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What Strategic Wargaming Can Teach Us

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It is a pleasure to deliver this presentation at long last, albeit through the virtual medium with which we have all perforce become so familiar over the past year. 12 months ago, I had returned to Europe to give the presentation in person, but the conference was cancelled as the Covid storm broke, and I had to re-book my flight at eye-watering expense and dash to the airport to catch the last plane back to Chile before the borders closed to foreigners like myself. There could be no better illustration of the challenge of coping with unexpected events, and the utility of techniques such as wargaming which may help us to think through in advance how we might cope better with high pressure crises of this kind.

Wargaming today is very much in vogue. In September 2019, the UK's defence minister spent an hour at King's visiting our biggest ever professional wargaming conference, and three years ago the Vice Chief of the Defence Staff opened the UK's new *Wargaming Handbook* by writing as follows:

> Wargaming is a powerful tool. It can deliver better understanding and critical thinking, foresight, genuinely informed decision making and innovation... It allows those involved to experiment and learn from their experiences in a 'safe to fail' environment.[1]

Even universities, which had traditionally paid far less attention to wargaming than to other scholarly techniques such as game theory or operational analysis, are taking more interest in wargaming as an alternative way of understanding conflict. Only a few years ago, I wrote that, 'when I retire, my modules will probably be replaced with more conventionally taught ones, and wargaming at King's will disappear with hardly a ripple'.[2] In fact, King's has not only recruited another academic (Dr David Banks) to take my place, but it has also established the King's Wargaming Network now co-directed by Dr Banks and Ivanka Barzashka, with an active programme of public lectures, study workshops, international partnerships, taught courses and grant-funded research projects using wargaming techniques. This is on top of the annual Connections UK professional wargaming conference, one of several now held across the world, which has been running since 2013 and which attracts hundreds of attendees from dozens of countries.[3] The shift to online video conferencing has made all

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1 Development, Concepts and Doctrine Centre 2017: iii.

2 Sabin 2016: 436.

3 The full proceedings are available at http://www.professionalwargaming.co.uk/, last accessed on 26 April 2021.

of these events even more easily accessible to a global audience. Why is war-gaming so much in vogue, and what contribution can it make to our strategic understanding?

What is Wargaming?

The very definition of wargaming is surprisingly problematic. Retiring US war-game expert Dr Peter Perla supplied the most widely-used definition in his classic 1990 book, and in his lecture at King's two years ago he slimmed this down by suggesting that wargames are 'a dynamic representation of conflict or competition in a synthetic environment in which people make decisions and respond to the consequences of those decisions'.[4] This focus on people and decisions distinguishes wargames from operational analysis (OA) with its focus on the quantifiable scientific modelling of conflict.[5] If I were asked to define a wargame in as few words as possible, I would opt for something similar – 'a dynamic model of conflict, shaped by player decisions'. The conflict need not be military, and many businesses have used wargaming techniques to model their competition with other enterprises for profits and market share.[6]

Many so-called 'wargames' consist of little more than large unstructured discussions, whether about military issues or about broader challenges such as Brexit, election campaigning, corporate planning, or of course our current dilemmas over how best to cope with Covid-19. To my mind, what distinguishes wargames from mere discussions or training exercises is not the iconic rep-resentational elements of maps and counters but rather two more fundamen-tal attributes – the explicit role-playing of different groups seeking to achieve conflicting objectives, and the ability to adjudicate the outcome of these groups' interacting tactical or strategic choices so that the game progresses through a series of unscripted rounds, in each of which the players must deal with the consequences of previous events and decisions.

Wargames are just one niche element of an enormous range of synthetic adversarial contests including all types of sports and games.[7] Clausewitz fa-mously wrote that 'in the whole range of human activities, war most closely re-sembles a game of cards'.[8] This apparently bizarre analogy reflects the fact that adversarial games artificially generate the kind of stark conflictual relationship which is so characteristic of war, but which is relatively rare in other kinds of human interactions.[9] It is no accident that wargames proper, designed to re-semble real war deliberately rather than coincidentally, were developed very

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[4] Perla 1990, and 'The Art & Science of Wargaming to Innovate & Educate', King's College London, Dec. 4th 2018, https://www.youtube.com/channel/UCgHWLM5I32fRKgoclCDaNhg, last accessed on 26 April 2021.

[5] Morse/Kimball 1959.

[6] Oriesek/Schwartz 2008.

[7] Huizinga 1970; van Creveld 2013.

[8] von Clausewitz 1976: 86.

[9] Luttwak 1987.

soon after Clausewitz's day in the form of the famous Prussian *Kriegsspiel*.[10] For two centuries, such wargames have been played as a way of studying and understanding the changing tactical and strategic dynamics of conflict without the appalling human and material costs of learning from the hard school of war itself.[11]

Quantitative & Qualitative Wargames

Wargames take many forms, but perhaps the most fundamental distinction is between those based on a mathematical model of reality and those which rely on the real world experience of game players and controllers. In the first type, one or more designers create an entire self-contained game universe akin to the rules and components of Chess, within which players may compete without the designers themselves having to be present and without even the need for an umpire to decide who prevails (since everything is laid out in the game rules). In the second type of wargame, there are no artificial rules, and the game works only by the players and umpires constantly shaping their decisions and judgements in the synthetic scenario according to what seems to them realistic if the events were occurring for real.

Rules-based wargames today have the significant advantage that they can be programmed into computers via a string of binary code, thereby creating a 'pick up and play' experience in which players are presented with a graphically intuitive display of the information which they would have available within the virtual world. A good example is the widely-used VBS training system in which each soldier's networked computer screen shows only that avatar's real time first person perspective in the evolving scenario.[12] As Artificial Intelligence (AI) and machine learning continue to progress, it also becomes possible for computers to imitate effectively the decisions of human players in rules-based games, as shown by the growing AI mastery not only of Chess but now also of vastly more complex games such as *Go* and *Starcraft*.[13] As Air Marshal Stringer said in his lecture at King's two years ago, this potentially allows automated iteration and repetition of wargames, overcoming the limited availability of live human players and blurring the boundary between wargaming, game theory and OA.[14]

The downside of computerisation is, of course, that designing and programming software capable of modelling the enormous complexities of real war is costly, time-consuming and very technically challenging. This explains the remarkable persistence alongside computer wargames of manual rules-based

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[10] Wintjes 2019.

[11] Caffrey 2019.

[12] Curry et al. 2015.

[13] Blakely 2019.

[14] Air Marshal E Stringer, 'Advancing the UK's Analytical Tools to Address Strategic Competition and Modern Deterrence', King's College London, Apr. 2nd 2019, https://www.youtube.com/channel/UCgHWLM5I32fRKgoclCDaNhg, last accessed on 26 April 2021.

wargames using the same basic technology of maps and counters as in the original *Kriegsspiel* two centuries ago, since even non-programmers can understand and tweak such games as they see fit.[15] The UK's Rapid Campaign Analysis Toolset (RCAT) is an excellent example, having been commissioned after the Libya war of 2011 revealed the inflexibility of available computer wargames in coming to grips quickly enough with such unexpected challenges.[16] Physical maps and playing pieces also offer a more attractive and socially interactive play experience, and so some wargames (like my own *Lost Battles* system modelling ancient warfare and the *Signal* game developed by the Carnegie-funded Project on Nuclear Gaming) use such physical components wherever possible, even though they have also been digitised for play on computer screens.[17] In previous years when I have been able to visit Hamburg in person, I have run multiple simultaneous iterations of a variety of simple rules-based wargames of my own design, to give participants a hands-on feel for how these kinds of wargames work. Experience over the past year has shown that trying to run such rigid wargames virtually over Zoom is much clumsier and more time-consuming because interaction is so much more stilted, so we have not tried to replicate this element in this year's conference.

Wargames which depend partly or entirely on player experience and judgement rather than formal rules lack the comprehensive mathematical models which are a pre-condition for full computerisation. They may be run virtually if required, though here again there are significant sacrifices in immersion and ease of interaction. Such 'talking wargames' are the most common form in use by governments, armed forces, universities and businesses today, because they do not require any familiarity with artificial game rules and they are flexible enough to model anything from platoon attacks to international crises, natural disasters and corporate takeovers. The cost of this flexibility and accessibility is that such wargames depend critically on the knowledge, design expertise, self-confidence and standing of the game controller. On the many occasions when inexperienced individuals are tasked to 'run a wargame', the activity usually degenerates rapidly into a mere discussion session or rubber-stamping exercise.[18]

Even if experienced game controllers are available, adjudication of events and outcomes in judgement-based wargames raises severe dilemmas in its own right. In rules-based wargames, stochastic variation due to the multiplicity of detailed variables may be allowed for through simple randomisation of individual outcomes within a specific range, even though players get frustrated when their clever plans are foiled by what they perceive as just unlucky die rolls. In judgement-based games, it is tempting for umpires to head off such frustra-

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15 Sabin 2011.

16 See the talk by G Longley Brown & J Smith at Connections UK 2013, http://www.professionalwargaming.co.uk/2013.html, last accessed on 26 April 2021.

17 Sabin 2007; Goldblum et al. 2019.

18 Longley Brown 2019.

tions by selecting what they consider to be the individually most likely outcome at every stage of the game, but this actually makes the overall pattern of events far too 'average', since (as Covid has just demonstrated so vividly) individually unlikely surprises or accidents become statistically almost inevitable in the real world after enough different events.[19] Game controllers may instead exploit their god-like authority by deliberately selecting plausible but worst-case outcomes which test the players to the maximum, just as pilots in flight simulators are subjected to multiple system failures. However, this kind of instrumental selection of outcomes by game controllers – a process I sometimes describe as 'satanic adjudication' - distorts the representativeness of wargame results and may make players feel like puppets of capricious and subjective authority.[20]

Overall, each type of wargame has enduring strengths and limitations, and no single type seems likely to supersede the others in future, however technology may change.[21]

The Human Element

As I said at the outset, what distinguishes wargaming from automatic simulation models of conflict is the central role of player decisions in shaping how the contest proceeds. Just as in a game of Chess, it takes players to animate the simulated forces and capabilities reflected in the scenario and game rules, and to decide how to employ them to best effect as they struggle for advantage. The most effective wargames are often those which model real world contests in which there are few if any effective limits on what can be done except for those imposed by the laws of physics. In such cases, the game system only needs to perform the relatively uncontroversial task of codifying the physical capabilities available to the antagonists, leaving players free to experiment and duel to their hearts content. Perhaps the most famous success in wargame history fell into precisely this category. From 1942 onwards, the Royal Navy's Western Approaches Tactical Unit (WATU) managed to model the known physical characteristics of merchant vessels, escorts and U-boats in terms of speed, turning circle, visibility, armament and so on, allowing players (including many young women) representing the opposing captains to experiment assiduously to discover the best tactics to protect the convoys.[22] Similar challenges in future could doubtless be tackled even more quickly and effectively by computer AI programmes like Alpha Zero and Deep Mind.

Unfortunately, the kind of challenge faced by WATU is increasingly the exception rather than the rule, and there are two big problems with using wargame techniques (whether with human or AI players) to study more represent-

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19 Sabin 2014: Appendix 3.

20 Downes-Martin 2013.

21 Sapinsky 2021.

22 Parkin 2019; see also P Strong's talk at Connections UK 2017, http://www.professionalwargaming.co.uk/2017.html, last accessed on 26 April 2021.

ative modern strategic challenges. First, wargames by their very nature have one inevitable artificiality, namely that (unlike in real war or business competition) nobody really dies and no companies and livelihoods are ruined. This is obviously a very welcome characteristic, allowing users to learn from their mistakes without the fatal or financially disastrous consequences of similar experiential learning in real conflicts.[23] However, the 'safe to fail' nature of wargames means that they often struggle to model situations in which human factors like morale, self-preservation, corporate responsibility and propensity for health or financial risk have a major influence alongside purely physical constraints. In the brutal convoy battles modelled by WATU, the morale of the sailors had little impact on their ability to survive, but in land or air battles where individual combatants face constant choices over how far to expose themselves to the storm of enemy fire, or in business or health decisions where thousands of jobs or lives are on the line, morale plays a much more important role. First person shooter games are notoriously prone to encourage gung-ho behaviour because of the unrealistically low stakes involved, since they miss the enormous suppressive effect of visceral fear when the bullets and shells are real.[24] Covid has recently given us an object lesson in how difficult and traumatic it can be for leaders to balance economic damage against real death and suffering from humanity's perennial nemesis of infectious disease.

The advent of nuclear weapons moved us to a very different strategic environment than the all-out naval battles modelled by WATU, and in our current age of hybrid warfare, restraint and limitation are even more important influences on how conflicts proceed. With every potential action or reaction in modern brinkmanship contests being weighed carefully to gauge what response it may provoke and how it will play in the constant media battle, our ability to create credible rules-based models of the manifold options from economic sanctions and 'fake news' to cyber attacks, hostage taking and drone or missile strikes becomes more and more in doubt. The same applies in business, where traditional economic considerations of competition on quality and price have been enormously complicated by chaotic influences such as social media trending, increasing regulatory constraint, political uncertainty and the disruptive potential of accelerating technological change. Trying to capture this increasingly complex and constrained decision environment within a highly simplified rules-based model such as the Project on Nuclear Gaming's abstract *Signal* game of grand strategic economic and military competition in an imaginary world is of dubious utility, and some might feel that *Signal* creates a rather carefree atmosphere more akin to the recreational games *Risk* or *Diplomacy* than to the dread of escalation which shapes more traditional nuclear crisis wargames like the recent Carnegie-funded games at King's College, which are

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23 Caffrey 2019; Longley Brown 2019.
24 Murray 2013; Bennett 2017.

based on player judgement, real world scenarios and the real experience of the former officials involved.[25]

The other challenge facing modern strategic wargames is even more intractable. Except at the lowest tactical levels, the number of different actors whose views and reactions now need to be considered far exceeds the number of players likely to be practically available. Wargames used to model a fairly straightforward bilateral military contest between competing hierarchical organisations, in which two players or teams could play the roles of the 'Red' and 'Blue' senior commanders while simple morale rules limited the sacrifices which the lower ranks were willing to make on their behalf.[26] In WATU, every submarine and escort vessel could have its captain directly represented by an individual player. Now, conflicts like those in Iraq, Afghanistan, Syria or Libya involve a patchwork of states and factions, each with their own interests and sensitivities, together with non-military actors such as reporters, aid agencies, local civilians, refugees, criminal gangs, commercial enterprises and domestic electorates. Success in modern limited wars or political struggles within states requires a deft balance of compromise, coercion and propaganda to forge temporary coalitions while keeping others divided and disheartened. Similar considerations apply in corporate competition, as illustrated by the continuing struggles of massive multinational enterprises like Google, Amazon and Facebook to retain their dominance in the face of regulatory pressures, tax demands and insurgent start-ups. Only 'megagames' with many dozens of participants come close to reflecting the human complexity of such tangled conflicts, and they bring challenges of their own in terms of the practical difficulty of controlling and monitoring the many parallel activities and interactions.[27]

Most strategic wargames can only afford to have the few most prominent individual states or blocs represented by player teams, with others (including local states whose reactions are central to the simulated crisis) having to be managed collectively by the 'control' team. Not only does this highlight the importance of the adjudication dilemmas which I mentioned earlier, but it also fails to reflect well the fact that the policies even of a single state are the (often dysfunctional) result of tangled infighting between many groups and individuals, as the UK's prolonged agony over Brexit illustrates so well. An obvious alternative possibility is to use AI to govern the reactions of the great majority of actors who cannot practically be represented by real human players, but one need only recall the toxic cocktail of passion, resentment, fear, ambition, incompetence and deceit which has shaped recent events from Hong Kong and Burma to Belarus and Chile to see how difficult it is to model such wildly unpredictable conflicts in terms of an interacting web of unemotional cost-benefit calculations like those in which computers excel. With dreams of stable tech-

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25 Goldblum et al. 2019; I Barzashka's talk at Connections UK 2017, http://www.professional-wargaming.co.uk/2017.html, last accessed on 26 April 2021.

26 Wintjes 2019.

27 http://www.megagame-makers.org.uk/mm-down.htm, last accessed on 26 April 2021.

nocratic progress looking ever more unrealistic as crises and conflicts proliferate and as climatic and immunological pressures grow, the world of the 2020s poses daunting modelling challenges for even the cleverest and most technically advanced wargame techniques.

How Can Wargames Help?

In view of these daunting challenges, is the current vogue for wargaming soundly based, and can wargames really deliver strategic insights not readily available through other techniques of research and intellectual enquiry? I think the answer is yes, because the significant limitations I have discussed are counterbalanced by equally powerful advantages inherent in the wargaming approach. The very complexity of our strategic predicament makes it vital for us to do all we can to help decision makers to understand better their current and potential future situation so that they may adjust their actions to maximise the chance of success and minimise the risk of disaster. Wargaming works best when it focuses on 'wicked problems' full of dilemmas and trade-offs, and not easily soluble through more straightforward analytical methodologies.[28] It is a highly immersive technique which has the ability to draw the players in to their simulated predicament and give them a powerful vicarious experience, not easily obtainable otherwise except through real crises. At one of our first Connections UK conferences, an RAF education officer reported that when his adult students played a wargame, they became like children again, and just like children, they began to learn. Wargames work best not when 'contracted out' to others to produce yet another external consultancy report, but when strategic decision makers and their teams are involved themselves as players, coming face to face with the kind of dilemmas they might later have to tackle for real.

Some fear that the one-off nature of wargames makes them invalid as research tools, since the results achieved are not repeatable like those in an ideal scientific experiment, and may differ considerably if the wargame is run again. Modern American social science is especially wedded to quantifiable data, and this preoccupation shaped the design of the simple rigid *Signal* game, which has been played thousands of times by many different groups (the vast majority with no connection to real nuclear policy-making) to generate the kind of statistical spread of results which US academics increasingly demand. Similar desires for statistical validity underpin the hopes of some policy makers that increasingly capable AI will allow us to transcend one-off wargames with human players and to get computers to play through endless scenarios and give automated insights into the best approaches to adopt. As I said earlier, I am very sceptical that AI, for all its incredible potential, can supersede traditional wargaming in this way, because of the sheer impossibility of capturing the complexity and chaos of the contemporary strategic environment within the

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28 See my own talk at Connections UK 2018, http://www.professionalwargaming.co.uk/2018. html, last accessed on 26 April 2021.

kind of rules-based model required for such iterative experimentation. Instead of running one model multiple times to generate increasing statistical insight into how that model itself operates, but with yawning uncertainty about whether the findings may safely be generalised to the real world, I think it is better to run a succession of different wargame designs, each of them inevitably highly imperfect as a representation of reality, but each with the potential to generate flashes of insight which traditional analysis may not have provided.

A common trend is for wargames to be sponsored as a means of investigating a specific policy question, such as what force structure should be adopted in future. Since military or commercial procurement involves such massive resource outlays, it is entirely understandable that the organisations responsible should look to wargames for practical help in determining whether their investments are on the right track. Even wargames sponsored by charitable foundations often have similarly specific policy relevance, to make them more likely to prevail in the battle for scarce research funding. For example, the Carnegie-funded *Signal* game is intended to explore whether the injection of new capabilities in the form of small nuclear weapons offers the holder significant deterrent or military advantages, while King's College's own Carnegie-funded games were originally focused on investigating the effects of new missile defence capabilities on strategic stability and nuclear risk.[29] The trouble with such specific policy objectives is that they require experimental methodologies which keep variables other than the presence or absence of the capability of interest as constant as possible, and the more that one simplifies or abstracts out these other variables, the greater the risk that the wargame will lose touch with reality.

Opinions differ about the ability of wargames to go beyond specific research questions like the ones I have just illustrated, and to cast light on what former U.S. defence secretary Donald Rumsfeld famously described as 'unknown unknowns'. In his lecture at King's, Air Marshal Stringer suggested that 'We cannot wargame what we do not know we do not know'.[30] I beg to differ. To my mind, wargames in fact have an unmatched potential to highlight for us issues which even the game designer had not thought of beforehand. Traditional scholarly research may throw up fascinating new insights in archives or interviews, but presenting this research in books, articles or lectures merely promulgates these insights rather than creating new ones. Wargames are different. They are dynamic interactive systems, and designing and playing them creates new research insights not programmed in consciously based on prior understanding. Like most wargame experts, I routinely downplay the predictive potential of wargames, since I believe that they are far better at highlighting new questions than providing definitive answers.[31] I actually think that such insights into 'unknown unknowns' are the most distinctive and important contribution

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29 Goldblum et al. 2019; Barzashka 2017.

30 Stringer 2019.

31 McGrady 2019.

which wargames can make as investigative tools. This suggests that wargames have more to contribute the broader and more open the research agenda, and that narrowly focused questions about specific capabilities may not yield the best research value once one has gone to all the trouble of creating an entire virtual world with which to experiment.

Recent history shows clearly how challenging it is for military, political and corporate decision makers to tackle effectively the painful and unexpected dilemmas with which they are increasingly confronted. Natural threats such as earthquakes, forest fires and pandemic disease combine with political upsets such as Brexit, the Trump presidency and the outbursts of popular protest and authoritarian repression across the globe to create a toxic cocktail of challenges which must be addressed. Wily adversaries and competitors make things even more difficult by devising tactics which deliberately subvert established norms, such as Putin's assassins, mercenaries and 'little green men', Xi's artificial islands in the South China Sea, and online innovations from Bitcoin to Uber which undermine established commercial practice. Wargames offer a vicarious way of anticipating and brainstorming these growing policy dilemmas, as players confront them in simulated form and try to devise initiatives and responses which will succeed despite opposing players' best efforts to frustrate them. Although wargaming will never be able to anticipate all of the challenges we will face or to provide unequivocal insights into how to respond, every little helps, and at least wargames may help us to avoid the more egregious errors we might otherwise commit as we scramble to devise instant responses to wholly unexpected events.

Conclusion

Wargaming is a breathtakingly ambitious endeavour which purports to be able to create playable but tolerably accurate and valid models of the real world with which one may experiment safely without human or economic sacrifice. To achieve this, it must make heroic simplifications and reduce the unimaginable complexity of the real world to just a few playable entities. WATU's focus was so narrow and technical that its modelling proved effective, but modern hybrid crises are so awash with multi-dimensional global implications, human fear and passion, media saturation and 'fake news' that the idea of reducing them to a wargame between a handful of player teams seems ridiculously reductionist. Although agent-based computer modelling can help to predict crowd behaviour in disaster situations, it is far from clear that it can reliably capture the wild swings seen recently in political and economic developments around the world as individual events and triggers and the mercurial choices of populist politicians are magnified by instant and pervasive media and social media coverage.

This makes it all the more important to strengthen the linkages between wargaming and related academic disciplines such as design theory, psychology,

sociology, cognitive theory, organisational learning and futurology.[32] Now that limits and restraints are pervasive and politics and psychology have moved to centre stage, it is vital that we challenge our assumptions and recognise the difficulty of creating intellectually and practically valid wargame or simulation models of contemporary conflict situations. We must validate our models against the growing record of hybrid confrontations and corporate crises in the recent past, to help reveal the limitations of the wargaming models developed in previous generations when strategic dynamics were rather less complex and chaotic. Only if wargames are perceived by busy senior leaders as sufficiently credible and compelling will they take note of their insights in advance without having to learn the hard way. As with the Japanese wargame which foresaw the chance of their disaster at Midway in 1942, it is little help for wargamers to be able to say in retrospect 'We told you so…'.[33]

Bismarck famously said that it is better to learn from the experience of others than from one's own real world mistakes. Wargaming offers a vicarious source of this precious experience, and this once led me to suggest that there are no losers in wargames – only winners and learners. Wargames can save lives and livelihoods by offering a safe to fail experimental environment, whose vicarious insights can help us to avoid or minimise real world conflicts or to limit our losses and maximise our gains should conflicts occur. Given the sad litany of policy failures in our recent history, anything which may help us to avoid or mitigate at least some similar failures in future is a welcome tool in our intellectual arsenal. Human ingenuity rather than iteration and statistical data collection must remain centre stage, and wargames should be sufficiently open and broadly focused to allow them to generate unexpected insights, while retaining the progressive structure and oppositional dynamics which distinguish wargames from mere seminar discussions. With judicious embrace of new technology and increasing integration with other academic disciplines, we can pass the torch from old wargaming 'gurus' like Peter Perla and myself to a new generation which will use wargames ever more effectively to address the daunting challenges ahead.

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