Chapter 15:

Theory Ascendant?
Spacepower and the Challenge of Strategic Theory

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Some time ago, one of us asked, "Where is the theory of spacepower? Where is the Mahan for the final frontier?"[1] Over 10 years later, such an exhortation still has resonance as the realm of spacepower still lacks a "space focused strategic theory" and a "binding concept" that can "aid understanding of what it is all about."[2] This chapter seeks to provide an explanation, or at least plausible reasons, as to why such a theory of space-power has yet to transpire. First, we shall discuss the difficulties involved in creating a theory of spacepower that is able to endure the test of time and that has universal applicability. The chapter then examines recent attempts at theorizing on spacepower by James Oberg, Everett Dolman, and John Klein. Lastly, the chapter outlines what a theory of spacepower should look like, and just as importantly, what it should not look like, as a guide for future theorists.

It should be noted that an exhortation of an "Alfred Thayer Mahan for the final frontier" is not to be confused with an endorsement of a Mahanian style of theory. Such a style of strategic theory may yet suffice (for the present, at least) for the purposes of guidance for spacepower, but we do encourage all plausible methods of elucidating a theory of space-power, be it directly influenced by the thought and style of either Mahan or of any other strategic theorist. Instead, the call for a Mahan for space-power is in fact a call for a theory that can match the *stature* of Mahan's collected thoughts on seapower.

This chapter uses the word *strategy* in an unashamedly Clausewitzian sense, and for clarity of meaning we offer up a definition of strategy as well as spacepower. *Strategy* is defined here as the use that is made of force and the threat of force for the ends of policy.[3] This definition is preferred because it takes into account the instrumental character of strategy that uses a variety of means as well as its ubiquitous applicability in both peace and war. This definition is distinctly military in scope, but we do not dismiss the notion of spacepower serving diplomatic, economic, and cultural aspects of a state's wider grand strategy. B.H. Liddell Hart defined *grand strategy* as the process and ability "to co-ordinate and direct all the resources of a nation, or band of nations, towards the attainment of the political object of the war."[4] Most satellite systems are dual-use; military systems such as the U.S. global positioning system (GPS) navigation satellites have myriad civil and commercial applications, and commercial systems, such as high-resolution imaging satellites, have myriad military applications. *Spacepower* is defined here as "the ability in peace, crisis, and war to exert prompt and sustained influence in or from space."[5] This influence can be exerted by commercial, civil, or military satellites as appropriate, though it should be noted that a theory of spacepower should have little to say about the purely commercial and civil exploitation of space, just as air- and seapower

theories have little to say about the purely commercial and civil exploitation of the sea and air. A theory of spacepower should not try to overreach its mandate and be all things to all agendas. Instead, a theory of spacepower is about the ability to exert prompt and sustained influence in or from space for the purposes and furtherance of *policy* in peace and war.

Impediments to a Theory of Spacepower

Why spacepower theory has yet to produce a notable theorist is the subject of speculation on numerous plausible and seemingly implausible factors. There is much to impede the creation and development of a sound theory for spacepower. Some of these impediments are unintentional and random incidents, phenomena and events that are the stuff of everyday defense planning and strategic decisionmaking. Other impediments are more insidious, the product of institutional prejudices and failings, or flaws in military and strategic culture. Spacepower theorists must try to remove themselves from these day-to-day impediments and institutional and cultural prejudices and failings in order to produce theory that is enduring and universally applicable.

Among the many impediments to the creation and development of spacepower theory, the following seem most pertinent for the purposes of our discussion.

Limited Spacepower History

At present, spacepower cannot draw upon any informative historical experience that can provide valuable lessons, as compared to the experience of land, air-, or seapower. Even the nuclear realm can draw upon historical experience, albeit a mercifully brief and limited one. Some might plausibly argue that spacepower has plenty of historical experience to draw upon from the Cold War and from military operations since Operation *Desert Storm* in 1991. The problem with the Cold War is that it was a unique moment in the history of international politics. Spacepower is a child of the Cold War but has also survived its erstwhile parent, which imposed a unique political context that dictated how spacepower was used. As the international system shifts from a unipolar to an eventual multipolar complexion, the political context in which spacepower operates shall also change and will likely resemble, in broad terms, previous multipolar experiences. This is not to say that the Cold War holds no lessons whatsoever for spacepower, but it does mean that it cannot be our sole data point.

Similarly, the exploitation of spacepower in the several wars of choice since the end of the Cold War from *Desert Storm* through to the present war on terror can be illustrative only to the extent that the largely unchallenged use of spacepower ever can be. In its numerous wars of choice since the early 1990s, the United States and its allies have become increasingly reliant upon spacepower for the threat and application of military force, yet real and potential adversaries have been relatively slow to counteract the strategic leverage derived from U.S. spacepower. This initially tardy response from those who have the most to fear from overwhelming U.S. military dominance, derived in large part from spacepower, is beginning to take greater urgency as more polities exploit space

for their own security objectives as well as develop and obtain their own counterspace capabilities.[6]

Of course, it might be argued that adversaries of the United States and its allies have countered the overwhelming advantages that are derived from spacepower by fighting in a manner that renders space-derived combat power irrelevant, such as terrorism and other asymmetric tactics. This argument is plausible to a point but is rendered moot when one discovers that even these adversaries are the beneficiaries of spacepower in their own unique ways. For example, al Qaeda is known to have used satellite telephones for tactical command and control, and Hizballah uses its own satellite television station, Al-Manar TV, to disseminate its virulent propaganda. These examples aside, as the offense-defense competition of fielded space capability versus counterspace capability is liable to continue, so the theorist is likely to glean meaningful lessons as the U.S. and allied reliance upon spacepower is increasingly challenged.

Among the calls for a theory of spacepower, it is often forgotten that the use and practice of spacepower is quite young in comparison to land, air-, and seapower. Land power has been in existence for thousands of years and yet it was not until the 16th century that a concerted effort at theorymaking truly began,[7] and it was not until the 19th century that we saw the greatest exponents of land power, and strategic theory in general, in Jomini and Clausewitz.[8] The naval and maritime theories of Mahan, Julian Corbett, Raoul Castex, and Charles Edward Callwell only appeared after sea and maritime power had been practiced for several thousand years.[9] It is only with the arrival of airpower in the early 20th century that we have seen attempts to theorize about its exploitation in parallel with its continuing evolution. It cannot be denied, however, that airpower theory is the subject of considerable debate and even controversy. For some, the body of work created by the likes of Giulio Douhet, William Mitchell, J.C. Slessor, and John Warden[10] is far from conclusive, and in many cases should perhaps be regarded more as vision than as theory. As David MacIsaac points out, "Air power . . . has nonetheless yet to find a clearly defined or unchallenged place in the history of military or strategic theory. There has been no lack of theorists, but they have had only limited influence in a field where the effects of technology and the deeds of practitioners have from the beginning played greater roles than have ideas."[11] Harold R. Winton is even more explicit on this point when he writes that "there simply does not exist any body of codified, systematic thought that can purport to be called a comprehensive theory of air power."[12] Winton goes on to assert that one of the reasons why this is so is because airpower has a very thin historical base upon which to draw for the purposes of creating a comprehensive and universal theory.[13]

Attempts to craft a plausible theory of spacepower at this early juncture in spacepower history are indeed unique in the history of military thought, especially if the aim is (as it indeed should be) to develop a theory that avoids the worst excesses of airpower theory. We are far from convinced that it is too early in the history of spacepower to begin crafting a theory that can guide its action and relate it to all other forms of military and national power, but such a possibility cannot be entirely discounted.

Confusion over Definitions

This chapter is emphatic in what it means by *spacepower*, *strategy*, and a *theory of spacepower*. Unfortunately, many misunderstand, misconstrue, or are ignorant of such terms. Much of this confusion is innocent enough in intent but has and continues to cause much damage to the quest for a theory of spacepower. For example, at a symposium associated with the project resulting in this book, several delegates seemed to think that a theory of spacepower was essentially a theory for the unilateral domination of space by the United States. Such an interpretation is mistaken, though it should be noted that a plausible theory of spacepower should be able to lend itself to imperialist space ambitions *as well as* efforts to create a multilateral regime in space. For what purposes spacepower is used is entirely up to the policymakers of the day. All that a theory of spacepower should do is assist the policymaker in achieving those purposes, regardless of what they are. Nor is spacepower alone in this matter. Airpower too has had problems in pinning down a consensus on key and fundamental definitions.[14]

The exploitation and capabilities of spacepower in the United States and other states are, and have been, highly classified, thus preventing many would-be theorists from accessing any lessons learned from previous applications of spacepower and publicly promulgating any theory based on such access. There are many good reasons to keep certain aspects of spacepower classified, especially as it relates to intelligence gathering and the technical details of satellite capabilities, yet there is also a culture of secrecy that has evolved over the decades that has kept not only adversaries, but for a long while much of the U.S. military and government, in the dark about U.S. space capability. The classification of spacepower is not a uniquely American phenomenon, as the space powers of Russia, China, Israel, and several European countries attest, but the dissemination of space capabilities to developing countries may see, from a theorist's perspective, greater transparency in how spacepower is used as space increasingly becomes an arena for greater and more intense competition.

Tales of Derring-do

Over the decades, civil space programs, such as the first Soviet and U.S. manned space missions, the Apollo moon landings, and the International Space Station, have helped divert public and media attention away from military and intelligence space programs. In the United States, a high-profile civil space program, in the form of the National Aeronautics and Space Administration (NASA), was set up deliberately to distract attention from the overhead reconnaissance satellite capability as well as other military space programs in order to lend credence to the principle of peaceful uses of outer space in the longstanding U.S. national space policy. This is not to argue that the U.S. civil space program does not have any intrinsic value beyond that of providing useful political cover for more sensitive programs, but rather to point out that the focus on the scientific and civil aspects of spacepower has done little to encourage the development of a theory of spacepower.

Portrayal of Space in Popular Culture

The influence of popular science fiction programs and films, such as *Star Trek* and *Star Wars*, has helped generate a public perception and expectation of space that are far removed from reality. Among the media, science fiction has had a deleterious effect, creating a view of it as a place of grandiose yet broken dreams, little green men, and alien abductions. As a result, space, and therefore spacepower, is not taken as seriously as it should be.

Complexity

A theory of spacepower has to explain and translate action in space into strategic effect on Earth, and *vice versa*. It must take into account not only spacepower itself, but also the effect and influence of land, air-, and seapower, nuclear and information operations, as well as special operations upon each other and upon spacepower. A theory of spacepower also has to consider the roles and influence of science, technology, politics, law, diplomacy, society, and economics, among others. It is a daunting subject.[15]

Policy Distractions

Debates on nuclear deterrence and stability theory, ballistic missile defense, revolutions in military affairs, and, more recently, global insurgencies have all impeded the quest for a theory of spacepower. Elements of information-enabled warfare, such as precision strike and persistent battlespace surveillance, are all, to varying degrees, enabled by space systems. At present, spacepower is often thought about in these terms, yet there is a danger that a theory for spacepower is conflated with information-led warfare when, in fact, spacepower has the potential to be much more than an enabler. Space systems play a vital role in maintaining nuclear postures, any proposed missile defense system, and information-enabled operations. More recently, spacepower has been playing a critical but quiet role in the war on terror. Yet spacepower is not just the maintenance of nuclear postures, missile defense, precision strike, or supporting counterinsurgencies; it is all of these things and more.[16]

Perils of Linear Thinking

To say that spacepower is dependent on science, engineering, and technology risks insulting even the most theoretically challenged person. However, such a dependency may encourage spacepower practitioners and commanders to think of spacepower in a mechanistic and linear fashion. A theory of spacepower, or at least one worthy of the name, should respect the nonlinear, interactive, and paradoxical nature of strategy and its dimensions, which defy mechanistic analysis or mathematical equation.[17]

Technological Determinism

Similarly, because spacepower is so obviously dependent upon technology for strategic performance, there is a danger that theory is either blinded or sidelined by a culture that is technocentric. A theory of space-power simply cannot afford to ignore the role of

technology, but it would not be a theory at all if this were the sole focus at the expense of the other dimensions of strategy.[18]

Understanding Orbitology

On a related issue, perhaps because spacepower *is* so dependent on science, engineering, and technology, strategic theorists (who normally have an educational background in the social sciences or history) have tended to avoid it. Any individual attempting to contribute to a theory of spacepower must have, at the very least, a working knowledge of orbitology and other principles of spaceflight.

Out of Sight, Out of Mind

Lastly, in many ways spacepower is discrete (even allowing for classification issues) and does not attract much attention in the way that armies, navies, and air forces do. Apart from the awesome sights and sounds of a space launch, one does not *see* spacepower. One does, however, *feel* spacepower, as its presence in the battlespace is ubiquitous. Indeed, spacepower can be likened to intelligence operations: one only hears of it when something goes wrong.

Small Steps: Building on Previous Spacepower Theory

Despite the importance the Department of Defense attaches to a theory of spacepower, there have been surprisingly few works on the subject within the body of spacepower literature that exists. The reasons for this may be ascribed to some of the impediments listed above, but perhaps the biggest reason is that developing and creating strategic theory, much like its practice, are very difficult to do. As Clausewitz pointed out, "Everything in war is very simple, but the simplest thing is difficult."[19] David Lonsdale is even more blunt: "Strategy is difficult; very difficult."[20] Discerning enduring and universal theory from scant (and often contradictory where it exists) evidence is "very difficult," despite the fact that many will not argue with the relatively simple proposition that a theory of spacepower is needed. Yet a number of thinkers have risen to the challenge in recent years and have attempted to fill the theoretical void. Among these are James Oberg (*Space Power Theory*), Everett Dolman (*Astropolitik*), and John Klein (*Space Warfare*).[21] Each deserves credit for placing himself above the parapet, and each in his own way has made unique contributions to the nascent body of theory. Can any of these authors lay claim to the mantle of being the Mahan of the space age? Alas, the answer must be a reluctant "no." Each has furthered our understanding of spacepower considerably, but none has offered a comprehensive theory of spacepower.

James Oberg

Oberg provides us with a comprehensive account of spacepower's role in everyday activities on Earth[22] but falls short in his effort to outline its nature, though his distillation of spacepower into Mahanian elements is a useful starting point for any analysis.[23] Oberg's writing is excellent for a description, in laymen's terms, of the physical workings

and constraints of spacepower.[24] Oberg is also to be thanked for many of his axioms—or "Truths and Beliefs"[25]—that attempt to distill something enduring about spacepower. These axioms include the following:

- "The primary attribute of current space systems lies in their extensive view of the Earth."[26] Spacepower is able to provide global coverage with relatively few assets.
- "A corollary to this attribute is that a space vehicle is in sight of vast areas of Earth's surface."[27] Spacepower can be vulnerable due to a lack of natural cover in space, though sheer distance can afford some protection.
- "Space exists as a distinct medium."[28] At the tactical and operational levels of war, space is most certainly a distinct medium, though it should be noted that there is nothing about space that places it beyond strategy. The nature of spacepower is the use, or threatened use, of space systems for political purposes.
- "Space power, alone, is insufficient to control the outcome of terrestrial conflict or ensure the attainment of terrestrial political objectives."[29] The same is true of air- and seapower. The seat of political power for all polities resides on the land, where people live. Control of such power can only be ultimately won or lost by controlling land. Spacepower, along with air- and seapower, can help leverage—even critically—land power to achieve victory on land, but can never do so by itself. An exception to this may come about should human beings colonize other celestial bodies, such as the Moon or Mars. In that event, one might see spacepower take the lead role in delivering sovereign effects, with other forms of military power (especially land and airpower delivered by a preponderant spacepower) providing support.
- "Space power has developed, for the most part, without human presence in space, making it unique among other forms of national power."[30] Space-power is unique in that, for the time being at least, it is the only form of military power that generates strategic effect through robotic proxies. Whether this situation will change in the future with manned platforms performing the spacepower mission remains to be seen, and will be subject to myriad factors. However, the trend in the air and sea environments among the assorted militaries of the industrialized world is toward unmanned platforms.
- "Technological competence is required to become a space power, and conversely, technological benefits are derived from being a space power."[31] As space technologies disseminate throughout the world at a rapid pace, Oberg reminds us that true spacepower is that which can be organically sustained rather than purchased on the open market. It may prove critical to be able to develop, manufacture, launch, and operate one's own space-power without having to rely upon a third party for technological expertise. Technological competence in this area undoubtedly will have strategic benefits as well as economic ones.
- "As with the earth-bound media [land, sea, and air], the weaponization of space is inevitable, though the manner and timing are not at all predictable."[32] Because spacepower is not beyond strategy, so it is not beyond the fate that has befallen every other environment that humankind has exploited. We may debate the desirability of space weaponization as a policy option in the near and mid-term,

and, indeed, what that may or may not look like, but weaponization in one form or another will happen.

- "Situational awareness in space is a key to successful application of space power."[33] Space situational awareness at present is sketchy at best, and yet it is required in order to carry out many of the simplest and most mundane spacepower functions, as well as to be able to distinguish between natural hazards and intentional threats or interference.
- "Control of space is the linchpin upon which a nation's space power depends."[34] In fact, Oberg does not reach far enough here. Because terrestrially based armed forces have become so space-dependent, the control of space will become critically important for a nation's land, air-, and seapower, not just spacepower.

Oberg's *Space Power Theory* should be viewed as an initial foray into theory-making. It does not meet our Mahanian criteria in that it lacks a comprehensiveness that links spacepower to national power in a manner that elucidates the nature of spacepower, and perhaps overly focuses on the technological dimension at the expense of others. Given that Oberg courageously stepped into the breach at the last minute of a troubled project sponsored by the then–Unified U.S. Space Command, *Space Power Theory* has aged not too badly, and provides sturdy shoulders upon which others may climb.

Everett Dolman

Everett Dolman's *Astropolitik* has been the most controversial book to appear on spacepower in recent years and yet, in many respects, is perhaps the most rigorous intellectually. Dolman posits spacepower within a classical geopolitical model based on the works of geopolitical theorists such as Mahan, Halford Mackinder, and Nicholas Spykman, among others.[35] His analysis finds that certain points in space may prove strategically advantageous to those powers that would control them. These points include low Earth orbit (LEO), geostationary orbit, Hohmann orbital transfers, and the Libration points L4 and L5 between the Earth and the Moon.[36] Others, such as Dandridge Cole and Simon "Pete" Worden,[37] have made similar arguments in the past, but not with the intellectual power that Dolman has mustered.

Dolman's signal contribution to the field is his outstanding explanation of the geographical and geopolitical relationships between space-power and land, air-, and seapower. The assertion made by Dolman that the United States should seize LEO (unilaterally if necessary) in order to preserve a liberal global order is questionable in intent and implausible,[38] although a U.S.-led alliance might feasibly have a more legitimate claim to controlling LEO for more attainable and realistic goals. Similarly, Dolman may yet be proven right in his claim that the current outer space legal regime has stifled healthy competition in space that may have brought about more robust military and civil space capabilities, although blaming the failure of the space age to materialize solely on the space regime can come across as reductionism.[39]

Dolman has done the field a great service with *Astropolitik*. He fearlessly questions spacepower's sacred cows and throws down an intellectual gauntlet in the process. This

said, Dolman's work cannot lay claim to be a comprehensive theory of spacepower, as its argument only resonates in the United States and lacks the universalism that marks all great works of strategic theory. Furthermore, *Astropolitik*'s durability may arise from its controversial assertions rather than from any overt attempt by Dolman to speak to the ages. Many of the policy concerns rightly raised by Dolman are unlikely to be of any broad interest to an audience seeking strategic guidance in the future.

John Klein

In Klein's *Space Warfare*, we see the first comprehensive attempt to apply a strategic analogy to spacepower. Klein takes Sir Julian Corbett's *Some Principles of Maritime Strategy* and applies it to spacepower, with mixed success. Corbett advocated a maritime approach to strategy that emphasized the interaction between land and seapower. Klein takes this a step further and advocates a spacepower version of maritime strategy that emphasizes the strategic interaction of spacepower with land, air-, and seapower.[40] The application, in broad terms, of Corbettian concepts of limited liability in war and the temporary nature of control to spacepower is useful, but when Klein seeks to apply the same framework to concepts such as offense, defense, concentration, and dispersal, the real limitations of the Corbettian strategic analogy are revealed.

The term *strategic analogy* is new, yet its theoretical roots can be found in the scholarship on historical analogies in statecraft and policymaking. An analogy "signifies an inference that if two or more things agree in one respect, then they might also agree in another."[41] Based on this definition, among others, a definition for the strategic analogy can be extrapolated. If two or more strategic environments separated, among other things, by time (though this is not a necessary criterion; strategic analogies may be used contemporaneously), geographical characteristics, doctrine, technology, culture, and political context agree in one respect, then they may also agree in another. Scholars, policymakers, military planners, and commanders use strategic analogies to provide a rational means for the comprehension and planning of novel strategic environments by retrieving information, principles, and past experiences from other, more established strategic environments and applying them to the new, unfamiliar strategic environment. In short, strategic analogies may provide a "shortcut to rationality"[42] in new and poorly understood strategic environments where there is little or no known strategic experience or established principles for effective operations. Strategic analogies are similar to historical analogies, except that the former use the strategic experiences and theories of other environments—such as the sea and the air—rather than the specific and particular historical events used in the latter. A strategic analogy may state that nascent spacepower is similar to seapower in several key respects, and then may infer that because of this it must be similar in other respects. A strategic analogy uses the body of theory and principles that has developed over the years, as well as the strategic history of the environment (land, sea, air) in question.

Klein's *Space Warfare* is an exercise in making strategic analogies and as a result reveals the limitations of this process. To be fair, Klein does state that "space is a unique environment, and any historically based strategic framework—whether naval, air, or

maritime—cannot realistically be taken verbatim in its application to space strategy. Only the most fundamental concepts of maritime strategy, therefore, will and should be used to derive the strategic principles of space warfare."[43] Yet despite this acknowledgment, Klein at times seems to make the reality fit the theory, or at the very least, let the theory gloss over awkward facts. For example, Klein overreaches in his discussion of spacepower dispersal and concentration, where it is far from clear whether he is speaking about the dispersal and concentration of actual satellites (impossible, given the constraints of orbital dynamics) or the dispersal and concentration of effects generated by space-power (which is plausible).[44]

The use of strategic analogies is a necessary step on the road to creating and developing an enduring and universal theory of spacepower. Problems arise, however, when we become overreliant on strategic analogies at the expense of critical thinking. Strategic analogies should be nothing more than a cognitive crutch that allows us to ask the right questions of spacepower. We shall make progress in theorymaking when we kick away these crutches and engage our critical faculties to start the process of inductive reasoning.

Guide for the Future

The authors discussed above have all made valuable contributions to a theory of spacepower. Even their mistakes and omissions are useful, as they allow those of us who follow to climb on their shoulders and adjust the theoretical framework accordingly. We are forced to address and correct their mistakes and omissions, and future theorists will have to rectify ours. Truly, a Mahan for the space age may yet appear, but in lieu of such a person, it is perhaps prudent to assume that the continued development of a theory of spacepower will be a team effort that will build on the labors of others that have gone before. It may seem churlish to critique these works, but criticism is made with gratitude to those who have intellectually dared, and the theory of spacepower ultimately will be best served by constantly striving through honest debate.

With these sentiments in mind, we offer our own thoughts on a theory of spacepower for others to ruminate upon, critique, and, ultimately and hopefully, improve in their own turn. Many of the thoughts offered here have been asserted before by us but are worth repeating for their strategic value.

Space is a Place

The idea that space can redeem human sin still persists in many quarters. The reason for this persistence is as much about the perception of space as a place, and what that place purports to represent, as it is about the technologies required for its manned and unmanned exploration and use. This particular way of framing space can be described as *astrofuturism*, which "posits the space frontier as a site of renewal, a place where we can resolve the domestic and global battles that have paralyzed our progress on earth."[45] We believe that space as a place is no different from the land, sea, and air, and we reject the astrofuturist credo as a fallacy. Human beings and their robotic proxies operate and (in the case of the land) live every day in these environments, carrying out myriad functions

from the spiritual and artistic to the martial (and these are by no means mutually exclusive).

Our entry into space must respect the human condition in its entirety, good and bad, and attempts to redeem human nature through the wonders of technology or hopes that the infinite expanse of space will offer the opportunity to unite humankind where our existence on Earth has failed are bound to disappoint. It is tragic but true that "short of a revolution in the heart of man and the nature of states, by what miracle could interplanetary space be preserved from military use?"[46]

Strategy, Eternal and Universal

In the quest for a theory of spacepower, it is perhaps wise to first state categorically what such a theory should *not* be. In particular, a theory of spacepower should not be at odds with the universal and eternal logic of strategy. Instead, it should be a theory of its use in the service of strategy. Edward N. Luttwak points out that to postulate such a thing as "nuclear strategy," "naval strategy," or, in this case, "space strategy" is to argue that each of these kinds of strategy is somehow fundamentally different from the strategy that governs them all. Luttwak writes, "If there were such a thing as naval strategy or air strategy or nuclear strategy in any sense other than a conflation of the technical, tactical, or operational levels of the same universal strategy, then each should have its own peculiar logic."[47] A theory of spacepower should not claim such a "peculiar logic," and the foundations for this theory should be cognizant and respectful of a superior and overarching logic of strategy.

Sir Julian Corbett wrote of the purpose of theory in strategy:

> It is a process by which we co-ordinate our ideas, define the meaning of the words we use, grasp the difference between essential and unessential factors, and fix and expose the fundamental data on which every one is agreed. In this way we prepare the apparatus of practical discussion; we secure the means of arranging the factors in manageable shape, and of deducing from them with precision and rapidity a practical course of action. Without such an apparatus no two men can even think on the same line; much less can they ever hope to detach the real point of difference that divides them and isolate it for quiet solution.[48]

Given the relative infancy of spacepower, it is important that sensible theoretical foundations be established. Spacepower has made itself ubiquitous in modern war and statecraft, yet discerning a strategic experience of spacepower has proved to be notoriously difficult. Over time, strategic experience will doubtless accumulate, and so eventually a comprehensive theory of spacepower will develop and evolve synergistically with its actual practice. Although spacepower is relatively new, the need for theory is not. As Corbett's thoughts suggest, a theory of spacepower should provide a common framework from which all can refer and a conceptual means by which spacepower is exploited to its full potential in order to attain policy objectives.

Pragmatism

That said, a theory of spacepower must guard against a creeping inflexibility and orthodoxy that stifle innovative thinking or constructive criticism. It will evolve along with its actual use, and it may be found that some tenets of spacepower thought are in fact wrong. A theory of space-power must also guard against flights of fancy and overactive imaginations that make theory useless as a guide to practice. Spacepower could be especially susceptible to such problems given that it is, conceptually, a blank canvas and is bound up for many people with science fiction. Spacepower is not science fiction, and its intellectual guardians, the theorists, much like the protagonists in the "widening gyre" of W.B. Yeats's "The Second Coming" who are either "lacking all conviction" or are "full of passionate intensity,"[49] must take care to protect it from the ignorance of some and the worst excesses of others. Theorists of spacepower, and practitioners who would read such theory, must always be mindful of the fact that strategy "is nothing if not pragmatic," and that "strategic theory is a theory for action."[50] A theory of spacepower that is disrespectful of the practicalities of spaceflight and orbitology, the limits of technology, and the eternal, universal workings of strategy could be worse than useless; it could be dangerous.

The Nature of Spacepower

To repeat, spacepower is not beyond the logic of strategy, nor can it be. Strategy is eternal in its nature and logic, and while the grammar and character of strategy evolve because of changes in their many dimensions such as society, politics, and technology, strategy's fundamental nature does not. Spacepower is subject to the nature of strategy and always will be. The nature of spacepower is simply the ability to use space for political purposes, and that too will never change. John G. Fox is only partially correct when he states, "The nature and character of space warfare 50 years from now may be wholly unrecognizable to those of us alive today."[51] Fox is probably correct in that the *character* of spacepower will change over the next 50 years, due perhaps to unforeseen technological developments. He is wrong, however, to state that the *nature* of spacepower is changeable; it is not. So long as humankind possesses the ability to exploit the space environment, then the nature of spacepower is immutable and impervious to societal, political, economic, technological, or any other kind of change.

Conclusion

This chapter has sought to elucidate the very real problems of creating and developing a theory of spacepower. The impediments are varied and tangible, but many of them apply equally to theorymaking for other military instruments. The crux of the matter is that strategy is difficult and so, therefore, is creating and developing a theory of spacepower. A true theory of spacepower will be able to account for its role in modern war and statecraft, as well as how it interacts with other instruments of power, and this chapter has sought to provide the would-be theorist with food for thought.

Notes

1. Colin S. Gray, "The Influence of Space Power upon History," *Comparative Strategy* 15, no. 4 (October–December 1996), 307.
2. Ibid., 304.
3. Colin S. Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), 17.
4. B.H. Liddell Hart, *Strategy*, 2d rev. ed. (New York: Signet, 1974), 322.
5. Colin S. Gray and John B. Sheldon, "Spacepower and the Revolution in Military Affairs: A Glass Half-Full?" in *Spacepower for a New Millennium: Space and U.S. National Security*, ed. Peter L. Hays, James M. Smith, Alan R. Van Tassel, and Guy M. Walsh (New York: McGraw-Hill, 2000), 254.
6. A growing number of countries are realizing the benefits and challenges of spacepower. Among them are the People's Republic of China, India, Brazil, South Korea, Israel, France, Germany, Italy, Nigeria, and Iran. See the special issue of *Astropolitics* 4, no. 2 (Summer 2006), for essays on the implications of rising spacepowers.
7. With the exception of Sun Tzu, Thucydides, and Vegetius, of course. On the evolution of military theory in the modern period, see Azar Gat, *A History of Military Thought: From the Enlightenment to the Cold War* (Oxford: Oxford University Press, 2001).
8. See Baron Antoine Henri de Jomini, *The Art of War* (London: Greenhill Books, 1992); and Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984).
9. See, among his other works, Alfred Thayer Mahan, *The Influence of Sea Power Upon History, 1660–1783* (Boston: Little, Brown, 1890); Julian S. Corbett, *Some Principles of Maritime Strategy*, introduction and notes by Eric J. Grove (Annapolis, MD: Naval Institute Press, 1988); C.E. Callwell, *Military Operations and Maritime Preponderance*, ed. and introduced by Colin S. Gray (Annapolis, MD: Naval Institute Press, 1996); and Raoul Castex, *Strategic Theories*, trans., ed., and introduced by Eugenia C. Kiesling (Annapolis, MD: Naval Institute Press, 1993).
10. See Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (Washington, DC: Air Force History and Museums Program, 1998); William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power, Economic and Military* (Mineola, NY: Dover Publications, 1988); Wing Commander J.C. Slessor, RAF, *Air Power and Armies* (London: Oxford University Press, 1936); and Colonel John A. Warden III, USAF, *The Air Campaign: Planning for Combat* (Washington, DC: Brassey's, 1989).
11. David MacIsaac, "Voices from the Central Blue: The Air Power Theorists," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton: Princeton University Press, 1986), 624.
12. Harold R. Winton, "A Black Hole in the Wild Blue Yonder: The Need for a Comprehensive Theory of Air Power," *Air Power History* 39, no. 4 (Winter 1992), 32.
13. Ibid., 32–33.
14. MacIsaac, 625.
15. Gray, *Modern Strategy*, 205. See also David Jablonsky, "Why Is Strategy Difficult," in *The Search for Strategy: Politics and Strategic Vision*, ed. Gary L. Guertner (Westport, CT: Greenwood Press, 1993), 3–45; and David J. Lonsdale, "Strategy: The Challenge of Complexity," *Defence Studies* 7, no. 1 (March 2007), 42–64.
16. A point also made in Gray and Sheldon, "Spacepower and the Revolution in Military Affairs: A Glass Half Full?" 239–257.
17. See, for example, Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," *International Security* 17, no. 3 (Winter 1992/1993), 59–90.
18. See Colin S. Gray, *Weapons for Strategic Effect: How Important Is Technology?* Occasional Paper No. 21 (Maxwell Air Force Base, AL: Center for Strategy and Technology, Air War College, January 2001) for an exposition on the limits of technology.
19. Clausewitz, *On War*, 119.
20. Lonsdale, 42.

21. James Oberg, *Space Power Theory* (Washington, DC: U.S. Government Printing Office, 1999); Everett C. Dolman, *Astropolitik: Classical Geopolitics in the Space Age* (London: Frank Cass, 2002); and John J. Klein, *Space Warfare: Strategy, Principles, and Policy* (New York: Routledge, 2006).
22. Oberg, 1–22.
23. Ibid., 43–66.
24. Ibid., 67–86, but also the very useful appendices.
25. Ibid., 124.
26. Ibid.
27. Ibid.
28. Ibid., 126.
29. Ibid., 127.
30. Ibid.
31. Ibid., 128.
32. Ibid., 129.
33. Ibid., 130.
34. Ibid.
35. See, in particular, Dolman, 12–59.
36. Ibid., especially 60–85.
37. See G. Harry Stine, *Confrontation in Space* (Englewood Cliffs, NJ: Prentice-Hall, 1981), for a discussion of Dandridge Cole's "Panama Canal" spacepower theory, and Simon P. Worden and Bruce J. Jackson, "Space, Power, and Strategy," *The National Interest*, no. 13 (Fall 1988), 43–52, for a similar "High Ground" view.
38. Dolman, 86–112.
39. Ibid., 113–144.
40. Klein, 44–50.
41. David Hackett Fischer, *Historian's Fallacies: Toward a Logic of Historical Thought* (New York: Harper and Row, 1970), 243.
42. Robert Jervis, *Perception and Misperception in International Politics* (Princeton: Princeton University Press, 1976), 220.
43. Klein, 20.
44. Ibid., 107–115.
45. De Witt Douglas Kilgore, *Astrofuturism: Science, Race and Visions of Utopia in Space* (Philadelphia: University of Pennsylvania Press, 2003), 2.
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47. Edward N. Luttwak, *Strategy: The Logic of War and Peace* (Cambridge: The Belknap Press of Harvard University Press, 1995), 156.
48. Corbett, 7.
49. With our sincerest apologies to the Bard of Sligo, see W.B. Yeats, "The Second Coming," in *The Collected Poems of W.B. Yeats* (New York: The Macmillan Company, 1952), 184–185.
50. Bernard Brodie, *War and Politics* (New York: The Macmillan Company, 1973), 452.
51. John G. Fox, "Some Principles of Space Strategy (or 'Corbett in Orbit')," *Space Policy* 17, no. 1 (February 2001), 7–11.