaptive systems theory, some aspects were elaborated in an accompanying *Planner's Handbook for Operational Design*, published in October 2011. This *Handbook* stressed the need for critical thinking, provided guidance about how to achieve this, and detailed the interaction between operational design and operational planning.[21]

The Evolution of ADF Operational Art

The key doctrine publication that describes the ADF's approach to operational art is Australian Defence Force Publication (ADFP) 5.0.1—*Joint Military Appreciation Process*. This publication provides guidance for planning ADF campaigns and operations using the JMAP, a planning tool designed to be used from the initial receipt of strategic level direction through to the completion of a comprehensive concept of operations (conops). The conops provides guidance for the conduct of an operation and forms the basis of subsequent orders given to the force elements that will conduct the operation. The JMAP is also suitable for use to revise plans once an operation has commenced, or to plan the cessation of an operation currently underway. The current iteration of the JMAP is shown in Figure 1.

The ADF aims to review and update each of its joint doctrine publications every three-to-five years as part its doctrine development process. Accordingly, the 2009 edition of the JMAP doctrine was revised in 2014. Beyond merely updating the doctrine, however, this review aimed to reinvigorate operational art for the ADF as it approaches the third decade of the twenty-first century. The three ADF organisations that most frequently employ operational art are HQJOC, which is the main ADF organisation responsible for applying operational art in practice, the Joint Warfare Training Centre and the Australian Command and Staff College, which are both responsible for teaching operational art as part of the ADF's Joint Professional Military Education (JPME) continuum. While the needs of these and other stakeholders remained the primary consideration throughout the revision, the review was also able to address the points raised in the articles summarised above, as well as to respond appropriately to the evolution of operational art that had occurred within the US military.

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[21] Department of Defense, *Planner's Handbook for Operational Design*, Version 1.0 (Suffolk: Department of Defense, October 2011).

Figure 1: How the ADF Applies Operational Art: The Joint Military Appreciation Process
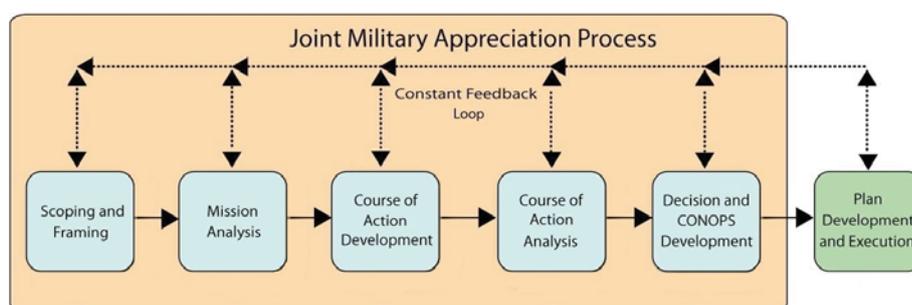
Source: ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., Figure 1.1.

Meetings with stakeholders, HQJOC in particular, led to the identification of three key areas where doctrinal updates were required. The first of these was confirmation of the need for increased doctrinal interoperability with the US military, due to the frequency of combined military activities involving the ADF and its US ally. Second, the utility of operational art needed to be expanded so that it could be applied to any operation across the spectrum of military activities, and to domestic as well as overseas operations. Several ADF operations in the last fifteen years have involved unconventional warfare and several others have been unopposed.[22] The previous iteration of JMAP, which concentrated on defeating a conventional adversary's centre of gravity (COG), had required ad hoc adaptation by practitioners during these operations. Third, the increased occurrence of multiagency operational planning had resulted in the need for a planning process that could easily be communicated to members of other government agencies and that would enable these agencies to be able to easily have input into ADF planning when the situation required.

Evolving the ADF's operational art in a way that successfully met this multitude of requirements was a significant challenge that was ultimately overcome by developing a functional approach to operational art—a recommendation that had been at the forefront of the body of critical literature. The development of this approach is one of the most significant aspects of the new JMAP doctrine.[23] Operational art, traditionally understood, is the sequencing of tactical actions to form a campaign in pursuit of overarching strategic objectives. The term itself has its origins in inter-war Soviet military theory and it was initially developed to cope with

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[22] Unopposed operations included humanitarian, disaster relief, non-combatant evacuation and Defence Assistance to the Civil Community operations. A partial list of these ADF operations can be found at: <www.defence.gov.au/Operations/default.asp> [Accessed 9 April 2015].

[23] The benefits of a functional approach to operational art are explored in greater detail in: Aaron P. Jackson, 'The Practice of Operational Art by Small Militaries: Why and How', *Military Operations*, vol. 3, no. 1 (Spring 2015), pp. 14-17.

very large scale military activities in a conventional, industrialised state vs. industrialised state setting.[24] In the words of Philip Jones, "what the Soviets handed down was an approach that mirrored tactics but on a larger scale".[25] Considered the realm of the front or theatre commander, the Soviets linked operational art to the activities of army groups, armies or perhaps sometimes divisions.

The ADF is, of course, nowhere near large enough to employ operational art the way the Soviets did. Addressing the first of the six major areas for refinement listed above, the new edition of JMAP doctrine has more fully-developed an alternative, functional approach to operational art that suits the contemporary Australian military context. In this approach operational art is the linking of strategic aims with tactical actions, the synchronisation of operations in depth and the linking of multiple tactical engagements to form an operation, *regardless of scale*.[26] This approach is suitable to the Australian context because of the flexibility with which it can be employed. To achieve this flexibility the new JMAP doctrine has been designed to be adaptable to a wide variety of operations, including those undertaken overseas or domestically, opposed or unopposed, and in which the actions of other government departments may contribute to achieving overarching national strategic objectives. To enable easier access by members of these departments the new edition of the JMAP doctrine is unclassified and publicly released.

Links to US doctrine have been achieved through the development of an ADF-specific concept of 'operational design' that reflects that contained in the US joint operations planning process, adapted to suit Australian conditions. In addition to emphasising a functional approach, in this adaptation operational art consists of a mix of both operational design and 'arrangement of operations', a delineation that parallels but is more distinct than in the equivalent US doctrine.[27] According to the new JMAP doctrine:

> Operational design produces a schematic that articulates the contemporary application of operational art. It constitutes a synthesis between classical notions of operational art, developed during the late nineteenth and twentieth centuries … and selected aspects of complex adaptive systems theory that have emerged during the early twenty-first century.
>
> Arrangement of operations adds additional depth and flexibility to the broad outputs of operational design … This vital detail allows commanders and planners to ensure that activities are ordered to efficiently progress towards

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[24] Justin Kelly and Mike Brennan, *Alien: How Operational Art Devoured Strategy* (Carlisle, PA: US Army War College Strategic Studies Institute, September 2009), pp. 11-71.
[25] Philip Jones, '"The Operational" in the Information Age', *Military Operations*, vol. 2, no. 2 (Spring 2014), p. 14.
[26] Australian Defence Doctrine Publication (ADDP) 5.0—*Joint Planning*, 2nd ed., Amendment List 1 (Canberra: Defence Publishing Service, 2015), ch. 2.
[27] For the US equivalent, see: *JP 5-0—Joint Operation Planning*, pp. III-35–III-38.

achieving the end state. Appropriate arrangement of operations helps determine the purpose and tempo of desired effects and activities.[28]

The elements of each of these aspects of the ADF's revised approach to operational art are shown in Table 1.

Table 1: Contemporary Operational Art: Elements of Operational Design and Arrangement of Operations

Elements of operational design	Elements of arrangement of operations
a. Conduct environment and problem framing b. Determine the desired campaign or operation end state c. Determine the campaign or operation objectives that together will achieve the desired end state d. Conduct centre of gravity analysis e. Determine decisive points f. Determine desired effects g. Arrange decisive points to form lines of operation that link to each objective	a. Assess operational risk b. Determine and mitigate against culminating points c. Determine probable operational reach d. Sequencing e. Phasing f. Determine main effort g. Develop branches and sequels h. Conduct operational assessment

Source: ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., para 1.9-1.16.

Incorporating this conceptualisation of operational art into the JMAP involved two major changes to the ADF's planning process. First, to maximise planners' situational understanding, Framing has been added as a vital component of operational design. "[U]sed when confronting an adaptive, interactively complex, and/or ill-structured problem", Framing "enables the commander and [planning] staff to develop an enhanced situational understanding". It is used to "deconstruct complexity and to ensure that the correct problem or series of problems are fully explored".[29]

This is an important evolution of the planning process. Even though the previous edition of the JMAP doctrine included 'Preliminary Scoping' before the JMAP commenced, this was comparatively limited and several aspects of the nature of the environment and problem were implicitly assumed to be known. By contrast, the inclusion of Framing within the new JMAP doctrine gives planning staff a much better opportunity to develop a deeper understanding of the operational environment and the problem they are facing before they apply other aspects of operational art to try and solve it (Framing has been integrated with the previous edition's Preliminary Scoping activities to form a new first JMAP step, titled 'Scoping and Framing'). This is highly useful for ADF planners as it helps them to understand each of the varied and unique scenarios they may face. Framing is also the aspect of the revised ADF conceptualisation of operational art that draws most heavily on complex adaptive systems theory. For example, the section of the

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[28] ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., paras 1.10, 1.13.
[29] Ibid., para 2.26.

doctrine about determining the environment frame encourages planning staff to develop a diagram illustrating relevant actor relationships in the operational environment within the 'observed system' and those in the 'desired system' as a first step towards understanding what may be required to prompt transition from one to the other.[30]

The second major change that this revised conceptualisation has brought is the determination that all aspects of operational design need to be completed by the end of the second step of the JMAP (Mission Analysis). The elements of arrangement of operations then constitute the remaining three steps.[31] In the contemporary operational environment, factors such as the 24-hour news cycle and the speed of global communications have increased both the amount of data available to operational planners and the need for them to produce options to strategic-level decision-makers more quickly than used to be the case. While the inclusion of elements such as Framing are useful to assist planners to develop situational understanding, the completion of operational design within the first two steps of a five-step planning process addresses the need to develop a broad plan quickly.

As Table 1 describes, by the time operational design is completed planners ought to have derived decisive points (DP) and sequenced them into lines of operation (LOO) that each lead towards achievement of a campaign or operation objective. Each objective should in turn be linked to the achievement of the desired campaign or operation end state and this end state should itself be linked to either a strategic objective or the strategic end state. Figure 2 shows the linkage between these elements and is referred to within JMAP doctrine as a 'LOO diagram'. At the conclusion of operational design, operational planners should be able to develop a schematic akin to this example.

Applying a functional approach results in operations being conceived as a sequence of tactical actions regardless of overall scale. Campaigns in turn sequence multiple operations as they progress towards a common strategic end state. This version of JMAP can be used to plan either campaigns or operations as it is simply the focus of planning that varies.[32] This series of linkages is referred to as 'nesting' and this aspect of the updated doctrine has been key to adequately addressing two of the areas for refinement listed

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[30] Ibid., paras 2.31-2.42.

[31] In the previous edition of JMAP doctrine several elements now completed in steps one and two were completed in later steps.

[32] Campaigns explicitly differ from operations because of their scale (linking a series of discrete operations rather than directly linking tactical actions) but the same conceptual relationships between the desired end state, objectives and DP remain applicable. Ibid., para 1.26-1.27; ADDP 5.0—*Joint Planning*, 2nd ed., ch. 3-4.

above: the linkage between operational and strategic objectives; and the delineation between campaigns and operations.[33]

Figure 2: A Lines of Operation Diagram: The Final Output of Operational Design
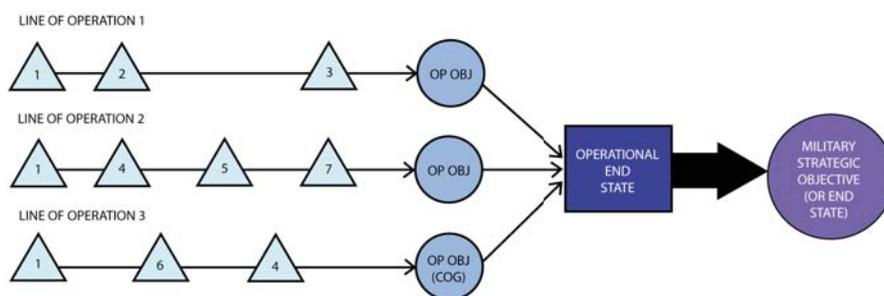
Source: ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., Figure 3.4.

Looking at Figure 2, one can observe that the third operational objective is defeat of the adversary's COG (symbolised by the inclusion of '(COG)' after the objective title). This positioning of the COG within the LOO diagram symbolises another significant evolution of the ADF practice of operational art: a comprehensive update of the role and place of COG analysis within operational planning. Previously, COG analysis was central to ADF operational art, with joint doctrine linking all LOO to the defeat of an adversary COG and this defeat being implicitly synonymous with reaching the desired operational end state (something that was not explicitly determined during planning). This resulted in an artificially narrow conception of operational art that was linked exclusively to defeat of an adversary's COG.

In addressing the need for greater doctrinal utility across several types of operations, including those where there is not necessarily an adversary, the review of the JMAP doctrine confronted two key issues. The first was

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[33] It may be argued that 'nesting' in this context supports the assertion by Justin Kelly and Mike Brennan that operational art has become analogous to an 'alien' that has 'devoured' strategy. In their assessment, campaign planning should fall under the remit of strategic and not operational level planning, in which case JMAP doctrine is not the appropriate place for a discussion of campaign planning at all. This author has disputed this analogy elsewhere, arguing that a more appropriate analogy would be that operational art has become a 'surrogate' that has 'adopted' strategy in light of practical requirements associated with endeavours to implement Samuel Huntington's idealised model of civil–military relations. Yet in the case of JMAP doctrine, the academic debate over where to situate campaign planning and why is moot. The stakeholders in the doctrine stated a requirement for it to address campaign planning and from a doctrine development perspective that was sufficient for it to need to be addressed within the publication. Kelly and Brennan, *Alien*; see also Aaron P. Jackson, 'Surrogate: Why Operational Art Adopted Strategy', *Military Operations*, vol. 2, no. 2 (Spring 2014), pp. 8-11.

whether to keep COG analysis in the doctrine at all. This issue was relatively easy to resolve, as all three major stakeholders wanted the concept retained. Indeed, this aspect of the review showed that culturally the ADF—the Army in particular—is wedded to the COG concept to the extent that removing it from the doctrine altogether would have resulted in insurmountable 'sales resistance', to the point where the revised iteration of JMAP likely would not have been applied.[34]

The second issue confronted during the review was determining what form COG analysis should take and where it should be positioned within the overarching planning process. This issue came about because of a substantial theoretical evolution in COG analysis methodology over the last decade, which had already led to changes to the curriculum of the Joint Operations Module taught at the Australian Command and Staff College. Fortunately, the theoretical work addressing COG analysis was also available to assist in the development of the doctrine. The final decision about how to fit COG analysis within the JMAP resulted from a thorough evaluation of this literature, supported by extensive consultation with the key stakeholders.[35]

New definitions of COG and related 'critical factors' (which encompass critical capabilities, critical requirements and critical vulnerabilities) were developed and are shown in Table 2.[36] These definitions are based on the discussion of COG analysis found in some of the more recent works of American theorist Dale C. Eikmeier, albeit modified to be simpler and more

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[34] Bassford asserted that 'sales resistance' to new doctrine is "often stimulated by overt attempts to introduce a new paradigm". In this case the opposite action, the complete removal of a familiar paradigm from the doctrine, would likely have had the same result. Christopher Bassford, 'Doctrinal Complexity: Nonlinearity in Marine Corps Doctrine', in F. G. Hoffman and Gary Horne (eds.), *Maneuver Warfare Science 1998* (Washington DC: Department of the Navy, US Marine Corps, 1998), p. 11.

[35] Relevant theoretical works include: Dale C. Eikmeier, 'Center of Gravity Analysis', *Military Review*, July/August 2004, pp. 2-5; Celestino Perez, Jr (ed.), *Addressing the Fog of COG: Perspectives on the Center of Gravity in US Military Doctrine* (Fort Levenworth, KS: US Army Combat Studies Institute Press, 2012); Dale C. Eikmeier, 'Give Carl von Clausewitz and the Center of Gravity a Divorce', *Small Wars Journal*, vol. 9, no. 7 (2 July 2013), <smallwarsjournal.com/jrnl/art/give-carl-von-clausewitz-and-the-center-of-gravity-a-divorce> [Accessed 17 February 2015]; James P. Butler, 'Godzilla Methodology: Means for Determining Center of Gravity', *Joint Force Quarterly*, no. 72 (1st Quarter 2014), pp. 26-30; Lawrence Freedman, 'Stop Looking for the Center of Gravity', *War on the Rocks* (blog), June 2014, <warontherocks.com/2014/06/stop-looking-for-the-center-of-gravity/> [Accessed 17 February 2015]. To ensure interoperability, another influential source that was thoroughly evaluated was *JP 5-0—Joint Operation Planning*, which contains the latest iteration of US joint doctrinal thinking on the subject.

[36] In this new COG construct there is no such thing as a 'targetable critical vulnerability', a concept that featured prominently in the previous construct (and which continues to feature in Australian Army doctrine). This is because, according to the new definition, all critical vulnerabilities are inherently targetable.

strongly interlinked.[37]   In addition to Eikmeier, the writings of Joseph L. Strange and Richard Iron were highly influential and the JMAP doctrine drew on the work of all three theorists to provide an explanation of how to conduct COG analysis.[38]   Jan L. Rueschhoff and Jonathan P. Dunne's approach to identifying COG "from the 'inside out'" shaped the doctrine's recommended methodology for conducting COG analysis starting with the identification of critical capabilities and then "working left and right" to determine the COG as well as the other critical factors.[39]

Table 2: New Definitions of Centre of Gravity and Related Critical Factors

Term	Definition
Centre of gravity	The primary entity that possesses the inherent capability to achieve an objective or the desired end-state.
Critical capabilities	An action (verb) done by the centre of gravity which enables it to achieve an objective or the desired end-state.
Critical requirements	A thing (noun), resource or means that is essential for a critical capability to enable a centre of gravity to function.
Critical vulnerabilities	Those critical requirements, or components thereof, that are inherently targetable and vulnerable to neutralisation, defeat or destruction in a way that will contribute to undermining a centre of gravity.

Source: ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., glossary.

These definitions of COG and the critical factors are very different to those contained in the previous edition of the JMAP doctrine. These changes are not just change for its own sake, however. On the contrary, the revised definitions are central to ensuring that the doctrine for ADF operational art is flexible enough to be relevant to a broad range of operations without the need for ad hoc adaptation. This revised COG construct is explicitly linked to either a DP, an objective or the desired end state, meaning that COG analysis can be flexibly applied depending on the requirements of the operational scenario. Additionally, the new edition of JMAP doctrine caters for situations where there is no adversary COG at all. In these cases COG analysis may simply be skipped, allowing planners to instead focus on other aspects of operational art that are more relevant to the scenario, or alternatively a COG analysis may be completed for a non-adversarial threat

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[37] Dale C. Eikmeier, 'Redefining the Center of Gravity', *Joint Force Quarterly*, no. 59 (4th Quarter 2010), pp. 156-8; Dale C. Eikmeier, 'After the Divorce: Clausewitz and the Center of Gravity', *Small Wars Journal*, vol. 10, no. 3 (6 March 2014), <smallwarsjournal.com/jrnl/art/after-the-divorce-clausewitz-and-the-center-of-gravity> [Accessed 14 February 2015].

[38] ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., para 3.19-3.22; Joseph L. Strange and Richard Iron, 'Centre of Gravity: What Clausewitz Really Meant', *Joint Force Quarterly*, no. 35 (October 2004), pp. 20-27; Joe Strange and Richard Iron, 'Understanding Centers of Gravity and Critical Vulnerabilities', unpublished paper in two parts. Available online, <www.au.af.mil/au/awc/awcgate/usmc/cog1.pdf> (part 1), <www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf> (part 2).

[39] ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., para 3.29-3.32; Jan L. Rueschhoff and Jonathan P. Dunne, 'Centers of Gravity from the "Inside Out"', *Joint Force Quarterly*, no. 60 (1st Quarter 2011), pp. 120-4.

that would prevent mission accomplishment if not adequately addressed.[40] The revised COG construct is therefore a significant example of how the updated JMAP doctrine allows for a more flexible application of operational art.

The final major evolution of the ADF's operational art that is worthy of mention is the inclusion of a focus on critical thinking. Although critical thinking itself is not new, its formal inclusion within JMAP doctrine is. Indeed, outside of the United States, the ADF is now the only other English-speaking military to address critical thinking in a high-level planning doctrine publication.[41] This inclusion recognises the high degree of uncertainty and need for flexibility that characterises contemporary operations and the new edition of JMAP doctrine includes a section that prompts planners to think critically not only about the situation they are facing but also about the planning process itself.[42] Specifically, the doctrine notes that:

> The JMAP is, as the name states, a process. Although it is robust and adaptable, it is nevertheless subject to some inherent limitations that stem from its linear nature and formulaic structure … Since JMAP is simply a tool for structured analysis and the drawing of conclusions to create a conops, it can be shaped to fit the immediate situation and experience of the commander and staff. It behoves commanders to allow their staff the freedom to think critically and creatively about solving the right problem within the most appropriate planning construct.[43]

Developing critical thinking skills is a vital component of JPME and accordingly the doctrine highlights that operational art is ultimately a subjective activity. Processes such as JMAP should support rigorous analysis and understanding and should never be followed merely out of routine or because of precedence.

The Limits of the ADF's New Approach

Even though the new edition of JMAP doctrine has refreshed the ADF's approach to operational art, it is not a panacea. Despite the suitability of the approach to operational art that it contains, there are three areas where the doctrine could further evolve. The first is a technicality, with the doctrine using the term 'lines of operation' to discuss what should more accurately be

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[40] ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., para 3.13-3.37.
[41] The United Kingdom has recently released a few joint doctrine publications that address *understanding* and mention critical thinking in passing, but these do not explain or focus on critical thinking, nor are they doctrine for military planning. It is also noteworthy that North Atlantic Treaty Organization (NATO) planning doctrine does not discuss critical thinking either. Joint Doctrine Publication 04—*Understanding* (Shrivenham, UK: Directorate of Development Concepts and Doctrine, 2010); Joint Doctrine Note 3/11—*Decision-Making and Problem Solving: Human and Organisational Factors* (Shrivenham, UK: Directorate of Development Concepts and Doctrine, 2011); Allied Joint Publication 5—*Allied Joint Doctrine for Operational-Level Planning* (Brussels: NATO Standardization Agency, June 2013).
[42] ADFP 5.0.1—*Joint Military Appreciation Process*, 2nd ed., para 1.30-1.32.
[43] Ibid., para 1.31-1.32.

referred to as 'lines of effort'. The difference is that historically the first term refers to a physical route taken by a military force moving through territory, whereas the second term refers to a conceptual linkage between related operational activities.[44] This inaccuracy is currently found in Australian Army as well as ADF joint doctrine. Although the current usage is workable, use of this term should nevertheless be reconsidered the next time the ADF approach to operational art is updated.

The second area is the approach to operational risk management that has been included in the JMAP doctrine. Here an issue arises from a fundamental contradiction between the requirements of current legislation, and traditional conceptualisations of military operational risk. The root of this contradiction is that the *Work Health and Safety Act 2011*(Cth) maintains that "the health and safety of people must underpin all operational decisions";[45] however, traditional military operational risk management involves weighing potential gains and costs in situations where risks to the safety of the people involved are likely to be an essential prerequisite for military mission success. The tactical impact of this contradiction has been concisely summarised by one Australian commander, although importantly this commander's assertions also apply at the operational and strategic levels:

> It is too risky to not accept risk in war. … If the most important risk assessment in war is whether the prize is worth the potential cost, then the management and assessment of hazards must take on a different form than the identification and mitigation of hazards under the orthodox workplace risk management model. … Workplace risk management processes are also suboptimal in warfare because they tend to reduce a commander's and staff's awareness of weak signals of looming threats.[46]

Despite this warning and the lessons learned that underlie it, risk management within the ADF remains geared towards an orthodox workplace risk management approach. Even though the JMAP itself constitutes a well-developed operational risk management tool in the traditional military sense, the unique nature and requirements of operational risk management are not addressed within the current legislation. As a result there has been a need

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[44] The ADF usage of these terms varies from the United States use of the same terms, with US doctrine stating that: "A LOO defines the interior or exterior orientation of the force in relation to the enemy or that connects actions on nodes and/or decisive points related in time and space to an objective(s). A line of effort links multiple tasks and missions using the logic of purpose—cause and effect—to focus efforts toward establishing operational and strategic conditions". *JP 5-0—Joint Operation Planning*, p. xxii. On the historical use of the term 'lines of operation', see: Azar Gat, *A History of Military Thought: From the Enlightenment to the Cold War* (Oxford: Oxford University Press, 2001), Bk I, esp. pp. 77-78.

[45] Comcare, 'Commonwealth Work Health and Safety Act 2011 Effective Now', 1 January 2012, <www.comcare.gov.au/news__and__media/features_/commonwealth_work_health_and_safety_act_2011_effective_now> [Accessed 2 June 2015].

[46] The Commanding Officer of an Australian Battle Group in Afghanistan in 2011, 'Commanding Officer's Observations: Mentoring Task Force Three', *Military Operations*, vol. 2, no. 2 (Spring 2014), pp. 5-6.

to include an operational risk management model based on a peacetime workplace risk management framework within the JMAP doctrine as a stand-alone annex.[47] This 'process within a process' leads to the duplication of effort and has the potential to undermine the achievement of military missions by causing over-prioritisation of force protection. Addressing this potential problem is beyond the remit of doctrine developers, however, and an amendment to the legislation is required before this problem can be addressed within doctrine.

The third area that warrants mention is perhaps the most significant, because it addresses the ADF's fundamental understanding of armed conflict and its approach to waging war. Despite the inclusion of Framing as a key component of operational design, the ADF's revised approach to operational art remains firmly rooted within the same paradigm as its predecessors, which Christopher Paparone refers to as "ends-based rationalism".[48] As Figure 2 shows, this paradigm assumes that there are clear and identifiable linear linkages between strategic objectives, a desired operational end state, operational objectives and tactical actions.[49] The desired end state, which is the start-point for all subsequent planning, can be broken down via reverse-engineering into objectives, which can be further broken down into DP. In this paradigm the desired end state is merely the sum of its parts. Achieving all DP, which can be sequenced linearly in space and time, achieves all objectives. This in turn achieves the desired end state. Despite its success in addressing the criticisms made about the ADF's previous approach to operational art, the revised approach therefore remains within a reductionist and linear paradigm.

Continued adherence to this paradigm suggests the limits of the ADF's revised approach; however, acknowledgement of these limits should not be construed as an admittance of failure. On the contrary, the ADF got the updated approach to operational art that is the best it could be at this particular point in time, given the organisation's prevailing culture and general requirements of its operational art. Working groups held with key stakeholders indicated from early in the review process that any efforts to push beyond an approach that fit within the ends-based rationalist paradigm would have met an insurmountable level of Christopher Bassford's so-called

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[47] This framework is based on that contained in Australian/New Zealand Standard AS/NZS 31000:2009 *Risk Management—Principles and Guidelines*, with which the ADF complies.

[48] Christopher R. Paparone, 'Beyond Ends-Based Rationality: A Quad-Conceptual View of Strategic Reasoning for Professional Military Education', in Gabriel Marcella (ed.), *Teaching Strategy: Challenge and Response* (Carlisle, PA: US Army Strategic Studies Institute, March 2010), p. 310.

[49] For the purposes of this paper, 'paradigm' is defined as the "constellation of beliefs, values, techniques and so on shared by the members of a given [scientific] community". Thomas S. Kuhn, *The Structure of Scientific Revolutions,* 4th ed. (Chicago and London: University of Chicago Press, 2012), p. 174. For a more detailed discussion of how Kuhn's conceptualisation of paradigms may be applied to military and strategic thinking see: Aaron P. Jackson, 'Paradigms Reconsidered', *Infinity Journal*, vol. 4, no. 1 (Summer 2014), pp. 26-31.

'sales resistance'.[50]   Although the inclusion of methodologies such as Framing have introduced ideas and approaches influenced by non-linear paradigms (such as complex adaptive systems approaches) in such a way that they have been generally accepted, this has come at the cost of having subordinated these approaches as steps within an overarching linear process framed within an ends-based rationalist paradigm.

Acknowledging the limits of this paradigm is useful as it allows the ADF to identify ways that it may further improve its approach the next time it reviews its operational art. For example, an expansion of Framing may allow this or a similar concept to include an evaluation not only of the environment and the problem, but also of which paradigm may incorporate the most appropriate approach to solving it. An ends-based rationalist approach to planning such as the JMAP would therefore become only one possible problem-solving tool in a multiparadigmatic toolkit, rather than being the only tool available, as is currently the case.

Alternative tools may come from alternative paradigms, including for example interpretivism, radical humanism and radical structuralism.[51]   There is also scope for the inclusion of a greater emphasis on critical thinking to assist in the development of 'out of the box' approaches to operational art that do not necessarily involve the conduct of JMAP. A discussion of 'thinking about thinking' about the JMAP and the rationalist paradigm that underlies it, encouraging a more pluralistic and explicit consideration of this paradigm and its implications, and introducing alternative paradigms and also multiparadigmatic approaches, could be a starting point for such critical thinking. Given the newness of these ideas to the ADF, a 'joint doctrine note' separate to the JMAP publication may be the best starting point for this discussion.[52]

An enhanced interest in operational art best practice, resulting from a fundamental cultural change as opposed to being driven by an interested few, will be required to ensure the effectiveness any such future evolution. To have the desired impact in this regard, any such emphasis within doctrine

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[50] Bassford, 'Doctrinal Complexity', p. 11. For an elaboration of Bassford's concept of 'sales resistance' see note 34.

[51] Unfortunately space constraints prohibit the further elaboration of these alternative paradigms herein. Readers interested in additional information are encouraged to consult: Dennis A. Gioia and Evelyn Pitre, 'Multiparadigm Perspectives on Theory Building', *Academy of Management Review*, vol. 15, no. 4 (1990), pp. 584-602. For discussions of inter-paradigmatic tension in a military context, see: Ben Zweibelson, 'An Awkward Tango: Pairing Traditional Military Planning to Design and Why it Currently Fails to Work', *Journal of Military and Strategic Studies*, vol. 16, no. 1 (2015), pp. 11-41; Christopher R. Paparone, 'Red Teaming: Multiparadigmatic Approach', in Gregory Moore (ed.), *The Encyclopaedia of US Intelligence,* vol. 2 (Boca Raton: CRC Press, 2015).

[52] Joint doctrine notes are short publications that introduce new ideas and concepts, enabling them to be discussed, debated, assessed and further developed before they are formally incorporated into joint doctrine publications.

would need to be accompanied by a commensurate change in focus within JPME courses, which are the most appropriate place to begin expanding practitioners' knowledge of alternative paradigms. Hence JPME will remain a vital means of ensuring that the ADF's practice of operational art remains robust well into the future.[53] Continuing evaluation of doctrinal effectiveness 'post-H-Hour' (i.e. after an operation has commenced) at a joint task force level is another vital aspect, and ongoing linkages between evaluation, doctrine and JPME will also be vital to ensuring all three enable the ADF to maintain its focus on achieving operational success.

Conclusion

The JMAP doctrine publication encapsulates the ADF's institutionally sanctioned approach to operational art. A new edition of this publication has recently been released, representing an innovative evolution of the ADF's approach to operational art. The key change between this edition and its predecessor is the more detailed development within this edition of a functional approach to operational art. This approach emphasises that operational art is the linking of strategic aims to tactical actions, the synchronisation of operations in depth and the sequencing of multiple tactical engagements to form an operation, *regardless of scale*. Accompanying conceptual changes have established 'operational design' as a core component of operational art. This includes the conduct of Framing to better take into account operational complexity and to greatly enhance situational understanding. Centre of gravity analysis has also been reviewed and comprehensively updated in light of recent theoretical developments. Finally, explicit discussion of the need for critical thinking and flexibility during the JMAP has been included within the doctrine.

At the core of his article criticising the ADF's previous approach to operational art, Evans asserted that "the ADF needs to develop a holistic approach to operational art that is at once sufficiently orthodox to ensure interoperability with major alliance partners, flexible enough to cover all likely missions and reflective of middle-power geopolitical reality".[54] As a result of the aforementioned changes to its operational art, the ADF has successfully achieved just such a holistic approach. ADF operational art can now be

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[53] Teaching of alternative paradigms is already being tested within some Canadian and American JPME courses. An evaluation of these courses could serve as a starting point for the ADF's development of its own multiparadigmatic JPME program. For further information on allied developments, see: Paul T. Mitchell, 'Stumbling into Design: Radical Action Experiments in Professional Military Education at Canadian Forces College' and Christopher R. Paparone, 'Critical Military Epistemology: Designing Reflexivity into Military Curricula', both in: *Journal of Military and Strategic Studies*, Special Issue: The Rise of Reflexive Military Practitioners, forthcoming in 2017. Grant Martin proposes another possible way to achieve such a change within JPME courses and Australia's JPME institutions may also benefit from considering his proposal, regardless of the state of ADF doctrine. Grant M. Martin, 'Deniers of "The Truth": Why an Agnostic Approach to Warfare is Key', *Military Review*, January-February 2015, pp. 42-51.
[54] Evans, 'The Closing of the Australian Military Mind', pp. 124-5.

applied to a much wider variety of operations, including unopposed as well as opposed operations. The JMAP itself is more easily interoperable with the equivalent planning processes of key allied militaries, the United States in particular, and the unclassified status of the updated edition of the JMAP doctrine will make it easier to refer to this publication when planning in a multiagency context.

Overall the updated JMAP, combined with rigorous JPME, gives the ADF an up-to-date and intellectually robust approach to operational art. As the varied nature of recent ADF operations attests, the development of innovative approaches to operational art is increasing in importance. The ADF's updated approach to operational art is therefore a significant step in the right direction. But it should not be considered the final step and accordingly the final section of this article proposes where the next step might go. Meanwhile, the new edition of the JMAP and the approach to operational art contained therein has set the ADF up for continued operational success until such time as this next step is taken.

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