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Concepts: Mind and Muscle

> Even if we break down war into its various activities, we will find that the difficulties are not uniform throughout. The more physical the activity the less the difficulties will be. The more the activity becomes intellectual and turns into motives which exercise a determining influence on the commander's will, the more the difficulties will increase. Thus it is easier to use theory to organize, plan, and conduct an engagement than it is to use it in determining the engagement's purpose. Combat is conducted with physical weapons, and although the intellect does play a part, material factors will dominate. But when one comes to the *effect* of the engagement, where material successes turn into motives for further action, the intellect alone is decisive. In brief, *tactics* will present far fewer difficulties to the theorist than will *strategy*.
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> Carl von Clausewitz[1]

1.1 STRATEGY AND INTELLECT

Strategic theory and the concepts that are its building blocks have only one purpose: to enhance understanding, to educate for action. In order to be fit for that purpose the strategic theory of the day needs to do two things. It has to keep faith with the unchanging general theory of strategy, while also it must be adaptable to the transient character of the historical context. Theorists have a policing function and duty. They should discipline contemporary strategic thought so that fads and fashions are detected and revealed to be only such, rather than the revelation of eternal value that often is claimed. It is commonplace but useful to think of fighting power, the core potential fuel for strategic effectiveness, as having three ingredients: the intellectual, the material, and the moral. As is unavoidable with super-reductionist trinities, this one risks explaining too little as the price for aspiring to explain too much. Nonetheless, the trinitarian formula highlights appropriately the importance of the intellectual contribution to strategic history. From time to time there is an

intellectual crisis when strategic thinkers seem manifestly unequal to the challenges of the day. Authors of strategic theory are apt to forget that fine-sounding concepts alone achieve nothing, much as excellent intelligence that is not actionable tends not to be useful. This conceptual perspective on strategy distinguishes between understanding strategy in general and doing it in a specific context. It is always necessary to be able to do both. This is not to ignore the enduring reality that the ability to invent and implement strategies fit for particular current circumstances is ever likely to be imperfect. Just as logistics typically is more demanding a command responsibility than is strategic conception, so conception for a specific purpose is more likely to be a serious challenge than is a sound grasp of the basics of strategy's general theory. The latter is vital for the former, but it falls in the necessary class of understanding, not the sufficient.

The conceptual perspective accommodates the whole house of strategy, but its domain is limited to the identification, understanding, and explanation of strategic phenomena.[2] To comprehend a problem is not synonymous with understanding how to solve it, while even the achievement of such understanding does not mean that one is able to solve it. In the winter of 1940–1, RAF Fighter Command fully understood its problem in attempting to defend against the Luftwaffe's Night Blitz. The RAF recognized that there was no practicable solution until reliable airborne radar and the aircraft to carry it were ready in suitable numbers, and that could not be done in the winter of 1940–1.[3] This was not a classic case of concept failure, but rather one of priorities and their consequences in sequenced achievement. Fighter Command's overwhelming first priority was the ground-based radar system to detect and help counter daylight attack. British science, technology, and industrial production achieved a near miracle with the Chain Home and Chain Home Low radar stations that were ready for the enemy by the summer of 1940. They could not be partnered by an airborne system in the same time frame, given the practical limits on resources, including the availability of appropriate two-seat air defence fighters. The tactical success of British daylight air defence in the summer of 1940 was the enabling expression of strategic conceptual excellence. The RAF's victory in the Battle of Britain was achieved only because the concept was executed tactically and directed operationally well enough. One needs to be ever alert to the error of undue exclusivity of assigning too much weight to the possibly brilliant inspiration, too little to the implementation, in considering historical strategies.

The conceptual perspective on strategy does not seek to diminish the weight attached to tactical matters, but it insists that as a general rule intellect does and should rule over muscle.[4] There is a great deal of literature as well as visual media material that focuses on the human dimension of lethal conflict. Not infrequently it is claimed that war is really all about the experience of the soldier, or the brutality of it all, and so forth. The 'face of battle' and the

experience of war reach us emotionally and morally in ways that discourse on strategy tends not to.[5] Unfortunately, the cost of reaching emotions and touching moral nerves is usually borne by some notable loss of understanding of the events in question. For example, the justly acclaimed 2010 television series, *The Pacific*, was utterly convincing and appropriately literally awful in the human reality of violence presented. But, the men and their violent deeds were presented in no historical or strategic context whatsoever. When the military violence that is tactical behaviour of all kinds is presented as entertainment with no endeavour to explain the purpose behind the action, it approximates a form of pornography. *The Pacific* did offer some modest measure of domestic social context for the young American soldiers, including their forward staging in and through Australia. That social context, however, offered no help to a viewer who would like to know why the American marines were required to fight as the series shows in convincing detail.

The conceptual perspective on strategy, and indeed strategy itself, often is overwhelmed by tactics that become self-referential. One reinforces success in that one does what one can do either because one can, or because one must do it. Military careers tend to appeal to people who are inclined to privilege 'doing it' over 'thinking about why one might do it'. The descriptors theorist and academic, as well as the adjectival use of arm-chair, are familiar features in pejorative professional military characterization of strategic thinkers and writers. Military anti-intellectualism is as old as military history itself, is thoroughly understandable, and often is well targeted. It is scarcely surprising that the person whose life is on the line should be sceptical of the authority, especially the moral legitimacy, of any advice he is given by a person who is not so endangered. There are severe limits to the practicality of this principle, but it has always been a necessity for effective leadership that the leader should 'be there', known and preferably seen to share some of the risks with the troops that he strives to lead as well as command.[6]

The apparent tacticization of strategy is an ever present danger in historical practice, because there is some sense in Charles F. Callwell's claim that '[s]trategy is not, however, the final arbiter in war. The battle-field decides.'[7] Belligerents fight in ways and for objectives that lend themselves to strategic conceptual explanation, certainly to ex post facto rationalization. But, because the enemy usually cannot be denied a vote on the acceptability of the contemporary trajectory of the course of events, and also because chance is all too active, the narrative of warfare is more likely to reflect operational opportunity that is exposed by the verdict of battlefield engagement. So essential is the tactical enabler of strategy that the role and contribution of the latter is apt to escape notice. Given that today strategic history is publicly accessible primarily as visual entertainment that presents war as violent tactical behaviour bereft of more than cursory strategic contextualization, it is unsurprising that the conceptual perspective typically is missing from the frame. After all, it is

hard to photograph a concept directly, unlike its plausibly inferable consequences (e.g. German soldiers freezing at Stalingrad in winter 1941–2; or American soldiers freezing at the Chosin Reservoir in North Korea in December 1950).

The material, including human physical, and the moral narratives of warfare are so compelling that the conceptual narrative usually is in peril of being slighted. To borrow gratefully from American historian Brian Linn, though to expand upon his usage, there is a 'heroic' tradition among the possible approaches to military behaviour that in practice encourages disdain for the conceptual perspective.[8] Superficially, though plausibly, strategy can seem a luxury of little value to the unfortunates who must get the military job done. Those people indeed do strategy in their tactical behaviour, for without such behaviour there can be no strategy. However, it does not follow that tactics has no need of strategic direction, that in practice it can provide its own guidance and, in effect, substitute for and therefore function strategically. Despite the popularity of the thesis, it is a categorical error on a major scale to believe that strategy can be 'tacticized'. Strategy and tactics are different in nature and cannot mate to produce a hybrid offspring.

1.2 FROM THE GENERAL TO THE PARTICULAR

Because strategy is a practical art, an education in its general mysteries can only be of limited value. This does not mean that the general theory of strategy is strictly of academic interest, understood pejoratively. Rather the point is that general wisdom requires application for particular contexts in ways appropriate to the circumstances. The general theory is exactly that, general[9]: its writ is eternal and universal. From Athens in the fifth century BC and before, to Afghanistan and after in the twenty-first century, the general theory of strategy is authoritative (see Table 1.1).

But the necessary price paid for this authority, indeed the condition for its rule, is a lack of specificity. The theory educates the aspiring strategist in how to think and what to think about, but only generically by category of concern. The general theory helps educate those who are educable, but its economical dicta provide no answers to strategists' pressing contemporary questions. The theory warns that strategy is difficult, but it does not specify what that means for a particular time or place. Furthermore, even if the practising strategist has succeeded in using his education to help select a promising strategy, he must also turn in a command performance for strategic execution that requires abilities beyond the intellectual. When presented as in Table 1.1, the general theory of strategy may have the appearance of a statement of the obvious, presented pedantically in the style of a check-list. The fact that theory should

Table 1.1 The General Theory of Strategy in 22 Dicta

Nature and character of strategy
1. Grand strategy is the direction and use made of any or all of the assets of a security community, including its military instrument, for the purposes of policy as decided by politics.
2. Military strategy is the direction and use made of force and the threat of force for the purposes of policy as decided by politics.
3. Strategy is the only bridge built and held to connect policy purposefully with the military and other instruments of power and influence.
4. Strategy serves politics instrumentally by generating net strategic effect.
5. Strategy is adversarial; it functions in both peace and war, and it always seeks a measure of control over enemies (and often over allies and neutrals, also).
6. Strategy usually requires deception, very frequently is ironic, and occasionally is paradoxical.
7. Strategy is pervasively human.
8. The meaning and character of strategies are driven, though not dictated and wholly determined, by their contexts, all of which are constantly in play and can realistically be understood to constitute just one compounded super-context.
9. Strategy has a permanent nature, while strategies (usually plans, formal or informal, expressing contingent operational intentions) have a variable character, driven but not mandated by their unique and changing contexts, the needs of which are expressed in the decisions of individuals.
Making strategy
10. Strategy typically is made by a process of dialogue and negotiation.
11. Strategy is a value charged zone of ideas and behaviour.
12. Historically specific strategies often are driven, and always are shaped, by culture and personality, while strategy in general theory is not.
Executing strategy
13. The strategy bridge must be held by competent strategists.
14. Strategy is more difficult to devise and execute than are policy, operations, and tactics: friction of all kinds comprise phenomena inseparable from the making and execution of strategies.
15. The structure of the strategy function is best explained as comprising political ends, chosen ways, and enabling means (especially, but not exclusively, military) and the whole endeavour is informed, shaped, and may even be driven by, the reigning assumptions, both those that are recognized and those that are not.
16. Strategy can be expressed in strategies that are: direct or indirect; sequential or cumulative; attritional or manoeuvrist-annihilating; persisting or raiding (more or less expeditionary); or a complex combination of these nominal alternatives.
17. All strategies are shaped by their particular geographical contexts, but strategy itself is not.
18. Strategy is an unchanging, indeed unchangeable, human activity in thought and behaviour, set in a variably dynamic technological context.
19. Unlike strategy, all strategies are temporal.
20. Strategy is logistical.
21. Strategic theory is the fundamental source of military doctrine, while doctrine is a notable enabler of, and guide for, strategies.
Consequences of strategy
22. All military behaviour is tactical in execution, but must have operational and strategic effect, intended and otherwise.

be uncontentious in its dicta has not prevented it being ignored in major respects throughout history. The theory is a trans-historical and trans-cultural summary of what should be close to intuitive understanding.

A strategist who has drunk deeply at the well of the classics on strategy should be incapable of forgetting that his military mission has a political purpose, that his enemy will ensure that any war is a project shared among all belligerents, and that friction, including the products of chance, is a certainty. Unfortunately what ought to be the refreshing waters of Sun Tzu, Thucydides, and Clausewitz have limited practical value. Brian Linn has been impressed by '[t]his failure of military intellectuals to agree on a concept of war [in the 1990s and 2000s]', as they have debated the latest 'buzzwords', among which he cites 'asymmetric conflict, fourth-generation warfare, shock and awe, [and] full spectrum dominance . . . '[10] But, it is misleading to identify concept failure as being partially responsible for intellectual confusion. Strategy's general theory has more utility as a source of guidance for history's strategies than appears possible at first glance.

When viewed in conceptual perspective, modern strategic history frequently has recorded lively debate among military (today defence) intellectuals. The evidence of intense debate of recent years about the nature, by which they mean only the character, of modern war and warfare can be identified as concept failure. As Linn claims, assuredly there is a lack of contemporary consensus over the most appropriate concepts. But, is this phenomenon truly a confusion of incompetent strategists who severally and collectively are responsible for concept failure? Does it make sense to talk of concept failure? Presumably the alternative condition to concept failure would be concept success. In this happy latter case, contemporary strategists would have gone to their inventory of concepts and located the one or more most fit for current strategic purpose. Or, possibly, strategic theorists would have discovered a new concept that seemed to fit the recent context comfortably.

For a heretical thought it might be argued that modern defence intellectuals have been guilty of categorical reification. After the fashion of Victorian botanists and entomologists, modern theorists are never happier than when they can locate, capture, and classify by name a new species of conflict (or warfare). The intention is worthy and usually is not without all merit. The problem is that while this kind of conceptual perspective is fun and sometimes profitable for expert theorists, it can be seriously misleading to the tactical agents of strategy who tend not to be sufficiently well versed in strategic theory to distinguish foam from substance. Clausewitz contributed to confusion when he wrote in a famous passage about the importance of 'establishing by that test [of fit with policy] the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something alien to its nature'.[11] Ignoring Clausewitz's confusing use of war's 'nature' here, when he means character, he fuels the illusion that particular wars are of a definite,

identifiable, and therefore stable kind. If to this belief one adds the proposition that wars in a particular era can usefully be comprehended collectively—let alone super-collectively, as in such heroically inclusive categories as early-modern war, modern war, or post-modern war—then the conceptual perspective can be applied in quest of the right idea that best captures the historical reality of the period.

The problem is not with theory per se. Theory is only about explanation and is essential for data to be transformed into information, and for that information to be transformed into candidate knowledge. Theory is not and cannot be the issue. Indeed, it is the very utility of theory that makes it so dangerous to misunderstand and misuse. In common with the case of the purported lessons of history writ large, so the sub-species that is strategic history lends itself to competitive theorization. It is an unusual concept of war for which no apparently plausible empirical evidence can be mustered. Because strategic history is so richly and diversely endowed a permanent field of experience, it is always probable that any and every family of concepts and sub-concepts will make some sense and probably have some validity. If strategic debate pertains to future conflict, either imagination or authority will have to act as conceptual policemen, because empirical evidence certainly cannot fulfil that function. Conceptual authority is required in the real world of defence and security, because plans must be developed and sometimes implementing action taken. These behaviours need to be tolerably congruent with the conflicts to which they are applied, and that therefore mandate an effort at understanding. The provision of explanation for understanding is the function of theory.

Michael Howard once wrote that wars in all periods have more in common with each other than they do with non-war phenomena in their own particular period, though I am less confident that a similar claim can be sustained for the commonalities among all armies in all periods.[12] This is why there can be a general theory of military strategy that is universally and eternally valid. Two of the levels of theory that can exist below the general are the domain (or geographically) specific but still general, and the strategy specific. This means, for one example, that below the general theory of strategy there is a general theory of (specific to) air power, and also that theories of air power in historical application are conceptualized and deployed to craft particular strategies.[13] The air component to a joint plan will reflect the relative strengths of air power *inter alia*, and those strengths will be more, or less, relevant to the particular challenges of the day. Also, the potential contribution of air power will vary over time and between strategic contexts. Thus there is a simple hierarchy that reveals the structure of the conceptual perspective on strategy. With a single major exception, that of strategy for nuclear weapons (and for other weapons of mass destruction [WMD] also), in principle the strategy realm comprises reasonably well-ordered space. Because of the importance of this claim, Table 1.2 should minimize the possibility of misunderstanding.

Table 1.2 Good Conceptual Order

From the general to the particular there is hierarchy.
1. The general theory of (military) strategy.
2. The general theory of military power for particular geographical domains: land power, sea power, air power, space power, cyber power—and arguably for nuclear weapons/WMD.*
3. The particular theory of application, when relevant, for each kind of military power, in individual historical cases as expressed in plans that are strategies.**

* There is no disputing that nuclear weapons can be and have been held to be a category of military power different from the five with a necessary geographical association. This difference is discussed in the main text below. Although cyber power and particularly cyberspace today typically are discussed as though they have geophysical properties analogous to the land, air, sea, and Earth-orbital space, it is nonetheless important not to forget that the cyber domain is a wholly constructed artificial one.

** Two admirably terse definitions of strategy serve helpfully to lay emphasis on this level of strategic phenomena. J. C. Wylie advises that strategy is '[a] plan of action designed in order to achieve some end; a purpose together with a system of measures for its accomplishment'.[14] The second half of that sentence is probably redundant. Also, with superb economy Carl H. Builder recommends that *'[a] strategy is a concept for relating means to ends'*.[15]

Reference to the specific general theories of strategy has to be qualified by the caveat, 'in principle', because none of the geographically keyed bodies of strategic theory enjoys high authority today. Ironically perhaps, land power is too important to be confinable within meaningful intellectual boundaries. There is no ignoring the fact that it cannot be regarded simply as another one of war and strategy's distinctive environments. Sea power, air power, space power, and now cyber power, all have to find strategic expression in consequences on the ground as land power. So many and so important can be the contributions of, say, sea and air power to the fortunes of land power, that theory tends not to succeed in providing useful explanation of the latter's structure and dynamics. Even land-locked battlespace these days typically witnesses belligerent action that requires reliable access to, through, and from the world's four great commons: the sea, the air, Earth-orbital space, and cyberspace.[16] Studies of land warfare still appear, but their conceptual integrity is as uncertain as is their logistical feasibility.[17] The general theory of land warfare as such has all but ceased to exist. What has happened is that the increasing complexity of the jointness of armed conflict has resulted in the theory of land warfare being elided into the general theory of warfare. Because of his Prussian continentalist outlook as well as his determination to address the basics of his subject, it is only a modest exaggeration to argue that we have a fairly sound general theory of land warfare in the impressive and arguably authoritative pages of Carl von Clausewitz's *On War*. In the Prussian's two-environments world of the early nineteenth century, he manages to make only a couple of insubstantial references to the sea.[18] For all intents and purposes, *On War* is a theory of war on land. The complete absence of a maritime dimension to *On War* is not remotely invalidating of the book's mission, but nonetheless it is modestly troubling. The reasons for this absence are not hard

to surmise, but still it would be useful had Clausewitz offered some brief explanation.

The four geographical environments other than the continental are neither more nor less geophysically distinctive than is the land. However, the vital difference is that the land is unique in strategic importance. All human conflict must have some territorial reference, because that is the sole environment where we humans can live. Even though the land is the environment most influenced by others, it is always in a league of its own in strategic significance.

Although technological change has characterized warfare in all geographies, it is an error to attempt to connect relative maturity to strategic theory for a particular geography to the maturity of its machines of war and war support. To explain: strategic theory often changes in good part because theorists confuse temporary apparent facts, verified or only assumed, with a permanent condition. Also, in addition to honest intellectual error the strategic realm has always attracted theorists with political, economic, and cultural-ideological agendas. This has meant that strategic theorists often have not been scholars seeking truth, rather have they been advocates for particular military and political causes who sought to advance recognition of a truth already discovered but in need of marketing to credulous customers. Such theorists have usually been able to construct the theory that purports to explain why what they believe is correct.

Modest understatement of the favoured case for particular kinds of military power is not a characteristic often found among strategic theorists. The nature of the marketplace for strategic ideas and their associated artefacts commands overstatement. In modern times, each of the newly exploited geographies of conflict—the air, Earth-orbital space, and cyberspace—has attracted imperial claims for superior relative potency. Contemporary insistence that cybernauts will determine future strategic success or failure is only the most recent example of a standard stamp of assertion masquerading as argument. Given that the strategic effectiveness of the machine most exciting today is being estimated (i.e. guessed) for the unknown, unknowable, and therefore largely unforeseeable future, claims for anticipated contingent strategic disaster can be hard to refute or prove. It is a challenge to identify anything that can serve as credible evidence for a future that by definition cannot now exist. Defence planners have this (non-)existential problem. It is difficult to persuade sceptical people that one knows enough to make expensive decisions now about a subject—future strategic need—about which actually one can know little for certain.[19] Much that sparkles in a dazzling PowerPoint presentation on the subject of 'international security in the twenty-first century' will transpire to have been costume jewellery rather than authentic gems. There is always someone who does guess correctly in anticipating future challenges. The trouble is that there is no thoroughly reliable way of knowing at the time how to identify that person.

A prime merit of competent general theory is that it evades the unsolvable problem of absent foreknowledge without sacrificing its intellectual integrity, though naturally at the cost of eschewing specific advice. For example, planning for the use of the air component to a joint campaign requires detailed understanding of current air power; what it can do, what it cannot, and how the particular enemy of today might be able to thwart it. But, behind the rationale for the strategy expressed in today's plan for air power there lies air power's general theory. Table 1.3 is this author's understanding of that theory. What the theory should do is help understanding of the nature of the air instrument of strategy; properly drafted, it will not need major revision as the world changes. However, what do need constant revision are the plans expressing strategies for the threat or use of air power in particular contexts. New technologies and changing ideas about legitimate military employment, for example, should not be able to invalidate the general theory of air power. When competently developed and carefully expressed, the theory should be subject only to marginal improvement by clearer contemporary phrasing, not to radical overhaul to accommodate new revelations.

It takes time for security communities to come to terms with abrupt seeming or even with cumulatively radical military change. It is one thing to notice and then implement military and highly military relevant innovation (e.g. the railway and the telegraph in the nineteenth century), it is quite another to understand their strategic meaning. Today, the specific general theories that explain the several kinds of military power differ in their maturity. Sea power theory is in fair condition for reason of Geoffrey Till's comprehensive reassessment,[20] while the theory of air power has been notably poor and misleading until recently.[21] The theory of space power remains a project still much in need of conceptual good order.[22] Finally, the theory of cyber power is ungoverned intellectual space, though early steps are being made to fill the vacuum.[23] Strategic anxiety has a way of propelling the creative imagination. A sure sign of conceptual uncertainty is the absence of discipline over spelling. For example, writings on cyber reveal uncertainty as to whether the subject is 'cyber power', 'cyber-power', or 'cyberpower'. The jury is still out. In times not long past, military literature referred to 'air-power', 'air power', and also to 'airpower'.

It is arguable how much empirical evidence is necessary before reliable environment and even weapon specific general theory can be composed. The relational precedence between technology and strategic theory is contested by scholars. While there was much highly imaginative speculation about air power before the first purpose-built military aircraft took to the sky in 1908, action not theory was in the cockpit from 1914 to 1918. Following the extensive evidence from trial by battle, air power was able to soar on wings of aspiration to any strategic destination favoured by its theorist advocates. It is plausible to suggest that by 1918 most of what needed to be checked

Table 1.3 The General Theory of Air Power

1. Air power theory is subordinate to the general theory of strategy.
2. Air power theory helps educate air power strategists: it is theory for practice.
3. Air power theory educates those who write air power doctrine and serves as a filter against dangerous intellectual viruses.
4. Air power is the ability to do something strategically useful in the air.
5. Air power is aircraft and air forces, not only Air Force.
6. Air power requires a dedicated Air Force, though not all air power needs to be Air Force.
7. Warfare is joint, but physical geography is not—the air domain is different.
8. Air power in its very nature has fundamental, enduring though variable, attributes that individually are unique, especially when they are more or less compounded synergistically for performance.
9. Air power has persisting characteristic strengths and limitations.
10. The strategic value of air power is situational, but is never zero.
11. Control of the air is the fundamental enabler for all of air power's many contributions to strategic effect.
12. Superior air power enables control of vital strategic 'commons'.
13. Control of the air is either essential or highly desirable, and it differs qualitatively from control of the ground.
14. The air is one and so is air power.
15. Air power has strategic effect, but it is not inherently strategic.
16. All air power has strategic value in every kind of conflict.
17. Air power both supports and is supported by land power and sea power (and space power and cyber power).
18. By its nature air power encourages operational and strategic perspectives, a fact with mixed consequences for good and ill.
19. Air power is not inherently an offensive instrument; rather does it have both offensive and defensive value.
20. The history of air power is a single strategic narrative, and a single general theory has authority over all of it—past, present, and future.
21. Strategy for air power is not all about targeting—Douhet was wrong.
22. Air power has revolutionized tactics, operations, and strategies, but not the nature of strategy, war, or warfare.
23. Air power is uniquely capable of waging geographically parallel operations of war, but this valuable ability does not necessarily confer decisive strategic advantage.
24. Aerial bombardment 'works', though not necessarily as the sole military instrument that decides a war's outcome.
25. The high relative (to land power) degree of technology dependency that is in the nature of air power, poses characteristic dangers as well as provides characteristic advantages.
26. Air power, space power, and cyber power are strongly complementary, but they are not essentially a unity.
27. One character of air force(s) does not suit all countries in all circumstances.

This theory is presented and explained fully in Colin S. Gray, *Airpower for Strategic Effect* (Maxwell Air Force Base, AL: Air University Press, 2012), ch. 9.

empirically, albeit arguably, about the strategic promise and meaning of air power was visible to those with eyes to see and assess it. However, one has to recognize the comfort of hindsight. It is sensible to bypass as a secondary matter the interesting question of how long it takes for scholars and practitioners of strategy to understand the strengths and limitations of radically new technology. What is certain is that in the past century strategists have had no choice other than to make what sense they could of air power, space power, cyber power (indeed all aspects of the electromagnetic spectrum [EMS], going back to the electric telegraph in 1837 and then the telephone in 1876). In addition, worthy of special mention, there has been the class of weaponry that kick-started modern strategic studies with three startling explosions in 1945, two of them delivered in anger. The nuclear age arrived largely unanticipated, unheralded, and not understood.

1.3 NUCLEAR WEAPONS AND STRATEGY

In modern times, at least, it has been usual for a radically new weapon technology to be anticipated in speculative literature, some of it explicitly fictional and intended to entertain as much as to inform. Furthermore, new military capabilities typically arrive in primitive guise beset by problems that inhibit high performance in action. They emerge and then mature by trial and error over a period of years or even decades. For example, the machine gun that contributed so greatly to the dominance of the defence from 1914 to 1918, had its useful origins in the 1860s, was invented more or less in its final form in 1885–6 by Hiram Maxim, and has been improved technically until the present day.[24] The strategic implications of the machine gun were not fully appreciated for thirty years. By 1916–17, it was appreciated as a team player along with artillery and, in due course, radically revised infantry tactics, as well as close ground-supporting aircraft.

A conceptual perspective on atomic weapons reveals a narrative very different to that for the machine gun. Atomic fission was achieved as a scientific breakthrough in January 1939, was not understood to have serious near-term practicable weapon potential until 1940, and was not known conclusively to be weaponizable until July 1945.[25] In 1945 the atomic bomb was employed to coerce Imperial Japan into surrender. There was extant no strategic literature on the threat, use, or probable consequences of atomic bombs. American (and British) policymakers and strategists had motive, opportunity, and indeed the need, to invent strategy for the use of atomic weapons in the summer of 1945. Notwithstanding scientific speculation and limited laboratory advances in atomic physics in the preceding decades, the authors of books on military subjects were thoroughly unaware that the

weaponization of the atom was a practicable proposition in the near term. Modern strategic studies has an intellectual ancestry extending over millennia, but in 1945 there was no conceptual perspective whatsoever available specifically on atomic weapons. Given that for its first decade and beyond the atomic bomb could only be delivered over long distances by large aircraft, air power thinking dominated US nuclear strategy.

The first question the conceptual perspective has to address regarding atomic, then thermonuclear, weapons (henceforth generically nuclear weapons), is whether or not these weapons are indeed such, or whether they are something else. Are nuclear weapons weapons and can they be accommodated conceptually with some comfort within the domain of strategy? Nearly seven decades of thought and behaviour, albeit behaviour short of military action, have yielded a shaky consensus, with many dissenters, upon the proposition that nuclear weapons are weapons and that they do fall within the domain of strategy. Notwithstanding a relatively brief American conceptual and material infatuation with nuclear weapons in the 1950s and early 1960s, the dominant view has been that these weapons differ significantly from other weapons. This view emphasizing nuclear singularity has long retained practical authority in the West.[26] But, singular weapons or not, the awkward truth was and remains that major powers, to remain such, had no prudent choice other than to acquire them. Objectively existential facts demand that the logical structure of strategy cannot be withheld from nuclear weapons. It is scarcely possible for a nuclear-arming state to avoid performing the strategic function expressed in the mantra of ends, ways, and means, even if this eternal trinity is framed by the assumption that these are not weapons for use. The probable fact that nuclear weapons in use would prove self-defeating on several scores—physical damage suffered, political interests harmed, moral values affronted, and so forth—does not remove them from the strategic domain. Many strategic choices for the (tactical) employment of weapons of all kinds have proved ill advised. What nuclear weapons have achieved is a dramatic raising of the stakes. The inherent risks and costs of war flagged emphatically in the general theory of strategy are raised to a level that sane, sober, and careful statesmen should find intolerable. However, there appears to have been great and even decisive value in the strategic effect of nuclear menace short of military use. The proposition that nuclear weapons prospectively are so destructive that they are really political, not military, weapons is simply logical nonsense. All weapons are political in purpose, but military in (tactical) employment.

It is important to recognize the potency of circumstance. Since no security community acquires nuclear weapons by accident, or once having acquired them could afford to treat them with an utterly benign and total neglect, these devices of arguable necessity have to be treated strategically. Polities need to be strongly motivated for them to be willing to pay the high costs of nuclear

acquisition. It follows that they are all but certain to have specific security concerns that will be reflected in the technical and tactical detail of their evolving nuclear force postures. Whatever the propelling political motivation, once a state acquires these weapons it is obliged by that fact to treat them within the conceptual framework of defence policy and strategy. They may be devices of last resort that politicians can scarcely imagine ever using, but their servant nuclear armed forces are obliged by necessity to train for war, albeit nuclear war. The human race is trapped strategically by its own technical ingenuity in the context of essentially permanent, if usually controllable, rivalry. Regarded politically, people should not have been trusted with the weaponization of nuclear fusion. However, it is no use blaming the scientists, the technologists, the military, or even ourselves as citizens (and policy-makers). We are what we are, and nuclear weapons arrived, indeed were force-marched into hasty action in 1945, well before the human race was ready for them. The weapons once invented under acute pressure of immediate anxiety (and then expediency) in the Second World War, required military mastering for strategic appreciation and for political understanding, all of which took time. Meanwhile, as the Cold War decades rolled on, rival nuclear arsenals and force postures had to be developed, deployed, commanded, and exploited in peace for deterrence and experimentally as occasional threats for attempted coercion. Plans were drafted and practised for the war that must never be waged.

With millennia of experience upon which to draw for strategic education, and with two of the greatest conflicts in history conducted well within living memory, one might think that the challenge to understanding presented by nuclear weapons would have been relatively easy to meet. The problem was to know what, if any, pre-nuclear historical experience was relevant to the nuclear era.[27] For most of the first decade of the nuclear age it was just about plausible to argue that atomic weapons simply added a new dimension of fairly prompt destructive potential to the grand narrative of modern industrial-age mass warfare *après* the templates of 1914–18 and 1939–45.[28] As late as the 1940s a Third World War thus would be a yet more awful version of the already terrible historical experience of the century to date.[29] Most of the argument between theorists over the character—or was it the nature?—of modern great power war was settled by the scientists, technologists, and engineers when they were able to produce the true 'super' hydrogen fusion bomb (ignited by a fission trigger) in the early 1950s. Weapon energy yields now could leap from the modestly horrific kiloton range to the monstrously immodest megaton zone, and they could do so with no theoretical limit. The hydrogen bomb was different from the atomic bomb. Quantity can have a quality all its own, as the saying goes, accurately. Military planners and prospective 'war-fighters'—to resort anachronistically to the contemporary jargon of Americans in the post-Cold War world—could consider atomic

warfare within an intellectual framework that one might term Second World War-plus. The arrival of hydrogen bombs by the mid-1950s cancelled that framework conclusively. Unfortunately for strategic theorists, they had to attempt to make strategic sense of a military context that seemed to preclude the probability, perhaps even the possibility, of the achievement of strategic advantage. A nuclear armed enemy certainly could be defeated by reasonable definition, but what would be the value of that if such a success could not prevent one's own near simultaneous or subsequent defeat? The most mighty of the strategist's questions here intruded yet again, 'so what?'

The intellectual products of the huge efforts expended on the conceptual perspective upon nuclear weapons were, and remain, deeply problematic. This author was raised on nuclear lore and behaviour, a body of assumptions, assertions, arguments, theories, attitudes, and practices that incontestably proved compatible with a peaceful outcome to the Cold War. It might appear churlish to attempt to argue with success. Self-evidently, the conceptualizers for the nuclear age performed well enough. Nonetheless, it is sensible to question assertions of particular intellectual cause and its claimed effect. What follows should not be read as criticism of the defence intellectuals who founded and developed modern strategic studies, but rather as a sceptical, though ironically admiring, look in the rear-view mirror of historical hindsight at the performance of those who provided the conceptual perspective on strategy for nuclear weapons.[30]

A body of strategic theory was invented and then refined, keyed to a dominant concept of stable mutual deterrence that served adequately to enable policymakers and strategists to make sense of their strategic context. The apparent strategic fact that the superpowers were caught by technology in a military context that precluded meaningful military victory was obvious to most people by the mid-1960s, but could never prudently be assumed by responsible military establishments to be a reliable permanent truth. We know today that the strategic terms of engagement in the 1960s and 1970s were robust against feasible technical change. However, that condition of stalemate could not be assumed at the time: it was only prudent for both sides to compete energetically in nuclear weapons and their delivery vehicles. Such effort offered the win–win outcomes either of (unlikely) meaningful advantage, or at least of high assurance that the adversary could not secure any strategically menacing superiority.

Western strategic thinking about nuclear weapons was intensely rational as well as notably ahistorical and often anti-historical, disdainful of the possible relevance of strategic experience prior to 6 August 1945. The logic of mutual nuclear deterrence and the generally comforting calculations of the requirements of deterrence stability were overconfident expressions of faith in the permanent authority of cool and calculating prudent people. Those people would prudently command and securely control vast untried machines of war

in the face of whatever friction and contingency might throw at them. To call this project a gamble is indeed appropriate.[31]

From the earliest years of the nuclear era strategists as theorists and as planners have sought to cope with the unavoidable practicalities of contingency action plans. Since nuclear arsenals undoubtedly are here to stay, how should these weapons be used in war? Even after nearly seventy years the conceptual perspective on this class of weapon cannot provide a thoroughly convincing answer. That is a scholar's self-indulgent judgement. The practical matter is that throughout the nuclear period, politicians, officials, and soldiers have been obliged to make practical choices concerning contingent nuclear employment options, whether or not those action plans for use deserved to have confidence placed in them. The obvious fact that there has rarely been a fully satisfactory answer determinable, does not serve as an excuse for evading the issue. Intellectually mastered or not, nuclear weapons have figured in war plans since the 1940s.

Defence communities learn from history what they want to learn. More often than not they learn from the particular interpretations found in some historians' stories what is believed to serve best the interests of institutions or bodies of opinion. Unfortunately for the potency of the usual argument from claimed analogy, there was general agreement among those theorizing about strategy that strategic history ended (and began again, differently) in 1945. The nuclear era might be a post-strategic age, strictly impossible though that would be, but nuclear weapon technology was assumed to have caused a break-point in strategic time. This Revolution in Military Affairs (RMA) was effected by technology and was married to the air power of the new armed service that was the US Air Force. The RMA prompted an intellectual context wherein theory for the new era devolved upon a small number of gifted physical and social scientists to whom the rejection of pre-1945 experience came naturally.[32] To be polite, nuclear-age strategic theorizing in its early decades was an effort undisturbed or challenged by potential evidence that pre-dated Hiroshima. The conceptual foundations of nuclear oriented and related strategic theory were constructed with a near total absence of historical perspective. Relevant history was born abruptly by surprise in 1945.

The lack of historical perspective meant necessarily that an empirical basis for new strategic theory also was absent. For understandable reasons, the conceptual perspective on contemporary strategic challenges was restricted to '(limited) war in the nuclear age'.[33] Since it was assumed that everything that really mattered had changed in 1945, the assumption that the relevant evidential base for strategic conceptualization could only postdate the Second World War seemed eminently reasonable; indeed, it was not contested seriously by scholars for many years. The near total absence of pre-1945 historical reference in nuclear weapon strategic theorization, added to the agreeable fact that there was no nuclear battle action as decade succeeded decade, has created

a situation wherein the relevant strategic theory happily is thoroughly speculative, though less happily rests with possibly unwarranted confidence upon contestable assumptions.

Whether or not the early theorists of the nuclear age as well as most of their successors merit criticism for largely ignoring the pre-1945 historical record, there can be little doubt that their speculative products are distinctly imperfectly verified by anything worthy of the label of positive evidence from experience. The real problem with the strategic thinking for nuclear related issues that theory could address is the fact that its fragility is hugely underappreciated. The logic of mutual deterrence is easy to understand, but the fact that there has been no nuclear use since 1945 may be more attributable to luck than to wisdom in theory and skill in practice. The conceptual perspective on nuclear weapons typically has remained comfortably focused on the prevention and early containment of nuclear war. Despite the unarguable existential peril of large-scale nuclear use in a world that shows no practical enthusiasm for strategically meaningful nuclear disarmament (regrettably for excellent pragmatic reasons, one must add), the conceptual perspective on nuclear weapons continues to risk misleading its dependants by assuming an authority for which it lacks reliable evidence. What is deplorable is not the absence of well evidenced theory for policy and strategy, but rather the assumption that no bad news on nuclear use amounts to the good news that the theory of stable deterrence must be correct.

The richly human as well as political and cultural history of strategic behaviour is not much in evidence in the library of strategic theory on and about nuclear weapons. In the same way that the Cold War, including its novel nuclear dimension, needs to be better integrated into the whole grand narrative of history, so theory for and about nuclear weapons is much in need of fuller reconciliation with the dicta of strategy's general theory.[34] Those who specialize in providing the conceptual perspective have yet to recognize adequately the need for this historical mission to be attempted. Prominent among the reasons why strategy for nuclear weapons needs to benefit more from strategy's general theory is the insistence in the latter that strategy's adversarial nature and context and its vulnerability to friction of many kinds must never be forgotten. Strategy's adversarial nature and its liability to harassment by friction should not simply be noted and then in practice ignored, because assumed to be of little consequence. Although strategy for nuclear weapons was developed for half a century with a particular dominant adversary in mind, it is still quite surprising when one is obliged to reflect upon how little Western officials, soldiers, and scholars really knew about the enemy of those decades in nuclear regard. It was a persisting fact during the Cold War that no matter how confident Western defence communities were in their unilateral conceptual mastery of evolving nuclear circumstances, they could never be confident that they enjoyed a reliable grasp of and grip upon

Soviet nuclear reasoning. Of course, many Western officials and theorists were certain that they understood Soviet nuclear thinking. In truth there was considerable doubt over Soviet assumptions and planned intentions regarding the use of nuclear weapons. Strategic history records many cases of states misunderstanding their adversaries' concepts and plans, but often there has been time to learn and adjust to unanticipated revelations. A problem with conceptual error and derivative mistakes in the assumptions informing plans with a nuclear dimension is that probably there would be no time to adapt to unanticipated and unexpected epiphanies.

The strategic conceptual perspective on nuclear weapons can never be assessed prudently save with reference to the possible behaviour of a self-willed Other, the enemy. Moreover, that enemy's nuclear style is unlikely to be readable in advance reliably, either from strictly material assessment or from the contingent menaces in declaratory policy and strategy. The much contested cultural perspective cannot prudently be ignored and is, in consequence, discussed at some length in Chapter 3.[35] The cultural perspective on strategy comprises a sub-set of influences inside the perilously big tent of the conceptual perspective. However, honesty compels one to admit that a no less potent claim can be made for the intellect in conceptual action as a sub-set inside the tent of culture.

From the earliest years of the nuclear age a powerful strand in the conceptual perspective on nuclear weapons in effect has denied that they can be thought about strategically at all. This is by no means an entirely foolish attitude to adopt.[36] One can acknowledge that nuclear weapons exist and cannot be disinvented. Furthermore one can recognize that nuclear disarmament is uninteresting because it could not be policed and enforced when states would be motivated to build, or rebuild, nuclear arsenals. An astrategic view appreciates that although nuclear weapons may have some welcome deterrent merit occasionally, that virtue would only be of existential strategic value. It follows that even though it is probably unavoidable to go through the motions of strategic reasoning, and to appear to exercise some care in the material provision for a nuclear force posture of modest size, hardly any of the strategic detail of the pertinent ways and means really matters. The strategic value of nuclear weapons is merely existential: 'they exist, therefore we assume that they will deter whomever and whatever might need deterring and is deterrable'. Details of warheads, means of delivery, basing and deployment modes, number of delivery vehicles, targeting plans, and so forth, are assumed, though of course not declared, to be irrelevant to the real world of prospectively terrified all too human politicians. And who could blame them?

The attitude just outlined and somewhat caricatured is reasonable on a number of grounds, not totally excluding the strategic. However, reasonable and plausible or not, assuredly it is not responsible, unless one assumes that strategic thought about (and planning for) the 'unthinkable' might have the

potential to lower desirable barriers against nuclear use.[37] Strategic theorists long have had to contend with the charge that their careful thought about dangerous subjects is itself a source of danger. This is foolishly anti-intellectual, but it cannot be denied that familiarity with the theory that is nuclear strategy can lead under-recognized to some over-familiarity, and even to the apparent neglect of ethical safeguards and moral sensibility. That said, there has been no practicable alternative to the provision of conceptual guidance for the new class of weapons that exploded with no strategic, intellectual, or moral notice upon the astonished world in 1945.

The focus here has been upon an extreme case of strategic conceptual challenge and response. The nuclear example of the difficulties in achieving conceptual mastery of strategy is especially rich, despite the fact that there is no reliable evidence that can be deployed in aid of discrimination between wise or foolish strategic ideas. Historical hindsight is an immense advantage, but does it reveal which ideas about nuclear strategy—the assumptions, ends, ways, and means—were more, as opposed to less, sound? The answer is a resounding 'no'. The strategic context of the early Cold War decades saw an impressive conceptual response to what was generally agreed to be the overwhelming challenge of the era; the need to understand the meaning of nuclear weapons for statecraft and strategy. Much has been deduced about the consequences of the nuclear revolution for peace, crisis, and war, but the historical record since 1945 has settled few of the controversies. Scholars do not know for certain whether or not nuclear weapons deterred. They do not know for certain whether or not anyone has needed to be deterred by nuclear anxieties. And assuredly they do not know how nuclear warfare would have proceeded and to what outcome. This essential ignorance does not mean that we are unable to make heavily favoured best guesses, but they are only guesses. The conceptual perspective upon strategy for nuclear weapons mercifully has no empirical base in actions beyond the initial awful demonstration with two entry-level atomic bombs that wrought havoc in Hiroshima and Nagasaki. How challenging is it to master intellectually a whole class of weaponry when there are no certain empirical referents? Materially and conceptually the understanding of air power, as well as much misunderstanding, was massively accelerated by the experience of war from 1914 to 1918. Space power continues to lack for a convincing strategic conceptual framework, despite its half-century plus of evolution.

The latest strategic conceptual challenge, that posed by cyber power, is being met with far more expedition than was space power, because cyber 'warfare' already is a notable, if constrained, reality. Governments are wrestling conceptually and politically with the conundrum posed by hostile action, not merely with potential menace, in the EMS. Is cyber warfare war? Whether or not it is so treated today, how ought it to be regarded for the future? Electrons that are maliciously chosen and directed can have deadly physical

consequences, even though they lack the material reality of traditional land power, sea power, air power, and even space power. The burgeoning strategic debate about the meaning and implications of cyber power generically is analogous to the intellectual challenge posed by nuclear weapons in the 1940s and 1950s.

1.4 FAITH, HOPE, AND ASSUMPTIONS

Concept failure refers to the phenomenon of strategic theory found wanting as a guide to strategic practice. For example, in the 1930s and into the 1940s the US Army Air Corps, and later Forces (USAAC/USAAF), adopted, promoted, and implemented in action the strategic theory of victory by unescorted high-altitude daylight precision bombing.[38] For its time and place, largely over Germany in 1943–5, the master concept simply was unsound. The general theory of strategy for air power does not and cannot condemn this idea. Instead, the theory maintains that the strategic effect generated by such a use of air power is highly situational. There can be many reasons why some strategic concepts fail to meet the pragmatic needs of strategists at particular times. As often as not, the principal cause of failure will be faulty operational military direction, doctrine, and tactical execution of strategic ideas that appeared sound enough in principle.

A frequently neglected foundation of strategy is the role played by the assumptions of strategists. T. X. Hammes, an important contemporary theorist, with reference to Eliot Cohen as heavyweight support, claims that

> He [Eliot Cohen] starts with the requirement to make assumptions about the environment and the problem. Once the strategist has stated his assumptions, then he can consider the ends (goals), ways (the how) and means (resources) triangle. However, Cohen states an effective strategy must also include prioritization of goals, sequencing of actions (since a state will rarely have sufficient resources to pursue all its goals simultaneously) and finally, a theory of victory ('How does this end?').[39]

Hammes (and Cohen) are correct; the great chain of strategic logic expressed in the words quoted is made of precious metal. But, there are traps for the incautious that can limit the value of that logic, particularly with respect to the requirement for according assumptions an explicit and even a formal role in the strategy-making process.

Consideration of the conceptual perspective on strategy might seduce one into recommending recognition of the role of assumptions as an intellectual key that should open many doors to understanding. However, two difficulties with assumptions are fundamental and beyond reliable alleviation. First,

argument for privileging the role of assumptions readily is revealed to be perilously close to tautological. Sound assumptions should promote the prospects for sound strategy. But, how does one test for the soundness of assumptions? The answer presumably has to be through empirical verification, though the record of success or failure is likely to be inconclusive as evidence because of the phenomenon of redundant causation, as well as the laws of physics that deny us knowledge of events that are yet to occur. Strategy may succeed despite being founded upon faulty assumptions, just as poor strategy may succeed because the troops perform well tactically, despite their strategic disadvantages, or because the enemy underperforms.

Second, it is an easy matter to slip innocently into abuse of the meaning of assumptions. By definition, an assumption is something that currently is not known for certain to be true, but nonetheless is taken for granted (assumed to be true). It may be knowable, though it is not known at present. However, more often than not assumptions are made about subjects that literally cannot be known today because they lie in the future. Thus there is a severe definitional limitation to the strategic value in the scrutiny of assumption. No methodology can reveal what is unknowable, though it should be helpful to identify assumptions as such, which is to say as 'known but assumed unknowns'. Since strategic assumptions typically refer to anticipated features of future strategic history, there has to be a measure of uncertainty irreducible save by the passage of time and events. This translates as meaning that it would be nonsensical to try to insist that a strategy-making process should strive to 'get its assumptions right'. The working assumptions of strategists must always by definition be more or less problematic. This claim was registered uncompromisingly by Clausewitz, though in different words, when he identifies uncertainty as constituting a permanent feature of the 'climate' of war, and when he argues incontestably that 'war is the realm of chance'.[40]

The practical problem is how, even whether, the strategist can improve his assumptions. The logical fact that a superior performance in assumption identification and utilization should ensure strategic success, alerts us to the tautological difficulty. Because strategic assumptions by definition are factually unproven, though not necessarily unsupported, the challenge to strategy reform can no more lie with assumptions per se than with strategy per se. A security community that performs poorly with strategy is unlikely to be one capable of achieving substantial reform by improving its strategic assumptions. On the same reasoning, it is improbable that a strategically challenged leadership would be able to correct its deficiencies in assumptions. The one weakness implies the other. To suggest otherwise would be to commit an error characteristic of the creative authors of 'virtual history', wherein historical actors are postulated to behave in ways of which they were systemically incapable. For example, it is interesting to speculate about Hitler's mistakes

in his strategic misconduct of the Second World War. The problem with such analysis is that it is deeply misleading to refer to strategic behaviour that was always very probable because of the nature of the individuals and institutions involved.

Although the conceptual perspective on strategy, in common with strategy's general theory, needs to recognize the practical significance of assumptions, there is small reason to anticipate that such recognition can enable much improvement in strategic performance. All aspects of practical strategy, from initial conceptualization, through planning, on ultimately to tactical implementation, have to rest upon assumptions, which is to say upon beliefs about causal relationships as yet unverified by events. The core reality of historical strategy, strategic thought, and military intention, is all speculative theory, which is the world of assumptions prior to validation or refutation by action.

Because they tend to be future oriented, and because the future is an unattainable foreign country, the assumptions of the strategist should not be accorded any more authority than one allows to hope resting upon a faith that currently is unverifiable. This reasoning does not challenge the importance of assumptions in the conceptual perspective on strategy, but it does suggest that

Table 1.4 Assumption Troubles

Assumptions are hugely important to the strategist. However, recognition of that importance is of less practical utility than one might think. The following list summarizes this theorist's methodological troubles with assumptions.

1. Some beliefs are so popular and uncontentious that they escape notice as the contestable assumptions that they are.
2. If assumptions are believed to be facts they are likely to evade examination in an assumptions audit.
3. Because assumptions must be unproven, though not necessarily unprovable, in order to be classed as assumptions, there is always going to be some uncertainty as to their reliability. There are unbreakable limits to what can be known with certainty at any one time.
4. Many assumptions of high importance for defence planning and strategy making must always be unprovable because they pertain to a future that is never reached: tomorrow never comes. By definition, assumptions about the future cannot be proven. No research methodology yet invented enables time travel.
5. By definition, sounder assumptions must be desirable and may be useful, but their identification is neither a necessary nor a sufficient condition for strategic success.
6. Strategic assumptions should not be considered a variable independent of the policy- and strategy-making process. A weakness in the working assumptions, whether or not they are recognized explicitly as such, is virtually certain to cohabit with other strategic conceptual weaknesses that will be systemic.
7. It is probably a serious mistake to believe that one can submit a strategy to an assumptions test in the expectation that it can be improved by an assumptions repair job. Many strategic assumptions are not really selected from a catalogue of offerings, but rather have cultural roots and are anchored in particular geopolitical and historical contexts.

it points to what would be a gold mine if only it could be exploited usefully. The more deadly of assumptions for the strategist are likely to be those of which either he is unaware or that are highly resistant to correction. Concept failure typically does reflect some assumption failure, but such recognition does not advance the cause of better strategy very far. It is necessary to penetrate deeper into the conditions and causes of strategic behaviour. It is appropriate to think of assumptions as providing a significant context for strategy making and execution. But, the common-sense claim that this context must enjoy authority as provider of an independent variable for the education of strategists is not a safe one. In practice, assumptions often are discovered and articulated under pressure in response to the perceived necessity of debate. Assumption discovery and generation is a process always apt to be corrupted by the explicit or implicit pressure to validate strategic choices already made. After all, once one has decided what should be done, it is no great intellectual feat to find the assumptions that provide legitimation. Table 1.4 summarizes most of the concerns expressed here.

1.5 STRATEGY IS TIMELESS, BUT STRATEGIES AND STRATEGISTS ARE NOT

There is more to strategy than can be seen strictly in conceptual perspective. After all, theory achieves nothing without practice. That logical point granted, this perspective should provide understanding relevant to the whole house of strategy. It identifies the structure of strategy in all its aspects and is the arsenal of ideas for the governance of otherwise chaotic strategic space. At the apex of the conceptual perspective towers general theory on the strategy function. The general theory is the principal fortress of distilled knowledge on strategy.[41] The sheer variety in human strategic history can be a potent source of needless confusion, as also can be the differences in language between diverse polities and cultures over time and in contrasting geographies. It is perhaps paradoxical that the rich variation in the details of human strategic affairs has coexisted with seemingly eternal and universal prosecution of the strategy function, whatever the contemporary local terminology used to contemplate its practice. To claim thus inclusively for the strategy function is not to 'ride roughshod' over the wealth of historical variation, as one historian has charged.[42] Empirically appraised, security communities have always performed the strategy function, whether or not they had a contemporary term approximating modern usage of the word strategy. The logic in, as well as the historical evidential support for, this argument could hardly be more compelling.

For reasons of politics inclusively and tolerantly understood, men have always been obliged by necessity to identify a concept or concepts to guide the use of their means, particularly their military means. Political and strategic conceptual choices reflect the extant assumptions, not all of which express favourable news. Security communities of every character must function strategically in order to survive and prosper. Strategy is not an option, let alone a conceptual invention of modern times. Many communities have not performed the strategy function well enough and have suffered severely as a consequence. But even this logic may mislead the unwary, should they neglect strategy's competitive nature. It is not necessary to be excellent in the practice of strategy, but it is certainly advisable to be better than the enemy of the day. For a conceptually disturbing thought, one might speculate that an enemy inferior in strategy may find more than adequate compensation elsewhere for that deficiency. However, when soundly assembled the general theory of strategy, with its high inclusivity, is able to cope with apparently disabling 'what ifs . . . ' Should any of the dicta in the general theory be falsifiable either empirically or logically, they would not belong in the theory in their current form, if at all.

The conceptual perspective on strategy is of timeless relevance because strategy understood as performance of the strategy function itself is timeless. In the late 2000s the American and other allied forces that had intervened in Afghanistan lacked a credible strategy for success in their war against a complex enemy known collectively, but loosely and not entirely accurately, as The Taliban. In the 1340s, England's King Edward III required, found, and pursued a strategy to bring his French foe, Philip VI, to battle in circumstances where he could be defeated. Edward's strategic concept to achieve this result was the reliable agency of a bloody and fiery *chevauchée* (cavalry raid) across northern France that Philip could not ignore.[43] Edward was reasoning and acting strategically. The political goal was the crown of France, the military means was a largely professional army of modest size deployed tactically to best advantage, and the raiding style in campaigning enticed the French into seeking a battle that they were unlikely to win: this comprised a sound theory of victory, a strategy for success. By way of contrast, the United States and its NATO allies in Afghanistan in the 2000s did not operate with a strategic understanding of their practicable choices and limitations at all comparable to the superior English strategic performance in 1346 in the Crécy campaign. However, the strategy function was needed equally in the two cases, and competitive strategic effect was generated in both of them, though in the needful quantity only in the 1346 example. A strategic conceptual perspective applied equally to both cases.

The timelessness of strategy as a challenge inherent in the human security condition is not matched by a like timeless quality to the thoughts and behaviour of historically contextualized strategists. Those who must practise

strategy by devising and commanding contextually adapted strategies are always, without exception, the products of their particular time, place, and circumstances. No strategic theorist or practitioner performs outside of his time, though certainly he may speak to later generations should they choose to read him, assuming that his words survive and can be recovered. There is a timeless reality to the strategy function that finds detailed historical expression in ever changing thought and action. Another way of stating this fundamental proposition is with the claim that strategy has an eternal and universal nature, but a highly variable character. The greater among the theorists of strategy are those authors who have exposed the enduring truths of the subject most clearly and perceptively. Regarded thus, Clausewitz can be appreciated necessarily as a man of his time, but also as the one who has understood and explained most persuasively to generations of variably faithful readers the unchanging nature of war and strategy.[44]

Clausewitz is justly revered as a theorist not because one can argue that he unravelled once and for all time the mysteries of war, but rather because his explanation is by far the most persuasive extant. For all its superiority over other explanations of the phenomena of war, that by Clausewitz is only a particular empirically based theory of an ever shifting historical reality of practice. But, that shifting historical reality of strategic practice is a contemporary expression accommodated within the single conceptual category we understand as the strategic. Explanation of strategy should begin, but not end, with Clausewitz.[45] Endeavours to comprehend strategy should command that we move forward with, not from, his achievements. Clausewitz does not provide a complete strategic education, but this is not a potent criticism. He is either plainly correct or arguably correct enough on most of the major concerns of the strategist, present and prospectively future.

Provided Clausewitz is read carefully with as much empathy and respect for his historical context of composition as one can muster, and so long as one is not paralysed into thoroughly uncritical adulation by the authority conferred by his reputation, *On War* can only be a positive intellectual force. There are important matters that Clausewitz does not treat very well, but so what? We can be unashamedly grateful that the conceptual perspective on strategy contains a work as theoretically powerful in its explanation as *On War*. This is not to slight other notable contributors to strategy's general theory.[46] Each in his way has added to our ability to govern the intellectual space of strategy. Much of Clausewitz's strategic wisdom has value that should prove timeless, but necessarily it was written in a way, and even with a content, plainly attributable to its historical context of creation.[47] Clausewitz's genius as a theorist sometimes sufficed to offset what could have been serious error. For example, his silent assumption that policymaking was a distinctly elite activity finds much useful compensation in his trinitarian theory of war, with its allocation of high significance to the people and popular enthusiasm in its

many possible forms. Clausewitz understood and explained war and strategy better than did those who preceded or succeeded him. But, unsurprisingly and indeed necessarily, his was a conceptual accomplishment that left work to be done by others. Clausewitz's writing requires some interpretation and even amendment, as well as clear restatement in our contemporary language, if it is to yield high value for the twenty-first century.

The theory in *On War* needs translation when effort is made to shift levels from the general and abstract to the specific and contemporary practical. Ideally, *On War* should be able pre-eminently to help educate the contemporary strategist to cope with the challenges of, say, menaces in the Earth-orbital space and cyber realms. Unambiguously, Clausewitz did not seek to advise strategists directly.[48] Nonetheless, uncritical borrowing of such potent seeming ideas from *On War* as the 'culminating point of victory', and the 'centre of gravity' has no small potential to mislead the incautious.[49] Strategic ideas matter for strategic performance.

NOTES

1. Carl von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (1832–4; Princeton, NJ: Princeton University Press, 1976), 140–1 (emphasis in the original).
2. My 'whole house of strategy' is adapted and borrowed from Lawrence's 'whole house of war'. *Seven Pillars of Wisdom: A Triumph* (New York: Anchor Books, 1991), 191.
3. See David Zimmerman, *Britain's Shield: Radar and the Defeat of the Luftwaffe* (Stroud: Sutton Publishing, 2001), ch. 13.
4. A particularly firm determination to demonstrate the historical merit in this generally sound if not always obviously correct, belief is John A. Lynn, *Battle: A History of Combat and Culture* (Boulder, CO: Westview Press, 2003).
5. See John Keegan's classic study, *The Face of Battle* (London: Jonathan Cape, 1976).
6. This issue is central to John Keegan, *The Mask of Command* (New York: Viking Penguin, 1987) and is discussed in Colin S. Gray, *The Strategy Bridge: Theory for Practice* (Oxford: Oxford University Press, 2010), ch. 6.
7. Charles E. Callwell, *Small Wars: A Tactical Textbook for Imperial Soldiers*, 3rd edn. (1906; London: Greenhill Books, 1990), 90.
8. Brian McAllister Linn, *The Echo of Battle: The Army's Way of War* (Cambridge, MA: Harvard University Press, 2007), 6–7. Linn traces the influence of three traditions in US military culture: the guardian, the heroic, and the managerial. The three are not thoroughly exclusive and all have endured, even as their relative fortunes have fluctuated.
9. See Gray, *The Strategy Bridge*, ch. 1.
10. Linn, *The Echo of Battle*, 2.
11. Clausewitz, *On War*, 88.

12. Michael Howard, *The Causes of Wars and Other Essays* (London: Counterpoint, 1983), 214.
13. I present my version of the general theory of air power in *Airpower for Strategic Effect* (Maxwell Air Force Base, AL: Air University Press, 2012), ch. 9. The theory is presented in summary form in Table 1.3.
14. J. C. Wylie, *Military Strategy: A General Theory of Power Control* (1967; Annapolis, MD: Naval Institute Press, 1989), 14.
15. Carl H. Builder, *The Masks of War: American Styles in Strategy and Analysis* (Baltimore, MD: Johns Hopkins University Press, 1989), 49.
16. Alfred Thayer Mahan advised memorably that '[A] first and most obvious light in which the sea presents itself from the political and social point of view is that of a great highway; or better, perhaps, of a wide common, over which men may pass in all directions, but on which some well-worn paths show that controlling reasons have led them to choose certain lines of travel rather than others.' *The Influence of Sea Power upon History, 1660–1783* (1890; London: Methuen, 1965), 25. A fine application of the 'commons' concept is in Barry R. Posen, 'Command of the Commons: The Military Foundation of U.S. Hegemony', *International Security*, 28 (Summer 2003), 5–46.
17. See David E. Johnson, *Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post-Cold War Era, MG–405–AF* (Santa Monica, CA: RAND, 2006). Also see Colin S. Gray, *Understanding Airpower: Bonfire of the Fallacies*, Research Paper 2009-3 (Maxwell Air Force Base, AL: Air Force Research Institute, March 2009), 31–5.
18. Clausewitz, *On War*, 220, 634.
19. This permanent reality for defence planning is discussed in Colin S. Gray, 'Strategic Thoughts for Defence Planners', *Survival*, 52 (June–July 2010), 159–78.
20. Geoffrey Till, *Seapower: A Guide to the Twenty-First Century*, 2nd edn. (Abingdon: Routledge, 2009).
21. Two somewhat contrasting reviews of air power are Martin van Creveld, *The Age of Airpower* (New York: Public Affairs, 2011), and Gray, *Airpower for Strategic Effect*. By far the best book on air power history is John Andreas Olsen, ed., *A History of Air Warfare* (Dulles, VA: Potomac Books, 2010).
22. Some years ago I wrote an essay about space power that registered serious dissatisfaction with the contemporary state of the relevant theory: 'The Influence of Space Power upon History', *Comparative Strategy*, 15 (October–December 1996), 293–308. The condition of space power theory today shows considerably improvement, but much remains to be done. Certainly there is as yet no market-leading magisterial work of space power theory. However, worthy steps along the way to such an accomplishment can be recorded in the publication of these works: Jim Oberg, *Space Power Theory* (Washington, DC: Government Printing Office, 1999); Michael V. Smith, 'Ten Propositions Regarding Spacepower', thesis (Maxwell Air Force Base, AL: School of Advanced Air and Space Studies, Air University, June 2001); Everett C. Dolman, *Astropolitik: Classical Geopolitics in the Space Age* (London: Frank Cass, 2002); and Charles D. Lutes and Peter L. Hays, eds., *Toward a Theory of Spacepower: Selected Essays* (Washington, DC: National Defense University Press, 2011).

23. See David J. Lonsdale, *The Nature of War in the Information Age: Clausewitzian Future* (London: Frank Cass, 2004); Martin C. Libicki, *Conquest in Cyberspace: National Security and Information Warfare* (Cambridge: Cambridge University Press, 2007); Franklin D. Kramer, Stuart H. Starr, and Larry K. Wentz, eds., *Cyberpower and National Security* (Dulles, VA: Potomac Books, 2009); John B. Sheldon, 'Deciphering Cyberpower: Strategic Purpose in Peace and War', *Strategic Studies Quarterly*, 5 (Summer 2011), 95–112; and David J. Betz and Tim Stevens, *Cyberspace and the State: Toward a Strategy for Cyber-Power* (Abingdon: Routledge for the International Institute for Strategic Studies, 2011). Bearing in mind the salience of Raymond Aron's judgement that '[t]roubled times encourage meditation' (*Peace and War: A Theory of International Relations*, Garden City, NY: Doubleday, 1966), it is unsurprising that cyber focused strategic worries manifested themselves in an exciting literature as the twenty-first century advanced into its second decade. See Richard A. Clarke and Robert K. Knake, *Cyber War: The Next Threat to National Security and What to Do About It* (New York: HarperCollins, 2010); James P. Farwell and Rafal Rohozinski, 'Stuxnet and the Future of Cyber War', *Survival*, 53 (February–March 2011), 41–60; and Chris C. Demchak and Peter Dombrowski, 'Rise of a Cybered Westphalian Age', *Strategic Studies Quarterly*, 5 (Spring 2011), 32–61.
24. C. J. Chivers, *The Gun: The AK-47 and the Evolution of War* (London: Allen Lane, 2010), esp. chs. 1–4. Also, Anthony Smith, *Machine Gun: The Story of the Men and the Weapons that Changed the Face of War* (London: Judy Piatkus, 2002), is a pacey popular but informative narrative.
25. From an enormous literature, see Gerard J. DeGroot, *The Bomb: A Life* (London: Jonathan Cape, 2004); and Jeremy Bernstein, *Nuclear Weapons: What You Need to Know* (Cambridge: Cambridge University Press, 2008). See also Colin S. Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), chs. 11–12; id., 'The Nuclear Age and the Cold War', in John Andreas Olsen and Gray, eds., *The Practice of Strategy: From Alexander the Great to the Present* (Oxford: Oxford University Press, 2011), 237–59; Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd edn. (Basingstoke: Palgrave Macmillan, 2003); and Beatrice Heuser, *The Evolution of Strategy: Thinking War from Antiquity to the Present* (Cambridge: Cambridge University Press, 2010), Part V.
26. The immodest official American enthusiasm in the 1950s for nuclear weapons in all forms of warfare is described critically in Linn, *The Echo of Battle*, ch. 6.
27. My own early attempt to deal with the issue of continuity and discontinuity after 1945 was offered in 'Across the Nuclear Divide—Strategic Studies, Past and Present', *International Security*, 2 (Summer 1977), 24–46.
28. Nuclear arsenals (almost entirely atomic, not thermonuclear) climbed from two for the United States and zero for the Soviet Union late in 1945, to 2,422 for the United States and 200 for the Soviet Union (and 14 for Britain) in 1955. Unclassified figures are to be found in Robert S. Norris and Hans M. Kristensen, 'Global Nuclear Weapon Inventories, 1945–2010', *Bulletin of the Atomic Scientists*, 66 (July/August 2010), 77–83.

29. See David Alan Rosenberg, 'The Origins of Overkill: Nuclear Weapons and American Strategy', *International Security*, 7 (Spring 1983), 3–71; and Stephen T. Ross, *American War Plans, 1945–1950* (London: Frank Cass, 1996).
30. See Colin S. Gray, *Strategic Studies and Public Policy: The American Experience* (Lexington, KY: University Press of Kentucky, 1982); and Freedman, *The Evolution of Nuclear Strategy*.
31. See the robust critique of American nuclear theory, policy, and strategy in Keith B. Payne, *The Great American Gamble: The Theory and Practice of Deterrence from Cold War to the Twenty-First Century* (Fairfax, VA: National Institute Press, 2008).
32. Bernard Brodie, *War and Politics* (New York: Macmillan, 1973), chs. 9–10. See also Fred Kaplan, *The Wizards of Armageddon* (New York: Simon & Schuster, 1983); John Baylis and John Garnett, eds., *Makers of Nuclear Strategy* (New York: St. Martin's Press, 1991); and Alex Arbella, *Soldiers of Reason: The RAND Corporation and the Rise of the American Empire* (Orlando, FL: Harcourt, 2008).
33. Morton H. Halperin, *Limited War in the Nuclear Age* (New York: Wiley, 1963) is an authoritative period piece.
34. Scholarship on the Cold War marches on, but inevitably still lacks much historical perspective, both for assessment of that episode as well as for its place in the whole narrative of modern history. The leading edge of recent historical consideration is well represented by Gordon S. Barrass, *The Great Cold War: A Journey Through the Hall of Mirrors* (Stanford, CA: Stanford University Press, 2009), and the near monumental trilogy that is Melvyn P. Leffler and Odd Arne Westad, eds., *The Cambridge History of the Cold War*, 3 vols. (Cambridge: Cambridge University Press, 2010).
35. The 'cultural turn' in American strategic thought and attempted behaviour in the 2000s was a belated response to evident strategic failure in the field in Iraq and Afghanistan. That granted, the modern strategic studies community had been debating the merit in cultural analysis since the mid-1970s. See my *Nuclear Strategy and National Style* (Lanham, MD: University Press of America, 1986), which, though plainly a period piece, did seek to address some important strategic issues from a perspective that had some, admittedly arguable, validity beyond its time of writing.
36. See Lawrence Freedman, 'Has Strategy Reached a Dead-End?' *Futures*, 11 (April 1979), 122–31. Freedman began this article with the following robust claims: 'For the moment strategy has effectively come to a dead-end. In future any radical departures in strategic thought will be prompted more by political change than innovation in weapon systems. Thus the tasks of strategic studies will lie more in the realm of political science than in traditional military science.' 122.
37. Compare the contrasting approaches to deterrence and possible nuclear use in Herman Kahn, *On Thermonuclear War* (Princeton, NJ: Princeton University Press 1960) and id., *Thinking About the Unthinkable* (New York: Horizon Press, 1960), with Thomas C. Schelling, *The Strategy of Conflict* (New York: Oxford University Press, 1960) and id., *Arms and Influence* (New Haven, CT: Yale University Press, 1966). In *The Great American Gamble*, Payne argues convincingly that the intellectual history of American policy and strategy for nuclear

weapons can be understood with heavy reference to the sharply contrasting schools of thought led by Kahn and Schelling. The conceptual legatees of those frontier theorists of the 1950s and 1960s are alive and active to this day.

38. See Peter R. Faber, 'Interwar US Army Aviation and the Air Corps Tactical School: Incubators of American Airpower', in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell Air Force Base, AL: Air University Press, 1997), 183–238; and Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914–1945* (Princeton, NJ: Princeton University Press, 2002), ch. 3.
39. T. X. Hammes, 'Assumptions—A Fatal Oversight', *Infinity Journal*, 1 (winter 2010), 4. Hammes is the author of the conceptually challenging book, *The Sling and The Stone: On War in the 21st Century* (St. Paul, MI: Zenith Press, 2004).
40. Clausewitz, *On War*, 101, 104.
41. With gratitude I have borrowed the concept of a fortress of knowledge from Daniel J. Boorstin (then the Librarian of Congress), who said that '[w]e must never forget that our libraries are our fortresses of knowledge'. *Gresham's Law: Knowledge or Information?* (Washington, DC: Library of Congress, 1980), 4. Boorstin presciently invoked the logic of Sir Thomas Gresham (1519–79), and applied it to the claim that information drives out knowledge.
42. Hew Strachan, 'Strategy in the Twenty-First Century', in Strachan and Sybille Scheipers, eds., *The Changing Character of War* (Oxford: Oxford University Press, 2011), 506. The complete sentence reads as follows: 'Gray rides roughshod over change across time and assumes that there can be a concept of strategy, and a practice derived from it, for epochs and civilizations which had no word for it.' Strachan's charge is answered in Gray, *The Strategy Bridge*, Appendix C; id., 'Conclusion', in Gray and Olsen, eds., *The Practice of Strategy*, 287–300; Beatrice Heuser, 'Strategy Before the Word: Ancient Wisdom for the Modern World', *The RUSI Journal*, 155 (February/March 2010), 36–42; ead., *The Evolution of Strategy*, ch. 1; and ead., *The Strategy Makers: Thoughts on War and Society from Machiavelli to Clausewitz* (Santa Barbara, CA: Praeger, 2010), ch. 1.
43. See Lynn, *Battle*, 87–8.
44. See the analysis and appreciation in Hew Strachan, *Clausewitz's On War: A Biography* (New York: Atlantic Monthly Press, 2007).
45. For a full explanation of this judgement, see Colin S. Gray, *Schools for Strategy: Teaching Strategy for 21st Century Conflict* (Carlisle, PA: Strategic Studies Institute, US Army War College, 2009).
46. My candidates for the hall of fame of great strategic thinkers is provided and briefly justified in *The Strategy Bridge*, 264–6.
47. For Clausewitz's intellectual and cultural historical context, see Peter Paret, *Clausewitz and the State* (New York: Oxford University Press, 1976); Azar Gat, *The Origins of Military Thought: From the Enlightenment to Clausewitz* (Oxford: Clarendon Press, 1989); Lynn, *Battle*, ch. 6; Strachan, *Clausewitz's On War*; and Heuser, *The Evolution of Strategy*.
48. Clausewitz, *On War*, 141.
49. Clausewitz, *On War*, 528, 595–6n.