ENVISIONING THE AEROPLANE: COMPARING THE SPECTRUM OF

RESPONSES IN THE AMERICAN AND BRITISH ARMIES TO A TECHNOLOGY

WITHOUT PRECEDENT, 1903-1939

A Dissertation

by

LORI ANN HENNING

Submitted to the Office of the Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Chair of Committee,	Jonathan Coopersmith
Committee Members,	Brian Linn
	Chester Dunning
	Adam Seipp
	Peter Hugill
Head of Department,	David Vaught

May 2015

Major Subject: History

ABSTRACT

This work examines the unique threat and opportunity posed by aviation to the horse cavalry in the 1900s through the 1930s and how cavalrymen responded. During that period, the American and British cavalries encountered advancing technologies that threatened to change war and directly alter cavalry's armament, tactics, and overall role.

With airplanes as with bicycles and other new technologies, cavalry officers were cautious. Rather than uncritically embracing or rejecting new technologies completely, cavalrymen tested them before coming to conclusions. Cavalrymen cautiously examined the capabilities of airplanes, developed applications and doctrine for joint operations, and in the United States, even tried to develop their own specially designed aircraft. Airplanes promised to relieve the cavalry of low-priority missions, not threaten its existence.

Instead of replacing the cavalry in the 1910s-1930s, airplanes worked cooperatively with cavalry in reconnaissance, security, communication, protection, and pursuit, a cooperation tested in maneuvers and officially blessed in both British and American doctrine. Just as cavalrymen became dependent on the close working relationship with airplanes in the 1920s-30s, this relationship altered drastically as aviation priorities and doctrine shifted to independent strategic bombardment from tactical support of ground troops. Airplane deployment and development began to overlook the missions of tactical support.

The experiences and responses of American and British cavalrymen to airplanes differed. While the British cavalry was the older organization with a more established

institution and traditions, it failed to mount a strong or lasting defense against the encroachments of the nascent aviation service into its reconnaissance and scouting roles. The American cavalry, despite its youth, contested the control of reconnaissance almost immediately in the 1910s and throughout the 1930s, decades after similar arguments ended in Britain.

Grounding this research are a variety of primary and secondary sources including government reports, memoirs, personal journals, books, professional journals, magazines, trade journals, and newspapers.

DEDICATION

In loving memory of the most caring and supportive person in my life, my grandmother

Lois McCreary. Gram, I wish you were still here to see it.

TABLE OF CONTENTS

Page

LIST OF TABLES

CHAPTER I

INTRODUCTION

This work examines how American and British cavalrymen responded to the

unique threat and opportunity posed by aeroplanes from 1903 through 1939.[1] They

perceived aviation as both a threat and potential opportunity, their opinions shifting over

time as aviation technology improved and their understanding of their branch's roles and

missions changed. Other works have described how various cavalry organizations

responded to another new technology, the tank. What is often forgotten is that the horse

had two potential successors the tank and airplane and that the organizations that

championed strategic bombing also created a doctrine of tactical observation that

connected aviation directly to the cavalry's missions. This work will reestablish the link

between cavalry and aviation in the first forty years of the twentieth century. It reveals a

horse cavalry that worked with technological change, embraced the airplane in some

cases and experimented in others, established doctrine and applications for joint

operations, and even tried to develop its own air contingent of autogiros. The cavalry

had some reactionaries who preferred the branch's traditions and rejected new ideas, but

most cavalrymen were pragmatic. They understood that technological change was

inevitable and wanted to manage the process for the benefit of their branch.

---

[1] Even though airplane replaced aeroplane in common usage in the United States after the term was
adopted by the National Advisory Committee for Aeronautics in 1916, the term airplane was only
occasionally utilized in British English. This work uses the term "aeroplane" when referring to heavier-
than-air aircraft except in direct quotation throughout the first three chapters. The term "airplane" is used
throughout the rest of the work. *Oxford English Dictionary Online,* s.v. "airplane," accessed January 7,
2013, www.oed.com.

Historiography

By restoring the connection between aviation and cavalry, this work ties three historiographical threads together: cavalry history, the history of technology, and the history of military aviation. The historiography of the horse cavalry in the early twentieth century usually concentrates on the branch's increasing obsolescence on the modern battlefield. This outmodedness is most frequently attributed to advances in technology. Some scholars even argue that the horse cavalry's doom dated even further back than the turn of the twentieth century with the advent of long-range and rapid-fire rifles.[2] Before 2000, most books on cavalry treated the demise of the horse cavalry as a logical and inevitable result of the advent of mechanization and motorization.[3] These works usually concluded that the cavalries in the United States and countries throughout Europe held on to the concept of a horse cavalry long after logic dictated its demise. Historian Brian Bond has suggested that the motivation for this refusal to dispose of the cavalry may have been subconscious but he attributed "such phenomena as the cult of the horse and the *arme blanche* . . . as a last desperate effort to withstand the de-

---

[2] These works include Richard Wormser, *The Yellowlegs: The Story of the United States Cavalry* (Garden City, NY: Doubleday, 1966), who was convinced that the usefulness of the cavalry ended during the Civil War. In Louis A. Dimarco, *War Horse: A History of the Military Horse and Rider* (Yardley, PA: Westholme, 2008), Dimarco argues that "as infantry weapons became easier to use and more deadly, the cavalry charge became more difficult to accomplish successfully because infantry no longer feared the charging war horse and rider"(xi-xii). In Gregory J.W. Urwin, *The United States Cavalry: An Illustrated History* (Pode, UK: Blandford, 1983), 180, Urwin states that after the Mexican Punitive Expedition the cavalry was no longer useful because "a man on a horse made too good a target, and under the conditions then existing, his nobility could not compensate for his excessive vulnerability."

[3] Brian Bond, "Doctrine and Training in the British Cavalry, 1870-1914" in *The Theory and Practice of War,* ed. Michael Howard (Bloomington: Indiana University Press, 1965); David Rowe Head *Dress of the British Heavy Cavalry 1842-1934* (Atglen, PA: Schiffer Military History, 1999); Turner Pub. Co., *11th U.S. Cavalry, Blackhorse* (Paducan, KY: Turner, 1990); Dimarco, *War Horse*; Urwin, *United States Cavalry*; and Peter Newark, *Sabre and Lance: An Illustrated History of Cavalry* (Poole, UK: Blandford, 1987).

2

personalization of war."[4] Bond assumed that the horse cavalry no longer had any real

use in the mechanical age and that some cavalry officers were irrationally resisting

technology. The introduction of the tank during the Great War is often presented as a

self-evident justification for many authors to explain the demise of the horse cavalry.

For example, Philip Warner, in *The British Cavalry,* simply stated, "the arrival of the

tank on the battlefield . . . concluded the story of cavalry warfare."[5]

In recent years, there has been a reexamination of the historical role and

importance of the cavalry during the early twentieth century. Gervase Phillips argued in

"Scapegoat Arm: Twentieth Century Cavalry in Anglophone Historiography" that

historians have accepted the view of "cavalry's most vehement critics" and fallen into

the trap of repeating the victors' propaganda as fact rather than assessing the historical

material on its own merits.[6] The traditional narrative, he notes, is based on the

assumption that horse soldiers rejected new technologies and innovations and were

"shock-obsessed, technophobic *arme blanche* reactionaries."[7] Phillips further argued

that this misreading of history has hidden the cavalry's true value and capacity for

reform, such as the use of a hybrid model of fighting dismounted and using mobile

firepower.

Recent scholars have echoed Phillips' argument that the cavalry was more

progressive than it has been given credit for by historians. Stephen Badsey's *Doctrine*

and Reform in the British Cavalry 1880-1918 "shows that the achievements of British

---

[4] Bond, "Doctrine and Training," 120.

[5] Philip Warner, *The British Cavalry* (London: J. M. Dent and Sons, 1984), 196.

[6] Gervase Phillips, "Scapegoat Arm: Twentieth Century in Anglophone Historiography," *Journal of Military History* 71 (January 2007): 59.

[7] Ibid., 64.

and Empire cavalry in the First World War, although controversial, are sufficient to contradict the argument that belief in the cavalry was evidence of military incompetence." He maintained that not only cavalrymen but other officers in the infantry and artillery believed that the cavalry still had a future.[8]

While new work examining the modernization of militaries between the first and second World Wars has begun to address many of the failings of previous research, there are still areas that remain to be explored. Historiographically there is a missing link in the narrative of the mechanization and modernization of the cavalry branch. The discussion still centers on the old theme of mechanization and tanks.[9] As a result, there is still extensive and essential work to be done in the field of the cavalry's relationship with aviation.

Scouting, reconnaissance, and mobility link cavalry with aircraft but despite this connection, few army or cavalry scholars have spent more than a few paragraphs or

---

[8] Stephen Badsey, *Doctrine and Reform in the British Cavalry 1880-1918* (Hampshire, UK: Ashgate, 2008), 3.

[9] Robert S. Cameron, "Americanizing the Tank: U.S. Army Administration and Mechanized Development Within the Army, 1917-1943," (PhD diss., Temple University, 1994); Mildred Gillie, *Forging the Thunderbolt: A History of the Development of the Armored Force* (Harrisburg, PA: Military Service Publishing, 1947); Lucian K. Truscott, Jr., *The Twilight of the U.S. Cavalry: Life in the Old Army, 1917-1942* (Lawrence: University Press of Kansas, 1989); George F. Hofmann, "Yankee Inventor and the Military Establishment: The Christie Tank Controversy," *Military Affairs: The Journal of Military History, Including Theory and Technology* 39, no. 1 (February 1975): 12-18; John L.S. Daley, *From Theory to Practice: Tanks, Doctrine, and the U.S. Army, 1916-1940* (PhD diss., Kent State University, 1993); Ronald Spector, "Military Effectiveness of the U.S. Armed Forces, 1919-1939," in *Military Effectiveness,* ed. Allan R. Millett and Williamson Murray (Boston, MA: Allen and Unwin, 1988); George Hofmann, *Through Mobility We Conquer: The Mechanization of U.S. Cavalry* (Lexington: University Press of Kentucky, 2006); Alexander Magnus Bielawkowski, "U.S. Army Cavalry Officers and the Issue of Mechanization, 1920-1942," (PhD diss., Kansas State University, 2002).

pages discussing the relationship between cavalry and aviation.[10] Among these brief

treatments is George Hofmann's *Through Mobility We Conquer: The Mechanization of*

U.S. Cavalry, which makes a passing reference to the shared observation and

reconnaissance functions of aviation and cavalry.[11] Roman Jarymowycz's *Cavalry from*

Hoof to Track, also remarks upon this connection. Jarymowycz went further than most

cavalry scholars, linking the airplane to the disappearance of cavalry from modern war,

but his work focused on mechanization and he does not follow through on this

observation.[12] Even Sarah Rittgers' dissertation that examined the American cavalry's

relationship with technology similarly fails to thoroughly examine the case of airplanes.

Throughout the work, Rittgers included airplanes in the litany of other technologies that

cavalrymen confronted, including: tractors, trucks, automobiles, motorcycles, armored

scout cars, and tanks. She spent little time, however, dissecting the unique challenges

posed by aviation.[13] Most other scholars also fail entirely to notice that aircraft began

their careers as reconnaissance vehicles, overlapping some of the duties and

responsibilities of the cavalry. Yet as early as 1913 in *A History of Cavalry from the*

Earliest Times with Lessons for the Future, George T. Denison discussed the American

---

[10] See Dimarco, *War Horse*; Newark, *Sabre and Lance*; Urwin, *United States Cavalry*; Warner, *British Cavalry;* Harold Winton, *To Change an Army: General Sir John Burnett-Stuart and British Armored Doctrine, 1927-1938* (Lawrence: University Press of Kansas, 1988); and Wormser, *Yellowlegs*.
[11] Hofmann, *Through Mobility We Conquer*.
[12] Roman Johann Jarymowycz, *Cavalry from Hoof to Track* (Westport, CT: Praeger, 2008), 131. Other works on cavalry that briefly discuss the connection between aviation and cavalry include: George T. Denison, *A History of Cavalry from the Earliest Times with Lessons for the Future,* 2nd ed. (London: Macmillan, 1913)*;* Hofmann, *Through Mobility We Conquer*; David E. Johnson, *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917-1945* (Ithaca, NY: Cornell University Press, 1998).
[13] Sarah Janelle Rittgers, "From Galloping Hooves to Rumbling Engines: Organizational Responses to Technology in the U.S. Horse Cavalry" (PhD diss., George Washington University, 2003).

air service's role in reconnaissance and how one cavalryman understood that the air service was "a suitable substitute" for cavalry in this role.[14]

It is not yet clear why this historiographical gap exists. It may be that the tank overshadowed and continues to eclipse coverage of the airplane because the tank as a land-bound vehicle was the obvious successor to the horse. Furthermore, it may be that many cavalry officers at the time did not clearly differentiate between aviation and mechanization as different forms of modernization, which led historians to the same conclusion. It may also be a result of the bomber mafia dominating aviation doctrine for most of the first half of the twentieth century.

The historiography of aviation is equally unhelpful in establishing a link between aircraft and cavalry. The traditional narrative focuses almost entirely on the development of air power doctrine and has dominated scholarship on the 1920s and 1930s. This interpretation omits that the earliest military aircraft were employed in reconnaissance and observation roles, concentrating instead on the development of strategic bombing. The historiography of military aviation rarely mentions the overlap of airplanes and cavalry for missions of tactical observation and the support of ground troops.[15] Its emphasis is on air operations independent of surface units, so any mention

---

[14] Denison, *History of Cavalry,* 96.

[15] Works in aviation history that briefly address the connection between aviation and cavalry include: Dallas R. Brett, *History of British Aviation, 1908-1914* (London: Aviation Book Club, 1934); Charles de Forest Chandler and Frank Purdy Lahm, *How Our Army Grew Wings: Airmen and Aircraft before 1914* (New York: Ronald Press, 1943); I.B. Holley, Jr., *Ideas and Weapons: Exploitation of the Aerial Weapon by the United States during World War I, A Study in the Relationship of Technological Advance, Military Doctrine, and the Development of Weapons* (1953 repr, Washington, DC: Office of Air Force History, 1983); Johnson, *Fast Tanks*; Peter Mead, *The Eye in the Air: History of Air Observation and Reconnaissance for the Army 1785-1945* (London: Her Majesty's Stationary Office, 1983); Malcolm Smith, *British Air Strategy between the Wars* (Oxford: Clarendon, 1984); and Lynn Montross, *Cavalry of the Sky: The Story of U.S. Marine Combat Helicopters* (New York: Harper and Brothers, 1954).

of air power in the service of land warfare is neglected.[16] As a result, the connections

between aviation and the cavalry have been slighted. Some aviation histories briefly

mention the connection between the airplane's early use as a reconnaissance platform

and cavalry's role as the eyes and ears of the army, but quickly turn to technical

discussions of aerial photography, cameras, or map making with little mention of how

these developments affected the cavalry.

This work also fits into the historiography of the history of technology, although

not to fill in a gap. It serves as further evidence of some of the field's central questions:

how and why do some people seem to resist new technologies while others embrace

them? From the late nineteenth to the mid-twentieth century, most Americans and

Europeans held a faith in technology's ability to transform and improve life. Each new

technology was seen as an improvement on the last. Despite temporary anti-

technological attitudes caused by the destructive use of technologies during the two

World Wars, new technology remains for many individuals a seeming panacea to

modern troubles even today.[17] Technological change is viewed by many as what Theo

---

[16] Robin Higham,*100 Years of Air Power & Aviation* (College Station: Texas A&M University Press, 2003); William O. Odom, *After the Trenches: The Transformation of U.S. Army Doctrine, 1918-1939* (College Station: Texas A&M University Press, 1999); David E. Omissi, *Air Power and Colonial Control: The Royal Air Force 1919-1939* (Manchester, UK: Manchester University Press, 1990); Elwood L. White, *Air Power and Warfare: A Supplement* (Colorado Springs, CO: United States Air Force Academy, 2002); Stephen Budiansky, *Air Power: The Men, Machines, and Ideas That Revolutionized War, from Kitty Hawk to Gulf War II* (New York: Viking, 2004); William Carr Sherman, *Air Warfare* (New York: Ronald, 1926); David R. Mets, *Airpower and Technology: Smart and Unmanned Weapons* (Westport, CT: Praeger, 2009); James L. Stokesbury, *A Short History of Airpower* (London: Robert Hale, 1986); James S. Corum and Wray R. Johnson, *Airpower in Small Wars: Fighting Insurgents and Terrorists* (Lawrence: University Press of Kansas, 2003); Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm, 1917-1941* (Washington, DC: Office of Air Force History, 1985); Samuel John Gurney Hoare Templewood, *Empire of the Air: The Advent of the Air Age, 1922-1929* (London: Collins, 1957).

[17] For more information on this viewpoint, see Joseph J. Corn, *Imagining Tomorrow: History, Technology, and the American Future* (Cambridge, MA: MIT Press, 1986).

Farrell and Terry Terriff call a "Darwinian-like order of succession," in which existing artifacts are continuously replaced by more advanced and improved ones in a natural unending and inevitable cycle. [18] Yet these scholars correctly observe that all technological change is not so clear and the adoption of new technologies by preexisting institutions is not so straightforward.

Many people may be surprised to discover that modern militaries at war still employ older technologies and materials that might be considered by many casual observers to be "obsolete." For example, American Special Forces in Afghanistan recently used horses with wooden saddles. Camels were also used in the past ten years to transport men and materials and to conduct reconnaissance over rugged terrain that was too difficult to cross in Humvees, jeeps, and tanks.[19] Yet on the other end of the technology scale, the United States has employed unmanned aerial vehicles, often called drones, in the war on terror. This concept—that older technologies and technological systems coexist with the new—challenges the traditional theory of progress that the new always replaces the old. In fact, older systems, technologies, or even muscle power can remain the most effective means to accomplish specific tasks.

Perhaps exemplifying the old cliché that "victors write the history," scholars usually write about successful technologies. Most scholars, including historians of technology, do not satisfactorily address the large number of technological ideas that

---

[18] Theo Farrell and Terry Terriff, *The Sources of Military Change: Culture, Politics, Technology* (Boulder, CO: Lynne Rienner, 2002), 14.

[19] Stephen Biddle, *Afghanistan and the Future of Warfare: Implications for Army and Defense Policy* (Carlisle, PA: Strategic Studies Institute, 2002), 9. See also Doug Stanton, *Horse Soldiers: The Extraordinary Story of a Band of U.S. Soldiers Who Rode to Victory in Afghanistan* (New York: Scribner, 2009).

fail.[20] The lack of this scholarship is more glaring during the first three decades of the

twentieth century because of the innovativeness of this period. The increase in the

number of accepted transformative technologies probably occurred not because the

quality of inventions increased but because the number of technologies being developed

increased. However, there are many obstacles to studying unsuccessful technologies

including embarrassment, lack of sources, and forgetfulness—both deliberate and

otherwise. Since most innovations do not succeed, those who resist a new technology

may prove to be more sensible than those that advocate blind adoption of new

technologies in the mistaken belief that they are automatically better. Of course, the

only way resisters can be accused of being backward is after the fact. This can lead to a

---

[20] Many historians of technology recognize the unfortunate absence of failure studies and call for further research in this area. Some of these calls can be found in the following works: E.S. Ferguson, "Toward a Discipline of the History of Technology," *Technology and Culture* 20 (January 1979): 13-30; Reinhard Rürup, "Historians and Modern Technology: Reflections on the Development and Current Problems of the History of Technology," *Technology and Culture* 15 (April 1974): 161-93. The works on failed technologies include failures within longer successful traditions, such as K. E. Bailes, "Technology and Legitimacy: Soviet Aviation and Stalinism in the 1930's," *Technology and Culture* 17 (January 1976): 55-81; Russell I. Fries, "British Response to the American System: The Case of the Small-arms Industry after 1869," *Technology and Culture* 16 (July 1975): 377-403; Robert C. Post, "The Page Locomotive: Federal Sponsorship of Invention in Mid-19th-Century America," *Technology and Culture* 13 (April 1972): 140-69. Studies of outright technological failures including the disappearance of the technology or loss of investors are much fewer in number and include the following: Carlos Flick, "The Movement for Smoke Abatement in 19th-Century England," *Technology and Culture* 21 (January 1980): 29-50; Stuart W. Leslie, "Charles F. Kettering and the Copper-Cooled Engine," *Technology and Culture* 20 (October 1979): 752-76; John H. Perkins, "Reshaping Technology in Wartime: The Effect of Military Goals on Entomological Research and Insect-Control Practices," *Technology and Culture* 19 (April 1978): 169-86 and Michael J. Neufeld, *The Rocket and the Reich: Peenmunde and the Coming of the Ballistic Missile Era* (New York: Free Press, 1995). For more works on technological failures, see the bibliography of John M. Staudenmaier, *Technology's Storytellers: Reweaving the Human Fabric* (Cambridge, MA: MIT Press, 1985).

situation in which scholars assume that particular technologies were destined to succeed and that opponents to the innovation were irrational, a form of determinism.[21]

Lacking the perfect hindsight of historical perspective, those confronted with a new technology must make their decisions based on insufficient information, which is not easy. According to cavalry historian Edward Katzenbach, "each new weapon system is . . . quickly idealized by those who control it," which complicates proper assessment of a technology's capabilities.[22] He argued that users must provide unexaggerated evaluations of the technologies' limitations or failures in practice. How a technology will be used, how long it will take to be accepted, or even if it will prove successful is difficult to predict. The failure to recognize the importance of a new transformative technology, or the failure to adopt it completely, can prove disastrous. The stakes are particularly high in military affairs. The problem is that few can predict which technologies will be transformative and which will fail. What is forgotten, as David Edgerton argues, is "living in an inventive age requires us to reject the majority [of new technologies] that are on offer."[23] Those potential users who resist new technologies or incorporate them slowly may prove more successful than those who advocate immediate adoption of new technologies simply because they associate "new" with "better." Although warning of the danger of immediately accepting an unproven technology is valid, complete resistance of anything new can prove just or more harmful.

---

[21] One particularly clear example of assuming that a technology was bound to succeed can be found in Holley, *Ideas and Weapons*.
[22] Edward Katzenbach, "The Horse Cavalry in the Twentieth Century: A Study in Policy Response," *Public Policy* 8 (1958): 139.
[23] David Edgerton, *The Shock of Old: Technology and Global History Since 1900* (Oxford: Oxford University Press, 2007), 210.

Even when a technology does succeed, there tends to be little concentration on the length of time it may take for an innovation to supplant what came before. Historians that ignore the sometimes long duration of debates over the use of a new innovation prevent a full understanding of how technological incorporation occurs. Even if the design of a specific technology does not change, its possible uses can. Sometimes it takes years to decide the appropriate use of a technology. For example, the zipper took decades to reach its stabilization.[24]

Many times failures do not stem from a technology's actual capabilities but from potential consumers' perception of it. Since the 1980s, scholars such as Ruth S. Cowan have focused more attention on the important role of the users of technology.[25] There is a reciprocal relationship between the consumers and producers of technology. This dissertation, however, looks at the relationship between a technology and those who do not use it, resist it, or adopt it slowly, all of whom are "important actors in shaping technological development."[26] Inventors, engineers, promoters, and users all give technology its form, meaning, and application. Historians of technology often note that "technologies do not provide their own explanations" but "are born out of conflict,

---

[24] Robert D. Friedel, *Zipper: An Exploration in Novelty* (New York: W. W. Norton, 1994).

[25] Ruth Schwartz Cowan, "The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology," in *The Social Construction of Technological Systems*, ed. Wiebe E. Bijker, Thomas P. Hughes, and Trevor Pinch (Cambridge, MA: MIT Press, 1989); Ronald R. Kline, *Consumers in the Country: Technology and Social Change in Rural America* (Baltimore, MD: Johns Hopkins University Press, 2000); Carolyn M. Goldstein, "From Service to Sales: Home Economics in Light and Power, 1920-1940," *Technology and Culture* 38 (1997); Nelly Oudshoorn and Trevor J. Pinch, eds., *How Users Matter: The Co-Construction of Users and Technology* (Cambridge, MA: MIT Press, 2003).

[26] Oudshoorn, *How Users Matter*, 24.

difference, or resistance." [27] This dissertation will "map the strategies deployed by those involved in dispute, disagreement, or resistance."[28]

There is little appreciation of technological resisters, easily portrayed as the villains in the grand narrative of technological progress. As historian Adrian Randall wrote, "much fundamental change is painful and that which destroys old ways of life more painful still." He called on his colleagues in the field of the history of technology to approach those "who resisted change with more humility and with more sympathy."[29] This work seeks to tell the story of a group of these "resisters," to recast them in the light of cautious technological examiners, transformed over decades into accepters of a transformative technology.

American and British cavalrymen during the second half of the nineteenth century and the beginning of the twentieth century fit this description. Similar to the Industrial Revolution, extensive innovations characterized this period forcing them to address the possibilities of new technologies. These included both inventions they might adopt and those that could affect them even if they did not adopt them themselves. The Marquess of Anglesey in his 1986 history of cavalry reflected on the "inexorable improvement and expansion of long-range breech-loading rifles, machine guns, and quick-firing artillery."[30] The American and British cavalries encountered advancing

---

[27] Wiebe Bijker and John Law, *Shaping Technology/Building Society: Studies in Sociotechnical Change* (Cambridge, MA: MIT Press, 2003), 8-9.
[28] Ibid.
[29] Adrian Randall, "Reinterpreting 'Luddism': Resistance to New Technology in the British Industrial Revolution," in *Resistance to New Technology: Nuclear Power, Information Technology, and Biotechnology,* ed. Martin Bauer (Cambridge: Cambridge University Press, 1995), 58.
[30] Marquess of Anglesey, *A History of British Cavalry,* vol. 4, *1899-1913* (London: Secker and Warburg, 1986), 25.

technologies that threatened to change war and directly alter the cavalry's armament, tactics, and overall role. American and British cavalrymen did not reject these technologies outright but in general wanted to subject the innovations to testing in the field before final adoption or rejection. Cavalry officers were cautious. Rather than participating in strikes, riots, and machine breaking like their Luddite predecessors, cavalrymen tested the new technologies before coming to conclusions.

More than fifty years ago in his article, "Horse Cavalry in the Twentieth Century," Katzenbach described the impact of technology on the ability of people to accurately predict what future war would be like. The "crystal ball," he wrote, "has been shattered by technology."[31] The airplane was among the revolutionary technologies that destroyed the ability to foresee the future.

The past century has been a period of increasing technological change. Understanding how individuals respond and deal with new technologies, especially novel ones that seem to threaten the roles, significance and even the continued existence of their institutions, is essential to uncovering how modern technological societies function. What makes an institution defensive? Why are some technologies accepted and others rejected? What cultural or institutional characteristics play a role in the way that individuals and groups respond? Does the age of the institution matter? When and why does a defensive position work or not?

The tension between the new and the established did not begin or end with the cavalry and aviation. In the anthology *Imagining Tomorrow: History, Technology, and*

---

[31] Katzenbach, "Horse Cavalry," 140.

13

the American Future, eleven historians of technology examined the difference between "expectations and developing realities" surrounding new technologies, concluding that few technologies entirely fulfill the promises made by their creators and promoters.[32] Warnings against too quickly or blindly accepting all new technologies without careful consideration and study seem reasonable since the majority of new technologies are failures, or at least the possibility of failure is likely.[33]

Historians have produced excellent studies of those who embraced the aeroplane and other early technologies, but far less is known about the "technological naysayers," the realists who questioned the overly enthusiastic and exaggerated predictions of aviation proponents. The study of the resistance to technology tends to focus on the years before 1903-1939 or on the decades after it. [34] This dissertation seeks to remedy this gap in the historiography of technology and to call scholars' attention to a period in need of further study from this perceptive. By analyzing the development of aviation in relation to the cavalry, this work examines one group of the "minority of commentators,"—the cavalrymen who sounded a "note of caution and skepticism amidst the din of unrestrained prophecy greeting the airplane." Refusing to accept the

---

[32] Corn, *Imagining Tomorrow,* 2.

[33] Edgerton, *Shock of the Old,* xv; Jonathan Coopersmith, "Failure & Technology," *Japan Journal for Science, Technology & Society* 18 (2009): 94.

[34] F. Peel, *The Risings of the Luddites, Chartists, and Plug Drawers* (London: Frank Cass, 1968); A.J. Randall, "The Philosophy of Luddism," *Technology and Culture* 27, no.2, 1-17; A. J. Randall, "Work, Culture, and Resistance to Machinery in the West of England Woollen Industry, in *Regions and Industries: A Perspective on the Industrial Revolution in Britain,* ed. P. Hudson (Cambridge: Cambridge University Press, 1989); and M. I. Thomis, *The Luddites: Machine Breaking in Regency England,* (Hamden, CT: Archon Books, 1970). Bauer, *Resistance to New Technology.*

predictions of aviation supporters on faith alone did *not* make cavalrymen "anti-airplane or even negative toward the invention's impact."[35]

Sources

The large number of questions this project seeks to answer required extensive research at a number of locations and the examination of a wide variety of documents. Dozens of newspapers in the United States and Great Britain provided a snapshot of public opinion about cavalry and the airplane, both individually and in their relationship to one another, as well as offering insights into wider debates about the purpose and functions of military organizations. Various professional journals, most heavily the *Journal of the United States Cavalry Association* and the British *Cavalry Journal* furnish an understanding of the climate of debates over aviation in the American and British cavalries. Additional sources—such as professional journals, magazines, trade journals, memoirs, personal journals, published books, government documents, and newspapers— revealed aviation's early use as a reconnaissance tool and the contemporary discussions of how aviation could assist or even replace the cavalry in these roles. Both the American and British National Archives provided a variety of sources. The Air Force Historical Research Agency at Maxwell AFB supplied insights into the early days of American military aviation and course materials from the classes taught at the tactical air school. The Military History Institute and the Combined Arms Research library also contained valuable documents. The RAF Museum, Liddell Hart Center, Imperial War

---

[35] Joseph J. Corn, *The Winged Gospel: America's Romance with Aviation, 1900-1950* (New York: Oxford University Press, 1983), 43.

Museum, and the Smithsonian Air and Space Museum archives also provided insights that helped to direct the research.

Chapter Breakdown

This work's five loosely chronological chapters demonstrate that cavalrymen and their supporters had pragmatic reasons to continue supporting the horsed cavalry. Although some sentimental aspects remained, cavalrymen critically examined the utility of flying machines by assessing their capabilities. Their claims that aviation was incapable of fully replacing the horsed cavalry were based on facts and experience, not the grandiose prophecies of the advocates of air power.

Despite many similarities between British and American military visions of aviation, each chapter illuminates noteworthy differences between the two that produced diverse results. These include Britain's early creation of an independent air force while the United States delayed establishing one, financial constraints, its need to police an expanding empire, as well as differences in culture, and the strategic position of each country. While the British cavalry was the older organization with a more established institution and set of traditions, it failed to mount a strong or lasting defense against the encroachments of the nascent aviation service into its reconnaissance and scouting roles. The American cavalry, despite its youth, contested the control of reconnaissance almost immediately in the 1910s and throughout the 1930s, decades after similar arguments ended in Britain. This project explores this previously unexamined occurrence by analyzing how the cavalry's institutional culture and unity (or lack thereof) in Britain

and the U.S. affected the way that each country's cavalry responded to the specific threat of aircraft.

Chapter Two provides a brief background of the histories of the American and British cavalries prior to their acquisitions of military heavier-than-air aviation units in 1907 and 1908. It describes how both nations' cavalries modernized their organizations to meet the demands of modern warfare. In particular, they founded military service schools and professional societies, studied military history and recent conflicts, and published journals. The chapter also explores how their respective history, tradition, and culture affected how they responded to modern conditions. The differences between these two nations and within each country's mounted forces included traditions based on the age and history of their branches, the organization of their mounted forces, their wartime experiences, public opinion, and attempts at professionalization.

The third chapter begins the examination of cavalrymen as cautious technological examiners in response to the introduction of military airplanes in the years between 1903 and 1917. This chapter explores the American and British cavalrymen's evolving responses to military aeroplanes as aviation technology improved and became capable of assisting in missions previously accomplished solely by the cavalry. Both groups were slow to realize the challenges posed by aviation to their organizations. American and British cavalrymen from 1903 until the Great War responded to the potential loss of role and missions to aviation differently due to their distinct assessments of cavalry's roles in modern warfare, different threats expressed in newspapers and periodicals, dissimilar experience with aviation, unique cavalry histories and

organization, geographic position, and military conditions. Utilizing each nation's respective cavalry journals and other specialist writings, this chapter shows that American cavalrymen appeared more concerned about the possibility of aviation usurping its reconnaissance duties than their British counterparts, who considered that task a low priority. Cavalrymen in both nations were cautious in assessing the limited but rapidly evolving capabilities of military aeroplanes. They saw aeroplanes as having far too many limitations and drawbacks to fulfill the predictions made by aviation supporters, but nonetheless they discussed them, experimented with them in maneuvers, and found them at times capable of aiding the mounted branch. Some cavalrymen, moreover, were willing to concede part of their reconnaissance role to these new innovations. Unfortunately, for the cavalry, there was a growing impression among the public and politicians that modern war and aeroplanes had already made horses and horsemen obsolete. The different solutions enacted to deal with organizational challenges, namely the creation of the independent Royal Air Force in Britain and the preservation of an army aviation corps in the U.S., caused the British and American arguments in support of cavalry to diverge. Beyond the theoretical debates, individuals within the American and British militaries addressed the real-world challenges of technologies in transition when no one was certain what aeroplanes could actually accomplish in the present or near future.

Chapter Four explores American and British cavalrymen's response to the lessons of World War I. The experience of the Great War caused many to question the future usefulness of the cavalry. American and British cavalrymen developed arguments

to demonstrate that aviation could help the cavalry but not replace it and to quiet any who charged that the branch had either functionally or financially outlived its usefulness. During this time, cavalrymen were constantly reevaluating aviation in response to continued technological development and their own greater exposure to aeroplanes in peacetime maneuvers and training. The organizational differences resulting from the creation of an independent air force in Britain sent the Americans and British on increasingly different paths in how they addressed the relationship between cavalry and aviation. In both cases, however, cavalrymen demonstrated a desire to apply the lessons of WWI to strengthen their organizations through combined training and maneuvers and the further incorporation of aviation into their branches.

War experiences, maneuvers, and training also prompted British and American cavalrymen to discuss aviation in increasingly different ways. Responses to attacks detailing cavalry's obsolescence included the repetition of prewar arguments, supported by new evidence gleaned from the war and maneuvers, and new arguments based on their continued experiments with airplanes. Cavalrymen challenged the exaggerated claims of aviation supporters by listing airplanes' technological and operational limitations, noting that airplanes required substantial support facilities such as airfields, negative information from an airplane was unreliable, and airplanes could not maintain direct contact with the enemy. They also began downplaying the significance of reconnaissance as a defining function of cavalry. Responding to popular perceptions that the cavalry was no longer needed in modern war, American and British cavalrymen attempted to prove that airplanes merely aided the cavalry and did not replace it.

Chapter Five examines the successful and unsuccessful attempts of cavalry supporters to demonstrate the cavalry's continued usefulness in the face of efforts to reduce the cavalry branch, most often on economic grounds. The chapter explores the debates over the relative cost effectiveness of cavalry and aviation, during which it was argued that horse cavalries were too expensive to maintain and that airplanes could perform cavalry duties more cheaply than horses. Another common charge was the horse cavalry simply could not compete with modern technologies. In response, cavalrymen placed a new emphasis on cooperation with air services and aircraft participating in joint air-ground activities, along the southern American border and throughout the British Empire during the 1920s and 1930s, which highlighted the working relationship between the cavalry and aviation in these operations. Although it was becoming clearer that recent innovations would one day replace the horse, cavalrymen maintained that the day had not yet arrived. This chapter traces arguments in support of aviation at the expense of the horse cavalry utilized in the United States and Great Britain in the period between the two world wars. This chapter also compares and contrasts what aircraft and horse cavalry were actually able to accomplish with popular contemporary beliefs about their capabilities. In Britain, the air advocates won the public relations battle; their assertions that air policing was cheaper than ground and mounted troops were accepted. Those attempting to demonstrate the limitations of airplanes or defended the continued viability of horsed cavalry were characterized as conservative diehards unwilling to accept anything new. Economy was attained, in part, by reducing the expenditure of all military branches but the cavalry was the one branch

continually singled out for reduction. American cavalrymen argued that policing the American border supported the continuation of the horse cavalry, while RAF officers and politicians maintained that policing the empire from the air saved money and men.

Chapter Six examines the cavalry's efforts to acquire tactical air support for its operations and to defend against another mechanical challenger to their existence, this one a ground-bound vehicle, the tank. It outlines the attempts of the U.S. cavalry to develop its own aerial component because the established air service was not inclined to provide support for surface units, being more interested in its independent missions. Arguments used against the airplane in earlier decades were recycled for use against the tank. Yet cavalrymen were becoming desperate, relying less on logic and more on sentiment. In addition to reasoned arguments, some cavalrymen's justifications for their service included poems decrying the loss of the horse to the unfeeling machine, which may be one reason why the modern perception of cavalrymen is so negative.

Yet the cavalry's records show a cavalry not opposed to the airplane, aviation, aviators, or mechanization advocates on general principals, but a group defending itself against the popular belief that it was obsolete. Discussions of the limitations of new technologies had less to do with a distrust or hatred of technology and more with debunking the theories of overly optimistic supporters of modern weapons elicited in part by national movements for economy and modernization. The cavalry made efforts to incorporate aviation technology well into the 1930s, and in the case of the United States, the early 1940s. This desire was clear in the cavalry's testing of autogiros (a type of experimental aircraft). Abandoned by the Army Air Forces, which was focused on

strategic bombing and other independent operations, the cavalry was still attempting to establish its own air section when the World War II commenced. The American and British cavalries were not threatened by aviation, but endeavored to embrace it, experimenting with new air machines to maintain their proficiency, and by extension, their existence. By World War II, aviators and the air services of the United States and Great Britain had ceased to battle with the cavalry over its missions or roles.

The conclusion of this work ties this historical experience with general insights into how organizations respond to novel technologies that threaten to alter or eliminate their institution. The United States and Great Britain faced two different sets of strategic challenges throughout the first half of the twentieth century that directly affected how the cavalries of each country responded to the introduction of aviation. Their histories, experiences, and culture directly affected the way militaries eventually eliminated their horse cavalry. The United States was behind its natural geographical ocean border with only minor intermittent problems with Mexico and small commitments outside of its continental location. Britain, which had relied almost entirely on its navy for the security of its home island, was forced to rethink its vulnerability when the airplane was introduced. It also had to concern itself with policing its extensive empire. Each country had different demands that called for different budgeting and concentration.

The United States cavalry desired to incorporate aviation technology well into the 1930s. Some of the most vocal support for the autogiro came from the cavalry. The theoretical debates about the relative merits of man and machine were less important

than the practical day-to-day challenges of limited budgets, uncertainty about enemy

plans, and technological limitations.

CHAPTER II

AMERICAN AND BRITISH CAVALRY PRIOR TO HEAVIER THAN AIR FLIGHT

British and American cavalrymen actively reshaped their branches in the years

before 1903 to meet the demands of modern warfare brought by technological

innovations. In keeping with the general trend of professionalization associated with the

late nineteenth century, they founded military service schools and professional societies,

studied military history and recent conflicts, and published journals. However, the

British and American cavalries approached these tasks differently, based on the

differences between their nations and mounted forces, which included traditions based

on the history of their branches, organization of their mounted forces, wartime

experiences, public opinion, and their attempts at professionalization. Substantial

differences existed within the American and British cavalry communities regarding

mounted versus dismounted tactics; the use of lances, sabers, and firearms; and the

relative importance of the charge, raids, and reconnaissance. Both inside and outside the

cavalry, military officers were divided over whether new technologies made the cavalry

obsolete or more valuable than ever. These divisions remained when aeroplanes entered

the picture in 1903 and brought with them a new set of challenges.

United States Cavalry before 1903

Unlike many European cavalries, the history of the United States cavalry was

short and non-continuous. The second fact stemmed in part from public fears, famously

expressed by George Washington, that a professional army was "dangerous to the liberties of the country."[1] The first use, temporary and minimal, of an American mounted service occurred during the Revolutionary War. Cavalry was of little use in colonial America due to the wooded and roadless terrain, so Washington, the commander of the Continental Army, entered the war with almost no experience with mounted tactics and organization. Primarily used in the southern theater where the terrain better suited a horse arm, the mounted forces served as escorts and messengers for Washington and his major subordinates in addition to working as scouts and pickets for the infantry. Cavalrymen usually fought on foot and rode horses primarily to increase their mobility. The cavalry was quickly disbanded when the war ended in November 1783. Over the following fifty years, mounted soldiers were only briefly raised to address acute local troubles including rioting, civil disturbances, and minor conflicts with Indian populations.[2]

Expanding further into the North American continent sparked a greater need for a mobile mounted arm to protect settlers and commerce along the Santa Fe, Oregon, and California Trails, all of which crossed the Great Plains through Indian Territory. The United States founded a more permanent force in the 1830s to deal with violence and disturbances on the frontier involving conflicts between settlers, whites and natives, raiding groups, bandits, and renegades. The more open terrain of the plains in the West

---

[1] Richard Wormser, *The Yellowlegs: The Story of the United States Cavalry* (Garden City, NY: Doubleday, 1966), 36. See also Robert M. Utley, *Frontiersmen in Blue: The United States Army and the Indian, 1848-1865* (New York: Macmillian, 1967), 14.

[2] Walter Millis, *Arms and Men: A Study in American Military History* (1956; repr, New Brunswick, NJ: Rutgers University Press, 1984), 21; Russell F. Weigley, *History of the United States Army* (New York: Macmillan, 1967), 70; Gregory J. W. Urwin, *The United States Cavalry: An Illustrated History* (Pode, UK: Blandford, 1983), 17, 29.

made horses more useful than they were in the forested territory of the east. The 1832

Black Hawk War led to the restoration of a cavalry arm in June of that year when

Congress approved the formation of a battalion of Mounted Rangers. Following the

recommendations of the November 1832 Report of the Secretary of War, the force was

changed to the 1st Regiment of Dragoons, and formally established on March 2, 1833,

consisting eventually of ten oversized companies of 1,715 men. The dragoons, mounted

for speed and able to fight mounted or dismounted, were a more versatile force than the

Mounted Rangers, who could fight only when dismounted. In addition, the Secretary of

War believed that the dragoons would be more economical.[3] Historians concur that

dragoons, however, largely retained the character of mounted infantrymen, spending

more time fighting dismounted and seldom used as a shock weapon. These soldiers

resided in permanent forts across the frontier to respond to any hostilities.[4] Although

increased conflict with Native American nations in the 1830s weakened the public's

objections to a more permanent mounted force in the West, the American public

remained uncomfortable with a professional army well into the nineteenth century.

Secretary of War J. R. Poinsett still referred to "that natural and well-grounded jealousy

justly entertained against the existence of a large standing army in our country" in his

annual report to the president in 1840.[5]

---

[3] "Report of the Secretary of War," November 25, 1832 Appendix to the Register of Debates in Congress, *Cong. Globe*, 22nd Cong., 2d Sess. 8-9 (1832).

[4] Millis, *Arms and Men,* 95-96; Mary Lee Stubbs and Stanley Russell Connor, *Armor-Cavalry Part I: Regular Army and Army Reserve* (Washington, DC: Office of the Chief of Military History United States Army, 1969), 8; Weigley, *History of the United States Army*, 159; Urwin, *United States Cavalry,* 54.

[5] "Report of the Secretary of War," December 5, 1840 Appendix to the Register of Debates in Congress, Cong. Globe, 26th Cong., 2d Sess. 10 (1840).

Not until war with Mexico in 1846, did the United States get what historian Gregory Urwin called its "first real cavalry war since the Revolution."[6] Instead of protecting commerce and chasing natives, the Mexican-American War allowed cavalrymen to meet troops of an organized foreign military in battle. American cavalry participated in all of the major campaigns of the war. As in the Revolutionary War, the reconnaissance and pursuit missions dominated. There were few cavalry charges. Legislation in May 1846 increased both the number of mounted units and cavalry soldiers. It included the establishment of seven regiments of cavalry to be staffed by volunteers, a regular regiment designated the Regiment of Mounted Riflemen, and an increase in number of troopers in each cavalry company. An additional regiment of dragoons was also added in 1847.[7]

The new strength of the branch was short-lived. After the end of the hostilities, the cavalry became an overextended constabulary due to the combination of official cavalry reductions and soldier desertions motivated by a desire for better living conditions or participation in the Gold Rush. By 1853, three mounted regiments—the 1st and 2d Dragoons and the Mounted Rifles—were spread throughout the largely expanded frontier in about sixty military posts.[8] Except in Texas, the army was scattered throughout the West. Increasing conflicts between white settlers and Plains Indians prompted Congress to authorize the 1st and 2d Regiments of Cavalry in 1855, bringing

---

[6] Urwin, *United States Cavalry,* 79.
[7] Stubbs and Connor, *Armor-Cavalry Part I,* 10-11.
[8] Conventions vary, but in this work the official designation for units will be utilized when numbered abbreviations are used. For example, 2d for Second Cavalry, 3d for Third, etc.

the total number of mounted regiments to five.[9] This enlargement failed to secure the large frontier, but the expense of cavalry units prevented Congress from authorizing more.[10]

The different titles accorded the mounted regiments—cavalry, dragoons, or mounted rifles—did not mean different roles or equipment. The major difference between them appeared to be the orange, green, and yellow uniform facings of dragoons, mounted rifles, and cavalry units, respectively. In theory, the mounted riflemen utilized the horse as transportation, fought on foot, and were unsurprisingly armed with rifles, but this did not always occur in practice.[11] The mounted units patrolled the frontier, responded to emergencies, and performed many of the roles of light cavalry, such as scouting, screening, raiding, and messenger services.

Cavalrymen of the conflicts with Mexico and Indians in the West had access to only a handful of tactical manuals, most foreign produced. The only American created document widely used was *Cavalry Tactics,* usually referred to as "Poinsett's Tactics" in tribute to Joel Poinsett, secretary of war when the book was published by the War Department in 1841. Principally a translation of a French manual, Poinsett's Tactics proscribed the use of the double rank formation and two-company squadrons as in European cavalries.[12] Some American officers argued that aspects of the book were not appropriate to the American context because of the different terrain and types of

[9] Urwin, *United States Cavalry,* 90-93; Stubbs and Connor, *Armor-Cavalry Part I,* 11-12; Millis, *Arms and Men*, 110.
[10] Utley, *Frontiersmen,* 20.
[11] Durwood Ball, *Army Regulars: On the Western Frontier, 1848-1861* (Norman: University of Oklahoma Press, 2001), xx-xi; Utley, *Frontiersmen*, 22.
[12] Sayre, "Cavalry Drill and Organization," 7.

combatants in North America.[13] Little official doctrine or tactics specific to fighting the

native populations, however, emerged prior to the Civil War. The army's missions—

determined by the "imperatives of national expansion" according to historian Robert

Utley—failed to provide clear direction to commanding officers on tactics.[14] As a result,

the double rank described in the 1841 regulations continued to be utilized by the cavalry

during the Civil War primarily in the eastern theaters. As the war progressed, however,

the Union and Confederacy issued new tactical manuals (*Cooke's Tactics* and *Wheeler's*

Tactics respectively) both of which stressed the advantage of single rank formations.[15]

During the Civil War, Federal mounted troops were finally united under one

organizational name. On August 3, 1861, the U.S. Congress redesignated all six

mounted regiments as cavalry irrespective of their previous titles.[16] The 1st and 2d

Dragoons became the 1st and 2d Cavalry. The Mounted Rifles claimed the title of the

3d Cavalry, while the 1st and 2d Cavalry, the most recently formed units, were renamed

the 4th and 5th Cavalry. An additional 6th cavalry regiment was also added to the

rolls.[17]

The United States and Confederate cavalries began to create an "American way"

of using cavalry as a result of their experiences and utilization of new weapons during

---

[13] Gray, *Cavalry Tactics,* 9; *Cavalry Tactics in Three Parts,* (Washington, DC: GPO, 1864 repr),
http://9thvirginia.com/poinsett's_cavalry_tactics.html; Farrand Sayre, "Cavalry Drill and Organization,"
Journal of the United States Cavalry Association 26 (July 1915): 7 (hereafter cited as *JUSCA*); Dennis
Hart Mahan, *An Elementary Treatise of Advanced-Guard, Out-post, and detachment service of troops, and
the manner of posting and handling them in presence of an enemy with a historical sketch of the rise and
progress of tactics* (New York: John Wiley, 1862), 33.
[14] Utley, *Frontiersmen*, xii, 2.
[15] Ibid., 7-8.
[16] Urwin, *United States Cavalry,* 112; Stubbs and Connor, *Armor-Cavalry Part I*, 16.
[17] Alonzo Gray, *Cavalry Tactics: As Illustrated by the War of the Rebellion Together with Many
Interesting Facts Important For Cavalry to Know* (Fort Leavenworth, KS: U.S. Cavalry Association,
1910), 6.

the Civil War. Historian Gregory Urwin argued that the war let mounted troops "shake off outmoded European notions and adopt a more pragmatic and thoroughly American doctrine."[18] This pragmatic doctrine evolved based on recent conditions and not historical examples of massed cavalry charges. American cavalrymen were not just shock troops, pickets, and scouts, but as summarized by Urwin, "highly mobile gunmen who could use their horses to deny strategic positions to the enemy and hold them with rapid-fire repeating carbines until infantry support arrived."[19] Brigadier General John Buford's use of the Union's First Division Cavalry Corps on the first day of the Battle of Gettysburg in 1863, exemplified this innovative use of mounted soldiers. Buford dismounted his cavalry to defend the favorable ground outside Gettysburg against a Confederate infantry division until Federal infantry arrived.[20] In the war, the Union cavalry as well as the Confederate cavalry served as a sort of jack-of-all-trades filling roles requiring both mobility and staying power. Cavalry proved invaluable in reconnaissance and counter reconnaissance when under the capable leadership of officers such, as Buford and Philip Sheridan.[21]

The Union cavalry, consisting mostly of volunteers of mounted militia, had access to the Poinsett manual; however, few of its leaders could be considered professional cavalry officers at the beginning of the war. The Union army took significant strides to rationalize the use of the cavalry. These efforts included the

---

[18] Urwin, *United States Cavalry,* 133.
[19] Ibid.
[20] Wormser, *Yellowlegs,* 212.
[21] Weigley, *History of the United States Army,* 239. See also John Bigelow Jr., *The Principles of Strategy: Illustrated Mainly from American Campaigns*, 2nd ed (Philadelphia: J. B. Lippincott, 1894), 92-102; 131-32.

publication of a cavalry manual for the United States in two parts (1861 and 1862).[22]

While providing extensive practical instruction on command, organization, and tactics,

the manual contained little theory on the cavalry's employment. Nonetheless with the

previous Poinsett manual, it provided a basis for standard practices both during the war

and after.

In common with many civilian occupations, the U.S. Army underwent a period

of professionalization in the late nineteenth century. Political scientist Samuel P.

Huntington aptly defined a profession as a "peculiar type of functional group with highly

specialized characteristics," such as "expertise, responsibility, and corporateness." A

professional did not simply work for a wage but pursued "a 'higher calling' in the

service of society."[23] Historian Carol Reardon argued in *Soldiers and Scholars* that the

development among U.S. Army officers of a "professional identity as specialists in the

art of war" was due to a combination of education, experience, and the formation of

professional associations.[24]

---

[22] Philip St. Geo. Cooke, *Cavalry Tactics or Regulations for the Instruction, Formation, and Movements of the Cavalry of the Army and Volunteers of the United States* (Washington, DC: GPO, 1861-1862).

[23] Samuel P. Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MA: Belknap, 1957)*,* 7-10. For additional discussions of professionalization see Morris Janowitz, *The Professional Soldier: A Social and Political Portrait* (Glencoe, IL: Free Press, 1960); Timothy K. Nenninger, *The Leavenworth Schools and the Old Army: Education, Professionalism, and the Officer Corps of the United States Army, 1881-1918* (Westport, CT: Greenwood, 1978); William B. Skelton, "Professionalization in the U.S. Army Officer Corps During the Age of Jackson," *Armed Forces & Society* 1 (1975): 443-71; Theo Farrell and Terry Terriff, *The Sources of Military Change: Culture, Politics, and Technology* (Boulder, CO: Lynne Rienner, 2002); William B. Skelton, "Samuel P. Huntington and the Roots of the American Military Tradition," *Journal of Military History* 60 (April 1996): 325-38.

[24] Carol Reardon, *Soldiers and Scholars: The U.S. Army and the Uses of Military History, 1865-1920* (Lawrence: University Press of Kansas, 1990), 11.

Although some professionalization happened before the Civil War in terms of centralization, uniformity, and efficient management, greater strides occurred following 1865.[25] Unlike at the end of previous wars, the Americans did not disband its cavalry afterwards. The U.S. Cavalry not only remained in existence, but its regular establishment was substantially increased.[26] The larger establishment, six regiments of cavalry, did not, according to cavalryman John Bigelow, improve the quality of cavalrymen as little was done to educate officers in the changing conditions of modern war including repeating rifles.[27] In 1866, the cavalry was again increased by four to consist of a total of ten cavalry regiments to deal with the policing of the South (Reconstruction) and growing Indian problems.[28] Frontier service was done by small units commanded by officers, who historian Robert Utley argued, believed that service "against the Indians required little knowledge of …'civilized warfare.'"[29] As before the war, the United States cavalry was spread across the frontier in small groups stationed at forts to secure both travelers and settlers in the west from Native American attacks. Little training or field exercises occurred in large units after the war concluded.

Few changes in drill regulations happened during the period following the Civil War, but the period provided a clearer demonstration of the new American way of using the cavalry. Cavalry historian Alexander Bielakowski argues there emerged a "dichotomy between the concept of the 'cavalryman' [as understood in the European

---

[25] Nenninger, *Leavenworth Schools and the Old Army,* 6.
[26] Stubbs and Connor, *Armor-Cavalry Part I,* 19.
[27] John Bigelow, Jr., *The Campaign of Chancellorsville, a Strategic and Tactical Study,* (New Haven, CT: Yale University Press, 1910), 49-50.
[28] Robert M. Utley, *Frontier Regulars: The United States Army and the Indian, 1866-1891* (New York: Macmillan, 1973)*,* 11.
[29] Nenninger, *Leavenworth Schools and the Old Army*, 16.

context] and the actual experiences of the men."[30] The concept of the cavalryman as a mounted warrior charging the enemy with sword contrasted with the actual use of cavalry, which scholars Mary Lee Stubbs and Stanley Russell Connor described as pursuing "marauding Indians on horseback, and if the chase ended, as it usually did, in a dismounted fight, the cavalrymen were trained for that as well."[31] These mounted soldiers were not trained exclusively to fight mounted, nor did they. The cavalry was rarely concentrated in a large force or put into situations that made charging desirable. Nor did units often have the opportunity to conduct joint campaigns or maneuvers to practice these tactics.

Not until the 1880s did American army officers seriously consider how cavalry would fight in a modern war or try to define what modern war would look like. Ronald Barr argued that the U.S. military modernized its training, organization, and officers inspired by a global "drive for progressive change designed to cope with a new political and economic age."[32] Despite some cases where cavalrymen appeared to be regressive, historian Brian McAllister Linn has noted, "those cavalry officers who wrote on warfare were active participants in the military debates of the time, and they included among their number prominent intellectuals… [who] believed themselves progressives readying the mounted branch for the wars of the future."[33]

---

[30] Alexander M Bielakowski, *U.S. Cavalryman, 1891-1920* (Oxford: Osprey, 2004), 5.

[31] Stubbs and Connor, *Armor-Cavalry Part I,* 21.

[32] Ronald Barr, *The Progressive Army: U.S. Army Command and Administration, 1870-1914* (New York: St. Martin's, 1998), 2.

[33] Brian McAllister Linn, *The Echo of Battle: The Army's Way of War* (Cambridge, MA: Harvard University Press, 2007), 66.

Professionalization included the formation of several schools to produce well-trained and knowledgeable officers to counteract what military historians Stubbs and Connor called the "evils of fragmentation."[34] William Tecumseh Sherman during his period as commanding general, 1869-1883, created a postgraduate school system beyond the Military Academy. He conceived of a pyramid of institutions where officers could learn the special skills of their branch of service as well as the attitudes and principles of higher command.[35] Although the system was not implemented as initially envisioned, Reardon has argued that the post-graduate officer education system proved vital to achieving the goal of professionalization.[36]

In 1881, the War Department founded the School of Application for Infantry and Cavalry at Fort Leavenworth, Kansas, to train junior officers in various professional military subjects, particularly small-unit tactics. The curriculum focused on the military arts of tactics, strategy, logistics, and military history.[37] The school disseminated the precepts of these branches throughout the army by assigning one lieutenant from each cavalry and infantry regiment every two years.[38]

The early years of the school failed to live up to Sherman's expectations in part because students lacked even a basic knowledge of reading and writing. Field commanders also initially treated the school as a dumping ground for their problem cases. Yet through the efforts of the school's instructors and organizers the school revived its original mission and according to Reardon, by 1890 had become "the

---

[34] Stubbs and Connor, *Armor-Cavalry Part I,* 22.
[35] Weigley, *History of the United States Army,* 273.
[36] Reardon, *Soldiers and Scholars,* 14-15.
[37] Nenninger, *Leavenworth Schools and the Old Army,* 3-4.
[38] Weigley, *History of the United States Army*, 273.

backbone of the Old Army's education system."[39] Attending the school became a good

way to gain a promotion through merit instead of through seniority. In 1892, the War

Department opened a similar school for cavalry and light artillery at Fort Riley,

Kansas.[40] The army opened more than thirty additional schools for various specialties

by the end of the First World War.[41]

In the early years, these schools developed useful curricula and included

instruction in the varied use of the cavalry. The "Programm [*sic*] of the Course of

Cavalry" at the Infantry and Cavalry School consisted of recitations, drills, problems,

and field exercises in tactics, field service, equitation, and hippology (the study of

horses).[42] The training for the cavalry was almost identical to the "Infantry Programme"

and stressed both mounted and dismounted action, corresponding to the cavalry's

experience on the western frontier and during the Civil War.[43]

Over the next twenty years, the military schools evolved into Sherman's vision

due to the writings of a few military theorists and officers, including Leavenworth

instructor and cavalryman Arthur L. Wagner, who helped to formalize cavalry policy.[44]

One of the many champions of reform, Wagner, dubbed the "American Pioneer in the

Cause of Military Education" by Eben Swift, a similarly minded colleague, became

"keenly aware of the increasing need to establish a tradition of professional military

---

[39] Reardon, *Soldiers and Scholars*, 14.
[40] Nenninger, *Leavenworth Schools and the Old Army,* 3-4, 34; Weigley, *History of the United States Army*, 273, 290. The name and character of the school changed in 1908 becoming the Mounted Service School, and in 1919 it was renamed the Cavalry School (Elizabeth T. Kirwan, "The Cavalry School Library, Fort Riley, Kansas," *Library Journal* 62 (March 1937): 196.)
[41] Reardon, *Soldiers and Scholars*, 16.
[42] *Regulations and Programm of Instruction of the U.S. Infantry and Cavalry School* (Fort Leavenworth, KS: United States Infantry and Cavalry School, 1895), 33.
[43] Ibid.
[44] Weigley, *History of the United States Army,* 274.

leadership based on continual and sustained academic study," according to Wagner's

biographer, T. R. Brereton.[45] Historians agree that Wagner was one of the builders of

the Infantry and Cavalry School, attempting to design both a strong theoretical and

practical curriculum. Wagner's works, written at Fort Leavenworth during his tenure

there (1888-1904), included the often-republished 1895 *Organization and Tactics* and

the 1893 *Service of Security and Information,* which detailed the tactical employment of

infantry, cavalry, and artillery in both offensive and defensive situations.[46] According to

Brereton, these two books were intended not only to replace British works at

Leavenworth with American texts on warfare and tactics but also "to validate American

military history and tactical innovation," "to establish a uniform guide for the instruction

of small unit duties," and "to provide the historical and theoretical groundwork for the

1891 *Infantry Drill Regulations.*"[47] Although Wagner's works' primary emphasis was

on the infantry, he noted the superior firepower of the artillery and the skill of cavalry at

reconnaissance, raiding, and pursuits.[48] He emphasized flexibility, not rigid doctrine,

promoting the jack-of-all-trades use of the cavalry. Wagner helped to condense much of

the wisdom of cavalry use developed during the Civil War. His writings concentrated on

the cavalry's non-battlefield duties, emphasizing the mounted branch's responsibilities

to the army on the move.[49]

---

[45] Eben Swift, "An American Pioneer in the Cause of Education," *Journal of the Military Service Institution of the United States* 44 (1909): 67, quoted in Reardon, *Soldiers and Scholars,* 38; T. R. Brereton, *Educating the U.S. Army: Arthur Wagner and Reform, 1875-1905* (Lincoln: University of Nebraska Press, 2000), xii.

[46] Arthur L. Wagner, *Organization and Tactics* (New York: B. Westermann, 1895).

[47] Brereton, *Educating the U.S. Army*, 40.

[48] Ibid., 51-52.

[49] Nenninger, *Leavenworth Schools and the Old Army* 42-43; Reardon, *Soldiers and Scholars*, 37.

These duties included the cavalry's becoming both a screen and the main reconnaissance force of the army, keeping commanders informed of the enemy's positions and denying similar information to the enemy. The opening pages of the *Security and Information* emphasized the importance of these roles, stating, "information in regard to the enemy is the indispensable basis of all military plans, and nothing but faulty dispositions for the security of an army can be expected if such information is lacking."[50] This data was to be gathered from spies, deserters, prisoners, newspapers, or by reconnaissance. Wagner claimed that cavalry was better suited than infantry to question civilians, employ guides, and examine prisoners. While reconnaissance could be completed by infantry, cavalry, horse artillery, or a combination, it was mainly executed by a cavalry screen well in advance of the main body.[51] Wagner argued in an abridgement of *The Service of Security and Information* that the cavalry could conduct reconnaissance better than infantry could because the greater mobility of cavalry meant that the "reconnoitering duty can be performed more efficiently and more easily by cavalry than by infantry" and a strong cavalry screen increased the army's security.[52]

Wagner argued that the cavalry could perform three different types of reconnaissance—reconnaissance in force, special reconnaissance, and patrolling—better than other branches. He maintained, "Cavalry is the arm *par excellence* for patrolling."[53] The unabridged version added, "especially when (as is the case with American cavalry) it unites mobility and defensive power, and does not need to be

---

[50] Arthur L Wagner, *The Service of Security and Information* (Kansas City: Hudson-Kimberly, 1903), 16.
[51] Ibid., 18-19, 100.
[52] Arthur L Wagner, *A Catechism of Outpost Duty, Including Advance Guards, Rear Guards, and Reconnaissance* (Kansas City: Hudson-Kimberly, 1895), 23, 26.
[53] Wagner, *Catechism of Outpost Duty,* 74.

hampered with a supporting force of infantry."[54] Other important uses for the cavalry

patrol included the destruction of roads and railroads, and the tapping of telegraph

lines.[55] The best situation for the cavalry was open country during daytime.[56]

Wagner recognized that the cavalry was not suited to all conditions, such as in

close country, at night, and when the enemy was near. Furthermore, because the branch

was expensive to train, equip, and maintain, it should not be wasted in unsuitable

conditions and "needlessly frittered away."   The superior mobility of the cavalry patrol

compared to an infantry patrol was obtained only when the cavalry patrol moved along

good roads. He stated that to "do otherwise would be to follow by-paths and traverse

difficult ground, where horses would often have to be led. The mobility which gives a

cavalry patrol its special value would thus be lost, and the patrol would not be worth as

much as one composed of infantry; for the horses would become a mere burden."[57]

In using cavalry as an advanced guard, Wagner noted a marked difference

between the training and roles of the American cavalry compared to its European

counterparts. The distance between the main army force and advanced guard of cavalry

in the American army could be reduced compared to other armies because the cavalry

could "make effective use of dismounted fire-action, [because it] has greater resisting

power than European cavalry, and it is not limited, as the latter seems generally to be, to

a charge to the front or a flight to the rear."[58] He explained further that

---

[54] Wagner, *Service of Security and Information*, 91.
[55] Wagner, *Catechism of Outpost Duty,* 98-99.
[56] Ibid., 35.
[57] Ibid., 74, 101, 105.
[58] Wagner, *Service of Security and Information,* 31.

all European authorities recommend the use of cavalry as reconnoiterers, but prescribe that the support should consist in part of infantry to supply the necessary resisting power. In our service this is not in general necessary, as our cavalry has enough resisting power to carry out the delaying action of the support; and nothing but the lack of sufficient cavalry should necessitate the adoption of a composite support. Indeed it is, in most cases, a great mistake so to combine cavalry with infantry as to tie the former down to the pace of the latter.[59]

On the battlefield and in defending the rear of the retreating army, the cavalry should fight both mounted and dismounted depending on the terrain and pace of the conflict. While shock action was the primary role of the cavalry to be used in every suitable situation, Wagner suggested the use of the carbine when the cavalry was on the defensive against a well-concentrated opponent.[60] He also argued that the cavalry in the rear guard could charge the enemy when it became disorganized as a result of the "ardor of pursuit" or artillery fire. However, according to Wagner, the cavalry should rely mainly on dismounted fire action, which was what "good cavalry of the American type" did.[61] In addition to reconnaissance, Wagner emphasized the importance of cavalry for screening the enemy when the army was on the march, both gaining information of the enemy's movements and preventing the enemy from doing the same.[62] Other works utilized at the military post-graduate schools combined with Wagner's works helped create a core of knowledge.[63] Swift shared Wagner's devotion to officer education. He

---

[59] Ibid., 31-32.
[60] Ibid., 152.
[61] Wagner, *Catechism of Outpost Duty,* 113.
[62] Ibid., 126.
[63] Additional writings used in the military post-graduate schools included: William Harding Carter, *Horses, Saddles and Bridles* (Leavenworth, KS: Ketcheson and Reeves, 1895); Charles Blair Mayne, *The Infantry Weapon and its Use* (London: Smith, Elder, 1903); Colmar Freiherr von der Goltz, *The Conduct of War: A Short Treatise on Its Most Important Branches and Guiding Rules* (London: K. Paul Trench, Trubner and Co, 1899); *Field Service Regulations*, Otto Griepenkerl, *Letters on Applied Tactics* (Kansas

lectured at various military schools and published a number of books that provided the

foundation of Leavenworth's methods and course content.[64]

Supplementing the school system and the tactical works produced and utilized

there, army officers formed professional branch associations, which debated the

organization and use of the various branch services.[65] Congress approved the first

society, the Military Service Institution of the United States, in 1878, to encourage the

recording and debate of military science and history.[66] The infantry, artillery, and

cavalry all created similar associations. These organizations began publishing

periodicals called service journals, including the *Journal of the United States Cavalry

Association,* the *Journal of the United States Artillery,* and the *Infantry Journal,* in 1888,

1893, and 1904 respectively.[67] According to Reardon, these semi-professional

organizations provided "forums for discussion and promotion of the special concerns

that affected every officer's career."[68] The constitution of the United States Cavalry

Association, established in 1888, stated its aim as the "professional improvement of its

City: Hudson, 1906); *Notes on Infantry, Cavalry, and Field Artillery Lectures Delivered to Class of Provisional Second Lieutenants Fort Leavenworth, Kansas. 1917* (Washington, DC: GPO, 1917) and drill regulations of the three arms including *Drill Regulations for Cavalry United States Army Amended 1909 Corrected to January 1* (Washington, DC: GPO, 1911); War Department: Office of the Chief of Staff. *Cavalry Drill Regulations United States Army 1916, Corrected to December 31, 1917 (Changes nos. 1 and 2.* (Washington, DC: GPO, 1918).

[64] Nenninger, *Leavenworth Schools and the Old Army*, 34-36; Reardon, *Soldiers and Scholars,* 38.

[65] *Annual Report of the Commandant General Service and Staff College for the School Year Ending August 31, 1904* (Fort Leavenworth, KS: Staff College Press, 1904), 116-20; *Annual Report of the Commandant Infantry and Cavalry School and Staff College for the School Year Ending August 31, 1905* (Fort Leavenworth, KS: Staff College Press, 1905); *Annual Report of the Commandant U.S. Infantry and Cavalry School, U.S. Signal School and Army Staff College for the School Year Ending August 31, 1907* (Fort Leavenworth, KS: Staff College Press, 1907), 36-37; Nenninger, *Leavenworth Schools and the Old Army,* 8; Weigley, *History of the United States Army,* 274.

[66] Weigley, *History of the United States Army*, 274.

[67] Huntington, *Soldier and the State*, 243.

[68] Reardon, *Soldiers and Scholars,* 3.

members and the advancement of the mounted service generally."[69] Starting in the late

1880s, these journals published the opinions of their members and other contributors

about the uses of their respective branches, lessons learned from history, and other

observations and news. The journals also served as a vehicle for ideas and studies

developed at the schools.[70]

These journals reflected the argument of cavalrymen and other officers that the

cavalry still had an important role to play in modern warfare. Philip St. George Cooke

began his 1879 *United Service* article with the warning "Our cavalry is in danger," not

just from non-cavalrymen but from within the branch itself. Cooke's concerns dealt

primarily with the debate over cavalry weapons and the continued use of cavalry. Cooke

worried that removing the saber from the cavalry's equipment would start a trend

leading eventually to the adoption of infantry tactics and the destruction of the cavalry

altogether. He argued that branches have different characteristics and as a result, they

should not have the same tactics.[71] Cavalryman Brigadier General Wesley Merritt, in

another article, argued that far from falling behind the advancing infantry and artillery,

the cavalry had through its battlefield experiences modernized as much as the other

services and claimed that the improvements in modern warfare favored mounted troops.

He criticized those officers who argued cavalry would be unnecessary in future wars and

[69] "Constitution of the United States Cavalry Association," *JUSCA* 13 (July 1902): 97.
[70] Reardon, *Soldiers and Scholars,* 3.
[71] Philip St George Cooke, "Our Cavalry," *United Service* 3 (July 1879): 329-46.

called on cavalry officers to defend their branch.[72] Merritt's arguments typified those of

many other cavalry authors.[73]

In June 1890, Lieutenant Colonel E. V. Sumner of the 8th Cavalry warned that

theories that were not based on practical wartime experience were dangerous. He

criticized many of the ideas of contemporary theorists while highlighting the difference

between American and European cavalry. Among his points was that the valuable

lessons of the Civil War had been neglected. He claimed that Europe suffered from poor

troops while the United States had sub-par commanders. Sumner maintained that

science helped the cavalry complete its missions and opponents of the continuation of

the cavalry were ignorant obstructionists.[74]

Contemporary European military observers acknowledged the unique usage of

the American cavalry by refusing to call American mounted soldiers "cavalry" since its

troopers were not primarily trained and utilized on the battlefield for mounted combat

such as shock action and pursuit of a disorganized or fleeing enemy. Instead, the

Europeans called them mounted infantry since they were not "traditional cavalry of the

lance- and saber-wielding kind."[75] Captain Moses Harris of the 1st Cavalry argued that

Europeans had stigmatized American cavalry "as mounted infantry" because "the

---

[72] Wesley Merritt, "Cavalry: Its Organization and Armament," *Journal of the Military Service Institute of the U.S.* 1 (1880): 42-44.
[73] For example see E. V. Sumner, "American Practice and Foreign Theory," *JUSCA* 3 (June 1890): 143; C. D. Rhodes, "The Duties of Cavalry in Modern Wars," *JUSCA* 6 (June 1893): 181; James H. Reeves, "Cavalry Raids," *JUSCA* 10 (September 1897): 232-247; William Gerlach, "Thoughts about Cavalry," *JUSCA* 13 (January 1903): 372-79; George H. Morgan, "Mounted Rifles, " *JUSCA* 13 (January 1903): 380-83; James Harbord, "Cavalry in Modern War," *JUSCA* 15 (April 1905): 765-71.
[74] Sumner, "American Practice," 143-45.
[75] Barr, *Progressive Army*, 2.

methods employed by our cavalry were opposed to old-world traditions."[76]

Paradoxically, modern cavalry scholars identified the use of cavalry during the Civil

War cavalry as "both the apotheosis and the demise of the cavalier tradition that was so

dear to Americans of the first half of the 19th century" despite the reality that this

cavalier use had never existed in the United States.[77] The European concern about a

cavalry that had been "converted to drab mounted infantry, who did their killing with

revolver and repeating carbines," as described by historian Urwin, speaks to the unique

dismounted use of American cavalry.[78] It also demonstrated the contemporary European

belief that a real cavalry fights mounted.

In 1880, *Mars-la Tour and Gravelotte* by John Bigelow of the 10th United States

Cavalry facilitated the beginning of a revolution in American military thinking. Bigelow

criticized European military thinking about the use of cavalry, arguing that they

misunderstood the use of cavalry as scouts and mobile infantry.[79] Wagner followed

Bigelow's example and maintained in his *The Campaign of Koniggratiz*, a book about

the Franco-Prussian War of 1870, that Prussian military doctrine did not provide the

appropriate standard by which American warfare should be judged.[80]

Some American military officers, however, objected to the means and methods

of professionalization. Some believed too much book learning would stifle the soldier's

---

[76] Moses Harris, "With the Reserve Brigade from Winchester to Appomattox-Fourth and Concluding Paper," *JUSCA* 4 (March 1891): 25.

[77] Urwin, *United States Cavalry,* 108.

[78] Ibid.

[79] John Bigelow, *Mars-la-Tour and Gravelotte* (Washington, DC: Ordnance Department, 1880), quoted in Reardon, *Soldiers and Scholars*, 5, 95.

[80] Arthur L Wagner, *The Campaign of Koniggratz: A Study of the Austro-Prussian Conflict in the Light of the American Civil War,* repr. (Fort Leavenworth, KS, 1889: Westport CT: Greenwood, 1972), quoted in Reardon, *Soldiers and Scholars,* 95.

necessary initiative on the battlefield, and that combat was the only teacher of the art of war. Others questioned the curriculum of post-graduate schools and the existence of the schools altogether.[81]

The Spanish-American War revealed numerous problems with the cavalry branch. Cavalryman John Bigelow Jr. assigned to a camp of instruction for units going into combat, found one squadron had training for non-commissioned officers but no theoretical or practical training for officers. Training of any kind remained minimal throughout his tenure with the 10th Cavalry Regiment and no large-scale training transpired at all.[82] This short-lived war involved little significant action for mounted cavalry, but it included the well-known dismounted "charge" of the 1st United States Volunteer Cavalry Regiment, the "Rough Riders," up San Juan Hill. More importantly, according to historians Allan Millett and Peter Maslowski, "the widespread sentiment that the war had been conducted unscientifically, the lack of interservice cooperation, and the [United States's] new international responsibilities allowed [Secretary of War Elihu] Root to institute army reforms." [83] The new responsibilities for the cavalry included service in the Philippines and China, and dealing with problems on the southern

---

[81] Nenninger, *Leavenworth Schools and the Old Army*, 38; James Chester, "Some of the Artillery Difficulties Like to Be Encountered during the Next Maritime War," *Journal of the Military Service Institution of the United States* 19 (1898): 557, quoted in Reardon, *Soldiers and Scholars* 90; C. D. Parkhurst, "The Practical Education of the Soldier," *Journal of the Military Service Institution of the United States* 19 (1898): 74, in Reardon, *Soldiers and Scholars,* 91.
[82] John Bigelow, Jr., *Reminiscences of the Santiago Campaign* (New York: Harper and Brothers, 1899), 13-14.
[83] Allan R. Millett and Peter Maslowski, *For the Common Defense: A Military History of the United States of America* (New York: Free Press, 1984), 304, 327-28; Stubbs and Connor, *Armor-Cavalry Part I,* 27-30.

border of the United States. Congress increased the number of regular cavalry regiments from ten to fifteen in February 1901 in part because of these additional needs.[84]

In addition to the Root reforms that included the founding of the War College, creation of a General Staff modeled after the German Great General Staff, and an improved military school system, the beginning of the new century witnessed a proliferation of American-authored books and articles on tactics and strategy as well as an abundance of English translations of foreign military work by authors who ranged from junior lieutenants to experienced generals. The professional journals continued to publish articles on strategy, tactics, and military history. American officers studied recent conflicts, including the Boer War and the Russo-Japanese War, in their reopened and newly founded schools (Leavenworth reopened in September 1902 and the War College in November 1903). The new schools, unlike their predecessors, were designed for generalists. Among Leavenworth's enduring contributions was *Field Service Regulations 1905,* an adaption by Captain Joseph T. Dickman of German Army regulations, which according to historian Timothy Nenninger, "became a comprehensive guide to the organization, administration, and tactics governing the army in the field."[85] While the education of officers improved, these new professional schools suffered from what Nenninger called a "failure to appreciate the full impact of technology on warfare" arguing that "almost no attention was given to aeronautics at either the school of the line or staff college."[86]

---

[84] Millis, *Arms and Men*, 177; Weigley, *History of the United States Army*, 317.
[85] Nenninger, *Leavenworth Schools and the Old Army*, 58-59, 82-83, 127-28.
[86] Ibid., 103.

Nenninger's assessment may overstate the case. The service schools paid some attention to new technologies, but not much. There was some concern that lighter-than-air craft and motorcycles might appropriate some of the cavalry's reconnaissance duties. While balloon reconnaissance with free and captive balloons had not frequently accomplished much when employed, there was, according to Wagner, a general belief that aerial reconnaissance would improve. Wagner also noted that balloons could not "observe the general principle of 'seeing without being seen.'"[87] In addition to captive balloons, Wagner predicted that the perfection of the dirigible balloons would vastly enhance the value of balloon reconnaissance.[88] Bicycles seemed a more realistic threat to horse cavalry. Wagner argued that "cyclist patrols can generally operate more effectively than patrols composed of either infantry or cavalry."[89] An article published in the *Army Navy Journal* and reprinted in the popular press proclaimed that although tests with bicycles in the United States Army concluded that bicycles helped to increase the efficiency of mounted units they could not replace the horse.[90]

By the time aeroplanes began to be used in reconnaissance after 1908, the United States cavalry had been in the process of reforming itself to meet modern conditions for decades. But despite its interest in technology, it still prepared to fight as it always had, mounted or dismounted in a dragoon style. It also recognized the importance of its screening, scouting, and reconnaissance functions for its continued utility to the army. Since its inception, American cavalry had not fit the European definition of cavalry as

---

[87] Wagner, *Service of Security and Information,* 130-32.
[88] Ibid., 133.
[89] Ibid., 129.
[90] Army and Navy Journal, "Is the Cavalry Obsolete?" *Hartford Courant,* November 2, 1903, 13.

primarily a mounted battlefield charging force, and its leaders expected it to continue along the same line. It was far more than an institution formed to conduct the mounted charge. Actual deployment and theoretical writings both downplayed the charge and focused instead on multiple functions.

American officers argued that their cavalry was a multi-purpose force able to meet the requirements of various situations. Although arguing that American cavalry far outpaced its European rivals in doctrine, cavalry and general officers also recognized that the branch was not without flaws and problems. Debates continued to rage over the use of the saber, the relative importance of mounted versus dismounted tactics, the usefulness of various firearms, and the value of shock action.[91] Military and governmental circles constantly debated improvements in size, organization, armament, and doctrine in American versus European models. American cavalrymen recognized the challenges confronting their branch and remained active in the debates that would determine their future without rejecting modernization.

Around the last decade of the nineteenth century, the development of balloons, airships, dirigibles, and wireless communication technologies inspired military

---

[91] For debates on the saber versus carbine, see John Bigelow, Jr., "The Sabre and Bayonet Question," *Journal of the Military Service Institute of the United States* 3 (1882): 65-96, E. P. Andrus, "The Saber," *JUSCA* 4 (December 1892): 373-82; M. C. Butler, "The Saber," *JUSCA* 14 (July 1904): 142-44; James Parker, "The Retention of the Saber as a Cavalry Weapon," *JUSCA* 14 (October 1904): 354-65; George Vidmer, "The Service Pistol and Its Caliber" *JUSCA* 16 (October 1905): 181-88; and James Parker, "Saber Versus Revolver Versus Carbine," *JUSCA* (July 1906): 35-41. For debates on mounted versus dismounted action, see C. D. Rhodes, "The Duties of the Cavalry in Modern Wars," *JUSCA* 6 (June 1893): 172-81; George H. Morgan, "Mounted Rifles," *JUSCA* 13 (January 1903): 380-85; and J. A. Augur, et al., "Comments on Mounted Rifles," *JUSCA* 13 (January 1903): 386-407. For additional debates on firearms see Aubrey Lippincott, "The Automatic Small Arm," *JUSCA* 13 (July 1902): 66-70; and Thomas Q. Donaldson, "The Revolver or Pistol Best Suited to Cavalry," *JUSCA* 13 (July 1902): 71-74. For the value of shock action, see J. Y. Blunt, "The Shock Action of Cavalry," *JUSCA* 5 (1892); J. A. Augur, Edward Anderson, and Cornelius C. Smith, "Comment and Criticism-Mounted Rifles," *JUSCA* 13 (April 1903): 718-23; and James G. Harbord, "Cavalry in Modern War," *JUSCA* 15 (April 1905): 765-71.

personnel, including cavalrymen, to examine these technologies' military possibilities.

These new technologies had the potential to challenge the primacy of cavalry in the

collection and distribution of information. Wireless radio promised to revolutionize

communications between troops and headquarters. Although only a few military

officers and civilians argued that these new technologies rendered the cavalry obsolete,

the cavalry since the late 1880s defended the branch against the small but growing

number of such accusations. Arguments that the rapid-firing rifle had made the cavalry

obsolete met counter-arguments that the effect of breech-loaded arms were exaggerated

and that the weapon was "not so terrible…as many claim."[92] In an *Army and Navy*

Journal republished in 1903 in the *Harford Courant*, the author dismissed the idea that

bicycles and motor vehicles could "be substituted for cavalry in actual operations of

offense and defense" as "little short of grotesque."[93] The Boer War demonstrated that

bicycles were a useful auxiliary to the horse in small units; however, in larger units the

required space around each bicycle led to overly congested roads crowding out other

necessary units.[94]

The British Cavalry prior to World War I

British cavalrymen faced many of the same problems of professionalization and

modernization as their American counterparts. According to Lieutenant Colonel G. F.

R. Henderson, the major British contemporary military theorist, the debate over the

---

[92] "Cavalry at Waterloo," *San Francisco Chronicle,* March 22, 1896, 7; Merritt, "Cavalry," 51-52.
[93] "Is the Cavalry Obsolete?" 13.
[94] D. R. Maree, "Bicycles in the Anglo-Boer War of 1899-1902," *Military History Journal* 4 (June 1977), 13.

future of the cavalry was a "momentous question" from the mid-nineteenth century through the turn of the twentieth century.[95] British cavalry had a far longer mounted tradition than its American counterpart, and this long history affected the British attitude towards reform. British mounted forces had existed for centuries but lacked even the tentative unity attained by the Americans.

Cavalry organization and roles differed greatly in the United States and Great Britain. By the eighteenth century, three distinctive types of cavalry defined by their weight, mission, and equipment existed in Great Britain. Heavy Cavalry, used for shock effect, utilized large horses with soldiers trained to fight mounted, armed with sabers and lances. Light Cavalry conducted reconnaissance, screening, and messenger services using smaller, faster horses and by the early nineteenth century carried both the saber and the carbine (short-barreled rifle). Dragoons were equipped with various weapons and trained to fight either on foot or on horseback. These differences in mission and equipment, however, decreased in importance throughout the nineteenth century.[96] The British also had other mounted troops, including the Yeomanry, Mounted Rifles, Life Guards, Hussars, Household Cavalry, Dragoon Guards, Imperial Yeomanry, and Mounted Infantry, during the late nineteenth century and early twentieth century, to be used either as traditional cavalry or, as occurred more frequently, in dismounted duties using the horse solely as a means of mobility.[97] The different names of regular units stemmed from their use and armament, but by the late nineteenth century, as in the

---

[95] Badsey, *Doctrine and Reform in the British Cavalry,* 1.
[96] Stubbs and Connor, *Armor-Cavalry Part I.*
[97] Anglesey, *History of British Cavalry,* 25, 100, 232, 236. Gray, *Cavalry Tactics*, 5-6.

United States, few of these names remained explanatory. Instead of describing the equipment and roles of the various mounted forces, the labels remained, as British cavalry scholar Stephen Badsey concluded, to feed an "ethos of uniqueness and closeness in a regiment . . . meant to be an important factor in its fighting abilities as well as its institutional existence."[98]

From 1880 until after 1918, the British had thirty-one regular cavalry regiments, raising additional irregular forces when needed. Regular units were loosely divided into four classes: the household, heavy, medium, and light cavalry. The line cavalry, which usually excluded the household class, served either overseas or at home by rotation in the United Kingdom while household cavalry remained in the United Kingdom prior to World War I to protect the sovereign and the royal palaces. All regular cavalry had swords and, except for the Lancers who carried a light ash or bamboo lance, carbines for dismounted service. Historically, the light cavalry was used for non-combat information gathering, scouting, and thwarting enemy reconnaissance as well as skirmishes and pursuit. Light cavalry also participated in independent actions, including cavalry raids during which large bodies of troops entered enemy territory with the aim of inflicting both economic and structural damage but without getting involved in a major conflict. The light cavalry's main strength was its speed over long distances made possible by lightly equipped men on smaller horses. While trained to exploit the charge, that role was historically assigned to the heavy cavalry.[99]

---

[98] Badsey, *Doctrine and Reform in the British Cavalry,* 10.
[99] Ibid., 4-6, 10.

The heavy cavalry used bigger horses and men (sometimes wearing armor) to break through enemy cavalry and infantry formations in cooperation with friendly infantry and artillery. Medium cavalry fell somewhere between the light and heavy type in size and weight of horse and rider. Its uses were less well defined than those of the other types. According to Badsey, by the late nineteenth century little separated light, medium, and heavy cavalry in actual use in part because of the limited numbers of each class. He added that an 1844 War Office regulation "stipulated that all regiments should be capable of carrying out any functions, including both scouting and charging" since there was not enough of any one kind to complete separate exclusive missions.[100]

The British made extensive use of irregular cavalry units in colonial warfare well into the twentieth century to augment regular cavalry.[101] The regular British cavalry did not have the numbers or the training to fulfill all of its obligations. Irregular mounted forces and imperial forces included local volunteers and short-term mounted forces. The main sources of colonial cavalry were the Indian and Egyptian armies.[102] The Indian cavalry during the period of the East India Company, which ended in 1858, was used for scouting (a light cavalry role) while the regular British cavalry regiments performed the battlefield charge. This distinction, Badsey notes, formed "part of the respective ethos" of the heavy cavalry. This difference remained after the Indian army took over the light

---

[100] Badsey, *Doctrine and Reform in the British Cavalry*, 5.
[101] Brian Bond, "Doctrine and Training in the British Cavalry 1870-1914" in *The Theory and Practice of War,* ed. Michael Howard (London: Cassell, 1965), 103.
[102] Badsey, *Doctrine and Reform in the British Cavalry,* 10.

and irregular native cavalry regiments of the East India Company. After 1899, mounted troops from Australia, Canada, and New Zealand also participated in imperial defense.[103]

Volunteer cavalry troops, similar to a militia, also added to the British mounted forces. These "yeomanry," armed with swords and carbines, were paid to train for less than a month a year and could be utilized for home service during incidents of civil disorder or foreign invasion, but by the 1880s, Badsey maintained, "their ceremonial and social functions were seen as more significant than their military value."[104] The number of yeomanry regiments varied throughout 1880-1914 with thirty-eight regiments in 1899 and fifty-seven in 1914.

Throughout the empire, locally raised irregular mounted rifles and light horse units provided a less costly, albeit less well-trained force than regular cavalry units. Mounted infantry supplemented regular cavalry in the First Boer War (1880-1881) and in Egypt (1882). When really pressed, such units were formed simply by issuing a horse to an infantryman. Like the regular cavalry units, the titles of "mounted infantry" and "mounted rifles" were often used loosely and interchangeably, causing confusion. The roles of irregular units were not always easily distinguished from the duties of the regular cavalry as on occasion mounted riflemen and infantry charged on horseback, sometimes using bayonets as swords, or even makeshift lances.[105]

For the regular cavalry to maintain its preeminence over other mounted troops and to prevent their replacement, cavalrymen had to demonstrate that they had

---

[103] Ibid., 11-12.
[104] Ibid., 12-13.
[105] Ibid., 13-14; Brian Bond, "Doctrine and Training in the British Cavalry," 104; Badsey, *Doctrine and Reform in the British Cavalry,* 14.

something unique and essential to offer that these supposedly cheaper units could not. This uniqueness was mobility and the use of *arme blanche* tactics. The *arme blanche* in particular held a central position in cavalry tradition and training in Britain. Ironically, cavalrymen stressed the unique role of the charge when new technologies of modern war called into question this role and the importance of a cavalry predominately trained in this tactic. British military theorists and cavalrymen began to address the new technologies during the 1880s, but they were hampered, unlike their American counterparts, by a lack of firsthand experience with a recent major war that challenged their traditional understanding of the uses of cavalry.

Yet despite the lack of direct experience, Badsey notes that a cavalry reform movement was introducing dismounted tactics before the Second Boer War in 1899.[106] Badsey, who has attempted to rehabilitate the conservative and anti-technological reputation of cavalry officers in the late nineteenth and early twentieth centuries in Britain, states that "reforming cavalry officers worked to create [a] . . . mounted force, proficient both mounted and on foot."[107] Military schools and other academic arenas, including the Royal Military College Sandhurst, the Royal United Service Institution, and the Army Staff College Camberley, provided a forum for officers to debate the future uses of mounted forces. While teaching at the Army Staff College Camberley between 1891 and 1899, Lieutenant Colonel G. F. R. Henderson and other officers

---

[106] Stephen Badsey, "The Boer War (1899-1902) and British Doctrine: A Re-evaluation" *Journal of Military History* 71 (January 2007): 75.
[107] Ibid., 84.

actively debated and tested various possibilities for the organization and use of military

branches including the cavalry by studying recent wars.

Henderson's writings and teaching at the Staff College helped to revitalize the

study of the American Civil War and the functions of a cavalry force that fought both on

horseback and foot. His work was a direct response to those who ignored changes in

cavalry tactics and who had forgotten the bloody and ineffectual charges of the Franco-

Prussian and earlier wars. [108] According to Bond, Henderson believed that the accession

of the "uniform loving cavalry devotee" Wilhelm II in Germany had caused military

thought in Europe to revert to old theories of employment, ignoring or rejecting the

newer dismounted tactics associated with American warfare. Bond argued that

Henderson's studies "persuaded him increasingly that it was firepower which provided

the key to the 'unorthodox' cavalry tactics in the Civil War; and he therefore gave his

considerable influence to the encouragement of the use of dismounted action and

firepower by British cavalry."[109] Henderson's arguments were not persuasive enough

for many cavalrymen to accept completely. A passionate debate over the correct

primary role for British Cavalry—fighting as mounted infantry or utilizing sword and

lance *en masse* in the *arme blanche*—waged on throughout the early twentieth

century.[110]

While debate proceeded over the future missions of the cavalry, the Second Boer

War provided new firsthand experience for the cavalry and became an opportunity to test

---

[108] Bond, "Doctrine and Training in the British Cavalry," 104-105.
[109] Ibid. See also Brian Holden Reid, "'A Signpost That Was Missed?': Reconsidering British Lessons from the American Civil War," *Journal of Military History* 70 (April 2006): 397.
[110] Reid, "A Signpost That Was Missed," 412.

new tactics. Despite utilizing both mounted and dismounted tactics, the British regular

cavalry did not accomplish much. Insufficient troops hampered operations during the

war. The British regular cavalry was not large enough even at the beginning of the war

to accomplish all of its duties. Mismanagement of these forces caused additional

problems. Frequently, commanders overextended the limited numbers of cavalry prior

to battles. Extensive screening in usually fruitless reconnaissance left them too

weakened to provide much assistance on the field of battle. Even when the cavalry was

not frittered away on scouting missions, it was ordered out for every alarm during the

night, which prevented it from regaining its strength. According to the *History of British

Cavalry,* both regular and irregular cavalry also lacked unit cohesion because "each was

more often than not split up into numerous parts and distributed *ad hoc*, amongst the

various columns."[111]

The use of British irregular forces to compensate for the insufficient number of

regular cavalry units masked British cavalry reforms. These irregular mounted forces

included the colonial Imperial Yeomanry and Mounted Infantry, which played a larger

role in the conflict than regular forces.[112] The major difference between regular forces

(including the Indian cavalry and yeomanry) and irregular cavalry (including mounted

rifles or light horse) was not tactics but training.[113] Badsey described the training for the

regular cavalry as including the "close order or 'knee-to-knee' charge . . . in which the

enemy was faced with an apparently solid wall of onrushing horsemen." Although "hard

---

[111] Anglesey, *History of British Cavalry,* 163, 232.
[112] Ibid., 25; Bond, "Doctrine and Training in the British Cavalry," 108.
[113] Badsey, *Doctrine and Reform in the British Cavalry,* 15.

to learn and execute" the charge was touted as "the pinnacle of the cavalry's achievements" and was "critical to cavalry ethos and doctrine."[114] Though rarely used, senior cavalrymen including Henderson and John Denson Pinkstone French viewed training in this tactic as vital to the morale of the regular cavalry and its cavalry spirit.[115] The charge separated the cavalry from other mounted troops. This was not the only form of charge available to mounted troops; indeed, Badsey notes that many contemporaries "confused the wide variety of charging tactics available to the cavalry with this single spectacular manoeuvre" and treated the cavalry and this form of charge as indivisible.[116] The irregular cavalry was capable of other types of charges, such as those with more open formations, but not the classic form, lacking both the equipment such as the appropriate heavy mounts and the training to complete this complicated maneuver.

Like the regular cavalry, the tactics of the irregular mounted forces also varied widely. For example, the Imperial Yeomanry often performed like the regular cavalry, as mounted infantry, or as mounted rifles (a combination of the previous two categories).[117] An additional challenge to the cavalry's mounted role came about during the Boer War. After 1886, bicycles appeared as a possible substitution for the horse and Great Britain began experimenting with cyclist units. Cyclists first appeared in Britain in the yeomanry and were far cheaper than horses. Bicycles proved their worth in the Boer War. By 1914, the bicycle had clear military uses and promised great savings in

---

[114] Ibid., 15.
[115] Anglesey, *History of British Cavalry,* 408.
[116] Badsey, *Doctrine and Reform in the British Cavalry,* 15.
[117] Anglesey, *History of British Cavalry,* 100.

upkeep over horses. Nonetheless, bicycles were not without problems, including the requirement for riders to produce their own motive power, drastic reduction in maximum speeds in bad weather, and the need for roads or level ground for operation. Instead of replacing the horse cavalry in a significant way, bicycles combined with cavalry to make up divisional mounted troops.[118]

The Boer War was a mixed experience for British mounted troops, and as a result, officers took various, and sometimes contradictory, lessons from it.[119] Extensive use of irregular mounted forces sparked intense debates about their future. Should mounted infantry and mounted rifleman continue to exist? Could irregular forces perform the duties of the cavalry more cheaply? Did Britain require a regular cavalry force at all? These questions were tied to the larger reform and reorganization of the British Army in the early twentieth century.[120]

Army reforms from 1902-1914 tried to address new technological developments and the deficiencies of army organization and doctrine revealed during recent colonial warfare. Historians agree that many of the reforms prior to the First World War were also shaped by fiscal restraint.[121] Among these reforms were the abolition of the commander-in-chief's post, the creation of the Army Council, a reorganization of the War Office, the creation of the general staff, and the publication of field service regulations. The first common written doctrine for the entire army, *Field Service Regulations, Part II—Administration,* appeared in December 1908, and with the training

---

[118] Badsey, *Doctrine and Reform*, 76-77, 234-35; Maree, "Bicycles in the Anglo-Boer War," 13.
[119] Bond, "Doctrine and Training in the British Cavalry," 110.
[120] Badsey, *Doctrine and Reform in the British Cavalry*, 2.
[121] Marquess of Anglesey, *A History of British Cavalry,* vol. 4, *1899-1913* (London: Secker and Warburg, 1986), 382-83.

manual for all arms *Field Service Regulations, Part I—Operations* formed what the Marquess of Anglesey called the "standard rule book for the conduct of a major war."[122] An additional major reform that helped to professionalize the cavalry was the founding of the Cavalry School at Netheravon House on Salisbury Plain in 1904.[123] This school, like those in the United States, did not end debate over what roles the cavalry could or should fill.

Though it started over the "relative merits of mounted action with the *arme blanche* and dismounted action with the rifle," the "Great Cavalry Debate" (a name bestowed in 1986 by the Marquess of Anglesey, the author of the multi-volume work *The British Cavalry*) also questioned whether strategic reconnaissance and protection duties were more important than previously thought.[124] Anglesey argued that tactically the cavalry remained the "chief means of mobility, while its strategic value in reconnaissance, raids and protective duties" was thought by contemporaries to "increase as armies and battle fronts both expanded."[125]

Those debating the future composition of the cavalry not only included military theorists, cavalrymen, and soldiers, but also senior British government figures.[126] Every senior British Army officer was expected to have an opinion on this doctrinal issue.[127] Senior army officers including Sir John D. P. French, Sir Douglas Haig, Sir Ian Hamilton, Lord Roberts, F. N. Maude, W. H. Birkbeck, Sir Horace Smith-Dorrien, Sir

---

[122] Ibid., 376, 386.
[123] Ibid., 428.
[124] Anglesey, *History of British Cavalry,* 25-26. See also Bond, "Doctrine and Training in the British Cavalry," 99.
[125] Bond, "Doctrine and Training in the British Cavalry," 99.
[126] Badsey, *Doctrine and Reform in the British Cavalry,* 3.
[127] Ibid.

Henry Wilson, and Sir Henry Rawlinson debated the issues in various professional journals, newspapers, magazines, and monographs. Published discussion about the future of the cavalry and technology proliferated between the end of the Second Boer War and the outbreak of the Great War in 1914.[128]

Advances in weaponry increased the amount of firepower that cavalry could employ but also increased the amount of firepower that could be used against cavalry. Among the options for the cavalry to survive against increased firepower, according to Badsey, was to improve the mounted charge's chance of success.[129] One possibility was "saddle fire" in which mounted soldiers shot their firearms while remaining in the saddle. Another alternative was for the cavalry to dismount with a firearm and briefly become infantry. Like the Americans, the British tried combinations of the two options.[130] Arming all cavalry with carbines and training them to fight dismounted would radically alter traditional concepts of the cavalry. Many members of what Anglesey called the "old school" of cavalry, who supported the continued use of shock action at every conceivable opportunity, such as Lieutenant-Colonel Henry de Beauvoir de Lisle (later commander of the 1st Cavalry Division in the First World War), however, believed that the cavalry could fight well both mounted and dismounted, citing recent colonial campaigns.[131] Although British reformers knew that the American cavalry

---

[128] Books included John Formby, *Cavalry in Action in the Wars of the Future* (London: H. Rees, 1905); Friedrich von Bernhardi, *Cavalry in Future Wars* (London: John Murray, 1909); Friedrich von Bernhardi, *Cavalry in War and Peace* (London: H. Rees, 1910); Erskine Childers, *War and the Arme Blanche* (London: E. Arnold, 1910); Erskine Childers, *German Influence on British Cavalry* (London: E. Arnold, 1911).
[129] Badsey, *Doctrine and Reform in the British Cavalry*, 2.
[130] Ibid.
[131] Anglesey, *History of British Cavalry,* 256, 394, 413.

could fight both mounted and on foot, some doubted that the cavalry could be adequately trained to fight equally well mounted or dismounted.[132] The Earl of Dundonald argued that "theoretical training in both *arme blanche* and riflemanship would in practice mean the perpetuation of the former" because of the historical connection with training the cavalry in the charge.[133]

Much of the discussion differed as a matter of degree not kind, but nonetheless became heated. A passionate debate grew over whether the sword or the rifle should be the cavalry's primary or secondary weapon. Would making the rifle the primary weapon of the cavalry lead cavalrymen to dismount in all conditions, irrespective of the situation, thus making them no longer cavalrymen but mounted infantrymen? Engineer Frederick Natusch Maude warned that "the evil…begins when the soldier is taught to rely on the firearm, not on the sword; for then he begins to look on the horse as a mere means of locomotion, and not, as it really is, an essential part of the ultimate cavalry unit.'"[134] Few participants on any side of the debate rejected the future value of either the *arme blanche* or dismounted fire action. Yet they violently contested the emphasis placed on each.

The arguments over how mounted troops should be equipped led to debates over the impact of changes in armament or tactics on the "Cavalry Spirit."[135] Despite the assumption that the battlefield charge would rarely be used in the future, many cavalrymen still believed that the charge was so vital to its branch's identity that it must

---

[132] Badsey, *Doctrine and Reform in the British Cavalry,* 2.

[133] Bond, "Doctrine and Training in the British Cavalry," 108.

[134] Quoted from Frederick Natusch Maude, *Cavalry: Its Past and Future* in Anglesey, *History of British Cavalry*, 404.

[135] Ibid., 26.

remain the principal tactic no matter how infrequently used. Many traditional cavalrymen believed that cavalry spirit, defined as the ethos, doctrine, and self-identity of the regular cavalry units, was tied to the charge. Yet Lord Frederick Roberts, commander-in-chief of the British Army from 1900-1904, and often cited as a leader of the "new school" of cavalry reformers by cavalry scholars, rejected that claim in the preface of a the new manual, *Cavalry Training,* issued in 1904. Roberts wrote, "instead of the fire-arm being an adjunct of the sword, the sword must henceforth be an adjunct of the rifle." The fierce and quick negative response to this controversial statement forced the Army Council to defer publication of the new manual.[136] *Cavalry Training* was eventually published officially but without the preface. Roberts refused to back down and published his opinions elsewhere, including within Erskine Childers' *War and the Arme Blanche*.[137]

Officers' opinions on the main cavalry duties varied at the new cavalry school and throughout the branch. Inspector-General of the Cavalry Robert Baden-Powell believed that cavalry existed to assist the infantry to win battles, first by destroying the opposing cavalry, second by locating the enemy's main force, third by assisting on the battlefield, and lastly by turning a defeat into a rout. Anglesey broke down Baden-Powell's description further by noting that the cavalry's strategic duties included covering the army's front, finding "the enemy's main force and concealing their own," and "threaten[ing] the enemy's communications and forc[ing] him to waste strength in defending them." Tactically, the responsibilities of the cavalry were "to destroy the

---

[136] Bond, "Doctrine and Training in the British Cavalry," 111-12.
[137] Childers, *War and Arme Blanche*, v-xvi*;* Bond, "Doctrine and Training in the British Cavalry," 116.

enemy's cavalry; to keep the infantry informed and protected; to cut off and hold the

enemy; to chip in where required on the battlefield; to smash up the enemy in pursuit or

to protect one's own side from pursuit." Henderson, on the other hand, stated that

reconnaissance was the foremost function followed by threatening "the enemy's line of

retreat."[138]

In 1907, the Director of Military Training on the General Staff at the War Office,

Douglas Haig, provided "what was, effectively, the official definition of the tasks of the

cavalry." It focused not on battlefield roles for cavalry but its support functions:

reconnaissance, security, scouting, orderly work, and communications. Haig divided

cavalry into the Independent, Protective, and Divisional Cavalry. Independent cavalry

conducted strategic reconnaissance under direct order of the chief. Protective cavalry

provided the "First Line of Security for the Army as a whole." Divisional cavalry

scouted for nearby infantry divisions, provided communication services, and acted as

orderlies between divisions.[139] A few years later, Haig added classifications of

observation and reconnaissance cavalry with the former stationary and the latter

mobile.[140]

Despite these differing definitions of duties and roles, all cavalry officers

believed that the cavalry and all other mounted units required more training. During the

combined maneuvers of 1903, Roberts reported, "one of the points brought prominently

---

[138] G. F. R. Henderson, *The Science of War-A Collection of Essays and Lectures, 1891-1903* (London: Longmans, 1933), 77, quoted in Anglesey, *History of British Cavalry,* 431.

[139] Douglas Haig, *Cavalry Studies: Strategical and Tactical* (London: H. Rees, 1907), 3, quoted in Anglesey, *History of the British Cavalry,* 431.

[140] "Notrefe" [Douglas Haig], *Cavalry Taught by Experience: A Forecast of Cavalry under Modern Conditions* (London: H. Rees 1910), 40-42, quoted in Anglesey, *History of the British Cavalry,* 431.

to notice was the want of sufficient training in scouting and reconnoitring—two of the most important duties of the cavalry soldier."[141] This weakness became more apparent during the 1910 annual maneuvers on Salisbury Plain.

Yet this exercise did not simply alert army leaders to a want of cavalry training. It also marked the first military testing of aeroplanes in Britain for scouting and reconnaissance when Captain Bertram Dickson of the Royal Horse Artillery flew a Bristol machine. [142] A new technology was challenging the reconnaissance and scouting functions of the cavalry, even as mounted forces outside of the regular British cavalry threatened the other roles of the cavalry.

While aircraft began to make progress in reconnaissance and scouting, British cavalrymen remained divided over the vision of their branch's future. The British cavalry's internal problems greatly hindered its ability to fight a united battle against the outside danger of aviation taking over its reconnaissance role as cavalrymen focused on the seemingly more pressing internal issues of training, tactics, and equipment. Training, tradition, and the popular press concentrated on the more exciting and glamorous *arme blanche*, to the detriment of reconnaissance and despite the attempts of Roberts and some of his contemporaries. Sneaking small groups of cavalry to locate the enemy contrasted poorly with the colorful dress and flashing swords pictured by many inside and outside the military. Reconnaissance, raiding, screening, and the like also did not clearly demonstrate a need for a specialized cavalry. Perhaps only mounted infantry

---

[141] [Official] *Report on Combined Manoeuvres,* September 1903, quoted in Anglesey, *History of the British Cavalry,* 437.
[142] Anglesey, *History of the British Cavalry,* 444.

would be needed in the future. Military histories and contemporary articles treated cavalrymen as brave chargers deciding battles, not quiet creepers supplying vital information. The charge was so central to the identity of British cavalrymen and fueled their branch's unity (cavalry spirit) that reconnaissance usually occupied only a secondary role in debates. Aviation was thus able to appropriate much of the British cavalry's reconnaissance and scouting functions before many cavalrymen accepted them as one of the mounted branch's most important duties.

Conclusion

Before the turn of the twentieth century, American and British cavalrymen tried to modernize their branches by keeping up with changing military conditions, including a variety of possibly revolutionary technologies. British and American cavalrymen actively participated in reforms before 1903 to meet the demands of modern warfare through the professionalization of their branches through the creation of professional service schools and associations, analyzing military history and recent conflicts, and producing journals. American and British cavalrymen did differ in their opinions about the roles and armaments of their branch. Their differences reflected the differences between their nations and cultures. The American cavalry was a much younger and more flexible force. During its short history, it had been utilized mostly as a dragoon force equally comfortable fighting mounted or dismounted. British cavalrymen were members of a service that had existed for centuries and had built their pride and spirit

around their use of the knee-to-knee charge. Although they were trying to reform themselves to address modern war conditions, debates remained.

The differences between the American and British cavalries were not static but continually changing and constantly under discussion. Recognizing the need to adjust to modern conditions, the cavalries of the United States, Great Britain, and much of the rest of the western world, broadly shared ideas across national borders through exchanges in personnel, visits, reprints and translation of articles, and books about the cavalry's future. Examining how commanders utilized the cavalry in previous wars, particularly the American Civil War, the Second Boer War, and the Russo-Japanese War, remained one of the most popular ways of identifying and discussing future roles. Military theorists in Great Britain and the United States gleaned different lessons from these wars, which had a significant impact on how each country planned to use their cavalry in the future and how they responded to aeroplanes.

CHAPTER III

THE BIRTH OF AND EARLY RESPONSE TO HEAVIER THAN AIR

FLIGHT: THREATS IN THE PRESS AND CAVALRY REACTION 1903-1917

Just as the cavalries of the United States and Great Britain reformed themselves

to address the new technological, tactical, and doctrinal challenges of modern warfare,

skeptics in the popular and military presses questioned the branch's ability to survive

against aeroplanes. Historian Roman Jarymowycz observed that the "airplane, with the

tank, were kindred specters of a revolution that would eventually conspire to remove

cavalry from modern war."[1] However, in 1903, the latter did not exist and the former's

technological limitations and lack of defined roles prevented it from replacing the well-

established cavalry branch immediately. The overthrow of the horsed cavalry took time

and did not appear obvious or inevitable to many military officers prior to, during, or

even after the First World War. Suspicion of the cavalry's demise grew, however, as

aviation technology advanced at a dizzying pace between 1903 and 1914. Within five

years of the first heavier-than-air flight, the aeroplane had become a new technology

threatening the traditional utility and value of the cavalry.

Historians have produced excellent studies about the enthusiasts who

unquestioningly embraced the aeroplane, but far less is known about the "technological

naysayers," the realists who questioned the wild predictions of aviation proponents.[2] By

---

[1] Roman Jarymowycz, *Cavalry from Hoof to Track* (Westport, CT: Praeger, 2008), 131.
[2] Joseph J. Corn, ed., *Imagining Tomorrow: History, Technology and the American Future* (Cambridge, MA: MIT Press, 1986), 224. For descriptions of aviation proponents and their predictions see Charles DeForest Chandler and Frank P. Lahm, *How Our Army Grew Wings: Airmen and Aircraft Before 1914*

analyzing the early years of military aviation through the initial stages of the First World War, this chapter examines what historian of technology Joseph Corn would call a group of the "minority of commentators," cavalrymen and others who sounded a "note of caution and skepticism amidst the din of unrestrained prophecy greeting the airplane." When cavalrymen judged the value of aeroplanes and their potential impact on cavalry and other military forces, cavalrymen were not universally or even predominately opposed to aeroplanes or "negative toward the invention's impact."[3] Cavalrymen enumerated the innovation's limitations, dismissing the most outrageous claims, but they also envisioned how cooperation with and utilization of aeroplanes would benefit their branch. Perhaps a better moniker for this group is "cautious technological examiners" rather than Corn's more negative "naysayers" since many cavalrymen welcomed the introduction of aviation into the military.

As with the creation of cavalry services and the reforms that followed examined in Chapter Two, the United States and Great Britain took slightly different paths in their response to aviation development's effect on cavalry. Their discrete routes stemmed from their dissimilar perspectives on the cavalry's roles in modern warfare, divergent public opinion, their unique experience with aviation, their cavalry history and organization, their country's geographic position, and each nation's contemporary

---

(New York: Ronald Press, 1943); James J. Cooke, *Billy Mitchell* (Boulder, CO: Lynne Rienner, 2002); Michael Paris, *Winged Warfare: The Literature and Theory of Aerial Warfare in Britain, 1859-1917* (Manchester, UK: Manchester University Press, 1992); James Tobin, *To Conquer the Air: The Wright Brothers and the Great Race for Flight* (New York: Free Press, 2003); Robert Wohl, *A Passion for Wings: Aviation and the Western Imagination, 1908-1918* (New Haven, CT: Yale University Press, 1994); and Robert Wohl, *The Spectacle of Flight: Aviation and the Western Imagination, 1920-1950* (New Haven, CT: Yale University Press, 2005).

[3] Joseph J. Corn, *The Winged Gospel: America's Romance with Aviation, 1900-1950* (New York: Oxford University Press, 1983), 43.

military situation. American cavalrymen writing primarily in the *Journal of the United States Cavalry Association* were more critical of aircraft than their British counterparts before the First World War. Yet prior to and shortly into the Great War, the American and British cavalries' responses to the aeroplane and its ability to take over cavalry duties demonstrated that they were composed of rationally cautious personnel. Some cavalrymen even welcomed aviation as a replacement for or supplement to what they considered the less prestigious cavalry functions, once aeroplanes became developed enough to fill these roles.

The maturation of military aviation proved a gradual, and uncertain process that took decades. As noted by technological scholar David Edgerton, innovations co-exist with older forms for years or decades prior to replacing them.[4] During the early years of military aviation (defined here as 1908-1917), aviation and ground forces worked together to study their respective strengths and weaknesses in efforts to produce the most efficient military service. This cooperative relationship was not always apparent to those outside of the military, and even, in some cases, to those inside. This lack of visibility fueled debates in the press about the appropriate rate of development of aviation and the amount of appreciation military personal had for aircraft.

---

[4] David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (New York: Oxford University Press, 2007). See also Eric Schatzberg, *Wings of Wood, Wings of Metal: Culture and Technical Choice in American Airplane Materials, 1914-1945* (Princeton, NJ: Princeton University Press, 1999).

Origins of American Military Aviation

The American social reaction to the aeroplane has been well documented by a number of aviation historians, most notably Joseph Corn.[5] According to Corn, from the late nineteenth century until the 1960s, "it had been common to think of machines as ushering in a better tomorrow, even utopia."[6] Aeroplanes were one of the most welcomed of these new technologies. Corn argued that the American public's faith in aviation raised aviation to the status of a secular religion. Starting around 1910, "they worshiped the airplane as a mechanical God and expected it to usher in a dazzling future."[7] In an era when Americans "viewed mechanical flight as portending a wondrous era of peace and harmony, of culture and prosperity," any group opposed to or preaching caution could easily be accused of backwardness and conservatism.[8] The military had a reputation as one of these groups.

The birth of American military heavier-than-air aviation followed a few years after Wilbur and Orville Wright's first successful 1903 flights. The U.S. government initially refused the Wright brothers' offer to purchase their aircraft or designs. This brief delay resulted from the unsuccessful and costly experiment of Samuel P. Langley, the Secretary of the Smithsonian Institute, whose work on heavier-than-air flight ended with a crash in the Potomac River two months prior to the Wright brothers' first effective flight. This experiment cost the War Department $50,000 and made the

---

[5] Corn, *Winged Gospel*.
[6] Corn, *Imagining Tomorrow*, 2.
[7] Corn, *Winged Gospel,* 135. For additional discussion on the religious treatment of aviation by Americans, see Wohl, *Passion for Wings* and Wohl, *Spectacle of Flight*.
[8] Corn, *Winged Gospel,* vii.

government wary of new investments in aviation.[9] According to Lieutenant Frank Purdy Lahm of the 6th Cavalry, who was detailed to aeronautical duty by the War Department in August of 1907, President Theodore Roosevelt did not pay much attention to Lahm's initial suggestion to buy the Wrights' patent. Handwritten remarks written by Lahm on his proposals noted that when Brigadier General James Allen called the president's attention to the document, "he threw up his hands indicating it was too long for him to read."[10] The Wrights then tried to sell their product to the governments of Britain, France, and Germany between 1905 and 1908 but failed to agree to terms with any of the nations despite extensive negotiations.[11]

Although they failed to come to mutually beneficial terms with European governments, the Wrights found the American government more receptive after European nations showed increasing interest in acquiring aeroplanes. The United States War Department responded by establishing an aeronautical division in the Office of the Chief Signal Officer of the United States Army in July 1908.[12] Following a few demonstration flights, the army purchased and received a Wright aeroplane in 1909.

[9] Herbert A. Johnson, *Wingless Eagle: U.S. Army Aviation through World War I* (Chapel Hill: University of North Carolina Press, 2001), 12; Harold Hinton, *Air Victory: The Men and the Machines* (New York: Harper and Brothers, 1948), 5; John H. Morrow, Jr. *The Great War in the Air: Military Aviation from 1909 to 1921* (Washington, DC: Smithsonian Institution Press, 1993), 4.

[10] *Appendix No. 1 Army Officers Ordered to Aeronautical Duty, Chronologically Arranged,* n.d., Call # 167.401-10, 1909-1939, IRIS # 00120709, in Frank Purdy Lahm's Collection 1913-1939, Air Force Historical Research Agency (AFHRA), Maxwell, AFB AL; and Frank Lahm, no title-summary of military aeronautics plan, February 3, 1909, Call # 167.601-30, IRIS # 1010118, in Correspondence File, General Lahm 1907-1943, AFHRA, Maxwell, AFB AL.

[11] Morrow, *Great War in the Air,* 4.

[12] United States Air Corps Tactical School, *Observation Aviation March 1930* (Langley Field, VA: Air Corps Tactical School, 1930), 1; I. B. Holley, Jr., *Ideas and Weapons* (New Haven, CT: Yale University Press, 1953), 6, 27.

The army's first aeroplane, designated Signal Corps No. 1, flew several times in

Virginia and Maryland before it was shipped, along with First Lieutenant Benjamin D.

Foulois, to Fort Sam Houston, Texas for further testing. Foulois had minimal experience

with aviation, but that was more than any of his army contemporaries, perhaps excluding

Lahm. Foulois had both flown balloons and ridden as a passenger in aeroplanes.

According to Foulois, he received simple instructions for testing. Army Chief Signal

Officer General James Allen ordered him to "evaluate the airplane…take plenty of spare

parts—and teach yourself to fly."[13] The logbook detailing the flights and repairs of the

twenty-five-horse power, four-cylinder engine, pusher plane with two chain-driven

propellers testifies to the difficulty of the task assigned. Early tests consisted of shaky

takeoffs and dangerous landings with only brief flights in between. Signal Corps No. 1

crashed frequently, resulting in expensive damage to the plane but fortunately only

minor injuries to the pilot. However, continuous repairs and alternations to the

aeroplane quickly consumed the $150 allocated by the government for this purpose.

Foulois provided an additional $300 from his own personal funds to keep the aircraft in

working order. It took a long period of trial and error for this early aviator and his

mechanics to learn to pilot and fix their new equipment.[14]

American aviation progressed slowly, much to the chagrin of Foulois. Within a

year of receiving the first military plane, Foulois had begun testing it as a reconnaissance

platform, which he was able to demonstrate during the 1912 summer Connecticut

---

[13] Benjamin D. Foulois and C. V. Glines, *From the Wright Brothers to the Astronauts: The Memoirs of Major Benjamin D. Foulois* (New York: McGraw-Hill Book, 1968), 2.
[14] Foulois and Glines, *From the Wright Brothers*, 4-5.

Maneuvers.[15] Despite his successes, the U.S. Army had only six active aviators and fifteen planes by the summer of 1913. All were acquired for the purposes of reconnaissance and artillery spotting. Meager appropriations had blocked attempts to increase this force. The Secretary of War's request for $2 million in 1912 to build a force of 120 planes to become competitive with European powers yielded a Congressional appropriation of only $125,000.[16]

Despite issues with finances, aeroplanes gained an official organization and began to receive recognition in regulations shortly before the 1914-1916 Mexican border troubles and the First World War. In July 1914, federal law created the aviation section of the Signal Corps and the March 1914 *Field Service Regulations* "included using the single aero squadron for reconnaissance in advance of the cavalry."[17] By the time the United States entered the Great War in the spring of 1917, military aviation consisted of sixty-five officers, 1087 men, and "fifty-five obsolete airplanes fit only for training purposes."[18] This deficiency of material did not reflect a lack of interest in aviation's potential. American officers continued to observe and comment on the use of airplanes in the Balkan wars and in the opening years of World War I. The poor equipment and dearth of personnel that plagued aviation before the Great War changed drastically when the United States entered the conflict.

---

[15] Major B. D. Foulois to Lieut. General Robert L. Bullard, *Personal Service Record for Period 1898-1919,* October 14, 1919, Call # 168.68-5, 1898-1919, IRIS # 00125307, in B. D. Foulois Papers, AFHRA, Maxwell, AFB AL.

[16] Morrow, *Great War in the Air*, 49.

[17] Ibid., 49-50.

[18] *Observation Aviation,* 1.

Early British Military Aviation

Unlike the American public, the British public did not believe that aeroplanes would create a peaceful utopia but saw the aeroplane as a threat to its nation's security by eliminating the historical defense of the English Channel. Lord Northcliffe, the great newspaper magnate, summed up the danger when he stated "England is no longer an island."[19] Alfred Gollin thought the phrase so accurate that he used it for the title of his book, *No Longer an Island,* in which he examined the British response to the Wright Brothers and their invention.[20] Geographer Peter Hugill echoed Gollin's work noting that the "moat defensive" previously employed against sea power nations would no longer be adequate to defend the country.[21] Having a strong navy meant little if the enemy could simply soar above ships lacking anti-aircraft defenses and reach the mainland. Gollin's second book on this topic, *The Impact of Air Power on the British People and Their Government, 1909-14,* explored the British government's dangerously slow development of aviation in light of the aerial developments in neighboring countries (particularly Germany). He also highlighted aviation enthusiasts' campaigns to rouse the public and government to the danger of lacking airships and aeroplanes. The press initiated various scare campaigns including articles that highlighted the danger of German airships flying over Britain, exaggerating the actual danger to the public.[22]

---

[19] Alfred Gollin, *No Longer an Island: Britain and the Wright Brothers, 1902-1909* (Stanford, CA: Stanford University Press, 1984), 2.

[20] Ibid., 433.

[21] Peter J. Hugill, *Global Communications since 1844: Geopolitics and Technology* (Baltimore, MD: Johns Hopkins University Press, 1999), 10.

[22] Alfred Gollin, *The Impact of Air Power on the British People and Their Government, 1909-14* (Stanford, CA: Stanford University Press, 1989). See also Alfred M. Gollin, "England is No Longer an Island: The Phantom Airship Scare of 1909," *Albion: A Quarterly Journal Concerned with British Studies*

Historian Joseph Corn was correct that "ignorance" of the aeroplane "fostered exaggerated expectations" in the United States, and so perhaps a similar ignorance produced inflated fears in Great Britain.[23]

Despite the predicted danger from the air, when the lead in aviation development shifted from the United States to Europe it did not go to the British. The British lagged well behind other nations in military heavier-than-air craft. When comparing Britain and France's aeronautical development in September 1911, one British reporter commented, "any comparison of the aeronautical work in France and England at the present moment is humiliating for ourselves."[24] The British, however, kept track of the military innovations occurring in Europe, particularly in France and Germany.

The British delay in the development of aircraft, an air force, and air defenses resulted from a combination of factors but not from an inability to recognize the value of aviation. Differing opinions held by government officials and the public on the best path to follow hindered development. While civilian aviation enthusiasts learned to build and fly aeroplanes by copying their contemporaries, some British officials, most notably Secretary of State for War Richard Burdon Haldane, wanted to create a "real scientific Department of State for the study of aerial navigation" separate from and independent of foreign developments.[25] The debate, however, was much more than an academic dispute between different philosophies of progress. According to David Edgerton, "it was

13, no. 1 (Spring 1981): 43-57; and W. Michael Ryan, "The Invasion Controversy of 1906-1908: Lieutenant-Colonel Charles a Court Repington and British Perceptions of the German Menace," *Military Affairs* 44, no. 1 (February 1980): 8-12.

[23] Corn, *Imagining Tomorrow*, 222.

[24] Charles C. Turner, "Aeronautics," *Observer,* September 17, 1911, 11.

[25] Gollin, *Impact of Airpower*, 4.

concerned also with the balance between public and private effort and between the concentration and diffusion of effort."[26]

Haldane's desire to create a more scientific method for developing aviation, replete with a technical committee organized to analyze the problems of flight, garnered criticism from contemporaries. Lord Northcliffe, the great newspaper proprietor, desired a more pragmatic development based on the purchase and testing of already functional foreign aircraft.[27] Arthur Lee, chairman of the Parliamentary Aerial Defence Committee, desired to merge Haldane's and Northcliffe's plans to create an integrated approach to aviation research and development that utilized both distinguished scientists as well as "really practical aeronauts." He accused Haldane of being "very much enamoured of," perhaps just short of "hypnotised by," science. Conceding that pure science "is very well in its way," Lee argued that in the case of aviation development, science "is of more value when diluted by a good deal of practical experience."[28] Still others rejected all approaches to aviation development arguing that aircraft would not be helpful to the military. The most notable member of this small group was the chief of the general staff, General Sir William Nicholson. Nicholson maintained that aircraft of any type would not be of much use to the army.[29] This opinion did not garner support or prevent the continuing development of heavier-than-air craft.

Ultimately, British aeroplane development included all of the above strategies to a greater or lesser extent. Initially, the military tried Northcliffe's practical experiments

---

[26] David Edgerton, *England and the Aeroplane: An Essay on a Militant and Technological Nation,* (London: University of Manchester, 1991), 6.
[27] Gollin, *Impact of Airpower*, 4.
[28] *Naval and Military Aeronautics*, Hansard HC Deb 02, August 1909, vol 8, col. 1574.
[29] Gollin, *Impact of Airpower,* 12.

with existing aircraft. Tests by aviation pioneers A. V. Roe, Samuel Franklin Cody, and

John William Dunne, flying both triplanes and biplanes in 1908 and 1909, resulted in

repeated failures. The War Office had employed Cody and Dunne to create an army

aeroplane in secret, but they failed to keep pace with other nations' developments.[30]

Haldane, objecting to the very nature of the testing not just its difficulties, declared Cody

and Dunne's investigations into powered flight as "not properly scientific" and fired

them in 1909. Instead, the secretary of state for war began initiating his plan to create a

system of scientific development. After removing Cody and Dunne, Haldane hired

Mervyn O'Gorman, a well-known consulting engineer, to run the Army Aircraft

Factory.[31] This hire and new system seemingly only hampered the developmental

progress by adding panels and meetings, but very little practical trial and error.

Impatient, the army turned to a private citizen to buy its first two planes, Farmans in

1910. Although sources are unclear, these planes were most likely "Longhorn" pusher

bi-planes.[32]

        The nation's attachment to airships also hindered British development of

aeroplanes. Financially, Britain had already deeply invested in airship research and

technology. This resulted in a continued preference and concentration on the proven

technology of airships.[33] In 1909, the Advisory Committee reported to the House of

Commons that while both aeroplanes and airships were assigned to the army for

---

[30] Hugh Driver, *The Birth of Military Aviation: Britain, 1903-1914* (Suffolk, UK: Boydell, 1997), 26-27; Ben Mackworth-Praed, ed. *Aviation the Pioneer Years* (Secaucus, NJ: Chartwell Books, 1990), 137.
[31] Edgerton, *England and the Aeroplane*, 4.
[32] Morrow, *Great War in the Air,* 21.
[33] Ibid.

experimentation they were to give their "first attention to the dirigible."[34] Some

supporters of airships, such as aviation expert and defender of the dirigible Major H.

Bannerman-Phillips, praised the "enthusiasm, labour, and ingenuity" spent on aircraft

but warned against the temptation to confuse an admiration and sympathy for an

inventor's "daring and determination" with the value of aeroplanes. Writing in a service

journal, Bannerman-Phillips concluded that aeroplanes "remain interesting scientific

toys, of little or no practical value for purposes of war."[35] On August 3, 1909, eleven

months after Bannerman-Phillip's article, the *Manchester Guardian* reported that the

House of Commons also believed that "aeroplanes [were] of little use at present" for

army purposes. However, members of parliament thought that heavier-than-air craft

might be used to conduct reconnaissance once they "achieve[d] higher altitudes and

gain[ed] greater reliability and control."[36]

The divided commitment between airships and aeroplanes manifested itself in

February 1911 when the Royal Engineers Air Battalion was established. It consisted of

two companies, divided by type of aerial vehicle, one airship and one aeroplane. The

airship unit possessed two airships and initially the aeroplane company consisted of five

planes of various types, including a Bleriot, [Wright] Flyer, Farman, and Paulhan.[37]

Reflecting a slight preference, pilots trained first in dirigibles, then heavier-than-air

---

[34] "House of Commons," *Manchester Guardian*, August 3, 1909, 6. For more on value of aeroplane compared to the dirigible or airship in Britain, see "The New Instrument of War," *Living Age,* November 12, 1910, 441.

[35] H. Bannerman-Phillips, "The Future of Airships in War," *United Service Magazine* 37 (September 1908): 589.

[36] "House of Commons," 6.

[37] Dimitar Nedialkov, *Genesis of Airpower* (Sofia, Bulgaria: Pensoft, 2004), 178; Eric Lawson and Jane Lawson, *The First Air Campaign: August 1914-November 1919* (Conshohocken, PA: Combined Books, 1996), 22; Michael Taylor, *Jane's Fighting Aircraft of World War I* (1919; repr., London: Random House, 2001), 28.

craft.[38] Additional organizational changes followed. The Technical Subcommittee of the Committee of Imperial Defense founded to study the aeronautical situation in Britain recommended the formation of the Royal Flying Corps composed of Naval and Military Wings. In addition to the two wings, the new organization included a central flying school, a reserve, and the Royal Aircraft Factory at Farnborough.[39] Early training, classes, and experimentation with heavier-than-air craft also took place at Farnborough.[40]

After Haldane's scientific route failed to keep pace with other European nations' developments, Britain eventually recovered by following Lee's suggestion of a combined approach to aviation. The extent to which Britain had fallen behind became clear when observing progress in other nations, particularly France. According to British investigations, the French War Office had about thirty aeroplanes immediately preceding their September 1910 maneuvers. The aeroplanes utilized during these exercises completed "successful aeroplane reconnaissance" and spurred a doubling of the French aeroplane arsenal (estimated by the British to be about sixty machines) by the end of 1910.[41] In addition to the number of planes, French aviators had reached extraordinary objectives including cross country flights of more than 130 miles, non-stop flights of over 250 miles, flights over 100 miles with two passengers, and flight to

[38] Air Ministry-Air Historical Branch (Great Britain), *A Short History of the Royal Air Force* ([S.I.] Air Ministry, July 1936), 9.
[39] Ibid., 10.
[40] Ibid., 11.
[41] "Aeronautical Reports for 1910," in *The Development of Aircraft*, n.d., AIR 2/2, The National Archives of the UK (TNA).

altitudes between 8,000 to 9,000 feet. Both American and British development at the end of 1910 paled in comparison.[42]

Britain closed the distance between itself and other European nations in aviation development by utilizing the pragmatic tactic of adopting foreign technology and altering it for British consumption. This was especially true when it came to aircraft engines.[43] These developments made it possible for ten Royal Flying Corps planes to participate in the 1912 army maneuvers and thirty-nine planes to appear in the 1913 fall maneuvers.[44] The types of aeroplanes tested at the 1912 maneuvers included designs by both French (Breguet and Maurice Farman) and British (The Royal Aircraft Factory, Short, and Cody) manufacturers. All the aircraft had foreign power plants consisting of Gnome, Renault, and Astro-Daimler engines.[45] Despite poor weather, these planes conducted air observation that convinced most British commanders of their future importance and provided "many lessons…which proved of utmost value when war broke out" according to the Royal Air Force official history.[46]

By 1914, even as Britain was catching up with neighboring European nations in aviation technology, it far surpassed American aviation development, which did not match British advancements until the 1920s. At the beginning of hostilities in Europe, Britain had sixty-three aircraft in the Royal Flying Corps and fifty operational aeroplanes in the Royal Navy Air Service with several more at home fit only for training purposes. At the same point, the French with approximately 120 planes, Russia with 190

---

[42] Ibid.
[43] Gollin, *Impact of Airpower,* 307.
[44] *Observation Aviation,* 2.
[45] "Aeronautical Reports for 1910," in *The Development of Aircraft*, n.d., AIR 2/2, TNA.
[46] Air Ministry, *Short History*, 15.

planes, and the Germans with 232 planes all out-numbered the British.[47] However, if

compared in terms of the sizes of each army and navy, as calculated by historian David

Edgerton, England was the most aeronautically inclined nation, since its mobilized army

was less than one million and the French and German armies equaled more than three

million.[48]

Although most historians agree that British military aviation progressed more

slowly than its European contemporaries, Edgerton stands out as one of the few

historians who has praised early British aeronautical development, even arguing that the

English may have been overenthusiastic about the new technology. He commended the

early combination of the science of flight and practical experiments, focusing on how the

unity of methods produced the successful BE2c. This two-seater reconnaissance plane

was a very stable platform for observation, but unfortunately, the stability came at the

expense of maneuverability, making it vulnerable to agile interceptors. The BE2c

exemplified the scientific development of an aircraft as well as the problems of a lack of

practical experience.[49]

Cavalry and Aviation Linked

Early aeronautical research and development in the United States and Britain

consisted of more than reliable operation and breaking distance, speed, and height

---

[47] Gollin, *Impact of Airpower,* 307. All of the numbers of planes are approximates since sources vary to the exact number of functional aircraft in each country. For additional estimates, see Lee Kennett, *The First Air War 1914-1918* (New York: Free Press, 1991), 21; Lawson and Lawson, *First Air Campaign,* 35-37; Morrow, *Great War in the Air,* 47-57; Nedialkov, *Genesis of Airpower*, 174-75, 182-84; and Edgerton, *England and the Aeroplane*, 10.

[48] Edgerton, *England and the Aeroplane*, 10.

[49] Ibid.*,* xiv, 7-8.

records. It also included experiments to determine the possible military uses of aeroplanes immediately and in the near future. The first application for heavier-than-air craft was reconnaissance, just as it had been for lighter-than-air craft.[50] Lighter-than-air craft, mostly tethered, had been used in wars since the French Revolution, including the American Civil War, the Crimean War, the Franco-Prussian War, the Spanish American War, and the Boer War.[51] Military personnel have long desired better intelligence. Aeroplanes had the possibility of both improving and weakening aerial reconnaissance capabilities. Their speed and maneuverability would allow them to avoid ground fire better than slower moving (or stationary) lighter-than-air craft. However, aeroplanes were inferior to balloons and dirigibles because they could not hover over a target silently.[52]

Shortly after heavier-than-air aviation became practical, its reconnaissance potential became a focus in both the United States and Britain. Popular, specialty, and military publications commented on this promise. A 1910 American article noted that aeroplanes would solve the difficulties associated with reconnaissance by "affording the commander a view of events transpiring behind the veil that screens his front."[53] One year later, cavalryman Frank P. Lahm, winner of the international dirigible balloon

---

[50] In the early Twentieth Century, numerous authors mentioned utilizing aeroplanes for reconnaissance. A small sample includes: "House of Commons," 6; "Wright Wins Berlin Away from Zeppelin," *New York Times*, September 12, 1909, C2; "Aeroplanes the Things," *Detroit Free Press*, March 17, 1907, B11; "Predicts War in the Clouds," *Los Angeles Times*, August 4, 1907, I4; E. ff. W. Lascelles, "The Airship and Flying Machine in War: Their Probable Influence on the Role of Cavalry," Royal United Service Institution *Cavalry Journal* 5 (April 1910): 211. Hereafter the Royal United Service Institution *Cavalry Journal* will be cited *CJ* (UK).
[51] Morrow, *Great War in the Air,* 1-3.
[52] "Aeroplanes the Things," B11.
[53] John P. Wisser, "The Tactical and Strategical Use of Balloons and Aeroplanes," *JUSCA* 21 (November 1910): 413-15.

contest in September 1906 and called "probably the foremost practical aeronaut" in 1909, stated, "reconnaissance is where air craft will find their real sphere of usefulness."[54] A fellow officer in the field artillery concurred saying that the "most obvious use to which aircraft will be put by the military will be that of reconnaissance."[55] British officers agreed with the Americans. A major of the 17th Lancers predicted that the "reconnoitring powers of the dirigible and aeroplane in the hands of an expert will be fully realised ere long."[56] This potential materialized in the British 1912 army maneuvers when aerial craft were assigned to conduct reconnaissance.[57]

Since reconnaissance remained one of the valuable tasks accomplished by the cavalry in both the United States and Britain, it is not surprising that aviation and cavalry soon became linked. Both military personnel and civilians understood this connection. American and British professional and popular newspapers, magazines, and journals

---

[54] "Foresees Aerial War," *Washington Post,* January 1, 1908, 4; "Friction Over Lahm," *Washington Post,* November 6, 1909, 4; Frank P. Lahm, "The Relative Merits of the Dirigible Balloon and Aeroplane in Warfare," *Journal of the Military Service Institution of the United States* 48 (1911): 202.

[55] Walter E. Prosser, "A Discussion of the War Balloon and Similar Craft, and the Best Methods of Attack by Artillery," *Journal of the United States Artillery* 34 (July-August 1910): 258.

[56] W. A. Tilney, "Aerial Reconnaissance in War," *CJ* (UK) 6 (January 1911): 13.

[57] "Aeroplanes at the Army Manoeuvres," *Times* (London), September 3, 1912, 2. For additional British articles mentioning aerial reconnaissance see Lascelles, "Airship and Flying Machine," 209; "Editorial Article 2-No Title," *Scotsman,* May 13, 1911, 8; "The Military Aeroplane," *Times* (London), December 7, 1911, 7; "The Military Aeroplane: Attitude of the War Office," December 19, 1911, 10; and "The Army Aeroplane Accident," *Times* (London), September 9, 1912, 8. For additional American articles discussing aerial reconnaissance see "Aeroplanes the Things," B11; "Future Wars will be Fought in the Air," *New York Times*, October 29, 1907, 10; "Aeroplane in War: French Expert Says It May Supercede Cavalry," *New York Times*, August 14, 1908, 8; "Mishap to Aeroplane," *Washington Post*, August 14, 1908, 2, "The Future of Flying," *Living Age*, September 10, 1910, 694; "The Aeroplane in War," *JUSCA* 21 (November 1910): 536-37; "New Instrument," 267; R. A. Campbell, "Aeroplanes with Cavalry," *JUSCA* 22 (September 1911): 311; Turner, "Aeronautics," 11; and F. S. Foltz, "The Necessity for Well Organized Cavalry," *JUSCA* 23 (March 1913): 726.

published articles speculating about the possibility of aviation replacing the cavalry in its reconnaissance and other related roles such as liaison, scouting, and communication.

In Britain, the conclusion before 1912 was that the cavalry could not be replaced yet. British officers defended the continued necessity of the cavalry for reconnaissance by noting the primitiveness of heavier-than-air machines. Brigadier-General Henry de Beauvoir de Lisle argued in a widely republished lecture that "aeroplanes could not be entirely depended on yet for acquiring information." Attempting to deflate the argument that cavalry would be replaced, he stated the belief that no one would "wish to see Cavalry reconnaissance abolished" entirely due to aerial reconnaissance.[58] De Lisle conceded that the time may "come when Cavalry would be used more to verify information acquired by air scouts than to procure this information primarily," but that was as far as it would go. Despite any additional aviation development, he still thought cavalry would be necessary.[59]

The general consensus was that aviation would support cavalry in the field as an auxiliary service and not replace mounted forces. Major F. H. Sykes, when commanding the military wing of the Royal Flying Corps, agreed that cavalry and aviation would work together. He reported that the 1912 maneuvers demonstrated that "aircraft will, it would appear, in no way render the services of cavalry useless, but they should save it

---

[58] "The Future of Cavalry," *Times* (London), April 25, 1912, 10. See also H. de B. de Lisle, "The Strategical Action of Cavalry," *CJ* (UK) 7 (January-October 1912): 320-34 for his lecture given at the Royal United Service Institution [hereafter de Lisle, "Strategical Action," *CJ*] that can also be found as a reprint from the June 1912 *Journal of the Royal United Service Institution* as H. de B. de Lisle, "The Strategical Action of Cavalry," *JUSCA* 23 (July 1912): 134 [hereafter de Lisle, "Strategical Action, *JUSCA*].

[59] "Future of Cavalry," 10. See de Lisle, "Strategical Action," *CJ,* 328; Vindex, "Modern Inventions and the Functions of Cavalry," *CJ* (UK) 7 (January-October 1912): 348, and Edmund Candler, "The Aeroplane in Mesopotamia," *Times* (London)*,* November 2, 1916, 5 for more on aeroplanes as auxiliary to ground forces.

much unnecessary work." Put simply, Sykes stated the "air service will form a great auxiliary to the other arms."[60] However, he added that once aeroplanes improved technically, making it possible to perfect aerial reconnaissance, it was possible or probable that cavalry reconnaissance would end. That time was still a long way off. Concerned with the danger aeroplanes posed to the lives of aeronauts, the London *Times* maintained that "an army in the field will have for a long time yet to come to depend upon its cavalry for its exact services of reconnaissance and protection" due to aviation's low level of technological development.[61]

In American publications, glowing predictions of aviation's future potential replaced the British periodicals' balanced treatment of the aeroplane's current limitations and potential cooperative relationship with the cavalry. Since the United States had only limited experience with aeroplanes, the American press cited those who had direct experience, British and European officers. As early as March 17, 1907, the *Detroit Free Press* reported that Captain John Edward Capper, Commander of the Balloon Section at Aldershot, remarked on the seeming invulnerability of these new machines. He believed aeroplanes "will move fast and be little liable to injury, as bullet holes in the surface will cause but little damage" and that they "will be able to go considerable distance even against strong winds."[62] The *Los Angeles Times* reported that British Major R. S. S. Baden-Powell, author of works on military tactics, contended that future wars would be

[60] F. H. Sykes, "Report upon the Employment of the Royal Flying Corps in Army Manoeuvres, 1912," November 16, 1912, W[ar] O[ffice] 33/620, TNA.
[61] "The Cavalry Division Reconnaissance," *Times* (London), September 9, 1912, 8.
[62] "Aeroplanes the Things," B11.

fought in the air, possibly rendering "armies… useless."[63] American observation of

European maneuvers also produced comments as to the value of aeroplanes. The French

Army Maneuvers in Picardy led the *Living Age* to report foreign observers' beliefs that

aeroplanes might rival gunpowder in their revolutionary impact on warfare.[64]

      These more promising predictions of aeroplanes revolutionizing warfare by

limiting or entirely replacing ground troops singled out the cavalry. Again, the

American press turned to Europe for its sources. As early as 1908, an American

periodical had published the opinion of a French aeronautical expert that the cavalry

would soon no longer be needed to conduct reconnaissance or scouting because an

aeroplane "could entirely supercede cavalry on account of its speed and the possibility of

securing more full and accurate observations." The unnamed expert claimed that the

aeroplane would "revolutionize warfare on the land by altering the whole conditions of

the problems of 'information.'"[65] The Wright brother's experience in Germany

produced a similar assessment in a 1909 *New York Times* article, which suggested that

an aeroplane could "accomplish more than an entire cavalry regiment as far as locating

the position of an enemy."[66] American aeroplane experiences also garnered attention.

Lieutenant Joseph Fichel's trial of aeroplanes with aviation pioneer Glenn Curtis on

behalf of the War Department in 1910 led him to declare, "that a battalion of aeroplane

---

[63] "Predicts War in the Clouds," I4.

[64] "New Instrument," 267. See similar argument in "Future Wars," 10.

[65] "Aeroplane in War," *New York Times*, 8; "Future of Flying," 694. For similar articles, see "Mishap to Aeroplane," 2; "Wright Wins Berlin," C2; Henry Woodhouse, "The Airscout," *Town and Country*, November 25, 1911; "Predicts War in the Clouds," I4.

[66] "Wright Wins Berlin," C2.

sharp-shooters will supplant cavalry in the army of the future."[67] The editors of the

enthusiast magazine *American Aeronaut* concurred with the evaluation that cavalry

would be replaced or face easy elimination. A 1909 editorial predicted that cavalry on

horses were so vulnerable to attack from the air that they were "obviously doomed,"

adding that both horses and army wagons "will fall before one gust of machine fire from

above, like as many children's toys."[68]

One of the most sensationalist and pro-aviation articles in a non-specialist

American publication appeared in the *Indianapolis Star* in 1911. It described a

disagreement over the future value of aviation, highlighting an increasing tension

between aviation and the cavalry. The article contained the reaction of an aviator to a

cavalry officer who dismissed the present value of aeroplanes. It addressed the

controversy that followed a speech by Colonel Walter S. Schuyler, described as a noted

Indian fighter and military critic, who had said that "the usefulness of the aeroplane in

warfare was vastly overestimated," and argued "that the flying man's hope was

practically useless in real war." The *Star* reported that Schuyler's statements had

aroused a "storm of opposition" among aeroplane producers and pilots. The subtitles of

the article clearly reflected the aviator's position—"Aviators Declare Air Vessels Must

Constitute Cavalry of Army," "Horse to Be Abandoned," and "Birdmen Will Scout

Territory for One Hundred Miles in Advance." The author provided only a summary of

Schuyler's thoughts while including extensive quotations supporting the aviation

proponent's arguments. Pilot Charles K. Hamilton responded by noting Schuyler's

---

[67] "Sharpshooters in Aeroplanes," *Los Angeles Times,* August 24, 1910, 17.
[68] Editorial, *American Aeronaut,* 1 no. 3 (October 1909), 115.

obvious bias suggesting his love for the cavalry branch colored his viewpoint.

Hamilton's own possible bias as an aviator was ignored. He attacked not just Schuyler

but all cavalrymen as "almost unanimous in decrying the aeroplane…as a new-fangled

toy that can not be developed into anything practical." Hamilton argued that

cavalrymen, like ostriches, "stick their heads down in traditions and decline to see the

aeroplane as it really is." Hamilton excused the cavalry's instinctive "prejudice" as

stemming from the "first law of nature, self-protection," believing that the cavalry's

"present exalted preeminence" will end as "soon as the aeroplane unmistakably

demonstrates its complete usefulness in warfare."[69] This article highlighted the most

extreme opposing viewpoints possible for cavalry supporters and aeroplane supporters.

The first perspective that aeroplanes would never amount to a viable military technology

and the second that aeroplanes would replace cavalry in the near future.

Far more temperate American journalists mimicked their British contemporaries

by discussing the abilities of aeroplanes to assist and cooperate with the cavalry and

other military branches rather than replacing them entirely. Yet they still praised

aviation's potential. Typical was a 1907 *New York Times* piece arguing that while the

cavalry was "designed to scout and develop information," infantry and aviation provided

"an additional and more complete means of obtaining information."[70] A few years later

in 1912, the same paper reported that the cavalry's usefulness for reconnaissance

---

[69] "Aeroplanes in Wars of Future: Aviators Declare Air Vessels Must Constitute Cavalry of Army," *Indianapolis Star*, December 24, 1911, C27. For more on discussions of the tension between aviation and the cavalry, see E. H. Gilpin, "Armament and Equipment of the Cavalryman," *JUSCA* 22 (July 1911): 82; "The Aeroplanes and the Cavalry," *JUSCA* 23 (July 1912): 123-24; Nickolaus Riedl, "Cavalry in War," *JUSCA* 23 (September 1912): 290; and N. F. McClure, "The Use of Cavalry," *JUSCA* 24 (May 1914): 965.
[70] "Future Wars," 10.

remained intact since recent maneuvers demonstrated that the "aeroplane is unable to fly low because of its vulnerability" to fire from the ground.[71] Articles from 1907 through the First World War suggested aeroplanes were an additional tool for observation and not a replacement for the cavalry.[72]

The American popular press was not alone in declaring the aeroplane a challenger to cavalry reconnaissance. Military journals also addressed aviation's possible impact on the cavalry, both echoing the arguments of the popular press and providing seemingly authoritative opinions for journalists to print. Some army officers claimed aeroplanes were of equal or greater value in reconnaissance than cavalry. Only a month before a similar contention in the *New York Times,* Infantry Captain John R. M. Taylor in the July 1909 issue of the *Infantry Journal* argued that one aeroplane was equal to a large cavalry force.[73] He maintained that cavalry historically was only able to "succeed in ascertaining where the fog lay densest" without providing any additional concrete information required by commanders.[74] He believed that the major investment in training cavalrymen—at least three years—seemed unwise when the cavalry's "most important function of obtaining and rapidly transmitting information" might soon be placed "in the abler hands of the navigator of the air."[75] According to Taylor, aeroplanes

[71] Frederick Palmer, "Military Lessons Taught by the War," *New York Times*, December 5, 1912, 2.
[72] See also "Wright Has Quiet Day," *Washington Post,* September 14, 1908, 2; "What Could Uncle Sam Do in the Event of Aerial War?" *Baltimore Sun,* February 23, 1913, B1; Henry J. Reilly, "Aerial Service Cannot Replace Cavalry Scouts," *Chicago Daily Tribune,* May 11, 1916, 6; Joseph W. Griggs, "Cavalry and Riders of Air Close Rivals in Staging Thrills," *Nashville Tennessean and the Nashville American,* August 16, 1918, 10; "Allies Win by Putting on Wheel and Wing: See Cavalry of Air and Tanks for All Troops in Near Future," *Chicago Daily Tribune,* August, 11, 1918, 3.
[73] John R. M. Taylor, "Cavalry and the Aeroplane," *Journal of the United States Infantry Association* 6 (July 1909): 87.
[74] Ibid., 84-85.
[75] Ibid., 85-88.

could do the job better and more cheaply. This argument of cost efficiency echoed earlier arguments by those who favored mounted infantry and mounted rifles over the regular cavalry (see Chapter Two). These arguments provoked curt responses by those who took aviation's current limitations into account.[76]

Responses to Early Aviation Predictions prior to 1912

Coverage of aviation and its connection to cavalry roles in the American popular press did not provoke an immediate cavalry response in the Cavalry Association's journal. Cavalrymen contributed only a few articles mentioning aviation to the *Journal of the United States Cavalry Association* (*JUSCA*), a major forum for cavalry concerns. Instead, they focused on concerns that appeared more urgent at the time including the need for a chief of cavalry, equipment and arms for their branch, training, service schools, horse care, and doctrine.

As with aviation, the cavalry branch did not lack advocates. In fact, three of the Army Chiefs of Staff in the beginning of the twentieth century came up through the cavalry branch. However, their tenures expired before military aeroplanes appeared in maneuvers (Samuel B. M. Young 1903-1904, Adna R. Chaffee 1904-1906, and J. Franklin Bell 1906-1910) and they were not able to defend the cavalry against aviation's inroads. Whether or not these chiefs of staff supported cavalry policy, the ongoing campaign for a designated cavalry chief demonstrated that something was missing.

---

[76] "Modern War," *JUSCA* 20 (March 1910): 965; Holland Rubottom, "Cavalry Reconnaissance and Transmission of Information by Modern Methods," *JUSCA* 23 (July 1912): 25-26; and Daniel L. Roscoe, "The Effect of Aeroplanes upon Cavalry Tactics," *JUSCA* 24 (March 1914): 857.

Junior officers felt a lack of leadership and demanded a cavalry chief.[77] Without a

strong branch chief to educate the public, Congress, and even cavalrymen about the

requirements and importance of cavalry until after the Great War, cavalrymen turned to

the United States Cavalry Association to discuss cavalry issues. That the journal rarely

covered aviation until 1912 suggests that aeroplanes were not seen as a serious challenge

to the cavalry. Of the more than 350 articles published in the *JUSCA* from 1908 to 1911

only eight articles mentioned aviation (see Table 3-1).

The first references to aeroplanes in the *JUSCA* were a handful of short articles

and brief notes in longer articles on various topics, the first of which appeared in 1909.

Surprisingly, even as other military officers expressed their opinions in the popular press

and military journals, such as the *Journal of the United States Artillery,* on aviation's

impact on the cavalry, the *JUSCA* offered few opinions on the innovation. When the

former journal published the article "Cavalry and the Aeroplane" editor of the latter

journal was more upset with the *Infantry Journal* discussing the business of the cavalry

than any predictions about aviation.[78]

---

[77] A sample of articles and letters contained in the *JUSCA* calling for a cavalry chief include: Velox
[pseud.], "A Chief of Cavalry" [Letter to the Editor], *JUSCA* 15 (April 1905): 944-46; Malvern-Hill
Barnum, "A Chief of Cavalry," [Letter to the Editor], *JUSCA* 15 (April 1905): 946-49; George H. Morgan,
"Some Needs of the Cavalry," *JUSCA* 16 (October 1905): 329-31; X [pseud.], "Chief of Cavalry: Shall
We Have a Chief of Cavalry?" *JUSCA* 17(January 1907): 556-558; Howard R. Hickok, "Chief of
Cavalry," 18(October 1907): 347-50; E. S., "Chief of Cavalry," *JUSCA* 18 (January 1908): 555-56; and
"Chief of Cavalry," *JUSCA* 19 (July 1908): 197-98.
[78] "Cavalry and the Aeroplane," *JUSCA* 20 (November 1909): 617.

Table 3-1: Articles Mentioning Aviation in the *Journal of the United States Cavalry Association* and the *Cavalry Journal* (UK)
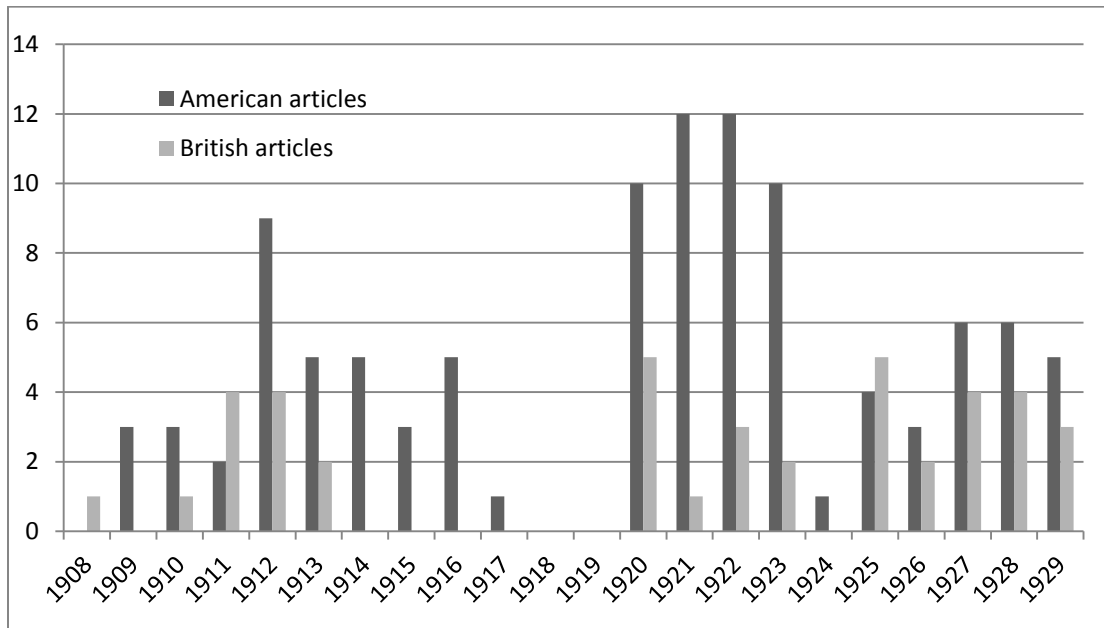
(American publication was suspended July 1918-April 1920; British publication suspended October 1914-April 1920)

The scarcity of articles about aviation in the *JUSCA* may have been the result of editorial policy or a lack of interest in the subject among it contributors. American cavalrymen authored very few articles concerning aviation until 1912. Nonetheless, the pre-1912 patchy coverage started to indicate to the Cavalry Association's readers the aeroplane's potential value and danger to the cavalry. The increase in articles about cavalry and aviation after 1912 reflects a growing concern among the journal's readership and a desire to learn more about the aeroplane. To meet the demand, the *JUSCA,* like the American popular press, repeated information from European sources, using British, French, German, and others countries' experiences to provide information on aviation capabilities and limitations. These contributions from overseas (including

91

reprints of European articles and American-authored articles based on observations of European activities) focused on the new technology's flaws and limitations, which were not difficult to identify. They included technological constraints due to weather, mechanical limitations and unreliability, as well as unfavorable comparisons to cavalry capabilities. American cavalrymen were reassured that the unreliability of aeroplanes meant they could not be depended on as the sole means of reconnaissance.[79]

The *JUSCA* did not condemn aeroplanes out of hand. It also reported on aviation's positive aspects. In November 1910, it reprinted an article from the British periodical *Broad Arrow* that claimed that the aeroplane had already fulfilled "sanguine hopes" and "achieved more than its most ardent friends anticipated" in its capacity for observation.[80] The article's author contended that the French Picardy Maneuvers demonstrated that, unlike the army's present "eyes and ears," (the cavalry), the future "eyes and ears," (aeroplanes) would "have an uninterrupted view, not only of the enemy's front, but of his flanks, center and rear."[81] The author's faith in the future value of aeroplanes was not diminished by their current weaknesses and these weaknesses did not prevent him from declaring aeroplanes an improvement over the cavalry. Other authorities simply hoped that if some predictions came true, aeroplanes could lighten

---

[79] V. Stockhausen, "Airships in War," *JUSCA* 20 (November 1909): 575-84; "Aeroplane in War," *JUSCA* 21: 536-37; Campbell, "Aeroplanes with Cavalry," 313; Captain Niemann, "Airships and Cavalry in the Reconnaissance Service," *JUSCA* 22 (March 1912): 874-75; M. S. E. Harry Bell, "The First Aeroplane under Rifle Fire," *JUSCA* 22 (May 1912): 1129, 1128-30; and Paul Hayne, Jr., "Organization and Employment of Cavalry Brigades," *JUSCA* 24 (September 1913): 202.
[80] "Aeroplane in War," *JUSCA* 21: 536-37. *Broad Arrow* was the nineteenth and early twentieth century periodical for military services in Britain that was later incorporated into the *Army and Navy Gazette*.
[81] "Aeroplane in War," *JUSCA* 21: 538.

cavalry exploration duty, eliminating the need to "pierce the enemy's protective screen and find out the movements of his main columns."[82]

Of the articles mentioning aviation in the *JUSCA* before 1912, only one author was an active American cavalryman. Five were reprinted from foreign sources. Other contributors included a member of the Coast Artillery Corps and a retired cavalryman. This divided authorship is shown in Table 3-2 below. The lack of articles written by American cavalry officers supports Major Nickolaus Reidl's observation, made in a 1912 *JUSCA* article, that cavalry officers had showed "little inclination in the past to carry on a paper war" over aviation's progress. However, Reidl noted a shift in that year observing that cavalrymen began combating the erroneous ideas that had begun to circulate about the overblown value of aeroplanes and the lack of appreciation for cavalry abilities.[83]

The increasingly positive reports on aviation and discussions in the American popular and specialist press pushed some cavalrymen to address aviation's possible effects on the cavalry, but only indirectly at first. The generally optimistic attitude towards aviation and other innovations led cavalrymen to start warning their colleagues and the public of the danger of overconfidence in unproven new technologies. Identifying himself only as "Boots and Saddles," one writer cautioned that "there is a great danger that a few over-zealous enthusiasts will succeed in getting their hobbies adopted in place of really valuable portions of the present equipment, that have stood the

---

[82] "Modern War," 965. See also F. H. Sykes, "Report upon the Employment of the Royal Flying Corps," November 16, 1912, WO 33/620, TNA; and Barry Domvile, "First Annual Report by the Air Committee on the Progress of the Royal Flying Corps," June 7, 1913, AIR 1/2311/221/6, TNA.
[83] Riedl, "Cavalry in War," 290.

tests of long and hard service successfully." The author attacked the silence of experienced officers because "in only too many instances, these gentlemen are keeping quiet while the faddists occupy the center of the stage and both wings in addition."[84] The United States did not lack aviation faddists in the 1910s with unrealistic expectations bordering on the fantastic.[85] "Boots" was concerned that the reasonable majority was not being heard.

Table 3-2: Authors of *JUSCA* Articles Mentioning Aviation
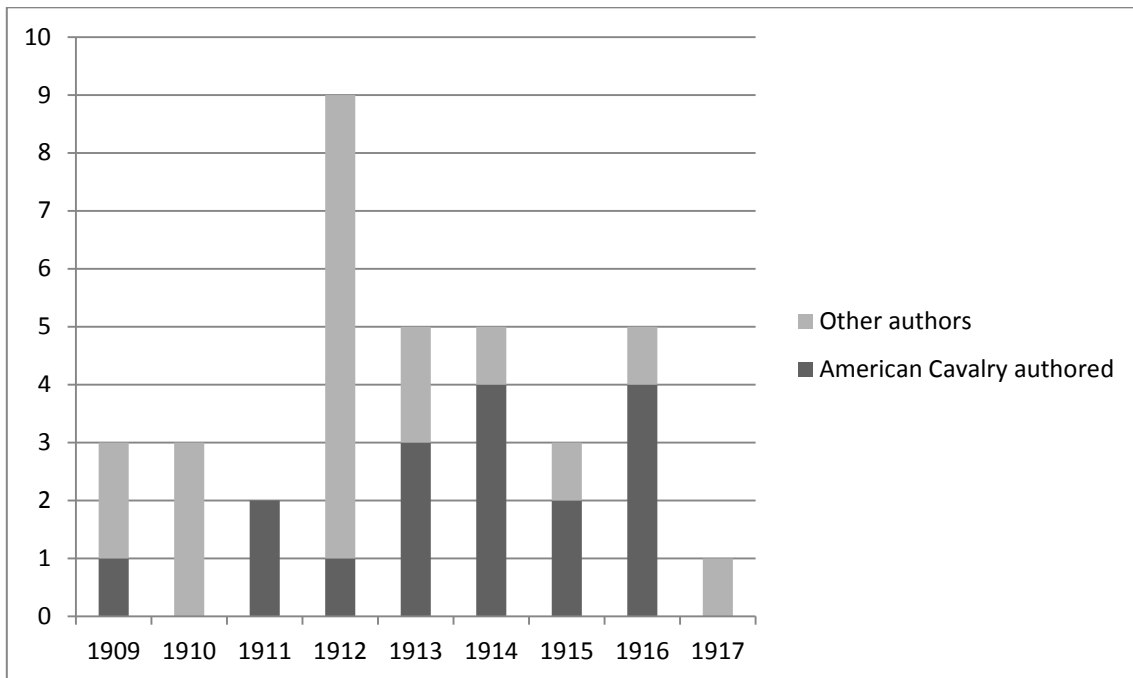
[84] Boots and Saddles [pseud.], "Cavalry Equipment," *JUSCA* 21 (March 1911): 968.
[85] Corn, *Winged Gospel,* 29-42.

Another writer, a Civil War volunteer cavalryman, echoed this concern that aviation supporters were getting carried away while realists remained silent. He warned that because often "the old is of more practical value," established technologies should not be abandoned until after a full debate and not simply "because, forsooth, aeroplanes have appeared on our horizon, the old order must give place to something new."[86] Yet he took his argument too far by claiming the invulnerability of cavalry. The creditability of his warning against the dangers of immediate uncritical acceptance of aeroplanes was damaged when he admitted that he had never seen a "maneuvering aeroplane," but he confidently argued, "a platoon of cavalry could shoot it full of holes with their carbines before it could do any mischief."[87] Such statements in defense of the old were often just as problematic as blind acceptance of the new and weakened the author's argument. It took time for both aviation and cavalry supporters to moderate their expectations before the *JUSCA* could host a meaningful and substantive debate within its pages. The *JUSCA*'s coverage of aviation increased greatly after 1912 as the aeroplane proved that it could accomplish certain missions in testing and exercises.

Britain before 1912

The British *Cavalry Journal*, like its American counterpart, focused on debates over its future organization, mission, and equipment more than on aviation before 1912.

---

[86] Gilpin, "Armament and Equipment," 76. See also an earlier warning that cavalry officers should retain their "calmness of mind" and discuss objectively other means introduced to complete their roles. J. F. Reynolds Landis, "Spirit of Sacrifice in Cavalry and Esprit de Corps in Its Officers," *JUSCA* 20 (July 1909): 1215-16.

[87] Gilpin, "Armament and Equipment," 82. See also Howard R. Hickok, "Role and Organization of Cavalry," *JUSCA* 25 (July 1914): 75.

The British cavalry had an established leader, but it still lacked a unified position concerning their branch's principal roles. Although the British cavalry had a written doctrine with defined missions, the heated debates concerned the *primary* role of the branch and the *primary* weapon.[88] This internal debate absorbed a vast amount of attention. Some contributors claimed the primacy of the charge, others the importance of dismounted action, reconnaissance, and screening.[89] The last position was not a very common one as reconnaissance was not a popular mission. That fact may have been why British cavalrymen appeared more receptive to aviation accompanying or replacing them in the reconnaissance role.

Some British cavalry officers rejected the importance of reconnaissance duties for the cavalry. Training, tradition, and popular history concentrated on the more exciting and glamorous *arme blanche*. The charge was central to the identity of many cavalrymen and an essential part of how they defined themselves. Reconnaissance lacked the emotional element of the charge.[90]

Some senior officers attempted to end the sometimes vicious debates by advocating the American policy of a flexible force. In the first issue of *The Cavalry Journal* in 1906, the Inspector of the Cavalry, R. S. S. Baden-Powell, avoided conflict over cavalry use by merely listing the possible roles of cavalry in assisting the infantry to

---

[88] For detailed coverage of this debate, see Stephen Badsey, *Doctrine and Reform in the British Cavalry 1880-1918* (Aldershot, England: Ashgate, 2008).

[89] "War and the 'Arme Blanche,'" *CJ* (UK) 5 (July 1910): 283-87; D. C. Crombie, "Cavalry in Frontier Warfare," *CJ* (UK) 5 (July 1910): 358-69; An Infantry Officer, "Impressions," *CJ* (UK) 5 (July 1910): 350.

[90] "Cavalry and the Mounted Infantry," *JUSCA* 17 (October 1906): 363-66; de Lisle, "Strategical Action," *CJ*, 324, 334; Hickok, "Role and Organization," 73; and John Stuart Barrows, "The Uhlans and Other Cavalry in the European War," *JUSCA* 26 (January 1916): 391, 398.

win battles as "shock action, dismounted action, reconnaissance, protection, long-distance raids, &c."[91] He did not attempt to assign priority to them. He simply urged cavalrymen to keep abreast of new developments to improve their branch's abilities, hailing the American Civil War as a time when "the Cavalry, being newly organised, were untrammelled by old traditions, but were trained and led as common-sense directed, [and] new tactics came into use."[92] He noted the importance of the cavalry spirit and the need to train for all possible roles and missions in a modern war.[93] Yet his article did little to satisfy the debates over cavalry roles or to define clearly the cavalry's usefulness to other military personnel and the larger British public. Five years later, the Inspector-General of the Forces J. D. P. French encouraged cavalrymen to be practical because

> we live in a time when very divergent views are being expressed in regard to the duties and employment of Cavalry in the field. Some of these views, though put forward with considerable force and ability, appear to be based on theory rather than on war experience and practical training, and if hastily adopted might reduce our mounted forces to impotence.[94]

French published his ideas in the British *Cavalry Journal,* the editors of which wanted it to be the "foremost place in promulgating their [cavalrymen's] ideas," including opinions about "recent scientific developments," such as wireless telegraphy and aeronautics that were "likely to affect the tactics of cavalry perhaps even more than those of the other arms." The 1911 Preface encouraged contributors to study these changes and to suggest the "most suitable methods of applying those conditions to the

---

[91] "What Lies Before Us," *CJ* (UK) 1 (January 1906): 3.
[92] Ibid., 5-6.
[93] Ibid., 10-11.
[94] "Preface," *CJ* (UK) 6 (January 1911).

accepted principles of cavalry training."[95] Anglesey argued that the founding of the

Cavalry Journal was "part of what looked like a concerted campaign by the 'shock'

advocates" and "was specifically designed to defend and to spread the *arme blanche*

gospel."[96] However, the journal also provided articles opposing *arme blanche* tactics

and supporting research into new technological advancements including the aeroplane.

Not only cavalrymen but fliers also participated in the early discussions of

aviation and its possible impact on the cavalry within the pages of the *Cavalry Journal*.

The British *Cavalry Journal* was like its American counterpart in that it published few

articles mentioning aviation at first, but differed from it by carrying longer articles

focused on the innovation instead of just short references. In addition, these articles

were produced by British cavalrymen. The proximity of other nations actively testing

aviation, especially France and Germany, made the new technology hard to ignore.

British treatment of aeroplanes before 1912 was largely positive, arguing that cavalry

would benefit if aeroplanes assisted in or appropriated its reconnaissance role.

As early as 1909, the argument that aviation could relieve cavalry from the

tedium of reconnaissance appeared in the *Cavalry Journal*. The aeroplane was seen as a

way for the cavalry to increase its mobility by freeing the branch of much of its

reconnaissance duties. British Army Motor Reserve officers M. J. Mayhew and G.

Skeffington Smyth (formerly of the 9th Lancers) proposed that since mobility was "the

---

[95] Ibid.
[96] Marquess of Anglesey, *A History of British Cavalry Volume 4 1899-1913* (London: Secker and Warburg, 1986), 401.

raison d'etre of Cavalry…any device that adds to its mobility increases its power."[97] Aeroplanes could facilitate the cavalry's work by reporting on enemy scouts or actively harassing them to assist the cavalry in its own reconnaissance permitting the cavalry to do its jobs better and preventing the cavalry from being wasted, a problem still remembered from the Second Boer War.[98] The aeroplane's large field of vision, speed, and range could allow aviators to direct large concentrations of cavalry against specific objectives instead of having mounted units "scattered throughout the whole of the strategical zone in the initial stages of operations, as at present."[99] A major of the 17th Lancers proclaimed, "the dirigible and aeroplane have completely changed all conditions, and with a strong stalker's glass in the hands of an expert no body of troops should be able to approach unseen within a distance of three miles."[100] He argued that the new aerial technologies of dirigibles and aeroplanes would accompany cavalry brigades and divisions at maneuvers and into action in the near future for reconnaissance purposes.[101]

Yet the aeroplane would not replace the horse, at least not immediately. The continued need for technological development tempered any positive predictions that cavalry would no longer be required for reconnaissance in the near future. British aviation expert Bannerman-Phillips expressed the beliefs of many of his colleagues that aeroplanes could not "entirely supplant the horseman for reconnaissance, because of

---

[97] M. J. Mayhew and G. Skeffington Smyth, "Motor Cars with the Cavalry Division," *CJ* (UK) 4 (October 1909): 442.
[98] H. Bannerman-Phillips, "Air-craft in Co-operation with Cavalry," *Nineteenth Century and After* 69 (1911): 806.
[99] Lascelles, "Airship and Flying Machine," 211.
[100] Tilney, "Aerial Reconnaissance," 12.
[101] Ibid., 13.

their dependence on meteorological conditions," which could "render their employment out of the question just when they are most wanted."[102] Aeroplanes may prove "excellent auxiliaries" he argued, but under "no circumstances will they ever be able entirely to relieve the cavalry of the duty of reconnaissance" because aircraft could not function at night and could only fly one day out of three on average because of weather considerations.[103] While progress in aeronautics "powerfully affected the public mind," according to a captain of the 3rd Dragoon Guards, these improvements did not justify "the assumption that their use will cause a revolution in the methods of making war in general."[104] A lieutenant of the Royal Engineers Air Battalion concurred with his colleagues, noting the current limitations of aeroplanes. This aviator argued that aeroplanes in war would "for the present be very largely limited to tactical reconnaissance," and even in that role they would "in no way replace the cavalry scout, whose capacity for resistance and screening they cannot imitate."[105] He envisioned that cavalry and aviation could work together with the aeroplane supplementing the cavalry. The aviator would be responsible for information in "plan" (view from above) while the cavalryman would determine "elevation" (view from the front).[106] The ground scouts would "still be essential in order to supply such information as is unobtainable by the aeroplanes, for the condition of the terrain cannot be ascertained from the air and it will

---

[102] Bannerman-Phillips, "Air-craft in Co-operation," 806. For more on aeroplane reliability, see also Lascelles, "Airship and Flying Machine," 211; F. H. Sykes, "Report upon the Employment of the Royal Flying Corps," November 16, 1912, WO 33/620, TNA; and Barry Domvile, "First Annual Report by the Air Committee," June 7, 1913, AIR 1/2311/221/6, TNA.
[103] Bannerman-Phillips, "Air-craft in Co-operation," 807-10.
[104] Lascelles, "Airship and Flying Machine," 208.
[105] R. A. Cammell, "Aeroplanes with Cavalry," *CJ* (UK) 6 (April 1911): 197.
[106] Ibid.

rarely be possible to say whether buildings, woods, &c. are occupied unless they are examined by patrols."[107]

German maneuvers lent support to the views of British cavalrymen and aviators that aeroplanes could strengthen the cavalry. An observer of the German cavalry maneuvers in 1911 noted that the demands on cavalry for detached duties, to conceal and protect the infantry and artillery, exhausted the cavalrymen, limiting their ability to act when "the decisive moment arrived" on the battlefield. Adding reconnaissance to these other duties would wear out the cavalry and further weaken its fighting ability. Aeroplanes could vastly reduce the cavalry's strategic (non-battlefield) duties, including reconnaissance, allowing "its utility as a fighting arm" to be "proportionately increased."[108] A lieutenant of the 19th Hussars and Royal Flying Corps similarly believed that in "some forms of reconnaissance they [aeroplanes] will probably relieve cavalry to a great extent," thus freeing large forces of cavalry for fighting and protection.[109]

Although some British cavalrymen seemed willing to share, if not cede, their reconnaissance role to aeroplanes even before 1912, few seemed concerned that this position could make them vulnerable to arguments that aviation would make them obsolete. Roles other than reconnaissance remained central in many arguments for the continued employment of cavalry, so relinquishing it did not seem problematic. Yet a

---

[107] Ibid., 199. See also F. E. Waldron, "Aeroplanes and Cavalry," *CJ* (UK) 8 (January-October 1913): 313; "A Study of Patrol Work," *CJ* 8 (January-October 1913): 427; and Vindex, "Modern Inventions," 349-50.
[108] Cecil Battine, "The German Cavalry Manoevures of 1911," *CJ* (UK) 7 (January 1912): 48-49.
[109] Waldron, "Aeroplanes and Cavalry," 314. See also Vedette, "Aeroplanes and Their Influence Upon Cavalry Training," *United Service Magazine* 83, no. 1005 (1912): 38.

few cavalrymen appreciated the danger, expressing their concerns in the pages of the *Cavalry Journal.* A lieutenant of the 12th Lancers noted that some cavalry officers were "often too much inclined to impress on our troopers that scouting and reconnaissance are their most important duties," neglecting "their education in fighting tactics."[110] This overconcentration was unwise because aeroplanes and other innovations (wireless telegraphy, telephones, etc.) would probably take the place of large units of cavalry.[111] If the cavalry became too closely associated with reconnaissance, it might be eliminated if aviation proved capable of taking over the task.[112] A fellow contributor*,* apparently concerned that officers were putting too much faith in new technologies' ability to usurp previous technologies, argued that "inventions in war tend to neutralise each other," implying that they had weaknesses to exploit.[113] He did not have difficulty finding the aeroplane's weaknesses. He argued that poor weather made the use of aviation impossible, and so "it would obviously be imperative for cavalry instantly to wholly resume those functions of reconnaissance and raid which nowadays may ordinarily be partly performed by aerial means."[114] He would not even concede that aviation could perform reconnaissance satisfactorily in good weather. His position was unambiguous: the cavalry would still be necessary.

---

[110] H. Clifton Brown, "The Training of Cavalry in Battle," *CJ* (UK) 7 (January-October 1912): 156.

[111] Ibid., 158.

[112] Ibid., 156-60.

[113] Vindex, "Modern Inventions," 348.

[114] Ibid., 349. See also Waldron, "Aeroplanes and Cavalry," 313.

Responding to New Technological and Political Realities

From the end of 1911 through the First World War, predictions that the aeroplane would replace the cavalry proliferated in American publications, supported by data from training operations and real conflicts.[115] As before, the American reports on the potential of aeroplanes were less supportive of cavalry than British accounts. American newspapers reports based on French, German, and Italian maneuvers observed that military airmen believed unequivocally that "for scouting purposes the aeroplane is a most efficient thing and so much surpasses the cavalry, the usual fastest scout, in quickness of obtaining results."[116] A French general argued in mid-1912, "there are no scouts in cavalry, no spies that give better information than the aeroplane about the position and the disposition of the enemy and their available forces."[117]

Such reports finally prompted direct substantial responses from American cavalrymen and the *JUSCA* to aviation's proponents. Many of these reactions centered on deflating the contentions that aeroplanes could completely replace cavalry in reconnaissance by both listing the technical limitations of aircraft and the unreliability of tests performed. The *JUSCA's* contributors cataloged the shortcomings of aeroplanes, basing their judgements on European observations of their technical weaknesses, especially the unreliability of early aero-engines, and their dependence on good weather.

---

[115] Woodhouse, "Airscout," 34; Henry Woodhouse, "The Progress of Aviation," *Independent…Devoted to the Consideration of Politics, Social and Economy*, June 6, 1912, 1264; "Army Air Scouts Do Great Work," *New York Times*, April 12, 1914, 8; "Aero Aids Maneuver," *Washington Post*, October 16, 1914, 11; "One Aeroplane Equal to Whole Cavalry Division," *Aero and Hydro: America's Aviation Weekly* 9 (October 17, 1914): 26; "Aeroplanes Built to Fly All Over the World," *Wall Street Journal*, January 12, 1916, 8; and Our Aviation Correspondent, "Aircraft in the War," *Observer,* October 5, 1916, 13.

[116] Woodhouse, "Airscout," 34. See also "New Instrument," 267.

[117] Henry Woodhouse, "Progress of Aviation," 1264.

One cavalry officer maintained that other officers overestimated the value of aeroplanes as air scouts based on their observations of maneuvers without considering the lack of actual bullets. In a lecture delivered at the Virginia Military Institute in Lexington, Virginia, and later published in the *JUSCA,* Major Charles D. Rhodes of the 15th Cavalry argued that unless aeroplanes approached within 800 yards of enemy troops, vegetation, smoke, fog, and other conditions would limit the accuracy of their observations. Yet aeroplanes venturing to within 800-1200 yards of the enemy, would likely be put out of action by rifle or shrapnel fire.[118] A 1912 article based upon an Italian report of combat with the Turks examining the reliability of aeroplane motors under fire from the ground supported Rhodes' conclusions. Its author recounted the following harrowing incident that began at the height of 600 meters:

> A bullet hit the aeroplane; the trail to ascent higher miscarried…Captain Montu [a passenger] was wounded and at that very time the motor gave out. Just as the pilot prepared to glide, the motor suddenly resumed its work. Hardly had the former altitude been reached again when the aeroplane was struck by two bullets. The motor did not now work regularly; it emitted a peculiar noise…as the motor worked badly, the altitude of 600 meters could not be preserved and, in order to avoid hostil [*sic*] patrol, a material detour had to be made.[119]

The *JUSCA* published many articles penned by foreign cavalry officers describing aviation's limitations. An Austrian cavalry captain argued that aviation faced almost impossible obstacles, including "thick weather, fog, rain and snow, thunderstorms, [and] heavy equinoctial gales" as well as the "great defect" of the "uncertainty of motive power."[120] A major of the Ninth Austrian Hussar Regiment

---

[118] Charles D. Rhodes, "The Cavalry of Today," *JUSCA* 24 (November 1913): 370.
[119] Bell "First Aeroplane," 1129, 1128-30.
[120] Niemann, "Airships and Cavalry," 874-75. See also V. Sanden, "Cavalry and Aircraft in the Service of Reconnaissance," *JUSCA* 23 (March 1913): 829-31.

agreed that the general opinion expressed in contemporary military literature, that

cavalry would no longer "play a decisive role in battle" partly due to the "enormous

progress made in fire-arms and aviation," was mistaken because balloons and aeroplanes

could "assist and supplement" the endeavors of the cavalry only during favorable

meteorological conditions.[121] An additional weakness was the aeroplane's inability to

keep in continual contact with the enemy—one of cavalry's essential functions—for

long periods, at night, or during an attack. Authors simply stated that aeroplanes could

not maintain the necessary contact with hostile ground troops which unless rediscovered

could then threaten friendly positions.[122]

Even as the American cavalry started addressing the possible menace of aviation,

a more pressing threat distracted it. The Hay Amendment to the Congress's Army

Reorganization Bill of 1912-1913 proposed to reduce the number of cavalry regiments

from fifteen to ten, the pre-Spanish-American War total. The editor of the *JUSCA*

quickly responded, providing the journal's readers with extracts from newspapers

opposed to the legislation because "there are hundreds of arguments, legitimate and

sound arguments, in favor of an increase of our cavalry and no good reason why there

should be a reduction."[123] Fortunately, the measure was defeated in the Senate when

Senator Henry Algernon du Pont of Delaware explained that it was removed because it

was "inserted without consultation with military authorities," it would greatly weaken

---

[121] Riedl, "Cavalry in War," 290-91.

[122] "Aeroplanes and the Cavalry," 124; Niemann, "Airships and Cavalry," 875.

[123] Ezra B. Fuller, Jr., "More Cavalry Instead of Less," *JUSCA* 22 (March 1912): 973-83. See also Ezra B. Fuller Jr., "Why We Need Cavalry," *JUSCA* 22 (March 1912): 966-969; and George B. Davis, "The Reorganization of the Cavalry," *JUSCA* (March 1912): 797-805.

the Regular Army, and the "resulting economies will not compensate for the diminution in the efficiency of our first line of defense."[124]

Although short-lived and unsuccessful, the 1912 attempt to reduce the cavalry may have prodded cavalry supporters to pay even closer attention to the possible threat of the aeroplane. The cavalry could not afford to ignore technological or any other kind of arguments that could be employed to justify its elimination or reduction. The number of articles discussing the cavalry's possible demise in the field of reconnaissance due to aviation increased significantly in 1912. Nine articles appeared in the cavalry journal that year refuting these claims, more than in the previous four years combined.[125] Aviation was no longer a mere oddity to be relegated to sidebars and short articles written by foreign cavalry officers and the members of other services. The aeroplane had become a new tool to be considered seriously by cavalry's supporters in their debates over roles, strategy, tactics, and planning.

The responses of American cavalrymen to the possibility of losing their reconnaissance function to aviation were similar to the brief arguments by non-cavalry officers that appeared in the *JUSCA* prior to 1913. Most common was the cautiously optimistic belief that aeroplanes would make a valuable and possibly essential adjunct to cavalry in reconnaissance and scouting. The strengths of one made up for the weaknesses of the other, with both working, as Colonel Hamilton Hawkins of the 3rd Cavalry stated, "hand in hand." Each assisted the other in the completion of their

---

[124] *Senate Committee on Military Affairs, Cavalry Regiments, 62nd Congress, 3rd Session 1912*, 1-2.
[125] See Table 3-1.

combined task, neither supplanting the other.[126] A 12th Cavalry captain admitted that aeroplanes would be of great value along with other units.[127]

In these arguments, neither aeroplanes nor cavalry took the lead, and therefore, the cavalry remained necessary. The use of aeroplanes in reconnaissance, cavalrymen argued, did not make the cavalry superfluous. A major of the 5th Cavalry maintained, "there is an ample field for both and that one will often succeed where the other fails."[128] Another officer went further, contending that in the future cavalry would only be able to complete its mission in combination with aerial reconnaissance.[129] A 9th Cavalry major stated flatly that "the aeroplane may become an adjunct, indeed has already become one, but no military man can see in it more than an adjunct—and least of all a substitute for anything that armies have always found necessary." He maintained that cavalry would, "in common with its sister arms, still be called upon to perform in the identical way, the same functions that it performed under Stuart, Buford, Sheridan and Wheeler."[130] Major Rhodes proclaimed the aeroplane would be "a very powerful aid to reconnaissance" with the important caveat "when developed."[131] He called the idea that aeroplanes would replace the cavalry "such an absurdity as to hardly merit consideration."[132]

In their early understanding and acceptance of the new aviation technology, American cavalrymen were not unreasonable. Their opinions were supported by

---

[126] Hamilton Hawkins, "Cavalry," *JUSCA* 26 (April 1916): 591.
[127] Hayne, "Organization and Employment," 202.
[128] McClure, "Use of Cavalry," 965.
[129] G. W. Moses, "Bulletin No. 18," *JUSCA* 24 (May 1914): 912.
[130] A. L. Dade, "Reducing the Cavalry of the Regular Army," *JUSCA* 22 (May 1912): 1014-15. See also Lascelles, "Airship and Flying Machine," 212.
[131] Rhodes, "Cavalry of Today," 369. See also Roscoe, "Effect of Aeroplanes," 857.
[132] Rhodes, "Cavalry of Today," 369.

members of the branch in charge of aviation, the Signal Corps. A Signal Corps captain

echoed the cavalry's belief that aerial reconnaissance should supplement the cavalry's

scouting role, arguing, "an ideal army would consist exclusively of cavalry and horse

artillery, and the necessary auxiliary troops." The cavalry was "eminently fitted" for

screening and reconnaissance, roles that could not be performed by any other service.

The Signal Corps would provide only "an auxiliary means of aerial reconnaissance" not

a replacement.[133]

Although most of the *JUSCA* articles accepted the assistance aeroplanes could

render cavalry reconnaissance, they also emphasized that reconnaissance would never be

completely ceded to aviation because its technological limitations were unlikely to be

remedied. Despite continual technological improvement, flying machines were still

unable to solve the problems enumerated in pre-1912 articles. American objections to

the aeroplane were essentially the same as those expressed by the British. Aeroplanes

remained auxiliary because they could not function in poor weather and bad terrain.[134]

One cavalryman took the problem of meteorological conditions to the extreme,

maintaining that stationary fogs would prevent flying in the fall, winter, and spring.[135]

Even if aviation technology improved to allow flying to occur year-round despite

stationary fogs, aerial reconnaissance would not be possible.

---

[133] Holland Rubottom, "Cavalry Reconnaissance," 25-26. See also Paul W. Beck, Lecture on Aeroplanes given before War College, Washington Barracks, DC, November 17, 1911, Box 15, Folder 247, U.S. Army Military History Institute, Carlisle, PA.

[134] G. W. Moses, "Communications and Reconnaissance on the Battlefield," *JUSCA* 23 (May 1913): 993-94 and Moses, "Bulletin," 911. See also Niemann, "Airships and Cavalry," 874-5 and Hayne, "Organization and Employment," 202.

[135] Olaf Schwarzkoff, "The Changed Status of the Horse in War," *JUSCA* 26 (January 1916): 347.

Not surprisingly, American cavalrymen attacked the exaggerated claims of aviation's proponents who stated or implied that the cavalry was no longer necessary. A 1st lieutenant agreed with his fellow cavalry officer that aviation enthusiasts had let their imaginations run wild and were leading the public astray. He criticized the military personnel who, "with childlike faith…in flights of fancy too vague for sane minds to record, have relegated cavalry to the land of Skidoo." This officer, obviously well-educated, was not above making his point through sarcasm, writing that

> the herald and the porte-crayon of this body-lunatic will picture for you a winged centaur traversing the heavens in a chariot of fire, disdaining the elements, while from heights too great to be reached by any projectile, death dealing missiles will be showered down upon the unsuspecting heads of our adversaries. They will show this Pegasus of the skies performing all the essential duties of cavalry in such style as to make the redoubtable Stuart, Phil Sheridan and Forrest, with their hordes of heroes, look to the future student of history like the proverbial "thirty cents:"—(10 cents each).

Despite his abusive rhetoric, he maintained that he was "a friend of the aeroplane," motivated by concerns that the "waves of popular enthusiasm" would "crash upon the rocks of cold fact" due to the dangers of exaggerating aviation's possibilities.[136] His belief was that the aeroplane was still only an adjunct to the cavalry unable to fulfill the capabilities attributed to it. Another cavalryman noted that articles in the daily press had been either too brief on their coverage of aviation or "so manifestly the result of a reporter's imagination as to be untrustworthy."[137] In both these cases, the authors suggested a more practical approach to evaluating aviation's current abilities.

---

[136] Roscoe, "Effect of Aeroplanes," 856.

[137] Moses, "Communications and Reconnaissance," 996. See also Rhodes, "Cavalry of Today," 369.

Maneuvers

Practical evaluations of military operations and maneuvers confirmed the beliefs of American cavalrymen that aeroplanes could not entirely replace the cavalry in reconnaissance roles. For example, in the 1912 Connecticut maneuvers, the aeroplanes' scouting and wireless communication equipment failed to live up to aviation proponents' expectations. A Field Artillery captain reported that some military officers had the "erroneous impressions" that "the aeroplane could *supplant* the cavalry in scouting work and reconnaissance," but noted that the trials revealed many reasons why such thoughts were premature. He listed numerous problems hampering the effectiveness of aviation including the dark, heavy fog, hazy atmosphere, dusty weather, poor landing grounds, and weak or unreliable engines.[138] He maintained that the maneuvers demonstrated that "the aeroplane was merely an adjunct to the cavalry" since it was not yet developed enough "to be yet accorded any fixed and definite role upon the battlefield."[139] Reports from trials in Rheims, France noted that aeroplanes did "not yet satisfy military requirements."[140]

The popular press began reporting more temperate evaluations of the value of cavalry and aviation after actual military tests of aeroplanes revealed the weaknesses of the latter. They admitted that military operations and maneuvers had not shown the cavalry superfluous, as they had predicted previously, and that cavalry remained invaluable in conducting reconnaissance. For example, a December 5, 1912, article in

---

[138] F. B. Hennessy, "The Aviation Squadron in the Connecticut Maneuver Campaign," *JUSCA* 23 (November 1912): 458-76.

[139] Ibid., 458.

[140] "Military Aeroplanes," *CJ* (UK) 37 (January-October 1912): 102. See also Rhodes, "Cavalry of Today," 370.

the *New York Times* maintained that cavalry was still useful after observing the lessons of the Italo-Turkish War. The writer noted that aeroplane reconnaissance results were "not as sensational as has been reported in regard to some European manoeuvres." He also refuted the much-published idea that the cavalry was no longer needed in light of aviation developments.[141]

Although the caution expressed by cavalrymen was shared by members of many of their sister services and experiments with aviation seemed to support their warnings that most aviation predictions were exaggerated, some aviators attacked the army for being shortsighted and slow to support the continued development of aeroplanes. One of these was Benjamin Foulois, the most experienced American military aviator. He noted the development of aviation in the United States, and chided the public for its lack of support in light of many significant technological developments. Foulois claimed that both the army and public showed a "lack of enthusiasm [for] and active interest" despite maneuvers in Europe and in the United States that had demonstrated that aircraft were "here to stay." Admitting that his statements may "seem to be exaggerated and visionary," he had "every confidence in the wonderful military future of these new weapons of warfare" because of his four years' experience with aeroplanes. He repeated his predictions that "information relative to the operations of the enemy," previously collected by the cavalry, will "hereafter be obtained by the aerial fleet and transmitted to the commander-in-chief long before the invading cavalry has gained touch with the

---

[141] Palmer, "Military Lessons," 2. See also "Bernhardi and French on Modern Cavalry," *Chicago Daily Tribune,* November 15, 1914; "Squadron Fails in Mexico," *New York Tribune,* March 28, 1916, 3; and Reilly, "Aerial Service," 6.

enemy." In contrast with recent unenthusiastic appraisals of European maneuvers, Foulois contended that recent maneuvers showed that "a modern military aeroplane, equipped with a radio-telegraph set, could easily reconnoiter the same area [as the cavalry] in one-half the time."[142] Foulois regarded anyone who preached caution or argued for limited aviation budgets as backward. Some reports supported Foulois's opinion. On April 12, 1914, a *New York Times* article stated Signal Corps tests with aeroplanes in San Diego were "accurate in every detail" and "report[ed] in fifty-three minutes what it would have taken cavalry two days to find out."[143] In addition to Foulois, General Allen also encouraged the "country to get busy" and acquire more aeroplanes. Supported by congressmen, Allen, not surprisingly, encouraged bills designed to increase monetary support of aviation development.[144]

Cavalrymen continued to deny that aeroplanes would ever make their branch obsolete, but some argued that aeroplanes could relieve the cavalry from several duties to allow it to focus on its other more important and necessary roles. American cavalrymen echoed the contention made by foreign authors and non-cavalrymen before 1912 that aeroplanes strengthened rather than weakened the cavalry. As a coast artillery officer stated, "cavalry in modern war has all it can do, and its burden or work is constantly increasing, consequently, every means of relieving it as much as possible must be resorted to, and the aeroplane promises to be one of the most effective

---

[142] Benjamin D. Foulois, "Military Aviation and Aeronautics," *Journal of the Military Services Institution of the United States* 52 (1913): 98-99,103-104.
[143] "Army Air Scouts," 8.
[144] "What Could Uncle Sam Do?" B1.

means."[145] Aeroplanes would spare the cavalry from "onerous reconnoitering duties" thus increasing the cavalry's ability to be utilized on the battlefield in greater numbers.[146]

As aircraft became more reliable and capable, more American cavalrymen began to consider the possibility of conceding the reconnaissance role to aviation altogether. However, like those before them in the *JUSCA,* these cavalrymen attempted to turn this loss into a victory by arguing that ridding themselves of this duty would strengthen the cavalry by freeing it up for other important missions. They denied that relinquishing this role made the cavalry obsolete or diminished its importance.[147] A cavalry colonel emphasized that "modern inventions relieved the cavalrymen from many hard rides" but not "the necessity of his services."[148] A brother officer praised the ability of aeroplanes to save horses for combat.[149] A cavalry major also contended that cavalry equipped with its own aeroplanes would add to the "reconnoitering and combat value of the mounted arm."[150] Cavalrymen were not alone in arguing that aviation strengthened the cavalry. A senior army officer, General James Parker, argued that the aeroplane had "added to the value of cavalry" for fighting against infantry.[151]

---

[145] Wisser, "Tactical and Strategical Use," 421.

[146] Niemann, "Airships and Cavalry," 876-77. See also "Modern War," 965; Campbell, "Aeroplanes with Cavalry," 313; Rhodes, *Cavalry of Today*, 370; James Parker, "The Value of Cavalry as Part of Our Army," *JUSCA* 25 (July 1914): 8-9; and Hickok, "Role and Organization," 57.

[147] Moses, "Communications and Reconnaissance," 994. See also Roscoe, "Effect of Aeroplanes,"857-58; Moses, "Bulletin," 912; Hawkins, "Cavalry," 601; Rhodes, "Cavalry of Today," 370.

[148] J. A. Gaston, "Divisional Cavalry on the March and in Action," *JUSCA* 25 (April 1915): 601.

[149] Moses, "Bulletin," 912.

[150] Rhodes, "Cavalry of Today," 370.

[151] Parker, "Value of Cavalry," 9.

War

In the months leading up to the outbreak of the Great War, cavalrymen in Great Britain and the United States remained uncertain as to their role in reconnaissance and modern war in general. Would cavalry facilitate aeroplane reconnaissance work or would aeroplanes serve the cavalry? Would the cavalry have a continued role in reconnaissance? The outbreak of conflict, however, forced the cavalries of both Britain and the United States to set aside debates and get to the business of fighting. Mobilizing and training forces, planning campaigns, and actual combat took precedence over theoretical discussions about how the successes of aviation in maneuvers translated into actual war and cavalry's continued value. The British even ceased the publication of military periodicals, including the *Cavalry Journal,* after Britain entered the Great War in 1914. This removed one of the major platforms available to cavalrymen to discuss cavalry topics. However, discussions continued in the United States until it entered the war three years later.

American newspapers and journals made up for the lack of aviation and cavalry coverage in Britain by publishing articles penned by observers in Europe. War correspondents reported events and discussions throughout 1914-1917 measuring the value of aviation and the cavalry. Usually cavalry did not do well in comparison. Already in the first months of the European war, a French corps commander declared that a single aeroplane was "worth as much as a division of cavalry" in reconnaissance.[152] Aeroplanes could prevent surprises, as "few important movements of

---

[152] "Aero Aids Maneuver," 11. Also see "One Aeroplane," 26.

troops have been made which have not been promptly reported by aerial scouts before their completion."[153] Indeed, the *St. Louis Post-Dispatch* reported that aeroplane scouts were relieving the "always overworked cavalry…discover[ing] in half an hour what a detachment of cavalry might fail to find in a day."[154]

During the years of the Great War while the United States remained a neutral nation (if only in name), U.S. newspapers continually reported that "cavalry has given way to it [the aeroplane]"[155] and "armies and navies are useless in modern warfare" unless assisted by aeroplanes.[156] An April 1917 *New York Times'* article had the subtitle "Airplanes Replace Cavalry as Eyes of Fighting Forces"[157] while the *Boston Daily Globe* quoted Rear Admiral Robert E. Peary's more damming prediction that airplanes would "do the work of cavalry, infantry and artillery combined."[158] The *Kansas City Star* proclaimed the "Cavalry's Last Days," noting that the American army preparing for service in Europe contained no cavalry. It argued that "from the French word for horseman came [the] word chivalry," but with the coming of the airplane "chivalry ha[d] taken to the sky" and that according to French army leaders "everything that cavalry ever did" could "be done better by airplanes."[159]

Nonetheless, American cavalrymen attempted to demonstrate that the cavalry remained a vital element of the military. To do this they utilized reports from the war to

---

[153] "Aero Aids Maneuver," 11.
[154] "Making Aeroplanes Fighting Machines," *St. Louis Post-Dispatch*, October 11, 1914, B7.
[155] "Aeroplanes Built," 8. See also "What Do You Know About the United States Army?" *Washington Post,* April 8, 1917, SM4.
[156] W. H. Fauber, "U.S. Must Have Powerful Air Fleet," *New York Times,* February 13, 1916, XI. See also Henry J. Reilly, "Control of the Air Decides Battles," *Boston Daily Globe*, April 15, 1917, 16.
[157] Reilly, "Control of the Air Decides Battles," 16.
[158] "Air Attack on U.S. Peary's Prediction," *Boston Daily Globe*, November 25, 1917, 13.
[159] "Cavalry's Last Days," *Kansas City Star,* June 18, 1917, 6.

attack those who wrote the cavalry was no longer needed. Cavalrymen even requested

funds and additional personnel, claiming that the cavalry only failed in the war because

it did not have the necessary material to fight effectively. One cavalry lieutenant took

offense to reports and "sensationally illustrated articles" that focused wholly on air

combat, accusing these publications of hiding the importance of less glamorous

missions, such as cavalry reconnaissance. He maintained that the reason why cavalry

was believed to have accomplished little in the war was because no one studied the

cavalry's actions. Attempting to correct this oversight, he argued that the cavalry

continually conducted close reconnaissance when hostile aircraft or weather grounded

friendly airmen.[160] He did not endeavor to minimize the value of aviation but simply

wanted the cavalry to get the notice and credit it deserved.

This lack of coverage was understandable and perhaps reasonable. Lieutenant

Colonel John Stuart Barrows wrote that since cavalrymen spent most of their time in the

trenches like other soldiers, traditional cavalry roles such as charges and reconnaissance

were "not given much space in the current news." He was very clear, however, that the

cavalry was not useless or obsolete.[161] A military contributor to the *Chicago Daily*

Tribune and the *JUSCA,* former cavalryman Henry J. Reilly, also wrote to correct what

he saw as the "most prominent" erroneous idea "that the day of cavalry is past."

Although admitting that mounted actions would be "few and far between," he argued

---

[160] Elbert E. Farman, "The Cavalry in the Present War," *JUSCA* 26 (April 1916): 625, 627-28.
[161] Barrows, "Uhlans and Other Cavalry," 391, 398.

that all cavalries would be armed with rifles allowing them to fight like infantry when not mounted.[162]

A 3d Cavalry veterinarian also pointed out that additional predictions and beliefs about the war did not hold up upon deeper examination. He responded to the predictions that aviation was cheaper than the horse cavalry and that the war would pit machines against one another. He argued that little of the "phantastic idea" of the predicted "contest of machines" had materialized. He curtly rejected the predictions of a horseless and almost manless war by observing that the conflict had not played out as people had anticipated. Although he focused primarily on automobiles, he also observed the important gap between the predictions about aeroplanes and their actual abilities. His assessment of the automobile as an excellent auxiliary but "as a substitute for the horse it proves a delusion," seem equally applicable to the cavalry's views of aeroplanes. He claimed it was the novelty "of the machines and not their economy that made them popular with armies at the beginning of the war." He provided evidence for his contention for the lack of saving produced by machines by citing the average life span of the various war-making components. Using statistics based on the first months of the war and published in December 1914 in the French newspaper *Figaro*, he stated, "the average life of a man in this war is *six and five-sixth* days, and that of a horse *four and one-third* days; aeroplanes and automobiles lasted three days, and motor truck less than *one* day."[163]

---

[162] Henry J. Reilly, "Cavalry Branch is a Big Factor in All War Moves: Army Expert Describes His Activities in Great European Conflict," *Chicago Daily Tribune,* October 20, 1915, 9.
[163] Schwarzkoff, "Changed Status," 335-40.

Even as European cavalry in the war seemed to show cavalry to be superfluous, American cavalrymen urged the public not to equate their value to that of the poorly performing foreign cavalry. Partially this stemmed from the belief that the latter had entered the war with bad ideas about how to use the vital cavalry arm.[164] Unlike its contemporaries, the United States did not expect to use the cavalry in great charges but, as Hamilton Hawkins argued, the "great work of modern cavalry would not be done in the limelight, that it would be non-spectacular and silent, and that of all the branches of the army it would make the least noise and be the least observed."[165] The fact that European cavalry did not successfully conduct charges in the Great War, therefore, did not affect the utility of American cavalry. Hawkins contended that the press had failed to cover the dismounted and scouting work of the cavalry properly because its useful reconnaissance work was not easily observed and thus "unheralded."[166]

Colonel Hawkins regarded popular writers who minimized the cavalry's future as uninformed and "very dangerous when they write of serious subjects about which they know little." He cited Charles William Eliot, a Harvard Professor of Mathematics and Chemistry, as one of those who claimed, "cavalry is a thing of the past, that aeroplanes have completely displaced cavalry for reconnaissance." In reality, argued Hawkins, "aerial reconnaissance accomplished much, but, until the trench warfare began, it did not do as much as some people believe." When the armies still moved, the cavalry

---

[164] Hawkins, "Cavalry," 581-89. See also Hickok, "Role and Organization," 73; A Cavalry Officer Abroad, "The Question of Organization," *JUSCA* 25 (October 1914): 205-207; One of Our Cavalry Officers, "Service with a French Cavalry Regiment," *JUSCA* (October 1914): 232-33; A Cavalry Officer Abroad, "Report Upon Year Spent with French Cavalry," *JUSCA* (January 1915): 447; and Henry J. Reilly, "Cavalry in the Great War," *JUSCA* 27 (April 1917): 478-79.
[165] Hawkins, "Cavalry," 582.
[166] Ibid., 583. See also Farman, "Cavalry in the Present War," 625.

performed "great and invaluable service in both screening and reconnaissance."[167] He

argued that "aerial reconnaissance alone was not reliable or sufficient" and that aerial

and cavalry reconnaissance "should work together, hand in hand." He concluded, as had

his colleagues, that aeroplanes provided a valuable adjunct to cavalry, making its duties

easier.[168]

Members of other branches also defended the cavalry's continued usefulness. A

captain of the Field Artillery (though previously a 1st Lieutenant in the 15th Cavalry)

authored a book on American preparedness for war motivated partly to correct the "most

erroneous belief" that the day of the cavalry was past.[169] The author cited an Austro-

Hungarian general who argued that since the cavalry's chief asset remains mobility,

"however much the aeroplane might replace cavalry in reconnaissance work; this would

not affect the value of cavalry" because "mobility makes cavalry especially valuable."[170]

The cavalry could still fight, and reconnaissance was not its only use.   In April 1917, the

same cavalry officer argued, "the gathering of information before, during, and after

combat, is primarily the function of the aviation service," but in many cases ground

reconnaissance remained necessary.[171]

Military reports from the Great War did not support the claim that "aeroplanes

had practically supplanted cavalry in reconnaissance" and that the conflict was not

"much of a war for cavalry."[172] By mid-1915, military observers abroad rejected the

---

[167] Hawkins, "Cavalry," 584-85, 589.
[168] Ibid., 601.
[169] Henry J. Reilly, "Cavalry in Modern War," *JUSCA* 27 (November 1916): 294.
[170] Ibid., 295.
[171] Reilly, "Cavalry in the Great War," 482.
[172] An Officer Abroad, "Notes on the European War," *JUSCA* 26 (July 1915): 54.

prophets of doom "who pronounced the death sentence of the mounted arm and denied it any but a small, special place as an assistant in battle."[173] Instead, reports noted the indispensability of cavalry for reconnaissance along with the not infrequently mentioned belief that the cavalry's glory days were in its future.[174]

Prior to the United States' entry into the Great War, American cavalrymen did not have to depend entirely on foreign conflicts for examples of how aviation and cavalry complemented or conflicted with one another in real combat situations. In March 1916, President Woodrow Wilson ordered the Punitive Expedition under the command of John J. Pershing to Mexico in response to a raid on Columbus, New Mexico, by Mexican revolutionary Pancho Villa, in which fifteen American civilians and soldiers were killed.[175] This, the United States' first combat test of the aeroplane supported the cavalry's belief that aeroplanes remained insufficiently developed to challenge seriously the primacy of cavalry reconnaissance. The brief involvement of aviation was described by one scholar who concluded the "army's earliest experiences with airplanes were long on promise and short on performance."[176] The flimsy and unreliable Signal Corps aircraft performed some reconnaissance and carried messages, but crashes and maintenance problems quickly deprived the army of aerial vehicles. [177] A year prior to American entry into the Great War, the cavalry was still needed for

---

[173] An Officer of High Rank, "What Has the World's War Taught Us Up to the Present Time that is New in a Military Way," *JUSCA* 26 (July 1915): 97-98.
[174] Ibid. See also "Dragoons Wrecked German Air Fleet: French War Office Describes Night Attacks of Cavalry on an Aeroplane Camp," *New York Times,* November 29, 1914, 2; Reilly, "Cavalry Branch Big Factor," 9.
[175] Allan R. Millett and Peter Maslowski, rev. ed., *For the Common Defense: A Military History of the United States of America* (New York: Free Press, 1994), 337.
[176] Millett and Maslowski, *For the Common Defense*, 331.
[177] Hofmann, *Through Mobility We Conquer*, 45; Millett and Maslowski, *For the Common Defense*, 333.

reconnaissance since the "army's aviation equipment was both deficient and

dangerous."[178] Of course, spared the urgency of major war, American aviation

development lagged behind their European counterparts. This expedition, less than a

year before the United States entered the European war, was not a great demonstration of

the aeroplane's potential value.

In both the quality and quantity of aircraft and engines, the Europeans were far

ahead of the Americans during the Great War. However, when the British initially

entered the conflict British aviation was not ready (although it was more prepared than

the Americans would be in 1917). When the conflict began in August 1914, the Royal

Air Corps sent four squadrons composed of fifty planes, all with French engines and

almost half constructed of foreign design, to France.[179] However, British aeronautical

development accelerated once Great Britain entered the war.[180]

When the United States finally entered the war in April 1917, the debates over

the relationship of airplanes and the cavalry declined drastically as the focus became

fighting the war. The *Journal of the United States Cavalry Association* ceased

publication just as its British equivalent had done three years earlier. The United States

entered the war unprepared, "especially dependent on foreign sources for artillery,

ammunition, tanks, airplanes, and machine guns."[181] The larger American experience of

---

[178] Johnson, *Wingless Eagle,* 139. For a more detailed treatment of aeroplane and cavalry use in the Punitive Expedition to Mexico see chapter five.
[179] Morrow, *Great War in the Air,* 45.
[180] Morrow's *Great War in the Air* provides a good treatment of European military aviation development during the war.
[181] Timothy K. Nenninger, "American Military Effectiveness in the First World War," in *Military Effectiveness, vol 1. The First World War*, ed. Allan R. Millett and Williamson Murray (Boston: Unwin Hyman 1988), 121.

the war was "basically one of learning by doing" because "there was no systematic effort beforehand to assess the new weapon, determine needs, develop a doctrine, and train troops and commander in its use."[182]

In preparation for the increasing possibility of entering the European conflict, the National Defense Act of 1916 had added ten cavalry regiments to the fifteen already existing. Two were formed and remained horse cavalry regiments during the war, but the rest, the 18th- 25th regiments, became Field Artillery units. Only part of the 2d, 3d, 6th, and 15th Cavalry regiments went overseas. They did not participate in much fighting. Most cavalry regiments remained at home along the border without gaining wartime experience. Few cavalry soldiers actually reached Europe, and no cavalry horses were shipped with American troops.[183] Additional debate over the value of cavalry compared with aviation would have to wait until after the end of hostilities.

Conclusion

American and British cavalrymen from 1903 until the outbreak of the Great War responded to the potential loss of roles and missions to aviation differently due to their unique assessments of the importance of reconnaissance, the treatment of aviation and the cavalry in the popular press, dissimilar experiences with aviation, and their individual experiences of involvement in military conflicts. The American cavalry responded less quickly to a more negative American press while the British cavalry

---

[182] Ibid., 139.
[183] Mary Lee Stubbs and Stanley Russell Connor, *Armor-Cavalry Part I: Regular Army and Army Reserve* (Washington, DC: Office of the Chief of Military History United States Army, 1969), 38; Hofmann, *Through Mobility We Conquer,* 2.

immediately engaged in discussion about how aviation could help the cavalry. Yet the British lacked a consistent and unified position and remained mostly unconcerned about the possibility of aviation usurping its reconnaissance duties because they considered them a low-priority. Individuals within the American and British militaries addressed the real-world challenges of technologies in transition when no one was certain what aeroplanes could actually accomplish in the present or near future.

Although skeptical of aviation's revolutionary impact, the *JUSCA* and the *CJ* revealed British and American cavalrymen to be primarily cautious technological examiners. Rather than rejecting new innovations that might expropriate their roles, American and British cavalrymen were cautious. They can be seen as rational people responding to the uncertainties surrounding the limited but rapidly evolving capabilities of military aeroplanes prior to the First World War. With little experience with the new technology, they saw it as having far too many limitations and drawbacks to fulfill the aviation supporters' predictions that cavalrymen no longer needed to conduct reconnaissance. Many, however, welcomed its ability to add to the capabilities of the mounted branch by providing additional information and relieving the cavalry of time-consuming tasks. Certainly, the new technology had not entirely appropriated the reconnaissance missions of ground units. Unfortunately, for the cavalry, there was a growing impression among the public and politicians that modern war and aeroplanes had already made them obsolete.

The horse cavalry did not become obsolete overnight nor did aviation fulfill the predictions made for it instantaneously. The horse cavalry continued to play a vital role

in the militaries of the United States and Great Britain well after the invention of

motorized vehicles. The caution shown by cavalrymen and governmental officials in

both countries about aviation prior to the First World War was a skeptical but rational

response to an unproven innovation. It would take time for aviation to become the

revolutionary technology many claimed it would be.

CHAPTER IV

DEVELOPING A RELATIONSHIP IN THE 1920s

As occurs with almost every conflict, military theorists and officers, politicians, and the media began debating the lessons of the Great War even before it ended. The success and potential value of the technologies, strategies, and tactics employed came under heated debate. How innovations including—tanks, radio, gas, and especially aeroplanes—should be used in the future became contentious issues. Whether the cavalry still had relevance was another subject of debate. British and American cavalrymen defended their branch against claims that technology had made the horse-mounted soldier obsolete, citing examples from the war to argue that the horse cavalry had not functionally outlived its usefulness despite improvements in the capabilities of aeroplanes and other technologies.

Once again cavalrymen argued that aviation, in cooperation with cavalry, was necessary for military success. However, the British and American cavalry forces had different problems arranging that cooperation because the United States and Great Britain organized their air arms differently. The British cavalry had to contend with an independent aviation organization, the Royal Air Force (RAF), whereas American cavalrymen had an air force within their own service, the United States Army. In both nations, however, cavalrymen demonstrated a desire to apply the lessons of the last war to strengthen their organizations by working with aviation units more intimately. This manifested itself in the form of demands for combined to learn how cavalry and

aeroplanes might support each other as well as requests for organic aviation within cavalry.

The success of aviation during the Great War, combined with the seeming absence of cavalry from the fighting, led many outside observers to resume the prewar argument that the aeroplane would supplant the horse. Cavalrymen, long used to such charges of irrelevance, generally responded with dignity, moderation, and reason to those calling for disbanding the cavalry. However, the strain of defending their branch's utility must have taken its toll, as some cavalrymen began resorting to sentiment and emotion rather than reason in their responses.

British and American cavalrymen continued to utilize journals, especially their nation's respective cavalry journals, to discuss their opinions and concerns. This coverage expanded as familiarization with aeroplane technology grew. Table 3-1 in Chapter Three demonstrated that the cavalry journal articles discussing aviation from 1908-1917 and 1920-1929 increased from thirty-six to sixty-nine articles in the American periodical and from twelve to twenty-nine in the British journal.[1] Some of this increase may be attributed to a rise in the average number of articles per issue in the 1920s, but a slight increase is still distinguishable. In the case of the American *Cavalry Journal* the increase was from slightly over four percent to more than six percent of articles (a fifty percent rise). The real significance, however, was not the total number of articles mentioning aviation, but the quality of the articles' treatment of the topic.

---

[1] The *Cavalry Journal* in London [*CJ* (UK)] and the *Cavalry Journal* [*CJ* (US)] in Washington, DC (previously entitled the *Journal of the United States Cavalry Association*) resumed publication in April 1920.

Historian William Odom has stated that only three U.S. *Cavalry Journal* articles from 1915-1925 "explore the relationship between the air service and cavalry."[2] He is in error. His total is accurate only if articles mentioning both aviation and cavalry in the title are counted. This calculation misses dozens of articles that address the relationship without necessarily announcing so in their titles. This mistake is understandable considering the lack of a subject index for the journal.

This chapter will provide a summary of the discussions on air forces and the cavalry in both the United States and Britain following the war as found not only in the cavalry journals but in newspapers, maneuvers, and doctrine. It will begin with a brief description of the status of the aeroplane-cavalry relationship at the end of the war and go on to describe the relationship between cavalry, aviation, and modern war during the 1920s. The old argument that cavalry was obsolete would not die, and in fact was apparently strengthened by the experience of the war. Cavalrymen continued to defend their existence, updating earlier arguments to take into consideration new technological developments. They dusted off the prewar arguments examined in Chapter Three, including their warnings about overconfidence in technology and the operational limitations of aeroplanes. Yet despite aviation's shortcomings, cavalrymen also understood that it would be of considerable service to them once it had matured. To expedite this process, cavalry and air forces worked together in maneuvers and border operations to identify the fundamentals of successful cooperation, though far more in the United States than in Great Britain.

---

[2] William Odom, *After the Trenches: The Transformation of U.S. Army Doctrine, 1918-1939* (College Station: Texas A&M University Press, 1999), 64.

Postwar Status of Debates

Rather than examine the cavalry's performance in the war, which would fill the pages of multiple volumes and actually has done so, this chapter focuses on the relationship between cavalry and aviation during the First World War and the decade following. [3] Not surprisingly, reconnaissance served as the primary link between aeroplanes and cavalry, just as it had before the war. The American Expeditionary Force (AEF) Cavalry Board, created in 1919 to determine what lessons the cavalry might draw from the war, reported that the greatest change would be the transfer of the responsibility for strategic (long-range) reconnaissance from the cavalry to aviation, leaving the former free to focus on tactical (short-range) reconnaissance operations.[4] The AEF Superior Board on Organization and Tactics—created to review the war for lessons for all American forces—agreed with the Cavalry Board that long-distance reconnaissance would be primarily assigned to aeroplanes, but with the understanding that cavalry remained necessary for near strategic (mid-range) and tactical reconnaissance when actual contact with the enemy proved necessary.[5] Its report combined the findings of several postwar boards established to assess the war's lessons in late 1918 through the

---

[3] Some of the volumes discussing the cavalry in the war include: Marquess of Anglesey, *A History of British Cavalry, 1816-1919* (London: Secker and Warburg, 1986); Cavalry School (U.S.) Academic Division, *Cavalry Operations during the World War* (Fort Riley, KS: Academic Division, The Cavalry School, 1929); David Kenyon, *Horsemen in No Man's Land: British Cavalry and Trench Warfare, 1914-1918* (Barnsley, South Yorkshire: Pen and Sword, 2011); R. M. Preston *The Desert Mounted Corps: An Account of the Cavalry Operations in Palestine and Syria, 1917-1918* (London: Constable, 1921); David R. Woodward, *Hell in the Holy Land: World War I in the Middle East* (Lexington: University Press of Kentucky, 2013); Alexis Wrangel, *The End of Chivalry: The Last Great Cavalry Battles, 1914-1918* (New York: Hippocrene Books, 1982).
[4] Sarah Janelle Rittgers, "From Galloping Hooves to Rumbling Engines: Organizational Responses to Technology in the U.S. Horse Cavalry," (PhD diss., George Washington University, 2003), 171-75.
[5] United States Army American Expeditionary Forces, *Report of Superior Board on Organization and Tactics* (United States: s.n., 1919), 65, OCLC 18673488, MHI.

middle of 1919, including the aforementioned Cavalry Board.[6] According to the cavalry

major who served as the Assistant Chief of Staff for Military Intelligence, aviation's

ability to "see over the hill" and determine enemy dispositions behind the front lines, as

well as take photographs for commanders, had transformed the collection of strategic

information but did not replace cavalry's tactical role.[7]

Despite these findings, the postwar popular press continued to denigrate the

usefulness of cavalry after the war, relying on many of the same arguments it had used

before the United States entered the conflict. Instead they adopted an attitude

reminiscent of one expressed in a prewar congressional debate over appropriations for

war preparedness. This debate pitted those who believed that cavalry had been replaced

by aircraft against those arguing that cavalry had never been so valuable.[8] Proponents of

the former argument included the press and were not difficult to find in the U.S. or

Britain prior to the war (as explored in the previous chapter.) Popular newspapers and

magazines, such as the *St. Louis Post-Dispatch* and the *Washington Post,* declared the

cavalry obsolete because "aeroplanes [now] serve as the eyes of the opposing armies"

and so the aeroplane service "supplant the cavalry" for reconnaissance.[9] British General

Lord Horne, the only British artillery officer to command an army in the war, reported

hearing this same conclusion on many occasions during the last two and a half years of

---

[6] Odom, *After the Trenches,* 26-27.
[7] George M. Russell, "Intelligence for Cavalry," *CJ* (US) 29 (October 1920): 254-59.
[8] United Press, "Aircraft and Cavalry in Contest for Preference in Defense Planes," *Washington Post,* February 23, 1916, 2.
[9] "The Race for Aeroplane Supremacy," *St. Louis Post-Dispatch,* February 27, 1916, B5; "What Do You Know About the United States Army?" *Washington Post,* April 8, 1917, SM4.

the Great War: "'the day of cavalry is past; cavalry is doomed: cavalry fulfills no good purpose.'"[10]

After the war, the press repeatedly reported the belief that cavalry was no longer useful in modern war, primarily due to technological advancements. New inventions including machine guns, tanks, gas, and aeroplanes, helped to create a landscape characterized by trenches, which curtailed the cavalry's mobility, its primary characteristic. A letter to *The Times* of London proclaimed that cavalry operations were impracticable as they would be observed and bombed from the air. Furthermore, tanks could do everything the cavalry could do at least "as effectively" and far more cheaply than horses.[11] A French cavalry captain, who was also the air service attaché in the French Embassy, argued poetically that the mounted cavalry fights of old had no place in modern war, "where death flashes from thousands of points; where battles are won or lost without adversaries even coming into contact with each other; where, despite the greatest precautions, the losses are so immense."[12] *The Nation & the Athenaeum*, a weekly British liberal political newspaper, reported that the "experience of the war showed that cavalry are as obsolete as bowmen."[13] The media's primary conclusion in the decade following the war, as *Current History* reported in 1928, was that the "cavalry [was as] dead as a dodo" because of the siege-like situation of trenches.[14]

---

[10] G. A. Weir, "Some Reflections on the Cavalry Campaign in Palestine," *Journal of the Royal United Service Institution* 67 (1922): 231.

[11] Theo H. Thorne, "Letters to the Editor: The Future of Cavalry," *Times* (London), April 22, 1919, 6.

[12] Captain de la Vergne, "A Few Words about European Cavalry," *Cavalry Journal* (US) 29 (July 1920): 155.

[13] A. G. G., "Life and Politics," *Nation and the Athenaeum* 37 (April 1925): 41.

[14] Elbridge Colby, "The Horse in War Today and Yesterday: I—Cavalry Still a Factor in Military Warfare," *Current History* 28 (1928): 446.

Cavalrymen as well as other military officers rejected these findings, yet the limited use of the mounted branch during the war complicated the horsemen's efforts to provide proof of their continued viability. This was especially true for the American cavalry because the late entry of the United States into the conflict, combined with the low priority accorded the transport of horses to Europe, meant only a small cavalry contingent reached the front and without its mounts. The portions of the 2d, 3d, 6th, and 15th Cavalry regiments that made it overseas while still retaining their identity as cavalry units served primarily as military police and guards, although they were also assigned remount duties.[15]

After the war the AEF Cavalry Board commissioned a survey of American cavalry members who served during the war, which provides a good picture of the frustrations experienced by their branch. A sergeant of the 4th cavalry reported joining the unit to get the chance to travel. He got his wish, but his usual travel assignment consisted of driving mule teams from Arizona to Texas, not exactly what he expected. He never went overseas.[16] An 11th cavalry regiment sergeant who also saw no service outside of the U.S. despite being scheduled for oversea duty several times moved horses by train to Fort Meyer, Virginia.[17] Members of the 12th and 306th cavalry regiments

[15] Joseph Cheries, "Army Service Experiences Questionnaire (1914-1921)," World War I Research Project, [hereafter "Army Questionnaire"] WWI 763, OCLC 457255624, U. S. Army Military History Institute, Carlisle, PA [here after MHI]; Nelson Greer, "Army Questionnaire," WWI 3581, OCLC 457255624, MHI; and Paul W. Krug, "Army Questionnaire," WWI 4289, OCLC 457255624, MHI.
[16] Paul Weil, "Army Questionnaire," WWI 6063, OCLC 457255624, MHI.
[17] Robert W. Jack, "Army Questionnaire," WWI 440, OCLC 457255624, MHI.

related similar experiences.[18] Even those cavalrymen in the 15th Cavalry Division who

went overseas had little to say about their experiences. A private summarized their

experiences best, reporting that they left their horses behind with the promise they would

be on the next ship. They never came.[19] A poem by Francis Parsons, published in *Life*

magazine in 1920, expressed the distress of American cavalrymen who went abroad

without their mounts. The second and third stanzas of his poem "Regular Cavalry" read:

> They took as cavalry soldiers
> And made us machine-gun men.
> I said good-by to my old brown horse
> And turned him into the pen.
> I never knew what a friend he was,
> But something stuck in my throat—
> He wheeled—and stopped—and looked
> At me…
> Good Lord, that got my goat!
>
> It wasn't much of a picnic—
> That scrapping over there.
> There was times I though I'd never last,
> And time I didn't care.
> I often thought of the horse I'd lost,
> And wished before I died
> I could go on him one last patrol
> Along by the Rio's side. [20]

Lessons about the future viability of cavalry used in its traditional roles (mounted and

used in reconnaissance, raiding, and scouting) had to come almost entirely from

examination of European cavalry experiences because American cavalrymen had little to

no experience during the Great War.

---

[18] Ray A. Ingle, "Army Questionnaire," WWI 6149, OCLC 457255624, MHI; Ethan A. Nelson, "Army Questionnaire," WWI 1354, OCLC 457255624, MHI; Rea A. Nunnallee, "Army Questionnaire," WWI 5633, OCLC 457255624, MHI.
[19] Mack Sheldon, "Army Questionnaire," WWI 4699, OCLC 457255624, MHI.
[20] Francis Parsons, "Regular Cavalry," *Life,* January 1, 1920, 42.

Postwar Cavalry Response

Once the war ended, the American and British cavalry journals served as forums for cavalrymen to debate the roles and value of cavalry in modern war. In its first postwar issue the American *Cavalry Journal,* appealed to officers to submit examinations of the conflict that evaluated how cavalry roles had changed. It acknowledged that certain cavalry roles were no longer needed observing that "the prominence of the new weapons and of the other services [had]…dimmed…[the] light" of the cavalry, but that the light was not yet extinguished.[21] The response was encouraging. Writers acknowledged that the relationship between aviation and the cavalry had changed, but there was still a need for mounted forces. The aeroplane would complement horse cavalry in the performance of near and distant reconnaissance.

As before the war, cavalrymen assailed the tendency of Americans to accept too readily new technologies over old ones. The U.S. *Cavalry Journal's* editor argued that military officers who believed the cavalry had no future because of new technologies were exchanging "apples for dead sea fruit." He thought that these officers were falling prey to the American national characteristic of "too ready adaptability" by swapping aeroplanes and tanks for cavalry before the new technologies had proved their abilities.[22] A 1921 editorial in the *Cavalry Journal* cautioned cavalrymen not to allow the "transitory predominance of gasoline and technical novelties" to convince them that they were "good for nothing."[23]

---

[21] Editorial Comment, "Cavalry Journal Reappears," *CJ* (US) 29 (April 1920): 81.
[22] Ibid., 82.
[23] Editorial Comment, "A Cavalry Army," *CJ* (US) 30 (October 1921): 420.

Major George S. Patton Jr., who would become famous as a general during World War II, admitted to his colleagues within the pages of the *Cavalry Journal* that before the war he had been guilty of being overenthusiastic about new weapons. He confessed that he was one of the many prophets for a new technologically motivated arm who based their arguments on little more than "oral proof." While not admitting entirely that he and his contemporaries were wrong, he argued there were too many "thoughtless critics" of the cavalry and of other arms supposedly made obsolete by the late war. Patton maintained, however, that these technological innovations had an important place in the future.[24]

Warnings against overconfidence in the ability of new technologies to replace the cavalry branch did not emanate only from active cavalry officers. The *Christian Science Monitor* observed in 1918 that the war "taught us that prophecy . . . is futile," noting that the cavalry successfully drove the Germans out of St. Mihiel despite predictions to the contrary.[25] General John Pershing claimed that while some "unthinking" people might exploit the minimal use of cavalry in the war to argue its day had passed, he believed that even the cavalry's brief employment proved that the cavalry would continue to be an important military branch.[26] Major William C. Sherman of the Air Service also noted the "regrettable tendency on the part of the overhasty to assert that aircraft have rendered cavalry useless for future wars."[27]

[24] George S. Patton, Jr., "What the World War Did for Cavalry," *Cavalry Journal* 31(April 1922): 168.
[25] "By other editors," "Cavalry Still Useful," *Christian Science Monitor,* September 19, 1918, 6.
[26] John J. Pershing, "A Message to the Cavalry," *CJ* (US) 29 (April 1920): 5-6.
[27] William C. Sherman, "Cavalry and Aircraft," *CJ* (US) 30 (January 1921): 26.

Even before the cavalry journals resumed publication following the war, some aviators debunked the exaggerated claims of aviation capabilities. A member of chief aviation officer General W. L. Kenly's staff reported Kenly's statement to a journalist that the "Air Service has already gotten into trouble with the American public by prophesying a performance and then not performing it."[28] A November 1919 Air Service report blamed those who were "ignorant of the capacity of an air service," including politicians and journalists, for overblown predictions about aviation's abilities. The report, without providing specifics, argued that American aviators "had been given an impossible standard to live up to" and the American people and even the army "expected too great things of the air service."[29]

On the other side of the Atlantic, the British followed a similar path. Field-Marshal Earl Haig called for the British *Cavalry Journal* to record cavalry history and lessons from the war to "correlate in the light of the experience of the war the policy and principles of the training of cavalry and allied arms." Haig argued that the war had expanded cavalry duties and "shown them to be much more diverse and complicated than heretofore supposed." He believed that the *Cavalry Journal* should "act as a valuable guide to the mass of new matter that will gradually become available" and that technical articles should amplify and exemplify official training manual teachings.[30]

A 1927 assessment of British army training also preached caution about placing too much confidence in new technologies. The Memorandum on Army Training warned

[28] Grover O'Neill, Diary Entry June 29, 1918, June 24-July 18, 1918, IRIS 00121421, box 167.606-1-167.607-5 1917-1918, Air Force Historical Research Agency (AFHRA), Maxwell, AFB, AL.
[29] F. F. Hunter, *Report of Air Service, 1st Army A.E.F., France,* November 16, 1918, Call # 167.401-21, IRIS 00120736 in Vol. 9, 1909-1939, AFHRA.
[30] Earl Haig, "Introductory Remarks," *CJ* (UK) 10 (April 1920): 5-6.

that an open mind was necessary for progress but so was a need to cultivate "a sense of proportion" because "exaggerated enthusiasm for a weapon, blind adherence to some form of tactical action, an inclination to enshroud the skill of an arm in mystery, are not conducive to progress." The memorandum added that the cavalry had "made genuine and successful effort to adapt their training to new conditions."[31]

Yet no one could doubt that aviation technology significantly advanced during the four years of conflict in Europe (as Appendix A illustrates), greatly increasing the capabilities of air units. The flimsy experimental aircraft in service in 1914, machines that had frequently killed their pilots, had disappeared. By the end of the war, specialized observation, fighter, and bomber aeroplanes had replaced the generic types available when the war began. Postwar aircraft were more reliable, flew faster and further, and had larger carrying capacities than their wartime predecessors due to improvements in aerodynamics and engine design.[32] Prewar aeroplanes had top speeds in the range of seventy mph. The fastest postwar aircraft, fighter planes, reached speeds of 120 mph in 1918 and almost 200 mph by the end of the 1920s. The maximum speeds of reconnaissance and bomber aeroplanes also increased over the decade from about 100 mph to 140 mph. Of course, speed is less important than stability and carrying capacity for reconnaissance and bomber aircraft; these characteristics improved relatively slowly during and after the war.[33] Communications between aeroplanes and the ground also

---

[31] *Memorandum on Training Carried Out during the Collective Training Period, 1927* (London: His Majesty's Stationary Office, 1927), December 15, 1927, 18-23, WO 231/210, The National Archives of the UK (TNA), London.
[32] See Appendix A for the changing capabilities of aeroplanes from 1908 to1929.
[33] Staff College Committee No. 7, *Monograph on Air Service, 1919-1920*, Call # 167.601-5, 1918-1920, IRIS 00121313, box 167.601-2-167.601-13 1917-1918, AFHRA.

improved with the development of lightweight wireless radio sets for aircraft while

aerial photography revolutionized the collection of information about terrain and enemy

positions.[34] In light of these developments, cavalrymen could no longer dismiss

aeroplane technology as low-powered, unreliable, or incapable of contributing to

successful campaigns.

Arguments for the continuation of cavalry despite improvements in aviation

technology in the United States came not only from the *Cavalry Journal* as before the

war but also from the work of the newly established chief of cavalry. The United States

Cavalry Association's journal no longer had to fill the place of a branch head in

discussions of doctrine and military developments. This long-awaited leader was the

result of the National Defense Act of 1920, which established chiefs of each of the

combat services.[35] The *Cavalry Journal* rejoiced at the announcement of the new

position and claimed it as a "cause for thanksgiving and a restorer of morale" because

[34] For additional discussions on aerial radio and photography, see Paul W. Beck, "Lecture on aeroplanes," November 17, 1911, OCLC 63674200, MHI; "American-Developed Radio Telephone Success in Airplanes," *Telephony,* November 23, 1918, 17, http://www.earlyradiohistory.us/1918air.htm; "Wilson Directs Air Maneuvers by Radiophone," (Boise) *Idaho Statesman,* November 23, 1919, 2; A. J. Tittinger, "The Future of Cavalry," *CJ* (US) 29 (April 1920): 68; Russell, "Intelligence for Cavalry," 258; N. N. Golovine, "Cavalry Reconnaissance: The Modern Service of Information and Cavalry's Role In It," *CJ* (US) 31 (April 1922): 193; Edward Davis, "The British Cavalry in Palestine and Syria," pt. 4 *CJ* (US) 31 (January 1923): 64; Edward M. Fickett, "A Study of the Relationship between the Cavalry and the Air Service in Reconnaissance," *CJ* (US) 32 (October 1923): 419; T. L. Leigh-Mallory, "Co-operation of Aircraft with Cavalry," *CJ* (UK) 17 (January-October 1927): 280; Edward J. Dwan, "The Reorganization of the United States Cavalry," *CJ* (UK) 19 (January-October 1929): 614; Samuel B. Fishbein, "Edward Steichen: A Brief Biographical Sketch of This Pioneer and the History of Photographic Technology prior to and during World War I," National Air and Space Museum Smithsonian Institution, 1994; George C. Larson, "Moments and Milestones: Can You Hear Me Now? When Radio Communication Took to the Air," *Air & Space Magazine* (March 2011), 80. http://www.airspacemag.com/history-of-flight/moments-and-milestones-can-you-hear-me-now-10947/?no-ist.
[35] Allan R. Millett and Peter Maslowski, rev. ed., *For the Common Defense: A Military History of the United States of America* (New York: Free Press, 1994), 384-86; "New Bill for Army of Three Branches," *St. Louis Post-Dispatch,* January 4, 1920, AI; "Divides New Army into 3 Branches," *Washington Post,* January 4, 1920, 10; and "For Three-Branch Army," *Baltimore Sun,* January 4, 1920, 2.

the holder of the post would assist the cavalry in future development.[36] Major Willard

Ames Holbrook, an 1885 West Point graduate and commander of the army's Southern

Department in 1918, became the first chief of cavalry, serving from the passage of the

new law, until his retirement from the army in July 1924. Like many of his cavalry

contemporaries, Holbrook had been preparing for overseas duty when the armistice

began and did not serve in Europe during the war. Instead, he commanded troops along

the border with Mexico.[37]

Holbrook did not specifically mention aviation in his first article in the *Cavalry

Journal*, but he stressed the importance of a spirit of cooperation and "team-play"

between the different elements of the army. He maintained that the cavalry remained an

"essential part of a well-organized army," a belief, he observed, shared by World War I

leaders and the AEF Cavalry Board.[38] Holbrook stressed the need for the cavalry to

prepare itself to confront any emergency by maintaining its mobility, firepower, and

spirit of cooperation.

How, why, and with whom the cavalry could cooperate and why it was still

needed was identified not only in the American and British cavalry journals but also in

The *Employment of Cavalry 1924-1925,* a work prepared under the direction of the new

American chief of cavalry. It represented the most thorough official thinking about the

role and utility of cavalry and enumerated the arguments American cavalrymen utilized

to defend their value in reference to aviation. This Cavalry School document

---

[36] Editorial Comment, "Cavalry Journal Reappears," 81.
[37] Arlington National Cemetery Website, "Willard Ames Holbrook," last modified May 20, 2006, accessed January 6, 2011, http://www.arlingtoncemetery.net/waholbrook.htm.
[38] Willard A. Holbrook, "A Few Words to the Cavalry," *CJ* (US) 29 (October 1920): 249-50.

encompassed most of the postwar justifications explaining the continued necessity for cavalry in situations where aviation failed. Its primary focus was on reconnaissance and it identified situations when cavalry would still be required, most significantly in certain meteorological and terrain conditions.[39]

Although postwar aircraft could fly faster, travel longer, carry larger loads, and maneuver more easily than previous craft, *Employment* noted that they were still incapable of operating in certain weather conditions.[40] This argument also appeared in the American and British *Cavalry Journals.* Only two years after the war ended, the former commander of the Rough Riders and chief of staff, Major-General Leonard Wood argued that cavalry would remain necessary for reconnaissance in weather conditions that grounded aircraft.[41] A British major in the Royal Engineers, the unit originally responsible for military aviation in Britain, noted that aerial observation was only possible in "reasonably fine weather."[42] A major and instructor in tactics at the Cavalry School warned that there would be many times when fog and rain would prevent aeroplanes from collecting necessary information.[43] Citing British maneuvers and French operations in Africa in 1929, a captain in the cavalry reserve observed that

[39] Cavalry School Department of Tactics, *Employment of Cavalry,* 1924-1925 (Fort Riley, KS, 1925), OCLC 13168234, MHI.
[40] Ibid., 7.
[41] Russell F. Weigley, *History of the United States Army* (New York: Macmillan, 1967), 328; Leonard Wood, "Cavalry's Role in the Reorganization," *CJ* (US) 29 (July 1920): 113.
[42] M. N. MacLeod, "Survey Work in Modern War," *CJ* (UK) 11 (January-October 1921): 169.
[43] Paul Davison, "The Cavalry's Cavalry: A Study of Armored Cars, Their Powers and Limitations, and Some Notes as to Their Tactical Employment," *CJ* (US) 36 (January 1927): 92.

when it rained "bird-men stay on the ground," meaning that "the day of cavalry is not yet done."[44]

Although flying might be possible at night, *Employment* argued that aerial observation was not.[45] Decreased visibility made observation difficult and it also made landing dangerous. An American aviator stationed on the southern border argued that it was especially hard to land a DH4 (the standard American bomber) in the dark because of the aircraft's design.[46] A British major concurred with his American and British counterparts that aeroplanes were more limited than "generally realized," as they could only be used during the day.[47] A 1921 U.S. article recounted a story that during the war, pilots attempting a night reconnaissance reported seeing a large body of Turks. They estimated that the force numbered from six to eight thousand troops and were marching towards the army's right flank. The sun revealed the "Turks" were actually "several enormous herds of sheep."[48] The incident highlighted the difficulty of identifying units on the ground from the air in conditions of darkness. How could nocturnal aerial reconnaissance be trusted if its practitioners could not even tell the difference between men and sheep?

---

[44] Leonard Mason, "Horse and Machine," *CJ* (US) 38 (April 1929): 195. See also A. W. H. James, "Co-operation of Aircraft with Cavalry: General Principles," *CJ* (UK) 10 (January-October 1920): 135; Hamilton Hawkins, "The Role of Cavalry," *CJ* (US) 29 (October 1920): 262; "Fundamentals of Cavalry Training Policy," *CJ* (US) 30 (April 1921): 183; MacLeod, "Survey Work in Modern War," 169; A. R. Mulliner, "Cavalry Still an Essential Arm," *CJ* (UK) 17 (January-October 1927): 641; H.V.S. Charrington, "Where Cavalry Stands To-day," *CJ* (UK) 17 (January-October 1927): 430; George Barrow, "The Future of Cavalry," *CJ* (UK) 19 (January-October 1929): 179-80; James Parker, "The Cavalryman and the Rifle," *CJ* (US) 37 (July 1928): 367.

[45] Cavalry School, *Employment of Cavalry,* 7.

[46] Stacy Hinkle, "Wings and Saddles: The Air and Cavalry Punitive Expedition of 1919," *Southwestern Studies* 5 (1967): 5.

[47] MacLeod, "Survey Work," 169.

[48] "Reconnaissance," *CJ* (US) 30 (October 1921): 353.

"Lest Ye Forget," a poem in the British *Cavalry Journal* in 1922, also cautioned

against depending on aviation alone for reconnaissance in poor weather and at night.

This poem summarized the major arguments of both cavalry's detractors and its

supporters. In the first stanza, aeroplanes were described as a means of replacing the

cavalry's reconnaissance role, yet in later verses the poem outlines the limitations of

aircraft. There was danger at night in stormy skies if a nation depended only on aviation

to seek out the enemy. The first stanza read:

> 'Tis said the cavalry is dead;
> That whirring planes high over head
> Will information gain;
> So why should cavalry maintain
> A place in modern wars?
> 'Tis said the cavalry is dead; that mars
> Needs not this mobile arm
> To guard against alarm
> When night or stormy skies
> Aid enemy's surprise.[49]

In a 1925 British *Cavalry Journal* article, a colonel made the argument simple saying,

"night comes and air information closes down."[50]

Terrain, *Employment* stated, could also limit aviation's observation capabilities.

Locating, identifying, and counting enemy forces from the air were difficult when those

forces are in certain types of terrain that provided easy concealment.[51] Major-General

Wood observed that the difficulty of aerial reconnaissance in terrain such as wooded

---

[49] Jack Wade, "Lest Ye Forget," *CJ* (US) 31(July 1922): 312.

[50] W. D. Croft, "Notes on Armoured Cars," *CJ* (UK) 15 (1925): 162. See also Hawkins, "Role of Cavalry," 262; "Fundamentals of Cavalry," 183; von Ammon, "Cavalry Lessons of the Great War from German Sources," *CJ* (US) 30 (October 1921) 358; Ernest N. Harmon, "The Second Cavalry in the Meuse-Argonne," *CJ* (US) 31 (January 1922): 17; Patton, "What the World War," 168-9; Hamilton S. Hawkins, "The Importance of Modern Cavalry," *CJ* (US) 35 (October 1926): 489; Charrington, "Where Cavalry Stands," 430; Parker, "Cavalryman and the Rifle," 367.

[51] Cavalry School, *Employment of Cavalry,* 7.

country challenged the idea that cavalry could be replaced entirely.[52] Aviator Stacy

Hinkle observed that when attempting to locate two flyers who had crash landed in

Mexico, one search aeroplane passed over them without its crew spotting them because

of the brush surrounding the men on the ground. He also argued that construction of the

DH4, in use in 1919 on the border, made landing on rough ground impractical.[53] It is

easy to forget that terrain affects the location of airfields as well as hindering

observation. Aircraft require large flat smooth areas for takeoffs and landings.

Cavalry Colonel Hamilton S. Hawkins claimed that reconnaissance was still "one

of the important duties of the cavalry." He argued that should another trench war

develop—which he thought unlikely—only then could aeroplanes "relieve the cavalry"

of this important mission.[54] Even if trenches developed in future conflicts, a British poet

claimed that cavalry could capture them citing an example from the war. He wrote:

> 'Tis said the cavalry's dead;
> Such is the word which not is spread;
> Yet pause to give a thought
> To lesson which Beersheba taught;
> Swift horsemen crossed that plain
> 'tis aid the cavalry is dead; how vain;
> When cavalry at work
> Took trenches of the Turk,
> Thus causing deep chagrin

---

[52] Wood, "Cavalry's Role," 113. See also "Fundamentals of Cavalry," 180-85; Topics of the Day, "The Expedition into Mexico to Recover the Pierson Airplane," *CJ* (US) 30 (July 1921): 305-306; Harmon, "Second Cavalry in the Meuse-Argonne," 15-16; Hawkins, "Importance of Modern Cavalry," 489; Davison, "Cavalry's Cavalry," 90-95; Charrington, "Where Cavalry Stands," 430; Mulliner, "Cavalry Still Essential," 641-42; E. G. Hume, "Some Thoughts on Modern Reconnaissance," *CJ* (UK) 18 (January-October 1928): 230; "The Future of Cavalry: A Lecture at the University of Bristol on 7th February, 1929," *CJ* (UK) 19 (January-October 1929): 378-79; C. C. Benson, "Mechanization - Aloft and Alow," *CJ* (US) 38 (January 1929): 60.
[53] Hinkle, "Wings and Saddles," 6, 23.
[54] Hawkins, "Role of Cavalry," 262.

To infantry therein.[55]

In addition to cavalrymen, some airmen also thought the airplane was not developed enough to completely take over reconnaissance tasks, especially in the same situations listed by cavalrymen, such as rough terrain and when fog and mist reduced visibility and made flying difficult or impossible.[56]

Even when weather, terrain, and time of day were ideal for aircraft, American and British cavalrymen argued throughout the 1920s that aerial reconnaissance could not collect all of the information mounted units could. Aircraft could not correctly identify ground forces or determine enemy intentions.[57] Nor could they capture prisoners for information or determine the accurate strength of troops in wooded or mountainous country. [58] In 1919, an American pilot argued that operations on the border required the cavalry to confirm who had been shot and if they had died after aircraft had fired at mounted men on the ground.[59] Around mid-decade, one British colonel maintained that even in ideal flying conditions, the RAF could not obtain identifications, which he called "priceless little items of information which enables the general staff to piece together the enemy's plan."[60] Late in the decade, cavalrymen continued to maintain that aircraft

[55] Wade, "Lest Ye Forget," 312.

[56] Leo G. Hefferman, "Co-operation between Cavalry and Air Service." *CJ* (US) 34 (April 1925): 151. and Sherman, "Cavalry and Aircraft," 28. See also Leigh-Mallory, "Cooperation of Aircraft," 279-80.

[57] Cavalry School, *Employment of Cavalry,* 8, 15.

[58] "Cavalry Staff Exercise Oxford April 19-22, 1927," 16, WO 279/58, TNA. See also Charrington, "Where Cavalry Stands," 419-30 for more on the ability of cavalry to question inhabitants, take prisoners, and examine documents. Hawkins, "Importance of Modern Cavalry," 488. American, British, and French writers stated the weaknesses of gathering information exclusively from the air. See James, "Co-operation of Aircraft," 137; "Foreign Magazines," *CJ* (UK) 18 (January-October 1928): 664-68.

[59] Hinkle, "Wings and Saddles," 32.

[60] Croft, "Notes on Armoured Cars," 163.

lacked the ability to "distinguish easily friend from foe."[61] The air service could not

accurately secure key data such as identification, strength, composition of units, or most

importantly, their intentions.[62] As U.S. *Field Service Regulations, 1923* noted, these

intentions could be acquired only through the capture and interrogation of prisoners;

seizing posts and telegraph offices; and examining letters, dispatches, and newspapers,

activities that aircraft simply could not do.[63] This lack of "flexibility" in gathering

battlefield intelligence supported the continued existence of and cooperation with

cavalry.[64] RAF Wing-Commander T. L. Leigh-Mallory concurred with the assessment

of aviation's limitation and as a result supported combined action between the cavalry

and RAF in reconnaissance operations.[65]

Cavalrymen also declared that, when gathered by air, negative information (the

reporting that no enemy were found in the area under investigation) could not be trusted

on the same level as information gathered from the ground.[66] *Employment of Cavalry*

contended "cavalry, but not the air service, can obtain complete negative information."[67]

Reliable negative information from the air was limited because of terrain and the

operational characteristics of aeroplanes. They could not search woods, inside buildings,

---

[61] Mulliner, "Cavalry Still Essential," 641; "Cavalry Staff Exercise Oxford April 19-22, 1927," 16, WO 279/58, TNA.

[62] Fickett, "Study of the Relationship," 414; Cavalry School, *Employment of Cavalry,* 7-8.

[63] United States Army, *Field Service Regulations 1923* (Washington, DC: GPO, 1924), 32. (Hereafter *FSR* 1923.)

[64] "Future of Cavalry: A Lecture," 378.

[65] Leigh-Mallory, "Co-operation of Aircraft," 280.

[66] U. S. Army Command and General Staff College, *Tactical Principles and Decision: Volume 1 Marches, Halts, and Reconnaissance and Security,* 1920 rev. ed. (Fort Leavenworth, KS: General Service Schools Press, 1922), 101. See also Fickett, "Study of the Relationship," 420; C. B. Dashwood Strettell, "Cavalry in Open Warfare, Illustrated by the Operations Leading Up to the Occupation of Mosul in November, 1918," *Journal of the Royal United Service Institution* 66 (1921): 617; Colby, "Horse in War," 446-47.

[67] Cavalry School, *Employment of Cavalry,* 8.

or hover over locations. Not only was negative information from the air of little value, according to a cavalryman, it could be "extremely misleading."[68] An 8th Hussar major declared "if aircraft report that they have flown over a locality—village or wood and have seen no signs of the enemy it does not, in the least, follow that no enemy is present in these places."[69] The 1st Surveillance Group operating as part of the army air service border patrol on the U.S.-Mexico border discovered cavalry had to locate the small groups that hid under cover when aeroplanes passed overhead.[70]

Cavalrymen also defended the continued value of the cavalry in reconnaissance, by arguing that no matter the conditions on the ground or in the air, aeroplanes could not maintain constant contact and observation with the enemy. In December 1920, the U.S. War Department's *Cavalry Memorandum No 1* stated that cavalry could maintain constant observation, but aerial reconnaissance was "necessarily intermittent."[71] This U.S. Army Command and General Staff College publication observed that aeroplanes had to land to refuel and replace worn out parts and pilots. Even if multiple aircraft provided continuous aerial observation, the information gathered by the first pilot could not be transmitted to his relief since the second pilot would be in the air before the first pilot landed and delivered his report (this problem was more acute before the development of small radio sets for aircraft).[72] Even at the end of the decade, a 1929 UK *Cavalry Journal* article noted that aeroplanes could not maintain continuous contact with

---

[68] James, "Co-operation of Aircraft," 135. See also H. S. Hawkins, "German Ideas on Modern Cavalry," *CJ (US)* 31 (April 1925): 155-68.
[69] Mulliner, "Cavalry Still an Essential Arm," 641.
[70] Stacy C. Hinkle, *Wings Over the Border: The Army Air Service Armed Patrol of the United States-Mexico Border 1919-1921* (El Paso: Western Press, University of Texas, 1970), 12.
[71] "Fundamentals of Cavalry," 183.
[72] U. S. Army Command and General Staff College, *Tactical Principles*, 101.

enemy forces, unlike the cavalry that could stay in close visual or direct contact with opposing forces.[73]

Another factor militating against the exclusive use of aircraft in reconnaissance was their dependence on landing fields and facilities near front lines.[74] As one airman stated in 1920, the best method to deliver reconnaissance reports and get orders from commanders was to land and receive instructions verbally, but the speed of modern aeroplanes made it "impracticable for them to land without 'crashing,' save in fairly large and unobstructed fields; too often such are unavailable."[75] The concern was not just theoretical. Aviator Hinkle argued that the lack of landing fields in the American south hindered the air service border patrol's ability to perform its duty to "protect the entire length of the American side of the United States."[76] Although cavalrymen recognized that additional and better-placed landing fields could remove this limitation in the future, they used this factor to demonstrate that they were still, for the time being, needed to maintain contact with headquarters.

Juvenile, Emotional, and Irrational Arguments

While many arguments for the continued existence of the cavalry were carefully reasoned, based logically on the technological and operational limitations of aircraft at the time, a few contentions appeared less well-grounded on facts. Not all cavalrymen in the 1920s followed the lead of the Cavalry Board, the chief of cavalry, and *The*

---

[73] Barrows, "Future of Cavalry," 179.
[74] U.S. Army, *FSR 1923*, 21.
[75] Sherman, "Cavalry and Aircraft," 29-30.
[76] Hinkle, *Wings Over the Border*, 2, 7, 9.

Employment of Cavalry by rationally assessing the abilities of the cavalry and aviation. Some of the cavalry's defenders resorted to personal attacks against those perceived to be cavalry detractors and contending that the horse and man were more valuable above all else in war.

Name-calling and questioning their opponents' intelligence were among the more childish of these arguments in both the United States and Great Britain. Those claiming the days of the cavalry were over were labeled "doubting Thomases," and "armchair doctrinaires" possessing questionable intelligence and knowledge. [77] British General Lord Horne argued that those calling the cavalry obsolete were unlikely to be experienced soldiers or men who had "responsibility of high command in war." Horne believed anyone who argued for the abolishment of cavalry had misread the lessons of the war, particularly its first weeks and operations in Palestine. [78] A U.S. army captain noted that "the present rage…over 'mechanization' and 'motorization'" in the British Army was "an exaggerated expression of flighty opinions held by people whose recent vision is restricted to the Western front." In contrast, "sober military judgment" recognized the "future utility for cavalry" in countries similar to Palestine. [79] The British *Cavalry Journal* reported that both in the dominion and abroad, magazines called cavalry's opponents "thoughtless critics," and "tank-obsessed, Ichabod-calling, mechanicalised Jeremiahs." [80] A British *Cavalry Journal* article summarized the feelings

---

[77] Editorial Comment, "Cavalry Journal Reappears," 81. Weir, "Some Reflections," 231-32.
[78] Weir, "Some Reflections," 231-32.
[79] Colby, "Horse in War," 446.
[80] "Dominion and Foreign Magazines," *CJ* (UK) 15 (January-October 1925): 96.

toward those that said the cavalry was obsolete stating simply, "You don't know what you're talking about."[81]

One theme popular with cavalry of all ranks, was the faith in the man (sometimes expressed as man and horse) over the machine, the contrast of the moral superiority of living beings to cold unfeeling machines. This man overcoming all technological challenges motif was rare in pre-war military writings but blossomed during the 1920s.[82] First Lieutenant Fenton Jacobs mastered the use of vivid descriptions to engage his readers' emotions, writing in 1921 that "whenever and wherever the lure of the open appeals and red blood surges in the veins of those who love adventure, dash, and romance, there one will find the mounted man in his glory and predominance," a warrior free to toss his "cigarette into the air and unrestrained, launch himself right at the foe." Pilots, however, "must hold hard, cool, and deliberate to launch their projectiles with mathematical precision along trajectories through miles of space."[83]

The belief in the superior fighting power of the soldiers was not confined to a few people or limited to the cavalry. Although few writers could compete with Jacob's flowery and romantic descriptions, other cavalrymen compared men and machines. Lieutenant-General Sir Alexander Godley argued at the Royal United Service Institute in January 1922, that "whatever modern inventions and mechanical appliances there may be, you may always, in the end, have to fall back on the combination of the man and the horse."[84] General Lord Horne added that "clear thinking will lead us to decide that the

---

[81] A Dweller on Earth, "A Little Bird Told Me," *CJ* (UK) 18 (1928): 603.
[82] For an example of the rare exception, see "The Action of the Future," *JUSCA* 19 (January 1909): 635.
[83] Fenton Jacobs, "The Cavalry," *CJ* (US) 30 (April 1921): 124-29.
[84] Weir, "Some Reflections," 233.

day is not yet when mechanical and other contrivances can take the place in war of either the man with the rifle, or the man on the horse."[85]

Field Marshal Earl Haig clearly displayed his sympathy for the human element when he proclaimed "I certainly am not among those who hold that cavalry is a dead arm, or that the place of flesh and blood, in man and horse, can ever be wholly taken by petrol and machinery" in 1922.[86] Three years later, Haig responded to accusations that the military horse was obsolete by arguing that aeroplanes and tanks were "only accessories to the man and the horse" and that the horse would have as much a place in the future as in the past. New inventions, he declared, "always produce an antidote."[87] One American cavalry colonel summarized the argument succinctly: "the fighting man, not the fighting machine will always continue to be the principal means of making warfare."[88] The report on the British Collective Training Period 1927 stated that "in future, as in past, the trained man, whether commander or soldier, will be the chief factor."[89] Brigadier General James Parker concisely stated the feelings of many cavalrymen asserting "the idea of displacing cavalry with machines is preposterous."[90] As late as 1929, Major K. S. Bradford argued the cavalryman was "nimbler than any machine. He is silent as well as swift" and that "the real sinew of war is not wealth, but man—and the horse."[91]

---

[85] Ibid., 232.
[86] "Cavalry, an Essential Arm," *CJ* (UK) 12 (January 1922): 6.
[87] "The Horse in War," *CJ* (US) 34 (October 1925): 412.
[88] Hawkins, "Importance of Modern Cavalry," 487.
[89] *Memorandum on Training Carried Out during the Collective Training Period, 1927* (London: His Majesty's Stationary Office, 1927), 8, WO 231/210, TNA.
[90] Parker, "Cavalryman and the Rifle," 367.
[91] K. S. Bradford, "Modern Cavalry," *Infantry Journal* 35 (December 1929): 564, 566.

This common theme of the superiority of men to machines harkened back to the old idea of a "cavalry spirit." Intangible and unmeasurable, this mystic force made success possible in the most hopeless situations. One cavalrymen argued that this spirit "often gave life and soul to an army which otherwise were a dead machine in some countries."[92] Liddell Hart called cavalry spirit "the very soul of war."[93] This element, unique to cavalry was viewed by those both inside and outside the cavalry as something to be cherished and maintained even if the cavalry branch itself was eliminated. In 1927, Haig warned the Sub-committee on the Strength and Organisation of the Cavalry that once lost, the cavalry spirit could not be reproduced in a minute.[94] The idea of transferring the spirit to other units, thus preserving it, gained many supporters as it became increasingly clear that tanks might replace horses. Winston Churchill, an advocate of the continued reduction of cavalry in the postwar period, argued that he was neither against the cavalry spirit nor its qualities but both "ought to be married to any mechanical mobile development."[95]

Building a Cooperative Relationship

Although cavalrymen continually listed aviation's limitations, many recognized that their services' continued usefulness required cooperation between the air services and cavalry. The various and indisputable shortcomings of aerial reconnaissance

---

[92] "The Cavalry Spirit," *CJ* (UK) 12 (January-October 1922): 225.
[93] Basil Henry Liddell Hart, "After Cavalry—What?," *The Atlantic Monthly* 136 (1925): 418.
[94] "Second Meeting of the Sub-committee on the Strength and Organisation of the Cavalry," December 19, 1927, 21, CAB 16/77, TNA.
[95] "Third Meeting of the Sub-committee on the Strength and Organisation of the Cavalry," February 9, 1928, 8, CAB 16/77, TNA.

provided cavalrymen the opportunities to present their case for cooperation and coordination. The editor of the American *Cavalry Journal* encouraged readers to be "ready-tongued" to point out the fallacies of those who may claim that reconnaissance could be done by a single service or technology.[96]

Yet which service had the primary responsibility for reconnaissance was not yet clear. Mirroring AEF Superior Board and Cavalry Board conclusions from 1919 which themselves reflected prewar arguments, cavalrymen pointed out that aeroplanes "supplement and extend, they do not replace."[97] But as an American cavalry captain argued, aerial reconnaissance was of the greatest value, but to be effective it "must be supplemented by the work of ground troops," an idea codified shortly thereafter in the U.S. 1923 *Field Service Regulations*.[98]

A similar debate took place across the Atlantic. A British *Cavalry Journal* article reflected upon the relationship between aviation and cavalry in a less technical and more literary manner. Written partially from the perspective of birds, this piece emphasized the military importance of having both land and air forces.[99] The father bird explained to his son why they could not avenge the murder of a fellow bird.

> On the ground, and in the ground, lie all sources of life. We birds lost all hope of mastery of the ground when we took to the air. The fishes lost all hope of mastery of the ground when they took to the water, but man was wiser. He put mastery of the ground first, and now he is rapidly becoming master of air and water as well.[100]

---

[96] Editorial Comment, "Modern Defense Policies Increase Importance of Cavalry," *CJ* (US) 32 (October 1923): 450.
[97] James, "Co-operation of Aircraft," 134. See also Tittinger, "Future of Cavalry," 68.
[98] Fickett, "Study of the Relationship," 414.
[99] Dweller on Earth, "Little Bird," 601-604.
[100] Ibid., 603.

In the second part of the article an old cabinet minister tells a young air-marshal that "only by the closest combination of all our forces—land, sea, and air . . . can we hope to be victorious over our enemies."[101]

No matter which service supported the other, the need for cooperation was clear. Numerous cavalry journal articles in both the United States and Great Britain stressed the importance of coordinating activities of aeroplanes and cavalry.[102] Each had virtues that compensated for the other's liabilities.

As before the war, American and British cavalrymen proposed that aviation was not an enemy of the cavalry but a technology that strengthened mounted units. An American first lieutenant in the 6th Cavalry argued that aeroplanes, along with other new inventions, such as tanks and armored cars, relieved the cavalry of some reconnaissance work "so that men and horses" were not "expended unnecessarily" and could thus be fresh for use on the battlefield. He believed cavalry benefited more from aviation than any other branch because cavalry so often operating in proximity to the enemy.[103] Edmund Allenby, commander of cavalry on the western front during the Great War, also

---

[101] Ibid., 604.

[102] H. D. Fanshane, "Cavalry in Mesopotamia in 1918," *CJ* (UK) 10 (January-October 1920): 429; "Mechanical Warfare," *CJ* (UK) 12 (1922): 156; Rex Osborne, "Operations of the Mounted Troops of the Egyptian Expeditionary Force," *CJ* (UK) 13 (January-October 1923): 24; De la Vergne, "Few Words," 157; Edward Davis, "The British Cavalry in Palestine and Syria," pt. 3 *CJ* (US) 31 (October 1922): 398; Golovine, "Cavalry Reconnaissance," 186; E. G. Hume, "Notes on Modern French Cavalry," *CJ* (UK) 15 (January-October 1925): 213; Topics of the Day, "Air Service and Other Auxiliaries for Cavalry," *CJ* (US) 31(October 1922): 412; Hawkins, "Importance of Modern Cavalry," 489; Topics of the Day, "Reorganizing of the British Cavalry," *CJ* (US) 36 (July 1927): 480; Leigh-Mallory, "Cooperation of Aircraft," 279; Charrington, "Where Cavalry Stands," 422; Davison, "Cavalry's Cavalry," 90; H. H. Arnold, "The Cavalry-Air Corps Team," *CJ* (US) 37 (January 1928): 76; Dweller on Earth, "A Little Bird," 604.

[103] Tittinger, "Future of Cavalry," 68. See also "One of the Faithful," "Faith in and a Doctrine for the Cavalry Service," *CJ* (US) 36 (April 1927): 227-31 for the argument that cavalry benefited most from aviation.

argued that aeroplanes strengthened and increased the mobility of the cavalry and augmented its "battle value" because of the greater field of vision possible from the air.[104] British Lieutenant-General Sir Philip Chetwode argued similarly that "modern inventions will not displace mounted troops" but that mounted troops could become "very much more powerful" by using such technology as aeroplanes.[105] Their postwar argument echoed pre-war thinking that new technologies facilitate but do not replace.[106]

To understand how best to take advantage of aviation, cavalrymen examined the recent war to identify the most effective techniques for air-ground cooperation. Campaigns in Mesopotamia and Egypt in 1918 demonstrated the "excellent work" done by the air force, cavalry, and infantry in concert, as testified to by British Lieutenant General H. D. Fanshane and Lieutenant Rex Osborne of the hussars.[107] Most of the reports focused on communication between aircraft and mounted forces and identified both successes and failures.

Ground troopers seemed pleased by the way friendly aeroplanes could aid communications. A cavalry lieutenant argued in a 1920 article in the U.S. *Cavalry Journal* that aeroplanes equipped with radio sets could increase the radius of action for

---

[104] Ibid., 21-41. E. H. H. Allenby, "Cavalry in Future Wars," *CJ* (US) 30 (January 1921): 2. See also Allenby's comments as reported in "'Cavalry Journal' Committee," *CJ* (UK) 16 (1926): 3.

[105] Weir, "Some Reflections," 234; and Topics of the Day, "Cavalry Discussed by Royal United Service Institution," *CJ* (US) 31 (April 1922): 202. For additional arguments discussing the added efficiency provided to the cavalry by mechanical means, see Kirby Walker, "Cavalry in the World War," *CJ* (US) 33 (January 1924): 11-22; Kenyon A. Joyce, "The British Army Maneuvers, 1925," *CJ* (US) 35 (January 1926): 17-20; For the strength and importance of cooperation, see Davison, "Cavalry's Cavalry," 90-95.

[106] "One of the Faithful," "Faith in and a Doctrine," 227. See also Herbert B. Crosby, "Cavalry of Today," *CJ* (US) 36 (October 1927): Frontispiece; N. N. Golovine, "Cavalry on the Flank and in the Rear," *CJ* (US) 31 (January 1922): 40-59; N. N. Golovine, "Modern Cavalry and Its Organization," *CJ* (US) 35 (January 1926): 30; Topics of the Day, "Two More Types of Guns for Cavalry," *CJ* (US) 37 (July 1928): 437; Allenby, "Cavalry in Future Wars," 2; General Brechard, "The French Cavalry," *CJ* (US) 38 (October 1929): 486.

[107] Fanshane, "Cavalry in Mesopotamia," 429; Osborne, "Operations of the Mounted Troops," 24.

cavalry units by relaying information and instructions between cavalry in the field and

commanders in the rear.[108] In one of the more than a dozen articles examining the

British cavalry campaign in Palestine, Colonel George Mitchell of the General Staff

Corps published details about reconnaissance reports dropped by aeroplanes, which

assisted the cavalry considerably in its movements.[109] Captain J. R. H. Cruikshank, a

subaltern under Allenby, noted how on a sunny cloudless day aeroplanes could receive

messages from sheets laid on the ground in particular patterns and then reply by Morse

code.[110] This system helped speed the transfer of information during the campaign in

Palestine. The advantage was that the airmen did not have to land to relay their

messages, a significant problem in the days before airborne radio became common.

Although attempts to establish rapid and reliable communication between aeroplane

scouts and cavalry patrols were not always successful, British cavalry operations in the

Middle East suggested the possible rewards of close cooperation in the form of rapid and

direct communication according to two American observers attached to British units.[111]

Writers had difficulty identifying similar situations when American cavalry

troops worked with aviation. The 1918 St. Mihiel Offensive was one of the few

occasions when the United States cavalry actually participated in its traditional remount,

---

[108] Tittinger, "Future of Cavalry," 68. See also Mulliner, "Cavalry Still an Essential Arm," 641; and Hume, "Some Thoughts," 211-32 for increasing the radius of cavalry operations due to technology.
[109] George E. Mitchell, "The Rout of the Turks by Allenby's Cavalry (Continued)," *CJ* (US) 29 (July 1920): 195. See also Davis, "British Cavalry in Palestine and Syria," pt. 3, 395-402. There were a few cases where the arguments mirrored those prior to the war, such as Hawkins, "Importance of Modern Cavalry," 487-99. He argued vaguely that reconnaissance by aviation could save the cavalry from exhausting work. Postwar he argued that aviation could support the cavalry.
[110] J. R. H. Cruikshank, "How the Cavalry Exploits a Victory: Being Extracts from the Diary of a Subaltern under Allenby in Palestine," *CJ* (US) 32 (April 1923): 164.
[111] Mitchell, "Rout of the Turks," 203. See also Edward Davis, "The British Cavalry in Palestine and Syria," pt. 1 *CJ* (US) 31 (April 1922): 123-29.

liaison, and patrol duties. However, it did not have much opportunity to work with

aeroplanes. The American cavalry's wartime experience with aviation, according to a

captain of the 2d Cavalry, consisted mostly of avoiding aerial observation by enemy

aircraft and wishing the American air service was as active as the enemy's.[112] Another

cavalryman related that troopers were employed "extinguishing fires and rescuing

French civilians from their wrecked homes" after bombs were dropped from

aeroplanes.[113]

The rarity of examples of direct cavalry and aeroplane cooperation did not

discourage postwar efforts for additional collaboration but rather stimulated them.

General John J. Pershing, AEF commander, encouraged the continued development of

cavalry cooperation in his message to the cavalry in April 1920.[114] One British officer

complained that the war provided too few opportunities for the cavalry and aviation to

work together, even though they were "so well adapted for mutual support."[115] Instead

of setting aeroplanes and cavalry in opposition, many postwar articles by cavalrymen

supported a necessary and positive interdependence arguing for more opportunities for

horse cavalry to work side by side with aviation.[116]

Postwar articles demonstrated a demand amongst cavalrymen for training and

maneuvers with the air service to improve cooperation and coordination between the two

---

[112] Ernest N. Harmon, "The Second Cavalry in the St. Mihiel Offensive," *CJ* (US) 30 (July 1921): 282-89. See also Harmon, "Second Cavalry in the Meuse-Argonne," 10-18.

[113] Redding F. Perry, "The 2d Cavalry in France," *CJ* (US) 37 (January 1928): 29.

[114] Pershing, "Message to the Cavalry," 5-6. See also Harmon, "Second Cavalry in the St. Mihiel," 282-89.

[115] James, "Co-operation of Aircraft," 133.

[116] Tittinger, "Future of Cavalry," 68; and Hume, "Notes on Modern French Cavalry," 33. See also Hawkins, "German Ideas," 155-68.

branches.[117] One such article called for additional opportunities to work together in

order to eliminate the possible ignorance and prejudice about the role and capabilities of

aviation which, the author believed, may have hindered successful cooperation during

the war. A. W. H. James, author of a series on aircraft and cavalry cooperation

published in the British *Cavalry Journal,* supported requiring horsemen to learn about

the actual capabilities of aircraft and focused on cooperation.[118] Cavalryman Major

LeRoy Eltinge, formerly Brigadier General and Deputy Chief of Staff of the AEF,

recommended that "every opportunity should be taken to hold maneuvers in conjunction

with large bodies of all arms."[119] The solution seemed clear—more cooperative training

focusing on learning "the fundamental principles of the other" could only improve

overall efficiency.[120] For the cavalry and aviation to perform their duties optimally

required each branch to understand the limitations and capabilities of the other, an

understanding that could only be formed through frequent communication, combined

training, and maneuvers. [121]

American Operations and Maneuvers

American cavalrymen experienced their first postwar practice with aerial

cooperation during operations on the border with Mexico. The United States organized

patrols of its southern border to defend against hostile bands (some paramilitary, others

---

[117] Topics of the Day, "Air Service and Other Auxiliaries," 412. See also Hume "Notes on Modern," 27-
38 for references to the importance of combined training.
[118] James, "Co-operation of Aircraft," 133.
[119] LeRoy Eltinge, "Review of Our Cavalry Situation," *CJ* (US) 29 (April 1920): 14-22.
[120] Fickett, "Study of the Relationship," 420.
[121] Ibid., 412-422. See also James, "Co-operation of Aircraft," 133-41; "Mechanical Warfare," 156.

bandits taking advantage of the instability) roving on the frontier. In June 1919, Army

Air Service Chief Major General Charles T. Menoher ordered eighteen DH4

aeroplanes—twelve from the 20th Aero Squadron and six from the 11th Aero

Squadron—to patrol from San Diego, California to Brownsville, Texas.[122] These

bombers were British designed but built in the United States powered by American

designed and constructed Liberty engines. The speed and service ceiling of the DH4

were improvements on previous aircraft, but its unprotected gas tank, pressure feed

system, and exposed gasoline line were vulnerable to damage from enemy fire. In

addition, the location of the main fuel tanks between the pilot and observer complicated

communications.[123]

In the Big Bend of Texas, cavalrymen of the 5th and 8th Regiments patrolled on

the ground, and airmen of the two squadrons assigned to the regiment flew circuits two

or three times a day, watching the border for any disturbance.[124] The standing

instructions for aviators was to search for bands of men and if found to determine their

number, location, and direction of movement. Radios weighed too much for the DH4s

so reports in the form of hand-written messages and sketches had to be dropped at the

nearest cavalry outpost for ground action.[125] These were placed in white canvas bags

---

[122] Hinkle, "Wings and Saddles," 3-4.

[123] Kenneth Baxter Ragsdale, *Wings over the Mexican Border: Pioneer Aviation in the Big Bend* (Austin: University of Texas Press, 1984), 74-75; John H. Morrow, Jr., *The Great War in the Air: Military Aviation from 1909 to 1921* (Washington, DC: Smithsonian Institution Press, 1993), 339; Lucien H. Thayer, *America's First Eagles: The Official History of the U.S. Air Service, A.E.F. (1917-1918)* (San Jose, CA and Mesa, AZ: Bender and Champlin Fighter Aces Museum Press, 1983), 243-44.

[124] "Ready for War in the Big Bend of Texas: Airmen and Cavalrymen Maintain Constant Vigilant Patrol Along Section of Border Often Overrun by Mexicans," *New York Times,* January 25, 1920, 42; Ragsdale, *Wings over the Mexican Border*, 74.

[125] Hinkle, *Wings Over the Border*, 11.

with red streamers for ease of visibility. Initially this one-way communication was the only way airmen could contact cavalrymen until landing.

The army air service border patrol and the cavalry began working together on a better way to communicate between the air and ground units before the end of 1919. Within a few months, five more air squadrons returned from Europe and joined the operations on the border. The new 1st Bombardment Group comprised of the 11th, 20th, and 96th Bombardment Squadrons, 12th Observation Squadron, and 104th Surveillance Squadron patrolled from Arizona to Texas.[126] By late October, they established a limited two-way communication system after ground forces created a panel system using white canvas strips to form predetermined messages and requests. Approximately two months later, an improved system utilizing signal flags increased the range of messages from the ground to the air. However, this system, according to a participant, remained unsatisfactory for aviators trying to read messages while battling wind turbulence and trying to write in an open cockpit while circling above a signaler.[127]

In addition to the routine operations, the air service and cavalry had an opportunity to test their new procedures when one of the aeroplanes of the border patrol disappeared somewhere over Mexico in 1921. The expedition to recover it teamed the 12th Cavalry and aviators. Although communications between the forces proved far from perfect, this operation demonstrated that work should continue.[128] Pigeons successfully facilitated air to ground communication, but a lack of sufficient ground

---

[126] Hinkle, "Wings and Saddles," 4-5.
[127] Ibid., 39-40.
[128] Topics of the Day, "Expedition into Mexico," 305.

signal panels complicated information sharing. A cavalry pack train also assisted a

liaison plane that went down early in the recovery operation. [129] These operations

proved insufficient to formalize cooperation between air and ground units, making

additional training required. Major William Sherman of the Air Service noted that

communications between air and ground had improved by these limited experiments but

they remained deficient.[130]

By mid-1921, the Americans had accomplished their objective of ending raiding

and property damage by Mexican bandits and revolutionaries so the army air service

border patrol was disbanded and its planes reassigned.[131] Although short-lived, the

patrols provided an opportunity for testing and applying techniques of cooperation

between air and land forces. Hinkle argued that the experiences along the border

demonstrated the need for better two-way communication and the importance of proper

liaison.[132]

The American cavalry's endeavors to foster and perfect cooperation with

aviation did not end after border patrol was discontinued. Throughout the 1920s,

cavalrymen participated in joint training and maneuvers with attached air units to satisfy

their desire to improve understanding between the cavalry and air corps. The training

exercise in 1922 at Camp Meade allowed the 62d Cavalry Division to participate in a

reproduction of a French battlefield replete with "real ammunition, infantry, machine-

guns, artillery, tanks, trench mortars, bomb-throwers, smoke screens, gas and air

---

[129] Ibid., 305-306.
[130] Sherman, "Cavalry and Aircraft," 29.
[131] Ibid., 63-64.
[132] Hinkle, "Wings and Saddles," 33, 35.

service." Airplanes maintained communication with ground signal units. The exercise spurred W. P. King to encourage cavalrymen to participate in similar future exercises.[133] The maneuvers of the 1st Cavalry Division in the fall of 1923 also provided opportunities for cavalrymen to work with aviation. Excellent weather and favorable terrain devoid of overhead cover allowed the army to gain experience in the use of signal panels with aviation. Contact planes also tracked the whereabouts and progress of various friendly and hostile units.[134]

Additional maneuvers throughout the 1920s, including the Air-Ground Maneuvers in San Antonio, Texas, May 15-21, 1927, provided opportunities for the cavalry and air service to learn how advances in technology changed each other's strengths and weaknesses. The maneuvers in San Antonio simulated operation of a field army with an attached bombardment group. These maneuvers helped to develop teamwork between air and ground units and facilitated the creation of the fundamentals of air action. Major General Ernest Hinds reported that the limits of the air force were recognized as well as how powerful it could be as an auxiliary arm.[135] A major of the cavalry attached as a liaison officer reported to the head umpire that the maneuvers went "quite satisfactory" with excellent use of cover but only one opportunity to communicate with aeroplanes.[136] The press release of the maneuvers noted, "absolutely no good can

---

[133] W. P. King, "The Fifteen Days' Training Period of the 62d Cavalry Division, Camp Meade, 1922," *CJ* (US) 31 (January 1923): 72.

[134] Adna R. Chaffee, "The Maneuvers of the First Cavalry Division, September-October 1923," *CJ* (US) 33 (April 1924): 135, 140, 152-53, 156. See also Hefferman, "Co-operation," 151.

[135] Ernest Hinds, *Report Air-Ground Maneuvers, San Antonio, Texas, May 15-21, 1927* (Fort Sam Houston, TX: Headquarters, Eighth Corps Area, 1927), OCLC 54074817, MHI.

[136] R. E. Cummins to Chief Umpire, "Umpire's Report, Army Maneuvers," May 19, 1927, in *Report, Air-Ground Maneuvers, San Antonio, Texas, May 15- May 21, 1927*, OCLC 54074817, MHI.

be accomplished by giving out any conclusion which belittle any branch whatsoever…every effort should be made to boost the interests of all branches."[137]

In late July 1927, a class from the Air Corps Advanced Flying School at Kelly Field arrived at Fort Bliss to train with the 1st Cavalry Division. An article about the exercises in the *Cavalry Journal* described them as "very valuable" as they provided the cavalrymen "a clearer understanding of the powers and limitations of the air corps" and a "desire for further training."[138] The forty-five planes assigned to these joint training operations included one Douglas O-2 observation plane, one Douglas C-1transport plane, fifteen AT-4 trainers (variants of the Curtiss Hawk fighter series), twenty-seven DH4s for attack or observation, and one ambulance plane of unidentified type.[139] Cavalrymen gained a clearer understanding of what aircraft could accomplish by watching and participating in dozens of demonstrations and operations with these aeroplanes. The most useful demonstrations according to a participating cavalry observer were tactical exercises testing cooperation with friendly aeroplanes, defense against enemy air attack, and communication between air to ground units. Major George Dillman of the 1st Cavalry reported that the observation planes provided ground commanders with "early and accurate information," demonstrating how aviation could "materially assist cavalry in rapidly moving situations." Dillman declared the exercise "very beneficial" overall.[140]

---

[137] B. G. Chynoweth to Adjutant General, "Report of Press Relations in the Maneuvers," May 21, 1927, in *Report, Air-Ground Maneuvers, San Antonio, Texas, May 15- May 21, 1927*, OCLC 54074817, MHI, 4.
[138] George Dillman, "Joint Cavalry and Air Corps Training," *CJ* (US) 36 (October 1927): 560.
[139] Gordon Swanborough and Peter M. Bowers, *United States Military Aircraft Since 1909* (Washington, DC: Smithsonian Institution Press, 1989), 212.
[140] Dillman, "Joint Cavalry," 560-67.

Additional maneuvers held in Marfa, Texas, in September 1927 involved a cavalry division with an observation squadron attached. According to Dillman, the air unit, the 12th Observation Squadron, functioned "in an excellent manner," but there were still some issues to work out.[141] Attack planes were also tested to gauge their effectiveness for use with cavalry in offensive actions. Although the planes worked well, problems remained with cooperation. Dillman stressed the importance of frequent divisional maneuvers following garrison training to improve cooperation.[142] Similar tests at Fort Leonard Wood attached air units to ground units so each could learn about the other.[143]

The army air service reciprocated cavalry's attempts at co-operation. In his 1922 annual report, the chief of the air service noted the importance of combined training with field maneuvers in tactical problems at the various special service schools. Far from rejecting cavalry, he stated the need to understand "one of the most essential features of peace time training," which was the "inter-relation between the air service and other arms."[144] Communication between the ground and the air remained a problem throughout the 1920s. American airmen rode horses in order to reduce the communications gap between the two services. An air unit's liaison officer had the unenviable job of accompanying the cavalry on training marches and maneuvers. One pilot assigned to such a duty described riding as "torture" because of the difficulty of

---

[141] George Dillman, "1st Cavalry Division Maneuvers," *CJ* (US) 37 (January 1928): 48, 65.
[142] Ibid., 54.
[143] Benson, "Mechanization," 58.
[144] United States Army, Air Service, "Annual Report of the Chief of Air Service for the Fiscal Year ending June 30, 1922," (Washington, DC: GPO 1922), OCLC 23822134, MHI.

getting the horse to follow directions and also the "hot desert sun and the choking clouds of dust thrown up by trotting or galloping columns of horses."[145]

Combined training in the United States led some cavalry officers to consider the practice of temporarily attaching air units to cavalry divisions for training as insufficient. A unit outside a commander's peacetime authority might make him unlikely to use it during war. The Superior Board's 1919 report recommended that "a command and reconnaissance squadron [of] eight to ten airplanes be made an integral part of the cavalry division."[146] Cavalrymen also proposed including aeroplanes within cavalry units or at least attaching them to cavalry units during appropriate operations.[147] While an American officer attached to the Desert Mounted Corps headquarters in Palestine was pleased by the dropped messages that provided the results of morning aerial reconnaissance and the occasional supplemental notes, he regretted the absence of aeroplanes attached directly to cavalry headquarters. He suggested that aeroplanes be directly employed by mounted units as well as the infantry corps and army headquarters.[148]

Events and discussions in other countries supported the cavalry's desire to cooperate with aviation. American observers with the wartime British cavalry had suggested how this kind of collaboration could work.[149] A 1922 French conference of general officers and department heads garnered attention from American cavalrymen

---

[145] Hinkle, *Wings Over the Border*, 40.
[146] U. S. Army AEF, *Report of Superior Board*, 65, 72.
[147] Eltinge, "Review of Our Cavalry Situation," 14-22; Contributed, "Cavalry Organization," *CJ* (US) 29 (July 1920): 121; Topics of the Day, "Air Service and Other Auxiliaries for Cavalry," 412; Dillman, "Joint Cavalry," 560.
[148] Mitchell, "Rout of the Turks," 195.
[149] Davis, "British Cavalry in Palestine and Syria," pt. 3, 395-402.

who believed the conference provided valuable ideas about how to combine cavalry and aviation. The conference showed that:

> the history of the employment of the air service indicates a necessity for the closest co-operation and team-work between the air service unit and the ground troops. This co-operation cannot be acquired successfully after the initiation of hostilities, bearing in mind also that the cavalry will be active from the first, and must be insured by the inclusion of air service units as part of the cavalry divisions for their peace-time training.

The French conference concluded that every corps of cavalry should have a squadron of airplanes attached, with the air service and ground troops closely cooperating.[150]

Five years later, the American chief of staff decided to "incorporate in each cavalry division an observation squadron, air corps" as part of the War Department's program to increase the future efficiency and usefulness of cavalry.[151] His subordinates agreed that aircraft added to the cavalry increased the "battle value of cavalry."[152] The third Chief of the Cavalry, Major General Herbert B. Crosby (1926-1930), argued that "an observation squadron of airplanes should be an integral part of a cavalry division" after reviewing the experiences of the 1st Cavalry Division in Fort Bliss, Texas, in 1928.[153] Crosby reported that the observation squadron would become effective if the air corps could "supply suitable equipment and the necessary personnel."[154] Aviation

---

[150] Topics of the Day, "Air Service and Other Auxiliaries for Cavalry," 412.
[151] Crosby, "Cavalry of Today," Frontispiece.
[152] Topics of the Day, "Two More Types of Guns for Cavalry," 437.
[153] Ibid. See also Benson, "Mechanization," 58.
[154] Topics of the Day, "Extracts from the Annual Report of the Chief of Cavalry," *CJ* (US) 37 (January 1928): 108.

supporters opposed such plans because they hoped for an independent aviation branch, not the subordination of air units to ground units.[155]

British Maneuvers

Air cooperation in Great Britain with cavalry was more problematic than in the United States. British airmen increasingly shunned cooperative roles, preferring independent action, both to justify their new doctrine and to save as much money as possible, as will be explored in later chapters. British doctrine asserted the importance of combined forces yet conflict between various military units emerged as a result of the organizational structure of the British armed forces. The Royal Air Force (RAF) was a separate service from the army, made independent on April 1, 1918, partly as the result of wartime expediency. As noted by historian Malcolm Smith, some British military personnel and government officials believed that combining the Royal Naval Air Service (RNAS) and the Royal Air Corps (RAC) into the RAF would prevent duplication and competition between these branches, providing better aerial protection of the homeland.[156] Thus in Britain, the cavalry did not work with the air force as a coequal branch of the same service, as in the United States. It had to learn to operate separate if roughly parallel independent administrations. This made combined training more difficult to coordinate because of the additional administrative steps required to arrange such exercises. However, British combined training was more structured than its

---

[155] See William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power Economic and Military* (1925; repr., New York: Dover, 1988), 20-22, 225.
[156] Malcolm Smith, *British Air Strategy between the Wars* (Oxford: Clarendon, 1984), 15-19.

American counterpart. The British divided training into an individual training season and a collective training period each year to train different combinations of units. These training exercises began in 1923 and continued into the 1930s.

However limited, early British maneuvers provided concrete information about the capabilities and limitations of the cavalry and the air services when attempting cooperation. These operations supported the conclusion that neither cavalry nor aviation could fulfill the roles of the other. A report prepared after the 1925 British Collective Training Period warned that reconnaissance purely from the air was often flawed, so ground "commanders must realise that…tactical reconnaissance air reports, though valuable, are by no means infallible. Undue reliance must not be placed on these reports, and, where possible, air information should invariably be checked by ground reconnaissance."[157] Training reviews from 1926 further warned about the need to maintain cavalry for reconnaissance purposes because weather limited aviation's effectiveness. The weather that year was particularly bad, demonstrating the "necessity for reconnaissance by cavalry."[158] The report of the 1927 maneuvers also stated that the cavalry was needed to pierce the enemy's protective screens on the ground.[159]

Unlike previous cycles, the 1927 training period gave the cavalry the opportunity to work with the RAF's Army Co-operation Squadrons. These units were non-divisional, as described in the *Memorandum on Training Carried Out during the Collective Training Period, 1927*, entire squadrons would be at the disposal of a division

---

[157] *Memorandum on Training, 1925*, 5.

[158] *Memorandum on Army Training Collective Training Period, 1926* (London: His Majesty's Stationary Office, 1926), 12, WO 231/208, TNA.

[159] *Memorandum on Training Carried Out during the Collective Training Period, 1927* (London: His Majesty's Stationary Office, 1927), December 15, 1927, WO 231/210, TNA.

during war. Despite the infrequency of army maneuvers and the resulted few

opportunities for training commanders in aerial reconnaissance, the report concluded that

great advances occurred in cavalry brigades giving orders and instructions to the RAF as

a result. A supplementary report concluded that cavalry remained necessary because of

the many shortcomings of aerial reconnaissance—the same ones that cavalrymen had

been identifying for years in the cavalry journals. These issues included limitations at

certain heights due to weather, gaps in coverage, and communication difficulties. The

memorandum suggested that the cavalry and air units continue to work on

communication during the next year's training period.

Additional maneuvers, including the Cavalry Staff Exercise in Oxford, gave

cavalrymen more opportunities to work on cooperating with the RAF in reconnaissance

as well as practicing techniques to avoid observation by enemy aircraft. The exercise

confirmed that the RAF was best to conduct distant reconnaissance, while armored cars

were best for medium reconnaissance and cavalry was best suited to completing close

reconnaissance. However, in bad weather or when roads were poor the cavalry would

assume responsibility for all reconnaissance activities. In addition, the report of the

exercise argued that even in cases of good weather the cavalry remained the only ones

able to "particularise." Aerial reconnaissance could collect information of a general

nature, but the cavalry provided the detail. In their attempts to avoid detection from the

air, the report concluded that cavalry could easily disappear from view. The report

agreed with previous training reports that communication between aircraft and cavalry needed improvement.[160]

Cavalrymen may have been willing to cooperate with the air force, but airmen were less concerned about working with cavalry than with preserving their independence. Reductions in military spending in the 1920s in Britain cause many to believe that it would be operationally efficient (and more economical) to disband the RAF and return its component units to the army and navy. The Army Council, the governing board of the British military, stated in 1925 that coordination was easier between two services rather than three, suggesting "the desirability of restoring to the Army its military air arm."[161] Sir Hugh Trenchard, the first (January 1918-April 1918) and third (March 1919-January 1930) Chief of Air Staff, avoided the need to defend the benefits of three services cooperating instead of just two by emphasizing the RAF's independent roles and downplaying its cooperative ones. He was supported in this effort by Winston Churchill, successively Secretary for War and for the Colonies between 1919 and 1922. During the years of debates over reducing expenditure, Trenchard claimed that the air force could not and should not be diminished. Although willing to concede that aerial support of troops on the ground was beneficial, for Trenchard its importance paled in comparison to independent missions. If any reductions were made, he argued, they should come from the "incidental role" of assisting the army and cavalry

---

[160] "Cavalry Staff Exercise Oxford April 19-22, 1927," WO 279/58, TNA.
[161] From H. J. Creedy at the War Office for the information of Lord Colwyn's Committee, "The Army and Royal Air Force," November 27, 1925, WO 32/2782, TNA.

and not from strategic bombing.[162] Trenchard testified that the RAF could accomplish

various reconnaissance and protection services with or without cavalry cooperation.[163]

These contentious debates over the funding and organization of the British military did

not provide an environment favorable to the development of close cavalry and RAF

cooperation.

Another Challenge from Aviation

Although cavalrymen provided numerous reasons why aviation could not replace

their branch in reconnaissance, they had no good defense to the horse's vulnerability to

aerial attack. They recognized the necessity of defending their units from bombing and

strafing, which placed a premium on not being spotted by enemy reconnaissance aircraft,

as George Mitchell, an American observer with the British cavalry under Allenby,

noted.[164] Ground strafing by enemy aircraft was of "special interest" for cavalry because

the "vulnerability of the horses exposes cavalry especially to this menace."[165]

The cavalry responded with innovative training and tactics. Solutions included

not smoking on night marches and keeping under the cover of woods when marching

---

[162] "Committee of Imperial Defence: Subcommittee on the Strength and Organization of the Cavalry 4th Meeting of Subcommittee, February 21, 1928, Evidence of Sir Hugh Trenchard," 9, CAB 16/77, TNA.
[163] Ibid.
[164] Mitchell, "Rout of the Turks," 183. See also T. Miller Maguire, "The Cavalry Career of Field Marshall Viscount Allenby," *CJ* (UK) 10 (1920): 379-84; Patton, "What the World War," 165-72; Topics of the Day, "Cavalry Discussed," 201-202; Cruikshank, "How the Cavalry Exploits a Victory," 163-70; Stephen H. Sherrill, "The Experiences of the First American Troop of Cavalry to Get Into Action in the World War," *CJ* (US) 32 (April 1923): 153-59; Edward Davis, "The British Cavalry in Palestine and Syria: Conquest of Syria (continued)," pt. 5 *CJ* (US) 32 (October 1923): 435-44.
[165] James, "Co-operation of Aircraft," 243.

during the day.[166] It was increasingly clear to cavalrymen and other military officers that

unless they gained air superiority freedom from hostile aircraft was unlikely for large

masses.[167] Major Patton suggested cavalry always keep mobile to prevent attack from

the air.[168] The discussion was not just theoretical. In Palestine, according to an

American observer with the British cavalry, a night cavalry march during bright

moonlight resulted in the death of many chargers when an enemy plane "swooped down

out of the skies and machine-gunned the picket lines."[169] A report from the 1925 British

Collective Training period observed how "it has now become second nature for troops to

seek concealment from the air on all occasions."[170] Firing at enemy aircraft from the

ground had not proved an effective deterrent.[171] At the end of the decade, British *Field*

Service Regulations stated that the cavalry still remained "very vulnerable to attacks

from the air."[172] The threat of bombing or strafing was of increasing concern to

cavalrymen.[173]

Doctrine

Guidelines for the various types of reconnaissance slowly emerged in the decade

after World War I. Incomplete experimentation with and the technological limitations of

---

[166] Harmon, "Second Cavalry in the St. Mihiel Offensive," 283. See also Harmon, "Second Cavalry in the Meuse-Argonne," 10-18.
[167] Weir, "Some Reflections," 230.
[168] Patton, "What the World War," 170. For additional discussion of protection from aerial attack see E.M. Whiting, "Protection from Enemy Aircraft," *CJ* (US) 37(January 1928): 103-106.
[169] Davis, "British Cavalry in Palestine and Syria," pt. 4, 62.
[170] *Memorandum on Training Carried Out during the Collective Training Period, 1925* (London: His Majesty's Stationary Office, 1925), 10, WO 231/207, TNA.
[171] C. F. Houghton, "Attack Aviation vs. Cavalry," *CJ* (US) 38 (April 1929): 224.
[172] War Office, *Field Service Regulations, Volume II: Operations 1929* (London: His Majesty's Stationary Office, 1929), 14.
[173] Houghton, "Attack Aviation vs. Cavalry," 222.

aircraft had not produced a clear doctrine prior to the war. Aviation could be used in

strategic reconnaissance to aid the cavalry but other forms of reconnaissance had to be

left primarily to ground forces. Postwar military doctrine established clearer

demarcations between aviation's and cavalry's reconnaissance duties. In the 1920s,

studies and combined training exercises led to the creation of manuals, field service

regulations, and military school handbooks that provided detailed explanations of the

joint uses of aviation and cavalry in communication, reconnaissance, and security.

The core lesson in both the United States and Britain was the importance of

combined operations. The United States Army American Expeditionary Report of the

Superior Board on Organization and Tactics (1919) supported a close coordination of

cavalry with air forces, a position shared by the Cavalry Board. The 1923 U.S. Army

Field Service Regulations repeatedly stressed that success in war could only occur when

all branches and arms of service worked together.[174] Not only was cooperation

necessary for success, "the special characteristics of each arm adapt it [the arm] to the

performance of special functions in execution of the mission of the unit in which the

action of all is combined."[175] The 1924 *Field Service Regulations* of the United

Kingdom echoed this thought, stating "the full power of an army can be exerted only

when all its parts act in close combination and this is not possible unless each arm

understands the characteristics of the other arms. Each has its special characteristics and

functions, and is dependent on the cooperation of the others."[176] For example, in the

---

[174] U.S. Army, *FSR 1923*, 3.
[175] Ibid., 11.
[176] War Office, *Field Service Regulations, Volume II: Operations 1924* (London: His Majesty's Stationary Office, 1924), 12.

absence of cavalry and aircraft, "the other arms are hampered by ignorance of the enemy's movements, cannot move in security, and are unable to reap the fruits of victory."[177]

This postwar doctrine provided for the proper employment and levels of cooperation between the cavalry and air forces for roles such as reconnaissance, security, and protection. First, both British and American doctrine divided reconnaissance into three types: distant, close, and battle. Cavalry and aeroplanes received specific assignments for different situations.

Distant reconnaissance—defined loosely as the collection of information about distant objectives for the creation of strategic and operational plans prior to, during, and following hostilities—was the duty of both the air service and cavalry; however, aviation was, according to *Cavalry Training,* capable of "carrying out distant strategical reconnaissance far beyond the reach of mounted troops."[178] British doctrine considered RAF aircraft "specially [sic] suited for long-distance work" and distant reconnaissance would "normally be a duty of aircraft," but their reports "must be verified and amplified by the cavalry."[179] By mid-decade, military theorist Basil Henry Liddell Hart claimed, "by the universal consent of all general staffs, aircraft have replaced cavalry as the means of distant reconnaissance, leaving to cavalry the duty of close reconnaissance and acting as a protective screen within a short radius of the main forces."[180]

---

[177] Ibid.
[178] *Cavalry Training, Volume II: War 1929* (London: His Majesty's Stationary Office, 1929), 21; United States Army, *FSR 1923*, 32.
[179] *Cavalry Training Volume II: War 1929*, 21-22.
[180] Hart, "After Cavalry," 414.

American policy was similar. The second-place winner in the U.S. *Cavalry Journal's* 1923 Prize Essay Contest included a chart of the most appropriate reconnaissance roles for aeroplanes and cavalry. The chart compared the abilities of the cavalry and aviation to complete various types of reconnaissance. The author, cavalryman Edward Fickett, created two detailed tables identifying the service best equipped to perform tactical and strategic reconnaissance missions.[181] Not surprisingly, aviation was considered best for strategic work while cavalry was better suited for tactical operations. Fickett clearly concluded that each service required the other to assist them in areas where they were less suited.

Close reconnaissance is the collection of information for tactical decisions when opposing armies were within a few days' march of each other, gathered by both aviation and cavalry in the "service of large units and by each arm in connection with its own operations," as American army manuals noted. [182] In Great Britain this duty was performed by the Army Co-operation Squadrons, the division of the RAF that aided the cavalry. In tactical reconnaissance, as in strategic reconnaissance, information obtained by aircraft was still required to be "confirmed and supplemented by cavalry, or other [ground] troops."[183]

The last form of reconnaissance, battle reconnaissance, was assigned to all combatant arms, including the air service and cavalry. Clearly dividing the responsibilities between aviation and cavalry proved difficult. As Air Corps Major H.

---

[181] Fickett, "Study of the Relationship," 415-18. See Appendix B for reproduced tables.
[182] U.S. Army, *FSR 1923*, 33.
[183] *Cavalry Training, Volume II: War 1929*, 22.

H. Arnold, commander of the 16th Observation Squadron at the Cavalry School, noted in 1928, "their work interlocks and intertwines to such an extent that no exact line of demarcation can be drawn separating their fields of reconnaissance."[184] Consequently, Tactical Principles and Decisions courses on reconnaissance stressed that "in order to prevent duplication of effort, there is a constant interchange of information secured in close reconnaissance by the cavalry and the other arms."[185] Army regulations also discussed the necessity of close cooperation between the cavalry and air services. Even with the use of both the air service and cavalry, U.S. field service regulations stated that they were "not sufficient" to complete reconnaissance entirely. Other branches, including the infantry, might also be required to collect pertinent information for commanders.[186]

The cavalry and air force also needed to cooperate in pursuit of routed units, distant action, and raids. British 1929 cavalry regulations stated that pursuit of the enemy remained "one of the special duties of cavalry and aircraft working in co-operation." The regulations also argued that in distant action and raids aircraft were essential.[187]

In Britain, not surprisingly, cavalry policy supported cavalrymen's contentions that they were still needed and would need to work closely with aviation. [188] As the decade passed the cavalry's position began to lose support in military policy circles. The 1929 British *Field Service Regulations* altered significantly the relationship between the

---

[184] Arnold, "Cavalry-Air Corps Team," 76.
[185] U.S. Army Command and General Staff College, *Tactical Principles and Decision*, 103.
[186] U.S Army, *FSR 1923*, 104.
[187] *Cavalry Training, Volume II: War 1929*, 12.
[188] Ibid., 16.

cavalry and aircraft. The broad term "mobile troops" replaced the word "cavalry" in descriptions of the relationship of providing security and winning the "fruits of victory." Cavalry was relegated to the end of the paragraph and stated to be "at a great disadvantage unless accompanied by artillery and armoured vehicles."[189] These changes demonstrated an adjustment in the value assigned to cavalry in relation to aviation and the rest of the army. Military policy no longer regarded cavalry as an equal partner with aviation. It also reflected the changing relationship between cavalry and mechanization. In 1928 and 1929, Britain converted the first two cavalry regiments into armored car regiments.

Conclusion

Utilizing experiences gained during the Great War, as well as postwar maneuvers and exercises, cavalryman continued to defend the utility of their branch in the 1920s. American and British cavalrymen continued to rely upon their prewar arguments while introducing new reasons why cavalry had not become superfluous. Their older arguments included challenging the exaggerated claims of aviation supporters and listing aeroplanes' technological and operational limitations. Their newer arguments included discussions of landing field accessibility, the unreliability of negative information from aeroplanes, and the inability of aviation to maintain direct contact with the enemy.

As before the war, cavalrymen argued that despite advancements in aviation, aeroplanes' limitations necessitated the continuation of the cavalry. While the

---

[189] War Office, *Field Service Regulations, Volume II: Operations 1929,* 10.

technological improvements of aircraft during the war reduced their operational limitations, cavalrymen argued that certain situations still required the cavalry. Not surprisingly, postwar discussions continued to center on the role that most connected the two organizations, reconnaissance.

Cavalrymen in the United States and Great Britain, supported by senior military officers, sought to apply the lessons of the Great War by actively cooperating with aeroplanes while fighting calls to eliminate their service. Cavalry journals, committee reports, and other publications as well as training, maneuvers, and doctrine reveal that cavalrymen were not rigidly opposed to aviation or aviators but were actively searching for ways to work with aviation. Discussions of the limitations of new technology had less to do with a distrust or hatred of technology and more with a realistic appraisal of the aeroplane's abilities, the theories of overly optimistic aviation supporters notwithstanding. The arguments for the continued viability of cavalry included more than the relative operational capabilities of horse cavalry and aeroplanes. Economic and efficiency arguments proved more damning for the cavalry as the next chapter demonstrates.

CHAPTER V

NATIONAL ECONOMY- AVIATION VS. THE CAVALRY

While cavalrymen addressed the challenge of airplanes in classrooms, training

grounds, and the pages of journals, another set of battles occurred in capital buildings

and the press, as political and military leaders battled over finances and the fate of the

cavalry. Here aviation scored a clear-cut victory over the cavalry by waving the sword

of economy. Both the United States and Great Britain became enmeshed in national

campaigns to reduce military spending after the huge expenditures of the Great War.

Both countries had to address their security, both national (metropolitan) and imperial, in

the decade after World War I. In Great Britain and to a lesser extent in the United

States, these sets of concerns overlapped. Government officials, aviation supporters, and

military officers debated the relative value of cavalry and aviation and their abilities to

fulfill their commitments as economically as possible. Economy was attained, in part,

by reducing the expenditure of all military branches, but the cavalry was the one branch

continually singled out for reduction in direct response to the creation of the air force.

This chapter examines arguments promoting aviation at the expense of the horse

cavalry utilized in Great Britain and the United States during the interwar period. These

arguments appeared in political debates, popular and professional journals, personal

correspondence, and official reports on national expenditure. Those campaigning to

reduce the size, role, and expense of cavalry argued that the cavalry could not compete

with new modern technologies on the battlefield, that it was too expensive to maintain, and that airplanes could perform national defense duties more cheaply.

This chapter also dissects two myths intertwined with the national expenditure and military reduction campaigns, particularly in Great Britain. The first myth was that air policing, the program for maintaining peace and stability through the use of air power alone, was cheap and successful.[1] In reality, British use of air policing was neither successful without ground support nor did it prove to be as inexpensive as predicted. Yet the air advocates won the public relations battle; their assertions that air policing was cheaper than ground troops, such as cavalry, were accepted and those who attempted to demonstrate the limitations of airplanes or defended the continued viability of horsed cavalry were overruled.

The second myth dealing with the stereotype of conservative and anti-technological horse cavalrymen is more difficult to outline. While the components of this stereotype are straightforward, how widely it was held is unclear. The stereotype was that cavalrymen were opposed to technological change and unquestioningly against any reduction of horses in the branch. The type of technology—whether combat cars, tanks, motorcycles, or a combination of all of these—was not important. While there are

---

[1] For detailed studies of the success and failure of air policing, see James S. Corum and Wray R. Johnson, *Airpower in Small Wars: Fighting Insurgents and Terrorists* (Lawrence: University Press of Kansas, 2003); David E. Omissi, *Air Power and Colonial Control: The Royal Air Force 1919-1939* (Manchester, UK: Manchester University Press, 1990); Brian Robson, *Crisis on the Frontier: The Third Afghan War and the Campaign in Waziristan, 1919-20* (Staplehurst: Spellmount, 2007); Andrew Roe, *Waging War in Waziristan: The British Struggle in the Land of Bin Laden, 1849-1947* (Lawrence: University Press of Kansas, 2010); Malcolm Smith, *British Air Strategy between the Wars* (Oxford: Clarendon, 1984); Philip Anthony Towle, *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare 1918-1988* (London: Brassy's, 1989); Lawrence James, *Imperial Rearguard: Wars of Empire, 1919-1985* (London, Brassey's Defence, 1998); Keith Jeffery, *British Army and the Crisis of Empire, 1918-22* (Manchester, UK: Manchester University Press, 1984).

countless examples of horse cavalry being called obsolete throughout the 1920s-1930s, direct accusations that cavalrymen were anti-technological and reactionary are difficult to identify. How much of the attack against the horse cavalry as an institution, or what Brigadier General Edward J. Stackpole, Jr. called the "horse cavalry's obsolescence complex was also applied to cavalrymen as a society is not clear.[2] Horse cavalry's supporters, however, certainly believed that the stereotype existed, as evidenced by their continued attempts to debunk it. Whether or not the stereotype was widely held by horse cavalry detractors or existed only in the minds of cavalrymen, it was not accurate. Many horse cavalry supporters actively campaigned for the retention of the horse cavalry but only until an adequate technological replacement could be produced. Despite their willingness to transform once a reliable alternative was available, they fought a battle against unnamed accusers that stereotyped cavalrymen as backward. Although successful in keeping such critiques of cavalrymen out of committee reports, they were still not able to prevent the reduction of cavalry.

Because these topics are best described thematically, this chapter deviates from the loose chronological format of earlier chapters. Each individual subject is presented in its own internal time order but the transition from one to the next requires significant jumps across some two decades' worth of debate and discourse, exploring the long-lasting economic and policy issues that characterized the interwar period. It also departs at times from an exclusive discussion of cavalry, unavoidable due to the need to

---

[2] Edward J. Stackpole, Jr., "The National Guard Cavalry," *Cavalry Journal* (US) 47 (March-April 1938): 101.

establish the larger context in which debates comparing the relative values of cavalry and airplanes occurred.

Cavalry Stereotype?

As previous chapters have explored, cavalrymen had faced accusations that their branch was obsolete for decades, if not longer. Although ultimately unable to halt a reduction in cavalry numbers during the budget cutbacks of the post-World War I period, British cavalrymen and horse cavalry supporters utilized the forum provided by professional journals and postwar economic committee hearings to address what some perceived as a popular stereotype of backwardness. In the conclusion of his book *Doctrine and Reform in the British Cavalry, 1880-1918,* historian Stephen Badsey claimed that by the early 1920s the "cavalry and their generals became scapegoats for the perceived wider failings of the British Army on the Western Front."[3] In addition to claims that cavalry was obsolete, Badsey described the development of the myth of the backward cavalryman tied to the past, unwilling to modernize. Once established, the myth of the old-fashioned, useless cavalry was impossible to shake, leading Badsey to call it a "zombie" myth, a story that once created will not die.[4]

While in most cases cavalrymen defended their branch from accusations of being obsolete, others responded to what they saw as personal attacks. While these cavalrymen almost universally failed to name their detractors, they argued that they were

---

[3] Stephen Badsey, *Doctrine and Reform in the British Cavalry 1880-1918* (Aldershot, England: Ashgate, 2008), 303-304.
[4] Ibid.

just as progressive as other military men. Major and Brevet Lieut.-Colonel C. B.

Dashwood Strettell stated in a 1921 lecture before the Royal United Service Institution

that the,

> discussion and argument as to the future role of cavalry which has so far taken
> place has, to my mind, been somewhat minimized in value by, on the one hand,
> the enthusiasm of the supporter of mechanical warfare leading him to somewhat
> didactically assume that cavalry officers are too conservative, and, indeed, too
> stupid, to move with the times, and, on the other hand, by a possibly righteous
> indignation on the part of cavalry officers at the assumption.[5]

Strettell recognized the need to adapt to modern mechanical devices and tactics while

rejecting the contention that cavalrymen were opposed to change.[6]

Perhaps Major A. R. Mulliner of the 8th Hussars best described the feelings of

his contemporaries, when he wrote that "one feels somewhat like a barrister, who pleads

in defence of a man charged with homicide against whom a mass of seemingly

convincing circumstantial evidence has been collected and for whose conviction the

populace clamours."[7] He clearly stated that cavalrymen did not "minimize the value" of

airplanes or other new inventions. Instead, Mulliner argued that cavalrymen desired an

impartial look at the limits of the new technologies to fully replace the cavalry. He

warned his government and fellow officers not to

> be like the child that, given a new toy, in its delight at obtaining something new,
> throws away the old before unwrapping the parcel; then, when it finds that this
> new thing does not afford it the pleasure and amusement it formerly derived from
> the old, cries for its return, only to find that the shops have ceased to stock it.[8]

---

[5] C. B. Dashwood Strettell, "Cavalry in Open Warfare, Illustrated by the Operations Leading Up to the
Occupation of Mosul in November, 1918," *Journal of the Royal United Service Institution* 66 (1921): 598.
[6] Ibid., 600.
[7] A. R. Mulliner, "Cavalry Still an Essential Arm," *CJ* (UK) 17 (1927): 640.
[8] Ibid., 647.

Mulliner provided a clear path for the future of technological incorporation that cavalry would approve: "test, prove, and carefully unwrap this new thing and strip it of the glamour and attraction of the 'something new' that is such a dangerous fetish of the present day."[9] He expressed the desire for caution when evaluating new technologies, not outright and immediate rejection.

General Sir George Barrow echoed Mulliner's point, arguing that it was "rash as well as unscientific to make deductions from speculative imaginations instead of from observed facts and experiences."[10] He warned, "do not let us be led astray, as has so often happened before by the verbose prophecies of those opponents of the cavalry arm who are but wise in their own conceit."[11] The cavalryman's question, another officer noted, was not "cavalry or machine" but "how to combine the essential characteristics of both."[12]

Horse cavalry supporters continually tried to refute the stereotype of backward, anti-technological cavalrymen in committee debates, particularly in Great Britain. In Great Britain, those who supported mounted troops were concerned about the widely held opinion that the cavalry was hostile to any change, which would facilitate cavalry reductions or elimination. The records of the 1927-1928 Sub-committee on the Strength and Organization of the Cavalry reveal this anxiety. In his testimony before this body, General Sir Alexander Godley, former commander of the New Zealand Expeditionary Force and an organizer of irregular mounted regiments, declared that cavalrymen were

---

[9] Ibid.
[10] George Barrow, "The Future of Cavalry," *CJ* (UK) 19 (1929): 178.
[11] Ibid., 184.
[12] "The Future of Cavalry: A Lecture Given at the University of Bristol on 7th February 1929," *CJ* (UK) 19 (1929): 376.

actually "crying out" for machines. "Of course, they are," he observed, "they are not retrograde."[13] Another cavalry officer, Lieutenant-General Sir David Campbell, testified that "people imagine that there is a tremendous prejudice in the cavalry about mechanization, I do not think this really exists . . . the cavalry soldiers, when he sees that you are able to give him something that will enable him to carry out his work more efficiently, he will, and regiments will, accept it."[14]

Witness after witness encouraged the further incorporation of technology into the cavalry and stressed the cavalryman's willingness to receive it. One such witness, the War Office's director of mechanization, Colonel S. C. Peck, used his own experiences to defend the flexibility of horse cavalrymen. He described the successful mechanization of two brigades of field artillery, one of which he described as having the reputation as "the most 'horsey' brigade of the Royal Regiment of Artillery." Although initially resentful of the transformation, Peck noted that after only a short time, officers and men alike of both brigades "took the same pride and interest" in their new machines as they had with their horses.[15] He argued that cavalrymen would respond similarly.

Committee reports did not overtly use the cavalry stereotype to justify cavalry reductions. In fact, the Sub-committee on the Strength and Organization of the Cavalry noted that any difficulty "anticipated in connection with the conversion of cavalry regiments into mechanized units" could be "treated as eliminated, since there is every

---

[13] "Minutes of the Second Meeting of the Sub-committee," December 19, 1927, 7, CAB 16/77, The National Archives of the UK (TNA).
[14] "Third Meeting of the Sub-committee on the Strength and Organisation of the Cavalry," February 9, 1928, 8, CAB 16/77, TNA.
[15] "Committee of Imperial Defence: Sub-committee on the Strength and Organization of the Cavalry 4th Meeting of Sub-committee, Evidence of Colonel S. C. Peck," February 21, 1928, 2, CAB 16/77, TNA.

reason to believe that cavalry officers… are quite ready to look facts in the face, and, with whatever natural regret, to take no exception to the changes from horses to machines."[16] Yet despite such support and the efforts of cavalry to work with new technologies and mechanization, the cavalry's detractors won the public relations and funding debate. The battle between the supporters and opponents of horse cavalry about mechanization closely mirrored the debates the advocates of horse cavalrymen and the proponents of aviation were experiencing with airplanes.

Great Britain-Air Organization

The conversations judging the value of cavalry and aviation occurred as Britain was trying to recover from the devastation of the Great War. World War I cost the nation millions of people and pounds and eroded its political and economic dominance of the world. Yet after the Great War, the British had to find the manpower and funds to administer the territories they had acquired as a result of the liquation of the German and Ottoman Empires. Their military commitments included troops in India, Iraq, Palestine, Egypt, Constantinople, and the United Kingdom itself.[17] It was necessary for Britain to identify a means to fulfill its expanded obligations while at the same time reducing its total military expenditure.

A national drive for economy consumed the British government after the conclusion of hostilities. In 1922, Henry Higgs, a historian of economic thought who

---

[16] "Committee of Imperial Defence Sub-committee on the Strength and Organisation of the Cavalry Report May 3, 1928," 6, CAB 16/77, TNA.
[17] "Appendix II Memoranda by the War Office on the Report of the Geddes Committee, Paper A-General Staff Paper Circulated to the Cabinet by the Secretary of State for War," January 10, 1922, 2-5, CAB 27/164, TNA.

was a founding member of the Royal Economic Society, wrote that in the postwar environment it was preferable to be dead than to be seen as a "waster" of the resources of the nation.[18] The government formed numerous committees to determine how best to cut national expenditure, including the Committee on National Expenditure; the Committee to Examine Part I (Defence Departments) of the Report of the Geddes Committee on National Expenditure; the Committee on Navy, Army and Air Force Expenditure; and the Committee of Imperial Defence: Sub-committee on the Strength and Organisation of the Cavalry (see Table 5-1).[19] Although all government spending was examined, military budgets were singled out as one of the best ways to save since the cabinet had declared the "Ten-Year Rule," a defense policy stating that the government would not plan to fight a major war within the next ten years.[20] The public and politicians wished to avoid additional continental commitments and to reduce the amounts spent on existing responsibilities. Their cost-cutting efforts started with reductions, examining how best to organize their military forces for maximum efficiency with minimal resources. The next step involved examination of the ability of new technologies to substitute for older services or to convert existing units into mechanized units.

---

[18] Henry Higgs, "The Geddes Report and the Budget," *Economic Journal* 32, no. 126 (June 1922): 251.
[19] See Chart I for selected committees and members.
[20] Malcolm Smith, *British Air Strategy between the Wars* (Oxford: Clarendon, 1984), 22, 31, 121.

Table 5-1- Selected Committees on National and Military Expenditure

Committee	Members	Meeting/report dates
Committee on National Expenditure (Geddes Committee)	Sir Eric Campbell Geddes (chairman), Lord Inchcape, Lord Faringdon, Sir Joseph Paton Maclay, Sir W. Guy Granet, Gerald A. Steel	December 1921
Committee of the Cabinet appointed to examine part I (Defence Departments) of the report of Committee on National Expenditure	Winston S. Churchill (chairman), Viscount Birkenhead, E. S. Montagu, Stanley Baldwin, and John Chancellor	January 9, 1922- February 23, 1922 February 4, 1922
Committee on Navy, Army and Air Force Expenditure (Colwyn Committee)	Lord Colwyn (chairman), Lord Chalmers, and Lord Bradbury	August 13, 1925-December 23, 1925
Committee of Imperial Defence: Sub-committee on the Strength and Reorganization of the Cavalry	Marquess of Salisbury (chairman), W. S. Churchill, *Sir John Gilmour, Walter Guinness, Viscount Peel, and G. N. Macready Witnesses: Earl Haig, Sir Alexander Godley, Sir David Campbell, Sir Walter Braithwaite, S. C. Peck, and Sir Hugh Trenchard *Sir L. Worthington-Evans later replaced Sir John Gilmour	Proceedings December 8, 1927-March 28, 1928 Army estimates 1927 and final report March 1928

All military services came under scrutiny for expenditure reductions, but some of the most contentious debates involved the newest service the Royal Air Force, and other aviation establishments. At the end of the First World War, the full potential of airplanes remained under investigation and agreement on the best organization for air services had not been finalized. The independent air force proved to be a tempting target for the older services for reduction to save themselves and perhaps regain their lost aerial assets. How the air force should be commanded and organized were also universal concerns.

The British had already taken steps to create a more efficient air force during World War I when they combined the Royal Naval Air Service (RNAS) and the Royal Flying Corps (RFC) to form the Royal Air Force (RAF) on April 1, 1918. Proponents justified the merger of these organizations by claiming that it prevented competition for resources, particularly airplane procurement, and offered better protection to the homeland, which had been attacked by German airships and heavy bombers during much of the war.[21] The army and navy had demanded more airplanes than producers could supply, pitting the services against one another for airplane procurement. Wartime experience had also demonstrated that divided control of the air (the army was responsible for overland defense and the navy was tasked with defense over water) greatly handicapped the ability of the rival services' air arms to coordinate responses to hostile aircraft crossing the channel.[22] The creation of the independent RAF in the war's

---

[21]"Interim Report of the National Expenditure Committee," December 14, 1921, 6-7, T[reasury] 172/1228 Part 15, TNA. See also Smith, *British Air Strategy,* 15-19.
[22] Smith, *British Air Strategy,* 15-16.

final year quieted some but did not end the debate over how best to organize aviation most effectively.

Immediately following the war, the War Office and the Admiralty joined forces against the RAF, motivated by a desire to have better control of air assets and, most likely, craving the money allotted to the RAF. Even if they could not claim the RAF's funds, they may have hoped that the savings created by eliminating the RAF would spare them from drastic reductions. They argued that having an independent air service added unnecessary expense because it required the same support services (supply, transport, medical, housing, etc.) as the army and navy. The army and navy maintained that if the older branches reabsorbed the RAF this duplication could be reduced by one-third, saving the government a significant amount.[23]

The vulnerability of their organization was not lost on RAF personnel. Rejecting any possible monetary savings by dismembering the RAF, independent air force proponents defended the value of the force from an operational and economic point of view. The austere postwar environment, combined with the RAF's desire to maintain its separate existence led RAF personnel and supporters to sell aviation as a cheaper and more effective way to fulfill the country's responsibilities abroad and at home. Most of the territories in the British Empire were so large they required individual army units to spread out over hundreds of square miles. Getting troops where they were needed often proved an extremely expensive and time-consuming undertaking. While the War Office and Admiralty fought to regain their monopoly on military expenditure, military

---

[23] "Committee on National Expenditure Interim Report," December 14, 1921, 10, AIR 8/41, TNA; and Omissi, *Air Power,* 38.

personnel and politicians outside of the War Office and Admiralty increasingly viewed the airplane, in the words of historian Keith Jeffery, as "a panacea for the army's problems of imperial security."[24] As early as December 1918, the Chief of the Air Staff, Sir Frederick Sykes, lobbied for the retention of a separate air force, arguing to the Secretary for War that "in air power we possess a rapid and economical instrument by which to ensure peace and good government in our outer Empire, and more particularly upon its Asian and African frontiers."[25] Sykes' statement appeared before the economy drive fully developed, but his declaration reflected the justifications for the continued existence of a separate air service used by his successors in the RAF. The argument had two parts, economics and effectiveness. First, he argued, independent aviation was more economical than when incorporated into other forces, and second, the RAF was an inexpensive and effective service (if not the best) for use in the expanded British commitments. Sykes's 1918 memorandum on South Africa noted, "the moral effect of aircraft on a native population and the great economy as compared with infantry need not be elaborated."[26] Sykes believed the moral effect and savings were so obvious that he did not even bother to make a clear case for either claim.

Sir Hugh Trenchard, Sykes' predecessor and successor, clarified the argument further, along with other supporters of an independent Royal Air Force. Trenchard was unwilling to see the newly established branch disappear. During the first few years of his second tenure as RAF Chief of Staff, he maintained that an independent air force

---

[24] Jeffery, *British Army*, 67.
[25] "Memorandum by the Chief of the Air Staff on Air Power Requirements of the Empire," December 9, 1918, 4, CAB 24/71, TNA.
[26] Ibid., 12.

could police the new mandates in the British Empire with air squadrons, a few armored

car units, and a few British and locally recruited troops "at a fraction of the cost of a

large army garrison."[27] Trenchard proposed that punitive operations normally conducted

by ground units of cavalry and infantry would be performed better by RAF planes,

which were faster than any surface unit, not restrained by terrain, and had greater

firepower than ground-based artillery (large guns are difficult to move away from roads).

As a result, each air unit could be smaller than the land units assigned to the same task

yet could cover more territory. This concept, "air policing,"[28] seemed like an ideal

solution to the expensive problems of empire and also justified the RAF's continued

independence and concentration on independent strategic missions.[29] A 1921 article in

the *Journal of the Royal United Service Institution* included a more focused attack. A

general staff colonel made a direct assault, not just against ground forces in general as

Sykes had done, but specifically against the cavalry. He declared that the terrain in

Mesopotamia, East Africa, India, and the Sinai Peninsula "was perfectly ridiculous from

the point of view of cavalry reconnaissance" and "in view of the development of aerial

reconnaissance, the use of cavalry under such conditions … [was] past."[30]

---

[27] Corum and Johnson, *Airpower in Small Wars*, 52.

[28] For detailed studies of the success and failures of air policing, see Corum and Johnson, *Airpower in Small Wars*; Omissi, *Air Power*; Robson, *Crisis on the Frontier*; Roe, *Waging War in Waziristan*; Smith, *British Air Strategy*; and Towle, *Pilots and Rebels*.

[29]"Colwyn Committee on Navy, Army, and Air Force Expenditure, January 1, 1925-December 31, 1925," AIR 19/121, TNA.

[30] A. E. Borton, "The Use of Aircraft in Small Wars," *Journal of the Royal United Service Institution* 65 (1921): 317-18. See also "Minutes of the First Meeting of the Sub-committee on the Strength and Organisation of the Cavalry," December 8, 1927, 24, CAB 16/77, TNA; "Third Meeting of the Sub-committee on the Strength and Organisation of the Cavalry," February 9, 1928, 8, CAB 16/77, TNA; "Committee of Imperial Defence: Sub-committee on the Strength and Organization of the Cavalry 4th Meeting of Sub-committee, Evidence of Sir Hugh Trenchard," February 21, 1928, 10-13, CAB 16/77, TNA.

Retention of the RAF through the Promise of Air Policing

By utilizing these arguments, RAF officers received support for the retention of an independent air force from committees formed to examine national expenditure. Historian David E. Omissi argued that the belief that an independent air service could "police the empire on the cheap…helped ensure the survival of the Third Independent Service during the lean financial years of the 1920s."[31] As part of its assignment to provide recommendations to the Chancellor of the Exchequer to reduce national expenditure, the 1921-1922 Committee on National Expenditure, perhaps the most well-known committee assigned to find ways to reduce spending, examined the merits of retaining or dividing the RAF. This committee—also known as the Geddes Committee after its chair, Sir Eric Campbell-Geddes, a businessman and conservative politician—suggested additional combinations and not separation. Despite the initial public criticism of the members, scope, and possible impact of the committee that accompanied the announcement of its creation, economist Higgs noted the positive public reception to the reports issued by the Geddes Committee.[32] Rather than directly supporting the continuation of the independent air service, the committee concluded that the best solution to increase economy was a fusion of all of the services—army, navy, and air force—under one minister to coordinate supply, transport, education, medical, and other services.[33] This was not a popular conclusion within the War Office, Admiralty, or the RAF.

---

[31] Omissi, *Air Power*, ix.
[32] Higgs, "Geddes Report," 254, 257.
[33] "Interim Report of the Committee on National Expenditure," n.d., 8-9, AIR 8/41, TNA.

The decisions of the Geddes Committee did not end debate on whether the RAF

should remain independent of the War Office and Admiralty. The RAF's supporters

continued to testify before later expenditure committees to suggest other ways to reduce

military expenditure on aviation. Secretary of State for Air F. E. Guest argued before

the 1922 committee formed to assess the Geddes Committee's findings that there were

two ways to cut aviation expenditure. The first option was to cut Britain's commitments

abroad, which would allow a reduction of units. The second choice was to cut army and

navy cooperation squadrons, a suggestion already recommended by the Geddes

Committee.[34]

Committees throughout the 1920s expressed interest in examining how air

policing could save money. The policy, according to historian Andrew Roe, promised to

be "an inexpensive means to deter rebellion" in places such as Waziristan (on the Raj's

northern border at that time, now part of Pakistan) or Afghanistan.[35] In theory, when the

inhabitants of a particular area became unruly, the appearance of a few airplanes over

their settlements, dropping warning leaflets, might be sufficient to settle them down. If

not, a few well-placed bombs would quiet the area, at least temporarily. Members of the

Geddes, Colwyn, and Strength and Organization of the Cavalry committees were very

interested in the possible savings promised by the RAF in reducing the need for large

armies in the periphery of the empire. The Geddes' committee's December 1921 report

noted it was "particularly impressed with the very large saving which we are told can be

---

[34] "Minutes of the Fourth Meeting of the Committee Appointed to Examine Part I (Defence Departments) of the Report of the Geddes Committee on National Expenditure," January 23, 1922, 1-2, CAB 27/164, TNA.

[35] Roe, *Waging War in Waziristan* 130. Also see Robson, *Crisis on the Frontier*.

realised in the Middle East" by utilizing aircraft. Although the report did not identify the committee's sources, it estimated that transferring responsibility from the army to the air force in the Middle East would reduce total military expenditure in the region over fifty percent, from £27,000,000 in 1921/1922 to £13,000,000 in 1922/1923.[36]

The committee further narrowed its focus from the army to the cavalry, concluding that the RAF could replace the cavalry and produce the nation's desired economy. It stated that the air arm not only added to "the older fighting services" but could substitute for them by "utilizing air forces in place of . . . cavalry in the army" and providing significant economies for the defense of the empire.[37] The committee recommended reducing the current twenty-seven cavalry regiments to nineteen with additional possible reductions in the future.[38]

The committee concluded that technologies not only supplemented manpower, they could substitute for men. This did not bode well for the older services, especially the cavalry. The retention and possible expansion of RAF units abroad directly involved the reduction of ground forces, particularly the cavalry. Governmental and military attempts to determine how to police the empire continually pitted the cavalry and aviation against one another in the 1920s and 1930s.

The cavalry was not without supporters attempting to save it from massive reductions. In response to the Geddes report, the Secretary of State for War, Sir Laming Worthington-Evans, came to the cavalry's defense in the form of a General Staff Paper,

---

[36] "Interim Report of the Committee on National Expenditure," December 14, 1921, T 172/1228, Part 15, TNA.
[37] Ibid.
[38] Ibid., 40.

which circulated among the Cabinet. The paper argued that the committee had "advance[d] no valid reason for the drastic reduction proposed in cavalry regiments" although from "the general tenor of their [the committee's] remarks" it was the creation of the air force that brought them to their conclusions.[39]

The War Office admitted that aircraft could discharge some duties more efficiently than cavalry, such as long-distance reconnaissance, but argued that to "assert that the place of cavalry can entirely be taken by aircraft in the work of close reconnaissance, protection and support is a complete fallacy." Aircraft were still unproven in traditional cavalry tasks, such as advanced and flank guard actions, and the secretary warned that "in the east the need for cavalry will be most urgent, and the committee's proposals" for further reduction of the cavalry would "disastrously cripple the efficiency of our expeditionary force."[40] The War Office agreed with the cavalry reductions that had already taken place.

However, the 1922 Committee Appointed to Examine Part I (Defence Departments) of the Report of the Geddes Committee on National Expenditure criticized the Geddes Report, claiming it had failed to make the appropriate corrections for inflation, that it misunderstood the prewar justifications for the army, and that it failed to appreciate the scale of Britain's postwar commitments and responsibilities.[41] Rather than support the Geddes Committee's reductions, the committee suggested that no further reductions should take place and endorsed the proposals made by the Secretary of

---

[39] "Appendix II Memoranda by the War Office," 7, CAB 27/164, TNA.
[40] Ibid.
[41] Winston S. Churchill, "Report of the Committee Appointed to Examine Part I (Defence Departments) of the Report of the Geddes Committee on National Expenditure, Report," February 4, 1922, 3, 10-11, CAB 27/164, TNA.

State for War Worthington-Evans. The secretary recommended significant reductions in

the army but not as drastic as the Geddes committee's suggestions. For example, the

secretary suggested reducing the army by 30,000 men instead of the 50,000 advised by

the Geddes report.[42]

The interrelated debates over the most economic administration of aviation and

substituting air units for ground units to cut expenditure continued in the 1925

Committee on Navy, Arms and Air Force Expenditure. Known as the Colwyn

Committee after its leader, Frederick Henry Smith, 1st Baron Colwyn and a rubber and

cotton manufacturer admitted to the Privy Council in 1924, it supported the 1922

committees' conclusions but more clearly emphasized that eliminating the RAF and

returning its airplanes to the army and navy would not avoid unnecessary duplication of

support services.[43] The committee affirmed "the necessity for an independent Air

Ministry to administer a single, unified Air Service."[44] Secretary of State for Air Sir

Samuel Hoare explained the War Office and Admiralty's claim was "inter-departmental

warfare…waged against the air ministry by the older services." He warned that

emulating countries such as the United States, which retained control of the air in the

hands of the army and navy, would arrest the air service's development.[45] This could be

particularly dangerous with the level of British commitments throughout the world. The

committee composed of Lords Colwyn, Chalmers, and Bradbury expected that

---

[42] Ibid., 7-12.

[43] "Colwyn Committee: Note upon alleged duplication of Ground Services by the Army and Air Force," November 9, 1925, AIR 19/121, TNA.

[44] "Committee on Navy, Army and Air Force Expenditure Report," December 23, 1925, 4, AIR 19/122, TNA.

[45] "Standing Committee on Expenditure Report of the Colwyn Committee, Memorandum by the Secretary of State for Air," n.d., [1925?], AIR 19/120, TNA.

substantial savings could be "secured by the extended substitution of air power as a substantive arm." The committee also concluded that far too much was being spent on the cavalry in light of modern technological developments, calling the expenditure "quite unjustifiable." The committee recommended reducing the number of cavalry regiments by "rolling up" existing regiments and reducing cavalry numbers in India.[46]

The discussion of further possible cavalry reductions and conversion continued into the 1927 and 1928 meetings and report of the Committee of Imperial Defence: Sub-committee on the Strength and Organization of the Cavalry which was organized to deal with cavalry of the line. This sub-committee examined witnesses and reviewed recommendations of previous committees to determine specifically if it was possible to decrease further the size of the cavalry branch and its services without harming the military capabilities of the country. The committee also examined briefly the possibility of converting horse cavalry regiments into mechanized or armored units.

Former Chief of the Imperial General Staff, Field-Marshal Sir William Robertson wrote a document in 1927 that was provided to the committee that argued that no new developments had demonstrated that the cavalry ceased to be essential. He maintained that any additional reduction of the cavalry would be an unjustified risk.[47] A little less than a month before the sub-committee's first meeting, Secretary of State for War Laming Worthington-Evans wrote a memorandum later printed for the sub-committee that the army had done more than its fair share to save the empire money. He called

---

[46] To Stanley Baldwin, "General Remarks on Defence Expenditure, Report, Committee on Navy, Army and Air Force Expenditure," December 25, 1925, 4, AIR 19/122, TNA.
[47] "The Future of Cavalry, Views of Field-Marshall's Viscount Allenby and Sir William Robertson, Enclosure No. 2," November 3, 1927, 17, CAB 16/77, TNA.

unwise the Chancellor of the Exchequer's suggestion to produce an additional savings of £600,000 by reducing the already barely sufficient twelve regiments of cavalry down to six. The secretary recognized that the Chancellor of the Exchequer since 1924, Winston Churchill (successively Secretary for War 1919-1921 and Secretary of State for the Colonies 1921-1922) was under overwhelming and continuous pressure to reduce expenditure, a push that had existed since 1922, but Worthington-Evan argued that the "army has made by far the largest contribution to the reduction in the expenditure on the fighting forces" and that reducing the twelve current cavalry regiments by half would not produce the savings that chancellor estimated.[48]

As members of the sub-committee, Churchill and Worthington-Evans battled over the degree by which cavalry could be reduced. The first meeting provided the basic path this discussion would take. Churchill adamantly argued that the cavalry be reduced further and attempted to discredit pro-cavalry witnesses even before they appeared before the committee. The former chairman of the 1922 Committee to Examine Part I of the Geddes report, Churchill took an adversarial position against the cavalry and his fellow committee members. Churchill advocated the reduction of cavalry even before the committee examined one witness.

In the committee's first meeting Churchill, not the chairman, took command and stated that he thought the cavalry "furnished the most likely field for economy" and no other reduction in fighting forces could provide any great scope of savings. He also

---

[48] "Further Memorandum by the Secretary of State for War, Army Estimates 1928, Committee of Imperial Defence Sub-committee on the Strength and Organization of the Cavalry, The Cabinet Committee on Expenditure," November 11, 1927, 2-3, CAB 16/77, TNA.

stated self-importantly that "his lead for economy should be accepted" since the government received "all the abuse from newspapers and the economy group in Parliament, as well as from the Opposition." Churchill recommended further that some cavalry regiments should be telescoped, two or more regiments combined into one, and the number of troops reduced, since cavalry was out of proportion to other arms. He suggested replacing cavalry regiments with yeomanry regiments, or at least allowing the latter to be established in times of need. He believed yeomanry regiments could "perform the functions of modern Cavalry quite satisfactorily" and more cheaply.[49] In addition, Churchill advocated transforming cavalry into mechanized units, recommending that cavalry should be compressed and then converted.

Secretary of State for Scotland and acting Secretary of State for War until Worthington-Evans' return from India, Sir John Gilmour cautioned the committee that they had not "quite reached the stage of mechanical development which enables us to produce a sufficiently trustworthy machine for transformation from cavalry to mechanized units."[50] Another committee member concurred with his colleague, citing statements by senior military officers that Britain was "still very far from the possibility of widespread mechanization."[51] While some reductions were thought possible, mechanization was not yet ready to transform the cavalry.

Churchill's animosity was clearly demonstrated when after listening to these concerns he looked around the room and stated that "the outlook as regards economy

---

[49] "Minutes of the First Meeting of the Sub-committee on the Strength and Organisation of the Cavalry, Committee of Imperial Defence," December 8, 1927, 2-5, CAB 16/77, TNA.
[50] Ibid., 7.
[51] Ibid., 9.

looked rather bleak." He claimed the army was not seriously assessing the possibility of creating savings by cutting or transforming the cavalry. He described most generals in high command during the war as cavalrymen, who if questioned, would protest against reduction, insist cavalry won the Great War, and that "what we want is cavalry." Churchill had no doubt that the sub-committee could get what he called "cavalry evidence" but thought it would be harder to "get the other side of the question proved." He maintained that without a reasonable amount of support "from the political side, it was hardly worth while pursuing the question."[52] Despite Churchill's skepticism, the sub-committee called witnesses to testify on the possibility as well as the advisability of reducing or transforming the cavalry.

Those witnesses who testified that the horse cavalry was still useful and further reductions would damage it found themselves repeatedly challenged, particularly by Churchill, no matter their military credentials. Churchill acted as if any former contact with the cavalry branch made officers incapable of making a fair assessment of the branch's future. Even before the Sub-committee on the Strength and Organisation of the Cavalry examined the majority of witnesses, he questioned the partiality of the witnesses because, he claimed, military leaders were "mostly cavalrymen."[53] Once they arrived, Churchill aggressively asked simplified and leading questions regarding which military branch should be reduced, trying to force the witnesses to advocate reducing the cavalry. When witnesses refused to agree to even theoretical reductions in cavalry before all else,

---

[52] Ibid., 9-10.
[53] "Minutes of the First Meeting of the Sub-committee on the Strength and Organisation of the Cavalry, December 8, 1927," 24, CAB 16/77, TNA.

Churchill made more and more ridiculous and oversimplified comparisons to get them to

put the cavalry on the chopping block. Since they did not take his bait, Churchill

maintained his original position that they would defend the cavalry no matter the

argument. During testimony at the third meeting of the sub-committee, when Churchill

finally heard what he wanted to hear from a military officer that regular cavalry could be

converted into a mechanized form without forming new units, he thought little more

committee research was necessary.[54]

When Worthington-Evans returned from India to retake his position from the

temporary Secretary of State for War and to attend the fourth meeting of the sub-

committee, Churchill's position was unyielding. Although this was the first meeting of

the committee he attended, Worthington-Evans was already familiar with and objected

to Churchill's tactics in earlier meetings. During discussions on what to include in the

committee's final report, Worthington-Evans accused Churchill of asking "trap"

questions to make the witnesses appear absurd or put them in a corner. Worthington-

Evans objected to Churchill's suggested inclusion of witnesses' specific answers to these

questions in light of the nature of the questions posed. He thought they would not be

accurate statements of what the witnesses actually believed. Other members provided a

moderating voice, suggesting using more general comments about witnesses' testimony.

Churchill strongly objected but was overruled. He refused to sign the committee's final

report. Instead, he added a note to the end of the report, listing his objections and

---

[54] "Minutes of the Third Meeting of the Sub-committee on the Strength and Organisation of the Cavalry," February 9, 1928, 16-17, CAB 16/77, TNA.

recommendations.[55] In the end, Churchill got what he desired from the sessions, support

for additional cavalry reductions.

British Air Policing in Practice

Although the national expenditure committees accepted the argument of RAF

supporters that using airplanes to replace ground troops would be cheap and effective,

this did not work out in practice. The British Air Ministry argued that campaigns

throughout the empire demonstrated the effectiveness of the policy of air policing.[56]

Operations in Somalia, Mesopotamia, Palestine, Aden, India, and Africa throughout the

1920s and 1930s were used to strengthen their claims.[57] Yet historians of air policing

agree that those who argued that air power was successful on its own got it wrong.[58]

Despite the impression left by RAF reports, "most of the operations in the colonies in the

interwar years were in support of, and in cooperation with, ground troops."[59] When

working with other arms, aircraft conducted reconnaissance, artillery observation,

bombardment, machine gun raids, supply, rebellion-deterring demonstrations, convoy

protection, casualty evacuation, and communications missions.[60]

RAF reports initially acknowledged this cooperation between ground and air

units, but its public statements about the vital contributions of surface forces "gradually

---

[55] "Minutes of the Fifth Meeting of the Sub-committee on the Strength and Organisation of the Cavalry,"
March 18, 1928, 2, CAB 16/77, TNA.
[56] Omissi, *Air Power,* 13.
[57] See Roe, *Waging War in Waziristan*; Omissi, *Air Power*; Lawrence James, *Imperial Rearguard: Wars of
Empire, 1919-85* (London: Brassey's Defence, 1988); Corum and Johnson, *Airpower in Small Wars*;
Jeffery, *British Army*; and Towle, *Pilots and Rebels.*
[58] Corum and Johnson, *Airpower in Small Wars,* 5. See also James, *Imperial Rearguard,* 51, 71.
[59] Corum and Johnson, *Airpower in Small Wars,* 5, 61.
[60] Roe, *Waging War in Waziristan,* 131.

faded" in the RAF's accounts of operations in the empire according to historians James Corum and Wray Johnson.[61] The increased absence, accidental or not, of this information created a belief in Britain that airpower was a successful precision instrument on its own. Yet even the air staff never claimed that aircraft would completely replace ground forces in colonial and mandated territories. They did not deny that ground troops were required to defend air bases and political centers.[62] This was reflected in the Sub-committee on the Strength and Organization of the Cavalry that stated "it is not suggested that by reason of this replacement [RAF for cavalry], the establishment of ground mounted troops of one sort or the other could be reduced."[63]

Numerous operational limitations hurt the ability of air policing to succeed without ground support. In Iraq, airplanes experienced serious problems. Engines overheated, "propellers warped, tyres were punctured by thorns and shock absorbers perished."[64] Inclement weather over the mountains along the Afghan frontier hindered operations in the Third Afghan War in 1919.[65] In the Northwest border of India a "month-long bombing campaign showed that the tribesmen could adapt to aerial attack."[66]

---

[61] Ibid., 63.
[62] Omissi, *Air Power*, 60.
[63] "Suggested Heads of Report, Committee of Imperial Defence: Sub-committee on the Strength and Organisation of the Cavalry," March 7, 1928, 7, CAB 16/77, TNA.
[64] Towle, *Pilots and Rebels*, 18.
[65] Omissi, *Air Power*, 9.
[66] Ibid., 12.

British cavalrymen questioned the empire's seeming overreliance on aircraft and praised combined operations.[67] An officer of the 12th Royal Lancers charged that operations in Morocco, Syria, and the Riff demonstrated that "neither mechanical vehicles nor aircraft, whether acting alone or in combination … [could] deal satisfactorily with a cunning enemy in difficult terrain."[68] He also rejected the ability of these forces to act as adequate police forces throughout the empire, arguing that airplanes by themselves could not have prevented violence in the Hankow and Shanghai concessions as ground forces had done.[69]

The cooperative nature of successful operations was apparent in the first use of airpower on the British frontier in 1917, when ground troops and BE2c biplanes worked together during the Waziristan campaign in the Northwest frontier of India. The effects of airpower were transitory but when used in conjunction with ground forces they were more lasting and successful. Within two years, ground and aerial forces were used again with improved airplanes contributing to the amir's decision to sue for peace.[70] In Egypt in 1919, the RAF also worked with ground troops while they "patrolled communications, scattered propaganda, delivered mail, relieved garrisons" and sometimes attacked Bedouins and demonstrators.[71] Historian Philip Anthony Towle argued that in Somalia a "combination of air and camel power" destroyed opposing

---

[67] Rex Osborne, "Operations of the Mounted Troops of the Egyptian Expeditionary Force (Cont.)," *CJ* (UK) 13 (1923): 24-31.
[68] Riff refers to the frontier of Morocco.
[69] H. V. S. Charrington, "Where Cavalry Stands To-day," *CJ* (UK) 17 (1927): 420-21.
[70] Roe, *Waging War in Waziristan,* 130, 134, 141.
[71] Ibid.

forces.[72] The 1920 rebellion in Iraq also persuaded observers that aircraft were unable to

take the place of ground troops as the main Imperial police force.[73] However,

economics overruled effectiveness, and the RAF's offer to garrison the country at a

minimal cost was quickly accepted because of the great expense of Iraq in personnel and

resources.[74]

Economic constraints also hampered effective combined operations. The use of

aviation in the empire proved that airplanes were, according to historians Corum and

Johnson, "tremendously effective as a force enhancer in military operations." Limited

funding, however, complicated the ability of the RAF to function in both its support and

independent role.[75] When budget reductions were demanded, the RAF did not want to

diminish the air force's ability to conduct independent operations. Instead, RAF officers

argued that cooperating with ground forces or providing cooperation squadrons were not

the RAF's first or most important priorities. Therefore, if further reductions were

required, army and navy cooperation squadrons would be eliminated and they were. The

RAF drastically reduced its army and navy cooperation squadrons, but air personnel

were unwilling to reduce the number of independent (strategic bombardment) squadrons

that justified their branch's separate existence. If the RAF had to lose funding, it

preferred to eliminate units assigned to cooperate with ground forces.[76]

This reduction supported aviation's visions of independent future missions at the

expense of the ground vision of cooperation. The "army emphasized a continental

---

[72] Towle, *Pilots and Rebels,* 12.
[73] Roe, *Waging War in Waziristan,* 23.
[74] Corum and Johnson, *Airpower in Small Wars*, 56.
[75] Corum and Johnson, *Airpower in Small Wars*, 81; Roe, *Waging War in Waziristan,* 136.
[76] Omissi, *Air Power,* 29.

commitment and 'small wars', while the air force stressed home defence and the independent bomber offensive." When the army requested thirty more cooperation units from 1923 to 1924, the RAF provided only four.[77] Historian Richard Muller interpreted this to mean that the RAF was not concerned about preparing for possible future wars but only working to insure its survival as an independent branch in the austere environment of the interwar period.[78]

This conviction contributed to the end of discussions about the return of the RAF assets to the two elder services and led to the emergence of a myth about the success of air control in the empire. Historian Omissi explained that this myth maintained that "a small force of airplanes was cheaper and more efficient" than ground forces because it could produce equivalent amounts of disruption and destruction, the goal of punitive missions. He argued that accurate explanations of why operations succeeded "became irrelevant." The cabinet continued to be "swayed by the impressive economies promised by Churchill" and convinced themselves that the myth was true.[79]

In addition to the lack of long-term effectiveness, substituting aircraft for ground forces did not produce the promised economy. Secretary of State for the Colonies, Leo Amery, wrote to officers in Palestine in 1926 that instead of producing savings, two flights in the air force in Palestine would cost £110,000 more than the cavalry regiment they were scheduled to replace. He recommended that Palestine should contribute

---

[77] Ibid., 70-71.
[78] Richard R. Muller, "Close Air Support: The German, British and American Experiences, 1918-1941," in *Military Innovation in the Interwar Period,* eds., Williamson Murray and Allan R. Millett (Cambridge: Cambridge University Press, 1996), 172.
[79] Omissi, *Air Power,* 16, 27.

additional resources to produce savings instead.[80] The Cabinet decided to remove the

cavalry regiment anyway because it would be cheaper to maintain it at home, not

because aviation would be cheaper than cavalry.[81]

United States

Similar to the British, Americans wished to decrease military expenditure while

maintaining military effectiveness. American officers also wished to incorporate new

technologies more fully into their forces, such as aircraft and tanks. However, the

United States did not share the same need to police a large empire as Britain. As a

result, it seemed unnecessary to squander the United States' resources on a large military

establishment, especially not on obsolete branches and unnecessary equipment.[82]

The American public made their position on waste clear to their representatives

after the postwar "billion-dollar bonfire" when over one hundred surplus obsolete

aircraft, some never used, were burned in Europe to spare the government the expense of

shipping them back to the United States. The destruction of so many expensive aircraft

horrified the American public. Politicians were equally shocked.[83] Although initial

[80] "Telegram from the Secretary of State for the Colonies to the Officer Administering the Government of Palestine," January 18, 1926, T 161/262, TNA.
[81] Unsigned draft letter to Undersecretary of State, August 1925; Letter on economy in Palestine and Transjordania, February 7, 1926, T 161/262, TNA.
[82] Russell F. Weigley, *History of the United States Army* (New York: Macmillan, 1967), 400-1.
[83] "Airplanes Used by Army Officers For Huge Bonfire: Witnesses Tell Congress Probers How American Officers Ordered Burning of Planes Burned Near Toul, France," *Atlanta Constitution,* July 31, 1919, 2; **"**Army Charged With Burning 150 Airplanes: Former Soldiers Tell House Investigators of "Million-Dollar Bonfire" in June at French Flying Field Shipping Tags on Same Congressman Hints at Plot to Lessen Competition for American Factories," *New York Tribune,* July 31, 1919, 2; "Sickening Administrative Inefficiency," *Los Angeles Times,* August 2, 1919, II4. "Topics of the Times: Destruction Really an Economy," *New York Times,* August 7, 1919, 6; "Seek Graft in Aircraft: Committee of Congress

reports proved to be misleading about the type, amount, and reason for the equipment's destruction, Senator Henry Cabot Lodge of Massachusetts, Chairman of the Senate Foreign Relations Committee and opponent of Wilson's League of Nations, used the bonfire as evidence of the "extravagance and waste" of the Democratic administration of Wilson. Interestingly, Lodge mentioned to an audience the number of horses the army had acquired during the war as further evidence that President Wilson was wasting the public's money, which elicited laughter from the assembled crowd.[84] He compared the waste of money spent on supporting animals and the loss of money when planes were destroyed. Horses were increasingly viewed as unnecessary. Americans did not want to spend money on the military or horses, not a good sign for the continuation of the horse cavalry.

From a similar goal to produce economy and effectiveness of military forces, British and American debates diverged significantly. While the composition of air forces also proved a contentious issue in the United States, the primary target of the independent air force advocates was not the cavalry but the navy, arguing that they could complete the missions of an older service better and cheaper. This divergence can be attributed to the unique military challenges the two nations faced.

Unlike Britain, which had strong potential enemies equipped with air forces across the English Channel and North Sea (Germany and France) and significant oversea commitments, the United States had no serious aerial challengers along its land borders

Starts Hearings Today in Matter of Spruce Production 'Million Dollar Bonfire' Starts Congressional Inquiry," *Los Angeles Times,* August 11, 1919, I3.
[84] "Lodge Describes War Waste at Big Rally in Brooklyn: Administration Purchases Revealed as Riot of Extravagance without Result," *New York Tribune,* October 19, 1920, 1.

and limited responsibilities beyond its own borders. The possible threats to the U.S. were more likely to come from the sea and its southern border, at least until airplane technology advanced further. Mobile horse cavalry remained vital to patrol the long Mexican border. Although the value of new technologies spurred the postwar creation of the Air Service and Chemical Warfare Service, postwar economy cut the army to less than 130,000 men who had to survive off Great War surplus supplies and equipment.[85]

Unsatisfied with the size and composition of the air force, aviation's supporters in the United States promoted the development of a new aviation branch as a way to maintain and improve military effectiveness and efficiency. General William "Billy" Mitchell, who had commanded the U.S. Army's Air Service in France during World War I, was the most well-known, outspoken, and controversial advocate of a separate and independent air service. He attacked the Navy and War Departments in the press for poorly handling the national defense, attempting to spur changes in American air force and funding structures.[86] In his many publications and speeches, including *Our Air Force: The Keystone of National Defense,* and *Winged Defense: The Development and Possibilities of Modern Airpower-Economic and Military,* Mitchell stressed the importance of a separate independent organization. He argued that an independent air force would need to provide only moderate support for ground and naval troops because it was capable of winning a war almost by itself.[87] In that case, it did not make sense to keep American air services divided between the army and navy.

---

[85] Brian McAllister Linn, *The Echo of Battle: The Army's Way of War* (Cambridge, MA: Harvard University Press, 2007), 118-19.

[86] Alfred F. Hurley *Billy Mitchell: Crusader for Air Power* (New York: Franklin Watts, 1964), 101.

[87] William Mitchell, *Our Air Force: The Keystone of National Defense* (New York: E. P. Dutton, 1921), 2.

While their justifications were not primarily financial, Mitchell and his supporters attempted to take advantage of the parsimonious atmosphere, arguing that airplanes would be a cheap replacement for older military technologies and services. He argued that "the much more effective and economical airplane had dethroned the battleship as the queen of national power."[88] He utilized 1921 service tests evaluating the damage aircraft could inflict on battleships as evidence of the strength of an independent air force and the weakness of ships at sea. Over two months in the summer of 1921 numerous vessels were sunk, but the July 18 experiment utilizing the *Ostfriesland*, a German battleship taken in reparations, garnered the most attention. After two days of attack, the *Ostfriesland* sank into the sea. General Mitchell cited the test as proof that there was no reason to devote funds to build new battleships made obsolete by the ability of airplanes to sink them easily.[89] Instead, the money could be saved or used to further aviation development.

The U.S. Navy responded, accusing Mitchell of invalidating the test by violating the rules, and then drawing incorrect conclusions from the evidence.[90] Sinking an unmanned stationary naval vessel with bombs dropped from unopposed airplanes did not adequately simulate what an actual naval battle would be like. One Congressman stated that the tests were equivalent to shooting a "tiger in a cage at the zoo" because that did not really demonstrate what it would be like to shoot that same "tiger in the jungle."[91]

---

[88] Hurley, *Billy Mitchell*, 57.

[89] Charles M. Melhorn, *Two-Block Fox: The Rise of the Aircraft Carrier, 1911-1929*, (Annapolis, MD: Naval Institute Press), 67-71; Hurley, *Billy Mitchell*, 59.

[90] Melhorn, *Two-Block Fox*, 71; William A. Moffett, "Some Aviation Fundamentals," *United States Naval Institute Proceedings* 51 (October 1925): 1873.

[91] Melhorn, *Two-Block Fox,* 70.

Instead, the navy concluded that the test proved the "utter and absolute interdependence of aircraft and surface craft."[92]

Undeterred, Mitchell continued agitating for an independent air service, repeating his faith in the airplane as an instrument of war while adding a financial element to his rhetoric. The economics of Mitchell's proposals are best expressed in his memoirs, published in 1928. He argued that air power would allow "a few men and comparatively few dollars" to bring "about the most terrific effect ever known against opposing vital centers."[93] Bombs and fire from the air combined with chemical weapons would "unquestionably decide a future war." Mitchell wrote, "today, armies and navies are entirely incapable of insuring a nation's defense."[94]

When it came to aviation's impact on the nation's security policy, defined by historian Brian McAllister Linn as "noninterventionist, deterrent, and focused on continental defense," aviation advocates' primary army target was the coast artillery. This branch, responsible for manning coastal defenses and protecting the nation's borders, at first welcomed aviation's assistance but later saw it as a challenger to its existence.[95] Although the navy and coast artillery took the brunt of Mitchell's attack, the army and cavalry did not avoid the movement to reduce military expenditure. His opinions infected the public, politicians, and some military personnel, but not until the U.S. Army Air Force proved its value during World War II did the United States grant independence to the service. Hoping to prevent arguments that a buildup of aviation

---

[92] Moffett, "Some Aviation Fundamentals," 1873.
[93] William Mitchell, *Memoirs of World War I: From Start to Finish of Our Greatest War* (New York: Random House, 1960), 4.
[94] Ibid., 5.
[95] Linn, *Echo of Battle,* 116-23.

should come at the expense of the cavalry, the acting Chief of Staff in 1926, Major General Fox Conner, stated that the air corps should not come at the "expense of any other branch" and advocated that pending Army Air Service budget bill H.R. 10827 should "provide that that shall not be done." He stated policing the 2,000-mile-long southern frontier of the United States still required the cavalry. Connor rejected the suggestion to follow the example of European nations and create an independent air force because he believed the situation in the United States was very different from that in Europe, particularly for Britain and France, which had powerful air forces dangerously close (Italy and Germany). [96]

Incidents on the border had already demonstrated the value of mounted troops and the limits of aviation. The Americans had first used their airplanes on their own frontier during the 1916 Mexican Punitive Expedition. In 1916, the 1st Aero Squadron flew 540 sorties and more than 340 flying hours over 19,000 miles supporting ground troops from March to August with eight Curtiss JN-3s. Popularly known as "Jenny" due to its designation, the JN-3 was a two-man biplane with a maximum speed of less than eighty miles per hour and a top altitude of only ten thousand feet. Although an adequate trainer, it proved "woefully inadequate as a combat platform."[97]

The planes experienced numerous mechanical problems throughout their brief service in Mexico. The harsh climate required removing their laminated wood propellers after each flight for storage in humidors to prevent cracking. The terrain also

---

[96] Army Air Service Hearing Before the Committee on Military Affairs United States Senate Sixty-Ninth Congress First Session on H. R. 10827, May 10, 1926, 42 (Washington, DC: GPO, 1926).
[97] Corum and Johnson, *Airpower in Small Wars,* 11-16.

caused problems as the JN-3s were incapable of going over even many of the foothills of the Sierre Madre. The passes and gorges also contained "high winds, vicious cross currents, and downdrafts" making piloting the airplanes difficult. The squadron was eventually relegated to carrying mail and maintaining communications with troops in forward positions. The JN-3s' replacements, Curtiss R-2s, little more advanced than the Jenny, hardly improved the capacities of the squadron as they suffered "from engine problems and structural defects."[98] All these problems in 1916 made aircraft incapable of policing the border unaided by mobile horse cavalry.

After the Great War ended, the army continued to monitor its southern border with both air and ground components. In the Big Bend of Texas, the 5th United States Cavalry Regiment patrolled on the ground while two squadrons assigned to it flew circuits two or three times a day watching the border for any disturbance. This army air service border patrol had been formed in late 1919. Aviators did not call for an end of cavalry operations along the frontier. Both aviators and cavalrymen recognized the value of air and horse units in cooperation to accomplish border security. The office of the Chief of the Cavalry recognized the great value of aviation to patrol the border alongside a large cavalry force.[99]

Border service was not the only responsibility of the cavalry and not all cavalry officers were happy about cavalry being stationed primarily on the border. Numerous

---

[98] Ibid., 17-19.

[99] Stacy C. Hinkle, *Wings Over the Border: The Army Air Service Armed Patrol of the United States-Mexico Border 1919-1921,*Southwest Studies, Monograph 26 (El Paso: Western Press, University of Texas, 1970), 39; "Ready for War in the Big Bend of Texas: Airmen and Cavalrymen Maintain Constant Vigilant Patrol Along Section of Border Often Overrun by Mexicans," *New York Times,* January 25, 1920, 42; "Pleads to Maintain Cavalry Strength," *New York Times,* April 17, 1921, 35.

letters were sent among cavalry commanders in the 1930s commenting on the number

and placement of cavalry units. In 1930, Colonel J. R. Lindsey, previously serving with

the 15th, 11th, and 14th Cavalries, recipient of the Distinguished Service Medal during

the First War while serving with the 328th Infantry Regiment, and at the time chief of

staff of the 61st Cavalry Division, Organized Reserve Corps (1928-1932), wrote to

Major George S. Patton that keeping cavalry in the south in case of problems with

Mexico was a mistake.[100] He stressed that horsed cavalry was needed in other locations

for vital training. He expanded further attacking the War Department's established

policies as "punk and should be knocked into a cocked hat." Lindsey asked whether the

army was "going to let a petit pais like Mexico dominate the permanent distribution of

our regular army?"[101] Patton forwarded the letter to the Chief of Cavalry, Guy Henry.

Lindsey's correspondence produced a series of letters that ended up going beyond his

initial displeasure of cavalry unit locations.

In his response, Henry expressed his own frustration about cavalry numbers and

locations seemingly suggesting that Lindsey was not addressing the correct person.

Henry discussed the complicated situation between the increase in aviation and the

reduction of the cavalry, exactly what Fox Connor had hoped to prevent four years

earlier. Henry commented that upcoming new air corps increments, the periodic

disbursement of appropriated funds, would be "as everyone knows, made at the expense

of other branches of the service." Henry stated that the outlook for cavalry in 1930 was

---

[100] "Julian R. Lindsey 1892," http://apps.westpointaog.org/Memorials/Article/3481/.

[101] J. R. Lindsey to George S. Patton, October 23, 1930, Distribution of Army by Arms of Service 323.2, Box 10 [hereafter B], General Correspondence, 1923-1942, Entry 39 [hereafter E39], Records of the Office of the Chief of Cavalry, Records of the Chiefs of Arms, Record Group 177 [hereafter RG], National Archives 2, College Park, Maryland [hereafter NACP].

not getting better, but worse.[102] In November 1930, the cavalry "suffered a reduction of

343 men for the 4th Air Corps increment," and War Department plans included an

additional cavalry cut for the development of the fifth Air Corps increment in the near

future.[103] Henry tried to stop cavalry reductions by encouraging corps area commanders

to request additional troops for summer training. Henry sent letters or radiograms to the

commanders of the 3rd U.S. Cavalry Regiment in Baltimore, Maryland, the 6th Corps

area, and the 4th corps area, as well as additional letters to the adjutant general stressing

the importance of the requests of these commanders.[104] Henry confided to Major

General Frank Parker that he campaigned to elicit requests from commanders for

additional cavalry because "special effort was being made to get back the men which

have been lost by the various arms to the air corps, and with your request in, the cavalry

would undoubtedly have obtained its use percentage of these men." Yet despite his

attempts, Henry lamented that his efforts were in vain, adding "unfortunately, this, I

understand, was knocked out yesterday in the budget."[105]

Some cavalrymen continued to attempt to get their numbers increased by arguing

they were needed outside the United States and not just at home. They argued that

cavalry should be part of the American expeditionary forces outside of the continental

United States because they were better capable of completing certain necessary tasks

than air and infantry units. In a letter to the adjutant general on July 31, 1934, cavalry

---

[102] General Guy Henry to George S. Patton, October 29, 1930, 323.2, B10, E39, RG 177, NACP.
[103] Guy V. Henry to Adjutant General November 26, 1930, 323.2, B10, E39, RG 177, NACP. See also Henry to Frank Parker, December 4, 1930, 323.2, B10, E39, RG 177, NACP.
[104] Guy V. Henry to Fred W. Sladen, November 14, 1930, 323.2, B10, E39, RG 177, NACP; Henry to Frank Parker, November 14, 1930, 323.2, B10, E39, RG 177, NACP; Henry to Frank McCoy, 323.2, B10, E39, RG 177, NACP; Henry to Adjutant General, November 26, 1930, 323.2, B10, E39, RG 177, NACP.
[105] Guy V. Henry to Frank Parker December 4, 1930, 323.2, B10, E39, RG 177, NACP.

colonel G. Williams recommended assigning horse cavalry to the Panama Canal

Department because they were much better suited than aviation to accurate observation

and identification. Williams utilized arguments that echoed those made in previous

decades stating, "mounted men only could make positive reconnaissance and obtain

definite information." Aircraft could not locate "bodies of enemy troops in the close

country of the Isthmus or on the hundreds of trails which exist in the jungles."[106]

Unfortunately Williams lacked the strong support from the commander of the Panama

Canal who acknowledged that a cavalry squadron would be a "convenient addition" but

other reinforcements had a higher priority, particularly infantry.[107]

Despite the lack of full support from the area commander, Williams wrote the

chief of cavalry Major General Leon B. Kromer arguing the Canal Zone was the best

place to demonstrate the continued value of cavalry and that it was the duty of all

cavalry officers to "keep the cavalry, horse, in the foreground showing its necessity."[108]

Kromer agreed that cavalrymen should keep horse cavalry in the foreground in both

word and deed but he noted that any change to the status quo would need to overcome

powerful economic considerations. He also asserted that an increase in cavalry could

only occur if a study of the whole defense organization showed such action necessary.[109]

Unfortunately for the horse cavalry, no such conclusion was made.

[106] G. Williams to Adjutant General, July 31, 1934, 323.2, B10, E39, RG 177, NACP.
[107] H. B. Fiske to Adjutant General, August 13, 1934, 323.2, B10, E39, RG 177, NACP.
[108] G. Williams to Leon B. Kromer, August 1934, 323.2, B10, E39, RG 177, NACP.
[109] Leon B. Kromer to George Williams, August 27, 1934, 323.2, B10, E39, RG 177, NACP.

Conclusion

Concerns for postwar economy and beliefs in the abilities of new technologies utilized in the war to replace the old were too much for the horse cavalry to overcome, and its size and significance shrank in the interwar period. Despite the large initial investment required to incorporate new technologies into the military establishment, the promised long-term savings in manpower and support services for men and animals tempted politicians to increase the use of airplanes at the expense of older services. That the air forces could not live up to expectations, managing only mixed success in imperial and border work did not seem to matter because the myth of airpower won.

In Britain, the debates about the purpose, organization, and ability to substitute planes for the older services lasted throughout the 1920s and 1930s with the status quo prevailing. The RAF remained autonomous and concentrated on further developing independent actions while it reduced army cooperation squadrons to appease the government's desire for economy. As a result, the cavalry had fewer opportunities to work directly with aviation to develop tactics and doctrine that would strengthen cavalry or even be used to fulfill the cavalry's duties.

Although cavalrymen argued for their branch's ability to transform, their efforts to demonstrate the cavalry's progressive character failed to prevent reductions to their branch. British cavalry regiments were reduced by combining them and still others would be converted to armor units (as discussed in more detail in Chapter Six). There had already been a reduction from a high of twenty-seven regiments down to nineteen in 1921 and additional reductions to twelve in 1927. American horse cavalry regiments

remained in the 1920s because the defense of the southern border still required them until something new could be placed in the field or until conflict ended. Although the United States retained horse cavalry, their effective number shrank. Reductions of more than 340 men were directly attributable to aviation.

Of all of the arguments against the cavalry, economics proved the most successful. Despite support for their continued value, horse cavalry numbers shrank as tanks, armored cars, and aviation developments slowly altered the composition of cavalry units. Cavalrymen and the branch's supporters maintained that these other technologies were not yet adequate in the 1920s and early 1930s. Horse cavalry was retained but in a reduced role. Cavalrymen did not universally or completely oppose the changes but instead actively participated in the orchestration of these changes and continuing their attempt to deepen their relationship with aviation and other technologies as the next chapter will show.

CHAPTER VI

AUTOGIROS AND MECHANIZATION: THE 1930S

By the late 1920s, aviation had appropriated many of the cavalry's traditional reconnaissance roles but had failed to replace the cavalry entirely. Aviation had altered the roles and employment of the cavalry, a fact made apparent in peacetime exercises and officially endorsed in both British and American policy. Cavalrymen accepted aviation's assumption of the cavalry's more burdensome duties and worked on creating the best possible cooperative relationship with air forces throughout the 1930s. Even as cavalry tried to fully integrate aviation and create organic air capabilities, the 1930s proved to be a decade with new aviation challenges and ground threats that targeted the very foundation of the branch, its identity as horse-mounted soldiers. This decade contained the extremes of cavalrymen working to develop their own aircraft while defending the continued vitality of the horse over machines.

This chapter starts by describing the stabilized cooperative relationship between aviation and cavalry as seen in published regulations, textbooks, and school curriculum throughout the 1930s. It then examines problems that occurred in implementing these policies in training exercises when aviation priorities shifted away from working with ground units. Cavalry continued to express a desire to work with aviation, a desire increasingly refused by more and more politically powerful aviation supporters. When their requests failed to produce the desired results, cavalrymen attempted to gain control of their own organic aircraft units and aircraft. The United States and, to a far lesser

extent, Britain, saw cavalry trying, albeit unsuccessfully, to establish organic air arms and promote the new technology of the autogiro. However, finances and the outbreak of the Second World War brought experimentation to an end.

At the same time that cavalrymen tested the autogiro, mechanized ground vehicles challenged the cavalry's traditional roles and its primary method of transportation, the horse. Cavalrymen responded to the challenges of mechanization in the form of tanks and armored cars in much the same way they had initially reacted to aircraft though in a much more compressed length of time. This chapter surveys the similarities between the responses utilized by cavalrymen in response to aviation and to the newer challengers. Despite the similar tactics, cavalrymen could not minimize the impact of mechanization on their branches, and horse cavalry began disappearing at an accelerated pace. Mechanization provided the opportunity for the cavalry to retain its roles and élan but only by transforming itself from a horse based service to a machine based one.

Doctrine and Regulations

By the early 1930s, the relationship between aviation and cavalry had stabilized. Official doctrine had established and defined the separate and cooperative duties and roles of air- and horse-mounted units. Military publications, military school courses, and maneuver reports disseminated these ideas. These roles were very similar in the United States and Britain despite their different national commitments and challenges.

Field Service Regulations of the United States 1923, as described by William Odom, the author of *After the Trenches,* was "the single best available description of how the army believed it should wage war," had already established this cooperative relationship between the air service and cavalry.[1] *FSR-US 1923* stated that ground reconnaissance not only supplemented aerial observation but utilized intelligence provided by aviation units to determine dispositions for its own reconnaissance. If aviation proved unable to make this initial reconnaissance, however, cavalry had to be "prepared to extend its reconnaissance to secure all information desired" and pass that information along to all interested parties.[2] *FSR-US 1923* identified cavalry as the "principal agency of terrestrial distant and close reconnaissance," but noted that the air service also participated "in all phases of distant, close, and battle reconnaissance."[3] These regulations were not superseded until 1939, but the new regulations retained much of the previous doctrine. any of the same policies. The 1937 *Tactics and Technique of Cavalry* also clearly outlined this cooperation, noting "aviation gains information of a general nature; cavalry obtains specific information to supplement that of the air force."[4]

As in the 1920s, the benefits of cooperation between aviation and cavalry appeared in student papers, textbooks, and lectures at army graduate schools. In his 1936 Command and General Staff School student paper, a Quartermaster Corps captain described the ideal relationship between aviation and cavalry as one in which each arm

---

[1] William O. Odom, *After the Trenches: The Transformation of U.S. Army Doctrine, 1918-1939* (College Station: Texas A&M University Press, 1999), 7.
[2] *Field Service Regulations United States Army 1923* (Washington, DC: Government Printing Office, 1924), 32. (Hereafter *FSR-US 1923*)
[3] Ibid., 36, 34.
[4] *Tactics and Technique of Cavalry* (Harrisburg, PA: Telegraph Press, 1937), 403.

enhances and aids the other, concluding that a close cooperative relationship between them was crucial.[5] The 1937 text *Reconnaissance Security Marches Halts* utilized at the Command and General Staff School, taught students, including cavalrymen, that commanders, or members of their staff, would frequently utilize airplanes to conduct reconnaissance to gather necessary information for successful operations, such as the nature of the terrain. However, the characteristics of each situation would determine whether airplanes or another reconnaissance agency were used.[6] The Fort Riley Cavalry School educated students about the capabilities and uses of aviation and trained them to appreciate the value of aerial assistance.[7] A major and instructor at the Cavalry School argued in the *Cavalry Journal* that it would not require much effort "to imagine large cavalry units of the future preceded by aviation on long-distance reconnaissance" because the information gained by aviation should simplify the "engagement of the main columns of the cavalry command."[8]

The air service could provide the most distant reconnaissance and was thus "the principal agency for seeking information within the enemy lines, for quickly verifying reports of enemy activities, or for meeting emergency needs for reconnaissance at a

---

[5] George T. Barnes, *The Necessity for Coordination of Reconnaissance Activities of a Cavalry Division—Aviation—Armored Car* (Combined Arms Research Library, CGSS Student Papers, 1936), 4. See also p 11. See also Major Pierce, "The Place of a Mechanized Force in Our Cavalry Organization," (Combined Arms Research Library, CGSS Student Papers, 1932), 18; Doyle O. Hickey, Otto R. Stillinger, and Albert G. Kelly, *Revision of cavalry, infantry, and field artillery school pamphlets to conform to the present attack, defense, and march reconnaissance pamphlets* (Combined Arms Research Library, CGSS Student Papers, 1936), 27; James T. Curry, Jr. *The strength, composition and missions, and sphere of action of: armored car reconnaissance detachments, horse cavalry reconnaissance detachments* (Combined Arms Research Library, CGSS Student Papers, 1936), 25.

[6] *Reconnaissance Security Marches Halts (Tentative)* (Fort Leavenworth, KS: Command and General Staff School Press, 1937), 6.

[7] *Other Arms Air Corps* (Fort Riley, KS: Academic Division, The Cavalry School, 1931-1932).

[8] E. C. McGuire, "Armored Cars in the Cavalry Maneuvers," *CJ* (US) *39* (July 1930): 398.

distance." The cavalry, in contrast, could not "be expected to gain information within the area occupied by its attached air service."[9] The cavalry's task was to establish and maintain contact with hostile forces, something aerial units could not do.[10] The 1939 *Reconnaissance by Horse Cavalry Regiments and Smaller Units* noted that the mounted reconnaissance patrol was to be utilized to augment information obtained by other ground units and the air corps.[11]

This collaborative relationship was also reflected in the curriculum and lectures of the Air Corps Tactical School at Maxwell Field, Alabama during the mid- to late 1930s. The school taught infantry, cavalry, and combined arms courses to educate airmen in the organization, characteristics, and roles of army branches, as well as how to cooperate with these units. The subjects explored in its cavalry courses included: offensive combat, reconnaissance, pursuit, cavalry organization, cavalry characteristics, cavalry roles, and delaying action.[12] Cavalry officers served as instructors for these courses and the texts reflected a combined arms doctrine.[13]

Lectures at the Air Corps Tactical School reflected current doctrine and tactics. The courses were intended to educate students about how cavalry could or could not and should or should not be employed. Cavalry courses taught that there were duties best

---

[9] Ibid., 10-11.

[10] *Reconnaissance Security Marches Halts,* 10.

[11] Terry de la Mesa Allen, *Reconnaissance by Horse Cavalry Regiments and Smaller Units* (Harrisburg, PA: Military Service Publishing, 1939), 15.

[12] J. C. Mullenix, "Form I, Cavalry Course, 1938-1939 School Year," Air Corps Tactical School, 248.80018, Air Force Historical Research Agency, Maxwell Air Force Base, Montgomery, AL. [Hereafter AFHRA.]

[13] Two of the most frequently referenced books in the cavalry course were Command and General Staff School's, *Tables of Organization* (Fort Leavenworth, KS: Command and General Staff School Press, 1937) and Command and General Staff School's *Tactical Employment of Cavalry* (Fort Leavenworth, KS: Command and General Staff School Press, 1935).

performed by aviation and some that could only be accomplished by cavalry, horse or mechanized. Aviation could provide early information regarding the enemy's disposition and movements, and cavalry could utilize this data to determine its dispositions for more detailed reconnaissance. The cavalry would provide all reconnaissance in situations where hostile aviation or weather prevented aerial craft from completing this task. As stated by one instructor, "each branch supplements and assists the other, the most intimate team play between them is essential." Each reconnaissance agency "should be employed in accordance with its characteristics."[14] The same instructor argued in a later course that while aviation had partly taken over cavalry duties, "there [was] plenty left for the most mobile of our ground forces (cavalry)."[15]

The most important characteristics of cavalry were mobility, fire power, and shock. Horse cavalry was useful in terrain unsuited to motor vehicles and shock was still a possible application of squadrons or smaller units. However, Lieutenant Colonel J. C. Mullenix, the instructor of the 1938-1939 cavalry course, argued that weapons should be used only when they were well-suited for the situation. Just because bombardment aviation was available did not mean that was a "good reason to order it to bomb," nor was it appropriate to use cavalry to breach fortifications or gallop arbitrarily simply because they were present. Although still mentioned, shock tactics were not

[14] R. L. Creed, "Tactics and Technique of Cavalry Reconnaissance," lecture, Air Corps Tactical School, November 25, 1936, 248.80017-5, AFHRA.

[15] R. L Creed, "Characteristics of Cavalry," lecture, Air Corps Tactical School, December 6, 1937, 248.80017-3, AFHRA.

central to the course curriculum and were excluded entirely from the curriculum in some school years.[16]

In describing the cooperative relationship between cavalry and aviation in the American *Cavalry Journal*, cavalrymen continued to point out that the loss of some of their traditional roles to aviation only strengthened the cavalry. Brigadier General Hamilton Hawkins, one of the foremost authorities on cavalry tactics, maintained that "now that the distant reconnaissance is largely taken over by the air force, the cavalry is relieved of a great part, though not all, of this exhausting duty and can be better saved for its great roles."[17] Even in 1938, one cavalryman noted in the *Cavalry Journal* that "the AVIATOR has come to the aid, not to replace the cavalry" and that "close reconnaissance…left to the cavalry whose vision is not dimmed by clouded skies."[18] These assessments did not invalidate the value of the aircraft but reinforced the idea that aviation was part of a mixed force which included cavalry. Lieutenant Colonel Mullenix noted with gratitude that aviation had "relieved cavalry of certain of the grueling, horse-destroying, man-killing distant reconnaissance that formerly frequently put large cavalry units…practically out of business before the fighting started."[19]

Policy did not vary greatly across the Atlantic. British *Field Service Regulations 1930* claimed that their doctrine was unique because the problems incurred in an empire of "self-governing communities widely separated and of varying resources" were

---

[16] J. C. Mullenix, "The Characteristics and Role of Cavalry," lecture, Air Corps Tactical School, November 3, 1938, 248.80018-2, AFHRA.

[17] Hamilton S. Hawkins, "Cavalry and Mechanized Force," *CJ* (US) 40 (September-October 1931): 24; "General Hawkins' Notes," *CJ* (US) 46 (May-June 1937): 239.

[18] Note following "Cavalry: A Requisite," *CJ* (US) 47 (May-June 1938): 212.

[19] Mullenix, "Characteristics and Role of Cavalry," lecture, Air Corps Tactical School, November 3, 1938, 248.80018-2, AFHRA.

"peculiarly its own." The British military had to be ready for anything "from a small

expedition against an uncivilized enemy to a world-wide war." Therefore, its planning

had to "ensure elasticity, unity of effort, decentralization of control, and economy."[20]

Their self-proclaimed uniqueness, however, did not create a tactical doctrine very

distinct from the Americans for cavalry and aviation. British regulations also preached

cooperation between the cavalry and air services. The 1931 British *Cavalry Training*

stated clearly that "an army can exert its full power only when all its parts act in close

co-operation."[21] This point was deemed so important that it appeared in bold print

> **Throughout their training, therefore, all ranks of cavalry must be taught to realize the close relationship between their own role and that of the other arms in battle. They must understand the methods employed by infantry, artillery, engineers, tanks and aircraft to support them, they must appreciate the importance of close liaison and intimate mutual co-operation during the preliminary arrangements for a battle and throughout every stage of the action.**[22]

British regulations also outlined the individual duties of the cavalry and aviation. *FSR

1935* identified cavalry duties as reconnaissance and force protection with the additional

battle duties of delaying the enemy, safeguarding the flank, forming a mobile reserve,

carrying out pursuits, covering withdrawals, and conducting special missions.[23]

The 1935 regulations also divided information and reconnaissance duties

between air and ground units on the basis of their differing capabilities. Air

reconnaissance could quickly gain "information of the enemy's movements and of the

---

[20] *Field Service Regulations Volume I: Organization and Administration 1930* (London: HMSO 1930), 1-3.

[21] *Cavalry Training Volume I: Training 1931* (London: HMSO 1931), 23.

[22] Ibid.

[23] *Field Service Regulations Volume II: Operations—General 1935* (London: HMSO, 1935), 6. (Hereafter *FSR II-Operations.*)

topography of the country…to a great depth"; however, it remained limited by weather and terrain and could not "produce the detailed information necessary for tactical plans."[24] In these situations, ground units had to supplement aviation, particularly in the forward battle area. The 1935 *Field Service Regulations* clarified these duties further by providing operational specifics for higher formations: "strategical reconnaissance [would] be mainly the work of the air force" but could be "supplemented and confirmed by mechanized forces or mounted troops according to the suitability of the ground for their operations."[25] Further regulations named the type of aerial elements that would work in cooperation with ground forces. During battle, Army Co-operation Squadrons would "carry out the duties of medium, close, artillery and photographic reconnaissance." In addition to gaining air superiority, aircraft in the British Army Co-operation Squadrons were "specially trained for work with the army" with their principal tasks being "reconnaissance, including photography, and artillery observation." [26]

Making the Relationship Work

The formal doctrine, written regulations, and school curriculums did not end cavalry debates over the use of aviation, however. Making a cooperative relationship work demanded serious effort especially as aircraft continued to progress technologically and aviation proponents shifted their attention toward independent activities. Training and maneuvers in the 1930s continued the work of the 1920s, testing

---

[24] *FSR II-Operations*, 62-63.
[25] *Field Service Regulations Volume III: Operations—Higher Formations 1935* (London: War Office 1935), 16.
[26] *FSR II-Operations*, 131, 16.

and practicing joint operations with airplanes and cavalry. The cavalry in both the

United States and Britain had become dependent on the assistance of airplanes. The

cavalry did not just want an aerial branch in front of it but one working closely with the

cavalry in its missions as described in doctrine.

Both British and American training emphasized the importance of cooperation.

In maneuvers, aviation supported the cavalry in reconnaissance, attack, and

communications. Reports on the May 1930 Cavalry-Infantry Maneuvers near San

Antonio, Texas, included praise from cavalry on aviation's ability to assist their

branch.[27] The 1931 Maneuvers of the 1st Cavalry Division also stressed teaching "sound

military lessons" about the joint employment of forces and not the "superiority of one

force over another."[28] In Great Britain, the 1930 annual Individual and Collective

Training seasons also tested how air units cooperated with ground troops, particularly in

close reconnaissance.[29] During the 1932-1933 Individual Training period, several

exercises in Great Britain and Egypt tested cooperation between ground forces and RAF

bombers, fighters, and army co-operation aircraft. The chief of the Imperial General

Staff concluded in the memorandum resulting from the collective training period that the

principles for "the employment of air forces by the army" were "sound."[30] The report on

---

[27] John B. Coulter, "Cavalry-Infantry Maneuvers, 1930," *CJ* (US) 39 (July 1930): 349-50; Cuyler L. Clark, "Maneuvers of 1st Cavalry Division," *CJ* (US) 40 (September-October 1931): 10-13.

[28] Clark, "Maneuvers of 1st Cavalry Division," 10-13. See also William J. Taylor, "The 305th Cavalry Command Post Exercise," *CJ* (US) 44 (May-June 1935): 24-25.

[29] "Army Training Memorandum No. 2 (Collective Training Period 1930 Supplementary)," (London: War Office, 1931), April 8, 1931, 5, W[ar]O[ffice] 231/218, The National Archives of the UK (TNA); "Army Training Memorandum No. 4 Collective Training Period 1931" (London: HMSO, 1931), December 21, 1931, 10, WO 231/220, TNA; "Army Training Memorandum No. 7 Collective Training Period 1932," (London: HMSO, 1932), December 13, 1932, 8, WO 231/223, TNA.

[30] *Army Training Memorandum No. 10 Collective Training Period* 1933, December 12, 1933, 7-9, WO 231/226, TNA.

the 1934 British Training season noted, "air reconnaissance is important in every phase of the operation, and the co-operation of bombers and fighters in assisting in the protection of the mobile force, either directly or indirectly, may be a factor vital to success."[31]

Reports from maneuvers, however, were not entirely positive. Some observers worried that the artificial conditions set by organizers created false lessons. Major Patton argued that the information provided by aircraft during the 1929 Cavalry Division Maneuvers was not incomplete or lacking but was "too good." The unrealistic test conditions produced an "undue reliance" on messages dropped from aircraft, which could only be corrected by restricting the employment of aircraft on maneuvers.[32] A cavalry major and instructor at the Cavalry School also noted that the "machine auxiliaries," airplanes and armored cars, still had "definite limitations, based upon weather, terrain, mechanical difficulties, and supply."[33] Cavalry observers of maneuvers in 1935 also questioned the value planes provided, noting that aviators put their planes at risk by flying too low, which they argued, would make them easy targets from ground fire.[34]

Although some cavalrymen still mentioned the limitations of aircraft, cavalry dissatisfaction about aviation during maneuvers in the United States stemmed more from misuse or absence of desired air units than with their limitations. In the early 1930s, the

---

[31] "Army Training Memorandum No. 14 Collective Training Period 1934 (Supplementary) and Individual Training Period, 1934-1935," May 22, 1935, 20, WO 231/230, TNA.
[32] George S. Patton, Jr., "The 1929 Cavalry Division Maneuvers," *CJ* (US) 39 (January 1929): 13.
[33] McGuire, "Armored Cars," 398.
[34] Kinzie Edmunds and Rufus S. Ramey, "6th Cavalry at the Maneuvers of the 8th Brigade, *CJ* (US) 44 (September-October 1935): 29.

cavalry lacked enough planes at its Fort Riley maneuvers to conduct proper cooperation. According to air historian I. B. Holley, there was "minuscule aerial participation" in the 1932 maneuvers.[35] Three years later, 6th Cavalry Lieutenant Colonel Kinzie Edmunds and Captain Rufus Ramey still complained that a shortage of planes made training with the Air Corps in the May 1935 maneuvers "not satisfactory." They had only a few observation planes to experiment with and no other types. As a result, the cavalry lacked sufficient aerial reconnaissance and did not have a chance to test themselves against the attack aviation of their mock opponents.[36]

The lack of sufficient numbers of airplanes for cooperation in maneuvers was evidence of a far more troubling situation. In both the United Kingdom and the United States during the 1930s, the army's relationship with aviation changed drastically when advances in aviation technology made large-scale strategic bombing, a concept introduced during the previous decade, practicable. Both the RAF and the United States Air Corps eagerly shifted their focus from the tactical support of ground troops to independent strategic bombardment, changing the tone and content of the cavalry debates in the 1930s. As discussed in Chapter Five, following the Great War the Royal Air Force decided to "concentrate on the development of a force which could operate primarily at the strategic end of the air power spectrum."[37] There were two reasons for this decision. The first was to justify the maintenance of the independent RAF and the second to minimize military expense in the frugal postwar environment. The second

---

[35] I. B. Holley, *Army Air Forces Historical Studies: No. 44 - Evolution of the Liaison -Type Airplane, 1917-1944* (Washington, DC: AAF Historical Office, Headquarters, Army Air Forces, April 1946), 31-32.
[36] Edmunds and Ramey, "6th Cavalry at the Maneuvers," 29.
[37] Malcolm Smith, *British Air Strategy between the Wars* (Oxford: Clarendon, 1984), 4-5.

was accomplished in part by eliminating or reducing army and navy co-operation squadrons.

In the United States, air corps leaders conducted a similar discussion on the role of aviation during the 1920s, but did not follow the British example until the 1930s. The basic ideas behind the creation of the Air Force, according to an AAF historian were founded on the three basic ideas on the role of air power in national defense:

> (1) air power to be effective must be based on bombardment; (2) command principles should be established by which that bombardment could be directed against proper targets; (3) heavy bombers of sufficient range should be constructed so that the doctrines might be implemented under the peculiar geographical conditions affecting the United States.[38]

In a decade of limited budgets, both the British and American air arms determined that they could not focus on too many roles, and as strategic bombing promised to liberate them from too close a relationship with land operations, their leaders focused on preparations for independent operations.

Aviation historian Roger Connor observed that "with the rise of airpower advocates" who desired an independent aviation service, "the Air Corps saw that only by increasing the capability of its technology could it achieve military objectives on par with land and naval forces." As a result, the Air Corps' Material Division "saw a mandate to create higher, faster aircraft with ever greater payloads and range."[39] The technological seductiveness of the faster and bigger, shinier and newer did not help the army in its efforts to retain or gain tactical air support units. As the speed and size of

---

[38] Harold Hinton, *Air Victory: The Men and the Machines* (New York: Harper and Brothers, 1948), 378.
[39] Roger Douglas Connor, "Grasshoppers and Jump-Takeoff: The Autogiro Programs of the U.S. Army Air Corps," paper presented at the 62nd Annual Forum and Technology Display of the American Helicopter Society, 2006.

airplanes continued to increase and strategic air power doctrine became more institutionalized, ground forces lost military support from air components and moral support from air leaders. Instead of defending its continued value in reconnaissance against aviation, as it once had to do, the cavalry repeatedly had to make special efforts to request their affiliated air arms to continue cooperating.

Once they adopted this new doctrine, RAF and U.S. Air Corps leaders increasingly neglected both tactical operations in support of ground units and the development of the aircraft types needed to complete those missions. Instead, they sponsored the development of airplanes with increased range, speed, and size, forsaking the acquisition of aircraft designed or suited for cooperative missions with the army including cavalry. This change was intentional although subtle at times. In the British *Army Training Memorandum no. 2 (Collective Training Period 1930 Supplementary)*, RAF orders changed their terminology from "in support of" to "on the front of" the army because the former phrase was "not suitable of application to the R.A.F."[40]

Ground troops had different priorities than aviators, as the tradeoff between mobility and speed demonstrated. High air speeds were not a measure of mobility for ground troops. Mobility had to be determined instead by where airplanes could operate. Faster planes were not always better planes. As an air corps colonel and instructor in the War Plans Division at the Army War College, Washington D.C. noted, tactical aviation, particularly observation and liaison duties, required slower aircraft than were under development. Slower landing and operational speeds allowed for closer support of

---

[40] "Army Training Memorandum No. 2," WO 231/218, TNA.

troops.[41] Aircraft could then take off and land near commanders and maintain aerial

observation. Unfortunately for the cavalry and other ground forces, the air arm largely

ignored their desire for tactical aircraft.[42]

However, there were still small positive steps. Chief of Cavalry Leon B. Kromer

praised a visit to Fort Knox by students of the Air Corps Tactical School that provided

the opportunity for contact between cavalry and aviators during a demonstration of a

mechanized cavalry brigade in 1937. He stated that "the more the officers of the various

arms know about what others are doing, the better it is for us all." He suggested that it

might also be beneficial for officers at Fort Knox to visit the depot at Wright Field since

"it would no doubt prove most interesting and instructive."[43] The visit, however, did not

retard the development of the independent air force theory.

Adna Chaffee, a lieutenant colonel on the General Staff, best described the

frustration of cavalrymen and other army officers about the concentration on strategic

bombardment over army cooperation in 1938 when he contended that "a determined

army can not be shot out of position and a determined people can not be bombed into

submission."[44] He maintained that air power could not win wars alone. The army

needed to combine all necessary forces to win a war, and aviation was a valuable tool

with which to gather important information and support ground troops. Chaffee,

---

[41] B. Q. Jones, Memorandum for the Commandant Army War College, "Corps and Army Organization-Aviation Components," December 9, 1936, Autogiros 452.1, B50, Document File, 1923-1942, 451.8-454, Records of the Chief of Arms Office-Office of Chief of Cavalry, Records of the Chiefs of Arms, RG 177, NACP.
[42] Connor, "Grasshoppers and Jump-Takeoff."
[43] Chief of Cavalry Major General Leon B. Kromer to Major Richard L. Creed, December 21, 1937, Folder Equitation-School and Post 1937-1940, 248.80017-9, AFHRA.
[44] Adna R. Chaffee, "The Army of the United States," *CJ* (US) 47 (March-April 1938): 110.

claiming that the use of aviation in the Spanish Civil War and in China did not

contribute directly to the success of ground army objectives, warned that aviation efforts

would be "largely lost" and only serve to "arouse the resentment of the rest of the world"

unless aviation was used for tasks other than strategic bombardment.[45] Also using the

Spanish War to criticize strategic bombing, Hawkins claimed, "airplanes have been

strangely enough more effective in assisting the infantry than in bombing important

centers, roads and railroads."[46]

This conclusion reflected similar findings from experiences of the British in their

territories and mandated areas. In neither case did aviation acting independently of the

army gain much praise from ground troops. The RAF's doctrinal transition away from

tactical air support harmed the cavalry and all ground forces. With air forces more

focused on independent missions, the desire expressed in earlier decades to have more

integrated air components took on a more desperate tone, especially in the U.S. cavalry.

If the Air Corps and RAF would not provide aircraft to support the cavalry, horsemen

would attempt to get their own.

Autogiros

Since the 1920s, cavalry commanders had expressed a desire for aviation

components to be permanently attached to their units to improve coordination between

air and ground units. Their desires were only partially fulfilled. Both the British and

Americans developed tactical air support units that could be temporarily attached to

---

[45] Ibid., 111.

[46] General Hawkins' Notes, "Some Lessons from the War in Spain," *CJ* (US) 47 (March-April 1938): 173.

ground forces but ultimate control of these elements remained in the Air Corps and RAF. As a result of their provisional status, these attached aviation components did not live up to the cavalrymen's expectations. Unless aviation was assigned permanently to the cavalry division, noted a *Cavalry Journal* article, cavalry officers feared their units would have to complete tasks for which they were no longer suited.[47] Aviation had become an effective way of liaison between forward ground forces and command in the rear, a good collector of strategic reconnaissance, and source of tactical support of ground units. A cavalry major assigned to Maxwell Field in Alabama argued that "a cavalry division has need of an organic air squadron trained to work with cavalry."[48] In the 1930s, efforts to maintain and improve aerial support of ground units became more desperate as the British and American air forces acquired aircraft and developed doctrine intended increasingly for missions other than ground support. As a result, the cavalry and other army branches attempted to find a replacement for the supporting roles that had first been appropriated and then neglected by the air force. The Office of the Chief of Cavalry sought observation squadrons to be assigned to cavalry divisions, a longstanding cavalry goal.[49]

Attempts to develop more effective tactical air support and liaison in the United States and Britain led to trials of a newly invented type of aircraft, the autogiro also known as a gyroplane, gyrocopter, autogyro, or Autogiro (the last originally a proprietary name for the Cierva Autogiro Company's products but eventual became a

---

[47] Kinzie B. Edmunds, "The Cavalry-Artillery-Aviation Team," *CJ* (US) 42 (March-April 1933): 11.
[48] H. A. Flint, "What a Cavalryman Should Know of the Air," *CJ* (US) 42 (July-August 1933): 9.
[49] Letter to Adjutant General from Colonel A. M. Miller, Jr., for Chief of Cavalry, December 12, 1936, Autogiros 452.1, B50, E39, RG 177, NACP. See also Letter to Adjutant General from Colonel A. M. Miller, Jr., April 10, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

generic term). This machine appeared in the 1930s to be a vehicle that the cavalry could

use to provide the tactical assistance that the air forces were taking away. H. F. Gregory,

an army pilot assigned to test-fly autogiros, described them as airplanes with "a windmill

on top."[50] They derived lift not from fixed wings but from rotors (like helicopters with

the difference that a helicopter's rotors are powered and a gyroplane's are not). The first

generation of autogiros resembled most other small airplanes, possessing a fuselage, tail,

front-mounted engine driving a propeller, and wings. The unique element was the rotor.

The autogiro flew like an airplane except that the wings autorotated. Gregory

illustrated autorotation by describing how a maple seed spins as it falls to the ground. In

an autogiro, an engine provides forward motion which drives the rotors, and the rotors

provide the lift.[51] This feature made them more user-friendly and less likely to crash

than airplanes. If the engine stopped, gravity would pull the craft downwards,

generating sufficient airflow to keep the rotors moving enough to produce lift. Fixed

wing aircraft were not very good gliders when they lost power and were thus more likely

to crash. Airplanes also required longer runways than autogiros because rotors could

generate lift at slower speed than fixed wings could.

This feature meant that autogiros were resistant to stalls, which occurs when a

lifting surface (wing or rotor) is not moving fast enough to produce enough lift to sustain

flight. Even though the first autogiros had solved the problem of moving at slow speeds

without the aircraft stalling, its control surfaces (the traditional wing-based ailerons,

---

[50] H. F. Gregory, *Anything a Horse Can Do: The Story of the Helicopter* (New York: Reynal and Hitchcock, 1944), 53.

[51] Gregory, *Anything a Horse*, 50-51. For an additional description of the way autogiros worked with diagrams, see L. J. McNair, "And Now the Autogiro," *Field Artillery Journal* 28 (1937): 3-17.

elevators, and rudder) became ineffective because they required a certain volume of air passing over them to work. Inventor Juan de la Cierva's solution to this problem was the direct control autogiro in which movements of the rotor hub, not the wings and tail, controlled the plane. The name "direct control" came from Cierva's mechanical system allowing the pilot to "achieve direct control by moving the rotor head" with a "control rod attached to the hub."[52] Historian Bruce Charnov described direct lift autogiros as the "next evolutionary stage of autogiros" and bearing "almost no resemblance to its airplane ancestor" because they no longer needed wings or tails made useless by the new control system.[53] Cierva continued to strive to produce a vehicle that integrated collective and cyclic pitch controls and could "jump" into the air. The goal was near vertical take-offs which would allow autogiros to land and take off almost anywhere that had a small patch of clear ground.

Although autogiros were never able to takeoff or land vertically, they could, as Cierva claimed, fly slower and lower than most fixed-winged aircraft requiring only small runways. They could even hover over the ground in a sufficiently strong headwind. They were thus, for Cierva, a better platform for reconnaissance than an airplane.[54] These characteristics of the autogiro and its ease of use made it a good candidate for use as a liaison and reconnaissance aircraft by even non-air force personnel.

---

[52] Bruce H. Charnov, *From Autogiro to Gyroplane: The Amazing Survival of an Aviation Technology* (Westport, CT: Praeger, 2003), 101-102.
[53] Ibid., 95.
[54] Juan de la Cierva and Don Rose, *Wings of Tomorrow: The Story of the Autogiro* (New York: Brewer, Warren and Putnam, 1931), 49-50.

Although continuingly distracted by the lure of air power independent of ground forces, the RAF did assign resources to the development of this new aircraft. The RAF assigned autogiros to army co-operation squadrons and tested them in combined maneuvers. Because the RAF maintained control of the autogiros, British cavalrymen were not able to test the machines themselves. RAF-cavalry interactions were limited to maneuvers and confined to reconnaissance and communication. In 1933, an inter-command training exercise on Salisbury Plain tested autogiros for communication and low height reconnaissance behind friendly lines, but the cavalry had no direct involvement.[55]

Although it service career was short, the autogiro achieved some small success in the British military. As noted by a special wire to the New York *Inquirer,* British autogiros substituted for captive "sausage balloons" for artillery spotting because, unlike balloons, they were more easily camouflaged, could hover, and could fly away "with sufficient speed to offer some chance of escape from hostile aircraft" unlike balloons.[56] By late December 1934, the War Office "decided to replace observation balloons with autogiros" due to their "obvious reconnaissance and observation potential."[57]

Additional testing with the autogiro was slow. The 1935 combined RAF and army war games produced mixed results from the six experimental Avro Rota autogiros deployed and did little to speed development. Difficulties with takeoffs and landings on rough terrain resulted in additional research in wind tunnels and decreased military

---

[55] "Army Training Memorandum No. 11 Collective Training Period, 1933 (Supplementary)," May 18, 1934, 18, WO 231/227, TNA.

[56] Special Cable to the *Inquirer*, "British to use 'gyros,' December 14, 1934, Autogiros 452.1, B50, E39, RG 177, NACP.

[57] Charnov, *From Autogiro to Gyroplane*, 131, 189.

trials.[58] The 1937 death of the inventor, Juan de la Cierva, delayed purchasing and tests

further.[59] However, limited trials with direct lift autogiros continued into 1939.[60] The

British army experimented with twelve C-30 wingless autogiros manufactured by A. V.

Roe & Company of Manchester and had additional autogiros of various types for

experimenting, research, and development.[61] The outbreak of the Second World War

hindered additional development and ended experimentation, but Britain did employ

autogiro squadrons during the war, the only victorious country to do so.[62] The

Intelligence Division of the U.S. War Department reported that the British had two Rota

autogiros in January 1940 but that experienced British observation officers were

"contemptuous of this equipment."[63]

　　　Cavalrymen in Britain did not play a role in the development of the autogiro for

both organizational and practical reasons. The British experience with autogiro

development reflected the larger problem that all aircraft fell under the purview of the

Royal Air Force. Unlike in the United States where the air corps and cavalry were both

part of the army, in the United Kingdom the RAF controlled all aircraft development,

even those intended for service alongside other branches. Although cooperation with

ground units was the least desirable use of aircraft from the perspective of RAF

---

[58] Ibid., 189. British aircraft designations do not use letters or numbers as the primary identifier for aircraft. Thus, Avro Rota identifies a machine called the Rota produced by Avro. The Avro Rota was a British version of the Spanish Cierva C.30A, manufactured under license.

[59] "Army Training Memorandum No. 18, April 1937," March 24, 1937, 26, WO 231/234, TNA.

[60] "Army Training Memorandum No. 22 Collective Training Period 1939," April 18, 1939, 26, WO 231/238, TNA.

[61] W. Wallace Kellett, "Autogiro Development in Europe," n.d. [1937?], Autogiros 452.1, B50, E39, RG 177, NACP.

[62] Charnov, *From Autogiro to Gyroplane*, 188, 199.

[63] Colonel E. R. W. McCabe War Department General Staff Military Intelligence Division to Lieutenant Colonel V. W. B. Wales 1st Cavalry Fort Knox, Kentucky, January 10, 1940, Autogiros 452.1, B50, E39, RG 177, NACP.

leadership because it weakened their arguments for their independent status, the air service still had control of all aviation.[64]

As with other types of aviation, the Americans followed European autogiro developments. American entrepreneur Harold Pitcairn was so impressed by demonstrations of autogiros in London and Paris that he joined forces with Cierva to build the first American autogiros in 1929, PC-1 and PCA-1. Two years later in 1931, President Hoover awarded Pitcairn the National Aeronautic Association's Collier Trophy after the PCA-1 landed on the White House lawn as part of a demonstration of its abilities. W. Wallace Kellett founded his own autogiro manufacturing company to compete with Pitcairn's Pitcairn-Cierva Autogiro Company of America. In the early days of American autogiro development, marketing focused on non-military uses of the aircraft. Most notably, both companies sought government contracts to supply autogiros for mail delivery.[65]

In the summer of 1934, the chief of the Air Corps was informed of both the president's interest in and the secretary of war's approval of tests of autogiros for observation at the field artillery, cavalry, and infantry schools.[66] This attention may

---

[64] Peter W. Brooks, *Cierva Autogiros: The Development of Rotary-Wing Flight* (Washington, DC: Smithsonian Institution Press, 1988), 192, 254.

[65] W. David Lewis, "The Autogiro Flies the Mail! Eddie Rickenbacker, Johnny Miller, Eastern Air Lines, and Experimental Airmail Service with Rotorcraft, 1939-1940," in *Realizing the Dream of Flight: Biographical Essays in Honor of the Centennial of Flight, 1903-2003,* ed. Virginia Parker Dawson and Mark D. Bowles (Washington, DC: National Aeronautics and Space Administration (NASA) History Division Office of External Relations, 2005): 75-77, 80.

[66] Adjutant General Wm. F. Pearson to Chief of the Air Corps, Subject-Autogiros, June 11, 1934, Autogiros 452.1, B50, E39, RG 177, NACP.

have come from Roosevelt's knowledge about German autogiro and helicopter development.[67]

American cavalrymen wanted aircraft specifically designed to support ground forces, and if the Air Corps would not provide them, they wanted their own. The autogiro appeared to be one possible solution to their problems. Indeed, the vice-president of the Autogiro Company of America promoted autogiros as "flying cavalry" in a confidential paper submitted to the U.S. military.[68] This claim made them attractive to American cavalrymen who wanted to continue to take advantage of aerial reconnaissance.

The American situation differed from the British. Assigned with flying in the War Department, the U.S. Air Corps had formal responsibility for testing liaison, reconnaissance, and tactical aviation, yet the Air Corps was prepared to allow other parts of the army to test new technologies that might fit their particular tactical support requirements.[69] Lieutenant-Colonel Harold E. Hartney, the Aviation Technical Adviser to the Senate Commerce Committee, testified to the House of Representative Military Affairs Committee in 1938 that the Air Corps had "awful[ly] big problems of their own to solve at the present time" and was not concerned if other branches experimented with new types of tactical aircraft.[70]

---

[67] Lewis, "Eddie Rickenbacker," 80.
[68] James G. Ray, "Military and Naval Uses of Autogiros, n.d. [1935?], Autogiros 452.1, B50, Document File, 1923-1942, 451.8-454, Office of Chief of Cavalry, Records of the Chiefs of Arms, RG 177, NACP.
[69] Connor, "Grasshoppers and Jump-Takeoff."
[70] *Hearings before the Committee on Military Affairs, House of Representatives Seventy-Fifth Congress Third Session on H.R. 8143: To Authorize the Appropriation of Funds for the Development of the Autogiro* (Washington, DC: GPO, 1938), 88.

The autogiro became the focus of American cavalrymen's attempts to gain control over tactical air assets from the "newly emboldened Air Corps, which was" according to Cierva, "willing to sacrifice the development of tactical capabilities in support of its greater strategic visions of airpower doctrine."[71] The viability of the autogiro for American forces "played out against… [a] backdrop of intra-service rivalry and shifting doctrine" as army branches, including the Air Corps and cavalry, were competing for predominance and money.[72] Although Holley argued that the "autogiro [was] looked upon by some authorities as possibly being the replacement for the horse for reconnaissance purposes,"[73] some of the most vocal support for the autogiro came from the American cavalry.

Far from rejecting technological changes, the U.S. cavalry actively campaigned for the autogiro. In the mid- to late 1930s, senior cavalrymen became increasingly interested in promoting autogiro procurement and experimentation. Beginning in July 1935, the Office of the Chief of Cavalry requested an autogiro to experiment with at Fort Riley.[74] Unsatisfied with the pace of delivery, less than a month later, Chief of Cavalry Major General Leon B. Kromer asked the Chief of Air Corps Office to "hasten procurement of an autogiro" for cavalry experimentation so he could determine if it would be "of material benefit to the cavalry arm in carrying out its assigned combat

---

[71] Cierva and Rose, *Wings of Tomorrow*, 49-50.
[72] Connor, "Grasshoppers and Jump-Takeoff."
[73] Holley, *Army Air Forces Historical Studies,* 45.
[74] Letter to Adjutant General from Executive Cavalry Colonel A. M. Miller, Jr. "Subject: Kellett Autogiro," July 29, 1935, Autogiros 452.1, B50, E39, RG 177, NACP.

roles."[75] The desire for testing did not end with the chief of cavalry's office. The colonel commanding the 1st Cavalry requested two autogiros for testing with the 7th Cavalry Brigade (Mechanized) at Fort Knox, Kentucky, in September 1936.[76]

The cavalry's interest and the correspondence did not relent. Only three months after its first letter, the Office of the Chief of Cavalry sent another letter to the adjutant general to emphasize that the chief of cavalry was still "intensely interested" in the development of the autogiro and would like an autogiro at the cavalry school in May of 1937 and then for testing with the 7th Cavalry.[77] The office labeled the "experimentation and development of the autogiro as an instrument of command and aerial observation" as "a high priority project" and continued to try to get autogiros for testing.[78] In March 1937, the commandant of the Cavalry School, adding his name to the list of cavalry officers who expressed a desire to work with autogiros, asked to test autogiros at the cavalry school.[79]

Finally, after a delay caused by technical and safety difficulties, the Cavalry School at Fort Riley received an autogiro in May 1937 and began testing its capabilities. Even the Army Air Corps did not receive its first autogiro, the Kellett YG-1, until

---

[75] Letter to Chief of the Air Corps from Leon B. Kromer Office Chief of Cavalry War Department, August 9, 1935, Autogiros 452.1, B50, E39, RG 177, NACP.

[76] Letter to the Adjutant General from Colonel Bruce Palmer, September 19, 1936, Autogiros 452.1, B50, E39, RG 177, NACP.

[77] Letter to Adjutant General from Colonel A. M. Miller, Jr. Office Chief of Cavalry, October 9, 1936, Autogiros 452.1, B50, E39, RG 177, NACP.

[78] Letter to Adjutant General from Colonel A. M. Miller, Jr., for Chief of Cavalry, December 12, 1936, Autogiros 452.1, B50, E39, RG 177, NACP. See also Letter to Adjutant General from Colonel A. M. Miller, Jr., April 10, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

[79] To Chief of Cavalry from Brigadier General Guy V. Henry, March 13, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

October 1936.[80] Although willing to share development of this new technology with

other agencies, the air corps wanted to determine its safety first. Delivery of autogiros to

the cavalry had to be delayed first because one was in the factory for repairs from April

to July 1937 and another disintegrated in the air in June 1937. The Air Corps even

suspended their own tests in June 1937 until as an air corps officer stated the "necessary

engineering changes" were made to "preclude danger of another failure."[81]

Despite these complications, tests with the cavalry began on May 10 and lasted

until May 28 to assess the suitability of the YG-1, a wingless direct control autogiro,

built by the Philadelphia-based Kellett Autogiro Corporation, and to compare it to

airplanes.[82] The cavalry wanted to know if the autogiro could enable commanders to

"observe the enemy situation in the immediate vicinity of [their] command and direct

from the air if necessary the movements of [their] own troops."[83] The air speed of the

autogiro ranged from 16 to 130 miles per hour, with a cruising speed of 105 miles per

hour and a maximum diving speed about 140 miles per hour. Its maximum ceiling was

18,000 feet and a minimum height was whatever height needed to clear any obstacle

with safety. The weight carrying capacity was approximately 500 pounds which usually

consisted of: a pilot, one passenger, and 30 pounds of baggage. The lower the weight

the less distance it needed for takeoff.[84] Although there were no direct comparison trials

[80] Charnov, *From Autogiro to Gyroplane*, 133.

[81] Letter to the Adjutant General from Lieutenant Colonel H. C. Davidson Air Corps Executive, "Subject: Schedule for Autogiros," June 25, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

[82] Gregory, *Anything a Horse Can Do,* 79.

[83] Guy V. Henry, "Report of Test of Autogiro," June 10, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

[84] Cavalry Board to Chief of Cavalry, "Report of Test of Autogiro," June 10, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

between autogiros and airplanes at the Cavalry School, the testing concluded that airplanes surpassed autogiros in long-range reconnaissance and column control, battle reconnaissance, contact missions, and artillery adjustments. These advantages were due to the autogiro's slow top speed, small carrying capacity, short cruising range, and lack of defensive armament. The autogiro's slow minimum speed and its ability to land and take off in small areas proved superior than the airplane in command reconnaissance (especially when conducting terrain studies), night reconnaissance, and command control (defined as the transmission of orders and messages throughout the command).

The Cavalry Board concluded that an autogiro and Air Corps pilots "should be attached to each regiment of cavalry and each regiment or separate battalion of field artillery serving with cavalry." In addition, the board recommended obtaining additional autogiros for the Cavalry School, the 1st Cavalry Division, and the 7th Cavalry Brigade (Mechanized) to improve the "technique of its employment." From Fort Riley, the YG-1 Kellett Autogiro was sent for additional testing at Fort Knox, Kentucky, with the 7th Cavalry.[85]

These opportunities to test autogiros did not satisfy the cavalry. Testifying in April 1938 before House Committee on Military Affairs on the authorization of funds for autogiro development, Colonel Guy Kent from the Office of the Chief of Cavalry asked to continue to test the autogiro to determine all of its abilities. Even though the chief of cavalry was not completely satisfied with the thoroughness of previous testing,

---

[85] Captain E. T. Rundquist, "Report of Commanding Officer, Det. First Observation Squadron, Air Corps, on Scope of Tests Conducted and the Suitability of the Autogiro for Military Use as Compared with the Airplane," June 16, 1937, Autogiros 452.1, B50, E39, RG 177, NACP; Guy V. Henry to Chief of Cavalry, "Report of Test of Autogiro by the Cavalry Board, Fort Riley, Kansas," June 10, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

he was convinced that "an autogiro…should be attached to each regiment of cavalry."[86]

His office wanted additional opportunities to work with autogiros to determine if they

would allow a commander or staff officer to observe and command from the air.[87] The

committee appropriated two million dollars to be "expended for the purpose of Autogiro

research, development, and procurement for experimental purposes.[88]

The cavalry's request to test the autogiro further was approved and additional

tests began in August 1938 at Fort Riley.[89] Cavalry commanders continued to develop

this unique aerial craft without the intermediary of the army air service command

structure. Experiments tested the possibilities of autogiros to improve communication

and observation with both horsed and mechanized units. Determining the feasibility of

the autogiro to complete a myriad of missions entailed familiarization flights, night

landings, road reconnaissance, command missions, and other tests.

The chief of cavalry was not wed to a particular technology but to fulfilling the

needs of the cavalry. He was not only interested in the development of autogiros but

also willing to embrace any new cost-effective and useful technologies that shared "the

best qualities of the autogiro."[90] In August 1938, the chief of cavalry told the adjutant

general that the cavalry remained "intensely interested in the development of the

---

[86] *Hearings before the Committee on Military Affairs*, 56.

[87] Ibid., 55.

[88] Mr. Dorsey, 76th Congress 1st Session-A Bill-to authorize the appropriation of funds for the development of the autogiro," August 4, 1937, Autogiros 452.1, B50, E39, RG 177, NACP.

[89] Dorsey R. Rodney, "Report on the Progress of Test of Autogiros" to Commandant, the Cavalry School, Feb 8, 1939, Autogiros 452.1, B50, E39, RG 177, NACP.

[90] Ibid., 56.

autogiro or a similar type of rotary wing aircraft for command and other purposes with both horse and mechanized cavalry."[91]

The 1938-1939 trials produced only mixed support for autogiros. Like previous aircraft in the early stages of development, the autogiro had its problems including low carrying capacity, vulnerability to ground fire, and structural deficiencies. These limitations did not prevent Colonel Charles Burnett from sharing the cavalry's excitement in a letter to the Kellett Autogiro Corporation in August 1939 declaring, "We recognize that it has great possibilities for use in the Cavalry Service and we are hopeful that in the future it may develop even greater possibilities than at present."[92]

Unfortunately for the Kellett Corporation, that enthusiasm was not universally shared. In late 1939, a board was formed at Fort Knox, Kentucky, at the behest of the president to test and compare the YG-1 B autogiro and the O-47 observation plane to determine if autogiros were worth the investment. The board consisted of two cavalry officers, Colonel Jack W. Heard of the 13th Cavalry and Lieutenant Colonel Victor W. B. Wales of the 1st Cavalry, a captain of the field artillery and two pilots, both first lieutenants, one from an observation squadron and the other from the air corps.[93] In early 1940, the board reported that the autogiro was superior to the O-47 in eight of the mission categories and about the same in five additional tasks, but the higher cost and the limited availability of autogiros were major drawbacks. The board's report depended

---

[91] War Department, Office Chief of Cavalry Washington letter to the Adjutant General, August 8, 1938, Autogiros 452.1, B50, E39, RG 177, NACP.
[92] Colonel Charles Burnett to R. G. Kellett, Kellett Autogiro Corporation, August 21, 1939, Autogiros 452.1, B50, E39, RG 177, NACP.
[93] C. H. Unger, Special Orders No. 66, Proceedings of a Board of Officers, Headquarters Seventh Cavalry Brigade, Fort Knox, Kentucky, October 10, 1939, Autogiros 452.1, B50, E39, RG 177, NACP.

heavily on the research ordered by the committee and completed by Air Corps 1st

Lieutenant Robert M. Lee. He provided information about production costs and the

availability of spare parts and raw materials. Lee made a slight alteration to the

assignment by replacing the O-49 for the O-47 for comparison with the autogiro since he

argued it "more nearly correspond[s] to the autogyro." Table 6-1 reports his findings.[94]

Table 6-1 Relative Cost and Estimated Performance

	O-49	Autogiro
Cost (based on number procured)	For 5: $43,850.08 ($8,770.02 each) For 10: $37,473.67 ($3,747.37 each)	For 7: $34,782.42 ($4,968.92 each)
Highest speed	137 mph	150 mph
Take off and clear obstacle 50 ft.	350 ft.	250ft (no roll)
Landing and clear obstacle 50 ft.	350 ft.	250ft (no roll)
Minimum Speed	29.5 mph	20mph
Ceiling	20,000 ft.	20,000 ft.
Availability of spare parts	Same as fixed wing	Limited
Availability of raw materials	Same as fixed wing	Limited

---

[94] Robert M. Lee to Chief of the Material Division, A. C. Wright Field, Dayton, Ohio, "Subject: Autogyro Data," November 7, 1939, Autogiros 452.1, B50, E39, RG 177, NACP.

Using Lee's findings, the board concluded in very strong language that the autogiro should not be added to the Observation Squadron attached to cavalry, instead recommending the developing of "a light, slow airplane" to perform essential missions.[95] The Cavalry Board recommended focusing on developing light conventional airplanes to operate with cavalry on observation, command, and liaison missions. Although the board members had yet to see such a plane, they believed there was one in development.[96] In 1941, the army acquired the Taylorcraft L-2, Aeronca L-3, and Piper L-4, civil aircraft modified for military use.

Three years earlier, the chief of cavalry had already given his support to testing low-speed conventional aircraft for observation, liaison, and command purposes in addition to the autogiro. One such aircraft that he suggested, the "B-42," proposed by the Crouch-Bolas Aircraft Corporation, was a "low-wing, cantilever monoplane" powered by four engines.[97] This plane did not end up in production.[98]

Despite the Cavalry Board's suggestions to focus on airplanes, the cavalry did not entirely abandon the autogiro, continuing to experiment with it in the 1940s. Autogiros were tested during the 1940 army maneuvers with the 1st Cavalry. The board's recommendations were not ignored but modified. As Cavalry Lieutenant

[95] Colonel Jack W. Heard, Board meeting minutes, February 20, 1940, Autogiros 452.1, B50, E39, RG 177, NACP.

[96] Letter to the Chief of Cavalry from Brigadier General Robert C. Richardson, Jr., March 22, 1940, Autogiros 452.1, B50, E39, RG 177, NACP.

[97] M. F. Davis to Assistant Chief of Staff, G-3; Assistant Chief of Staff, G-4; Chief of Field Artillery, Chief of Cavalry, and Chief of Infantry, in turn, "Subject: Proposed Corps and Army Observation Airplane," December 28, 1937, Autogiros 452.1, B50, E39, RG 177, NACP; Colonel A. M. Miller, Jr. for the Chief of Cavalry to the Chief of Infantry, February 2, 1938, Autogiros 452.1, B50, E39, RG 177, NACP.

[98] The Crouch-Bolas B-42 should not be confused with the Douglas XB-42, which appeared late in World War II.

Colonel Willis D. Crittenberger wrote after flying the autogiro, "I am for the autogiro until something better is actually in our hands—not promised." He thought the autogiro almost filled the cavalry requirements and was better than any other substitutes in existence and should be used.[99]

Despite its potential, in the end, the autogiro was a failed technology in the United States since it was never widely adopted by civilian or military organizations. It did not become a permanent part of the American cavalry, or the army in general, because of financial and operational considerations. Another hindrance to autogiro development was the outbreak of the Second World War because design developments had to focus on aircraft immediately available for action. Nevertheless, the cavalry's intensive testing of the experimental aircraft demonstrated a desire to develop and deploy an aerial tool alongside their mounted ground forces.

The New Challenger -Tanks

While cavalrymen actively experimented with aviation, mechanization in the form of tanks and motor cars replaced aviation as the new technological challenge to the roles of the cavalry in the early 1930s.[100] Mechanization's advocates circulated familiar

---

[99] William D. Crittenberger to Major Topkins, June 25, 1940, Autogiros 452.1, B50, E39, RG 177, NACP.
[100] For detailed descriptions on the development of mechanization in the United States and Great Britain see Alexander Magnus Bielakowski, "U.S. Army Officers and the Issue of Mechanization, 1920-1942" (PhD diss., Kansas State University, 2002); Robert S. Cameron, *Americanizing the Tank: U.S. Army Administration and Mechanized Development within the Army, 1917-1943* (PhD diss., Temple University, 1994); Mildred H. Gillie, *Forging the Thunderbolt: A History of the Development of the Armored Force* (Harrisburg, PA: Military Service Publishing, 1947); Barton C. Hacker, "The Military and the Machine: An Analysis of the Controversy over Mechanization in the British Army, 1919-1939" (PhD diss., University of Chicago, 1968); Basil H. Liddell Hart, *Tanks: The History of the Royal Tank Regiment and Its Predecessors-Heavy Machine-Gun Corps, Tank Corps, and Royal Tank Corps, 1914-1945, Vol. I* (New

predictions about the ability of their new technologies to replace the horse cavalry while cavalrymen cited aviation to show how, yet again, the technological promoters were mistaken and armored and mechanized vehicles would not necessarily make the horse cavalry obsolete.[101] A lieutenant colonel of the cavalry made this connection clear when he argued that "theories of the extremists in mechanization are not likely to have more effect on our doctrine than those of certain extremists in aviation."[102] Cavalrymen utilized a similar framework to respond to this new contender as they had against aviation.

First, they attacked overconfidence in new unproven technologies. Although it was "natural that new arms and armaments should arouse ardent enthusiasm and acquire stanch supporters," untested innovations usually fell "short of expectations."[103] Major George S. Patton, Jr agreed with this observation attacking the idea that motorized and mechanized vehicles would destroy the cavalry by referring to the inaccuracy of earlier predictions that airplanes would replace the cavalry. He stated "experience of the effects of storms, fogs, darkness, forests, and enemy planes has so modified this view that now the airplane is considered as the ally not the supplanter of cavalry for strategic reconnaissance."[104] Patton provided additional examples of aviation's limitations including the inability to obtain identifications and to maintain constant surveillance as

York: Frederick A. Praeger, 1959); George F. Hofmann, *Through Mobility We Conquer: The Mechanization of U.S. Cavalry* (Lexington: University Press of Kentucky, 2006); David E. Johnson, *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917-1945* (Ithaca, NY: Cornell University Press, 1998); Vincent J. Tedesco, III, "'Greasy Automatons' and the 'Horsey Set': The U.S. Cavalry and Mechanization, 1928-1940." (master's thesis, Pennsylvania State University, 1995).

[101] G. S. Patton, Jr. and C. C. Benson, "Mechanization and Cavalry," *CJ* (US) 39 (April 1930): 234-40.

[102] K. B. Edmunds, "Tactics of a Mechanized Force: A Prophecy," *CJ* (US) 39 (July 1930): 414.

[103] M. N. MacLeod, "This Tank Business—in Fact and Fancy," *CJ* (US) 42 (January-February 1933): 48.

[104] George S. Patton, "Motorization and Mechanization in the Cavalry," *CJ* (US) 39 (July 1930): 335.

evidence that such predictions could not be trusted.[105] Patton, author of many *Cavalry Journal* articles in the early 1930s, compared the chariot, elephant, gunpowder, dynamite gun, and submarine to the tank, airplane, and gas noting that each had at one time or another been "acclaimed as the mistress of the battlefield" and adding that none lived up to these claims.[106] Patton argued that the "fraternity of motorists" and "gasoline neophytes" was leading astray a "mechanically minded and gullible public."[107]

Before the military accepted a new technology, cavalrymen argued it must be tested, the same contention they had made about airplanes throughout the 1910s and 1920s. One American cavalry colonel proclaimed that his colleagues were "earnestly striving to determine all the possibilities of these new developments in the interest of National Defense and to fit each into its proper place in our respective combat teams." Rather than blindly adopting new technologies, he thought it more prudent to test each new invention to make sure it worked before discarding "the experiences of centuries in equipment to put our faith in a new 'gadget.'"[108]

At the beginning of the decade, the cavalry's agenda to modernize itself was evident in the newly created "Progress and Discussion" section in the *Cavalry Journal.* Introduced in January 1930, this section's purpose was to record the "state of development of various items of material in which the cavalry is particularly interested, progress in technique or tactics" and "to encourage discussion of matters of general professional interest to cavalry officers." The introduction invited "suggestions

---

[105] Ibid., 336.
[106] Patton, "Motorization and Mechanization," 334.
[107] Ibid., 331-33.
[108] Charles L. Scott, "Are More Changes Needed in Our Horsed Cavalry Regiment Now?" *CJ* (US) 44 (September-October 1935): 42.

concerning the new methods developed and discussion or constructive criticisms of present methods, equipment, etc."[109] Throughout the 1930s, this new section discussed evolving technologies including armored cars, machine guns, and semi-automatic rifles. A 1935 article, in the *Cavalry Journal*, stated that "the suggested changes in organization and equipment that now come into the Chief of Cavalry's office and appear in print are conclusive proof that the cavalry as a whole is wide-awake to new developments for this arm."[110]

Testing the possibilities and use of armored cars and tanks in training maneuvers in the 1930s mirrored those of the 1920s with aircraft. As before, cavalrymen argued that the maneuvers using these vehicles showed the importance of cooperation between horsed and mechanized units, not that the latter replaced the former. As before with aviation, the difference between cavalrymen and the new technology's supporters was a matter of degree. The cavalry did not reject mechanized vehicles outright but actively attempted to evaluate this new technology, even improvising their own armored cars when the army provided none.[111]

Reports on maneuvers describing the problems of the new wheeled and tracked vehicles in the 1930s closely resembled the arguments about the limitations of aviation in the 1920s. The 1929 American Cavalry Division Maneuvers "marked the debut of the armored car in maneuvers" with the cavalry.[112] Terrain, weather, supplies, and an inability to maintain continuous contact all harkened back to early objections to aviation.

---

[109] "Progress and Discussion," *CJ* (US) 39 (January 1930): 118.
[110] Scott, "Are More Changes Needed?"42.
[111] Taylor, "305th Cavalry Command Post Exercise," 24.
[112] Patton, "1929 Cavalry Division Maneuvers," 9.

For mechanized vehicles, the inability to work in various types of terrain proved their major limitation.[113] Throughout the decade "roads, bridges, forests and mountains still oppose[d] mass employment of motor vehicles."[114] Exercises during the rainy season revealed that "mechanized cavalry, tanks and truck trains encountered considerable difficulty except on paved roads."[115] Additional shortcomings included the dependence of armored forces on fuel supply and spare parts for field repairs.[116]

Nor could mechanized vehicles "maintain continuous contact irrespective of visibility or weather conditions."[117] The British *Cavalry Journal* claimed that horsed cavalry was still needed because mechanized vehicles made attractive targets for enemy fire. Therefore the "obligations of reconnaissance and 'screening,' which are the essence of dispersion, can never be adequately carried out by the man in the armored vehicle, since, in his steel box, like the crab in its shell, he exhibits a perfect example of high-vulnerable concentration."[118] Massachusetts State Representative Henry Cabot Lodge, Jr., a 1st lieutenant in the cavalry reserve, also rejected the claims by mechanization's supporters that the cavalry was obsolete by "'assessing the issue mathematically.'" Lodge argued that Captain B. H. Liddell Hart's dismissal of the

---

[113] "A. F. V.," "Cavalry and Tanks," *CJ* (UK) 24 (1934): 454. See also *Reconnaissance Security Marches Halts*, 11. See also Adna Chaffee, "Mechanization in the Army" (General Staff, 1931), Combined Arms Library Digital Library, 5, 9; "Iron Horses for the Cavalry," *Literary Digest* (March 19, 1932), 41; Thomas J. Johnson, "A Horse! A Horse! My Kingdom for a Horse," *Quartermaster Review* 16 (September-October 1936): 6.
[114] "Cavalry: A Requisite," 212.
[115] "Machines, Maneuvers, and Mud," reprint from editorial in *The Milwaukee Journal* in *CJ* (US) 48 (January-February 1939): 73.
[116] Chaffee, "Mechanization in the Army," 7.
[117] William R. Irvin, *Combined Reconnaissance Operation by Cavalry and Aviation* (Fort Leavenworth, KS: Command and General Staff School, 1934), 5. See also *Tactics and Technique of Cavalry: A Text and Reference Book of Cavalry Training (Includes all the technical change to June, 1937)* 8th ed. (Harrisburg, PA: Military Service Publishing, 1937), 256.
[118] Reginald Hargreaves, "Crisis in the Cavalry," *CJ* (UK) 28 (1938): 596.

cavalry, based on his comparing the speeds of man on foot, on horse, and in motorized vehicles, was too simplistic. Lodge's tour of active duty on the Mexican border convinced him that the "manifold varieties of terrain" an army may have to traverse made all three "methods of locomotion" necessary.[119] The American *Cavalry Journal* reprinted an editorial that originally appeared in a Milwaukee newspaper in which it was noted that observations such as these should convince skeptics "of the importance of *real* cavalry in any modern scheme of war."[120] The assertion here was the true cavalry was horsed, not wheeled or tracked.

The belief that mechanization was not yet a mature enough technology to replace the cavalry appeared in cavalry journals. An article in the U.S. *Cavalry Journal* noted the influence of the motor-minded public in discussions of the replacement of horses by motorized vehicles but remarked that, *"*while it is conceivable that his hoof print will someday be found only in the fossilized exhibits of the museum, the tire tread cannot as yet claim mastery over his domain."[121] This argument was just like previous statements made throughout the preceding two decades that although aviation may one day replace the cavalry in reconnaissance, that day had not arrived.

An American infantry lieutenant colonel rejected the argument that the new inventions of airplanes and scout cars made the cavalry lose its label the "'eyes and ears' of armies," a description it had held for centuries. He admitted airplanes and scout cars may be the eyes of the army but "it will be a long-time before they become the ears of

---

[119] Henry Cabot Lodge, Jr, "Cavalry 'Marches' on Wheels: A Description of the Big Bend Portée," *Army Ordnance* 14 (November-December 1933): 135.
[120] "Machines, Maneuvers, and Mud," 73. Emphasis added.
[121] John B. Smith, "The Effect of Mechanization Upon Cavalry," *CJ* (US) 40 (November-December 1931): 21, 24. See also "Foreign Magazines," *CJ* (UK) 22 (1932): 298-99.

armies…and there will be situations" like bad weather "where neither the one nor the other will even be the eyes."[122]

Cavalryman argued that mechanization and motorization, like aviation, would strengthen but not replace horsed cavalry. One of the most elegantly constructed arguments praising mechanization came from a discussion in the *Cavalry Journal* about foreign views of mechanization. It stated that "far from being the condemnation of the cavalry, the motorized engines constitute for it the opportunity for a resurrection, in which, with formidable means at its disposal, the cavalry spirit will be able to amplify infinitely its innate qualities of boldness, skill, and heroism."[123] Lieutenant Colonel Adna Chaffee, a member of the General Staff, stated that both cavalry and mechanized vehicles would "be necessary" because they "supplement each other where combat [is] moving even as the cavalry and airplane do today in the duty of reconnaissance."[124]

Throughout the 1930s, training reports, student papers, and articles in the *Cavalry Journal* (both the US and UK) argued that mechanization would help the cavalry. A report of the 1931 British Collective Training period suggested that scout cars were valuable and saved horseflesh.[125] Major J. T. Pierce's 1932 Command and General Staff School student research paper stated that mechanized forces do "not displace cavalry, nor can they be used interchangeably, its proper place is an adjunct to cavalry and so used will broaden the scope of cavalry and increase its combat

---

[122] Bernard Lentz, "A Justification of Cavalry," *CJ* (US) 44 (January-February 1935): 10.
[123] "Foreign Views on Mechanization," *CJ* (US) 40 (July-August 1931): 64.
[124] Chaffee, "Mechanization in the Army," 5.
[125] "Army Training Memorandum No. 4 Collective Training Period 1931" (London: HMSO, 1931), December 21, 1931, 31, WO 231/220, TNA.

efficiency."[126] Captain William R. Irvin in a similar paper two years later concluded that the "advent of the mobilized vehicle and armored car [had] greatly increased the mobility and operating range of cavalry in combined reconnaissance."[127] Citing the combined brigade maneuver of the 8th Brigade with the 6th Cavalry in May 1935, two cavalry officers, a lieutenant colonel and a captain, argued that scout cars increased "greatly the efficiency of the cavalry, extending its vision…by their information, largely negative, they lessen the worry over security." Although they "take an enormous load of work off the horses" neither scout cars nor "anything resembling them" could replace mounted troops because motors are only faster in "exceptional terrain" and no machine in existence could "do everything a horse can do."[128] In reconnaissance, an American text used for cavalry training in 1937, *Tactics and Technique of Cavalry,* stated that airplanes, motor-trucks, scout cars, armored cars, and combat cars added to large units "greatly augment[ing] its powers of reconnaissance" and had "materially added to the mobility of the cavalry and increased its range." [129] *Tactics* concluded that despite this value, mechanization still did not "replace any other combatant arm, but tremendously assist[ed] the operation of both infantry and horse cavalry."[130]

Hamilton Hawkins thought that tank units could "be of great assistance in special situations" and "may be a valuable adjunct" to the cavalry.[131] A mechanized vehicle could "probably render much more important services if it is operated in combination

---

[126] Pierce, "Place of a Mechanized Force," 18.
[127] Irvin, *Combined Reconnaissance Operation*, 4.
[128] Edmunds and Ramey, "6th Cavalry at the Maneuvers," 28.
[129] *Tactics and Technique of Cavalry: A Text*, 9, 14.
[130] Ibid., 256.
[131] H. S. Hawkins, "Some Observations on the Attack by Combined Arms," *CJ* (US) 47 (March-April 1938): 147.

with horse cavalry than it could alone." Vehicles could supplement cavalry when they performed "covering force duty" including "reconnaissance, screening and security. . . delaying actions, exploiting a success, combination with infantry in battle, holding positions until infantry [could] arrive or until it [could] withdraw, and in the pursuit."[132] This desire for complementary horse and mechanized cavalry was made clear in 1939 when Chief of Cavalry Major General John K. Herr told the House Subcommittee on Military Affairs "that combined with a proper proportion of mechanized cavalry, the capabilities of cavalry are greatly increased."[133] The horse could not be fully replaced by any combination of vehicles, particularly for close reconnaissance in wooded areas.[134] Herr concluded by saying that "it is my fixed opinion that, although in some cavalry missions it may be better to use horse cavalry alone or mechanized cavalry alone, on the whole the best results can be accomplished by using them together."[135]

Despite the many similarities between how cavalrymen responded to aviation and to mechanization, significant differences emerged. Unlike the previous debates on aviation, the discussion about mechanization focused primarily on eliminating the horse component of cavalry and not whether the cavalry branch was obsolete. The arguments and terms in this decade increasingly pitted animals against machines. Machines, capable of moving more quickly than horses and armored for protection against modern weapons, posed a different challenge than aviation to the traditional cavalry branch. Despite his article's title "Exit the Cavalry…Enter the Tanks," Army Chief of Staff

---

[132] General Hawkins' Notes, "The Combination of Horse Cavalry with Mechanized Cavalry," *CJ* (US) 47 (September-October 1938): 462.
[133] "Cavalry Affairs before Congress," *CJ* (US) 48 (March-April 1939): 130.
[134] Ibid., 130-131.
[135] Ibid., 133, 135.

Douglas MacArthur did not proclaim the end of the cavalry in 1931 but predicted that in situations where the "country [was] not too rough cavalrymen of the future [would] ride . . . gasoline steeds into battle."[136] The annual British training memoranda following the collective and individual training seasons reflected this change in the standing of the traditional cavalry. By 1931, the cavalry no longer had a separate section in the reports of the training periods, and a tank section appeared in 1932.[137]

Evaluations and reports of maneuvers provided support for horses in their competition with machines. After reviewing the maneuvers at Fort Benning in May 1935, two cavalry officers argued, "there is no machine yet invented that can do everything a horse can do."[138] British collective training maneuvers in 1937 experienced problems with the abilities of machines to operate in certain terrains that were not a problem for horses.[139] In fact, Colonel Bruce Palmer, commander of the 1st Cavalry Mechanized at Fort Knox, Kentucky, maintained that "the horse is more indispensable to the army today than…ever" because the "'versatility of the horses is the key to the whole matter, these troops can maneuver on any terrain, day or night regardless of weather conditions." [140] The reporter who recorded this statement noted that the colonel's

---

[136] "Exit the Cavalry . . . Enter the Tanks," *Popular Science Monthly* 119 (August 1931), 40-41.
[137] "Army Training Memorandum No. 6. Individual Training Period, 1931-32," May 6, 1932," WO 231/222, TNA.
[138] Edmunds and Ramey, "6th Cavalry at the Maneuvers," 28.
[139] "Army Training Memorandum No. 17 (Collective Training Period, 1936)," January 7, 1937, 18, WO 231/233, TNA.
[140] "Horses and Motors," reprint from the (Springfield) *Illinois State Journal* in *CJ* (US) 45 (March-April 1936): 105.

explanation would be of "interest to many civilians who [had] been unable to understand the value of horses in modern warfare."[141]

Another difference between the cavalry-aviation debate and the cavalry-mechanization debate was that the cavalry succeeded in gaining at least temporary control of the mechanization process. While failing in the 1920s and 1930s to gain its own permanent air component, the cavalry succeeded in gaining its own motorized and mechanized vehicles in the 1930s and was transformed in the process. After the 1931 Collective Training Period, the British army adopted the recommendation of one commander that "an Austin Scout troop of 5 cars should be included in each divisional cavalry regiment in peace time."[142] A committee considering the organization of the mechanized cavalry and the Royal Tanks Corps reported that the "development of motor transport in all its forms has made it necessary to equip the cavalry arm with fast moving armoured vehicles to enable it to perform its traditional role."[143] A lieutenant-colonel believed that some of the problems of working together to determine the appropriate employment of horse and mechanized cavalry would be solved by working together as "part of the same arm" without "antagonistic prejudice."[144] This combination was clearly demonstrated when the British *Cavalry Journal* added the subtitle *Horsed and Mechanized* in 1938.

---

[141] Ibid.

[142] "Army Training Memorandum No. 5 Collective Training Period 1931 (Supplementary)," April 21, 1932 (London: HMSO, 1932), 7, WO 231/221, TNA.

[143] "Report by a Committee Assembled to Consider the Organization of the Mechanized Cavalry and the Royal Tank Corps," n.d. [1938?], WO 33/1509, TNA.

[144] E. G. Hume, "Cavalry Today—Horse v. Machine?" *CJ* (UK) 20 (1930): 180.

During the 1930s, the cavalry's response to mechanization pitted those cavalrymen advocating complete mechanization against their more cautious peers who wanted to retain some horse units. Among the latter were several high-ranking officers. General Hugh A. Drum's experiences and observations of the terrain in China and Spain and during the 1938 Command Post Exercise caused him to conclude that the "proposal that motors replace all animals [was] an extreme view not warranted."[145] In a 1939 Congressional budget hearing, General Malin Craig defended the continued existence of horsed cavalry by arguing that "there are many circumstances where it is essential and where mechanized cavalry cannot take its place."[146] As early as 1930, British cavalryman Lieutenant Colonel E. G. Hume also argued that the public belief that "cavalry should be composed entirely of horsed troops, or be completely mechanized" was unsound and that further examination should be made of the "respective spheres of usefulness and limitations of these two methods of mobility; the machine and the horse." They should cooperate "wholeheartedly."[147]

The division between horse cavalrymen and mechanized cavalrymen became so pronounced that some individuals such as Major R. W. Grow tried to heal the wounds. He remarked that in his "humble opinion it is high time to drop all this controversy between horse and mechanized and get together as *cavalrymen*." He maintained "to be pointed out as a 'horse' cavalryman savors too much of hidebound tradition" while "to be pointed out as a 'mechanized' cavalryman savors too much of a scatter-brained

---

[145] "Machines, Maneuvers and Mud," 73.
[146] "Value of Animals in Modern Warfare," *CJ* (US) 47 (March-April 1938): 109.
[147] Hume, "Cavalry Today," 180.

enthusiast without his feet on the ground." It was his belief that "neither the four-footed horse nor the steel horse, in themselves, make cavalry." He argued that they all should be horsemen but "above all…cavalrymen."[148] A contributor to the British *Cavalry Journal,* identifying himself only by the initials A. F. V. also noted the tensions between tank men and horse men. He acknowledged that the division, although overemphasized by outsiders, did exist. He maintained that it seemed "to be forgotten by the disputants that the horsemen, and the tank men…have to fight in any future war besides, and not against each other." They all had the same goal, achieving victory. This desire for victory he argued "must enable us, if we have not lost all sense of reason, to hope for, and even rejoice in, the success of the rival arm over our own."[149]

The American chiefs of cavalry attempted to be a progressive and unifying voice during this debate. Both Major General Leon Kromer and Major General John K. Herr desired further mechanization. Kromer, Chief of Cavalry from 1934-1938, "recognized from the start that the 'iron horse' [had] opened to cavalry a greater sphere, and that cavalry must unhesitatingly seize and exploit to the fullest extent consistent with its development, an implement that bids fair to greatly enhance the powers of the arm."[150] Unlike many of his more traditional contemporaries, Kromer "steadfastly held…that mechanized cavalry [was] cavalry."[151] The 1937 curriculum at the Air Corps Tactical School also expressed this viewpoint. In these courses the term cavalry referred to both

[148] R. W. Grow, "One Cavalry," *CJ* (US) 47 (March-April 1938): 150.
[149] "A. F. V." "Cavalry and Tanks," 449.
[150] The Editor's Saddle, "Major General Leon B. Kromer," *CJ* (US) 47 (March-April 1938): 164.
[151] Ibid.

armored cars and horses. One lecture stated distinctly that, cavalry could use "the

machine, the horse, or both" to achieve its strategical or tactical mobility.[152]

Herr, Chief of Cavalry from 1938-1942, also considered mechanization an

"integral part of each arm" and not separate.[153] In 1938, he reminded his fellow

cavalrymen of the importance of the cavalry's mobility, which he maintained was

centered on the horse, but that horse could be the "iron horse or the horse of flesh and

blood."[154] Herr demonstrated that cavalrymen could embrace mechanization yet still

maintain horse elements. Eight years of study and development by the U.S. Cavalry

proved to Herr that mechanization could help in the completion of cavalry missions "to a

very considerable extent" but still could not fulfill all of the requirements of mobile

warfare. The cavalry must include both mechanized vehicles and horses; if not, they

would be "courting disaster."[155] There needed to be a proper balance between horse and

mechanized units.[156] The 1937 *Tactics and Technique of Cavalry,* conveyed a similar

opinion:

> although there are many means of transportation more rapid than the horse, none
> of them can completely replace him…mud, snow, and shell torn roads still hold
> their terrors for the motor vehicle, while fog and low visibility often render
> impotent the best efforts of the air force the horse can still work efficiently under
> these trying conditions.[157]

---

[152] Lecture "Characteristics of Cavalry," Conference No. 4, December 6, 1937, Course: Cavalry, The Air
Corps Tactical School, Maxwell Field, Alabama 1937-1938, Folder Cavalry Form II 1937-1938, No. 4
248.80017-3, 1937-1938, AFHRA. Emphasis in original.
[153] John K. Herr, "What of the Future?," *CJ* (US) 48 (January-February 1939), 3.
[154] John K. Herr, "My Greetings to All Cavalrymen," *CJ* (US) 47 (March-April 1938), 99.
[155] Herr, "What of the Future?," 4.
[156] "Cavalry Affairs before Congress 1939," 130.
[157] *Tactics and Technique of Cavalry: A Text,"* 14.

Arguing for British Cavalry Reductions

In the 1930s, mechanization increasingly replaced aviation as a justification for the reduction of cavalry. Cavalrymen and supporters of the continuation of horse cavalry employed similar arguments to those they had used to defend their branch when confronted by aviation. These contentions included claims that mechanization was not advanced enough to replace the horse, tanks could not accomplish what their proponents predicted, mechanization actually strengthened the horse cavalry, and that those who contended that the Great War proved cavalry was obsolete misunderstood the war. Historian Edward Katzenbach observed that during the mid- to late 1930s when horse cavalry was most threatened by military reorganization plans, the value of the horse in the Great War was emphasized more than in any time previous.[158]

Parliamentary debates in the 1930s provide excellent examples of the divisions between politicians and military officers over the relative values of mechanization and the cavalry and the future of both. M. P. John Joseph Tinker took the role of mechanization advocate and cavalry detractor. In 1932, he targeted the cavalry for reduction during a discussion over Army Estimates.[159] Tinker argued that mechanization of the army was "for the purpose of removing what are called obsolete units, and in these days cavalry cannot be called a useful arm of the service."[160] Tinker brushed aside accusations that he failed to consider and appreciate the battle honors afforded those regiments, stating "every one of us who fought in the War attained some

---

[158] Edward L. Katzenbach, Jr., "The Horse Cavalry in the Twentieth Century: A Study in Policy Response," *Public Policy* 8 (1958): 138.
[159] Hansard HC Deb 08 March 1932, vol. 262, col. 1683.
[160] Ibid.

honour for trying to save the country."[161] He campaigned to eliminate the cavalry

regretting that "we have lost many thousands and millions of pounds by our delay in this

matter."[162]

Against such adamant opponents, the cavalry needed all of the supporters it could

get. One appeared from an expected quarter: the Royal Air Force. Wing Commander

Archibald James stated that Tinker appeared to be putting too much value on what had

occurred on the Western Front.   James argued that although he was a member of the

RAF, a service that did not dispose him to favor the cavalry, he recognized the nation's

responsibilities included "very 'unmechanisable' parts of the world" such as Poland and

that it was not yet "proved that our types of mechanised machines in substitution for

horses are satisfactory."[163] Mechanization was coming, he agreed, but "you cannot

hurry these things." Brigadier-General Sir Henry Page Croft concurred, citing

conditions in Iraq and proclaiming that the "total abolition of the cavalry would be a

frightful blunder."[164] He warned that once horses were eliminated, it would be very

difficult to bring them back due to the time necessary to raise and train new mounts.

Despite these warnings, other military officers disagreed with their colleagues

and echoed Tinker's arguments for increased economy by reducing or eliminating the

horse cavalry and replacing it with mechanization. Although Major James Milner did

not state directly that tanks would supplant cavalry, he argued that the "cavalry have

been obsolete on the Continent of Europe since the Battles of Crecy and Poitiers"

---

[161] Ibid., 1685.
[162] Hansard HC Deb 19 March 1936, vol. 310, col. 729.
[163] Ibid.
[164] Ibid., 730.

leaving "ample scope for a great reduction in the cavalry arm" which would free money

for the acquisition of tanks.[165]

This time, politician Allen Bathurst, Lord Apsley, who had served with the Royal

Gloucestershire Hussars during World War I, came to the cavalry's defense. He called

for an increase in the cavalry establishment to correct the handicap experienced by field

officers who did not have enough cavalry in the Great War. He supported Wing

Commander James's assertion that horse cavalry was needed to "work in country where

mechanical vehicles cannot proceed, and . . . to carry out reconnaissance…" but before

he could finish his statement he was interrupted by Milner who stated simply "do it by

aeroplane."[166] Lord Apsley responded:

> tactical reconnaissance by air is useless. Strategical reconnaissance is not so bad,
> but it is impossible to tell from the air where the flank of an advance is, where
> troops are deployed, what form the troops take and what positions they are
> holding. You can only get tactical reconnaissance by drawing fire. If you are
> going to retain any cavalry it should be brought up to strength and made efficient.

Apsley was not against technological change. He suggested that "as many as possible of

the motorized cavalry should be equipped with light tanks" and that cavalry should be

given control of its own aviation in the form of light airplanes for reconnaissance.[167] He

was primarily concerned that the cavalry accomplish its job—reconnaissance, rearguard

actions, and pursuit—and not with the means. "We want the best, quickest and most

effective means of transport to get these functions performed," he argued. Apsley

advocated training "plenty of men" to use whatever type of mount was available whether

---

[165] Hansard HC Deb 12 March 1936, vol. 309, col. 2457.
[166] Ibid., 2466.
[167] Ibid., 2467.

it be horse, mule, camel, donkey, motor car, light tank, or aircraft. He also hoped that

horses from recently mechanized units in Egypt would not be given away or killed but

given to the remaining horse cavalry regiments.[168]

Stereotypes

The defense of the horse had been part of the debate over the replacement role of

the bicycle, motorcycle, and airplane, but in the 1930s, this defense became more

common and more central for cavalrymen. The argument that the man (and the horse),

not machines won wars, so common in the military and public in the 1920s, dropped in

visibility by the 1930s except for the writings of cavalrymen. Cavalrymen during this

period were more susceptible to the charges of "muddy-boots fundamentalism" and

irrational and unquestioning support of the horse that historian Brian Linn described as

part of the negative connotations of the "Heroes" intellectual tradition of the United

States Army. American cavalrymen tended to "characteristically dismiss those who

[sought] to impose predictability and order" onto war, which they viewed as "chaotic,

violent, and emotional."[169] More cavalrymen slipped into emotional posturing, elitism,

and grandiose proclamations.[170] This defense of the traditional horsed cavalry was

atypical of arguments during the first twenty years of military aviation but a major

component of the response to the threat of mechanized ground vehicles. This was

especially the case in Britain.

---

[168] Hansard HC Deb 19 March 1936, vol. 301, cols. 732-33.
[169] Brian McAllister Linn, *The Echo of Battle: The Army's Way of War* (Cambridge, MA: Harvard University Press, 2007), 66-67.
[170] Ibid., 6-7.

Two British poems clearly demonstrated the emotionalism of cavalrymen fearful of losing their horses to mechanization. Significantly, they appeared in 1938 and1939, after mechanization had clearly supplanted the horse in Britain, and not earlier when horse cavalry still maintained its numbers. These poems, published in the British *Cavalry Journal: Horsed and Mechanized,* eulogized the rapidly disappearing army horse. In one, "Night Guard," the unnamed author recalled the sense of familiarity and comfort when their steeds remained.

> It was different when we had horses;
> The stables were warm and snug,
> You could go and chat to your "long-faced pal"
> And straighten his rucked-up rug.
> There were munching sounds in the darkness
> As you opened the stable door,
> And the rattle of chain on head stall,
> Or the clink of a hoof on the floor.

 He contrasted these happy memories with the present in his next stanza, noting the characteristics of the "garage block":

> But now there's only a garage block,
> Dark and lifeless and dumb,
> And you're bored quite stiff, and you wonder if
> Your relief will ever come.
> You rattle a door or window,
> And continue to the weary round;
> You gaze at the clock or whistle a tune,
> Just for the sake of the sound

The author ended his poem on a more positive note, attempting to raise the spirits of his fellow cavalrymen by stating

> And there's one very big advantage;

When the leave seasons come on
You can turn the key on your tanks and trucks,
And pack up your kit and be gone.
Now that means a hell of a lot chaps,
So you needn't moan or take fright;
The army's seen changes before, pals
It'll weather this lot alright.[171]

The author of the second poem, Major Cyril Stacey, formerly of the 14th King's

Hussars, was far less willing to embrace mechanization and motorization. He praised

the old ways and wondered if horses might be needed again.

No more the dung pit's reek perfumes the breeze,
No more the squadron-leader shouts out "march at ease,"
No more the troop horse searches in his manger
Oblivious to any thought of danger.

He also observed the good fortune of the few able to retain the horse in a few special

regiments.

Gone are those chestnuts, browns and bays
From all except those lucky 'Royal' and 'Greys';
And Household Cavalry, who when at home
Still use the hoof-pick and curry comb.

Hussars, dragoons, and lancers still bear ancient names,
The men content to play dismounted games
While tanks and lorries grimly thunder past,
Replacing those dear gees that have been cast.

Of petrol now they draw a daily ration
Instead of oats and hay which were in fashion.
Gone is the farrier and the skillful vet.;
Who know but we may want them badly yet?[172]

---

[171] "Night Guard," *CJ* (UK) 28 (1938): 170-71.
[172] Cyril Stacey, "The Passing of the Cavalry, 1939," (1939): 566.

Despite these emotional arguments, every defense of the horse was not unthinking

nostalgic conservatism, although much of it could be construed that way. Cavalry

historian Katzenbach has observed that with the exception of these poems, the

cavalrymen's arguments in their various professional forums, were "absolutely sound."

Tanks and airplanes could not replace the horse "until such time as it could perform all

the missions of the horse."[173] The major issue overlooked, however, was whether these

missions were valuable.

The contention that the cavalry branch and its leaders were backward and

conservative took a powerful visual form in Britain on April 21, 1934, when David Low,

the famed cartoonist for London's *Evening Standard*, created the "powerful icon" of

"reactionary stupidity" in the British military: Colonel Blimp. It is not an accident that

this pretentious yet inept character was identified as a British cavalry officer.[174]

Cartoons fearing the colonel proved immensely popular, so much so that his name

entered the language. The Oxford English Dictionary identifies Colonel Blimp as a

character "representing a pompous, obese, elderly figure popularly interpreted as a type

of diehard or reactionary."[175] Low intended, however, to typify the "current disposition

to mixed up thinking, to having it both ways, to dogmatic doubleness, to paradox and

---

[173] Katzenbach, *Horse Cavalry,* 140.

[174] Mark Hampton, "Inventing David Low: Self-Presentation, Caricature and the Culture of Journalism in Mid-Twentieth Century Britain," *Twentieth Century British History* 20 (2009): 483. This Colonel Blimp should not be confused with the title character of the 1943 British film *The Life and Death of Colonel Blimp,* although the name was taken from Low's popular cartoon creation.

[175] Peter Mellini, "Colonel Blimp's England," *History Today* 34: 10 (October 1984). http://www.powell-pressburger.org/Reviews/43_Blimp/Blimp18.html.

plain self-contradiction."[176] Blimp was a fitting name, as it referred to a type of airship—a balloon, a gas bag. Blimp initially took the form of a cavalryman because Low had read a letter from an officer that the "cavalry should continue to wear their traditional uniform and spurs even when they were mechanised."[177] The defining characteristic of Blimp, according to Low, was his daftness. He strongly emphasized that Blimp did "NOT represent a coherent reactionary outlook so much as slapdish stupidity."[178] Low used Blimp not to criticize the military but political issues and individuals. Despite his attempts to protect his definition of his character, Low quickly lost control of his creation. Low's readers turned his comic figure typifying stupidity into a symbol of the conservatism of British military officers, a matter of great concern to the British public. Yet most Britons did not exclusively associate Blimp with the cavalry but instead perceived him as a generic British army officer. [179]

C. S. Forester conveyed a similar message with his 1936 novel *The General* which strengthened the popular belief that cavalrymen and commanding officers were backward and reactionary. The main character, Herbert Curzon, was Forester's "caricature of the best and worst" of British commanders during the Great War, "hide bound, traditional and utterly devoid of imagination, yet, brave and honorable to a fault."[180] Curzon, unsurprisingly, was a cavalryman who distrusted the highly educated

---

[176] Colin Seymour-Ure and Jim Schoff, *David Low* (London: Secker and Warburg, 1985), 136.
[177] Ibid. See also Colin Fleming, "The Greatest British Film Ever Is 'The Life and Death of Colonel Blimp," *The Atlantic* http://www.theatlantic.com/entertainment/archive/2013/03/the-greatest-british-film-ever-is-the-life-and-death-of-colonel-blimp/274381/.
[178] Seymour-Ure and Schoff, *David Low,* 94.
[179] Ibid., 94, 133.
[180] C. S. Forester, *The General* (1936; repr., Annapolis, MD: Nautical and Aviation Publishing, 1982), x.

and military theorists. He believed that any man discussing the theory of war would almost surely

> bring forward some idiotic suggestion, to the effect that cavalry had had its day and that dismounted action was all that could be expected of it, or that machine guns and barbed wire had wrought a fundamental change in tactics, or even— wildest lunacy of all—that these rattletrap aeroplanes were going to be of some military value in the next war.[181]

Curzon was mortified that one of the "feather-brained" subalterns voluntarily and with enthusiasm "quitted the ranks of the twenty-second lancers, the Duke of Suffolk's Own, to serve in the Royal Flying Corps."[182] Curzon complained that this subaltern had further insulted the cavalry by having "had the infernal impudence to suggest to the senior major of his regiment…who had won the Battle of Volkslaagte by a cavalry charge that the time was at hand when aeroplane reconnaissance would usurp the last useful function which could be performed by cavalry."[183]

In reality, of course, the majority of military officers in Britain and the United States were not Blimps or Curzons. There may have been some who agreed with the poems cited above and desired to charge their horse once more at the enemy when defeat appeared certain, as Curzon did in the last pages of Forester's novel, but to characterize all cavalrymen who defended the continued utility of the cavalry and horses as hide-bound anti-intellectuals is to do a disservice to the great number of cavalrymen who pragmatically addressed new technologies.

---

[181] Ibid., 24.
[182] Ibid., 25.
[183] Ibid.

Hamilton Hawkins, labeled by scholar Alexander Bielakowski as traditional,[184] rejected the contention that opposition to mechanization came from "ultra-conservatives" and "old fogies" in the cavalry, claiming that airplanes and mechanized vehicles realistically could not fully replace the cavalry. Instead, "brilliant success" could occur in battle if an air force and mechanized force combined with the motor transport of supplies to cooperate with the cavalry.[185]

Although some cavalrymen may have been overzealous in their defense of the horse, the cavalries of the United States and Britain examined and attempted to incorporate new technologies. Less nostalgic about this involuntary "great metamorphosis" that the cavalry was experiencing, a 1938 British *Cavalry Journal* editorial argued that while "a person may or may not like change" it was "apparently…quite inevitable."[186] Consequently, the journal shifted coverage from saddles and sore backs to concentrate on pistons and differential gears. Despite this change, the editor argued that cavalrymen may have switched their mounts but would continue to complete their duties with the same devotion as before.[187]

Conclusion

The overly sentimental defense of the horse by a few cavalrymen in the 1930s may seem to prove that the cavalry was conservative and backward, yet that Colonel Blimp image, whilst widespread, did not reflect the reality: that of a military branch

---

[184] Bielakowski, "U.S. Army Officers," 93.
[185] Hawkins, "Cavalry and Mechanized Force," 25.
[186] "Editorial," *CJ* (UK) 28 (April 1938): 163.
[187] Ibid., 164.

trying to adapt to new technologies by adopting them. Although some cavalrymen were reactionary and backward in their defense of the horse from mechanization, the more common response to the challenges of technology in the 1930s was the continuation of the attitude of acceptance that had marked the cavalry's approach to aviation in the 1920s. Doctrinal statements, student papers, school curriculum, cavalry journal articles, and miscellaneous reports show both American and British cavalrymen working with aviation as much as they were able. Circumstances made the Britain cavalry less able to cooperate with air than their American counterparts, who fought for aviation into the 1940s despite obstruction from the air force personnel and politicians supporting independent aviation.

Cavalrymen used similar arguments against mechanization as they had against aviation, but their resistance to these innovations was not an indication of anti-technological or reactionary thinking, but simply a prudent caution in the face of unproven novelty. Amongst their warnings about exaggerated predictions and technological limitations, cavalrymen argued that mechanization could strengthen the cavalry and be just as or even more helpful than airplanes. Yet mechanization proved the more transformative threat. Budget cuts and mechanized vehicles such as tanks, combat cars, and armored cars proved unstoppable enemies to the horsed cavalry. By the end of the decade, the British had completely converted to mechanization, except for a few ceremonial regiments. The Americans followed that path more slowly, finally retiring their horse cavalry at the end of the Second World War.

CHAPTER VII

CONCLUSION

In the chapter called "Opponents of Mechanization," of his dissertation about

cavalrymen and mechanization, Alexander Bielakowski accused John K. Herr, the last

commander of the American horse cavalry, of being "opposed to the new paradigm of

mechanization" and furthermore claimed that Herr's support for the retention of the

horse was motivated by nothing more than "personal and emotional attachments to the

symbol of [his]. . . profession."[1] Yet this explanation is too simplistic. The predictions

Herr made about needing the horse in the future have, in a way, come true. After the

American cavalry was officially dismounted in the early 1940s, he warned that horses

had not outlived their usefulness. Unless horsemanship training restarted, he feared the

knowledge needed for campaigns in regions where terrain and other factors made the

new modern technology (jeeps, trucks, motorcycles, airplanes, and tanks) unusable

would be lost. Herr realized that the skills required for mounted action would be

difficult to recreate on demand.[2] He was correct. The United States military has needed

horses since the cavalry was disbanded, most recently in Afghanistan, and the loss of the

necessary skills has adversely affected performance, as evidenced by the mishaps of an

American soldier who repeatedly fell off of his horse, as reported by the PBS television

---

[1] Alexander Magnus, Bielakowski, "U.S. Army Cavalry Officers and the Issue of Mechanization, 1920-1942," (PhD diss., Kansas State University, 2002): 93.
[2] John K. Herr and Edward S. Wallace, *The Story of the U.S. Cavalry 1775-1942,* (Boston: Little, Brown, 1953): 261.

series *Frontline*.[3] In another case, a Special Force team mounted on Afghan ponies was saved from falling off steep cliffs only by the fortunate knowledge of its commander, who happened to be a high school rodeo rider in his younger years. American Special Forces in Afghanistan used horses with wooden saddles and camels to transport men and materials and to conduct reconnaissance through rugged terrain too difficult to cross by Humvees and tanks.[4]

Cavalrymen's prediction that horses would be useful in future conflicts should not be automatically dismissed as an unreasonable or illogical attachment to the past, or a sentimental regard for animals. The expense of maintaining a horse cavalry over the past seventy years just for occasional use would probably not have justified the expense required, but cavalrymen were correct that horses would be useful in future wars. Labeling cavalry officers as sentimental or anti-technological for listing the limitations of new technologies or defending the continued utility of horses is too simplistic. Cavalrymen recognized the value of aviation and mechanization but rejected the contentions that these innovations made the horse cavalry unnecessary. Regardless of the tendency of a few cavalrymen to sentimentally defend the horse, the cavalries of the United States and Britain continually examined and attempted to incorporate new technologies throughout the beginning of the twentieth century. Even Herr called for a combination of horse and mechanized cavalry units.

[3] http://www.pbs.org/wgbh/pages/frontline/shows/campaign/ground/warstories.html.
[4] Stephen Biddle, *Afghanistan and the Future of Warfare: Implications for Army and Defense Policy* (Carlisle, PA: Strategic Studies Institute, 2002): 9-10. See also Doug Stanton, *Horse Soldiers: The Extraordinary Story of a Band of U.S. Soldiers Who Rode to Victory in Afghanistan* (New York: Scribner, 2009.)

Herr and his fellows understood that the cavalry would still provide value in situations where the limitations of technology prevented airplanes and mechanized vehicles to be employed, as was demonstrated during the Great War and in maneuvers up through the 1930s. Cavalry journals, committee reports, and other publications show an officers' corps not opposed to the airplane, aviation, aviators, or mechanization advocates on principle but a group attacking the belief that cavalry was obsolete due to new technological advancements and those who supported that claim. Discussions of the limitations of new technologies had less to do with a distrust or hatred of technology and more with debunking the theories of overly optimistic supporters of modern war weapons elicited in part by national movements for economy and modernization. The cavalry desired to incorporate aviation technology well into the 1930s, and in the case of the United States all the way until the early 1940s. This desire was clear in the cavalry's move to test autogiros. The branch was still attempting to gain control of its own aircraft to maintain the organization's usefulness when the Second World War commenced.

Defense of the horse in the 1930s may seem to prove that the cavalry was conservative and backward, yet that does not explain the American cavalry's trials of experimental aircraft during those same years. Although the cavalry may have gained its reputation of backwardness due to its defense of the horse, the 1930s also provided the example of its push for new innovations, especially its experimentation with new types of aircraft. Rather than criticize cavalrymen's lack of vision about the future impact of airplanes and mechanization or their attachment to horses, it is better to understand the cavalry's experience with airplanes during the more than thirty years the two coexisted.

American and British cavalrymen encountered advancing technologies that had the potential to change war which would have directly altered the cavalry's armament, tactics, and overall role. They did not reject these technologies outright but neither did they embrace them unquestioningly. Their position, that they wanted to subject the innovations to tests in the field before adopting or rejecting them, cannot be faulted. Cavalry officers were cautious. They were not Luddites who rejected and attempted to destroy the technology that challenged their way of life, but realists who cautiously examined its capabilities and utility for their branch.

Before the turn of the twentieth century, American and British cavalrymen were modernizing their branches to keep up with changing military conditions that included a variety of possibly revolutionary technologies. Before 1903, British and American cavalrymen actively participated in reforms to meet the demands of modern warfare, through the professionalization of their branches, the founding of military service schools and professional societies, the studying of military history and recent conflicts, and the publication of journals intended to be forums for the discussion of their problems and opportunities. Influencing how the United States and Great Britain responded to modern conditions were their respective histories, traditions, and culture. The differences between these two nations and within each country's mounted forces were based on the age and history of their branches, the organization of their mounted forces, their wartime experiences, public opinion, and their differing approaches to professionalization.

American and British cavalrymen did not entirely share the same understanding of the roles, armaments, and purposes of their branches. The American cavalry was a much younger and more flexible organization. During its short history, it had been utilized mostly as a dragoon force, equally comfortable fighting mounted or dismounted. American cavalrymen also recognized the importance of their screening, scouting, and reconnaissance functions to its continued utility to the army. Their pragmatic doctrine was based on current conditions and not historical examples of massed cavalry charges, as was too often the case with their European counterparts. Since its inception, American cavalry had not fit the traditional definition of cavalry as primarily a mounted battlefield charging force with its leaders expected its further development to continue along the same line.

In contrast, British cavalrymen were members of a service that had existed for centuries and had built their pride and spirit around their use in the knee-to-knee charge. Although they were trying to reform themselves to address modern war conditions, disagreements abounded. Throughout the early twentieth century, British cavalrymen engaged in a long and passionate debate about whether the branch was to fight as mounted infantry or as cavalry utilizing sword and lance *en masse* in the *arme blanche*. The British cavalry focused on internal disagreement involving issues of training, tactics, and equipment greatly hindering its ability to fight a united battle against the outside danger of aviation taking over its reconnaissance functions. British cavalrymen also had to defend the uniqueness of its branch—mobility and the use of *arme blanche* tactics—against other supposedly cheaper mounted units.

American and British cavalrymen from 1903 until the Great War responded to the potential loss of role and missions to aviation differently due to their divergent assessments of the importance of reconnaissance, unique threats expressed in newspapers and periodicals, dissimilar experience with aviation, and their proximity to potentially hostile neighbors which affected how each estimated the urgency of war preparations. The American cavalry was consistently skeptical of aircraft while the British cavalry lacked a consistent unified position and was willing to allow aircraft to take over its reconnaissance duties, which it considered a low-priority. Beyond the theoretical debates, individuals within the American and British militaries addressed the real-world challenges of technologies in transition when no one was certain what airplanes could actually accomplish in the present or near future.

The American and British cavalries' responses to the airplane prior to, during, and after the Great War demonstrated they were rationally cautious about the ability of aviation to perform and take over cavalry duties. With little experience with the new technology, they saw it as having far too many limitations and drawbacks to fulfill the predictions made by its supporters. Yet they discussed it, experimented with it in maneuvers, and with time, realized it might be a useful auxiliary to the mounted branch. Some cavalrymen even welcomed aviation to replace or supplement what they considered the less prestigious cavalry functions, once airplanes became developed enough to fill these roles.

Newspaper coverage of airplanes in the United States and Great Britain varied. Military and civilian analysis of the technical primitiveness and limitations of early

aircraft received the most attention in Britain, while across the Atlantic the general

attitude was that airplanes would revolutionize warfare. Predictions that airplanes would

soon replace the cavalry branch quickly appeared in the American press. The lack of

direct evidence in the capabilities of aviation in no way impeded the enthusiasm of

writers in attacking those who did not immediately and whole-heartedly embrace the

new technology. More temperate news articles that discussed the abilities of airplanes to

assist and cooperate with the cavalry and other military branches did not have the impact

of the more sensational accounts.

After initially ignoring the airplane, American cavalrymen gave greater attention

to airplanes following a 1912 movement to reduce their branch. They realized it was a

new tool to be considered seriously in any debate about roles, strategy, tactics, and

planning. Their responses included the cautiously optimistic belief that airplanes would

make a valuable and possibly essential adjunct to cavalry in reconnaissance and

scouting. Yet flying machines still suffered from the same shortcomings that had been

identified in the years before 1912, including their inability to function in poor weather

and bad terrain.

As aircraft became more reliable and capable each year, American cavalrymen

began to admit the possibility of conceding the reconnaissance role to aviation

altogether. However, like those before them in the *JUSCA,* they attempted to turn this

loss to a victory. Cavalrymen argued that losing this duty could strengthen the cavalry

by freeing it up for other important missions and denied that relinquishing this role made

the cavalry obsolete or diminished its importance. Reports from military operations and

maneuvers confirmed the beliefs of American cavalrymen that airplanes could not entirely replace the cavalry in reconnaissance roles.

Unlike their American colleagues, British cavalrymen responded quickly to the airplane in print. The proximity to Britain of other nations developing aviation, especially France and Germany, made the new technology hard to ignore. The British cavalry's treatment of airplanes before 1912 was largely positive, arguing that it would benefit the cavalry if airplanes assisted in or even appropriated its reconnaissance role. Yet, despite seeming willing to share if not cede its reconnaissance roles even before 1912, British cavalrymen actively combated the idea that aviation would make them obsolete. Unlike the Americans, some British cavalrymen insisted that reconnaissance was not the primary role of their branch.

Following the Great War charges that the cavalry had either functionally or financially outlived its usefulness compelled cavalrymen to greater efforts. Cavalrymen used examples from the war to support their current usefulness and participated in maneuvers to demonstrate their value on a battlefield composed of a combination of forces as well as challenging the ability of aviation to take over its reconnaissance roles completely.

By late 1919, American cavalrymen were working with the Army Air Service Border Patrol to solve the problem of communication between the air and ground units revealed by their joint border patrols. Although short-lived, the patrols provided an opportunity for the development of cooperation between air and land forces in the continental United States. Reports of several maneuvers in the 1920s portray an

American cavalry seeking to improve the understanding and cooperation between the cavalry and air corps. The army air services partially reciprocated cavalry attempts at cooperation.

British doctrine also supported the importance of combined forces, yet conflict emerged as a result of the organizational structure of the British forces. The American situation was an internal army matter, whereas the British system involved two separate services, the army and air force. The arrangement made combined training in the postwar military more difficult to coordinate because of the additional administrative steps involved. However, British combined training was more structured than its American counterpart. Early maneuvers provided concrete information on the capabilities and limitations of the cavalry and the air services in cooperation and demonstrated the need for cavalry to fill the holes in aviation employment. Some cavalrymen desired an even greater integration of aviation into existing branches. Combined training led some cavalry officers to think that simply attaching an air unit to a cavalry division was insufficient.

The maneuvers demonstrated that additional cooperation was needed between all units including the cavalry and aviation. These operations supported the conclusion that neither cavalry nor aviation could fulfill the roles of the other. Early conclusions from the lessons of the war and combined training led to the creation of manuals, field service regulations, and military school handbooks that provided detailed explanations of the joint uses of aviation and cavalry in communication, reconnaissance, and security. The core lesson was the importance of combined operations among all military units.

As time passed, however, the cavalry's position lost support in military policy circles, especially in Great Britain. Cooperation between air and land forces in Great Britain was problematic. Despite the willingness of the cavalry to work with the RAF, aviators were no longer interested in discussing or training for joint operations. The head of the RAF played down its cooperative roles with cavalry, claiming that if reductions in its size were necessary, they should be applied to units assisting the army and cavalry.

Despite cavalrymen's efforts to modernize and cooperate closely with the developing aviation services, unceasing postwar attacks against the cavalry forced some cavalry officers to focus their attention on defending the continued need for their branch. These officers resurrected the old prewar arguments to defend the continued necessity for the cavalry, such as blaming the tendency of Americans to accept too readily new technologies over old ones and enumerating the limitations of airplanes in certain weather and terrain conditions. In addition, as before the war, cavalrymen advanced the belief that aviation was not an enemy of the cavalry, but a technology that strengthened mounted units.

While many cavalry arguments were inspired by technological limitations of aircraft at the time, one emotional argument existed. This resurfacing argument, popular with cavalry of all ranks, was the faith in the man or the man and his horse over the machine, the contrast of the moral superiority of the cavalryman and his horse to the cold unfeeling flying machine. The belief in the fighting power of the soldiers was not confined to a few or limited to the cavalry. This spirit of man overcoming all

technological innovations rarely appeared in pre-war military writings, but blossomed during the 1920s.

During that decade, cavalrymen continued to work on modernizing their organization and testing new technologies. They were forced to respond to frequent accusations that the use of airplanes, tanks, and other modern weapons in the recent war proved that the horsed cavalry was an obsolete arm with no future. Cavalrymen rejected the idea that these new advancements made the cavalry outdated. Instead, both the American and British cavalries contended that while aviation could accomplish some of the cavalry's roles, such as strategic reconnaissance, many situations still required cavalry where the limitations of technology prevented airplanes' employment, as had been demonstrated during the Great War and in maneuvers and exercises during the 1920s. Cavalry journals, committee reports, and other publications, as well as training, maneuvers and doctrine show a cavalry not rigidly opposed to aviation but a group actively engaging theoretically and practically in determining how to work with these new technological advancements. Discussions of the limitations of new technology had less to do with a distrust or hatred of technology and more with debunking the theories of overly optimistic supporters of aviation elicited in part by movements for economy and modernization.

The greatest divergence between the American and British cavalry's experience with aviation occurred in response to their national commitments. Central in the debates over economy and modernization in Britain were attempts to police the British Empire and mandated territories in the 1920s and 1930s. A concerted campaign supported

aviation at the expense of the horse cavalry, claiming the former was more effective and cheaper. The Americans had no such requirement.

Although it was becoming clearer that recent innovations would one day replace the cavalry, cavalrymen maintained that the day still had not arrived and were supported by senior military personal and government officials who testified in front of various committees in control of military expenditure that the cavalry was still useful and that further reductions would damage it. The committee members, however, appeared to already have their minds made up and called for cavalry reduction. As reductions commenced, they were stalled on a few occasions when officers warned of the danger of overhasty reductions. Unfortunately for the witnesses and their supporters, their testimony did little to halt the continued reduction of the cavalry.   Air advocates won the public relations and budget battles. Their assertions that air policing were cheaper than ground and mounted troops were accepted. Although it became clear upon deeper analysis that the success of independent air policing was a myth unsupported by fact, the contemporary belief in its value provided support to maintain the RAF and to continue to advocate reducing national expenditure by reducing ground instead of air forces.

Unlike in Great Britain, the need to patrol the U.S.-Mexican border elicited demands for increased cavalry establishments for a few years after the end of the Great War. U.S. attempts at postwar economy hindered the development of aviation. The connection between aviation and cavalry was not entirely ignored in the United States but a direct connection was often neglected.

By the late 1920s, aviation ceased to be seen as the cavalry-killing technology. Like machine guns, bicycles, and motorcycles, aviation had altered the roles and employment of the cavalry but the mounted branch continued to exist and perform most of its traditional missions. Instead of replacing the cavalry, these innovations worked cooperatively with cavalry in reconnaissance, security, communication, protection, and pursuit, an arrangement tested in maneuvers and officially blessed in both British and American doctrine. However, just as cavalrymen were becoming dependent on airplanes, this relationship altered drastically. The change centered on the shift in aerial doctrine to focus on independent strategic bombardment instead of the tactical support of ground troops. Strategic bombing took the preeminent position in the doctrine and theory of both the Air Corps in the United States and the Royal Air Force in Britain, which changed the tone and content of the cavalry debates in the 1930s. These air arms no longer sponsored the development of aircraft for tactical support nor did they apply much effort to the creation of doctrine for tactical aviation.

As a result, cavalry demonstrated its progressiveness by attempting to find a replacement for its roles appropriated and then neglected by the air force. Tactical aviation, particularly observation and liaison duties, required slower moving aircraft than were under development. Slower landing and operational speeds allowed for closer support of troops. The autogiro became the focus of ground forces' attempts to develop their own tactical air assets. Despite its possibilities, in the end, the autogiro was a technological failure since it was never widely adopted commercially or militarily and it never became a part of the American cavalry or the Army. Nevertheless, the cavalry's

286

intensive testing of the experimental aircraft demonstrated a desire to develop and deploy an aerial tool for its missions. Instead of aircraft threatening the cavalry, the American and British cavalries experimented with new air machines to maintain their existence.

By the early 1930s, mechanization in the form of tanks and motor cars replaced aviation as the new technological challenges to the cavalry. Although previous technological innovations had not replaced the cavalry entirely, mechanization advocates circulated familiar sounding predictions about the ability of the new technologies to replace the horse cavalry. Cavalrymen used the example of aviation to show how, yet again, the technological promoters were mistaken and armored and mechanized vehicles did not make the cavalry obsolete.

The cavalry responded to mechanization in much the same way that it replied to aviation. The difference was that unlike aviation, mechanization directly threatened the horse yet provided an opportunity for the cavalry to retain its roles and élan—but only by transforming itself. Testing the possibilities and use of new technologies in training maneuvers in the 1930s with armored cars and tanks mirrored those of the 1920s with aircraft. As before, cavalrymen argued that the maneuvers showed the importance of cooperation between horsed and mechanized units, not that the latter replaced the former. Major limitations were listed including operational difficulties in certain terrain, dependence on bases of fuel supply and carrying spare parts for field repairs.

Although regulations and practice demonstrated that aviation did not make the cavalry obsolete, the contention that the cavalry branch and its leaders were backward

and conservative took a powerful visual form of Colonel Blimp of the British cavalry, an image that lasted for many decades. Wearing his traditional uniform and spurs while riding in his tank, Colonel Blimp became the representation of a coherent reactionary outlook. To characterize all cavalrymen who defended the continued utility of the cavalry and horse as hide-bound anti-intellectuals did a disservice to the majority, who pragmatically addressed new technologies. Yet there were some cavalrymen who resorted to sentiment and emotion in the face of the seemingly inexorable pace of progress. These romantic anti-technological arguments may be the cause of the conservative stereotype attributed to many cavalry officers by historians and contemporaries over the past century. But they were uncommon; most cavalrymen were excited by the opportunity to evaluate the capabilities of new technologies in maneuvers and operations instead of merely trusting the opinions of salesmen or the public.

Unlike the debates about aviation in the 1920s, the discussion about mechanization and the cavalry in the 1930s centered not on whether the cavalry branch was obsolete but whether the cavalry should be horsed or mechanized. This debate garnered a few extreme responses as it challenged the future of the horse. The arguments and terms used in this decade increasingly tied the threat to the cavalry branch to the defense of the animal over the machine. It is easy to see why in this period cavalrymen were open to attacks of being unthinking, anti-technological, and conservative. Yet focusing on the defense of the traditional horsed cavalry masks the

true nature of the cavalry's response to technology. The tactic was uncharacteristic of previous arguments during the first twenty years of military aviation.

There is an irony in that much of the criticism of cavalrymen ("the old") in the early twentieth century was originated by the advocates of aviation ("the new"), whose twenty-first century successors are facing a similar challenge of their own. In recent years, the United States Air Force has been experiencing similar debates regarding Unmanned Aerial Vehicles (UAVs). As in the early days of aviation, many politicians and military officers have praised the capabilities of the new technology to improve reconnaissance and conduct precision strikes on enemy targets without putting American lives in jeopardy. Yet Air Force fighter pilots have responded negatively to the affect this technology is having on their position and preparedness of their service for future wars. A September 19, 2009, article in *Newsweek* entitled "Attack of the Drones" stated that a "fierce fight is on for the mission, culture, and identity of the Air Force, and the Top Guns are losing." Drones are cheaper than manned aircraft and their adherents claim they have the same capabilities. Their opponent argue that without a human in them to make on-the-spot and instantaneous decisions, drones are less flexible than aircraft with crews. The article characterized the supporters of the F-22, a fighter plane, defining the Air Force as "fast, agile planes dogfighting in the sky" in conflicts against another industrialized nation. Fighter-pilot generals worried that there will not be enough F-22s if needed in a future war between large air powers. [5] This argument

---

[5] "Attack of the Drones," Newsweek, September 19, 2009, accessed January 6, 2011, http://www.newsweek.com/2009/09/18/attack-of-the-drones.html.

mirrors that of horse cavalrymen who argued that at least one regiment of horse cavalry should be retained in case it is needed in the future.

This is not the first time that the Air Force has fought a similar battle over its service's missions. General Curtis LeMay, who in the 1950s led the Strategic Air Command, the American bombing force, was opposed to the "development of the intercontinental ballistic missile, which he feared would supplant the long-range bomber. He did not want the Air Force to become "the silent silo-sitters of the '60s.'" Yet in neither of these cases were air force pilots or bomber pilots called luddites for their caution with new technologies. The Air Force has never been characterized as an anti-technological organization nor calls to put UAVs under the control of a new service branch. Fighter-pilots are unlikely to join horse cavalrymen or Luddites as typical examples of backwardness or reactionary stupidity in responding to new technologies in the near future because of the Air Force's clearly technological culture but other such cautious technological examiners of a new technology may not be so fortunate. The hope is that this project encourages scholars not only to examine more groups of technological examiners but to avoid missing the journey of technological change and incorporation by concentrating on the conclusion.

NOMENCLATURE

AFB	Air Force Base
AFHRA	Air Force Historical Research Agency, Maxwell Air Force Base, Montgomery, AL
CGSC	Command and General Staff College/School
CJ (UK)	*Cavalry Journal*, United Kingdom
CJ (US)	*Cavalry Journal*, United States
FSR	*Field Service Regulations*
GPO	Government Printing Office
HMSO	His Majesty's Stationery Office
JUSCA	Journal of the United States Cavalry Association
MHI	U.S. Army Military History Institute, Carlisle, PA
NACP	National Archives 2, College Park, MD
RG	Record Group

REFERENCES

Archive Sources

Air Force Historical Research Agency (AFHRA), Maxwell Air Force Base, Alabama
        Air Corps Tactical School Collection
        Army Air Service Collection
        Benjamin D. Foulois Papers
        Frank Purdy Lahm Collection
        Grover O'Neill Collection

The British National Archives, London (TNA)
        Air Ministry and Royal Air Force Records (AIR)
        Cabinet Office Series (CAB)
        Public Record Office Series (PRO)
        Treasury (T)
        War Office Series (WO)

Military History Institute, Carlisle, PA (MHI)
        United States Army, Air Service, "Annual Report of the Chief of Air Service for the Fiscal Year ending June 30, 1922." Washington: GPO, 1922.
        Paul W. Beck, Lecture on Aeroplanes United States Army.
        American Expeditionary Forces, *Report of Superior Board on Organization and Tactics.* United States?: s.n., 1919.
        Cavalry School Department of Tactics, *Employment of Cavalry,* 1924-1925, Fort Riley, KS: Cavalry School, Dept. of Tactics, 1925.
        World War I Veterans Survey Collection, 1898-1941

National Archives 2, College Park, Maryland (NACP)
        Office of the Chief of Cavalry, Records of the Chiefs of Arms, RG 177

Primary Sources

"The Action of the Future." *Journal of the United States Cavalry Association* 19 (January 1909), 635-641.

"Aero Aids Maneuver." *Washington Post*, October 16, 1914.

"The Aeroplane in War." *Journal of the United States Cavalry Association* 21 (November 1910): 536-539.

"Aeroplane in War: French Expert Says It May Supercede Cavalry." *New York Times*, August 14, 1908.

"The Aeroplanes and the Cavalry." *Cavalry Journal* (US) 23 (July 1912): 123-125.

"Aeroplanes at the Army Manoeuvres." *Times* (London). September 3, 1912.

"Aeroplanes Built to Fly All Over the World." *Wall Street Journal*, January 12, 1916.

"Aeroplanes in Wars of Future: Aviators Declare Air Vessels Must Constitute Cavalry of Army." *Indianapolis Star*, December 24, 1911.

"Aeroplanes the Things." *Detroit Free Press*, March 17, 1907.

"A. F. V." "Cavalry and Tanks." *Cavalry Journal* (UK) 24 (1934): 449-455.

A. G. G. "Life and Politics." *Nation and the Athenaeum* 37 (April 1925): 41-42.

"Air Attack on U.S. Peary's Prediction." *Boston Daily Globe*, November 25, 1917.

Air Ministry-Air Historical Branch (Great Britain). *A Short History of the Royal Air Force.* [S.I.] Air Ministry, July 1936.

Allen, Terry de la Mesa. *Reconnaissance by Horse Cavalry Regiments and Smaller Units.* Harrisburg, PA: Military Service Publishing, 1939.

Allenby, E. H. H. "Cavalry in Future Wars." *Cavalry Journal* (US) 30 (January 1921): 1-2.

"Allies Win by Putting on Wheel and Wing: See Cavalry of Air and Tanks for All Troops in Near Future." *Chicago Daily Tribune,* August, 11, 1918.

"And Now the Autogiro," *Field Artillery Journal* 28 (1937): 3-17.

Anderson, Edward "Comment and Criticism on 'Mounted Rifles.'" *Journal of the United States Cavalry Association* 13 (April 1903): 719-722.

Andrus, E. P. "The Saber." *Journal of the United States Cavalry Association* 4 (December 1892): 373-382.

Annual Report of the Commandant General Service and Staff College for the School Year Ending August 31, 1904. Fort Leavenworth, KS: Staff College Press, 1904.

Annual Report of the Commandant Infantry and Cavalry School and Staff College for the School Year Ending August 31, 1905. Fort Leavenworth, KS: Staff College Press, 1905.

Annual Report of the Commandant U.S. Infantry and Cavalry School, U.S. Signal School and Army Staff College for the School Year Ending August 31, 1907. Fort Leavenworth, KS: Staff College Press, 1907.

"The Army Aeroplane Accident." *Times* (London), September 9, 1912.

"Army Air Scouts Do Great Work." *New York Times*, April 12, 1914.

Army Air Service Hearing Before the Committee on Military Affairs United States Senate 69th Congress First Session on H.R. 10827 May 10, 1926, 42.

Army and Navy Journal. "Is the Cavalry Obsolete?" *Hartford Courant* November 2, 1903.

Arnold, H.H. "The Cavalry-Air Corps Team." *Cavalry Journal* (US) 37 (January 1928): 70-76.

"Attack of the Drones." Newsweek*,* September 19, 2009. http://www.newsweek.com/2009/09/18/attack-of-the-drones.html

Augur, J. A., et. al. "Comments on Mounted Rifles." *Journal of the United States Cavalry Association* 13 (January 1903): 386-407.

Bannerman-Phillips, H. "Air-craft in Co-operation with Cavalry." *Nineteenth Century and After* 69 (1911): 798-810.

———. "The Future of Airships in War." *United Service Magazine* 37 (September 1908): 589-594.

Barnes, George T. *The Necessity for Coordination of Reconnaissance Activities of a Cavalry Division—Aviation—Armored Car.* (Combined Arms Research Library, CGSS Student Papers, 1936) Fort Leavenworth, KS: Command and General Staff School, 1936.

Barnum, Malvern-Hill "A Chief of Cavalry." [Letter to the Editor] *Journal of the United States Cavalry Association* 15 (April 1905): 946-949.

Barrow, George. "The Future of Cavalry." *Cavalry Journal* (UK) 19 (January-October 1929): 176-184

Barrows, John Stuart. "The Uhlans and Other Cavalry in the European War." *Journal of the United States Cavalry Association* 26 (January 1916): 390-398.

Battine, Cecil. "The German Cavalry Manoevures of 1911." *Cavalry Journal* (UK) 7 (1912): 47-52.

Bell, M.S.E. Harry. "The First Aeroplane under Fire." *Journal of the United States Cavalry Association* 22 (May 1912):1128-1130.

Benson, C. C. "Mechanization Aloft and Alow." *Cavalry Journal* (US) 38 (January 1929): 58-62.

Bernhardi, Friedrich von. *Cavalry in Future Wars.* London: John Murray, 1909.

———. Cavalry *in War and Peace.* London: H. Rees, 1910.

Bigelow, John Jr. *The Campaign of Chancellorsville, a strategic and tactical stud.* New Haven, CT: Yale University Press, 1910.

———. *The Principles of Strategy: Illustrated Mainly from American Campaigns*. 2nd edition. Philadelphia: J. B. Lippincott, 1894

———. *Reminiscences of the Santiago Campaign.* New York: Harper and Brothers, 1899.

———. "The Sabre and Bayonet Question," *Journal of the Military Service Institute of the United States* 3 (1882): 65-96.

Blunt, J. Y. "The Shock Action of Cavalry." *Journal of the United States Cavalry Association* 5 (1892): 33-45.

"Boots and Saddles." "Cavalry Equipment." *Journal of the United States Cavalry Association* 21 (March 1911): 966-969.

Borton, A.E. "The Use of Aircraft in Small Wars." *Journal of the Royal United Service Institution* 65 (1921): 310-319.

Bradford, K.S. "Modern Cavalry." *Infantry Journal* 35 (December 1929): 558-566.

Brechard, General. "The French Cavalry." *Cavalry Journal* (US) 38 (October 1929): 486-517.

Brown, H. Clifton. "The Training of Cavalry in Battle." *Cavalry Journal* (UK) 7 (January-October 1912): 156-160.

Butler, M. C. "The Saber." *Journal of the United States Cavalry Association* 14 (July 1903): 142-144.

"By other editors," "Cavalry Still Useful," *Christian Science Monitor,* September 19, 1918, 6.

Cammell, R. A. "Aeroplanes with Cavalry." *Cavalry Journal* (UK) 6 (1911): 197-199.

Campbell, R. A. "Aeroplanes with Cavalry." *Cavalry Journal* (US) 22 (September 1911): 311-314.

Candler, Edmund "The Aeroplane in Mesopotamia." *Times* (London)*,* November 2, 1916.

Carter, William Harding. *Horses, Saddles and Bridles.* Leavenworth, KS: Ketcheson and Reeves, 1895.

"Cavalry Affairs before Congress." *Cavalry Journal* (US) 48 (March-April 1939): 130-135.

"Cavalry and the Mounted Infantry." *Journal of the United States Cavalry Association* 17 (October 1906): 363-366.

"Cavalry, an Essential Arm." *Cavalry Journal* (UK) 12 (January 1922): 6-8.

"Cavalry and the Aeroplane." *Journal of the United States Cavalry Association* 20 (November 1909): 617.

"Cavalry at Waterloo." *San Francisco Chronicle* March 22, 1896, 7.

"The Cavalry Division Reconnaissance." *Times*, September 9, 1912.

"'Cavalry Journal' Committee." *Cavalry Journal* (UK) 16 (1926): 1-3.

A Cavalry Officer Abroad. "The Question of Organization." *Journal of the United States Cavalry Association* 25 (October 1914): 199-220.

A Cavalry Officer Abroad. "Report Upon Year Spent with French Cavalry." *Journal of the United States Cavalry Association* (January 1915): 446-447.

"The Cavalry Spirit." *Cavalry Journal* (UK) 12 (January-October 1922): 225.

Cavalry Training Volume I: Training 1931. London: His Majesty's Stationary Office, 1931.

Cavalry Training Volume II, War 1929. London: His Majesty's Stationary Office, 1929.

"Cavalry's Last Days." *Kansas City Star,* June 18, 1917.

Chaffee, Adna R. "The Army of the United States." *Cavalry Journal* (US) 47 (March-April 1938): 110-113.

———. "The Maneuvers of the First Cavalry Division, September-October 1923." *Cavalry Journal* (US) 33 (April 1924): 133-162.

———. "Mechanization in the Army." General Staff: Combined Arms Research Library, 1931.

Charrington, H. V. S. "Where Cavalry Stands To-day." *Cavalry Journal* (UK) 17 (January-October 1927): 419-430.

Childers, Erskine. *German Influence on British Cavalry.* London: E. Arnold, 1911.

———. *War and the Arme Blanche.* London: E. Arnold, 1910.

"Chief of Cavalry." *Journal of the United States Cavalry Association* 19 (July 1908): 197-198.

Cierva, Juan de la and Don Rose. *Wings of Tomorrow: The Story of the Autogiro.* New York: Brewer, Warren and Putnam, 1931.

Clark, Cuyler L. "Maneuvers of 1st Cavalry Division." *Cavalry Journal* (US) 40 (September-October 1931): 10-18.

Colby, Elbridge. "The Horse in War Today and Yesterday: I—Cavalry Still a Factor in Military Warfare." *Current History* 28 (1928): 446-452.

"Comment and Criticism-Mounted Rifles." *Journal of the United States Cavalry Association*13 (April 1903): 718-723.

"Constitution of the United States Cavalry Association." *Journal of the United States Cavalry Association* 13 (July 1902): 97-100.

Contributed. "Cavalry Organization." *Cavalry Journal* (US) 29 (July 1920): 116-121.

Cooke, Philip St. Geo. *Cavalry Tactics or Regulations for the Instruction, Formation, and Movements of the Cavalry of the Army and Volunteers of the United States.* Washington, DC: Government Printing Office, 1861-2.

Cooke, Philip St George. "Our Cavalry," *United Service* 3 (July 1879): 329-346.

Coulter, John B. "Cavalry-Infantry Maneuvers, 1930." *Cavalry Journal* (US) 39 (July 1930): 349-365.

Croft, W.D. "Notes on Armoured Cars." *Cavalry Journal* (UK) 15 (1925): 160-175.

Crombie, D.C. "Cavalry in Frontier Warfare." *Cavalry Journal* (UK) 5 (1910): 358-369.

Crosby, H. B. "Cavalry of Today." *Cavalry Journal* (US) 36 (October 1927):
    Frontispiece.

Cruikshank, J.R.H. "How the Cavalry Exploits a Victory: Being Extracts from the Diary
    of a Subaltern under Allenby in Palestine." *Cavalry Journal* (US) 32 (April
    1923): 163-170.

Dade, A. L. "Reducing the Cavalry of the Regular Army." *Journal of the United States
    Cavalry Association* (UK) 22 (May 1912): 1010-1016.

Davis, Edward. "The British Cavalry in Palestine and Syria." *Cavalry Journal* (US) 31
    (April 1922): 123-129.

———. "The British Cavalry in Palestine and Syria." *Cavalry Journal* (US) 31 (July
    1922): 270-277.

———. "The British Cavalry in Palestine and Syria." *Cavalry Journal* (US) 31
    (October 1922): 395-402.

———. "The British Cavalry in Palestine and Syria." *Cavalry Journal* (US) 31
    (January 1923): 56-65.

———. "The British Cavalry in Palestine and Syria: Conquest of Syria (continued)."
    Cavalry Journal (US) 32 (October 1923): 435-444.

Davis, George B. "The Reorganization of the Cavalry." *Journal of the United States
    Cavalry Association* (March 1912): 797-805.

Davison, Paul. "The Cavalry's Cavalry: A Study of Armored Cars, Their Powers and
    Limitations, and Some Notes as to Their Tactical Employment." *Cavalry
    Journal* 36 (January 1927): 90-95.

De la Vergne, Captain. "A Few Words about European Cavalry." *Cavalry Journal* (US)
    29 (July 1920): 155.

De Lisle, H. de B. "The Strategical Action of Cavalry." *Cavalry Journal* (UK) 7
    (January-October 1912): 320-334.

Dillman, George. "1st Cavalry Division Maneuvers." *Cavalry Journal* (US) 37 (January 1928): 47-65.

———. "Joint Cavalry and Air Corps Training." *Cavalry Journal* (US) 36 (October 1927): 560-567.

"Dominion and Foreign Magazines." *Cavalry Journal* (UK) 15 (January-October 1925): 96-98.

Donaldson, Thomas Q. "The Revolver or Pistol Best Suited to Cavalry." *Journal of the United States Cavalry Association* 13 (July 1902): 71-74.

"Dragoons Wrecked German Air Fleet: French War Office Describes Night Attacks of Cavalry on an Aeroplane Camp." *New York Times,* November 29, 1914.

Drill Regulations for Cavalry United States Army Amended 1909 Corrected to January 1, Washington, DC: Government Print Office, 1911.

Dwan, Edward J. "The Reorganization of the United States Cavalry." *Cavalry Journal* (UK) 19 (January-October 1929): 602-615.

A Dweller on Earth. "A Little Bird Told Me." *Cavalry Journal* (UK) 18 (1928): 601-604.

Editorial, *American Aeronaut* 1 no. 3 (October 1909):115.

"Editorial." *Cavalry Journal* (UK) 28 (April 1938): 163-164.

Editorial and Professional Notes. "Military Aeroplanes." *Journal of the United States Artillery* 37 (Jan-Feb 1912): 102.

Editorial Comment. "A Cavalry Army." *Cavalry Journal* (US) 30 (October 1921): 418-420.

———. "The Cavalry Journal Reappears." *Cavalry Journal* (US) 29 (April 1920): 81-83.

———. "Modern Defense Policies Increase Importance of Cavalry." *Cavalry Journal* (US) 32 (October 1923): 450-451.

The Editor's Saddle. "Major General Leon B. Kromer." *Cavalry Journal* (US) 47
(March-April 1938): 164-167.

Edmunds, Kinzie B. "The Cavalry-Artillery-Aviation Team." *Cavalry Journal* (US) 42
(March-April 1933): 11.

———. "Tactics of a Mechanized Force: A Prophecy." *Cavalry Journal* (US) 39 (July
1930): 410-417.

———. and Rufus S. Ramey. "6th Cavalry at the Maneuvers of the 8th Brigade."
Cavalry Journal (US) 44 (September-October 1935): 21-29.

Eltinge, LeRoy. "Review of Our Cavalry Situation." *Cavalry Journal* (US) 29 (April
1920): 14-22.

E. S. "Chief of Cavalry." *Journal of the United States Cavalry Association* 18 (January
1908): 555-556.

"Exit the Cavalry…Enter the Tanks." *Popular Science Monthly* 119 (August 1931), 40-
41.

Fanshane, H. D. "Cavalry in Mesopotamia in 1918." *Cavalry Journal* (UK) 10
(January-October 1920): 414-429.

Farman, Elbert E. "The Cavalry in the Present War." *Journal of the United States
Cavalry Association* 26 (April 1916): 625-643.

Fauber, W. H. "U.S. Must Have Powerful Air Fleet: Armies and Navies Useless in
Modern Warfare Unless Aided by the Cavalry of the Air," *New York Times*
February 13, 1916.

Fickett, Edward M. "A Study of the Relationship between the Cavalry and the Air
Service in Reconnaissance." *Cavalry Journal* (US) 32 (October 1923): 412-422.

Field Service Regulations United States Army 1923. Washington, DC: Government
Print Office, 1924.

Field Service Regulations Volume I: Organization and Administration 1930. London:
His Majesty's Stationary Office, 1930.

Field Service Regulations Volume II: Operations—General 1935. London: His
    Majesty's Stationary Office, 1935.

Field Service Regulations Volume III: Operations—Higher Formations 1935. London:
    War Office, 1935.

Flint, H. A. "What a Cavalryman Should Know of the Air," *Cavalry Journal* (US) 42
    (July-August 1933): 5-11.

Foltz, F. S. "The Necessity for Well Organized Cavalry." *Journal of the United States
    Cavalry Association* 23 (March 1913): 723-745.

Formby, John. *Cavalry in Action in the Wars of the Future.* London: H. Rees, 1905.

"Foreign Magazines." *Cavalry Journal* (UK) 18 (January-October 1928): 664-668.

 "Foreign Magazines." Cavalry *Journal* (UK) 22 (1932): 298-300.

"Foreign Views on Mechanization." *Cavalry Journal* (US) 40 (July-August 1931): 64.

Foulois, Benjamin F. "Military Aviation and Aeronautics." *Journal of the Military
    Service Institution of the United States* 52 (1913): 98-119.

——— with C.V. Glines. *From the Wright Brothers to the Astronauts: The
    Memoirs of Major General Benjamin D. Foulois.* New York: McGraw-Hill,
    1968.

Fuller, Ezra B. Jr. "More Cavalry Instead of Less." *Journal of the United States Cavalry
    Association* 22 (March 1912): 972-983.

———. "Why We Need Cavalry." *Journal of the United States Cavalry Association*
    22 (March 1912): 966-969.

"Fundamentals of Cavalry Training Policy: Cavalry Memorandum No. I War
    Department, December 10, 1920. *Cavalry Journal* (US) 30 (April 1921): 180-
    185.

 "The Future of Cavalry." *Times* (London), April 25, 1912.

"The Future of Cavalry: A Lecture Given at the University of Bristol on 7th February, 1929." *Cavalry Journal* (UK) 19 (1929): 365-379.

"The Future of Flying." *Living Age*, September 10, 1910.

"Future Wars will be Fought in the Air." *New York Times*, Oct 29, 1907.

Gaston, J. A. "Divisional Cavalry on the March and in Action." *Journal of the United States Cavalry Association* 25 (April 1915): 600-607.

"General Hawkins' Notes." *Cavalry Journal* (US) 46 (May-June 1937): 239.

General Hawkins' Notes. "The Combination of Horse Cavalry with Mechanized Cavalry." *Cavalry Journal* (US) 47 (September-October 1938): 461-462.

General Hawkins' Notes. "Some Lessons from the War in Spain." *Cavalry Journal* (US) 47 (March-April 1938): 173-174.

Gerlach, William. "Thoughts about Cavalry." *Journal of the United States Cavalry Association 13* (January 1903): 372-379.

Gilpin, E. H. "Armament and Equipment of the Cavalryman." *Journal of the United States Cavalry Association* 22 (July 1911): 76-84.

Golovine, N. N. "Cavalry on the Flank and in the Rear." *Cavalry Journal* (US) 31 (January 1922): 40-59.

———. "Cavalry Reconnaissance: The Modern Service of Information and Cavalry's Role In It." *Cavalry Journal* (US) 31 (April 1922): 184-194.

———. "Modern Cavalry and Its Organization." *Cavalry Journal* (US) 35 (January 1926): 29-39.

Goltz, Colmar Freiherr von der. *The Conduct of War: A Short Treatise on Its Most Important Branches and Guiding Rules.* London: K. Paul Trench, Trubner, 1899.

Gray, Alonzo. *Cavalry Tactics: As Illustrated by the War of the Rebellion Together with Many Interesting Facts Important for Cavalry to Know.* Fort Leavenworth, KS: U.S. Cavalry Association, 1910.

Griepenkerl, Otto. *Letters on Applied Tactics.* Kansas City, KS: Hudson Press, 1906.

Griggs, Joseph W. "Cavalry and Riders of Air Close Rivals in Staging Thrills." *Nashville Tennessean and the Nashville American,* August 16, 1918.

Grow, R.W. "One Cavalry." *Cavalry Journal* (US) 47 (March-April 1938): 150.

Haig, Earl. "Introductory Remarks," *Cavalry Journal* (UK) 10 (April 1920): 5-6.

Harbord, James. "Cavalry in Modern War." *Journal of the United States Cavalry Association* 15 (April 1905): 765-771.

Hargreaves, Reginald. "Crisis in the Cavalry." *Cavalry Journal* (UK) 28 (1938): 596-607.

Harmon, Ernest N. "The Second Cavalry in the Meuse-Argonne." *Cavalry Journal* (US) 31 (January 1922): 10-18.

———. "The Second Cavalry in the St. Mihiel Offensive." *Cavalry Journal* (US) 30 (July 1921): 282-289.

Harris, Moses. "With the Reserve Brigade from Winchester to Appomattax-Fourth and Concluding Paper." *Journal of the United States Cavalry Association* 4 (March 1891): 3-26.

Hart, Basil Henry Liddell. "After Cavalry—What?" *Atlantic Monthly* 136 (1925): 409-418.

Hawkins, Hamilton S. "Cavalry." *Journal of the United States Cavalry Association* 26 (April 1916): 581-606.

———. "Cavalry and Mechanized Force." *Cavalry Journal* (US) 40 (September-October 1931): 19-25.

———. "German Ideas on Modern Cavalry." *Cavalry Journal* (US) 31 (April 1925): 155-168.

———. "The Importance of Modern Cavalry and its Role as Affected by Developments in Airplane and Tank Warfare." *Cavalry Journal* (US) 35 (October 1926): 487-499.

———. "The Role of Cavalry." *Cavalry Journal* (US) 29 (October 1920): 260-265.

———. "Some Observations on the Attack by Combined Arms." *Cavalry Journal* (US) 47 (March-April 1938): 146-149.

Hayne, Paul, Jr. "Organization and Employment of Cavalry Brigades." *Journal of the United States Cavalry Association* 24 (September 1913): 202-223.

Hearings before the Committee on Military Affairs, House of Representatives Seventy-Fifth Congress Third Session on H.R. 8143: To Authorize the Appropriation of Funds for the Development of the Autogiro (Washington, DC: Government Printing Office, 1938).

Hefferman, Leo G. "Co-operation between Cavalry and Air Service." *Cavalry Journal* (US) 34 (April 1925): 147-154.

Hennessy, F. B. "The Aviation Squadron in the Connecticut Maneuver Campaign." *Cavalry Journal* (US) 23 (November 1912): 455-477.

Herr, John K. "My Greetings to All Cavalrymen." *Cavalry Journal* (US) 47 (March-April 1938): 99.

———. "What of the Future?" *Cavalry Journal* (US) 48 (January-February 1939): 3-6.

Hickok, Howard R. "Chief of Cavalry." *Journal of the United States Cavalry Association* 18 (October 1907): 347-350.

———. "Role and Organization of Cavalry." *Journal of the United States Cavalry Association* 25 (July 1914): 50-76.

Holbrook, Willard A. "A Few Words to the Cavalry." *Cavalry Journal* (US) 29 (October 1920): 249-250.

"The Horse in War." *Cavalry Journal* (US) 34 (October 1925): 412.

"Horses and Motors" Reprint from the (Springfield) *Illinois State Journal Cavalry Journal* 45 (March-April 1936): 105.

Houghton, C. F. "Attack Aviation vs. Cavalry." *Cavalry Journal* (US) 38 (April 1929): 222-227.

"House of Commons." *Manchester Guardian*, August 3, 1909.

Hume, E.G. "Cavalry Today—Horse v. Machine?" *Cavalry Journal* (UK) 20 (1930): 180-182.

———. "Notes on Modern French Cavalry." *Cavalry Journal* (UK) 15 (January-October 1925): 27-38.

———. "Some Thoughts on Modern Reconnaissance." *Cavalry Journal* (UK) 18 (January-October 1928): 211-232.

An Infantry Transfer. "Impressions." *Cavalry Journal* (UK) 5 (July 1910): 348-353.

The Inspector of Cavalry. "What Lies Before Us." *Cavalry Journal* (UK) 1 (1906): 3-11.

"Iron Horses for the Cavalry." *Literary Digest* (March 19, 1932): 41.

Irvin, William R. *Combined Reconnaissance Operation by Cavalry and Aviation.* Fort Leavenworth, KS: Command and General Staff School, 1934.

Jacobs, Fenton. "The Cavalry." *Cavalry Journal* (US) 30 (April 1921): 124-129.

James, A. W. H. "Co-operation of Aircraft with Cavalry: Co-operation Training." *Cavalry Journal* (UK) 10 (January-October 1920): 481-487.

———. "Co-operation of Aircraft with Cavalry: General Principles." *Cavalry Journal* (UK) 10 (January-October 1920): 133-141.

———. "Co-operation of Aircraft with Cavalry: Rifles and Machine Guns *versus* Low-Flying Aircraft." *Cavalry Journal* (UK) 10 (January-October 1920): 242-253.

Johnson, Thomas J. "A Horse! A Horse! My Kingdom For a Horse." *Quartermaster Review* 16 (September-October 1936): 5-12, 77.

Joyce, Kenyon A. "The British Army Maneuvers, 1925," *Cavalry Journal* (US) 35 (January 1926): 17-28.

King, W.P. "The Fifteen Days' Training Period of the 62d Cavalry Division, Camp Meade, 1922." *Cavalry Journal* (US) 31 (January 1923): 69-73.

Lahm, Frank P. "The Relative Merits of the Dirigible Balloon." *Journal of the Military Service Institution of the United States* 48 (1911): 200-10.

Landis, J. F. Reynolds "Spirit of Sacrifice in Cavalry and Esprit de Corps in Its Officers." *Journal of the United States Cavalry Association* 20 (July 1909): 1211-1219.

Lascelles, E.ff.W. "The Airship and Flying Machine in War." *Cavalry Journal* (UK) 5 (1910): 208-212.

Leigh-Mallory, T.L. "Co-operation of Aircraft with Cavalry." *Cavalry Journal* (UK) 17 (January-October 1927): 277-283.

Lentz, Bernard. "A Justification of Cavalry." *Cavalry Journal* (US) 44 (January-February 1935): 7-11.

Lippincott, Aubrey. "The Automatic Small Arm." *Journal of the United States Cavalry Association* 13 (July 1902): 66-70.

"Lodge Describes War Waste at Big Rally in Brooklyn: Administration Purchases Revealed as Riot of Extravagance without Result." *New York Tribune,* October 19, 1920.

Lodge, Henry Cabot Jr. "Cavalry 'Marches' on Wheels: A Description of the Big Bend Portée." *Army Ordnance* 14 (November-December 1933): 135-139.

"Machines, Maneuvers, and Mud." Reprint from editorial in *The Milwaukee Journal, Cavalry Journal* (US) 48 (January-February 1939): 73.

MacLeod, M.N. "Survey Work in Modern War," *Cavalry Journal* (UK) 11
    (January-October 1921): 165-179.

———. "This Tank Business—in Fact and Fancy," The Foreign Military Press Great
    Britain *Royal Engineers Journal* June 1932 *Cavalry Journal* (US) 42 (January-
    February 1933): 48.

Maguire, T. Miller. "The Cavalry Career of Field Marshall Viscount Allenby." *Cavalry
    Journal* (UK) 10 (1920): 379-384.

Mahan, Dennis Hart. *An Elementary Treatise of Advanced-Guard, Out-post, and
    detachment service of troops, and the manner of posting and handling them in
    presence of an enemy with a historical sketch of the rise and progress of tactics.*
    New York: John Wiley, 1862.

"Making Aeroplanes Fighting Machines." *St. Louis Post-Dispatch*, October 11, 1914.

Mason, Leonard. "Horse and Machine." *Cavalry Journal* (US) 38 (April 1929): 195.

Mayhew, M. J. and G. Skeffington Smyth. "Motor Cars with the Cavalry Division."
    Cavalry Journal (UK) 4 (1909): 438-442.

Mayne, Charles Blair. *The Infantry Weapon and its Use.* London: Smith, Elder, 1903.

McCleave, R. "Report, Air-Ground Maneuvers, San Antonio, Texas, May 15- May 21,
    1927." Headquarters, Eighth Corps Area, 1927.

McClure, N. F. "The Use of Cavalry." *Journal of the United States Cavalry Association*
    24 (May 1914): 956-970.

McGuire, E. C. "Armored Cars in the Cavalry Maneuvers." *Cavalry Journal* (US) *39*
    (July 1930): 386-399.

"Mechanical Warfare." *Cavalry Journal* (UK) 12 (January-October 1922): 153-156.

Merritt, Wesley. "Cavalry: Its Organization and Armament." *Journal of the Military
    Service Institute of the U.S.* 1 (1880): 42-52.

"Mishap to Aeroplane." *Washington Post*, August 1914, 1908.

Mitchell, George E. "The Rout of the Turks by Allenby's Cavalry (Continued)." *Cavalry Journal* 29 (July 1920): 174-205.

Mitchell, William. *Memoirs of World War I: From Start to Finish of Our Greatest War.* New York: Random House, 1960.

———. *Our Air Force: The Keystone of National Defense.* New York: E.P. Dutton, 1921.

———. *Winged Defense: The Development and Possibilities of Modern Air Power Economic and Military.* New York: Dover, 1988.

"Modern War." *Journal of the United States Cavalry Association* 20 (March 1910): 962-985.

William A. Moffett, "Some Aviation Fundamentals," *United States Naval Institute Proceedings* 51 (October 1925): 1873.

Morgan, Geo. H. "Some Needs of the Cavalry." *Journal of the United States Cavalry Association* 16 (October 1905): 329-331.

Morgan, George H. "Mounted Rifles." *Journal of the United States Cavalry Association* 13 (January 1903): 380-385.

Moses, G. W. "Bulletin No. 18," *Journal of the United States Cavalry Association* 24 (May 1914): 908-914.

———. "Communications and Reconnaissance on the Battlefield." *Journal of the United States Cavalry Association* 23 (May 1913): 990-999.

Mulliner, A.R. "Cavalry Still an Essential Arm." *Cavalry Journal* (UK) 17 (January-October 1927): 640-647.

Nason, Leonard. "Horse and Machine." *Cavalry Journal* (US) 38 (April 1929): 192-195.

Niemann, [?]. "Airships and Cavalry in the Reconnaissance Service." *Cavalry Journal* (US) 22 (March 1912): 873-877.

"Night Guard." *Cavalry Journal* (UK) 28 (1938): 170-171.

Note following "Cavalry: A Requisite." *Cavalry Journal* (US) 47 (May-June 1938): 212.

Notes on Infantry, Cavalry, and Field Artillery Lectures Delivered to Class of Provisional Second Lieutenants Fort Leavenworth, Kansas. 1917. Washington, DC: Government Printing Office, 1917.

Observation Aviation March 1930. Langley Field, VA: Air Corps Tactical School, 1930.

"An Officer Abroad." "Notes on the European War." *Journal of the United States Cavalry Association* 26 (July 1915): 53-61.

An Officer of High Rank. "What Has the World's War Taught Us Up to the Present Time that is New in a Military Way." *Journal of the United States Cavalry Association* 26 (July 1915): 97-99.

"One Aeroplane Equal to Whole Cavalry Division." *Aero and Hydro: America's Aviation Weekly* IX (October 17, 1914).

One of Our Cavalry Officers. "Service with a French Cavalry Regiment." *Journal of the United States Cavalry Association* (October 1914): 226-234.

"One of the Faithful." "Faith in and a Doctrine for the Cavalry Service." *Cavalry Journal* (US) 36 (April 1927): 227-231.

Osborne, Rex. "Operations of the Mounted Troops of the Egyptian Expeditionary Force (continued)." *Cavalry Journal* (UK) 13 (January-October 1923): 21-41.

Other Arms Air Corps. Fort Riley, KS: Academic Division, The Cavalry School, 1931-1932.

Palmer, Frederick. "Military Lessons Taught by the War." *New York Times*, December 5, 1912.

Parker, James. "The Cavalryman and the Rifle." *Cavalry Journal* (US) 37 (July 1928): 362-367.

———. "The Retention of the Saber as a Cavalry Weapon." *Journal of the United States Cavalry Association* 14 (October 1903): 354-358.

———. "Saber Versus Revolver Versus Carbine." *Journal of the United States Cavalry Association* (July 1906): 35-41.

———. "The Value of Cavalry as Part of Our Army." *Journal of the United States Cavalry Association* 25 (July 1914): 5-13.

Parsons, Francis. "Regular Cavalry." *Life,* January 1, 1920, 42.

Patton, George S., Jr. "Motorization and Mechanization in the Cavalry." *Cavalry Journal* (US) 39 (July 1930) 331-348.

———. "The 1929 Cavalry Division Maneuvers." *Cavalry Journal* (US) 39 (January 1929): 7-15.

———. "What the World War Did For Cavalry." *Cavalry Journal* (US) 31 (April 1922): 165-172.

——— and C.C. Benson. "Mechanization and Cavalry." *Cavalry Journal* (US) 39 (April 1930): 234-240.

Perry, Redding F. "The 2d Cavalry in France." *Cavalry Journal* (US) 37 (January 1928): 27-41.

Pershing, John J. "A Message to the Cavalry." *Cavalry Journal* (US) 29 (April 1920): 5-6.

Pierce, John T. *Place of a Mechanized Force in Our Cavalry Organization.* Fort Leavenworth, KS: Command and General Staff School, 1932.

"Pleads to Maintain Cavalry Strength." *New York Times,* April 17, 1921.

"Predicts War in the Clouds." *Los Angeles Times*, August 4, 1907.

"Preface." *Cavalry Journal* (UK) 6 (January 1911).

Preston, R. M. *The Desert Mounted Corps: An Account of the Cavalry Operations in Palestine and Syria, 1917-1918.* London: Constable, 1921.

"Progress and Discussion." *Cavalry Journal* (US) 39 (January 1930) 118-125.

Walter E. Prosser, "A Discussion of the War Balloon and Similar Craft, and the Best Methods of Attack by Artillery," *Journal of the United States Artillery* 34 (July-August 1910): 258.

"Ready for War in the Big Bend of Texas: Airmen and Cavalrymen Maintain Constant Vigilant Patrol Along Section of Border Often Overrun by Mexicans." *New York Times,* January 25, 1920.

"Reconnaissance." *Cavalry Journal* (US) 30 (October 1921): 353.

Reconnaissance Security Marches Halts (Tentative). Fort Leavenworth, KS: Command and General Staff School Press, 1937.

Reeves, James H. "Cavalry Raids." *Journal of the United States Cavalry Association* 10 (September 1897): 232-247.

Regulations and Programm of Instruction of the U.S. Infantry and Cavalry School. Fort Leavenworth, KS: United States Infantry and Cavalry School, 1895.

Reilly, Henry J. "Aerial Service Cannot Replace Cavalry Scouts." *Chicago Daily Tribune,* May 11, 1916.

———. "Cavalry Branch is a Big Factor in All War Moves: Army Expert Describes His Activities in Great European Conflict." *Chicago Daily Tribune,* October 20, 1915.

———. "Cavalry in Modern War." *Journal of the United States Cavalry Association* 27 (November 1916): 294-297.

———. "Cavalry in the Great War," *Journal of the United States Cavalry Association* 27 (April 1917): 477-482.

———. "Control of the Air Decides Battles." *Boston Daily Globe*, April 15, 1917.

"Report of the Secretary of War," November 25, 1832 Appendix to the Register of
Debates in Congress, Cong. Globe, 22nd Cong., 2d Sess. 8-9 (1832).

Rhodes, Charles D. "The Cavalry of Today." *Journal of the United States Cavalry
Association* 24 (November 1913): 359-371.

———. "The Duties of Cavalry in Modern Wars," *Journal of the United States Cavalry
Association* 6 *(*June 1893): 172-181.

Riedl, Nickolaus. "Cavalry in War." *Journal of the United States Cavalry Association*
23 (September 1912): 290-307.

Roscoe, Daniel L. "The Effect of Aeroplanes upon Cavalry Tactics." *Journal of the
United States Cavalry Association* 24 (March 1914): 856-858.

Rubottom, Holland. "Cavalry Reconnaissance and Transmission of Information by
Modern Methods." *Journal of the United States Cavalry Association* 23 (July
1912): 25-29.

Russell, George M. "Intelligence for Cavalry." *Cavalry Journal* (US) 29 (October
1920): 254-9.

Ryan, W. Michael. "The Invasion Controversy of 1906-1908: Lieutenant-Colonel
Charles a Court Repington and British Perceptions of the German Menace,"
Military Affairs 44, no. 1 (February 1980): 8-12.

Sanden, V. "Cavalry and Aircraft in the Service of Reconnaissance. *Cavalry
Journal* (US) 23 (March 1913): 826-832.

Sayre, Farrand. "Cavalry Drill and Organization." *Journal of the United States Cavalry
Association* 26 (July 1915): 5-17.

Schwarzkoff, Olaf. "The Changed Status of the Horse in War." *Journal of the United
States Cavalry Association* 26 (January 1916): 335-353.

Scott, Charles L. "Are More Changes Need in Our Horsed Cavalry Regiment Now?"
Cavalry Journal (US) 44 (September-October 1935): 42.

Senate Committee on Military Affairs, Cavalry Regiments, 62nd Congress, 3rd Session 1912, 1-2.

Sherman, William C. "Cavalry and Aircraft." *Cavalry Journal* (US) 30 (January 1921): 26-30.

Sherrill, Stephen H. "The Experiences of the First American Troop of Cavalry to Get Into Action in the World War." *Cavalry Journal* (US) 32 (April 1923): 153-159.

"A Study of Patrol Work." *Cavalry Journal* (UK) 8 (January-October 1913): 420-427.

Smith, John B. "The Effect of Mechanization Upon Cavalry." *Cavalry Journal* (US) 40 (November-December 1931): 21-24.

Stacey, Cyril. "The Passing of the Cavalry, 1939." *Cavalry Journal* (UK) 29 (1939): 566.

Stockhausen, V. "Airships in War." *Cavalry Journal* (US) 20 (November 1909): 575-584.

Strettell, C.B. Dashwood. "Cavalry in Open Warfare, Illustrated by the Operations Leading Up to the Occupation of Mosul in November, 1918." *Journal of the Royal United Service Institution* 66 (1921): 598-617.

Sumner, E. V. "American Practice and Foreign Theory." *Journal of the United States Cavalry Association* 3 (June 1890): 142-150.

Tactics and Technique of Cavalry. Harrisburg, PA: Telegraph Press, 1937.

Tactics and Technique of Cavalry: A Text and Reference Book of Cavalry Training. 8th edition. Harrisburg, PA: Military Service Publishing, 1937.

Taylor, John R. M. "Cavalry and the Aeroplane." *Journal of the United States Infantry Association* 6 (July 1909): 84-88.

Taylor, William J. "The 305th Cavalry Command Post Exercise." *Cavalry Journal* (US) 44 (May-June 1935): 24-25.

Thorne, Theo H. "Letters to the Editor The Future of Cavalry." *Times,* April 22, 1919.

Tilney, W. A. "Aerial Reconnaissance in War." *Cavalry Journal* (UK) 6 (1911): 12-13.

Tittinger, A. J. "The Future of Cavalry." *Cavalry Journal* (US) 29 (April 1920): 67-69.

Topics of the Day. "Air Service and Other Auxiliaries for Cavalry." *Cavalry Journal* (US) 31(October 1922): 412.

———. "Cavalry Discussed by Royal United Service Institution." *Cavalry Journal* (US) 31 (April 1922): 201-202.

———. "The Expedition into Mexico to Recover the Pierson Airplane." *Cavalry Journal* (US) 30 (July 1921): 304-307.

———. "Extracts from the Annual Report of the Chief of Cavalry, Major General Herbert B. Crosby." *Cavalry Journal* (US) 37(January 1928): 108-109.

———. "Reorganizing of the British Cavalry." *Cavalry Journal* (US) 36 (July 1927): 479-481.

———. "Two More Types of Guns for Cavalry." *Cavalry Journal* (US) 37 (July 1928): 436-437.

Turner, Charles C. "Aeronautics." *Observer,* September 17, 1911, 11.

U. S. Army Command and General Staff College. *Tactical Principles and Decision: Volume 1 Marches, Halts, and Reconnaissance and Security,* 1920 revised edition. Fort Leavenworth, KS: General Service Schools Press, 1922.

"Value of Animals in Modern Warfare." *Cavalry Journal* (US) 47 (March-April 1938): 109.

Vedette. "Aeroplanes and Their Influence upon Cavalry Training." *United Service Magazine* 83 (1912): 555-557.

Velox [psued]. "A Chief of Cavalry." [Letter to the Editor] *Journal of the United States Cavalry Association* 15 (April 1905): 944-946.

Vidmer, George. "The Service Pistol and Its Caliber" *Journal of the United States Cavalry Association* 16 (October 1905): 181-188.

Vindex. "Modern Inventions and the Functions of Cavalry." *Cavalry Journal* (UK) 7 (January-October 1912): 348-352.

Von Ammon. "Cavalry Lessons of the Great War from German Sources." *Cavalry Journal* (US) 30 (October 1921): 358-364.

Wade, Jack. "Lest Ye Forget." *Cavalry Journal* (US) 31(July 1922): 312.

Wagner, Arthur L. *A Catechism of Outpost Duty, Including Advance Guards, Rear Guards, and Reconnaissance.* Kansas City, MO: Hudson-Kimberly, 1895.

———. *Organization and Tactics.* New York: B. Westermann, 1895.

———. *The Service of Security and Information.* Kansas City, MO: Hudson-Kimberly, 1903.

Waldron, F. E. "Aeroplanes and Cavalry." *Cavalry Journal* (UK) 8 (1913): 313-319.

Walker, Kirby. "Cavalry in the World War." *Cavalry Journal* (US) 33 (January 1924): 11-23.

"War and the 'Arme Blanche.'" *Cavalry Journal* (UK) 5 (July 1910): 283-287.

War Department: Office of the Chief of Staff. *Cavalry Drill Regulations United States Army 1916, Corrected to December 31, 1917 (Changes nos. 1 and 2).* Washington, DC: Government Printing Office, 1918.

War Office. *Field Service Regulations Volume II: Operations 1924.* London: His Majesty's Stationary Office, 1924.

War Office. *Field Service Regulations Volume II: Operations 1929.* London: His Majesty's Stationary Office, 1929.

Weir, G.A. "Some Reflections on the Cavalry Campaign in Palestine." *Journal of the Royal United Service Institution* 67 (1922): 219-235.

"What Do You Know About the United States Army?" *Washington Post,* April 8, 1917.

Whiting, E. M. "Protection from Enemy Aircraft." *Cavalry Journal* (US) 37(January 1928): 103-106.

Wisser, John P. "The Tactical and Strategical use of Dirigible Balloons and Aeroplanes." *Cavalry Journal* (US) 21 (November 1910): 412-424.

Wood, Leonard. "Cavalry's Role in the Reorganization." *Cavalry Journal* (US) 29 (July 1920): 113-115.

Woodhouse, Henry. "The Airscout." *Town and Country*, November 25, 1911, 34.

———. "The Progress of Aviation." *The Independent…Devoted to the Consideration of Politics, Social and Economy*, June 6, 1912.

"Wright Wins Berlin Away from Zeppelin." *New York Times*, September 12, 1909.

X [pseud]. "Chief of Cavalry: Shall We Have a Chief of Cavalry?" *Journal of the United States Cavalry Association* 17(January 1907): 556-558.

Secondary Sources

Anglesey, Marquess of. *A History of British Cavalry.* 8 vols. London: Secker and Warburg, 1986.

Badsey, Stephen. "The Boer War (1899-1902) and British Cavalry Doctrine: A Re-Evaluation." *Journal of Military History* 71 (January 2007): 75-97.

———. *Doctrine and Reform in the British Cavalry 1880-1918.* Burlington, VA: Ashgate, 2008.

Ball, Durwood. *Army Regulars: On the Western Frontier, 1848-1861.* Norman: University of Oklahoma Press, 2001.

Barr, Ronald J. *The Progressive Army: US Army Command and Administration, 1870-1914.* New York: St. Martin's, 1998.

Bauer, Martin. *Resistance to New Technology: Nuclear Power, Information Technology, and Biotechnology.* Cambridge: Cambridge University Press, 1995.

Bielakowski, Alexander M. "United States Army Cavalry Officers and the Issue of Mechanization, 1920 to 1942." PhD diss., Kansas State University, 2002.

———. *U.S. Cavalryman, 1891-1920.* Oxford: Osprey, 2004.

Bijker, Wiebe, Thomas P. Hughes, and Trevor Pinch. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology.* Cambridge, MA: MIT Press, 1997.

——— and John Law. *Shaping Technology/Building Society: Studies in Sociotechnical Change.* Cambridge, MA: MIT Press, 1992.

Bond, Brian. "Doctrine and Training in the British Cavalry 1870-1914" in *The Theory and Practice of War.* Michael Howard. London: Cassell, 1965.

Brereton, T. R. *Educating the U.S. Army: Arthur Wagner and Reform, 1875-1905.* Lincoln: University of Nebraska Press, 2000.

Brett, R. Dallas. *History of British Aviation, 1908-1914.* 2 vols. London: Aviation Book Club, 1934.

Brooks, Peter W. *Cierva Autogiros: The Development of Rotary-Wing Flight.* Washington, DC: Smithsonian Institution Press, 1988.

Budiansky, Stephen. *Air Power: The Men, Machines, and Ideas that Revolutionized War, from Kitty Hawk to Gulf War II.* New York: Viking, 2004.

Cameron, Robert Stewart. "Americanizing the Tank: U.S. Army Administration and Mechanized Development within the Army, 1917-1943." PhD diss., Temple University, 1994.

Chandler, Charles Deforest and Frank P. Lahm. *How Our Army Grew Wings: Airmen and Aircraft before 1914.* New York: Ronald Press, 1943.

Charnov, Bruce H. *From Autogiro to Gyroplane: The Amazing Survival of an Aviation Technology.* Westport, CT: Praeger, 2003.

Connor, Roger Douglas. "Grasshoppers and Jump-Takeoff: The Autogiro Programs of the U.S. Army Air Corps." Paper presented at the 62nd Annual Forum and Technology Display of the American Helicopter Society, Phoenix, Arizona, May 9-11, 2006.

Cooke, James J. *Billy Mitchell.* Boulder, CO: Lynne Rienner, 2002.

Coopersmith, Jonathan. "Failure & Technology." *Japan Journal for Science, Technology & Society* 18 (2009): 93-118.

Corn, Joseph J., ed. *Imagining Tomorrow: History, Technology, and the American Future.* Cambridge, MA: MIT Press, 1986.

———. *The Winged Gospel: America's Romance with Aviation, 1900-1950.* New York: Oxford University Press, 1983.

Corum, James S. and Wray R. Johnson. *Airpower in Small Wars: Fighting Insurgents and Terrorists.* Lawrence: University Press of Kansas, 2003.

Cowan, Ruth Schwartz. "The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology." In *The Social Construction of Technological Systems*, edited by Wiebe E. Bijker, Thomas P. Hughes, and Trevor Pinch, 261-280. Cambridge, MA: MIT Press, 1989.

Crosby, Francis. *A Handbook of Fighter Aircraft.* London: Hermes House, 2002.

Dimarco, Louis A. *War Horse: A History of the Military Horse and Rider.* Yardley, PA: Westholme, 2008.

Driver, Hugh. *Birth of Military Aviation: Britain, 1903-1914.* Woodbridge, UK: The Royal Historical Society Boydell Press, 1997.

Edgerton, David. *England and the Aeroplane: An Essay on a Militant and Technological Nation.* Hampshire, UK: Macmillan, 1992.

———. *The Shock of the Old: Technology and Global History Since 1900.* Oxford: Oxford University Press, 2007.

11th U.S. Cavalry, Blackhorse. Paducan, KY: Turner, 1990.

Farrell, Theo and Terry Terriff. *The Sources of Military Change: Culture, Politics, Technology.* Boulder: Lynne Rienner, 2002.

Fishbein, Samuel B. "Edward Steichen: A Brief Biographical Sketch of This Pioneer and the History of Photographic Technology Prior to and During World War I." National Air and Space Museum Smithsonian Institution, 1994.

Forester, C. S. *The General.* Annapolis, MD: Nautical and Aviation Publishing, 1982.

Friedel, Robert. *Zipper: An Exploration in Novelty.* New York: W. W. Norton, 1994.

Gillie, Mildred Hanson. *Forging the Thunderbolt: A History of the Development of the Armored Force.* Harrisburg, PA: Military Service Publishing, 1947.

Goldstein, Carolyn M. "From Service to Sales: Home Economics in Light and Power, 1920-1940." Technology *and Culture* 38 (1997): 121-152.

Gollin, Alfred. "England is No Longer an Island: The Phantom Airship Scare of 1909." *Albion: A Quarterly Journal Concerned with British Studies* 13, no. 1 (Spring 1981): 43-57.

———. *The Impact of Air Power on the British People and their Government, 1909-14. Stanford*: Stanford University Press, 1989.

———. *No Longer an Island: Britain and the Wright Brothers, 1902-1909.* Stanford: Stanford University Press, 1984.

Gregory, H.F. *Anything a Horse Can Do: The Story of the Helicopter.* New York: Reynal and Hitchcock, 1944.

Hampton, Mark. "Inventing David Low: Self-Presentation, Caricature and the Culture of Journalism in Mid-Twentieth Century Britain." *Twentieth Century British History* 20.4 (2009): 482-512.

Herr, John K. and Edward S Wallace. *The Story of the U.S. Cavalry 1775-1942.* Boston: Little, Brown, 1953.

Higham, Robin. *100 Years of Air Power and Aviation.* College Station: Texas A&M University Press, 2003.

Hinkle, Stacy. "Wings and Saddles: The Air and Cavalry Punitive Expedition of 1919." *Southwestern Studies* 5 (1967).

Hinton, Harold. *Air Victory: The Men and the Machines.* New York: Harper and Brothers, 1948.

Hofmann, George F. *Through Mobility We Conquer: The Mechanization of U.S. Cavalry.* Lexington: University Press of Kentucky, 2006.

Holley, I.B. *Army Air Forces Historical Studies: No. 44-Evolution of the Liaison- Type Airplane, 1917-1944.* Washington, AAF Historical Office, Headquarters, Army Air Forces, April 1946.

Holley, I.B., Jr. *Ideas and Weapons: Exploitation of the Aerial Weapon by the United States during World War I; A Study in the Relationship of Technological Advance, Military Doctrine, and the Development of Weapons.* 1953. Reprint, Washington, DC: Office of Air Force History, 1983.

Howard, Michael. *The Theory and Practice of War.* Bloomington: Indiana University Press, 1965.

Hugill, Peter J. *Global Communications since 1844: Geopolitics and Technology.* Baltimore, MD: Johns Hopkins University Press, 1999.

Huntington, Samuel. *The Soldier and the State: The Theory and Politics of Civil- Military Relations.* Cambridge, MA: Belknap Press of Harvard University Press, 1957.

Hurley, Alfred F. *Billy Mitchell: Crusader for Air Power.* New York: Franklin Watts, 1964.

James, Lawrence. *Imperial Rearguard: Wars of Empire, 1919-85.* London: Brassey's Defence, 1988.

Janowitz, Morris. *The Professional Soldier: A Social and Political Portrait.* Glencoe, IL: Free Press, 1960.

Jarymowycz, Roman. *Cavalry from Hoof to Track.* Westport, CT: Praeger, 2008.

Jeffery, Keith. *The British Army and the Crisis of Empire 1918-22.* Manchester, UK: Manchester University Press, 1984.

Johnson, David E. *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917-1945.* Ithaca, NY: Cornell University Press, 1998.

Johnson, Herbert A. *U.S. Army Aviation through World War I.* Chapel Hill: University of North Carolina Press, 2001.

———. *Wingless Eagle: U.S. Army Aviation through World War I.* Chapel Hill: University of North Carolina Press, 2001.

Katzenbach, Edward. "The Horse Cavalry in the Twentieth Century: A Study in Policy Response," *Public Policy* 8 (1958), 120-149.

Kennett, Lee B. *The First Air War, 1914-1918.* New York: Free Press, 1991.

Kenyon, David. *Horsemen in No Man's Land: British Cavalry and Trench Warfare, 1914-1918. Barnsley*, South Yorkshire: Pen and Sword, 2011.

Kirwan, Elizabeth T. "The Cavalry School Library, Fort Riley, Kansas." *Library Journal* 62 (March 1937): 196-198.

Kline, Ronald R. *Consumers in the Country: Technology and Social Change in Rural America.* Baltimore: Johns Hopkins University Press, 2000.

Larson, George C. "Moments and Milestones: Can You Hear Me Now? When Radio Communication Took to the Air," *Air & Space Magazine,* (March 2011): 80. http://www.airspacemag.com/history-of-flight/moments-and-milestones-can-you-hear-me-now-10947/?no-ist. Macmillan, 1967).

Lewis, W. David. "The Autogiro Flies the Mail! Eddie Rickenbacker, Johnny Miller, Eastern Air Lines, and Experimental Airmail Service with Rotorcraft, 1939-1940," 69-86. In Dawson, Virginia P. and Mark D. Bowles, eds. *Biographical Essays in Honor of the Centennial of Flight, 1903-2003*. Washington, D.C.: National Aeronautics and Space Administration NASA History Division Office of External Relations, 2005.

Linn, Brian McAllister. *The Echo of Battle: The Army's Way of War.* Cambridge, MA: Harvard University Press, 2007.

Mackworth-Praed, Ben ed. *Aviation the Pioneer Years.* Secaucus, NJ: Chartwell Books, 1990.

Maree, D.R. "Bicycles in the Anglo-Boer War of 1899-1902." *Military History Journal* 4 (June 1977), 1-13.

Mead, Peter. *The Eye in the Air: History of Air Observation and Reconnaissance for the Army 1785-1945.* London: Her Majesty's Stationary Office, 1983.

Mets, David R. *Airpower and Technology: Smart and Unmanned Weapons.* Westport, CT: Praeger, 2009.

Millett, Allan R. and Peter Maslowski. *For the Common Defense: A Military History of the United States of America.* New York: Free Press, 1984.

Millis, Walter. *Arms and Men: A Study in American Military History.* New Brunswick, NJ: Rutgers University Press, 1984.

Montross, Lynn. *Cavalry of the Sky: The Story of U.S. Marine Combat Helicopters.* New York: Harper and Brothers, 1954.

Morrow, John H. Jr. *The Great War in the Air: Military Aviation from 1909 to 1921.* Washington DC, Smithsonian Institute Press, 1993.

Muller, Richard R. "Close air support: The German, British and American experiences, 1918-1941." In *Military Innovation in the Interwar Period,* 144-190 ed. Williamson Murray and Allan R. Millett (Cambridge: Cambridge University Press, 1996).

Munson, Kenneth. *Bombers: Patrol and Reconnaissance Aircraft.* London: Bounty Books, 2012.

———. *Fighters: Attack and Training Aircraft 1914-19.* London: Bounty Books, 2004.

Murray, Williamson and Allan R. Millett. *Military Innovation in the Interwar Period.* Cambridge: Cambridge University Press, 1996.

Nenninger, Timothy K. "American Military Effectiveness in the First World War." In *Military Effectiveness vol 1. The First World War*, ed. Allan R. Millett and Williamson Murray. Boston: Unwin Hyman 1988, 116-156.

———. *The Leavenworth Schools and the Old Army: Education, Professionalism, and the Officer Corps of the United States Army, 1881-1918.* Westport, CT: Greenwood Press, 1978.

Newark, Peter. *Sabre and Lance: An Illustrated History of Cavalry.* Poole, Dorset: Blandford Press, 1987.

Odom, William. *After the Trenches: The Transformation of U.S. Army Doctrine, 1918-1939.* College Station: Texas A&M University Press, 1999.

Omissi, David E. *Air Power and Colonial Control: The Royal Air Force 1919-1939.* Manchester, UK: Manchester University Press, 1990.

Oudshoorn, Nelly and Trevor Pinch. *How Users Matter: The Co-Construction of Users and Technologies.* Cambridge, MA: MIT Press, 2003.

Paris, Michael. *Winged Warfare: The Literature and Theory of Aerial Warfare in Britain 1859-1917.* Manchester: University of Manchester, 1992.

Phillips, Gervase. "Scapegoat Arm: Twentieth-Century Cavalry in Anglophone Historiography." *Journal of Military History* 71 (January 2007): 37-74.

Ragsdale, Kenneth Baxter. *Wings over the Mexican Border: Pioneer Aviation in the Big Bend.* Austin: University of Texas Press, 1984.

Randall, Adrian "Reinterpreting 'Luddism': Resistance to New Technology in the British Industrial Revolution." In *Resistance to New Technology: Nuclear Power, Information Technology, and Biotechnology,* edited by Martin Bauer, 57-79. Cambridge, UK: Cambridge University Press, 1995.

Reardon, Carol. *Soldiers and Scholars: The U.S. Army and the Uses of Military History, 1865-1920. Lawrence*: University Press of Kansas, 1990.

Reid, Brian Holden. "A Signpost That Was Missed?: Reconsidering British Lessons from the American Civil War." *Journal of Military History* 70 (April 2006): 385-414.

Rittgers, Sarah Janelle. "From Galloping Hooves to Rumbling Engines: Organizational Responses to Technology in the U.S. Horse Cavalry." PhD diss., George Washington University, 2003.

Robson, Brian. *Crisis on the Frontier: The Third Afghan War and the Campaign in Waziristan, 1919-20.* Staplehurst: Spellmount, 2007.

Roe, Andrew. *Waging War in Waziristan: The British Struggle in the Land of Bin Laden, 1849-1947.* Lawrence: University Press of Kansas, 2010.

Rowe, David. *Head Dress of the British Heavy Cavalry: Dragoon Guards, Household and Yeomanry Cavalry 1842-1934.* Atglen, PA: Schiffer Military History, 1999.

Schatzberg, Eric *Wings of Wood, Wings of Metal: Culture and Technical Choice in American Airplane Materials, 1914-1945.* Princeton, NJ: Princeton University Press, 1999.

Seymour-Ure, Colin and Jim Schoff. *David Low.* London: Secker and Warburg, 1985.

Skelton, William B. "Professionalization in the U.S. Army Officer Corps during the Age of Jackson." *Armed Forces & Society* 1 (1975): 443-471.

———. "Samuel P. Huntington and the Roots of the American Military Tradition." *Journal of Military History* 60 (April 1996): 325-338.

Smith, Malcolm. *British Air Strategy between the Wars.* Oxford: Clarendon Press, 1984.

Stanton, Doug. *Horse Soldiers: The Extraordinary Story of a Band of U.S. Soldiers Who Rode to Victory in Afghanistan.* New York: Scribner, 2009.

Stokesbury, James L. *A Short History of Airpower.* New York: William Morrow, 1986.

Stubbs, Mary Lee and Stanley Russell Connor. *Armor-Cavalry Part I: Regular Army and Army Reserve.* Washington, DC: Office of the Chief of Military History United States Army, 1969.

Taylor, Michael. *Jane's Encyclopedia of Aviation.* New York: Portland House, 1989.

———. *Jane's Fighting Aircraft of World War I.* 1919. Reprint, London: Random House, 2001.

Tedesco, Vincent J. III. "'Greasy Automatons' and the 'Horsey Set': The U.S. Cavalry and Mechanization, 1928-1940." Master's thesis, Pennsylvania State University, 1995.

Templewood, Samuel John Gurney Hoare. *Empire of the Air: The Advent of the Air Age 1922-1929.* London: Collins, 1957.

Tobin, James. *To Conquer the Air: The Wright Brothers and the Great Race for Flight.* New York: Free Press, 2003.

Towle, Philip Anthony. *Pilots and Rebels: The Use of Aircraft in Unconventional Warfare 1918-1988.* London: Brassy's, 1989.

Utley, Robert M. *Frontier Regulars: The United States Army and the Indian, 1866-1891.* New York: Macmillan, 1973.

———. *Frontiersmen in Blue: The United States Army and the Indian, 1848-1865.* New York: Macmillian, 1967.

Urwin, Gregory J.W. *The United States Cavalry: An Illustrated History.* Pode, UK: Blandford, 1983.

Warner, Philip. *The British Cavalry.* London: J.M. Dent, 1984.

Weigley, Russell F. *History of the United States Army.* New York: Macmillan, 1967.

Winchester, Jim. *American Military Aircraft: A Century of Innovation.* New York: Barnes and Nobel Books, 2005.

Winton, Harold. *To Change an Army: General Sir John Burnett-Stuart and British Armored Doctrine, 1927-1938.* Lawrence: University of Kansas Press, 1988.

Wohl, Robert. *A Passion for Wings: Aviation and the Western Imagination, 1908-1918.* New Haven, CT: Yale University Press, 1994.

———. *The Spectacle of Flight: Aviation and the Western Imagination, 1920-1950.* New Haven, CT: Yale University Press, 2005.

Woodward, David R. *Hell in the Holy Land: World War I in the Middle East.* Lexington: University Press of Kentucky, 2013.

Wormser, Richard. *The Yellowlegs: The Story of the United States Cavalry.* Garden City, NY: Doubleday, 1966.

Wrangel, Alexis. *The End of Chivalry: The Last Great Cavalry Battles, 1914-1918.* New York: Hippocrene Books, 1982.

Appendix A

	1908	1909	1911	1912	1914	1916	1917	1918	1918	1918
Aeroplanes	Wright 1908 military flyer	Farman III	Curtiss Model D	BE2	Farman MF.11 Shorthorn	Curtiss JN-3 (Jenny)	Dayton Wright DH4	Packard-Le Pere LUSAC	Sopwith 7F.1 (Snipe)	Handley Page V/1500
Speed mph (max)	N/A	37	50	72	66	75	124	136	121	99
Endurance	N/A	N/A	2.5hrs	3hrs 15 mins	3.75 hrs	2 hrs 15mins or 250 miles	3hrs 3min-half throttle	320 miles	3hrs	17 hrs or 1300 miles
Ceiling ft.	N/A	N/A	N/A	10,000	12,467	N/A	19,000	20,200	19,500	11,000
Weight lbs.	773	1,213	1,300	2,350	2,045	2,130	2,020	3,745	2,020	30,000
Engine horse-power	35	50	40	90	100	90	230	425	230	375 (4 engines)
types	general	general	general pusher	recon	general	general	recon/ light bomber	fighter	fighter	heavy bomber

Appendix A cont.

	1919	1920	1925	1927	1928	1929
Aeroplanes	Vickers Vimy	Martin NBS-1 Aka Martin MB-2	Armstrong Whitworth Siskin IIIA	Curtiss P-6E Hawk	Boulton Paul Sidestrand	Bristol Bulldog II
Speed mph (max)	100	99	156	198	140	178
Endurance	900 miles	400 miles	1 hr 12 mins	285 miles	520 miles	275 miles
Ceiling ft.	7,000	7,700	27,000	24,700	24,000	29,300
Weight lbs.	10,884	12,027	3, 012	3,430	1,060 (bombs)	3,490

Table constructed from data collected from Francis Crosby, *A Handbook of Fighter Aircraft.* (London: Hermes House, 2002); Kenneth Munson, *Fighters: Attack and Training Aircraft 1914-19* (London: Bounty Books, 2004); Kenneth Munson, Bombers*: Patrol and Reconnaissance Aircraft* (London: Bounty Books, 2012); Michael J. H. Taylor, *Jane's Encyclopedia of Aviation (*New York: Portland House, 1989); Jim Winchester, *American Military Aircraft: A Century of Innovation (*New York: Barnes and Nobel Books, 2005).

Appendix B

Strategic Reconnaissance

Mission	Service best equipped to perform mission and means used	Reason
Areas of concentration of enemy	Air (visual)……….	These areas are denied to formed troops in the early stages of the combat; other sources are more or less unreliable.
Enemy strength and general composition	Air (visual)……….	The Air Service, for the same reason, can secure data more nearly correct than can be secured from observers, in most cases, in the early stages of an operation; the information from all sources must be collated.
Routes and direction of movement of each of enemy's main columns	Air (visual and photographic)	Ground troops are often deceived as to the main effort unless they are able to penetrate very definitely the enemy's cavalry screen.
Progress, depth, and width of movement	Cavalry (contact elements)	Can best determine the width and progress of the movements by the establishment and maintenance of contact.
	Air (visual and photographic)	Can best determine the depth of the movement for reasons outlined above.
Location and configuration of enemy's position and his defensive organization	Cavalry (intelligence personnel). Air (visual and photographic, especially the latter).	Each can determine a part of this requirement, and the photographic reconnaissance of the Air Service in this case is of the utmost value, but in the present stage of photography ground troops *must* supplement the interpretative work of the Air Service by ground

		interpretation.
Location and strength of general reserves or mass of maneuver	Air (visual)………. Cavalry (as a result of successful penetration of the enemy cavalry screen).	Difficult to secure by any service, but more available to the Air Service.
Lines of supply and administrative establishments	Air (photographic and visual)	Particularly important that these be photographed and made a part of map information for the use of Artillery and Air Service commanders in long-distance bombardment.
Verification and supplementing of information on: topographic and geographic characteristics of terrain	Air (photographic) Cavalry (intelligence personnel). Engineers (topographers).	One of the pre-eminent functions of the Air Service is reconnaissance of this character, which, after interpretation by trained ground troops, is incorporated in map form.
Economic and political characteristics	This is distinctly a function of ground troops and should be made the subject of special reports by the intelligence personnel of these troops.	

Tactical Reconnaissance

Details of the location, distribution, strength, composition, and movements of the enemy.	Cavalry, reconnaissance and combat patrols, scouts, observers.

Air, visual, except in the location of enemy forces, where photographic is valuable. | This is a large order and is one of the most important of the tactical reconnaissance missions; each of the reconnaissance services is nearly co-ordinate, one with the other. The Cavalry is considered first because a great portion of this information is incapable of definite determination without combat. |
| Location of flanks and local reserves of | Air, visual, and Cavalry | If the Cavalry has properly accomplished |

the enemy		its missions, as determined by the results of the preceding strategic reconnaissance, this information is immediately available at all times; if not, visual reconnaissance by the Air Service must make up the deficiency. Both should supplement each other, however, and it is the duty of both.
Local defensive organization of the enemy. Local supply arrangements.	Air, photographic, and ground troops.	The most efficient solution of this mission is by the aerial photography of the organized area, its interpretation by the Air Service observers, and checking and reinterpretation by ground troops in the course of their reconnaissance work, for final compilation in map form preparatory for the attack.
Equipment, training, physical condition, and morale.	Ground troops, especially Cavalry.	Vigorous and aggressive cavalry reconnaissance, such as that conducted by the famous leaders of the Confederate cavalry during the Civil War, are the only effective solution of this mission during war of movement. During stabilized situations, all troops have their opportunity to perform this class of reconnaissance. It is impossible for the Air Service to assist here except by deduction from the results of other missions.
Detailed examinations of the terrain.	Ground troops, based on map information, supplemented by air photography.	Aerial photography is excellent for this purpose, in that it gives an excellent

		detailed study of the area, which when compared with the map will reveal startling facts, but the interpretation of aerial photographs is an art and many things are subject to some doubt, unless all points are definitely verified by ground troops. Here is one of the greatest opportunities for co-operative activity by the Air Service and Cavalry.
Inquiry into local resources and other information.	Due to the general nature of this statement, it necessarily includes all services, but when used in this classification of reconnaissance, the Cavalry is the arm which is in the most favorable position to secure such information, from the very nature of its mission.	

Tables reproduced from Edward Fickett, "A Study of the Relationship between the Cavalry and the Air Service in Reconnaissance," *Cavalry Journal* (US) 32 (October 1923): 415-418.