Research Project

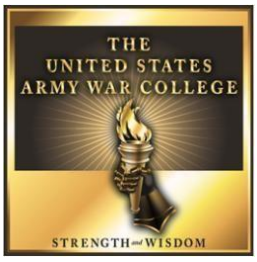
# From Air to Space: The Perils of Domain Parochialism

by

Lieutenant Colonel Peter M. Atkinson
United States Army, Space Operations

Under the Direction of:
Dr. Erik Lin-Greenberg and Colonel Benjamin Ogden

While a Fellow at:
Massachusetts Institute of Technology

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## Abstract

Is there a correlation between 20th-century air domain and 21st-century space domain functions? If so, can the space domain benefit from the air domain lessons? Air Defense, naval aviation, and close air support were the most contentious 20th-century air domain functions. Analyzing these functions led to the identification of seven characteristics termed herein as domain parochialism. Domain parochialism is defined as a limited, self-absorbed outlook relating to the land, maritime, air, and space domains. This paper argues that domain parochialism explains why the close air support innovation was the most contentious case study, despite requiring the least resources and organizational change to adopt. To mitigate domain parochialism, military services must: be receptive to integrating forces under another service; support organizational change efforts; avoid displaying domain preeminence over another domain; think beyond traditional roles and domain boundaries; focus on the purpose of the effect, not where it is generated from; embrace performing collateral military functions; and conduct joint research, development, testing, and evaluation for capability development. Without adequate mitigation, domain parochialism will stymie capability development and delay innovation adoption. Overcoming domain parochialism is essential for the Defense Department to succeed in 21st-century warfare.

## From Air to Space: The Perils of Domain Parochialism

Air defense, naval aviation, and close air support were the most contentious 20th-century air domain functions.[1] The tumult surrounding these functions exhibited *domain parochialism* that inhibited timely innovation adoption. Domain parochialism is defined herein as a limited, self-absorbed outlook relating to the land, maritime, air, and space domains.[2] Domain parochialism is often purported to reduce duplicate capabilities; however, the air defense, naval aviation, and close air support case studies illustrate that it had the opposite effect. Domain parochialism stymied capability development, delayed innovation adoption, and was the underlying source of contention. This paper suggests there is a strong correlation between the 20th-century air domain and the 21st-century space domain functions because they both involve the creation of a new military service and a further delineation of roles and responsibilities. Following the establishment of the Air Force and Space Force, functions and priorities were redefined. This historic change showcased domain parochialism among the other services and the parallels between the air and space domains are noteworthy.

General Giulio Douhet, an early 1900s airpower theorist, "initiated a fundamental debate, never resolved, over whether airpower is unique and revolutionary or whether it is just another arrow in a soldier's or sailor's quiver – and thus evolutionary."[3] The airpower theory debate is central to domain parochialism. On one side, there is an

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[1] Air defense, naval aviation, and close air support were the most contentious air domain functions because of prolonged innovation adoption rates and resistance to organizational change among the military services. In contrast, air supremacy, air domain joint doctrine and procedures, strategic air warfare, air transport, and aerial photography functions were adopted without contention.
[2] Joint Publication 3-0, *Joint Operations*, defines physical domains as land, maritime, air, and space; and the information environment (which includes cyberspace), as well as the electromagnetic spectrum.
[3] Phillip S. Meilinger et al., "*The Paths of Heaven: The Evolution of Airpower* Theory," (Maxwell Air Force Base: Air University Press, 1997), 19.

argument that airpower will be unique and revolutionary, and, on the other side, that air forces will be an extension of surface forces. These contrasting views frame the 20th-century airpower debate, and they correlate with the 21st-century spacepower debate. Upfront, it is important to highlight that domain parochialism is not unique to a particular service, or a specific period, but rather to major innovation and large-scale organizational change like the Air Force establishment.

This paper consists of four parts: (1) case study research framework and military functions overview; (2) the air defense, naval aviation, and close air support case studies; (3) air and space correlations and space domain implications; (4) summary and conclusion. While analyzing air defense, naval aviation, and close air support functions, the paper captures how these air domain functions interrelate with space domain functions such as tactical intelligence, reconnaissance, and surveillance (ISR), space control, and satellite communication. This interrelatedness becomes increasingly noticeable as the studies progress.

Using a descriptive, historical research approach, the cases were analyzed using a six-step process: (1) provide the background and key events; (2) expand upon the innovation and organizational change; (3) examine the contentious issues; (4) identify influential change agents; (5) explain how the contentious issues were resolved; and (6) address future implications. The cases were selected because they include an innovation that transformed the air domain, involved contentious issues spanning multiple years, and exhibited domain parochialism. These innovations would have been adopted earlier and the military would have been more effective sooner had domain parochialism been mitigated at the outset.

The National Security Act of 1947, which created the Air Force, and the Key West Agreement, which defined military functions, are two of the most significant structural changes to the military in the 20th century. These changes serve as the foundation for the 21st-century spacepower debate. In 1948, the Department of Defense defined a military function as a service's responsibilities, missions, and tasks.[4] Today, the Defense Department defines a military function as "the broad, general, and enduring role for which an organization is designed, equipped, and trained."[5] In the Key West Agreement and the Department of Defense Directive 5100.01, which articulate military functions, an attempt to mitigate domain parochialism is made by giving services primary functions, without precluding services from performing collateral functions.[6] However, the military services lost sight of this, and domain parochialism ensued.

## Case Studies

This section presents case studies of three innovations: air defense, naval aviation, and close air support. This paper argues that domain parochialism explains why the adoption of close air support was the most contentious of these three, despite requiring the fewest resources and organizational change to adopt. Figure 1 displays domain parochialism, as an independent variable, in correlation with innovation adoption time, the dependent variable. On the left side of the figure, domain

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[4] Richard I. Wolf, "*The United States Air Force: Basic Documents on Roles and Missions*," (Washington, DC: Office of Air Force History, 1987), 165.
[5] Office of the Chairman of the Joint Chiefs of Staff, *Joint Publication 1-02: Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: Joint Chiefs of Staff, January 15, 2016), 96.
[6] Austin Stephens, "Johnson Prohibits Changes in Roles of Armed Forces," *New York Times,* last modified October 29, 1949, https://timesmachine.nytimes.com/timesmachine/1949/10/29/84579234.html?pageNumber=1.

parochialism consists of seven characteristics. On the right side, innovation adoption time is displayed. The air defense case spans 13 years from the Soviet atomic bomb test in 1949 to the LeMay-Decker Agreement in 1962. The naval aviation case spans 21 years from the USS Langley commissioning in 1922 to the Navy adopting carrier doctrine in 1943. The close air support case spans 28 years from Executive Order 9877 in 1947 to an Army-Air Force close air support understanding agreement in 1975.

| Domain Parochialism Characteristics | Air Defense | Naval Aviation | Close Air Support |
|---|---|---|---|
| Resisting the integration of forces under another service | X | | |
| Using delaying tactics to impede large-scale organizational change | X | | |
| Emphasizing domain preeminence over another domain | | X | |
| Overemphasizing traditional roles and domain boundaries | | X | X |
| Focusing on where an effect is generated from instead of the purpose of the effect | | X | X |
| Obstructing a service from performing collateral (or supporting) military functions | | | X |
| Narrowing research, development, testing, and evaluation for capability development | | | X |

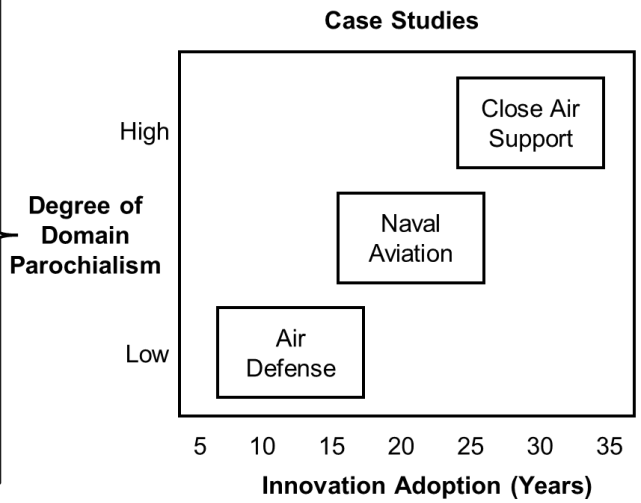


Figure 1: Case study findings[7]

## Air Defense

The Key West Agreement tasks the Air Force "to provide land-based air defense in coordination with other services in matters of joint concern."[8] In 1948, at the time of the conference, ballistic missiles could threaten the United States, but the threat was not existential. In 1949, the Soviets successfully tested an atomic bomb and developed a bomber aircraft capable of traversing the Arctic.[9] The atomic bomb test presented an existential threat and created a vast sense of urgency to act. This prompted a renewed

[7] Author-derived figure synthesizing air defense, naval aviation, and close air support case study findings.
[8] Wolf, "*The United States Air Force*," 163.
[9] "SAGE: Semi-Automatic Ground Environment Air Defense System," Massachusetts Institute of Technology Lincoln Laboratory, last accessed January 27, 2022, https://www.ll.mit.edu/about/history/sage-semi-automatic-ground-environment-air-defense-system.

focus on continental air defense, and Air Force leadership instructed Major General Ennis Whitehead, the Commander of the Continental Air Command, to “consider air defense his command’s most important mission.”[10]

Without existing air defense technology, the Defense Department sought to collaborate with academia. Harvard University and the Massachusetts Institute of Technology were identified because of their computer science expertise. The Massachusetts Institute of Technology was selected because Harvard expressed reservations about supporting classified defense programs.[11] With a burgeoning defense partnership, the Massachusetts Institute of Technology created its Lincoln Laboratory to oversee the air defense system program.[12] Development of the Semi-Automatic Ground Environment air defense system, or SAGE as it became known, was underway, and the Air Force recognized it needed Army and Navy support to be successful. However, the services disagreed on how to proceed.

Army and Navy apprehension to integrate forces under the Air Force was one of the contentious issues surrounding air defense. The Army envisioned two separate systems, whereas the Air Force preferred a single system.[13] The Army also sought to retain control of its antiartillery battalions and not assign them to the Air Force Continental Air Command. The Air Force countered by stating that "air defense was an operation of integrated components in which each contributed to the total operation, and

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[10] Kenneth Schaffel, T*he Emerging Shield: The Air Force and the Evolution of Continental Air Defense 1945-1960* (Washington, DC: Office of Air Force History, 1991), 123.
[11] Thomas P. Hughes, *Rescuing Prometheus: Four Monumental Projects That Changed the Modern World* (New York, NY: Vintage Books, 2000), 29.
[12] “Technology in Support of National Security,” Massachusetts Institute of Technology Lincoln Laboratory, last accessed January 27, 2022, https://www.ll.mit.edu/about/history.
[13] Schaffel, “*The Emerging Shield*,” 116-117.

each was employed in conjunction with the others."[14] Resistance to early integration needlessly prolonged the air defense innovation.

Air Force collaboration with academia at the outset of the SAGE air defense system was important. General Gordon Saville, the Air Force Deputy Chief of Staff for Development, "intuitively believed that technology still on the drawing board or in the laboratory could eventually be developed and incorporated in a modern air defense system." Saville's outreach to academia connected him with Dr. George Valley, a prominent Massachusetts Institute of Technology physicist who is credited with the SAGE air defense system planning, development, and employment. The defense-academia partnership helped reduce domain parochialism by rapidly expanding research, development, testing, and evaluation efforts.

The Air Force requirement for Army and Navy support was unique to the air defense case. Simply stated, the Air Force could not go at it alone. In August 1950, the Air Force and the Army signed the Vandenberg-Collins Agreement, which accounted for increased integration between the two services.[15] Expanding upon the Vandenberg-Collins Agreement, air defense functions were divided among the services in support of a single command: "the Army was assigned point defense surface-to-air missiles; the Air Force area defense missiles; and the Navy and Marine Corps responsibility for weapon systems to carry out their assigned functions.[16] In 1954, the Joint Staff established the Continental Air Defense Command with the Air Force as the executive agency.[17] Next, the Air Force and the Army signed the LeMay-Decker Agreement in

[14] Schaffel, "*The Emerging Shield*," 117.
[15] Wolf, "*The United States Air Force*," 219.
[16] Wolf, "*The United States Air Force*," 292.
[17] Wolf, "*The United States Air Force*," 274.

1962 to establish a single commander responsible for continental air defense.[18] This division of labor minimized domain parochialism and allowed each service to support air defense.

The air defense case study suggests three factors that could minimize domain parochialism in the 21st-century: a clear, common threat (such as the Soviet atomic bomb test), defense-academia partnerships to develop and integrate emerging technologies, and a unified command structure that allowed services to seamlessly integrate forces. Additionally, the Vandenberg-Collins and LeMay-Decker Agreements embodied the Key West Agreement spirit by allowing the Air Force to perform its primary function without excluding the Army and the Navy from performing collateral functions. Next, the naval aviation case study will prove more contentious than air defense and it hearkens back to the earliest days of aviation.

Naval Aviation

In November 1910, Eugene Ely, an exhibition pilot, made history by being the first pilot to operate an aircraft from a cruiser outfitted with an 83-foot platform.[19] Two months later, Ely took to the skies again, and this time he became the first pilot to successfully land an aircraft aboard an armored cruiser.[20] Building upon the Wright Brothers' historic flight in 1903, Ely's demonstrations became the proof of concept for naval aviation. Over the next decade, the Navy iterated upon these inaugural flights as it

[18] Wolf, "*The United States Air Force*," 356.
[19] Norman Polmar, *Aircraft Carriers: A History of the Aircraft Carrier and Its Influence on World Events Volume 1, 1909-1945* (Dulles: Potomac Books, Inc., 2006), 3-4.
[20] Polmar, "*Aircraft Carriers*," 5-6.

modified ships to advance naval aviation. Next, the Navy commissioned its first aircraft carrier, the USS Langley, in March 1922.[21]

While the British developed the first aircraft carrier, it was the United States that perfected aircraft carrier operations, which culminated with its World War II carrier doctrine.[22] Before the aircraft carrier, the battleship was the centerpiece of the United States Navy fleet. Dr. Michael Horowitz, a political scientist, emphasizes that "given the five-hundred-year history of the naval gun determining control of the seas, and subsequent devotion to the battleship by both naval officers and the public at large, it is remarkable that the carrier replaced the battleship as the beating heart of successful naval organizations within a single generation."[23] While the rate of change was remarkable, adopting naval aviation did not come without domain parochialism. Unique to naval aviation, the Navy benefited from 25 years of internal discourse before the Air Force was established. This discourse allowed the Navy to hone its argument in favor of naval aviation before the Key West Agreement.

From World War II onward, the aircraft carrier has been the Navy's capital ship and the core of naval power.[24] In 1943, the Navy adopted its multi-carrier task force doctrine, which served as the blueprint for aircraft carrier operations in the Pacific.[25] The Key West Agreement later codified naval aviation functions by directing the Navy to "organize, train, and equip Navy and Marine Forces for the conduct of prompt and

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[21] Polmar, "*Aircraft Carriers*," 46.
[22] Polmar, "*Aircraft Carriers*," 24-25.
[23] Michael C. Horowitz, *The Diffusion of Military Power: Causes and Consequences for International Politics* (Princeton: Princeton University Press, 2010), 67.
[24] William Howard, *Defense Science Board on The Future of the Aircraft Carrier. (*Washington, DC: Office of the Under Secretary of Defense Acquisition, Technology, and Logistics, 2002), 5.
[25] Stephen P. Rosen, "New Ways of War: Understanding Military Innovation," International Security 13, no. 1 (Summer 1988): 158.

sustained combat operations at sea, including operations of sea-based aircraft and their land-based naval air components."[26] While the naval aviation debate was settled at the time of the agreement, an episode labeled the *revolt of the admirals* would resurface debate artifacts. This included the Air Force's concern that the Navy wanted to encroach on its strategic air warfare mission and the Navy's concern that the Air Force wanted to eliminate carrier airpower.[27]

While neither of these fears came to fruition, contention surrounding naval aviation traces back to the World War I aftermath. Credited with being one of naval aviation's earliest pioneers and, later, one of its staunchest opponents, General William Mitchell offered conflicting views that intensified domain parochialism. In the 1920s, Mitchell was "advancing the theory that airpower had made all surface ships other than aircraft carriers obsolete," which spurred senior Navy leadership to look more closely at naval aviation.[28] Concurrently, he was "calling for an independent air service with a monopoly of all military aviation."[29]

Likely influenced by Mitchell's comments, Rear Admiral William Moffett testified before Congress in 1928 that "supremacy in the air is of no use to anybody except as it affects conditions on the surface beneath."[30] His testimony challenges the belief that airpower alone can win a war. Moffett, a distinguished sailor, proved to be naval aviation's most influential change agent. He set the conditions for the Navy to adopt the

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[26] Wolf, "*The United States Air Force*," 160-161.
[27] Jeffery G. Barlow*, Revolt of the Admirals: The Fight for Naval Aviation 1945-1950*. (Washington, DC: Naval Historical Center, 1994), 290-291.
[28] Rosen, "*New Ways of War*," 151-152.
[29] Mark A. Clodfelter and I. B. Holleu Jr., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell Air Force Base: Air University Press, 1997), 94 and 583.
[30] William A. Moffett, "Aircraft Needs of the Navy." *Royal United Services Institution Journal* 73, no. 492 (September 2009): 795.

aircraft carrier innovation while serving as the Navy's first Director of Naval Aviation and Chief of the Bureau of Aeronautics.[31] Moffett also transformed Navy promotions by insisting that only naval aviators were to command aircraft carriers.[32] This decision ensured that the purpose of aircraft carriers, to complement airpower, was not lost.

Some scholars do not fully account for Moffett's pivotal role in the Navy adopting naval aviation. Dr. Jeffery Barlow, a military historian, emphasizes that "the *revolt of the admirals* proved pivotal for the future of naval aviation."[33] Furthermore, Horowitz relegates Moffett's naval aviation role to tabletop experiments and Navy promotion structure changes.[34] Moffett's official biography offers a more accurate characterization, stating that he was "more experienced in all types of aircraft, seaplanes and big airships than any admiral in any navy in the world."[35] Moffett transformed the Navy's mission to account for naval aviation through effective communication and demonstration. The Navy's World War II experience also mitigated domain parochialism by providing other military services with concrete naval aviation examples.

In naval aviation history, the *revolt of the admirals* episode surfaces as one of the more contentious issues. With a catchy moniker and high-profile resignations, the event is an aberration rather than an actual threat to naval aviation. Dr. Warren Trest, a military historian, provides an overview surrounding the revolt, which was initiated in 1949 after the Secretary of Defense canceled the Navy's $188 million supercarrier

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[31] "National Museum of the U.S. Navy," Navy History and Heritage Command, last accessed February 21, 2022, https://www.history.navy.mil/content/history/museums/nmusn/explore/photography/personnel-us/personnel-us-m/moffett-william-a-rear-admiral.html.
[32] Rosen, "*New Ways of War*," 156.
[33] Barlow*, Revolt of the Admirals*, 117.
[34] Horowitz, "*The Diffusion of Military Power*," 73.
[35] Navy History and Heritage Command, "National Museum of the U.S. Navy."

program.[36] In the truest sense of domain parochialism, the Defense Secretary acted on the opinion that the Navy supercarrier would be redundant to Air Force strategic bombers. To make matters worse, the decision was announced without notifying or consulting the Navy Secretary, John Sullivan, who was "outraged and bitter over the handling of the matter and resigned in protest."[37] This revolt had a minor impact on naval aviation as funding for the supercarrier was delayed but ultimately approved.

The naval aviation case study displays three domain parochialism characteristics: (1) emphasizing domain preeminence over another domain; (2) overestimating traditional roles and domain boundaries; and (3) focusing on where an effect is generated instead of the purpose of the effect. Fortunately, the Navy overcame each characteristic as it successfully adopted naval aviation. The *revolt of the admirals* episode resurfaced aspects of the naval aviation debate; however, the 14-month budget spat proved insignificant overall. Next is the close air support study, which shares many similarities with naval aviation.

Close Air Support

The Key West Agreement states that the Air Force is "to furnish close combat and logistical air support to the Army."[38] It also states that the Army "includes land combat and service forces and such aviation and water transport as may be organic therein."[39] Varying Key West Agreement interpretations provided services with sufficient ambiguity to act in self-interest, which led to domain parochialism. Rather than focusing

[36] Warren A. Trest, *Air Force Roles and Missions: A History* (Washington, DC: Office of Air Force History, 1998), 127.
[37] Trest, "*Air Force Roles and Missions*," 127.
[38] Wolf, "*The United States Air Force*," 163.
[39] Wolf, "*The United States Air Force*," 159.

on how to integrate Army aviation as a collateral function, the Air Force sought to prevent the Army from conducting close air support altogether. Furthermore, instead of relying on the Air Force, the Army sought to develop its own close air support capabilities despite explicit prohibitions.

Throughout the 20th century, the primary disagreement between surface and air forces has been ownership and control of airpower on the battlefield.[40] This disagreement is most noticeable in close air support, as Air Force leaders likely reflected on General John Pershing's claim that "an air force acting independently can of its account neither win a war at present time nor, as far as we can tell, at any time in the future."[41] As the senior military leader in the 1920s, Pershing had immense influence throughout the War Department. His comments undercut prominent airpower theorists, such as General Douhet, who suggested that "the country controlling the air would also control the surface."[42] Even though Pershing remained skeptical of airpower's role in warfare, he did support the creation of an air corps with the Army. Throughout the 1930s and 1940s, the Army continued to develop fixed-wing aircraft and began to explore rotary-wing aircraft technologies. General Jacob Devers, as a member of the Joint Research and Development Committee, reflected on his World War II experience and frustrations surrounding artillery rounds being wasted, which he attributed to a lack of fixed-wing liaison aircraft. To address this problem, he desired to supplement the Army's fixed-wing aircraft with helicopters.[43]

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[40] Meilinger, "*The Paths of Heaven*," xxv.
[41] Annual Report of the Secretary of War (United States: United States Government Printing Office, 1920), 1459.
[42] Meilinger, "*The Paths of Heaven,*" xiii.
[43] John Schlight, *Help From Above: Air Force Close Air Support of the Army 1946-1973* (Washington, DC: Office of Air Force History, 2003), 74.

In the early 1960s, the Howze and Disosway boards would reshape the close air support debate. The Army position, from the Howze Board, suggested that the Air Force was not responsive to its close air support requirements and that ground forces should command pilots.[44] The Air Force position, from the Disosway board, suggested that the Army failed to consider joint operations and the Army is most effective when it utilized Air Force assets.[45] Next, General John Paul McConnell, the Chief of Staff of the Air Force, commissioned a close air support study to determine if a capability gap existed and how to resolve it.[46] Following the boards and the McConnell study, the McConnell-Johnson Agreement was signed. This agreement lifted Army prohibitions to develop close air support capabilities, and, by the 1970s, "the Army's helicopter force provided a large degree of the close air support required by the Army."[47] The Army's attack aviation inventory rapid growth, coupled with the Vietnam conflict, prompted the two services to sign the first agreement of understanding delineating close air support roles.

Close air support is the only case study in which one service focused on preventing another service from performing a collateral function. This domain parochialism characteristic proved the most antagonistic, and it was the least congruent with the Key West Agreement. A 1971 Rand Corporation study suggests that "the tendency of the Air Force to emphasize its separateness and its enhanced status, coupled with its emerging preeminence among the services, disquieted not only the Army but the Navy as well, and led to continual struggles among the services over the

[44] Schlight, "*Help From Above*," 233.
[45] Schlight, "*Help From Above*," 233.
[46] Schlight, *Help From Above,* 357.
[47] Wolf, "*The United States Air Force*," 5.

roles and missions."[48] While crass, this statement bears a hint of truth. General Curtis LeMay recounts "airpower was misused in the Korean War as flying artillery. The bomber fleet, he felt, should be preserved for the supreme strategic campaign against the real enemy's heartland."[49] In contrast, "Army leaders, impressed with the light close air support planes of World War II and Korea, kept pressure on the Air Force to develop a dedicated, light, subsonic, close air support plane that could operate from forward fields and could be controlled by ground commanders at lower levels."[50]

Lieutenant General Hamilton Howze proved decisive in shaping the McConnell-Johnson Agreement in 1966 and the Army-Air Force Close Air Support Understanding Agreement in 1975. In 1962, Howze spearheaded the Army Tactical Requirements Board in response to Secretary of Defense Robert McNamara's memorandum to the Army to "completely reexamine its quantitative and qualitative requirements for aviation."[51] In parallel, the Air Force established its board with Lieutenant General Gabriel Disosway as the presiding officer.

Following the Howze and Disosway boards, in 1962 the Defense Secretary instructed the Air Force and the Army to conduct a joint close air support study and have the Joint Staff evaluate the concepts.[52] While both services claimed joint study success during the early testing of their concepts, the Vietnam conflict ultimately led the Defense Department to side with the Army. Vietnam created a sense of urgency that

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[48] Alfred Goldberg and Donald Smith, *Army-Air Force Relations: The Close Air Support Issue* (Santa Monica: The Rand Corporation, 1971), 6.
[49] Mike Worden, *Rise of the Fighter Generals: The Problem of Air Force Leadership 1945–1982* (Maxwell Air Force Base: Air University Press, 1998), 63.
[50] Schlight, "*Help From Above*," 189.
[51] J.A. Stockfisch, *The 1962 Howze Board and Army Combat Developments* (Santa Monica: The Rand Corporation, 1994), 39.
[52] Schaffel, "*The Emerging Shield*," 257.

prompted McNamara “to retain the new air mobility division and make it a replacement for the 1st Cavalry Division.”[53] This spurred the McConnell-Johnson Agreement and, ultimately, the Army-Air Force close air support understanding agreement. The Howze Board report became the “bible of airmobility,” as it embodied the fundamental belief that the Army is more effective when using its aircraft.[54] Howze left an indelible mark on the Army and the close air support debate by advancing airmobility theory and doctrine.

Pinpointing the Air Force's close air support investments between 1947 and 1975 is complicated because its aircraft performed two or more functions. In 1975, the A-10C Thunderbolt was developed as its first aircraft specifically designed for close air support.[55] Before the Thunderbolt, the Air Force opposed the development of an aircraft that could only perform one function. Instead, the Air Force built aircraft to support three missions in priority order: air superiority, air interdiction, then close air support.[56] With close air support being its third priority, the Army expressed dissatisfaction with the Air Force's close air support capabilities.

The most contentious issues surrounding the close air support debate were resolved through compromise and concession. Ultimately, the Air Force lost its monopoly on close air support, and the Army gained close air support as a collateral function. Intense domain parochialism spanned decades and the characteristics include overemphasizing traditional roles and domain boundaries; focusing on where an effect is generated from instead of the purpose of the effect; obstructing a service from

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[53] Schaffel, “*The Emerging Shield*,” 296-297.
[54] Schaffel, “*The Emerging Shield*,” 382.
[55] “A-10C Factsheet,” Air Force, last accessed February 22, 2022, https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104490/a-10c-thunderbolt-ii/.
[56] Worden, “*Rise of the Fighter Generals,*” 39-40.

performing collateral military functions; and narrowing research, development, testing, and evaluation for capability development. The most important lesson is to not preclude another service from performing a collateral function. The blurring of traditional domain boundaries must be normalized in the 21st century, and services will have to encroach into multiple domains to be successful in a multi-domain environment.

## Space Domain Implications

Political scientists point to a wide range of causal factors leading to heightened contention and domain parochialism. When comparing the three air domain case studies, a single theory does not provide a thorough, consistent, or complete explanation for case variations. Horowitz offers his adoption-capacity theory. He argues that "once states have the necessary exposure to an innovation, the diffusion of military power is mostly governed by two factors: the level of financial intensity required to adopt a military innovation, and the amount of organizational capital required to adopt an innovation."[57] Among the air domain cases, the adoption-capacity theory would suggest that close air support should be adopted more rapidly than naval aviation.

Close air support involved the least organizational capital and financial intensity, yet its diffusion rate was the slowest.[58] This paper argues that, among like functions,

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[57] Horowitz, "*The Diffusion of Military Power*," 9.

[58] The following three Government Accountability Office (GAO) reports were used to measure financial intensity among cases: (1) *Continental Air Defense: A Dedicated Force Is No Longer Needed,* GAO/NSLAD-94-76 published May 1994; (2) *Navy Aircraft Carriers: Cost-Effectiveness of Conventionally and Nuclear Powered Carriers,* GAO/NSIAD-98-1 published August 1998; (3) *Weapon System Sustainment: Aircraft Mission Capable Rates Generally Did Not Meet Goals and Cost of Sustaining Selected Weapon Systems Varied Widely*, GAO-21-101SP published November 2020. Using the Consumer Price Index (CPI) inflation calculator, https://www.officialdata.org/us/inflation/, all costs were compared using 2022 CPI estimates. The annual cost for air defense was $708.3 million as clearly stated in the GAO report. The assessed annual cost for naval aviation was $4.88 billion, which accounts for the operations and support costs for its eleven nuclear-powered aircraft carriers. The assessed annual cost for close air support was $1.83 billion, which accounts for the annual operations and support costs of its 282 A-10C Thunderbird aircraft, which is the Air Force's only dedicated close air support aircraft.

domain parochialism is the independent variable that accounts for the innovation diffusion variations over time, the dependent variable. Simply put, innovations that require a lot of resources and organizational change ought to be more difficult to adopt. Applying Horowitz's theory and moderate cost estimates, naval aviation should be the most contentious case study, followed by air defense, then close air support. Considering the degree of domain parochialism and the amount of time it took to resolve, the exact opposite is true. For the three air domain case studies, perhaps leadership experts offer greater fidelity as to the source of contention.

Dr. W. Warner Burke, an organizational change expert, explains the role of leadership in large-scale organizational change. He states that "from a sociological perspective success of an organization largely depends on external factors. These are factors that are beyond the control of leaders such as economic, historical, and technological factors.[59] In addition to external factors, he also emphasizes that an insufficient sense of urgency impedes organizational change.[60] External factors and a sense of urgency were significant in all three case studies. It was the Soviet atomic bomb test that created a sense of urgency to construct the nation's first air defense system. World War II created the conditions for the aircraft carrier to replace the battleship as the Navy's capital ship. Finally, the Vietnam conflict altered the close air support debate by cutting short the Howze and Disosway experiments and deploying an airmobility battalion.

[59] W. Warner Burke, *Organization Change Theory and Practice* (Thousand Oaks: SAGE Publications, Inc., 2011), 247-248.
[60] Burke, "*Organization Change Theory and Practice*," 128.

Another organizational change expert, Dr. John Kotter, addresses sociological dimensions in his book *The Heart of Change.* He concludes there are eight steps for successful large-scale change: increase urgency, build the guiding team, get the vision right, communicate for buy-in, empower action, create short-term wins, do not let up, and make change stick.[61] There is a correlation between Kotter's model for organizational change and the case studies; however, there are discrepancies in the sequencing of innovation adoption. Beyond the model, he also makes a crucial point regarding culture. Kotter states that "in a change effort, culture comes last, not first."[62] This was true for the three case studies, and it is particularly important for the Space Force as it seeks to define its service culture and priorities.

The inaugural Space Capstone Publication wrestles with Space Force priorities, stating that the "employment of military space forces must enable the lethality of the Joint Force and provide national leadership with independent options for achieving national objectives; however, any loss of space domain freedom of action compromises the other two responsibilities."[63] The publication goes on to state that because of this, "preserving freedom of action in space is the essence of military spacepower and must be the first priority of military space forces."[64] This change in prioritization represents a historic shift that will have ripple effects among the other services and in the other domains. The subtle yet historic change reflects an updated purpose for the Space Force, but it is not true for all space forces. It is prudent for space forces assigned to

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[61] John P. Kotter, and Dan S. Cohen, *The Heart of Change: Real-Life Stories of How People Change Their Organizations* (Boston: Harvard Business School Press, 2002), 7.
[62] Kotter, "*The Heart of Change,*" 175.
[63] Headquarters United States Space Force, *Space Capstone Publication: Spacepower* (Washington, DC: Department of the Air Force, 2020), 44.
[64] Space Force, "*Space Capstone Publication*," 44.

other services to continue to prioritize enabling terrestrial forces above preserving freedom of action in space.

In 1920, when Moffett stated that “supremacy in the air is of no use to anybody except as it affects conditions on the surface beneath,” his comments were myopic.[65] While his point might be true from a naval perspective, it is not the case in the broader context of warfare. Air and space supremacy should not be solely bound to affecting terrestrial conditions just as maritime supremacy is not solely bound to affecting land conditions. Thinking in these terms exhibits domain parochialism—that one domain has preeminence over another. The Space Force must pay close attention to this domain parochialism characteristic because most space capabilities are designed to affect terrestrial conditions. As more space capabilities shift to affect conditions in the space domain, the fundamental reason for the existence of space capabilities will need to evolve.

As war extends into space, the Space Force must be cognizant of the evolving character of warfare without overemphasizing revolutionary claims. Early airpower theorists overemphasized aircraft as being “qualitatively different from any weapon that had come before.”[66] War extending into the air domain changed the character of war but was bound to the timeless principles of war. Historically, war involves nine principles: objective, offensive, mass, economy of force, maneuver, unity of command, security,

[65] Moffett, “*Aircraft Needs of the Navy*,” 795.
[66] Peter R. Faber, *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell Air Force Base: Air University Press, 1997), 184.

surprise, and simplicity.[67] Just as orbital mechanics is bound by the laws of physics, a war in space is bound by the principles of war.

Conforming to the principles of war should not diminish the significant role of space in warfare. Pershing's comments in 1920 that an independent Air Force could not win a war at the present time, or any time in the future, share Moffett's narrow perspective of the air domain.[68] In the 21st century, it is irresponsible to assume that wars in the future cannot be won, or lost, in any domain. Similarly, it is irresponsible to think that capability advancements in one domain render the capabilities of another domain obsolete. Mitchell's comment that airpower made all surface ships, other than aircraft carriers, obsolete illustrates this point.[69] Pejorative generalizations such as these fuel domain parochialism and diminish trust among services.

The Space Force is unique among services because of its imbalance between system operators and system users. Most Space Force system operators provide space support to users in other services in terrestrial domains. This imbalance emphasizes the need for greater integration between the Space Force and other services. Building upon this imbalance, the Space Force must embrace adjacent service space forces and space capabilities. Some space capabilities ought to transition to the Space Force, but not all. Lessons from the air domain case studies highlight the value of other services contributing to the success of another. The naval aviation case study demonstrated how aircraft carriers played a vital role in airpower, complementing the Air Force.[70] Other

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[67] Office of the Chairman of the Joint Chiefs of Staff, *Joint Publication 1: Doctrine for the Armed Forces of the United States* (Washington, DC: Joint Chiefs of Staff, 2017), I-3.
[68] Annual Report of the Secretary of War (United States: United States Government Printing Office, 1920), 1459.
[69] Rosen, "*New Ways of War*," 151-152.
[70] Barlow*, "Revolt of the Admirals*," 289.

service capabilities are particularly beneficial because they address capability gaps among the domains. The Space Force benefits the most by encouraging other services to maintain space forces and develop space capabilities. Domain parochialism must be mitigated to embrace this mindset because it directly impacts other services.

As the largest user of space capabilities in the Defense Department, the Army has an interest in the space domain.[71] This also necessitates a high degree of cooperation and trust between the Army and the Space Force. Major General Robert Dickman, as the Director of Space Programs for Air Force Acquisition, shed light on the role of trust when he spoke about the future of space activities in the early 1990s. Dickman stated that "the reason the other services perhaps do not trust the Air Force to run the entire space show is because our service has not always distinguished itself in space matters, and the Army and Navy can claim that they are using space applications better than the Air Force."[72] Without casting aspersions on the Air Force's defense space program management, the second half of his statement requires a closer examination.

Dickman's comment regarding the Army and Navy's claims that they are using space applications better than the Air Force (now Space Force) is perplexing. This circles back to the system operation and system user imbalance discussion. The preponderance of space system users are the Army and the Navy, and as such, they ought to be the most proficient space capability users. The Space Force should empower adjacent military services to be the most proficient space capability users.

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[71] "Army Space Operations Officers (FA40)," United States Army Space and Missile Defense Command, last accessed February 25, 2022, https://www.smdc.army.mil/RESOURCES/FA40/.
[72] George W. Bradley III, *The U.S. Air Force in Space 1945 to the Twenty-first Century* (Washington, DC: United States Air Force History and Museums Program, 1998), 166.

This will promote trust between the operators who provide space capabilities and the users who require them to conduct joint operations. General John Raymond, the Chief of Space Operations, speaks to this point in his foreword from the Space Capstone Publication. He states that "as we grow spacepower theory and doctrine, we must do so in a way that fosters greater integration with the Air Force, Army, Navy, Marine Corps, and Coast Guard. It is only by achieving true integration and interdependence that we can hope to unlock spacepower's full potential."[73]

With an end strength of 480,000 active-duty soldiers, it is easy to see why the Army is the largest user of space capabilities by sheer volume.[74] To ensure proper utilization and integration of space capabilities across the service, the Army relies on four hundred full-time space operations officers.[75] In addition to its space officers, the Army augments the force with a cadre of over 5,000 space enablers who completed space training and have relevant space experience. Army space officers differentiate themselves from Space Force space officers because their focus is to utilize and integrate space capabilities in support of ground forces.[76] The Army overcomes the system operator and system user imbalance by creating a shared understanding and common lexicon among space officers.

As the Space Force increases its focus to preserve freedom of action in space, the Army should increase its focus on the utilization and integration of space capabilities. This includes the development of tactical satellites. The Army is exploring

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[73] Space Force, "*Space Capstone Publication*," iii.
[74] Mark F. Cancian, "U.S. Military Forces in FY 2020: Army," Center for Strategic and International Studies, last modified October 15, 2019, https://www.csis.org/analysis/us-military-forces-fy-2020-army.
[75] United States Army Space and Missile Defense Command, "Army Space Operations Officers (FA40)"
[76] United States Army Space and Missile Defense Command, "Army Space Operations Officers (FA40)"

tactical satellites with the Gunsmoke-J experiment, which is “designed to provide information or sufficient data relative to tactical decision-making that is delivered in a timely manner.”[77] Likewise, the Space Force intends to develop space-based tactical ISR. With tactical satellites becoming more affordable and operationally relevant, Raymond stated that “there’s a role here for the Space Force and tactical-level ISR.”[78] With both services expressing interest, it is imperative to foster cooperation not competition. For the Army, tactical satellites offer greater space capabilities to ground forces. For the Space Force, tactical satellites enhance freedom of action in space by providing volume and diversity of its space systems.

For both services to succeed promptly, overcoming domain parochialism is essential. Both services ought to heed the following recommendations. The Space Force should promote and encourage the Army to conduct tactical satellite operations as a collateral function. The Army should request Space Force assistance in performing tactical satellite operations. The Space Force should pursue opportunities to integrate forces within the Army to support tactical satellite operations. The Army should request Space Force support for joint research, development, testing, and evaluation. The Army should leverage the Space Force acquisition expertise. Both services must avoid emphasizing domain preeminence over another domain, overemphasizing traditional roles and domain boundaries, or focusing on where an effect is generated from instead of the purpose of the effect.

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[77] Cutshaw, Jason, “Army Website: Army Launches Second Gunsmoke-J Demonstration Satellite,” last modified March 23, 2021, https://www.army.mil/article/244571/army_launches_second_gunsmoke_j_demonstration_satellite.
[78] Brian W. Everstine, “Raymond: Expect the Space Force to Provide Tactical ISR,” Air Force Magazine, last modified May 12, 2021, https://www.airforcemag.com/raymond-expect-the-space-force-to-provide-tactical-isr/.

This advice comes from synthesizing the three air domain case studies and will prevent years, if not decades, of dysfunctional discourse. The proliferation of tactical satellites ought to follow a path like unmanned aerial systems did in the early 2000s. The widespread use of unmanned aerial systems, particularly tactical systems operated by ground forces, did not threaten the Air Force's role in warfare, it complemented it—just as naval aviation complemented airpower decades before. Tactical satellites, operated by any service, complement rather than threaten the Space Force's role in warfare. The key point is to recognize service biases that can lead to domain parochialism and mitigate them at the earliest possible opportunity. Tactical ISR is one example, but there are other areas the Army ought to invest in alongside the Space Force.

Of the ten space operations and associated capability areas outlined in the joint publication for space operations, the Army should invest in the following four areas: tactical ISR; space control; satellite communication; and position, navigation, and timing.[79] These areas best enable ground forces to conduct joint operations. The Gunsmoke-J demonstration supports tactical ISR requirements mentioned previously. For space control, the Army should retain organic forces to deny adversaries the ability to utilize space capabilities in support of ground forces. As with the close air support debate, the Army and the Space Force will likely share similar forces and capabilities; however, they will have different purposes in the operations they conduct.

For satellite communication and position, navigation, and timing areas, the Army should focus on integrating Space Force capabilities. As the Space Force looks to

[79] Office of the Chairman of the Joint Chiefs of Staff, *Joint Publication 3-14: Space Operations* (Washington, DC: Joint Chiefs of Staff, 2020), II-1-II-8.

develop space systems to provide a capability, the Army must look at the user systems. This consists of satellite receivers with features unique to the ground segments. There must be a symbiotic relationship between Space Force system operators and Army system users to fully harness the nation's space capabilities. The Space Force ought to embrace the Army as a principal user of its space capabilities, and the Army ought to leverage Space Force's domain expertise.

Like the Army, the Navy shares a rich history in space. From its ballistic missile program in the 1950s to establishing the maritime space officers career field in 2022, the Navy has made significate contributions in space. Among the notable contributions is the development of highly elliptical orbiting communication satellites. This service-specific requirement—to ensure submarines can effectively communicate in the Arctic—emphasizes the benefit one service affords to another. Today, the Air Force and the Army benefit from satellite communication across the Arctic region. In the coming years, the Navy will transfer operations of its satellites to the Space Force; however, it will retain portions of its research labs that focus on space.[80] With the transfer of its satellites, the Navy will increase its focus on integrating space capabilities.

With the creation of maritime space officers, the Navy is mirroring Army space officers. The Navy is emphasizing that maritime space officers are "uniquely qualified to integrate joint space capabilities into maritime plans and operations."[81] Maritime space officers will make sure to account for naval equities as they relate to the space domain. The naval perspective also broadens the space system user profile, which is not

[80] Patricia Kime, "Navy to Transfer 13 Satellites to Space Force," Military.com, last modified April 28, 2021, https://www.military.com/daily-news/2021/04/28/navy-transfer-13-satellites-space-force.html.
[81] "Navy Space Cadre," Navy Website, last accessed February 25, 2022, https://www.mynavyhr.navy.mil/Career-Management/Detailing/Officer/Space-Cadre/.

accounted for by other terrestrial forces. The Marine Corps is also increasing its space cadre with a focus on utilizing and integrating space capabilities. Creating an additional military occupational specialty for its space officers and the Marine Corps Forces Space Command establishment are two recent developments.

The air domain teaches another useful lesson regarding pilots and aircraft. Since the historic first flight in 1903, each military service has looked at aircraft through a lens that is shaped by their domain. Today, each service has pilots and aircraft unique to itself. The diversity in pilots and aircraft contributes to the overall Air Force segment. The same will be true for space. In the future, all services must have organic space officers and satellites, just as they do pilots and aircraft. Overcoming domain parochialism will make this reality less contentious and play a vital role in spacepower that is complementary to the larger Space Force segment.

## Conclusion

If left unchecked, tactical ISR, space control, and satellite communication are the space domain functions that will most likely succumb to domain parochialism. To avoid this, the services must be receptive to integrating forces under another service; supporting organizational change efforts; avoiding displaying domain preeminence over another domain; thinking beyond traditional roles and domain boundaries; focusing on the purpose of the effect, not where it is generated from; embracing services performing collateral military functions; and conducting joint research, development, testing, and evaluation for capability development. These actions will prevent stymied capability development and innovation adoption delays throughout the services.

While the nature of war has remained unchanged, its character has evolved. As wars expanded into the air domain in the 20th-century, warfare was bound to the same timeless principles of war. The 20th-century case studies provide essential lessons that are relevant to 21st-century warfare. An unfortunate example harkens back to the *revolt of the admirals* when senior military leaders told the Secretary of Defense that a supercarrier would be redundant to strategic bombers. Regardless of whether the advice was warranted, it was provided without consulting the Navy Secretary, whose domain the outcome affected the most. Domain parochialism is the reason air defense, naval aviation, and close air support were the most contentious air domain functions of the 20th century, and why close air support was the most protracted and contentious innovation to adopt.

Contention surrounding the air defense, naval aviation, and close air support case studies stymied the timely acceptance of air domain innovations that, once adopted, forever shaped the character of war. Petty inter-service fighting likely resulted in the loss of lives of service members who would have benefited from them. Often disguised as minimizing redundancy and limiting duplicity, domain parochialism is a far worse byproduct than two services acquiring similar capabilities. To avoid the perils of domain parochialism, military services must work together to expand collateral functions and develop capabilities accordingly. This will allow the Defense Department to thrive in multi-domain operations and succeed in 21st-century warfare.