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MILITARY VETERINARY SERVICES: LOOKING BACK, LOOKING FORWARD

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JCSP 37

Master of Defence Studies

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**MILITARY VETERINARY SERVICES: LOOKING BACK, LOOKING
FORWARD**

By Major A.G. Morrison

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ABSTRACT

Military veterinary services originated with human domestication of the horse, for military and other uses. From these humble origins, there developed the modern military veterinary services that first emerged in the late eighteenth century, and reached their zenith during the First World War. Afterwards, and with the rise of the gasoline engine, the military veterinarian was no longer required for the care of the military horse. Consequently, since the second half of the twentieth century, military veterinarians look after much smaller numbers of service animals, but have also become active in international development work, food and water safety programs, and preventive medicine. The Canadian Armed Forces (CAF) currently does not have a veterinary service, having disbanded its veterinary corps after the First World War. However, the opinions and attitudes of some currently-serving CAF members who have had contact with military veterinarians were surveyed for this study. Overall, their responses revealed a belief that the work of military veterinarians is valuable, though varying opinions were expressed regarding how best to employ them. Military veterinary services remain active in the majority of North Atlantic Treaty Organisation (NATO) and other countries, and given their diverse range of skills, are still highly relevant in the modern world. A case for the return of the Royal Canadian Army Veterinary Corps is supportable.

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INTRODUCTION

Military veterinary services originated with human domestication of the horse, for military, agricultural and other uses. From these humble origins, there developed the modern military veterinary services that first emerged in the late eighteenth century, and reached their zenith¹ during the First World War. Afterwards, and with the rise of the gasoline engine, the military veterinarian was no longer required in any great number for the care of the few remaining military horses. Consequently, since the second half of the twentieth century, military veterinarians look after much smaller numbers of service animals (dogs in particular), but also have become active in international development work, food and water safety programs, and preventive medicine. The Canadian Armed Forces (CAF) currently does not have a veterinary service, having disbanded its veterinary corps after the First World War. However, the opinions and attitudes of some currently-serving CAF members who have had contact with military veterinarians were surveyed for this study. Overall, their responses revealed a belief that the work of military veterinarians is valuable, though varying opinions were expressed regarding how best to employ them. This study will show that military veterinary services are still highly relevant in the modern world, and that a case for the return of the Royal Canadian Army Veterinary Corps (RCAVC) is supportable.

Research on the topic of military veterinarians reveals that to date, there has not been much written in the way of general studies of the field as a whole. The majority of published manuscripts are national histories of a particular country's veterinary service,

¹ It was their zenith in terms of size, but not of sophistication. Today's military veterinary services are smaller, but as will be discussed in this paper, they have a much broader range of duties.

with the majority of these being records and listings of organisations, duties, movements, names, promotions and statistics. *A History of the Royal Army Veterinary Corps 1796-1919* by Major General Smith is one example of a Corps history.² He discusses the evolution of veterinary medicine from the original French and English veterinary colleges, the farrier trade in the army, the development of the Veterinary Corps, and the Corps' work through to the end of the First World War.

In addition to the Corps histories, there are a significant number of journal articles and news stories concerning sub-topics of military veterinary medicine, such as the military veterinarian's role in development work and stability operations. One example is Major Jessica McCoy's study assessing Veterinary Civil Action Plans (VetCAPS) in Afghanistan, in which she concludes that they have a place, but must follow certain rules to ensure negative outcomes are minimised, and positive outcomes predominate.³ The care of service animals - military working dogs (MWD) in particular - and the advanced treatment they receive is discussed by Major Janice Baker in her review of combat trauma care for MWDs in Afghanistan and Iraq. Her conclusions include closer modelling of human trauma doctrines as well as increasing investment in veterinary resources in theatre.⁴ Evidence of veterinary laboratory and pathology services increasing their support to the protection of the soldier from foreign disease is demonstrated by Major Scott Hanna's article "Army Veterinary Food Analysis Laboratories: Past, Present, and

² Major General Sir Frederick Smith, *A History of the Royal Army Veterinary Corps 1796-1919* (1927; London: Bailliere, Tindall and Cox, 1983).

³ Major Jessica McCoy, "Veterinary Civil Action Programs in Afghanistan: Pros, Cons, and How," *Army Medical Department Journal* PB 8-09-1/2/3 (January – March 2009): 25-32. Also see: Lieutenant Colonel Niall B. Finnegan, "Military Veterinary Medicine in Disasters," *Journal of the US Army Medical Department* PB 8-92-5/6 (May/June 1992): 24-26.

⁴ Major Janice Baker *et al*, "Overview of Combat Trauma in Military Working Dogs in Iraq and Afghanistan," *Army Medical Department Journal* PB 8-09-1/2/3 (Jan-Mar 2009): 33-37.

Future.” He notes that advances in technology have produced tests that are very rapid, with courier service making up a large part of the time it takes to get a result back to the customer. The result is that deployed laboratories are becoming more common as the customer demands ever-faster results.⁵

In addition to formal studies, memoirs and personal reminiscences of military veterinary service have also been published, such as John Riordan’s *Horses, Mules and Remounts*, a memoir of his time in the United States Army Veterinary Corps during the First World War.⁶ Dave Heyhoe’s autobiography, *It’s All About Treo*, tells the story of an improvised explosive device (IED) detection dog and his handler, who was a member of the Royal Army Veterinary Corps.⁷ But despite this volume of publishing, there appears to be very little scholarship focused on examining the global profession of military veterinarians or specific assessments of their effectiveness, whether in their most notable service during the First World War, or in modern battlespaces such as Afghanistan or the Sudan.

From a Canadian perspective, there is minimal discussion of military veterinarians in either the popular press or in Canadian Armed Forces doctrine. Cecil French’s book *A History of the Canadian Army Veterinary Corps in the Great World War 1914-1919*

⁵ Major Scott Hanna *et al*, “Army Veterinary Food Analysis Laboratories: Past, Present, and Future,” *Army Medical Department Journal* PB 8-07-7/8/9 (July-Sept 2007): 12-16. Also see Staci L. Mitchell *et al*, “Veterinary Surveillance Laboratories: Developing the Training Program,” *Army Medical Department Journal* PB 8-10-10/11/12 (Oct-Dec 2010): 22-24.

⁶ Lieutenant John J. Riordan, *Horses, Mules and Remounts: the Memoirs of a World War I Veterinary Officer* (Glendale, CA: privately printed, 1983).

⁷ Dave Heyhoe, *It’s All About Treo* (London: Querus, 2012). Treo received the 63rd Dickin Medal, considered in the United Kingdom as the animal Victoria Cross, for the work done in Afghanistan. The Dickin Medal is awarded by the People's Dispensary for Sick Animals (PDSA), a British animal charity. “Animal Bravery Awards,” last modified September 3, 2013, accessed October 14, 2013, <http://www.pdsa.org.uk/about-us/animal-bravery-awards>.

provides many details about the Canadian veterinarians' contribution to the First World War, and it is the only book to do so.⁸ It provides a comprehensive summary of the service, but as the editors note in the forward, the manuscript suffered in the post-war editorial process and then languished for decades before it was revived and published in 1999. The overall lack of Canadian scholarship can reasonably be tied to the current lack of a Canadian military veterinary service; Canada is one of few North Atlantic Treaty Organisation (NATO) countries without an active service.⁹ In addition to the history by Cecil French, there are two un-credited editorials lamenting the demise of the service (with the unidentified author of both making a case to bring back the Royal Canadian Army Veterinary Corps (RCAVC)), and the Library and Archives Canada guide to its holdings on the subject (war diaries and the like).¹⁰ This means that both the Canadian public and the majority of Canadian soldiers generally have no exposure to this small, specialised field of military operations.

As outlined, the historiography of military veterinary services can be divided into two broad groups. One group focuses on the histories of military organisations, and the other

⁸ Cecil French, *A History of the Canadian Army Veterinary Corps in the Great World War 1914-1919*. (Guelph: Crest Books, 1999). See also Major General Smith, *Royal Army Veterinary Corps...* and Lieutenant Colonel Everett B Miller, ed., *United States Army Veterinary Service in World War II* (1961; Washington, D.C.: Office of the Surgeon General, Department of the Army, 1986). The bibliography contains additional examples.

⁹ The author is a Canadian Army Reserve Intelligence Officer currently serving with 36 Signal Regiment. He is a civilian veterinarian who first became interested in this topic after receiving several positive descriptions of military veterinary services from fellow officers returning from overseas operations where they encountered other nations' services.

¹⁰ French, *A History of the Canadian Army Veterinary Corps...*, *passim*; "Canadian Army Veterinary Corps," *The Canadian Journal of Comparative Medicine and Veterinary Science* 7 (Oct 1943): 290; "Royal Canadian Army Veterinary Corps," *The Canadian Journal of Comparative Medicine and Veterinary Science* 5 (1941): 92-93; Andrew Morrison, "The Case for Reactivating the Royal Canadian Army Veterinary Corps," *Canadian Military Journal* 12 (2012): 28-36; Library and Archives Canada, *Guide to Sources Relating to Units of the Canadian Expeditionary Force: Canadian Army Veterinary Corps* (Undated), accessed October 14, 2013, <http://www.collectionscanada.gc.ca/obj/005/f2/005-1142.29.031-e.pdf>.

offers topical articles centered around one aspect within the broader field of military veterinary medicine. In addition to this review of the existing historiography, this paper will use information obtained from surveys taken among current members of the CAF to show that military veterinary services are regarded as relevant to the CAF today. These surveys provide a wealth of information unattainable through any other means. While Canada no longer has its own branch of military veterinary services, there is a small group of Canadian soldiers that has encountered military veterinarians from other countries. The majority of this group are operators in Civil Military Cooperation (CIMIC) deployed to either Afghanistan or to the Sudan with some having their encounters in Bosnia. This small group makes for an interesting subject of study because their opinions on military veterinarians are freshly-formed, based on experience rather than doctrine and training. Their impressions come from observation and interaction with non-Canadian military veterinarians, framed by their own histories and training, and as such can be both highly supportive and highly critical.

This paper is laid out in three sections. Section One, consisting of three chapters, will outline the history and development of the traditional field of military veterinary medicine. Chapter One offers a history of military veterinarians, independent of nationality, from ancient times up until the eighteenth century, as well as the formative years of the modern veterinary profession up to the First World War. This chapter will by no means be a complete history of the profession, but rather a primer on the subject for the uninitiated. Given the Canadian focus of this paper, this first chapter also includes a more detailed examination of the Canadian military veterinary service, from its origins to its disbandment. Further, it provides a brief discussion of the veterinary service of the

North West Mounted Police (the progenitor of the RCMP) unique to the Canadian military experience. Chapter Two considers the role of the military veterinarian in the First World War, focusing on the Allied effort and the impact of mechanization which brought a gradual shift from service animals to modern weapons of warfare.¹¹ Chapter Three looks at the duties and work of the current military veterinarian from the Second World War through to today. This section provides a sound understanding of the transformation of military veterinary services from traditional to contemporary. Combined, these three chapters afford a solid understanding of how and why the needs of Armed Forces around the world have either adopted and maintained or disbanded their military veterinary services, including the CAF.

Section Two of this paper is comprised of a single chapter which focuses specifically on a set of surveys¹² completed by Canadian soldiers who have been on CIMIC deployments in the past few decades. The information extrapolated from these surveys will be used to make the case for the return of military veterinary services in the CAF. Section Three serves as the conclusion and it looks towards the future of military veterinarians in general and to their roles and responsibilities. This last section will provide the reader with a better understanding of the profession as a whole and its relevance in the global village. Perhaps of greater importance for this paper, the conclusion will discuss the

¹¹ Here, language is the barrier to expanding the focus to both sides of the war. Though information is available on the Central powers, much of it is in the original German. Also the Eastern powers, such as Russia, have histories written in their own languages. See N.A. Kuz'min, "[Unforgettable pages from the history of Soviet Veterinary Science (recollections of a participant in the Great Patriotic War)]," *Veterinariia* 6 (1971): 116-8, accessed October 14, 2013, <http://www.ncbi.nlm.nih.gov/pubmed/4942594> and O.S. Belen'kii, "[Veterinary Service of the Armed Forces of the USSR During the Last 60 Years]," *Veterinariia* 12 (1977): 22-5, accessed October 14, 2013, <http://www.ncbi.nlm.nih.gov/pubmed/341480>.

¹² As will be described in Chapter Four, the surveys were developed by the author and tested with a small group. Ethics approval and permission from the CAF for distribution were secured. Results were returned by email and the author performed both a quantitative and qualitative analysis of the results.

relevance of military veterinary services to CAF operations. Overall, the three sections of this study will support the relevance of the military veterinarian and the argument that Canada should consider bringing back this capability to its Armed Forces.

Though there will be plenty of justification by example of why military veterinarians should exist, this study will not provide a conclusive analysis of Measures of Effectiveness (MoE) for military veterinarians. MoEs are important to ensure resources are correctly allocated and appropriately used, but are also difficult to accurately measure when effects take a period of years to become measurable. From the literature there are lots of good examples of apparent success, but little critical analysis. One such example is from the US Africa Command.¹³ In their document they state that their Community Animal Health Worker training's primary objective: "is to teach local veterinary students common livestock diseases and treatments, social issues affecting the agro-pastoral community, and how to use veterinary tools and medicines." They add: "The training also allows the students to discuss issues that affect their varying communities and tribes in a safe environment." This is presumably due to the security the military provides during the training process. However, the same document states the outcome: "As of March 31, 10 vets recorded more than \$18,500 (37,000,000 UGX) in sales of drugs and services treating close to 14,000 animals and birds servicing 1,298 farmers." This outcome, though positive due to the increased veterinary activity, does not measure the training directly, but rather measures an element of economic development. They also provide another measure of economic development rather than training: "Because of the stimulated demand for animal health

¹³ United States Africa Command Public Affairs, "U.S. Army Civil Affairs VETCAP & Community Animal Health Worker Training Programs Make An Impact in Uganda," *U.S. Africa Command Vignette* (October 2010), accessed October 14, 2013, www.africom.mil/NEWSROOM/Document/7785.

services, the vets were able to hire an additional 40 employees in the form of vet technicians and sales agents.” Africa Command makes no mention in the stated outcomes of whether the student training objectives were achieved. The reader is left to make the link that improved training led to greater demand for veterinary services leading to the stated economic development. This is the general difficulty in measuring the effectiveness rather than the performance of a development program. Stated another way, injecting one thousand cattle with a vaccine is a measure of performance, but having a high percentage of those cattle with demonstrable immunity due to the vaccine is a measure of effectiveness. The military veterinary profession suffers just like other components of Influence Activities¹⁴ on deployment, resorting to measures of performance rather than measures of effect. The long time frames of development projects, such as herd production improvements through breeding programs, often take from a calendar year to possibly several generations to show effects.¹⁵ It is then difficult to measure the effectiveness of these projects as they exceed the timeframe of the CAF’s current model of six-month rotations. Each rotation of troops would be required to follow up on the projects of each of the previous rotations. More specifically, the first rotation would develop the project, the second would implement, the third rotation would monitor and the fourth rotation would measure and report - a two-year process that in the Canadian

¹⁴ Influence Activities (IA) in Canadian Doctrine includes Civil Military Cooperation (CIMIC), Psychological Operations (PSYOPS) and Media Operations (distinguished from Public Affairs). It is a subset of Information Operations (IO). Veterinary medicine is not found in Canadian Doctrine, but in the Influence Activities role would likely come under CIMIC as a functional specialist doing development work, or in the traditional and Public Health roles under the medical system doing primary care for service animals and public health duties.

¹⁵ A classic example is the increasing of milk quality and quantity in dairy cows by breeding in or out certain traits. Bulls of known genetic quality are bred with the existing herd to improve their overall genetic quality. The time required to see the results of this one breeding cycle includes the gestation and maturation of the calf, then this calf’s (now a heifer’s) own pregnancy. Only then can the improved milk quality and quantity be measured. The initial economic benefits to the farmer cannot be measured until the end of the heifer’s first lactation and the final effects until the end of the heifer’s life. However, in veterinary medicine such breeding programs are well-researched and the likelihood of a positive outcome is high.

model involves not only four changes in troops but likely one or two changes in the main operation language. This is not an insurmountable challenge, but does require a degree of leadership and coordination to be effective.

Notwithstanding the complexity of measures of effects, especially on long projects, there is still a wide scope to the work of the military veterinarian. This study provides the reader with a good grasp of the basics of military veterinary work and how it can be employed in the modern world. That said, it should always be kept in mind that veterinary services are a very small part of any military and they never work in a vacuum.

Veterinarians work in close collaboration with a military's medical, CIMIC and operational staffs, and with other government departments and Non-Governmental Organisations (NGOs) to ensure their development work is sustainable. The military veterinarian has a broad range of skills and expertise beyond the typical perception of preserving the health of service horses and dogs, and being military, these skills must always remain in support of the Commander's mission. Canada cannot and should not depend on allies providing military veterinary support on every deployment. To ensure Canadian commanders have this capability, identified as important through surveys completed by Canadian soldiers, a small Canadian military veterinary service should return to service.

SECTION ONE

Chapter One: The Origins of Military Veterinary Service

The Ancient World and Middle Ages

History points to a thriving awareness of veterinary issues in existence for several millennia. Where there were humans and horses, there were soldiers and cavalry, and there was some degree of medicine.¹⁶ References to healers of animals are found in some of the oldest texts in the West. Chiron (or Kheirôn) the centaur, a character from Greek mythology, is referred to by Homer in *The Iliad*,¹⁷ and is believed by some to have been a real person,¹⁸ who over time was transformed into a mythical character. The Greek philosopher, poet and warrior Xenophon wrote *De Re Equestri* (On Horsemanship) around 500 BCE.¹⁹ Though it deals mostly with the care and employment of the horse in battle, the chapter that covers the medical assessment of the horse is not dissimilar to any pre-purchase exam conducted by the modern veterinarian where the health and soundness

¹⁶ For more on the history and importance of the horse in warfare, see Archer Jones, "Ancient Warfare," in *The Art of War in the Western World* (New York: Oxford University Press, 1987), 1-45; Erik Hildinger, "Nomads" and "Horse and Bow", in *Warriors of the Steppe: A Military History of Central Asia, 500 B.C. to 1700 A.D.* (Cambridge: Da Capo Press, 2001); Christon I. Archer *et al*, *World History of Warfare* (Lincoln: University of Nebraska Press, 2002); William H. McNeill, *The Pursuit of Power* (Chicago: University of Chicago Press, 1982); Thomas E. Griess, ed., *The Dawn of Modern Warfare* (New York: Avery Publishing Group, 1984).

¹⁷ Homer, *The Iliad*, trans. Robert Fitzgerald (New York: Anchor Books, 1989), p. 95.

¹⁸ Walter Hausmann and W. Jöchle, "The Discovery of Chiron's Cave: a Prehistoric School of Medicine for Animals and Humans," *Canadian Veterinary Journal* 29 (1988): 857-860. Chiron may have lived circa 1300 BCE. It is thought he was a tribal chief who invaded northern Greece on horseback. It is about this time that horses with riders appeared in Greek records. He is thought to have taught healing of man and animals from a cave in the Pelethronic Balley. In 1981, Walter Hausmann, by tracing ancient texts and local folklore, wrote of his discovery of this cave. The Greek mythological character of the centaur is a commonly-used symbol of veterinary medicine and is found on the hat badges of the Royal Army Veterinary Corps and The Royal Canadian Army Veterinary Corps, among others.

¹⁹ Xenophon, *On Horsemanship*, trans. unknown, accessed October 14, 2013, <http://www.shannonleighbstables.com/XENOPHON>.

of the animal are verified. The Indian Emperor Ashoka the Great of the Maurya Dynasty (269-232 BCE) noted in one of his edicts:

King Piyadasi made provision for two types of medical treatment: medical treatment for humans and medical treatment for animals. Wherever medical herbs suitable for humans or animals are not available, I have had them imported and grown. Wherever medical roots or fruits are not available I have had them imported and grown. Along roads I have had wells dug and trees planted for the benefit of humans and animals.²⁰

The use of cavalry by Hannibal, and by many other warring states, is well-known and was often a key asset in many battles. The Battle of Cannae on the 2nd of August 216 BCE used cavalry as a significant part of the double envelopment of the Romans by Hannibal's forces.²¹ Given their importance in providing speed and manoeuvrability on the battlefield, military horses had great value and logically should have received whatever level of veterinary care was available. Archaeologists have discovered what appear to be veterinary artefacts from the ancient world, including: "the Vindolanda tablet (TV II, 320) which mentions the veterinarian Virilis and a forfex, and the Aix-en-Provence altar depicting a veterinarian at work."²² In addition to the Roman professional *veterinariii* depicted in ancient documents, a recent work by Latin scholar J.N. Adams provides one of the first studies of Latin veterinary language: *Pelagonius and Latin Veterinary Terminology in the Roman Empire*.²³ There is some suggestion that the *veterinariii* were

²⁰ Ven. S. Dhammika, editor, *The Edicts of King Asoka* (Kandy: Sri Lanka, 1993), accessed October 14, 2013, <http://www.cs.colostate.edu/~malaiya/ashoka.html>. Note: references to King Piyadasi are self-references by King Asoka.

²¹ B.H. Liddel Hart, *Strategy*, 2nd Ed. (New York: Meridian Printing, 1991), pp. 28-29.

²² A forfex is a Latin term for a pair of shears. Stijn Heeren, "New Views on the forfex of Virilis the veterinarian: shears, emasculator or twitch?" *Journal of Archaeology in the Low Countries* 1-1 (2009), accessed on October 14, 2013, <http://dpc.uba.uva.nl/jalc/01/nr01/a05>. Additionally, the earliest written records of veterinary medicine can be found in the Egyptian Papyrus of Kahun (1900 BCE) and Vedic literature in ancient India; Michael Thrusfield, *Veterinary Epidemiology*, 3rd ed. (Oxford: Blackwell Science, 2007), p. 2.

²³ J.N. Adams, *Pelagonius and Latin Veterinary Terminology in the Roman Empire*, Volume 11 in Studies in Ancient Medicine Series (Leiden: New York; Koln: Brill, 1995).

classed as *immunis* and were not subject to regular duties (such as ditch digging and rampart patrol), likely recognition of the nature of their specialty and their value.²⁴

The veterinary knowledge of the Greeks and Romans was preserved and expanded on during the Middle Ages, both in the West and in the Arab world. In Europe, the first attempts to organize and regulate the practice of treating animals tended to focus on horses because of their economic significance. The great Islamic libraries maintained knowledge of hippiatry (the medicine of horses, from the Greek *hippo* - horse) and Arab horse hospitals employed stablemen called *baytars*. These men were involved in both the training and the healing of the horses in their care.²⁵ Similar men were referred to in medieval England as “marshals” (as opposed to farriers, who were responsible only for shoeing horses); for example, Master Thomas de Bardeney was marshal to Queen Eleanor of Castile in the late 1200s.²⁶ Farriers combined their work in shoeing and generally caring for horses' hooves with “horse doctoring.” In 1356, the Lord Mayor of London, concerned about the poor standard of care given to horses in the city, requested that all farriers operating within a seven-mile radius of the City of London form a “fellowship” to regulate and improve their practices.²⁷

²⁴ The historical references are unclear, but a reference can be found in Samuel P. Scott's translation of *Digesta* of Justinian (Bk 50.6.7) to veterinarians being exempt from more onerous employments. Accessed October 14, 2013, <http://www.constitution.org/sps/sps11.htm>.

²⁵ “History of medieval Arab veterinary medicine”, presentation to Faculty of Veterinary Science, Szent Istvan University, Budapest, Hungary, accessed October 14, 2013, www.univet.hu/sc1/feltoltott/23_1318404132.pdf.

²⁶ John Clark, editor, *The Medieval Horse and its Equipment: c. 1150-c. 1450*, rev. 2nd edition (London: The Boydell Press, 2004), p. 14.

²⁷ Pamela Hunter, *Veterinary Medicine: A Guide to Historical Sources* (Aldershot: Ashgate Publishing, 2004), p. 1.

Between the late 1200s and the early 1700s medicine in general continued to advance, albeit slowly as compared with the tempo of today. Veterinary medicine advanced in step or just a step behind human medicine during this part of human history. The major advance into the modern period started in the mid to late eighteenth century.

The Modern Period (1700 -)

The modern period of veterinary medicine is inexorably linked with a shift in military needs that began in the eighteenth century.²⁸ The origin of the modern veterinary profession is associated with the opening of the first modern veterinary school on 4 August 1761 at Lyons, France by Claude Bourgelat. The opening of *L'École Royale Vétérinaire de Lyon* was followed in 1766 by another in Alfort, a Paris suburb.²⁹ This formalising of the profession in Europe, and the great reliance of militaries of the time on horses and other beasts of burden, led to the creation of the military veterinary services as we think of them today.³⁰

Beginning in the late eighteenth century Britain, like France, began to make great strides in the field of military veterinary services. In 1793, Edward Coleman became the sole professor of the London Veterinary College and two years later, he was charged with the creation of the Army Veterinary Service of Great Britain. During the following century,

²⁸ Though animals were predominantly used in agriculture, the investment in veterinary medicine was tied to the military and its need to care for the military horse.

²⁹ A-L-J Railliet, and L Moulé, *Histoire de l'École d'Alfort, par MM* (Paris: Asselin et Houzeau, 1908).

³⁰ It should be noted that farriers were the progenitor of the modern veterinarian. Though today they are associated with the trimming and shoeing of the horse, the farrier of half a millennium ago also would have been involved in practices of bloodletting, drenching, etc. The other related profession noted is the saddler, thus covering two critical areas for a cavalry horse: contact with the ground and contact with the rider. In his previously-noted history of the Royal Army Veterinary Corps, Major General Smith dedicates Chapter Two to the topic of the Army Farrier. Major General Smith, *Royal Army Veterinary Corps...*, pp. 5-26.

the Office of the Principal Veterinary Surgeon and a system of Regimental veterinary surgeons and farriers³¹ evolved into the Army Veterinary Department. By the nineteenth century Britain developed specific Regulations for the Army Veterinary Department and this would gradually evolve into the Army Veterinary Corps (AVC) by the early twentieth century. King George V conferred the much-coveted title of “Royal” upon the AVC in November 1918 as recognition of the service provided by the Corps during the First World War. Since that time, Britain’s military veterinary corps has been known as the Royal Army Veterinary Corps (RAVC).

Britain provided a model for the development of military veterinary services that shaped the development of veterinary service in its colonies and those of other imperial powers. Britain, as the mother country, ensured that the British model became the standard throughout its empire; given that horses were common to all colonial powers, military veterinarians were likely included. The lack of local veterinary colleges in the colonies meant that for some time there was a close relationship between Britain and local colonial military veterinary services, with the local services staffed by graduates of the British educational system.

The United States Army Veterinary Service followed a similar pattern to that of Britain, with the army farrier first authorised in 1792; a subsequent regimental system of farriers, veterinary sergeants and veterinary surgeons was developed. During this period, the

³¹ The regimental veterinary surgeon was usually authorised by Army establishments, but locally sourced by the Commanding Officer of the Regiment. A Corps system of training standards, administration, promotion, continuing education, etc. was not necessarily a component of the Regimental system. French, *A History of the Canadian Army Veterinary Corps...*, p. 1.

United States was gripped by Civil War. It should be noted that the US Confederacy's approach to their horses – which saw troopers supplying their own mounts rather than being government-supplied, and providing no regimental veterinary service - may have been a contributing factor that cost them the war. According to historian Walter Heiss, “Their efforts to salvage their cavalry needs however nobly pursued were too late to defer the inevitable.”³² However, the inclusion of a category titled “hire of veterinary surgeons”, which appeared in the Confederate Quartermaster's Budget of January 1865, just three months before the Confederate surrender, shows that they had eventually recognized the need for veterinary services. By way of contrast, the Union forces clearly identified the importance of centralised management and veterinary services, having both government-supplied mounts and a regimental veterinary service.³³ With Union victory, the British model was proven effective and the pattern continued. On 3 June 1916 the US congressional legislation authorised the creation of the Veterinary Corps as a permanent part of the Medical Department of the Army.³⁴

Within the British Empire, Australia, New Zealand and India all saw their veterinary services develop based on the British pattern. Each of these three regions formed an initial Regimental system, manned by British graduates, followed by the opening of

³² Walter R Heiss, *Veterinary Service During the American Civil War: A Compilation* (Baltimore: PublishAmerica, 2005), p. 63.

³³ These details are summarised from Miller, *United States Army Veterinary Service...* and Heiss, *Veterinary Service During the American Civil War...* Though military historians will no doubt debate the various factors leading to the defeat of the Confederates, given that millions of horses and mules were used and died during the conflict (4.7 million available in the Union and 2.8 million available in the Confederacy), veterinary care would have been a significant factor. The financial and property rewards for a Confederate soldier may have led some to sacrifice their mount in battle, before it was lost to disease, since the Confederates did not compensate for losses due to illness. The Confederates suffered such loss of horse that if they removed the horse from ploughing the field and used it for military service, they could not produce sufficient forage to feed the military horse.

³⁴ Miller, *United States Army Veterinary Service...*, p. 4.

national veterinary schools and the creation of an Army Veterinary Corps. The Australian Army Veterinary Corps (AAVC) emerged from the Veterinary Department of the Commonwealth Military Forces in 1909, and served in both World Wars. By 1946, in spite of their success and with the evolution of the gasoline engine, the AAVC was effectively disbanded and officially disappeared on 27 February 1947.³⁵ Currently, there are a few veterinarians serving with the Australian forces, though not in an organised corps. Army reservists who have a different Army career, but are also civilian veterinarians are seconded to military veterinary duties.³⁶ Similarly, the New Zealand Army Veterinary Corps was established in 1907, and served in both World Wars but they were disbanded in 1947.³⁷ India's Remount Veterinary Corps (RVC) has a history spanning over 233 years evolving out of a Board formed in 1794 by the British for horse breeding. The RVC contributed to both World Wars as part of the British Empire. Since Indian independence, the RVC continues to serve within India and abroad.³⁸

Given the establishment of military veterinary capabilities around the world, a version of the British pattern was replicated wherever any other imperial power (France, Russia, Spain, Portugal, the Netherlands, etc.) deployed its military power or advised on the

³⁵ Michael Tyquin, *Forgotten Men: the Australian Army Veterinary Corps 1909-1946* (Newport, Australia: Big Sky Publishing, 2011), p. 355.

³⁶ "Vietnam veterinary adventure," Australian Army, accessed October 14, 2013, <http://www.army.gov.au/Our-work/News-and-media/News-and-media-2012/News-and-media-August-2012/Vietnam-veterinary-adventure>.

³⁷ C. J. Reakes, "Chap IX: New Zealand Veterinary Corps", in *The War Effort of New Zealand* (Auckland: Whitcombe and Tombs Limited, 1923), pp. 149-162, accessed October 14 2013, <http://nzetc.victoria.ac.nz/tm/scholarly/tei-WH1-Effo-t1-body-d9.html>; Jim G. Gilbert, "NZ Veterinary Corps", *Boot and Saddle* (1989), accessed October 14, 2013, <http://riv.co.nz/rnza/hist/boot/bs17.htm>.

³⁸ For a history of the Indian Army Remount Veterinary Corps (RVC), see: "Official Website of Indian Army - Remount And Veterinary Corps," accessed October 14, 2013. <http://indianarmy.nic.in/Site/FormTemplate/frmTempSimple.aspx?MnId=fes+8u1fKh49IavIB/Uylg==&ParentID=klFaNb6BboTm2l79syUowA==&flag=wCvDBK9fg28LVKJMvPiRg>

development of a local military force.³⁹ One of those powers, only the Dutch had disbanded its Corps. However, within the last decade the Netherlands have re-established their military veterinary capability and it currently has seven army reserve veterinarians.⁴⁰

Brief History of the Royal Canadian Army Veterinary Corps

Beginning in the early twentieth century, Canada's initial development of military veterinary services was predicated on the British model but gradually incorporated some unique features, such as the veterinary services of the North West Mounted Police (the progenitor of the RCMP, discussed below). Prior to 1910, veterinary support to the military forces in Canada was provided by a British regimental system. Veterinary practitioners from the Regiment's home region would hold a commission and would leave practice for ten to fifteen days per year to train with and supervise the regiment's horse. Only one or two regiments had permanent veterinary officers.⁴¹

In 1910, there began a gradual move to replace the Regimental Veterinary Service with the Canadian Army Veterinary Service, which included the Canadian Permanent Army Veterinary Corps (the regulars or full-time) and the Canadian Army Veterinary Corps (the

³⁹ It is beyond the scope of this paper to detail the histories of every modern military veterinary service, but a good number of European-influenced, and in particular British-influenced, countries followed a pattern of a Regimental system becoming a Corps system during the First World War. In parallel, most militaries of the world, from the late eighteenth- to the mid-twentieth centuries, had a veterinary service of some calibre. Annex 1 provides a partial reference list of these services. Given language barriers as well as the limitations of digital collections suitable for automated translation, this paper cannot go into great detail on many of the histories of non-English speaking military veterinary services. However, the author's research indicates that there are writings on the topics. It is possible to find documentation of services in the Imperial Japanese Army, the German Armies of both World Wars, the Soviet Army, etc.

⁴⁰ Colonel B.A. Steltenpool, D.V.M., M.V.M. Chief Army Veterinarian, The Netherlands, email message to author, August 4, 2013.

⁴¹ French, *A History of the Canadian Army Veterinary Corps...*, p. 1.

reservists or part-time).⁴² By the start of the First World War, this reorganisation had not yet been completed, but sections from Winnipeg and Montréal were sufficiently developed to form the backbone of the Canadian expeditionary veterinary services, referred to as the Canadian Army Veterinary Corps (CAVC) – Canadian Expeditionary Force (CEF). Table 1 below outlines CAVC – CEF organisation.

During the initial move to England in October 1914, at the outbreak of war, the CAVC supervised the shipping of 7,636 horses in 14 ships, with the *SS Montezuma* carrying the largest number at 973. During the crossing, only 86 horses (less than 1%) were lost.⁴³ In time, two Canadian veterinary hospitals were set up in Europe: No. 1 Canadian Veterinary Hospital in Le Havre, France, and No. 2 Canadian Veterinary Hospital in Shorncliffe, England. The latter eventually housed the Canadian Veterinary School and the Instructional School for Farriers. No. 1 Canadian Veterinary Hospital was one of 18 Imperial Veterinary Hospitals on the Lines of Communication and supported not just Canadian but all horses of the Imperial Army.⁴⁴ At its peak, No. 1 Canadian Veterinary Hospital had stabling for 1,364 horses, though at one point the number of horses under care exceeded 2,000.⁴⁵

In addition to the hospitals, veterinary support extended to the field forces, where 221 officers and sergeants cared for the 23,484 horses of the Canadian Expeditionary Forces, as well as other horses of the Imperial forces. Their role was not only to treat minor

⁴² *Ibid.*, p. 2.

⁴³ *Ibid.*, p. 6.

⁴⁴ *Ibid.*, Chapters 5&6, *passim*.

⁴⁵ *Ibid.*, p. 34.

illnesses, but also to provide supervision and preventive measures to ensure the fitness of the fighting horse. More serious cases were transferred to the Veterinary Hospitals and replacements were provided through the Remount Units. Mobile veterinary sections provided additional services and a link to the Veterinary Hospitals.⁴⁶

Table 1: CAVC – CEF Organisation⁴⁷

CEF Army Veterinary Corps	CAVC/CPAVC Source	Served In
“A” Canadian Mobile Veterinary Section	Recruited from No 2. Canadian Veterinary Hospital, Shorncliffe	Canadian Cavalry Brigade (5 th Division)
No 1. Canadian Mobile Veterinary Section	No. 10 Section CAVC (Winnipeg)	1 st Canadian Division
No 2. Canadian Mobile Veterinary Section	Recruited from No 2. Canadian Veterinary Hospital, Shorncliffe	2 nd Canadian Division
No 3. Canadian Mobile Veterinary Section	Montreal	3 rd Canadian Division
No 4. Canadian Mobile Veterinary Section	Recruited from No 2. Canadian Veterinary Hospital, Shorncliffe	4 th Canadian Division
No 5. Canadian Mobile Veterinary Section		Formed in England (Witley) but did not see service.
No 6. Canadian Mobile Veterinary Section	Petawawa	Siberian Expeditionary Force
No 1. Canadian Veterinary Hospital	No. 3 Section CAVC (Montreal)	Le Havre, France
No 2. Canadian Veterinary Hospital		Shorncliffe, England
Canadian Corps Veterinary Evacuating Station		Ecoivres, France

At this formative time in its history, the role of the military veterinary service as a whole was to reduce animal wastage. During the entire First World War, the Canadian gross

⁴⁶ *Ibid.*, p. 84.

⁴⁷ Combined information from French, *A History of the Canadian Army Veterinary Corps...*, *passim* and Library and Archives Canada, *Units of the Canadian Expeditionary Force...*. Note that there were many reorganisations and re-namings during the initial deployments, so the sources of personnel are more complex than what is represented here. However, this was the final organisation for the CAVC – CEF.

wastage rate (including animals evacuated to hospital, missing and dead) was 26%, where the dead wastage (those who died, were killed or destroyed) was 9.5%. During the war, the Corps returned 80% of injured horses back to the line, where they continued to move soldiers, ammunition, food, water, guns, etc. into combat.⁴⁸ In November 1919, the CPAVC received the “Royal” designation due to its excellent performance in the First World War, a title later extended to the CAVC in 1936.⁴⁹

The interwar years brought about the mechanisation of the Canadian Army, as well as reorganisation and rationalisation.⁵⁰ The result was a smaller RCAVC, whose role was accordingly diminished like that of other units. However, the twilight years of the Corps were characterised by a leadership (including that of the RCAVC itself) which did not foresee a role for the veterinary corps beyond the welfare of the military horse. As a result, on 1 November 1940 the RCAVC was disbanded by a recommendation of the Treasury Board, which was approved by the then-Governor-General, the Earl of Athlone. The annual cost savings achieved was just \$10,334.⁵¹ The demise of the Corps was lamented by contemporaries in editorials appearing in *The Canadian Journal of*

⁴⁸ French, *A History of the Canadian Army Veterinary Corps...*, p. 80.

⁴⁹ *Ibid.*, pp. 186 & 190.

⁵⁰ For studies that consider the impact of mechanization on the art of warfare, see: Griess, *Modern Warfare...*; Geoffrey Parker, ed., Section Four, “The Age of Mechanized Warfare,” in *Cambridge Illustrated History of Warfare* (New York: Cambridge University Press, 1995), pp. 216-340; Richard A. Preston and Sydney F. Wise, *Men in Arms: A History of Warfare and its Interrelationships with Western Society* (USA: Holt, Rinehart and Winston, 1979). For a consideration of the shift towards mechanization by the Canadian Military during the First World War see Rene Chartrand, *Canadian Military Heritage*, Volume III: 1872-2000 (Montreal: Art Global, 2000), accessed October 14, 2013, http://www.cmp-cpm.forces.gc.ca/dhh-dhp/his/docs/CMH_vol3_e.pdf. In particular see Canadian participation in the War beginning on page 92. This chapter of the book provides an in-depth analysis of the shift from horses to mechanization that included rolling artillery barrage, aircraft, tanks at Amiens and motorcycles.

⁵¹ French, *A History of the Canadian Army Veterinary Corps...*, p. 199. Note that according to the Bank of Canada that would equal \$160,896.46 at the time of this writing <http://www.bankofcanada.ca/rates/related/inflation-calculator/>.

Comparative Medicine and Veterinary Science,⁵² in one such editorial, the decision-makers were characterised as suffering from “muddle-headedness”.⁵³

North West Mounted Police Veterinary Service

Separate from the RCAVC, but in a para-military copy of the British military model, Canada had the North West Mounted Police (NWMP), the precursor to the Royal Canadian Mounted Police (RCMP), who employed John Luke Poett as their first veterinary surgeon and who was possibly the first qualified veterinarian in the Northwest.⁵⁴ Here too the British influence can be seen, as he was a graduate of the Class of 1860, Edinburgh Veterinary College (popularly known as the “Royal Dick”). After a brief engagement with the British Army and private practice in Ontario, he was appointed to the NWMP on 29 April 1874. As a mounted para-military organisation, it travelled great distances, relying on Poett and subsequent veterinarians to care for the horses that were fundamental to the NWMP’s duties.⁵⁵ The horse is still an iconic image of the RCMP, as honoured in the Musical Ride,⁵⁶ as reflected in the red serge uniform with its riding boots and bloused trousers, and as found in the contemporary detail of marked RCMP vehicles.

⁵² “Royal Canadian Army Veterinary Corps,” pp. 92-93.

⁵³ “Canadian Army Veterinary Corps,” p. 290.

⁵⁴ Franklin M. Loew and Edward H. Wood, *Vet in the Saddle. John L. Poett: First Veterinary Surgeon of the North West Mounted Police* (Saskatoon: Western Producer Prairie Books, 1978), p. 1.

⁵⁵ *Ibid.*, *passim*.

⁵⁶ “RCMP Musical Ride”, last modified April 18, 2007, accessed October 14, 2013, <http://www.rcmp-grc.gc.ca/mr-ce/index-eng.htm>

Chapter Two: The First World War – The Zenith of Traditional Military Veterinary Services

At an international level, the First World War is symbolic of a golden age for the traditional military veterinarian, where all combatants had millions of horses, donkeys and oxen carrying men and materials to and from battle. Though there have been millennia of wars and conflicts using the horse, and a few centuries of modern military veterinarians tending to these animals, nothing compares to the First World War for a near-global use of both.

As the number of service animals increased throughout the course of the war, so too did the overall number of military organisations responsible for their care. As the prime mover in the field, the healthy horse was keenly important, forming a vital link between the troops and the major shipping modes of the railway and the steamship. There were several military organisations involved in maintaining the horses, irrespective of the army employing them. Remount units were responsible for the procurement and training of horses and donkeys. Horses would have to be acquired to counter attrition, selected based on their planned employment,⁵⁷ tested for temperament, and trained for their task under battle conditions. The UK War Office noted: “Over the course of the war, a total of 468,323 horses were purchased in the United Kingdom, 428,608 horses and 275,097 mules in North America, 6,000 horses and 1,500 mules came from South America, and

⁵⁷ Author’s comment: The physical characteristics of horses vary with species. Warm bloods are lean and fast, suitable for cavalry work. Draft horses have the power to pull great weights such as artillery pieces and supply trains, but with less speed. Donkeys are tough, small and nimble, making them good pack animals for mountain and jungle operations.

3,700 mules from Spain and Portugal.”⁵⁸ What makes these numbers incredible is that over 700,000 horses and donkeys would have been shipped across either the Atlantic or the Pacific Oceans after they were purchased. A standard ocean-going transport was capable of carrying 600-900 horses. To move these remounts, it would require roughly a thousand trans-oceanic shipments.

On the other side of the fighting, remounts were difficult to purchase by the Central Powers given that they were geographically surrounded by their enemy, and it was only through capturing territory of enemy animals that they could gain significant numbers of horses - a difficult task. Local horse production would have been severely diminished, given that a foal is carried for eleven months’ gestation and generally requires two to three years to mature. This meant a horse conceived in the spring before the outbreak of the First World War would only come into service in the spring of 1917 or 1918. Therefore the horses alive at the beginning of the conflict would not be a significantly renewable resource given the numbers used. Nevertheless, in spite of such obstacles, reliance on horses during the war required an increase in military efforts to obtain remounts on all sides of the oceans.

Once obtained, service animals required a substantial investment in subsistence and military personnel. Unit Quartermasters provided food and water for all the animals used. This was a challenging task since horses consume a great quantity of forage (dried grasses), which can only be made in the summer, but must be provided year-round. This

⁵⁸ United Kingdom War Office, *Statistics of the Military Effort of the British Empire during the Great War, 1914-1920* (London: HMSO, 1922), p. 396.

created the necessity to provide safe, dry and secure storage. Due to its dryness the forage was vulnerable to fire, but if allowed to get wet, it became vulnerable to moulds and disintegration.⁵⁹ A working horse might consume a square bale of hay each day, supplemented with grain-based rations. Considering that the British forces used about half a million horses on the Western Front at any one time (Canadians used about 23,500), the quartermaster would have to supply half a million bales of hay per day, or fifteen million bales per month. Add to that a grain ration and clean, safe water, and it was no easy feat to supply the service animals.

Finally, veterinary and farrier services were responsible for maintaining the health of the horses, ideally through preventative measures, but also through treating disease and injury as it occurred. Staying with the British example, the Army Veterinary Corps during the First World War included 1,668 officers,⁶⁰ and 41,755 other ranks.⁶⁰ This was still a very small percentage of the overall British Army (less colonial and other forces), roughly one half of one percent. However, it represents about one Corps member for every 28 horses and one veterinarian for every 1,000 horses. Not unlike the current concepts of medical care deployed in roles (or echelons),⁶¹ with increasingly more capable services as the patient moved from the battlefield, veterinary services were also organised into roles.

⁵⁹ British colonial records are replete with discussions concerning the need to procure forage for service animals in North America. In several correspondences from the Secretary of State, the problem of ensuring forage was kept dry and free from mould was a predominant theme. For more on this refer to Letter from Kingston, Upper Canada, July 29th 1815, Colonial Office, Original Correspondence, Secretary of State, Vol. 356, Mic Reel B-296, National Archives and Library of Canada.

⁶⁰ These statistics from the RAVC history 1796-1919 appear to be only for the RAVC; however, the historical record often muddles forces from Great Britain itself and those joining from the colonies to form the Imperial Army. In this case, it is likely the numbers are accurate since the Corps history is distinct from the expeditionary force histories. Major General Smith, *Royal Army Veterinary Corps...*, p. 240.

⁶¹ NATO Medical doctrine assigns roles to their medical facilities. Role one would be the medic in the field at unit level, role two a field hospital in theatre at the formation level, role three a major surgical hospital in

The Canadian experience during the First World War provides a good understanding of how veterinary services were gradually organised into more articulated roles within military operations, and in particular as they functioned within the greater Imperial Army organisation. As discussed above, two Canadian veterinary hospitals were set up in Europe: No. 1 Canadian Veterinary Hospital in Le Havre, France, and No. 2 Canadian Veterinary Hospital in Shorncliffe, England. Their responsibilities included the treatment of minor illnesses, and the provision of supervision and preventive measures to ensure the fitness of the fighting horse. The execution of these responsibilities included daily rounds to ensure the horses were properly cared for by the troops to whom they were assigned. Though injury due to combat was the first thought of many, more mundane but equally serious problems with disease, nutrition and husbandry occupied much of the veterinarian's time. Through the process of triage, the unit military veterinarian (role 1) could have more serious cases transferred to the mobile veterinary sections (role 2) and then on to the Veterinary Hospitals (role 3) by horse ambulance or other means; if warranted, he also ensured the humane destruction of the horse beyond medical care. Replacements were provided through the previously-described Remount Units. Mobile veterinary sections provided additional services and formed part of the link to the Veterinary Hospitals. Throughout the course of the war, each of the roles developed and expanded to provide specific services within the broader area of military veterinary services.

The Canadian experience is representative of the development and expansion of new and more specialized roles in military veterinary services globally. All the forces that participated in the First World War could be expected to have had the same requirements to maintain their equine resources as Canada did, though each may have been organised somewhat differently. For all sides, the horse was a finite resource and critical to the war effort. Despite increasing mechanisation, cavalry charges were still common, artillery pieces were still towed by horses, and though trains carried major supplies forward, it still fell to the horse and donkey to move supplies across the last hurdle.

Many factors led to the defeat of the Central Powers; the great restrictions on acquiring remounts, continual loss of active duty horses, and reduced farmland for the production of forage were obstacles that not even the best veterinary service could overcome. Towards the end of the war, a shortage of horses would have hampered artillery movement and logistics and would have been a contributing factor to the defeat of the Central Powers. For the Allies, access to the remounts and farm land of North America, India and Oceania, and the good work of the Allied veterinary services to minimise wastage, gave the Allies a significant advantage. The technological advancements of the First World War, and specifically the gasoline engine replacing the horse as the prime mover, fuelled a shift from service animals to mechanization. As Chapter Three will show, this was to the detriment of the field of military veterinary medicine. Mechanization meant, at worst, the disbanding of some veterinary corps, and at best their retention (in a scaled-down capacity) to support military working animals, public health, military research and food security.

Chapter Three: The Post-Horse Era of Military Veterinary Service

Globally speaking, since the end of the First World War, the work of the military veterinarian has been transformed from traditional to more contemporary roles within the military – comparable to civilian veterinary roles. Military veterinarians no longer look after the health and welfare of the cavalry and artillery horse, nor the logistics donkey, to any great extent. So what is the military veterinarian doing in modern warfare?

The *US Army Field Manual 4-02.18, Veterinary Service Tactics, Techniques and Procedures* (TTPs), specifies three broad functions for the military veterinarian:

- 1) food safety, food security, and quality assurance;
- 2) veterinary medical care; and
- 3) veterinary preventive medicine.⁶²

These three functions are also the core of civilian veterinary medicine everywhere.⁶³ The first function, that of food safety, food security, and quality assurance, does not have much of a public profile, but in fact food supplies are secured and monitored in large part by veterinarians (meat inspectors being the best-known example). Anyone with pets would be familiar with the second function, that of veterinary medical care. The third function, veterinary preventative medicine, prevents disease in animal populations (e.g.

⁶² Headquarters, Department of the Army, *FM 4-02.18 Veterinary Service - Tactics, Techniques and Procedures* (Washington, 2004), pp. 1-1 and 1-2.

⁶³ The Canadian Veterinary Medical Association echoes the US Army functions in its statement: “Veterinarians are educated to protect the health of both animals and humans. Not only do they address the health needs of a wide variety of animal species, they also play a critical role in environmental protection, food safety, animal welfare and public health.” Canadian Veterinary Medical Association, “A Career in Veterinary Medicine,” accessed October 14, 2013, <http://www.canadianveterinarians.net/about-veterinary-medicine/career.aspx>.

via vaccination, proper nutrition and effective breeding), but is also an important part of the human medical system that identifies and helps prevent transmission of zoonoses (diseases that pass from animals to humans).⁶⁴

All of these veterinary functions also constitute a vital contribution to the “One Health” concept - an emerging field of study that connects veterinary, human and environmental health (see Figure 1) into a comprehensive, synergistic approach to planetary health. The One Health Initiative originated in the United States when the American Veterinary Medical Association approached the American Medical Association in an effort to encourage cooperation across multiple disciplines within the scientific community.⁶⁵ It has since garnered US and international support from the Centers for Disease Control, the European Union and the World Bank, among others. One Health promotes the tenet that environmental, medical and veterinary health disciplines must be linked in order to provide a solid foundation for progress. It is: “a movement to forge co-equal, all-inclusive collaborations between physicians, veterinarians, and other scientific-health and environmentally-related disciplines.”⁶⁶ Over millennia, the study of medical, veterinary and environmental health has diverged considerably. This initiative attempts to have them converge again for the benefit of all involved. Additionally for military planners, acceptance of the One Health concept, even at the scale of the individual soldier or small

⁶⁴ Vicky L. Fogelman *et al*, “The Role of Veterinary Public Health and Preventive Medicine During Mobilization and Deployment” in *Military Preventive Medicine: Mobilization and Deployment, Volume 1* (Washington DC, TMM Publications, 2003), *passim*. Accessed October 14, 2013, http://ke.army.mil/bordeninstitute/published_volumes/mpmVol1/PM1ch30.pdf.

⁶⁵ American Veterinary Medical Association, *One Health: A New Professional Imperative*, One Health Initiative Task Force: Final Report July 15, 2008, accessed October 14, 2013, https://www.avma.org/KB/Resources/Reports/Documents/onehealth_final.pdf.

⁶⁶ “One Health Initiative will unite human and veterinary medicine,” accessed October 14, 2013, <http://www.onehealthinitiative.com>. See also: “One Health,” accessed October 14, 2013, http://en.wikipedia.org/wiki/One_Health.

task force, allows for cross-training and reductions in troop deployments.⁶⁷ The United States Special Forces also has some aspects of One Health in their training. The medical courses listed in their Academic Handbook include many veterinary and environmental topics in addition to traditional medic training. The scope of the Civil Affairs Medical Sergeant Course is described thusly:

Recognize the relevance of medical threats for field forces; environmental health programs; medical threat briefing prep and presentation; assess/conduct/advise HN in waterborne illness/disease identification, investigation and prevention; assess/conduct/ advise HN in water analysis, sampling, testing, purifying; assess/conduct/advise HN in foodborne illness/disease, identification, investigation and prevention; assess/conduct/advise HN in arthropod borne illness/disease identification, investigation, prevention and control; veterinary emergency and preventative care for large and domestic animals; simple farm systems (animal/crop), environmental factors impacting HN livestock/crops; and dental disease recognition and emergency treatment.⁶⁸

This senior-level medic incorporates in a single individual what are considered to be elements of three disciplines: the medic, the veterinary technician and the environmental technician. By adopting a One Health approach, staffing is reduced from three soldiers to one, an important factor when considering small special forces teams.

⁶⁷ Major Ronald Burke, "One Health and Force Health Protection During Foreign Humanitarian Assistance Operations: 2010 Pakistan Flood Relief," *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 81-85.

⁶⁸ U.S. Army John F. Kennedy Special Warfare Center and School, *Academic Handbook 2013*, p. 44.

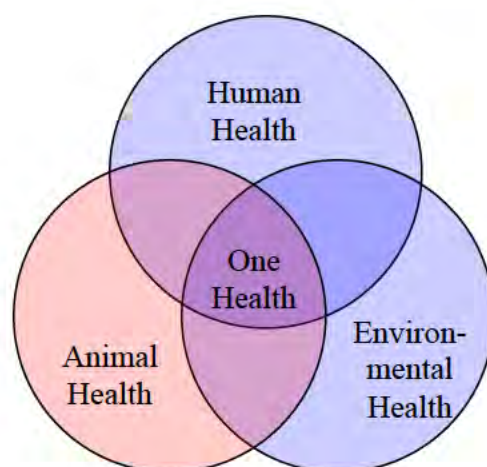


Figure 1. The One Health concept, illustrating the interconnections of animal, human and environmental health.

The modern military veterinarian can employ these three functions in support of three broad military roles:

- 1) support to conventionally-deployed forces;
- 2) support to civil authorities; and
- 3) support to foreign powers.

The first role, of support to conventionally-deployed forces, can be executed by providing care to military working dogs and other military animals, support to the military medical system by providing veterinary medical intelligence on the zoonoses of a particular area of operations, and advising and supporting commanders on the safety of local food procurement. Training can be provided to soldiers on safe practices around indigenous animals. This role is largely part of force medical care and force protection.

The second role, of support to civil authorities, directly reinforces provincial and federal veterinarians during an emergency (which can be executed in conjunction with the first

role, where the emergency is war, or separately, such as in response to natural disasters). This can be done by operating in regions and conditions where civilian veterinarians cannot, as well as advising commanders during domestic operations that involve livestock - such as rafting of cattle in the New Brunswick floods of May 2008 by CAF Engineers⁶⁹ (see Figure 2), and assisting authorities during the 2001 outbreak of Foot and Mouth Disease in the United Kingdom. Though animal care and welfare may seem unnecessary to military planners, it must be acknowledged that the evacuation of civilians from an area of operations is more easily accomplished if provisions have been made for the care and transport of their animals (whether pets or livestock). For instance, it has been informally estimated that as a result of Hurricane Katrina in 2005, up to 50% of the human fatalities could be attributed to people refusing to evacuate without their pets, or returning to the disaster zone in an attempt to rescue their pets.⁷⁰ A Zogby International poll found that 61% of pet owners would refuse to evacuate their homes if they could not take their pets.⁷¹ Given that about 56% of households in Canada contain at least one cat or dog, that there are an estimated 8.5 million cats and 6 million dogs in Canadian households,⁷² and that many pets are considered part of the family (even to the point of being regarded as “furry kids”), the human emotions involved can be intense and therefore should be a factor in planning for domestic operations.

⁶⁹ “140 cows rescued from flood,” *CBC News*, last modified May 3, 2008, accessed October 14, 2013, <http://www.cbc.ca/news/canada/new-brunswick/140-cows-rescued-from-flood-1.718780>.

⁷⁰ Dr. Heather Case, American Veterinary Association, email to author, May 4, 2010.

⁷¹ “Emergency plans assure pets aren’t left behind,” accessed October 16, 2010, <http://www.zogby.com/soundbites/ReadClips.cfm?ID=14961>. See also “Community Pet Preparedness,” accessed October 14, 2013,

http://www.oes.ca.gov/PlanningandPreparedness/Documents/PetPreparednessToolkit_100429.doc, p. 25.

⁷² Terri Perrin, “The Business of Urban Animals Survey: The Facts and Statistics on Companion Animals in Canada,” *The Canadian Veterinary Journal* 50.1 (2009): 48-52.



Figure 2. Military personnel from CFB Gagetown and a group of farmers and veterinarians escort dairy cows on a barge on the flood-swollen St. John River near Burton, N.B. on Friday, May 2, 2008. The river is at near record levels and several farm communities are cut off with road closures. (Photo credit: The Canadian Press/Andrew Vaughan)

The third role, of support to foreign powers (which can be executed in conjunction with the first role (war) or separately, such as in response to natural disasters), is perhaps the most relevant for Canada given that Canadian Forces are, and likely will continue to be, deployed to disaster zones (such as Haiti) or to developing, “failed/failing states” (such as Afghanistan, Congo, and Sudan). It is this work in international development that distinguishes military veterinarians from most of their civilian counterparts, with veterinary charities and certain academics being the notable exceptions. Canadian Army Counter-Insurgency Operations recognises that the military may be the only element of

power capable of working in such environments.⁷³ The root of much civil strife, though framed in ideological arguments, is generally linked to quality of life. Issues like lack of food, disease, and a poor economy are often the result of agricultural failure. By improving the state of livestock health through emergency, routine and preventative medicine, and by improving livestock hygiene, the modern military veterinarian can assist in improving food production and reducing animal and human disease, thereby establishing a base from which to improve the economy through increases in local market activity. When working with non-governmental organisations and government agencies such as Foreign Affairs, Trade and Development Canada (DFATD),⁷⁴ separate areas of operations would usually be defined. Development aid agencies such as the former Canadian International Development Agency (CIDA – now part of DFATD) would not normally contemplate directly-supported or joint projects with the military. Rather, the likely *modus operandi* would see the military on the ground first, providing veterinary services during the stabilization period. Later, CIDA programs and local resources could replace and expand on the military veterinarians' initial work. The military could provide reconnaissance data to CIDA and ensure a smooth handover.⁷⁵ All three of these military roles can be supported by one or more types of military veterinary tasks, as outlined in Table 2.

⁷³ Canada, Department of National Defence, *B-GL-323-004/FP-003 Counter-Insurgency Operations*, (Ottawa: Director of Army Doctrine, 2008), p. 513 para 2.

⁷⁴ DFATD was created by merging the Canadian International Development Agency (CIDA) into the Department of Foreign Affairs and International Trade (DFAIT) in March of 2013. CIDA's role is now part of the International Development portfolio of DFATD. The term CIDA will still be used here as it was their policies under discussion at the time of communication. It is assumed DFATD will maintain the same policies in the short term. "Department of Foreign Affairs and International Trade," accessed October 14, 2013, <http://www.international.gc.ca/international/index.aspx?lang=eng>.

⁷⁵ Jean McCardle, Canadian International Development Agency, personal communication, February 2010.

Table 2: Proposed Classification of Military Veterinary Tasks

Mil Vet Task	Description
Surge	Augments existing veterinary capabilities during an emergency.
Bridging	Replaces a destroyed or ineffective capability until it can be reconstituted, or another agency can take over.
Initiating	Provides the first wave of veterinary care where none existed before. Requires planning of follow-on support by non-military agency (NGO/GO).
Targeted	Specific projects targeting a particular issue, e.g. once-off projects to vaccinate a population against a known disease.
Training	Provides specific knowledge and skills to local veterinary services and locals, which they will be able to sustain within their economic and technological base, e.g. basic husbandry techniques, disease prevention, breeding strategies.
Security	Operates in security situations where civilians cannot operate.
CBRNE	Assists with identification of biological agents, advises on animal quarantine requirements, identifies at risk and not at risk species, provides decontamination of herds and pets.
Service animals	Health care standards, vaccination and other health protection for deployments, medical care, selection of appropriate animal handlers.
Research Support	Laboratory, forensic, and other research support to military activities.
Food and Water Safety	Ensuring food animals are fit for human consumption and that animal pathogens are absent from food and water sources.
Emergency slaughter	Assisting with CFIA-ordered emergency slaughter of herds as part of a foreign disease outbreak. Military Vets well suited given the firearms training provided by the military. Trains and coordinates the use of military personnel to support CFIA-ordered slaughters.

The Role of Modern Military Veterinarians for Canada's Allies and Other Militaries

The demand for military veterinary services continues amongst Canada's allies and new capabilities within the profession are developing. Historically, the military veterinarian was closely tied to the horse, and in Canada, the move towards adopting the "Iron Horse" led in part to the disbandment of the RCAVC. This move was mirrored in Australia and New Zealand, as discussed in Chapter Three. However, many other militaries have active veterinary services today, both Regular and Reserve. It should be noted that many militaries maintain veterinary capability wholly as a reserve capability, leveraging the skills, training, experience and continuing education of veterinarians in private practice. Currently, notable allied services include the United States Army Veterinary Corps⁷⁶ and the Royal Army Veterinary Corps (UK).⁷⁷ The 55th International Military Veterinary Medical Symposium held in 2009 in Marseilles, France saw the participation of military veterinarians from Austria, Croatia, Slovenia, Morocco, Denmark, the Netherlands, the United States, France, Italy, Germany, Poland, Belgium, Norway and Finland.⁷⁸ The 19th annual Asia-Pacific Military Medical Conference held in 2009 in Seoul, South Korea, had a total of 36 military veterinarians participating from Malaysia, Nepal, the Philippines, South Korea and the United States.⁷⁹ Not only do these military veterinarians serve in their home countries, but they routinely deploy with their forces around the world.

⁷⁶ "U.S. Army Veterinary Corps," accessed October 14, 2013, <http://veterinarycorps.amedd.army.mil/index.htm>.

⁷⁷ "Royal Army Veterinary Corps," accessed October 14, 2013, <http://www.army.mod.uk/medical-services/veterinary.aspx>.

⁷⁸ "Report of the 55th International Military Veterinary Symposium," accessed October 14, 2013, <http://www.cimm-icmm.org/page/anglais/rapportcongresvetoANG2009.php>.

⁷⁹ "Military veterinarians meet in South Korea, France," accessed October 14, 2013, <https://www.avma.org/News/JAVMANews/Pages/090715o.aspx>.

As examples of post-horse era deployments to different regions, the United States has deployed a veterinary service in many conflicts, including the Second World War, Vietnam and Iraq.⁸⁰ Additionally, the US, German, and British militaries have had veterinary services in Afghanistan, where both the US and the UK have had members of their veterinary services killed in action.⁸¹ Both International Security Assistance Force (ISAF) and NATO have used veterinary programs in Afghanistan.⁸² Civilian veterinary programs have also started in some parts of Afghanistan.⁸³ The Indian Army has had veterinary detachments in the Sudan where they worked with Canadian Civil Military Cooperation (CIMIC) Officers (see Figure 3).⁸⁴

⁸⁰ Miller, *United States Army Veterinary Service...*; Colonel William Henry Harrison Clark, *The History of the United States Army Veterinary Corps in Vietnam 1962-1973* (Roswell, GA: privately printed, 1991); and Captain Marla Brunell, "A Veterinary Service Squad Deployment In Support of Operation Iraqi Freedom," *Army Medical Department Journal* PB 8-09-1/2/3 (Jan – Mar 2009): 21-24.

⁸¹ For information regarding US veterinary services and deaths see Patricia Rodriguez, "Healing Afghanistan," *Veterinary Practice News* 22.10 (2010): 55, accessed October 14, 2013, <http://www.veterinarypracticenews.com/vet-industry-people/profiles-in-medicine/healing-afghanistan.aspx>; "Army vets wage unconventional campaign abroad," accessed October 14, 2013, <https://www.avma.org/News/JAVMANews/Pages/060615g.aspx>; and "U.S. Army veterinarian killed in action," accessed October 14, 2013, <https://www.avma.org/News/JAVMANews/Pages/060715c.aspx>. For Germany see "Marjan, The Lion of Kabul Kabul Zoo & Brooke Hospital 2005 Updates - Afghanistan," accessed October 14, 2013, <http://animom.tripod.com/kabulzoo.html>. For United Kingdom, see "EXCLUSIVE: A lasting legacy from the Herriot of Helmand," accessed October 14, 2013, <http://ukforcesafghanistan.wordpress.com/page/234/?archives-list&archives-type=cats> and "Army dog handler killed in Afghanistan named," accessed October 14, 2013, <http://www.telegraph.co.uk/news/worldnews/asia/afghanistan/2461765/Army-dog-handler-killed-in-Afghanistan-named.html>.

⁸² "Afghan Veterinarian, Civil Affairs Team Help Ranchers," accessed October 14, 2013, <http://www.defenselink.mil/news/newsarticle.aspx?id=49561> and "ISAF provides veterinary care to nomadic tribes," accessed October 14, 2013, <http://www.nato.int/isaf/docu/pressreleases/2008/10-october/pr081031-577.html>.

⁸³ "Afghan veterinary association finds its way," accessed October 14, 2013, <https://www.avma.org/News/JAVMANews/Pages/071115c.aspx> and "U.S. veterinarians help jump-start Afghan animal health clinic," accessed October 14, 2013, <https://www.avma.org/News/JAVMANews/Pages/060315a.aspx>.

⁸⁴ Major Alex Brennan, email message to author, March 4, 2009.



Figure 3. “The Force Reserve Battalion (FRB) of UNMIS acting as an ambassador of goodwill in the war-torn state has taken upon itself the task of helping the people of Sudan. A number of projects have been undertaken which have brought UNMIS closer to Sudanese hearts. Providing veterinary care is one such task being performed by the Battalion as the key CIMIC (Civil Military Cooperation) Project. FRB has a vet detachment comprising of one Doctor and two nursing assistants. The detachment is equipped with necessary equipment, vet medicines and vaccines.” Excerpted from “Improved Veterinary Care: A Gift from UNMIS to Sudan”, Lieutenant Colonel Vishal Nanda, Indian Army (photo credit: Indian Army photographer).

Clearly, in all these cases, the modern military veterinarian has found varied and valuable work to undertake, as these armies and the conflicts they participate in do not rely on the horse. Indeed the presence of military veterinarians in the majority of NATO countries as well as many other non-NATO countries indicates that the profession is still relevant.

Table 3 demonstrates how veterinary services are incorporated in one of the main

documents used by the United States Armed Forces in their operational planning process, the Universal Joint Task List.⁸⁵

Table 3: Excerpts from the United States Universal Joint Task List (UJTL) that reference veterinary services (refer to the complete document for full details)

SN 4.3.3 Coordinate Health Services	
	Notes: This task includes: medical, dental, <i>veterinary</i> , optical, and ancillary services
SN 6.6.4 Expand Health Service Support	
	Description: To maintain and/or expand essential health services including: medical, dental, optometry, <i>veterinary</i> , ancillary services, and preventive medical support. M1: Of existing medical, dental, optometry, <i>veterinary</i> , and preventive medical support, sufficient to meet deployment/employment requirements of force.
SN 8.1.5.1 Conduct Humanitarian and Civic Assistance (HCA)	
	Notes: Humanitarian and Civic Assistance (HCA) is a specific and distinct program from Foreign Humanitarian Assistance. HCA generally includes activities such as medical, dental, and <i>veterinary</i> care.
SN 9.4.6 Coordinate Medical Response to Weapons of Mass Destruction (WMD) Events	
	Description: To coordinate the medical response in CM operations to mitigate the effects of a WMD attack or event and restore essential operations and services. Notes: This task addresses coordinating domestic and foreign CM activities with NGOs, HN entities, and other government agencies and conducting public awareness campaigns and policies for use of the strategic national stockpile (SNS). This task also provides for integrating and coordinating national and DOD medical surveillance systems, assessing foreign medical capabilities to identify shortfalls, and ensuring that food and water supplies for DOD personnel are not contaminated. It includes coordinating medical and <i>veterinary</i> care resources and medical responder protection, performing mass mortuary activities, and incorporating national plans for DOD and civilian medical support of WMD incidents. This task involves identifying and assessing the capabilities of DOD military treatment facilities to support patient care and treatment for the WMD incident-affected population.
ST 4.2.2 Coordinate Health Service Support (HSS)	

⁸⁵ The guiding document for the Universal Joint Task List is US Government Joint Chiefs of Staff, *CJCSM 3500.04F Universal Joint Task Manual* (Washington, DC, 2011). Accessed October 30, 2013, http://www.dtic.mil/cjcs_directives/cdata/unlimit/m350004.pdf. However the list itself is now a living electronic document. The most recent version is accessible here: Joint Electronic Library, UJTL Tasks, Accessed October 30, 2013, http://www.dtic.mil/doctrine/training/ujtl_tasks.htm.

	Description: Coordinate health service support (HSS) including, but not limited to first responders, forward resuscitative surgery, theater care, en route care, preventive medicine, mental health, dental, and <i>veterinary</i> services, in preparing and sustaining theater forces.
ST 4.2.2.3 Manage Medical, Dental, and <i>Veterinary</i> Services and Laboratories and Supply	
	Description: To ensure an effective and consistent program, in peacetime and war, of medical and dental services, across the area of responsibility, including the provision of laboratory support and medical supply. This task also covers responsibility for ensuring preventive medicine and <i>veterinary</i> services for all Services on a theater-wide basis.
ST 8.2.4 Coordinate Humanitarian and Civic Assistance (HCA)	
	Notes: ... Assistance is limited to: 1) Medical, surgical, dental, and <i>veterinary</i> care provided in areas of a country that are rural or are underserved by medical, surgical, dental, and <i>veterinary</i> professionals, respectively, including education, training, and technical assistance related to the care provided.
OP 4.4.3 Provide Health Services	
	Notes: These services include, but are not limited to: ... medical, dental, <i>veterinary</i> , laboratory, ...

By having its capability enshrined in such a fundamental document, the United States confirms the validity of the service within their scope of operations. From a Canadian perspective, there remains the question of whether the military *veterinary* service is valid within the Canadian scope of operations.

SECTION TWO

Chapter Four: Survey of CAF Members

Insights gleaned from the survey questionnaires devised for this study, which were completed by CAF personnel, suggest possibilities for the return of Canadian military veterinary services. Since the CAF does not currently have a military veterinary service, the majority of its members are unlikely to have anything but the most peripheral understanding of this area of operations. However, in recent years, especially with the deployment to Afghanistan, the role of Influence Activities (IA) and more specifically Civil Military Cooperation (CIMIC) has brought some CAF members into direct contact with foreign military and civilian veterinarians, service animals or civilian livestock. The primary purpose of this survey was to gather the opinions and experiences of some of these members. Secondary to that, it aimed to gather information on rates of exposure of CIMIC members to military veterinarians.

Methodology

A survey questionnaire was developed that allowed for the collection of both quantitative and qualitative data (see Annex 2). In developing the questionnaire, the best practices of the American Association for Public Opinion Research (www.aapor.org/BestPractices1.htm) were employed, specifically:

1. Have specific goals: the goal was to gather facts and opinions on the topic of military veterinarians as experienced by CAF personnel on deployment.

2. Consider alternatives: ideally, face to face interviews would have produced more detailed responses, but the logistics and costs of this approach were prohibitive. Even more relevant would have been visits to the field, but again logistics and costs ruled this out. In this case, a survey distributed by email was the most effective and economical given the time and resources available. The ethics and approval process alone took a significant amount of time.

3. Select samples that well represent the population to be studied: though many CAF personnel will have encountered animals on deployments, only those in command, liaison and CIMIC positions could be expected to have had professional interactions with foreign military veterinarians, and of those, the CIMIC personnel would likely have had the most exposure.

4. Use designs that balance costs with errors: the email survey cost only the time of the personnel involved in approving the survey (Royal Military College Ethics Board, Social Studies Research Review Board, Canadian Army) and these are funded for this purpose. In this case, there was no funding available for alternative options, so the email survey was the only economical option.

5. Take great care in matching question wording to the concepts being measured and population being studied: every attempt was made to keep the language plain and to provide a sensible introduction to each section of the survey. Background information was provided to put the subsequent questions into context.

6. Pretest questionnaires and procedures: given the predicted small sample size, pretesting was limited. However, during several reviews, the questions were refined to avoid bias or leading the respondents to a particular answer.

7. Train interviewers carefully on interviewing techniques and the subject matter of the survey: no interviewers were used, so this practice does not apply.

8. Check quality at each stage: in the draft stages, there were several reviews for bias, grammar, and ease of comprehension. During the analysis stage, the quantitative data collected was checked several times to ensure accuracy.

9. Maximise cooperation or response rates within the limits of ethical treatment of human subjects: given that this was a voluntary study, there were significant limits to persuasion available. Use of an internal CAF database ensured that a high percentage of the target audience was selected. A limiting factor was that the survey was restricted to those still serving. This excluded about 20% of the names retrieved from the CAF database. An additional complication arose due to language considerations. The initial plan was to target only English language service soldiers. The guidance provided through the approvals process was that an English-only survey was permissible, provided French-language units were not canvassed (such as Land Force Quebec Area units). However, due to the difficulty of determining the primary language of each selected subject's unit, the survey made it to a few subjects that required the survey in French. As a result, as soon as

a translation could be secured, a French version was distributed to all subjects, to ensure the widest possible access and to ensure compliance with Canada's language laws.

10. Use appropriate statistical analytic and reporting techniques: in this case, the majority of quantitative questions had only one of two, or occasionally three, answers. Statistical analysis beyond basic arithmetic was not required. The qualitative data was somewhat more problematic as it required not only the generation of a narrative to explain the results, but also the selection of representative quotes to illustrate the narrative.

11. Develop and fulfill pledges of confidentiality given to respondents: as part of the questionnaire package, a voluntary consent form and study outline was provided. Within this were noted procedures to guard privacy as well as the policy on the destruction of completed questionnaires once the study was completed.

12. Disclose all methods of the survey to allow for evaluation and replication: the survey method as well as its content is disclosed here and in the appropriate annex.

During the development of the survey, many questions were trialed. Based on the pattern of questions, they were eventually grouped into five sections:

- a. Contact with International Military Veterinary Services;
- b. Military Veterinary Service Activities;
- c. The Value of a Military Veterinary Service;
- d. A Canadian Forces Military Veterinary Service; and
- e. General Comments.

Once the questionnaire had been tested and was considered complete, it was submitted to and approved by the Royal Military College of Canada Research Ethics Board (RMC REB), the Chief of Military Personnel Social Studies Research Review Board (SSRRB) and by the Canadian Army Chief of Staff for Land Operations. There was no requirement identified by the SSRRB for Royal Canadian Navy or Royal Canadian Air Force approvals. These steps allowed access to approximately 216 CAF members, mostly from the Army, but all services were represented.

Due to the nature of voluntary questionnaires, a response rate of ten to fifteen percent was anticipated, giving an expectation of twenty-one to forty-three replies. In order to target the questionnaires, a query was run in the Canadian Forces Training Planning Operations (CFTPO) database archives looking for members who had served in a CIMIC position in any theatre of operations. Additionally, select members of the Influence Activities Task Force (IATF) were also added to the list due to their involvement in this related field.

Once the list was complete, and the necessary approvals secured, the questionnaire, with its accompanying information, disclosure, and voluntary consent forms, was emailed to the currently-serving members from the list. The members were asked to reply within a month, though a few were accepted after that time as a result of members being on

deployment, training, exercise or vacation. Due to limitations of the CFTPO query, it was expected that certain job descriptions would not match the actual employment in theatre, resulting in some selected individuals who had nothing to contribute.

Of the 216 questionnaires distributed, 204 were successfully delivered, with the majority appearing to have reached their intended target as measured by the “read” receipts returned by the mail system. Of those, fifty replied either with a brief email or a completed questionnaire. Table 4 gives a general breakdown of these replies.

Table 4: Survey distribution results

Category	Number	Percentage of total
Undeliverable	10	4.7%
Delivered, read, no reply	103	50.5%
Replied, no experience with military veterinarians	21	10.3%
Replied, with questionnaire	20	9.8%
Replied, CFTPO inaccurate description	9	4.4%
Total replies	50	24.5%

The quantitative questions produced varying amounts of responses and the numbers are presented in the Annex. In sections one and two of the surveys, if the first answer was no, then that was the only answer in the section. Sections three, four and five could be answered irrespective of the previous sections.

Part One: Contact with International Military Veterinary Services

In this section, the intent was to confirm that Canadian soldiers had come into contact with military veterinarians and to get some information on their nationality, theatres of

operation and employment. Of those who completed the questionnaire, about half had encountered a military veterinarian, but if all replies were included that figure dropped to about one-quarter that had encountered a military veterinarian. For about half of those who did have an encounter, it was due to their military duties. The military veterinarians came from the United States, the United Kingdom, France, Poland, India and Kenya, and were encountered in Europe, the Sudan, the Golan Heights, Bosnia and Afghanistan. Though the duties varied with the theatre of operations, all three categories of military veterinary service were performed when all theatres were assessed together.

Part Two: Military Veterinary Service Activities

The intent of this section was to get some measure of the effectiveness of the military veterinary service when used in development/stability roles. This is perhaps the most difficult area in which to assess effectiveness. Other areas, such as service animals, force protection (food/water security), and laboratory services have less-complex measures of performance and effectiveness. Of course, given the low number of responses in this section, only limited conclusions can be drawn; however, individual commentary is illuminating, as the following examples demonstrate.

Lieutenant Commander Michael Wood summed up his own perception of the effectiveness of the military veterinarian during his tour in Bosnia in this way:

Often we found ourselves at a disadvantage whenever we would discuss agricultural or animal issues with local farmers due to our lack of large animal knowledge. The majority of Canadian and/or UK personnel did not have any farming experience. The presence of a veterinarian eliminated disadvantages stemming from knowledge gaps or naïveté that locals or officials might have exploited when negotiating animal-related issues, such as feed support, roaming spaces, shelter development, etc. Military veterinarians ensured their availability

within operational areas since force protection measures needed to protect them were the same as other military personnel, vice additional protective measures that were needed for civilian veterinarians.

However, Major Janie Desjardins commented: “They were providing services but they weren’t targeting how to have a biggest [*sic*] impact regarding the stability or development of the areas [*sic*].” Her comment reinforces the need to have carefully-planned veterinary objectives that support the overall mission. Offering yet another consideration, Captain Howard Chafe noted that the military veterinary effectiveness: “seemed good but generally worked without sufficient cultural knowledge to have lasting impact.” Again, this speaks to having a good plan that also incorporates the cultural reality of those receiving the assistance rather than those giving it. Irrespective of these problems, Major Sandi Banerjee raised a good point, noting that the military veterinarians were: “far more reliable and consistent with their ability to deploy and deliver programs than their NGO counterparts.” She added: “They were happy and able to hand over certain parts of their program to NGOs but had to be called back when the NGOs failed to deliver follow-on care.” This rebuke is a common refrain, when it comes to letting contractors or NGOs do the work. With military veterinarians the commander has complete control; with contractors, the commander still has significant control. However, with NGOs, there are varying qualities of organisation and resourcing, making [for] some less-than-reliable partners.

When measuring effectiveness, one indirect measure is whether the insurgents targeted the military veterinary capability. The rationale is that an effective military veterinary capability would be seen by insurgents as a threat and would then be targeted. None of the respondents indicated that insurgents targeted the military veterinary capability. The

absence of insurgent attacks against military veterinary projects can be explained in several ways: the capability was not seen as a threat by the insurgents; the capability was seen as valuable by the local population and to attack it would be to distance the locals; or deployment was organised in such a manner that the insurgents could not react quickly enough. An alternate MoE is to measure whether the local population requested military veterinary services when they were known to be available. In response to this question, the majority of survey respondents noted that military veterinary services were requested, indicating that there was a local need. As these two examples show, developing useful MoEs remains a challenge.

An additional challenge for the military veterinarian is the broad range of species that can be encountered in theatre. Though there are theatre differences, all species listed in the survey (cattle, camels, goats, sheep, horses, pigs and poultry) were attended to by the military veterinarians in at least one of the theatres of operation. Though not on the list of animals provided on the survey, respondents added donkeys, dogs, cats, monkeys and even bees to the list. This reinforces the fact that military veterinarians can provide services across a broad range of species.⁸⁶ With respect to the bees, Lieutenant Commander Michael Wood noted that during his tour in Bosnia the CIMIC organisation was assessing the validity of a proposal by a displaced person to build and sell beehives as part of their small business development program. The military veterinarian was consulted and “proved her worth by confirming the legitimacy of the need, design and

⁸⁶ It would also suggest the need for the deployed military veterinarian to have access to a robust communications capability allowing for reach-back to specialist advice.

operations of the local farmers.” In this case, the addition of beekeeping into the local economy was generally accepted as positive.⁸⁷

Using the beehives as an example, the challenge of the MoEs is again highlighted. The veterinarian was able to confirm that the idea was sound, but it is not known if the beehives were successful in housing bees, if the bees were effective pollinators, or if there was an improvement in crop yields. This demonstrates the difficulty of longer-term measures to validate initial assessments. When devoid of well-planned MoEs, alternate, less reliable MoEs are used. Lieutenant Colonel Sanchez King noted: “Based on the requests and priority [for veterinary care] placed by locals and local governments, the impact was positive and likely well worth the expense.” The fact that several respondents made similar observations indicates that with the lack of any other formal measure, the local requests for service became an informal measure of success. Unfortunately, this type of measure leads to many questions. Was there an actual need? Were the locals simply taking whatever they could get? Did the projects reach their intended targets? Was there a positive change due to the project? Such questions serve to underscore the need for more formalized methods.

According to Lieutenant Colonel David Myles’ responses, in the Sudan, the process appears to be much more formalised. He stated: “India deploys with all its own medical assets for the veterinary det[achment]. They absorb the cost of all the treatments and they also sent one or two host nation veterinarians back to India for further education and

⁸⁷ The reader should consider here that bees are fundamental to agriculture, being the primary pollinator for many plants. Some of those plants feed the population directly, while others provide forage for animals. Many of those animals then provide milk, eggs, meat, etc.

tr[ainin]g.” Several other respondents, who had been deployed to the Sudan, echoed Lieutenant Colonel Myles’ comments. Collectively the respondents described the Indian Army Veterinary Detachments as having had a well-detailed and resourced plan to build the local livestock economy, not only with immediate care, but also by building the capacity of the local government and veterinary service. By involving local government and veterinarians, and establishing longer-term planning, the Indian Army has forged a link between the Sudanese and the Indian veterinary education system, which should provide measurable success in the future.

In light of calls for a more robust and formalized process, it may be asked if veterinarians from NGOs can perform the same function and be as effective, and if they can also work in cooperation with military veterinarians. In regards to this question, half the respondents who completed the surveys indicated that NGOs were present in their theatre of operations. According to their replies, they had mixed reviews of NGO veterinarians and of their effectiveness. In Bosnia, due to the large number of NGOs and their lack of overall coordination, Lieutenant Commander Wood noted: “Some NGOs would support local farmers by providing cattle, but in their enthusiasm to assist, would in error donate the cattle to displaced farmers squatting on occupied fields. [Specifically] in the Federation (Drvar in particular) some Croatian farmers squatting on formerly Serb farms received cattle.” He goes on to link the NGO activity to its effect on the International Community’s objectives: “This action in many ways legitimized their desire to remain where they squatted and hindered the SFOR DPRE mission, which intended to return these farmers back to their previous fields.” This is a good example of how similar goals shared by NGOs and the diplomatic/military mission can conflict with objectives set at

the international level. So while the International Community's stated objective was to return the displaced to their lands, this NGO created, possibly by default rather than design, conditions where the squatter became more attached to the land, and thus prevented the return of the DPRE. The author's own experience in Bosnia found that the quality and goals of NGOs varied considerably, from those with a genuine desire to help, to those looking to support a particular agenda, to those that were fronts for foreign intelligence services. Overall, NGOs often have many of the same goals as the international community but these goals can potentially change if the amount of donated funds changes. Military veterinarians have the financial backing of the state, and are required to complete their mission within the context of the stated long-term objectives, both international and domestic. NGOs, however, typically have a less-reliable source of funding and as such their goals are in large part dependent on their donor's objectives and financial stability. This can at times place them at odds with military/international purposes, as suggested by Lieutenant Commander Wood and the case of NGOs in Bosnia. The implication is that the NGOs' veterinarians may not be able to replace the military veterinarian because their objectives are often more short-term and based on the prerogative of their financial supporters, who may have their own set of objectives. Only the military veterinarian, other government veterinarians or contractors paid by the government can be held to the international community's long-term goals and only the military veterinarian can reasonably be expected to deploy into combat areas. Going hand in hand with the international community's goals is the need for sustainability.

Equally important, according to some respondents, is a consideration of sustainability for all military projects with a development component. Building on points made by

Lieutenant Commander Wood, Major Bennett raised a fundamental issue relating to the practicality and long-term sustainability of all development activities undertaken. He staunchly maintains that regardless of who takes on the project, whether military or any other organisation: “Militaries only create conditions for sustainable activities.” Further: “We [militaries] should not be in the business of offering services that we cannot sustain such as first world veterinary services in a developing country.” A more familiar example which serves to underscore Major Bennett’s point is the typical example of building a school in a developing country, without ensuring there is a capability to supply or pay for the teacher, the books for the students, the power for the lights, etc. This is a classic example of a development failure through unsustainability. Any investment in development must be measured against the ability for it to be sustained. In veterinary terms, vaccination, if done broadly, can significantly reduce the incidence of a particular disease, giving a short-term benefit. But eradication of a disease takes generations of vaccination, accompanied by movement controls, biosecurity procedures and surveillance programs. Any military veterinary program that includes a development component must ensure the development is sustainable, ideally by the locals themselves or by a follow-on force or NGO. Lieutenant Colonel Lamoureux reflects this sentiment as well, stating “That asset[s] need to be link[ed] with the T[ask] F[orce] effect[s] plan.” In particular, he comments that the military veterinarians need to be incorporated into the Influence Activities portion of the effects plan to ensure that the right service is delivered at the right time. As with any military activities, military veterinary development programs must be deliberate, planned and compliment the overall military plan.

Part Three: The Value of a Military Veterinary Service

The intent of this section was to determine if seasoned soldiers found value in the military veterinarian. This is especially interesting in the CAF, since there is little to no opportunity for these soldiers to be exposed to this speciality in their training or doctrine. The majority of respondents agreed that there is a place for military veterinarians in failed and failing states (95%), that they are an alternative to civilian agencies in a non-permissive environment (82%), and that they are worth funding (68%). Lieutenant Colonel King noted categorically: “The importance to the civilian populations in agrarian societies of the animal herds and – by extension – vet services cannot be overstated.” He added: “As reported elsewhere, the health of the herd is sometimes prioritized over the health of children (my personal experience in Afghanistan).” According to King: “As an economic system, the animal herd can be critical to stability in many of the areas which CIMIC operators will likely work.”

King’s response offers a strong statement in favour of veterinary services. Yet in spite of such support there are those who would challenge this view. Some may argue that there is no need for a military veterinarian, stating that civilian agencies are sufficient to fill the gap. Though Gemmill and Bamidele-Izu argue for a greater role of civil society, and NGOs in particular, in global environmental governance, they do concede: “Designing governance structures that draw NGOs into global-scale environmental problem solving, policymaking, and implementation remains an important global challenge.”⁸⁸

⁸⁸ Barbara Gemmill and Abimbola Bamidele-Izu, “The Role of NGOs and Civil Society in Global Environmental Governance,” p.19, accessed October 14, 2013, <http://environment.research.yale.edu/documents/downloads/a-g/gemmill.pdf>.

Additionally, as Chief Warrant Officer Scott Stewart pointed out: “When on operations we are called to visit areas that are less than secure, that is no place for a civilian. ... The military uniform brings credibility to the person wearing it in the eyes of the locals.” Stewart’s comments pertinently capture and reflect a key point put forward by other respondents who completed the survey - that the military veterinarian is a soldier first. As a soldier, the military veterinarian can work anywhere soldiers are required to work and they can be easily integrated into force protection, adapt to harsh living conditions, etc. As stated by Master Warrant Officer Arthur Tackley: “It depends on the mission statement.” Once the environment becomes permissive, it is then appropriate to hand over to civilian agencies - either governmental, international or non-governmental organisations.

Part Four: A Canadian Forces Military Veterinary Service

In this section, opinions were solicited on whether the CAF could use a military veterinary service. When asked about a Canadian military veterinarian on deployments, the respondents all saw a mission-specific role, but were split between support to service animals and support to CIMIC missions in agrarian regions. Chief Warrant Officer Stewart reported on his deployment to Bosnia: “One also must be aware that while the military is able to import safe food supply many of our UN and other NGOs cannot.” The military owns and operates a logistics system that can move vast quantities of food and water purchases from accredited suppliers. Chief Warrant Officer Stewart continues: “For example in Bosnia CIVPOL [international civilian police] was forced to shop on the economy [to] buy meat products from local farmers.” However, the safety of these products are often in question and as Chief Warrant Officer Stewart notes: “It would be

nice if we could keep our Canadian Police safe while on deployment.” Although Stewart is implicitly suggesting that military veterinarians could contribute to local food safety through meat inspection and herd health programs while on deployment, he could just as easily be arguing for the military to extend its logistics to Canadian civilians deployed into the theatre of operations. But his point about local meat safety is not only relevant for the health and safety of the international civilian police on deployment, but equally beneficial for the population at large because it would lead to a reduction in the overall number of incidents of food-borne illness in that area.

In addition to its expeditionary role, the CAF has for all intents and purposes a limited domestic role, yet the response to the survey suggest there is a place for military veterinarians. When asked whether military veterinarians could have a role in domestic operations, the respondents were split between those for and those against. Within Canada there exists a highly advanced system of government and private practice veterinarians, and short of a major disaster or a major foreign disease outbreak,⁸⁹ they cope with all the animal requirements. On one side of this issue Captain Bennett stressed: “We have an excellent veterinary service in Canada. We have no need for [military veterinarians]...in a Dom Op.” This side also noted that civilian contractors could be used to provide care for military service animals while in Canada. However, on the other side of the issue, some respondents noted the need for military specialists to advise military commanders, and they argued military veterinarians could provide assistance to overwhelmed local

⁸⁹ As noted in the British press, the Army had a role to play in controlling the Foot and Mouth Disease (FMD) outbreak in the United Kingdom. “Foot-and-mouth disease,” *BBC News*, accessed October 14, 2013, http://news.bbc.co.uk/2/hi/in_depth/uk/2001/foot_and_mouth/1199183.stm. Interestingly, the Army was also implicated in the press as being the source of the outbreak: Joe Murphy, “Army caused original foot and mouth infection,” *The Telegraph*, last modified 29 April 2001, accessed October 14, 2013, <http://www.telegraph.co.uk/news/uknews/1317644/Army-caused-original-foot-and-mouth-infection.html>.

authorities during major disasters or foreign disease outbreaks. Lieutenant Colonel King makes a valid and important point: “Vets could be useful possibly in support of specific operations – tied to Health Canada.” This underlies the basic principle of disaster assistance in Canada, namely that once municipal resources are exhausted, provincial resources are used. Once provincial resources are exhausted, federal resources are committed. Within the federal model, for foreign disease outbreaks, Canadian Food Inspection Agency resources (including the civilian Canadian Veterinary Reserve) would take the lead; military veterinarians, should they exist, would support the CFIA as requested. Major Sean Ahern also saw a domestic role for Canadian military veterinarians. He argues that with respect to CAF operations in the North: “While the Cdn Rangers use snow-mobiles, I can envision the occasional use of dog teams.”⁹⁰ The majority of Canadian veterinarians, private or government, are found in the lower latitudes of Canada, in mostly urban areas. The case made by King and Ahern is further grounded if one considers that access to civilian veterinary contractors for the care of service animals is limited in Northern and other remote areas.

In addition to their opinions on military veterinarians in CAF operation, the respondents were asked about whether there would be a role for military veterinarians in task-force pre-deployment training. The respondents were again divided, though the majority saw a

⁹⁰ Major Ahern was right. See the Maple Leaf article on dog teams used in the north: “Dog gone it!” *The Maple Leaf*, 13.14 (2010): p. 1. Additionally the author has briefly worked in Labrador City on a locum and was the only veterinarian in that region. The only other veterinarian in Labrador was in Happy Valley – Goose Bay. Dr Leia Cunningham was the first veterinarian resident in Nunavut and has been recently joined by Dr Ross Dickinson, her husband, as the only two veterinarians in Nunavut. “Nunavet Animal Hospital,” accessed October 14, 2013, <http://www.nunavet.ca>. There are vast regions of Northern Canada that are not provided with veterinarians in private practice. If deploying domestic or allied dog teams, veterinary support should either be on location, or within easy access of air evacuation.

role (71%) for Canadian military veterinarians. They argued that the role should predominately be educational, providing a proper understanding of the cultural relevance of animals within other cultures, the dangers of strays and wildlife, policies on unofficial “mascots”, and zoonoses. In the same vein, some respondents saw a specific need to provide additional training to CIMIC teams, to prepare them for some of the assessments they may have to make in an agrarian society. Knowing or having insights into the members of the community with which one is about to engage is something civilian veterinarians could address only through research. However, a military veterinarian recently returned from a deployment can provide first-hand experience, aiding the CIMIC teams about to deploy with up-to-date knowledge.

The 20 percent of respondents who did not see a need for a specific Canadian military veterinary role in pre-deployment training indicated that civilian veterinary contractors could provide the necessary briefings. Certainly there are some topics that are mostly academic and need no field experience to present; however, military personnel could pair their academic skills with military/global experience and pass along essential information. Today’s Canadian soldier, often raised in a predominantly industrialized society, could learn a great deal from those members of the CAF who have first-hand experience dealing with cultures and societies of non-industrial regions. So while some of the respondents noted that soldiers were more interested in kinetic training, at least some would benefit from a wide variety of non-kinetic training. This sort of training and experience can be just as valuable in protecting the soldier’s life and limb while deployed. In his response to one of the survey questions, Lieutenant Commander Wood provided an excellent example. He noted in his survey: “Many of our CF personnel are no longer from an

agricultural background, and therefore their urban experience may not necessarily prepare them for the usually rural areas, and animal knowledge, that military personnel on operations often require.” It is imperative to provide them with a certain amount of basic information to help familiarize them with the cultural significance of animals within certain cultures. Soldiers need to understand that in some societies, especially those that are agricultural-based, the livestock and the crops are essential elements for all life. Today’s soldier needs to understand that if they damage crops while carrying out a mission, it has real consequences for the civilian population in that region. In this manner the soldier could do more harm than good to the community and the overall mission. Additionally, the soldier’s conduct around animals can be important in the prevention of harm to the soldier.⁹¹ In Section Five of the survey Captain Chaffe brings to the fore the importance of understanding the cultures of the people with whom one is engaged. He notes:

For Bosnia, knowing the practices for handling swine would have been useful in dealing with differences between Serbs and Muslim Bosnians. In general most countries have not only specific animals they treat as livestock but also cultural considerations for their care and treatment. Having specialists in this cultural aspect would likely require specific and intense cultural training even for specialists prior to deployment. In other words, a military vet support team should not be assigned on a ROTO 0 except in a recce capacity in order to provide information to teams on focused study to allow considered and appropriate actions in later ROTOs.

Cultural intelligence can be a pivot on which an operation can succeed or fail. A single violation of a cultural norm can cause a loss of local support. In counterinsurgency operations, that local support is critical to force protection and human intelligence

⁹¹ Rabies is a common example, but other zoonotic diseases can be transmitted through the keeping of Camp Mascots without veterinary supervision. Under veterinary supervision, Camp Mascots can be not only a psychological aid to the troops, but a form of disease and pest control.

gathering. Understanding the locals' relationship with their animals affords a better understanding of the overall culture of the area of operations. If cultural norms are respected, it can paint the military force as an assistance force rather than an occupier. As Captain Chaffe also points out, having a veterinary aspect to theatre reconnaissance can be of value in capturing some of this cultural intelligence. Additionally, veterinary reconnaissance provides information on local veterinary needs if any, and information to the health services for soldier protection (zoonotic disease risk, food and water safety assessments, etc.).

The surveys were replete with suggestions that members of the military receive proper information about the values of the society in which they are to engage. In particular, a proper understanding of the cultural significance of animals in an agrarian society, especially the economic effects of the loss of an animal to disease or combat, was highlighted in the surveys several times. For a soldier in combat, the enemy is obviously the prime target. However, consider the second-order effects of destroying either the livestock directly, or the irrigation and crops that provide for the livestock during the first order effect of defeating the enemy. There is potential to create another enemy while defeating the first enemy. This sort of cultural training is not necessary for civilian veterinarians and would form a unique part of the military veterinary profile.

Having interpreted the survey question to assume that soldiers could be trained in veterinary medical procedures during pre-deployment, Petty Officer Greidanus cautions: "If a soldier appears to be incompetent while working on a veterinary issue and an animal dies...it could cause more harm to the mission than if he had done nothing in the first

place.” This raises an incredibly important distinction. In general, the practice of military veterinary medicine is conducted only by military veterinarians, veterinary technicians and certain specially-trained medics. Pre-deployment training delivered by military veterinarians to the majority of soldiers would be on animal-related issues of force protection and local animal-related customs, and not on the conduct of veterinary medicine in the field. CIMIC teams would get more detailed mission-specific training, but it would not include the practice of veterinary medicine; rather, it would better prepare them for making assessments of veterinary needs. Only medics could receive veterinary medicine training that builds on their established skills, if the deployment warranted it. There are precedents for this. As previously noted, in the US Special Forces, civil affairs medical sergeants are cross-trained in limited veterinary medicine as well as other disciplines.

Overall, the respondents confirmed that there is a place for the military veterinarian with the CAF during deployed operations. This was expected given the agrarian economies of recent deployments. There was less of a consensus on what a military veterinarian can do for the CAF during domestic operations and pre-deployment training, but mission-specific animal awareness training figured prominently in the responses.

Part Five: General Comments

This was a free-form section where respondents could make any comment. Not all used this opportunity, but the following items were raised for consideration and have yet to be mentioned elsewhere.

Full-time or Part-time: Major Donna Allen raised the issue of where military veterinarians might fit into the CAF: “Just as the requirement for CIMIC officers to be Reservists a few years ago (2001 timeframe) was instituted for good reason, perhaps a military veterinary service in Canada would be a Reserve military occupation for similar reasons.” This is the most economical way to have the capability. Having a Regular Force component would require provisions for continuing education and clinical hours to prevent skill slippage. A veterinary capability based in the Reserve Force ensures military-related training can be delivered part-time, while veterinary skills are maintained by full-time private practice. Lieutenant Colonel King echoes Major Allen’s comments: “Several cost-effective solutions could be used to provide this service – Reserve based is an obvious concept. Our key allies maintain this service. A closer look at our allies’ Veterinary programs is advised.”

Pest Control: Chief Warrant Officer Stewart commented on camp animals: “Of course all camps have rodent problems and the best solution is a cat.” Not in itself justification for a military veterinary capability, but it demonstrates one more task where a military veterinarian can maintain the health of an animal that provides a service to the military.

Military Veterinarians as Peacekeepers: Lieutenant Colonel Myles commented on his experience of how effective the military veterinarian can be in preventing conflict on certain types of operations:

In Sudan, the Indian Army utilized them to great effect, providing VETCAPS and MEDCAPS in various areas where there were no NGOs or host nation services. It was so effective that it prevented tribal conflict on more than one occasion. I am very confident [*sic*] that this capability could be used in other conflict scenarios.

In areas that are primarily agrarian, it has a huge potential to influence the region to the Commander's objectives or aim.

This is a case where the commander is able to allocate one resource to avoid using another. Not only is this important when all resources are limited, but the use of each resource, in particular kinetic resources, can have detrimental secondary and tertiary effects. Though the immediate problem is resolved, it creates additional problems for the future. In this case, the use of a small medical and veterinary detachment prevented violence that could have required infantry intervention and the need for a larger medical contingent.

"Nice to Have": Petty Officer Greidanus raised the issue of how commanders assign tasks: "Having worked outside the wire in a combat zone going through 15 villages in a single province of Afghanistan, I did encounter times when having a veterinarian could have been an asset. Not having one did not prevent us from having a successful tour of duty." From his statement, he identified a local need, but answering that need was not part of his mission. As most soldiers do, he judged mission success in the timeframe of a tour of duty, typically six months. But if instead, the period of mission assessment was three to five years, would that have made the assessment of a local need more important? This is fundamental to operational and strategic planning, that longer timeframes are used in terms of assessing success, and that there is continuity of effort from one tour of duty to the next.

Service Animal Investment: Colonel Dwayne Hobbs raised the issue of service animals: "If the CAF were investing in employing government-owned service animals, the case

[for a military veterinary capability] would be stronger.” Though horses are not in common military usage, military working dogs (MWDs) have a significant place in military operations, especially in improvised explosive device detection and patrolling. A switch from using contractors to government-owned MWDs on deployments would necessitate provisions for their health, though Allies could provide care under contract when the CAF is collocated.

Discussion

The general impression from the surveys is that there are two broad groups of opinion on the need for military veterinarians. There are those who have worked with veterinarians in agrarian battlespaces and found them to be a very valuable tool to help create stability (but definitely not the only or principal tool). The other group has had either peripheral exposure to military veterinarians or none at all, and as such, tended to have more reservations. The majority of respondents do support some form of veterinary capability and generally agree that it should be small and focused, though there is disagreement on whether there should be military personnel or civilian contractors providing the service.

The survey itself does allow some conclusions to be drawn, but due to the small sample size, these should not be taken as definitive comments on the general opinion of CAF personnel. As the survey was targeted towards personnel that were likely to have contact with military veterinarians, it can be expected that a certain bias is contained in the results. However, the survey does provide insight into the wide potential of military veterinarians as used by other nations’ militaries. It also demonstrated that perceptions of

what military veterinarians can do varied amongst the respondents and tended, not unexpectedly, to be incomplete.

SECTION THREE

Chapter Five: The Future Relevance of Military Veterinary Services

Some of the Best Weapons for Counterinsurgents Do Not Shoot.

Counterinsurgents often achieve the most meaningful success in garnering public support and legitimacy for the HN government with activities that do not involve killing insurgents (though, again, killing clearly will often be necessary). Arguably, the decisive battle is for the people's minds; hence synchronizing IO with efforts along the other LLOs is critical. Every action, including uses of force, must be "wrapped in a bodyguard of information." While security is essential to setting the stage for overall progress, lasting victory comes from a vibrant economy, political participation, and restored hope. Particularly after security has been achieved, dollars and ballots will have more important effects than bombs and bullets. This is a time when "money is ammunition." Depending on the state of the insurgency, therefore, Soldiers and Marines should prepare to execute many nonmilitary missions to support COIN efforts. Everyone has a role in nation building, not just Department of State and civil affairs personnel.⁹²

Development/Force Protection

Perhaps the greatest value of military veterinarians is their second-order effect of force protection and economic stability, derived from the first-order effect of development work. Very basic veterinary projects such as parasite removal, vaccination, improved nutrition and better breeding can significantly improve animal production amongst a given local populace. With increased productivity comes more food, better human health, more economic activity, and ultimately a greater number of locals who experience higher levels of happiness, satisfaction, and perhaps even gratitude.

⁹² Headquarters, Department of the Army, *FM 3-24 Counterinsurgency* (Washington: December, 2006), p. 1-27.

Consider also that two of the United Nations' Millennium Development Goals, created at the turn of the millennia, are directly related to agriculture: *Eradicate extreme poverty and hunger* and *Ensure environmental sustainability*. Both of these goals must have a veterinary component if they are to be achieved.⁹³ Insurgents are not likely to provide a veterinary service to the community and local resources will either be non-existent, severely damaged or unable to operate in non-permissive environments; therefore, in an insurgency, the military veterinarian provides an essential service that the locals are unlikely to jeopardise. This also has the potential to lead to better intelligence, fewer tier two fighters and a more stable community that sees value in the military presence. The insurgency then appears unable to look after the needs of the locals and loses legitimacy. At a more advanced level, veterinary involvement in Agri-Business Development Teams (ADTs)⁹⁴ can assist in stabilising and growing the agricultural economic base of society, aiding the supported community to increase its capacity to meet its most basic of physiological needs. Once the security situation has improved, in small part due to veterinary activities, the greater civilian veterinary resources of governmental and non-governmental organisations can continue to build upon the foundations established by military veterinarians.

As a partner in global animal health and security, the military veterinarian also has a role to play in keeping foreign disease out of Canada. Work done overseas in identifying

⁹³ Millennium Development Goals (MDGs) are a United Nations program detailed and discussed at "United Nations Millennium Goals," accessed October 14, 2013, <http://www.un.org/millenniumgoals/> and discussed by Andy Tamas in *Warriors and Nation Builders* (Kingston: Canadian Defence Academy Press, 2009), pp. 5-8. There is debate within the development community on whether the MDGs provide the right framework, but they also have broad acceptance among many governmental organisations.

⁹⁴ Center for Army Lessons Learned, "Agribusiness Development Teams in Afghanistan Tactics, Techniques, and Procedures," *Handbook No 10-10*, Nov 2009, accessed October 14, 2013, <http://usacac.army.mil/cac2/call/docs/10-10/10-10.pdf>.

foreign disease, and in the implementation of appropriate decontamination or quarantine procedures, can assist the Canadian Food Inspection Agency (CFIA) in preventing foreign disease outbreaks in Canada that would jeopardise the food on which our nation's health and economy depends. This becomes particularly relevant when soldiers return from theatre where contaminated uniforms, foodstuffs, illegal animal products, unofficial mascots, etc. can find their way back to Canada. If this can be prevented in theatre, then the CFIA has an easier job defending Canada from foreign animal disease.

Domestic Operations

The potential scope of Canadian military veterinarians in Domestic Operations is vast. The most likely scenario would involve aid to civil powers in response to a natural or man-made disaster. Every disaster will have an animal component, whether pets, livestock or wildlife. The military veterinarian would be a valued resource in these operations, providing liaison with other government departments on animal issues and providing service on the ground where civilian resources are unable to operate, or have been exhausted.

The Canadian Veterinary Medical Association has recently established the Canadian Veterinary Reserve (CVR) as a civilian tool for emergencies.⁹⁵ Initially, the CVR was formed to give the Canadian Food Inspection Agency a surge capacity in the face of a foreign animal disease outbreak on Canadian soil. It has subsequently expanded to a point where it can provide individual and small veterinary team support both domestically and

⁹⁵ "Canadian Veterinary Medical Association and Canadian Food Inspection Agency Establishing Veterinary Reserve," accessed January 3, 2012, http://www.canadianveterinarians.net/Documents/Resources/Files/508_news-releaseCVR_E.pdf.

abroad. Currently this support is voluntary and provides only the services of veterinarians, without any equipment. A military veterinary capability could support and even serve as the vanguard for the CVR, due to its faster deployability and the greater acceptable risk assumed by military personnel. A military veterinary capability would also have its own equipment and could access greater resources through the military supply system. In the case of a Domestic Operation where the military is supporting an evacuation (e.g. floods), military veterinarians can be deployed into the evacuation area to care for and rescue pets and livestock prior to transfer to civilian authorities.

Many animal rescue organisations now provide mobile shelters to assist with disasters, but their access to the disaster area may be restricted for security and mobility reasons. Anecdotally, it has been suggested that there have been instances in which civilian organisations attempting to rescue animals have been mistaken for looters.⁹⁶ The military veterinarian can serve as the bridge between these civilian organisations that provide the majority of care, and the secured area of operations. The animal rescue world is a highly complex environment, incorporating legally mandated SPCAs and Humane Societies, charitable organisations, emergency measures organisations, well-meaning individuals, etc; military officers unfamiliar with this world would find it difficult to integrate effectively with these groups. A military veterinarian would be expected to have some mastery of the complexities surrounding animal issues, and the associated agencies including government departments, official and unofficial non-governmental organisations, and well-meaning but sometimes misguided individuals. The military

⁹⁶ Dr. Ben Weinberger, personal communication, March 2010. Dr. Weinberger is a veterinarian who volunteered in New Orleans after Hurricane Katrina.

veterinarian could play a valuable role as the Commander's liaison with this dynamic and often emotional environment.

Arctic Sovereignty

Currently very few veterinarians work in remote parts of Canada, especially the North. Army veterinarians could use these regions for training exercises, achieving realistic training by running triage facilities and quick impact projects (i.e. vaccine clinics) while providing service to currently under-serviced communities. Adding veterinarians to Arctic sovereignty missions would add extra legitimacy to Canada's presence and additional services to its citizens in the North. During a recent exercise, Op NUNALIVUT 10, CAF members worked with the Danish forces' SIRIUS Dog Sledge team. The team was there to conduct a familiarization patrol around CFS Alert.⁹⁷ With a force of military veterinarians, the Canadian Forces might in future consider the use of service dog teams in the North, in conjunction with the Ski-Doos and ATVs currently used by Rangers and other forces.

Research

Though this would admittedly be beyond the likely scope of the Canadian Forces, military veterinarians can serve as important partners in military research. Research into biological defence - a component of Chemical, Biological, Radiological-Nuclear, and Explosives (CBRNE) - can be directly supported by military veterinarians, as many

⁹⁷ "Dog gone it!" *The Maple Leaf*, 13.14 (2010): p. 1.

biological agents are of animal origin (i.e. anthrax).⁹⁸ The US Navy Marine Mammal program not only trains marine mammals for service, but conducts important research on their health as well as methods of protecting them from the effects of military equipment.⁹⁹

Service Animals

Several federal government departments have active working dog programs, including the RCMP Police Dog Service and the Customs and Border Services Agency, whose dogs detect narcotics, firearms, currency and agricultural products. The Canadian Forces also has working animals, including the Military Police Working Dog Trial.¹⁰⁰ In both Bosnia and Afghanistan, pack mules and donkeys have been used by the CAF where access by vehicles was difficult (see Figure 4). Goats have been used by CIMIC teams in Afghanistan as reparation for damage and injury caused by CAF actions (see Figure 5). The CAF contracts with civilian companies to provide explosive ordinance detection dogs in Afghanistan and an incident with such a dog that resulted in a soldier being bitten led to a Safety Digest notice.¹⁰¹

⁹⁸ “Veterinarians needed to develop comprehensive animal protection, decontamination plans,” accessed October 14, 2013, <https://www.avma.org/News/JAVMANews/Pages/050701m.aspx>.

⁹⁹ “Marine Mammal Program,” accessed October 14, 2013, <http://www.spawar.navy.mil/sandiego/technology/mammals/veterinary.html>.

¹⁰⁰ Major D.N. Boot, Briefing note for CFD, *Military Police Working Dog (MPWD) Trial*, 17 Mar 2008.

¹⁰¹ Steven Chase “Forces planning to expand use of sniffer-dog teams,” *The Globe and Mail*, accessed November 7, 2013, <http://www.theglobeandmail.com/news/politics/forces-planning-to-expand-use-of-sniffer-dog-teams/article1206842/> and “Canadian military seeks more bomb-sniffing dogs for Afghan mission,” *Cape Breton Post*, accessed October 14, 2013, <http://www.capebretonpost.com/Living/World/2010-01-05/article-777188/Canadian-military-seeks-more-bomb-sniffing-dogs-for-Afghan-mission/1>. For civilian contracts see: “Bomb-sniffing dogs a key part of Afghan military team,” accessed October 14, 2013, http://www.canada.com/story_print.html?id=2367240&sponsor; “Canadian soldier hurt in bomb blast in Afghanistan,” *CBC News*, accessed October 14, 2013, <http://www.cbc.ca/news/world/canadian-soldier-hurt-in-bomb-blast-in-afghanistan-1.686968>; Kelly J. Maguire, *VCSi Statement of Capabilities and Experience (rev 1.6)*, (Las Vegas: Vigilant Canine Services International, n.d.), p. 13. For the Safety Digest



Figure 4. Cpl. Scott King, 27, of Lamaline, Nfld, from 1 Combat Engineer Regiment based in Edmonton, returns from grazing Hughes, a two-year-old donkey the soldiers purchased from their Afghan National Army counterparts, at a Canadian patrol base west of Kandahar City, Afghanistan, Tuesday, April 2, 2008. Hughes, the pint-sized Afghan donkey, clearly eases more than just the physical burden of being a Canadian soldier in Afghanistan. (Photo credit: The Canadian Press/ James McCarten)



Figure 5. CIMIC Operator Captain Kent MacRae, a reservist with the PEIR, escorting a sheep to an Afghan family. The sheep was used to make reparations for unintended Canadian Forces actions. (Photo credit: Cpl Pop, Public Affairs)

Special Forces

notice see: "K-9 Canines Aren't Pets," accessed 16 October 2010, <http://www.vcds-vcemd.forces.gc.ca/dsafeg-dsg/pi/sd-dsg/1-07/article-11-eng.asp>.

In addition to the previously-described training that Special Forces medics can receive, US Army veterinarians have been assigned to Special Forces Groups to plan and run preventive medicine tasks, run veterinary civic action programs (VetCAPs), assist in training SOF medics, provide technical advice to the Commander, support military working dogs (MWDs), assist in the purchase and care of pack animals where vehicles were not practical, and conduct neutering and rabies vaccination programs around coalition bases to decrease the rabies risk to humans. The VetCAPs in particular can be quite varied. Examples include lectures to Afghan veterinarians on Highly Pathogenic Avian Influenza, training of Afghan laboratory workers on the Brucellosis test card provided by the US Department of Agriculture, and vaccination and deworming programs. According to Colonel Robert Vogelsang: “Due to the sometimes remote locations in which SOF operates, the unit Veterinary Corps officer may be the only veterinarian in a particular area. As such, they will work with the local Host Nation public health personnel to improve local capabilities.”¹⁰²

The Bottom Line

To deny the intensity of human emotion where animals are concerned, because the object of the emotion is an animal rather than another person, is naïve and unrealistic. The reality is that the emotion still originates in the human and by managing the object, animal or otherwise, stress is relieved in the human; thus they are likely to be more responsive to the emergency management organisation instructions. Not having a plan to cope with the animals located in an area of operations can make it more difficult than

¹⁰² Colonel Robert Vogelsang, “Special Operations Forces Veterinary Personnel,” *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 69-70.

necessary to assist the local populace. There are also situations in which only military or specially-trained veterinarians could operate, such as security and CBRNE environments. Decontamination of animals is likely to be necessary when civilians are being decontaminated. Veterinary expertise could be useful for the biological portion of CBRNE, given that many of the agents involved are of animal origin.

In these operations, civilian veterinary involvement must of necessity be limited, especially in the initial phases of disaster operations and over the longer term in areas with security problems. A military veterinarian can be part of reconnaissance teams and the Canadian Forces' Disaster Assistance Relief Team (DART), and can undertake regular rotations through theatres of operation. Some military responsibilities in these operations could include gaining support of the local population for the mission, mitigating some of the root economic causes of the conflict, and enhancing domestic services like water and food supplies. The military veterinarian provides a bridge until the security situation permits civilian veterinarians to resume or establish their practice.

By working with the communities within an area of operations, providing basic training for local veterinarians and farmers, and facilitating the delivery of supplies like vaccinations and de-worming products, the military veterinarian can start programs aimed at the well-being of agricultural livestock that will increase the productivity of local herds and flocks. The improvement in overall conditions of the people and through them, the society itself, can assist the military commander in shortening the period between the commencement of military operations and the handover of a secure area of operations to civilian authorities. Many of the projects spearheaded by military veterinarians can be

relatively inexpensive and short-term, but can also provide lasting benefits even after the operational forces depart. Handover to reputable NGOs or agencies such as CIDA would allow for long-term sustainability.

CONCLUSION

To the typical layperson, the military veterinarian was primarily a horse doctor who had his heyday during the First World War. The reality is that the military veterinarian has been present for millennia, practicing state-of-the-art medicine, such as it was or is.

Though in early times the role may have been combined with horse trainers, blood-letters and farriers, there was a recognised requirement for a specialist. That modern specialist now uses the latest medical knowledge, the most technologically-advanced equipment, and the benefit of the knowledge of his predecessors to investigate, diagnose and treat a very wide number of species (not limited to mammals), to prevent disease in humans as well as the rest of the animal kingdom, to maintain and protect food and water supplies, and to educate. In some cases, the role of the military veterinarian is very general, going back to basics in a developing country. In others, it involves working in a laboratory to provide information back to commanders and front line workers. They may be included in policy development that is then executed by others. They may be teachers in classrooms, preparing the next generation. But in current world affairs and in conflict zones around the globe, the military veterinarian still has a place.

That place is not a large one; it is very much a niche occupation in the military. Despite the virtues extolled in this study, the military veterinarian still serves but a small, supporting function. The centre of effort for the military is and always will be combat arms. It is that application of hard power, or the threat of it, that gives the military its role. However, every mission, no matter how hard, has elements of soft power. Often militaries

are leveraged as international first responders due to their logistic and administrative capabilities, their training, their cohesiveness and their unlimited liability. It is within the sphere of soft power that the military veterinarian is most at home in the modern battlespace. Whether it is providing force protection through preventive medicine, medical care to the military animals that support the soldier, or food and water safety, the military veterinarian still directly supports the soldier. Add to that the ability to provide veterinary care in non-secure, non-permissive environments, and it is evident that the military veterinarian, with other specialists, is ideally placed to build or rebuild the agrarian economy, the preventive medicine infrastructure and policy, and the civilian veterinary capability of failed and failing states. These are among the foundations of stability, and the military veterinarian is one among many that can speed the return to a stable state, no longer requiring hard military power.

Though many, even soldiers, would argue that a civilian contractor and agency can accomplish the same function, ask that same soldier to have to provide for the safety of that civilian in an area like Afghanistan and their tune is likely to change. Military veterinarians are indoctrinated into the ways and means of military life. They are trained and equipped to provide their own security and they are part of the team, playing by the same rules. This is perhaps the most valuable aspect; they can and will go where others will not or cannot.

There may come a time when medicine has an easy treatment for every injury and disease, when food animals are replaced by factory-produced protein, where economies do not place their foundations on agriculture, where conflict is replaced by harmony.

Until that time, the military veterinarian maintains a small but important role in military operations, including the CAF. This study has demonstrated that it is past time that the CAF formally reinstated military veterinary services.

ANNEX 1: MILITARY VETERINARY SERVICES AND SYMBOLOGY

As far as the author is aware, there is no single list of military veterinary services from around the world and through the ages. The list attached here is as complete as the author can make it at this time. This list has also been published by the author to Wikipedia¹⁰³ in the hopes that it will continue to grow over time as others become interested in the subject and contribute to the article's contents.

A highly-visible facet of military organisations is the use of symbols, crests, badges, etc. to identify the profession of the soldier. Common symbology associated with military veterinary units and services is sometimes specific to the veterinary service, sometimes a derivative of another service (such as a medical service), or is just that of the medical service. The symbols include, but are not limited to, the following:

Rod of Asclepius – a Greek symbol of medicine composed of a single snake curled around a staff or rod. In Greek mythology, Asclepius was the god of medicine and healing, son of Apollo. He was raised by Chiron, the healer. Variations on the rod include changing it to a sword, adding wings, and using two rods to form a “V,” each with a snake. (See Poland, France and Sweden below)

¹⁰³ The full list of references used in the creation of the Wikipedia page is included on that page and is not repeated here; however, all are included in the bibliography below. “List of Military Veterinary Services,” accessed October 14, 2013, http://en.wikipedia.org/wiki/List_of_Military_Veterinary_Services.

Bowl of Hygieia – a Greek symbol of pharmacy, composed of a chalice with a snake entwining the stem and with its head above the bowl. Hygieia was the goddess of health, cleanliness and sanitation, daughter of Asclepius. (See Soviet Union below)

Chiron – in Greek legend, a centaur (half man, half horse) known for its knowledge of medicine both human and animal. (See Canada and UK below)










The Horse/Horseshoe – a reflection on the original purpose of the military profession, the cavalry; sometimes wrapped in a snake or two. (See Argentina and Ecuador below)

Pegasus/Bellerophon – in Greek mythology, Pegasus was the winged horse, and Bellerophon was its tamer and an archer. Sometimes combined to appear as Chiron acting as an archer. (See Australia below)












Caduceus – a Greek symbol of commerce, eloquence, trickery and negotiation, and the symbol of Hermes, the messenger of the gods. Erroneously used for medicine, primarily in the United States. A superimposed “V” has been used for veterinary medicine. (See USA below)

Crosses – Blue or green have been used, though in Europe the green cross is primarily the symbol of pharmacies. (See Italy, China and Russia below)











Country	Service Name	Service Crest, Badge or Logo	Years Active
 Argentina	Remount and Veterinary Command (Comando de Remonta y Veterinaria)		current
 Australia	Australian Army Veterinary Corps (AAVC)		1909-1946
 Austria			current
 Austria-Hungary	Veterinary Service		First World War
 Bangladesh	Remounts Veterinary and Farm Corps (RV and FC)		current
 Belgium			current
 Brazil	Jungle Warfare Instruction Center (CIGS): Division of Veterinary Medicine		current

 Canada	<p>Canadian Veterinary Corps Canadian Expeditionary Force, Army Veterinary Corps Royal Canadian Army Veterinary Corps (RCAVC)</p>		<p>1910 to 1940</p>
 Colombia	<p>Veterinary Service</p>		<p>current</p>
 Croatia			<p>current</p>
 Czech Republic	<p>Military Medical Agency</p>		<p>current</p>
 Denmark			<p>current</p>
 Ecuador	<p>Veterinary Service</p>		
 Estonia			<p>current</p>

 Finland			current
 France	Service de santé des armées - Vétérinaires des armées		1769 to present
 Germany	German Veterinary Service (Zentraler Sanitätsdienst der Bundeswehr - Veterinärmedizin)		current
 Hungary	Chief of Defence, Medical Directorate		current
 India	Remount Veterinary Corps (RVC)		1794 to present

 Italy				current
 Japan	Japanese Imperial Army Veterinary Service			
 Japan	Imperial Japanese Army Veterinary School			1893-1945
 Mexico				current
 Morocco				current
 Nazi Germany	Waffen SS-Veterinary Service			World War II
 New Zealand	New Zealand Veterinary Corps (NZVC)			1907- 9 January 1947
 Norway	Norwegian Veterinary Corps			1791 to present

 Pakistan	Remount, Veterinary, and Farming Corps (RV&FC)		current
 People's Republic of China	People's Liberation Army		current
 Poland			current
 Portugal			current
 Republic of Korea	ROK veterinary corps		current

 Romania	Veterinary Service		1831 - unknown
 Russia	Veterinary-Sanitary Department		current
 Slovakia			current
 Slovenia			current
 South Africa	South Africa Veterinary Corps		(1913-??) - incorporated into South African Medical Corps
 Soviet Union	Veterinary Service		Cold War

 Spain	Spanish Armed Forces Military Veterinary Center (CEMILVET)	 	1904 to present
 Sweden	Various Military Veterinary Staff Officers		current
 Switzerland	Centre of Competence for Veterinary Service and Army Animals		current
 Thailand	Royal Thai Army Veterinary & Remount Department		current
 The Netherlands			current
 Turkey	Turkish Veterinary Corps		current

 Uganda	Uganda People's Defense Force - a single veterinarian		current
 United Kingdom	Army Veterinary Corps Royal Army Veterinary Corps (RAVC)		1796 to present
 United States	Veterinary Corps (United States Army)		3 June 1916 to present

ANNEX 2: SURVEY DOCUMENTATION

- a. English Questionnaire
- b. French Questionnaire
- c. English Voluntary Consent Form and Study Outline
- d. French Voluntary Consent Form and Study Outline
- e. Royal Military College Ethics Review Board Permission
- f. Social Studies Research Review Board Permission
- g. Canadian Army Permission
- h. Quantitative Question Results.

Annex 2

Appendix A: English QuestionnaireQuestionnaire: Military Veterinary ServicesInstructions for Completion:

This questionnaire is designed to be completed electronically in MS Word. Please answer the questions as fully and as honestly as possible. Where choices are presented in blue, please delete the incorrect answer. Where questions are open (free text), please add as much or as little text as you wish. Once completed, please save this file and return by email to andrew.morrison@forces.gc.ca. The last date to submit is 30 June, 2013. Additionally, please print and sign the accompanying consent form. If you encountered military veterinary services on multiple deployments, please complete part 1 and 2 in a separate questionnaire for each deployment.

Identification

Rank:

Last Name and initials:

Contact Email:

Would you be interested in answering follow-up questions? **Yes/No**

1. Contact with International Military Veterinary Servicesa. Have you come into contact with a military veterinarian? **Yes/No**If yes, what was the context? **(free text)**b. Was the contact casual or as part of your military duties? **Yes/No**

If it was through military duties, please describe your relationship to the veterinarian.

c. From which country was the military veterinarian? **(free text)**

d. There are three broad categories of military veterinary service. Which of these did s/he perform?

i. food safety, food security, and quality assurance **Yes/No**

ii. veterinary medical care

- service animals (i.e. bomb dogs, pack animals) **Yes/No**

- indigenous animals (i.e. cattle, sheep, zoo animals, etc) [Yes/No](#)

iii. veterinary preventive medicine

- Vaccination and anti-parasitics (dewormers, dips, etc) [Yes/No](#)

- Nutrition programs [Yes/No](#)

- Breeding programs [Yes/No](#)

- Support to the human medical service [Yes/No](#)

2. Military Veterinary Service Activities

Military veterinarians can be used in a development/stability role such as Veterinary Civil Action Programs (VetCAPs) or Agri- Business Development Teams. In principle, they should provide a service where none exists and sustainably develop civilian services that do exist. They should also handover duties to civilian agencies as soon as civilian agencies are able to operate in the region.

a. Have you encountered military veterinarians in development/stability roles?
[Yes/No](#)

b. If you have encountered such veterinarians, how would you assess their effectiveness? ([free text](#))

c. The following factors can be used to assess the effectiveness of a veterinary program. Please choose the best answers below:

i. Were the veterinary programs targeted by the opposition (insurgents)?
[Yes/No](#)

ii. Were the veterinary programs requested by the indigenous population?
[Yes/No](#)

iii. Which species were they primarily involved with? Please select all the apply.

Cattle [Yes/No](#)

Camels [Yes/No](#)

Goats [Yes/No](#)

Sheep [Yes/No](#)

Horses [Yes/No](#)

Pigs [Yes/No](#)

Poultry [Yes/No](#)

Other (Please specify) (free text)

iv. In your opinion, was there a change in the local economy due to improved livestock health and welfare? **Yes/No**

d. In some military doctrines, military veterinary services are used as part of an overall civil-military cooperation plan where the objectives of development are tied to making the state self-sufficient and assisting in the conclusion of the overall mission.

i. Was the effect of the military veterinary service on the overall military mission positive, neutral or negative? **Pos/Neut/Neg**. Please explain. (free text)

ii. Did the military veterinary service build, have no effect, or degrade force protection? **Yes/No**. If yes, how? (free text)

iii. What veterinary capabilities were requested, if any, by the local authorities? (Or did they specifically ask to have the veterinary capability removed?) (free text)

iv. Was there a formally-assessed veterinary need? **Yes/No**. If yes, was the assessment from the local government or by military/ foreign service planners? **Local/military/foreign service**. What were the assessed needs? (free text)

v. Were the resources allocated to the military veterinary service a cost-effective method of influencing the battlespace? **Yes/No**. Please explain your answer. (free text)

vi. Were there veterinary NGOs operating in the area? **Yes/No**. If so, please describe their effectiveness and security requirements. (free text)

3. The Value of a Military Veterinary Service

a. In your opinion, does a military veterinary service have a place in military operations in failed and failing states? **Yes/No**. Please explain. (free text)

b. In your opinion, is a military veterinary service an alternative to civilian agencies in the non-secure/non-permissive environments? **Yes/No**. Please explain. (free text)

c. Every military capability consumes valuable resources. In your opinion, does a military veterinary service warrant funding or is it a luxury? **Funding/Luxury**. Please explain. (free text)

4. A Canadian Forces Military Veterinary Service

Assume for the following questions that the Canadian Forces has a Military Veterinary Service.

- a. Please describe how you would see a Canadian Forces military veterinary service being used on Expeditionary Operations. Is it an important or unimportant enabler? (free text)
 - b. Is there a domestic operations role you can envision for a Canadian Forces military veterinary service? Yes/No. Please explain. (free text)
 - c. Is there a training role for a Canadian Forces military veterinary service in preparing soldiers for their deployments? Yes/No. Please explain. (free text)
5. General comments.

Please add any additional comments you have on the theory or practice of military veterinary services. (free text)

Annex 2

Appendix B: French QuestionnaireQuestionnaire : Services vétérinaires militairesInstructions pour remplir le questionnaire :

Le présent questionnaire est conçu pour être rempli électroniquement en format MS Word. Veuillez répondre aux questions de la façon la plus complète et honnête possible. Lorsqu'il y a des choix de réponse en bleu, veuillez supprimer la réponse qui ne correspond pas à votre choix. Pour les questions ouvertes (texte libre), vous pouvez écrire autant de texte que vous le souhaitez. Une fois le questionnaire rempli, veuillez enregistrer le fichier et le renvoyer par courriel à andrew.morrison@forces.gc.ca d'ici le 30 juin 2013. De plus, veuillez imprimer et signer le formulaire de consentement ci-joint. Si vous avez été témoin de services vétérinaires militaires lors de plusieurs déploiements, veuillez remplir les sections 1 et 2 dans un questionnaire distinct pour chacun des déploiements.

Identification

Grade :

Nom de famille et initiales :

Courriel :

Seriez-vous intéressé à répondre à des questions de suivi? **Oui/Non**

1. Contact avec des services vétérinaires militaires à l'étrangera. Avez-vous été en contact avec un vétérinaire militaire? **Oui/Non**Si oui, quel était le contexte? **(texte libre)**b. Est-ce que ce contact était occasionnel ou est-ce qu'il faisait partie de vos fonctions militaires **Oui/Non**

Si le contact faisait partie de vos fonctions militaires, veuillez décrire votre relation avec le vétérinaire.

c. De quel pays provenait le vétérinaire militaire? **(texte libre)**

d. Il existe trois grandes catégories de services vétérinaires militaires. Quels services parmi les catégories suivantes ont été fournis par le vétérinaire?

i. salubrité des aliments, sécurité alimentaire, et assurance de la qualité
Oui/Non

- ii. soins médicaux vétérinaires
 - services aux animaux (p. ex., chien détecteur, bêtes de somme) **Oui/Non**
 - animaux indigènes (p.ex., bovins, mouton, animaux de zoo, etc.) **Oui/Non**
- iii. médecine vétérinaire préventive
 - Vaccination et antiparasitaires (vermifuge, bain insecticide, etc.) **Oui/Non**
 - Programmes de nutrition **Oui/Non**
 - programmes de sélection **Oui/Non**
 - Soutien aux services médicaux aux humains **Oui/Non**

2. Activités liées aux services vétérinaires militaires

On peut avoir recours aux vétérinaires militaires dans le cadre de rôles de développement/stabilité, tels que les programmes vétérinaires de mesures civiles (VetCAP) ou les équipes de développement de l'agroentreprise. En principe, ils devraient intervenir lorsqu'aucun service n'existe et développer durablement les services civils existants. Ils devraient également céder les fonctions aux organismes civils dès que ces derniers sont en mesure d'accomplir leur travail dans la région.

- a. Avez-vous rencontré des vétérinaires militaires dans des rôles de développement/stabilité? **Oui/Non**
- b. Si oui, comment évalueriez-vous leur efficacité? (**texte libre**)
- c. Les facteurs suivants peuvent être utilisés pour évaluer l'efficacité d'un programme vétérinaire. Veuillez choisir la meilleure réponse :
 - i. Est-ce que les programmes vétérinaires étaient ciblés par l'opposition (insurgés)? **Oui/Non**
 - ii. Est-ce que les programmes vétérinaires avaient été demandés par la population indigène? **Oui/Non**
 - iii. Quelles espèces traitaient-ils principalement? Veuillez sélectionner toutes les réponses applicables.

Bovins **Oui/Non**

Chameaux [Oui/Non](#)
 Chèvres [Oui/Non](#)
 Moutons [Oui/Non](#)
 Chevaux [Oui/Non](#)
 Cochons [Oui/Non](#)
 Volaille [Oui/Non](#)
 Autre (veuillez préciser) ([texte libre](#))

iv. À votre avis, y a-t-il eu un changement dans l'économie locale en raison de l'amélioration de la santé et du bien-être des animaux d'élevage? [Oui/Non](#)

d. Dans certaines doctrines militaires, les services vétérinaires militaires sont utilisés dans le cadre d'un plan global de coopération civilo-militaire lorsque les objectifs de développement sont inhérents à l'autosuffisance de l'État et aident à la conclusion de la mission dans son ensemble.

i. Est-ce que l'effet du service vétérinaire militaire sur la mission militaire dans son ensemble a été positif, neutre ou négatif? [Positif/Neutre/Négatif](#). Veuillez expliquer. ([texte libre](#))

ii. Est-ce que le service vétérinaire militaire a accru ou diminué la protection de la force ou n'a eu aucun effet sur celle-ci? [Oui/Non](#). Si oui, comment? ([texte libre](#))

iii. Quelles capacités vétérinaires ont été demandées, le cas échéant, par les autorités locales? (Ou ont-elles demandé explicitement le retrait des capacités vétérinaires?) ([texte libre](#))

iv. Y avait-il un besoin de services vétérinaires officiellement évalué? [Oui/Non](#). Si oui, est-ce que l'évaluation avait été faite par le gouvernement local ou par des planificateurs de services militaires/étrangers? [Local/service militaire/étranger](#). Quels étaient les besoins évalués? ([texte libre](#))

v. Est-ce que les ressources allouées au service vétérinaire militaire étaient une méthode rentable pour influencer sur l'espace de bataille? [Oui/Non](#). Veuillez expliquer votre réponse. ([texte libre](#))

vi. Est-ce qu'il y avait des organisations vétérinaires non gouvernementales dans la région? [Oui/Non](#). Si oui, veuillez décrire leur efficacité et leurs exigences de sécurité. ([texte libre](#))

3. La valeur d'un service vétérinaire militaire

a. À votre avis, est-ce qu'un service vétérinaire militaire a sa place dans les opérations militaires dans les États défaillants et en déroute? [Oui/Non](#). Veuillez expliquer. ([texte libre](#))

b. À votre avis, est-ce qu'un service vétérinaire militaire est une solution de rechange aux organismes civils dans les environnements non sécuritaires/non permissifs? **Oui/Non**. Veuillez expliquer. (texte libre)

c. Toute capacité militaire utilise des ressources précieuses. À votre avis, est-ce que le financement d'un service vétérinaire militaire est justifié ou est-ce un luxe? **Financement/Luxe**. Veuillez expliquer. (texte libre)

4. Un service vétérinaire militaire des Forces canadiennes

Pour les prochaines questions, supposez que les Forces canadiennes disposent d'un service vétérinaire militaire.

a. Veuillez décrire comment vous croyez qu'un service vétérinaire militaire des Forces canadiennes pourrait être utilisé lors d'opérations expéditionnaires. Est-ce un instrument d'habilitation important ou sans importance? (texte libre)

b. Est-ce qu'il y a un rôle que vous pouvez envisager pour service vétérinaire militaire des Forces canadiennes lors d'opérations nationales? **Oui/Non**. Veuillez expliquer. (texte libre)

c. Est-ce qu'il y a un rôle d'instruction pour un service vétérinaire militaire des Forces canadiennes dans le cadre de la préparation des soldats en vue des déploiements? **Oui/Non**. Veuillez expliquer. (texte libre)

5. Commentaires généraux

Veuillez ajouter tout autre commentaire sur les services vétérinaires militaires, sur le plan théorique ou pratique. (texte libre)

Annex 2

Appendix C: English Voluntary Consent Form and Study Outline**Voluntary Consent Form and Study Outline**

Study Title: Awareness of the field of Military Veterinary Services

Researcher: Major Andrew Morrison

The purpose of this study is to get a primarily qualitative overview of knowledge and experience of select members of the Canadian Armed Forces. Due to budget and time constraints, as well as issues of internal validity and consistency of measures, the questionnaire provided will be in English only. However, French responses are welcomed.

Participants will be selected based on their employment in certain planning and/or expeditionary roles. Each participant is asked to complete one questionnaire in its entirety. If you had multiple tours where there is relevant information, you are asked to complete the first parts of the questionnaire again. Some participants may be contacted with follow-up questions, for the purposes of clarity. If a participant knows of another serving member of the CF who may be able to provide valuable information, please suggest their name to the researcher.

The benefit of this study is that each participant will be contributing their knowledge and experience to an uncommonly studied area of military operations.

There will be no health, psychological, physical, or any other risks to the subjects' person in this study. Participation is strictly **VOLUNTARY** and participants may choose to not complete the questionnaire, without repercussions.

Participant names and personal details will be attached to the questionnaires and will be kept in a secure location. Participants will have the option to consent to excerpts of their response being published and credited (Name, Rank). If publishing consent is withheld, then the information provided will be collated with the rest of the data and the results published un-credited. Personal information will not be released during the running of the study. The analysis of the questionnaires is to be included in a thesis for the degree of Master of Defence Studies and potentially other academic publications. Questionnaires will be destroyed on completion of the study. If there are any questions regarding this study please contact the researcher listed below:

Major Andrew Morrison andrew.morrison@forces.gc.ca

The Research Ethics Board (REB) of RMC has approved this study (Ref# REB 2013-009 CFC MDS). If you have any questions regarding the ethical nature of this study, please feel free to contact the Chair of the Research Ethics Board, Dr. Sarah Hill,

Department of Military Psychology and Leadership, RMC, Kingston, Ontario, K7K 7B4,
Sarah.Hill@rmc.ca.

The Social Studies Research Review Board (SSRRB) has approved this study (Ref#1212/13N). They can be contacted via email SSRRB-CERSS@forces.gc.ca.

For members of the Canadian Army, the Chief of Land Staff Operations has approved this study (attached).

Please sign and return this consent form to Andrew Morrison.

36 Signal Regiment
Box 99000 Station Forces
Halifax, Nova Scotia B3K 5X5

Please make a copy for your personal records.

I _____ consent to participate in this study and understand that it is voluntary.

Additionally, I **DO/DO NOT** (circle one) consent to portions of my answers being quoted and attributed to me in publication.

_____ Date

_____ E-mail Address

_____ First Name

_____ Last Name

_____ Participant Signature

Would you like a copy of the thesis once it has been completed/published? (Circle one)

Yes No

If so, it will be sent to the e-mail address listed above.

Annex 2

Appendix D: French Voluntary Consent Form and Study Outline**Formulaire de consentement volontaire et aperçu de l'étude**

Titre de l'étude : Connaissance du domaine des services vétérinaires militaires

Chercheur : Major Andrew Morrison

L'objectif de cette étude est d'obtenir un aperçu principalement qualitatif des connaissances et de l'expérience de membres sélectionnés des Forces armées canadiennes.

Les participants seront sélectionnés en fonction de leur emploi dans certains rôles de planification et/ou expéditionnaires. Tous les participants sont priés de remplir un questionnaire au complet. Si vous avez participé à plusieurs missions pour lesquelles vous pourriez fournir de l'information pertinente, vous êtes priés de remplir les premières parties du questionnaire pour chacune des missions. Certains participants pourraient être contactés afin de répondre à des questions de suivi, à des fins de clarification. Si vous connaissez un autre militaire en service actif dans les FC qui pourrait être en mesure de fournir de précieux renseignements, veuillez en faire part au chercheur.

Cette étude permettra à chaque participant d'enrichir un domaine peu étudié des opérations militaires grâce à leurs connaissances et leur expérience.

Les participants à cette étude ne seront exposés à aucun risque pour sanitaire, psychologique, physique ou autre. La participation à cette étude est entièrement **VOLONTAIRE** et les personnes sélectionnées peuvent choisir de ne pas remplir le questionnaire, sans crainte de répercussions.

Le nom de participants et leurs renseignements personnels seront joints aux questionnaires et conservés dans un emplacement sûr. Les participants ont le choix de consentir à ce que des extraits de leurs réponses soient publiés avec mention du répondant (nom, grade). En cas de non-consentement, l'information fournie sera regroupée avec les autres données et les résultats seront publiés sans mention de la source. Les renseignements personnels ne seront pas diffusés tout au long du déroulement de l'étude. L'analyse des questionnaires sera incluse dans une thèse en vue de l'obtention d'une maîtrise en études de la défense et possiblement dans d'autres publications universitaires. Les questionnaires seront détruits une fois l'étude terminée. Pour toute question concernant cette étude, veuillez communiquer avec le chercheur :

Major Andrew Morrison andrew.morrison@forces.gc.ca

Le Comité d'éthique de la recherche (CER) du CMR a approuvé cette étude (Réf. REB 2013-009 CFC MDS). Si vous avez des questions concernant la nature éthique de

cette étude, n'hésitez pas à communiquer avec le président du Comité d'éthique de la recherche, Madame Sarah Hill, Ph. D., Département de psychologie militaire et leadership, CMR, Kingston, Ontario, K7K 7B4, Sarah.Hill@rmc.ca.

Le Comité d'examen de la recherche en sciences sociales (CERSS) a approuvé cette étude (Réf. 1212/13N). Ce Comité peut être joint par courriel à SSRRB-CERSS@forces.gc.ca.

Pour les membres de l'Armée canadienne, le Chef d'état-major – Opérations terrestres a approuvé cette étude (pièce jointe).

Veillez signer et envoyer le présent formulaire de consentement à l'attention d'Andrew Morrison.

36^e Régiment des transmissions
C. P. 99000, succ. Forces
Halifax (Nouvelle-Écosse) B3K 5X5

Veillez faire une copie pour vos dossiers personnels.

Je, _____, consens à participer à cette étude et comprends que ma participation est volontaire.

De plus, je **CONSENS/NE CONSENS PAS** (encerclez une réponse) à ce que des extraits de mes réponses soient cités et me soient attribués dans une publication.

Date

Courriel

Prénom

Nom de famille

Signature du participant

Aimeriez-vous avoir un exemplaire de la thèse lorsqu'elle sera terminée/publiée?
(encerclez une réponse)

Oui Non

Si vous avez répondu oui, une copie de la thèse vous sera envoyée à l'adresse courriel indiquée ci-dessus.

Annex 2

Appendix E: Royal Military College Ethics Review Board Permission



ROYAL MILITARY COLLEGE OF CANADA
 1101 SANDHURST DRIVE, SANDHURST, ONTARIO, CANADA K0A 1L0
 TEL: 613-541-6000 FAX: 613-541-6001

Ethics Approval Letter

File number: REB 2013-005-CFC-MBS
 Project title: Awareness of the field of Military Veterinary Services
 Principal investigator: Andrew Morrison
 Co Investigator: n/a
 Supervisors: Cheryl Desroches
 Date of submission: 17 February 2013
 Anticipated commencement date: 1 April 2013
 Anticipated completion date: 1 August 2013
 Date of approval: 4 March 2013
 Period of approval: 4 March 2013-3 March 2014

This is to inform you that RMC Research Ethics Board (REB) has granted approval to the above-mentioned project and it can now proceed. The approval is based only on the documents submitted and only in the language(s) presented. This approval is valid for twelve (12) months. If the project goes beyond this date, you must inform REB and obtain approval for an extension.

Any intentional changes to the protocol, prior to the start of data collection must be submitted to and approved by the Chair.

Researchers should not proceed with a project if unforeseen changes to the protocol threaten participants' right to informed consent or place participants at a higher risk level than anticipated. Such unforeseen changes to the protocol during the conduct of the research must be communicated within four working days to the REB Chair, as well as the actions taken to protect the dignity of participants.

Any undesirable experience or response (adverse event) from participants during their involvement in the study must also be reported within four working days to the REB Chair, as well as actions taken by the research team to protect the participants. Such adverse event may be emotional, psychological, physiological, or physical in nature.

Signature: 
 Dr. Sarah A. Hill
 Chair, RMC REB
 Phone: 613-541-6000 x6017
 e-mail: sarah.hill@rmc.ca

Annex 2

Appendix F: Social Studies Research Review Board Permission

RE: AiP request - SSRRB ref #1212

Page 1 of 1

Morrison Maj AG@36 Sig Regt@Glance Bay

From: +SSRRB-CERSS@CMP DGMPRA@Ottawa-Hull**Sent:** Wednesday, 22, May, 2013 15:04**To:** Morrison Maj AG@36 Sig Regt@Glance Bay; Bernard Maj AJ@C Army DGLS/COS Land Ops@Ottawa-Hull**Subject:** RE: AiP request - SSRRB ref #1212

Good Afternoon,

I realized I never actually sent the approval e-mail. The approval text is pasted below in blue. The SSRRB approval # is: 1212/13N.

The research submission "Awareness of the field of Military Veterinary Services" has been coordinated by the DGMPRA Social Science Research Review Board, in accordance with CANFORGEN 198/08. The SSRRB coordination # is 1212/13N.

Thank you,
Mehreen

2013-08-10

Annex 2

Appendix G: Canadian Army Permission



National Defence

National Defence Headquarters
Ottawa ON
K1A 0K2

5762-1 (G1 Concepts 4)

May 2013

Distribution List

UNSOLICITED RESEARCH
OPINIONS AND AWARENESS
OF THE FIELD OF MILITARY
VETERINARY SERVICES STUDY

References: A. RFB 2013-009 CFC MDS
Ethics Approval Letter 4 Mar 2013
B. CPM/DGMPRA Social Science Research
Review Board Coordination #1212/13N

1. This research is part of a project sanctioned by the Royal Military College in Kingston. The aim of this research is to gather information and opinions from Canadian Army members that have encountered Veterinary Services while deployed in order to assess the usefulness of this asset in Modern Conflict. The majority of selected participants will be chosen from CF/PO positions that identified them as a member of the Civil Military Cooperation (CIMIC) specialty while on tour. Whether the theatre of operations was Afghanistan, Bosnia, the Sudan or Haiti, each tour was likely to have some degree of contact with the local agrarian population. The experiences gained and opinions formed during these encounters are valuable to our understanding of military veterinary capacities. Though the CA does not maintain a capability, there are aspects of veterinary medicine that affect deployed CA personnel, either directly through contact with allied military veterinary services, or indirectly as part of the medical system's body of knowledge and as a factor in food and water

1/3

Défense nationale

Quartier général de la Défense nationale
Ottawa (Ontario)
K1A 0K2

5762-1 (G1 Concepts 4)

Le mai 2013

Liste de distribution

RECHERCHE SPONTANÉE
ÉTUDE D'OPINION ET DE
CONNAISSANCE DU DOMAINE
DE SERVICES DE
VÉTÉRINAIRES MILITAIRES

Références : A. REB 2013-009 CFC MDS
Lettre d'approbation éthique 4 mars 2013
B. CPM/DGRAPM Comité d'examen de la
recherche en sciences sociales #1212/13N

1. Cette recherche s'inscrit dans le cadre de projet sanctionné par le Collège Militaire Royal de Kingston. Le but de cette recherche est de recueillir l'information et les opinions des militaires au sein de l'armée canadienne (AC) ayant été en contact avec les services de vétérinaires lors de leur déploiement afin d'évaluer l'utilité de cet atout dans les conflits modernes. La majorité des participants sélectionnés sera choisi par l'entremise du PSTFC et les identifieront comme membre de la spécialité CIMIC lors de leur déploiement. Quel que soit le théâtre d'opération (Afghanistan, Bosnie, Soudan or Haïti), chaque tour pouvait à certain degré être en contact avec la population agraire. Les expériences acquises et les opinions faites lors de ces contacts sont des éléments importants pour notre compréhension des capacités des vétérinaires militaires. Quoique l'AC ne possède pas cette capacité, il y a des aspects de la médecine vétérinaire qui influencent le personnel de l'AC déployé, soit directement lors de contact avec les services de vétérinaires alliés, ou indirectement, en relation avec les

DMCS 85224FILE 5762-1

Canada


safety. As per Ref A and B, this project has been approved by the RMC Research Ethics Board and by the Social Studies Research Review Board (SSRRB).

2. The CA's participation is important to the success of this research and access to soldiers is authorized. All selected participants are invited to complete the survey prior to 30 June 2013. In order to achieve widest distribution and minimize the operational impact of the survey, it will be conducted directly via email to the selected audience. Your support is requested to facilitate the completion of the survey from your personnel that will be selected by the researcher.

3. Any questions regarding this research can be directed to the researcher, Major Andrew Morrison at the following email address: andrew.morrison@forces.gc.ca. The CA Comd OPI for this research is Maj Jean Bernard C1 Concepts and Policy 4; he can be reached at 613-971-7291.

4. Your support is greatly appreciated and will assist in illuminating a little studied area of modern military operations.

Le Chef d'état-major opérations terrestres



Brigadier-General K.D. McQuillan
Chief of Staff Land Operations

connaissances du système médical ou comme facteur lié à la sécurité des aliments et de l'eau. Tel qu'indiqué à la réf A et B, le comité d'éthique de la recherche du CMR et du comité d'examen de la recherche en sciences sociales (CRRSS).

2. La participation de l'AC est importante pour le succès de cette recherche et l'accès à nos militaires est autorisé. Tous les participants sélectionnés seront invités à compléter un sondage pour le 30 juin 2013. Afin d'obtenir une participation maximale et de réduire l'impact du sondage sur les opérations, ce dernier sera effectué directement auprès des participants sélectionnés par l'entremise du courriel. Votre support est requis pour faciliter l'administration du sondage auprès de votre personnel qui sera choisi par le chercheur.

3. Toutes questions à l'égard de la recherche peuvent être adressées au chercheur, le major Andrew Morrison à l'adresse électronique suivante : andrew.morrison@forces.gc.ca. Le BPR au sein du commandement de l'AC est le maj Jean Bernard, C1 Concepts 4; il peut être rejoint au 613-971-7291.

4. Votre soutien est grandement apprécié et permettra ainsi d'illuminer une partie de la recherche dans les opérations militaires modernes.

Distribution List

Action
1st Cdn Div HQ/Comd
List B

Information
COS Land Ops/G1

Liste de distribution

Action

Liste B

Information
CEM Opérations terrestre/G1

Annex 2

Appendix H: Quantitative Question Results

1 Contact with International Military Veterinary Services

a.	Have you come into contact with a military veterinarian?	Yes:	9	No:	11
b.	Was the contact casual or as part of your military duties?	Casual:	4	Military:	5
d.	There are three broad categories of military veterinary service. Which of these did s/he perform?				
i.	food safety, food security, and quality assurance	Yes:	6	No:	2
ii.	veterinary medical care				
	- service animals (i.e. bomb dogs, pack animals)	Yes:	4	No:	4
	- indigenous animals (i.e. cattle, sheep, zoo animals, etc)	Yes:	6	No:	1
iii.	veterinary preventive medicine				
	- Vaccination and anti-parasitics (dewormers, dips, etc)	Yes:	7	No:	1
	- Nutrition programs	Yes:	5	No:	2
	- Breeding programs	Yes:	2	No:	5
	- Support to the human medical service	Yes:	4	No:	2

2. Military Veterinary Service Activities

a.	Have you encountered military veterinarians in development/stability roles?	Yes:	8	No:	11		
c.	The following factors can be used to assess the effectiveness of a veterinary program. Please choose the best answers below:						
	i. Were the veterinary programs targeted by the opposition (insurgents)?	Yes:	0	No:	7		
	ii. Were the veterinary programs requested by the indigenous population?	Yes:	7	No:	2		
	iii. Which species were they primarily involved with? Please select all that apply.						
	Cattle	Yes:	6	No:	1		
	Camels	Yes:	3	No:	5		
	Goats	Yes:	8	No:	0		
	Sheep	Yes:	7	No:	1		
	Horses	Yes:	3	No:	3		
	Pigs	Yes:	2	No:	4		
	Poultry	Yes:	6	No:	1		
	iv. In your opinion, was there a change in the local economy due to improved livestock health and welfare?	Yes:	6	No:	0		
d.	i. Was the effect of the military veterinary service on the overall military mission positive, neutral or negative?	Positive:	9	Negative:	0	Neutral:	0
	ii. Did the military veterinary service build, have no effect, or degrade force protection?	Yes:	6	No:	2		
	iv. Was there a formally-assessed veterinary need?	Yes:	8	No:	1		

	If yes, was the assessment from the local government or by military/ foreign service planners?	Local:	0	Military:	7	Foreign:	0
v.	Were the resources allocated to the military veterinary service a cost-effective method of influencing the battlespace?	Yes:	7	No:	0		
vi.	Were there veterinary NGOs operating in the area?	Yes:	4	No:	4		

3. The Value of a Military Veterinary Service

a.	In your opinion, does a military veterinary service have a place in military operations in failed and failing states?	Yes:	19	No:	1		
b.	In your opinion, is a military veterinary service an alternative to civilian agencies in the non-secure/non- permissive environments?	Yes:	14	No:	3		
c.	Every military capability consumes valuable resources. In your opinion, does a military veterinary service warrant funding or is it a luxury?	Funding:	13	Luxury:	6		

4. A Canadian Forces Military Veterinary Service

b.	Is there a domestic operations role you can envision for a Canadian Forces military veterinary service?	Yes:	11	No:	8		
c.	Is there a training role for a Canadian Forces military veterinary service in preparing soldiers for their deployments?	Yes:	12	No:	5		

BIBLIOGRAPHY

I. PRIMARY SOURCES

- “140 cows rescued from flood.” *CBC News*. Last modified May 3, 2008. Accessed October 14, 2013. <http://www.cbc.ca/news/canada/new-brunswick/140-cows-rescued-from-flood-1.718780>
- “Army dog handler killed in Afghanistan named.” *The Daily Telegraph*. Last modified 26 July 2008. Accessed October 14, 2013. <http://www.telegraph.co.uk/news/worldnews/asia/afghanistan/2461765/Army-dog-handler-killedin-Afghanistan-named.html>
- Blaine, Delabere. *The Outlines of the Veterinary Art; or, the Principles of Medicine, as Applied to the Structure, Functions, and Economy, of the Horse, and to a More Scientific and Successful Manner of Treating His Various Diseases: Comprehending, Also, a Concise View of Those of Neat Cattle and Sheep*. Second Edition. London: T. Boosey, 1816.
- “Bomb-sniffing dogs a key part of Afghan military team.” Accessed October 30, 2013. <http://www.canada.com/news/Bomb+sniffing+dogs+part+Afghan+military+team/2367240/story.html>
- Bourgelat, M. *Éléments de l'Art Vétérinaire. Zootomie ou Anatomie Comparée, a l'usage des Elèves des Ecoles Vétérinaires*. Paris: Vallat-la-Chapelle, 1766.
- Boot, Major D.N. *Military Police Working Dog (MPWD) Trial*. Briefing note for CFD. 17 Mar 2008.
- Canada, Department of National Defence. *B-GL- 323-004/FP-003 Counter-Insurgency Operations*. Ottawa: Director of Army Doctrine, 2008.
- “Canadian military seeks more bomb-sniffing dogs for Afghan mission.” *Cape Breton Post*. Accessed October 30, 2013. <http://www.capebretonpost.com/Living/2010-01-05/article-777188/Canadian-military-seeks-more-bomb-sniffing-dogs-for-Afghan-mission/1>
- “Canadian soldier hurt in bomb blast in Afghanistan.” *CBC News*. Last modified 20 March 2007. Accessed October 14, 2103. <http://www.cbc.ca/news/world/canadian-soldier-hurt-in-bomb-blast-in-afghanistan-1.686968>
- Center for Army Lessons Learned. “Agribusiness Development Teams in Afghanistan Tactics, Techniques, and Procedures.” *Handbook No 10-10*, Nov 2009. Accessed October 14, 2013. <http://usacac.army.mil/cac2/call/docs/10-10/10-10.pdf>

- Department of the Army, United States Army Medical Command Headquarters. *Medcom Pam 40-13 U.S. Army Veterinary Command Guidelines and Procedures*. Fort Sam Houston, Texas, 2006.
- Dhammika, Ven. S., editor. *The Edicts of King Asoka*. Kandy: Buddhist Publication Society, 1993.
- “Foot-and-mouth disease.” *BBC News*. Last accessed 25 March 2001. Accessed October 14, 2013.
http://news.bbc.co.uk/2/hi/in_depth/uk/2001/foot_and_mouth/1199183.stm
- Headquarters, Department of the Army. *FM 3-19.17 Military Working Dogs*. Washington: July, 2005.
- Headquarters, Department of the Army. *FM 3-24 Counterinsurgency*. Washington: December, 2006.
- Headquarters, Department of the Army. *FM 4-02.18 Veterinary Service - Tactics, Techniques and Procedures*. Washington: December, 2004.
- Heyhoe, Dave. *It's All About Treo*. London: Querus, 2012.
- Homer. *The Iliad*. Translated by Robert Fitzgerald. New York: Anchor Books, 1989.
- Letter from Kingston, Upper Canada, July 29th 1815. Colonial Office, Original Correspondence, Secretary of State, Vol. 356, Mic Reel B-296, National Archives and Library of Canada.
- Maguire, Kelly J. *VCSi Statement of Capabilities and Experience (rev 1.6)*. Las Vegas: Vigilant Canine Services International, n.d.
- Medical Department, U. S. Army. *Guide for the Use Of Officers Of The Veterinary Corps*. Washington: Office of Surgeon General, 1918.
- Murphy, Joe. “Army caused original foot and mouth infection.” *The Telegraph*. Last modified 29 April 2001. Accessed October 14, 2013.
<http://www.telegraph.co.uk/news/uknews/1317644/Army-caused-original-foot-and-mouth-infection.html>
- NATO Logistics Handbook*. Brussels: SNLC Secretariat, 2007.
- Riordan, John J. *Horses, Mules and Remounts: the Memoirs of a World War I Veterinary Officer*. Glendale, CA: privately printed, 1983.
- Scott, Samuel P., translator. *Digesta of Justinian (Bk 50.6.7)*. Accessed October 14, 2013.
<http://www.constitution.org/sps/sps11.htm>
- Training School Instructors. *The Army Horse in Accident and Disease: A Manual*. Washington: Government Printing Office, 1906.

- United Kingdom Home Office (Air Raid Precautions Department). *Air Raid Precautions for Animals*. Air Raid Precautions Handbook No. 12. First Edition. London: His Majesty's Stationery Office, 1939.
- United Kingdom War Office. *Statistics of the Military Effort of the British Empire during the Great War, 1914-1920*. London: HMSO, 1922.
- United States Army John F. Kennedy Special Warfare Center and School. *Academic Handbook 2013*. Accessed October 30, 2013.
<http://www.soc.mil/swcs/pdf/AcademicHandbook.pdf>
- United States Government Joint Chiefs of Staff, *CJCSM 3500.04F Universal Joint Task Manual*. Washington: 2011. Accessed October 30, 2013.
http://www.dtic.mil/cjcs_directives/cdata/unlimit/m350004.pdf
- U.S. Government Printing Office. *Handbook on Japanese Military Forces*. 1944. Accessed October 14, 2013. <http://books.google.com/?id=-nzfAAAAMAAJ&pg=PA1>
- War Department. *Special Regulations No. 70 - Regulations Governing The Army Veterinary Service*, Washington, Government Printing Office, 1918. Accessed October 14, 2013.
<http://history.amedd.army.mil/booksdocs/wwi/RegulationsArmyVetService/frontmatter.htm>
- Xenophon. *On Horsemanship*. Accessed October 14, 2013.
<http://www.shannonleighstables.com/XENOPHON>

II. SECONDARY SOURCES

A. Books and Reports

- Adams, J.N. *Pelagonius and Latin Veterinary Terminology in the Roman Empire*. Studies in Ancient Medicine 11. Leiden; New York; Koln: Brill, 1995.
- American Veterinary Medical Association. *One Health: A New Professional Imperative. One Health Initiative Task Force: Final Report July 15, 2008*. Accessed October 14, 2013.
https://www.avma.org/KB/Resources/Reports/Documents/onehealth_final.pdf
- Archer, Christon I., John R. Ferris, Holger H. Herwig, and Timothy H.E. Travers. *World History of Warfare*. Lincoln: University of Nebraska Press, 2002.
- Chartrand, Rene. *Canadian Military Heritage*. Volume III: 1872-2000. Montreal: Art Global, 2000. Accessed October 14, 2013. http://www.cmp-cpm.forces.gc.ca/dhh-dhp/his/docs/CMH_vol3_e.pdf

- Clabby, Brigadier J. *The History of the Royal Army Veterinary Corps 1919-1961*. London: J. Allen & Company, 1963.
- Clark, Colonel William Henry Harrison. *The History of the United States Army Veterinary Corps in Vietnam 1962-1973*. Roswell, GA: privately printed, 1991.
- Clark, John, editor. *The Medieval Horse and its Equipment: c. 1150-c. 1450*. Rev. 2nd edition. London: The Boydell Press, 2004.
- French, Cecil. *A History of the Canadian Army Veterinary Corps in the Great World War 1914-1919*. Guelph: Crest Books, 1999.
- Griess, Thomas E., editor. *The Dawn of Modern Warfare*. West Point Military History Series. New York: Avery Publishing Group Inc., 1984.
- Hart, B.H. Liddel. *Strategy*. 2nd edition. New York: Meridian Printing, 1991.
- Heiss, Walter R. *Veterinary Service During the American Civil War: A Compilation*. Baltimore: PublishAmerica, 2005.
- Hunter, Pamela. *Veterinary Medicine: A Guide to Historical Sources*. Aldershot: Ashgate Publishing, 2004.
- Loew, Franklin M. and Edward H. Wood. *Vet in the Saddle. John L. Poett: First Veterinary Surgeon of the North West Mounted Police*. Saskatoon: Western Producer Prairie Books, 1978.
- McNeill, William H. *The Pursuit of Power*. Chicago: University of Chicago Press, 1982.
- Miller, Lieutenant Colonel Everett B, editor. *United States Army Veterinary Service in World War II*. 1961; Washington: Office of the Surgeon General, Department of the Army, 1986.
- Moore, Major General Sir John. *Army Veterinary Service in War*. London: H&W Brown, 1921.
- Parsonson, Ian M. *Vets at War: A History of the Australian Army Veterinary Corps 1909-1946*. Loftus: Australian Military History Publications, 2005.
- Preston, Richard A. and Sydney F. Wise. *Men in Arms: A History of Warfare and its Interrelationships with Western Society*. USA: Holt, Rinehart and Winston, 1979.
- Railliet, Alcide-Louis-Joseph and Moulé, L. *Histoire de l'École d'Alfort, par MM.* Paris: Asselin et Houzeau, 1908.
- Smith, Major General Sir Frederick. *A History of the Royal Army Veterinary Corps 1796-1919*. 1927; London: Ballière, Tindal and Cox, 1983.

Stenius, R., F. Svanström and W. Ehrström. *Veterinary Institutions in Finland*. Accessed October 14, 2013. <http://www.cabdirect.org/abstracts/19362200829.html>

Tamas, Andy. *Warriors and Nation Builders: Development and the Military in Afghanistan*. Kingston: Canadian Defence Academy Press, 2009.

Thrusfield, Michael. *Veterinary Epidemiology* 3rd ed. Oxford: Blackwell Science, 2007.

Tyquin, Michael. *Forgotten Men: the Australian Army Veterinary Corps 1909-1946*. Newport, Australia: Big Sky Publishing, 2011.

B. Articles in Journals and Books

Adams, Brigadier General Timothy K. "A Corps Challenged, Capable, and Committed." *Army Medical Department Journal* PB 8-09-1/2/3 (January – March 2009): 5-6.

Andress, Captain Miranda, and Michelle E. Goodnight. "Heatstroke in a Military Working Dog." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 34-37.

Baker, Lieutenant Colonel Janice and Master Sergeant Laura Miller. "The Effects of Environmental Extremes on Working Dogs: A Collaborative Initiative." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 22-27.

Baker, Major Janice, Captain Christina Truesdale and Captain Justin Schlanser. "Overview of Combat Trauma in Military Working Dogs in Iraq and Afghanistan." *Army Medical Department Journal* PB 8-09-1/2/3 (Jan-Mar 2009): 33-37.

Belen'kiĭ, O.S. [Veterinary Service of the Armed Forces of the USSR During the Last 60 Years]. *Veterinariia* 12 (1977): 22-25.
<http://www.ncbi.nlm.nih.gov/pubmed/341480>

Brglez, Lieutenant Colonel Boris, Lieutenant Colonel James Giles and Colonel Kelly Mann. "The Army Animal Care Specialist; Past, Present, and Future." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 11-21.

Broussard, Major Kent A. "The Development of the Army Public Health Enterprise for Full Spectrum Operations." *Army Medical Department Journal* PB 8-11-7/8/9 (July-Sept 2011): 74-79.

Brunell, Captain Marla. "A Veterinary Service Squad Deployment In Support of Operation Iraqi Freedom." *Army Medical Department Journal* PB 8-09-1/2/3 (Jan – Mar 2009): 21-24.

- Burke, Major Ronald L. "One Health and Force Health Protection During Foreign Humanitarian Assistance Operations: 2010 Pakistan Flood Relief." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 81-85.
- Burke, Major Ronald, Colonel Kelly Mann, Steven Richards and Colonel Timothy Stevenson. "US Veterinary Support to Standardization of Food and Water Safety and Animal Care and Use Within NATO." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 86-91.
- "Canadian Army Veterinary Corps." *The Canadian Journal of Comparative Medicine and Veterinary Science* 7 (Oct 1943): 290.
- Carpenter, Lieutenant Colonel Larry. "Operation Mad Dog - A Humanitarian Civic Action Project in Haiti." *Army Medical Department Journal* PB 8-96-7/8 (July-August 1996): 17-20.
- Catanzaro, Lieutenant Colonel Thomas E. "A Military Veterinary Perspective of How To Swim with Sharks." *Journal of the US Army Medical Department* PB 8-90-1 (January 1990): 25-26.
- Cates, Brigadier General Michael B. "Healthy Animals, Healthy People: Inextricably Linked." *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 4-7.
- "Chapter 7 - Military Veterinary." *World Congress on Military Medicine XXXVI Report*, St Petersburg, Russia. 5-11 June 2005.
- Cline, Captain Curtis R. and Major Michelle E. Goodnight. "Pit Viper Envenomation in a Military Working Dog." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan – Mar 2013): 28-33.
- Connett, Colonel Ty and Colonel Bob Cassidy. "VSO: More Than Village Defense." *Special Warfare* 24.3 (Jul-Sept 2011): 22-27.
- Cooper, Colonel James C. and Lieutenant Colonel Thomas G. Tecec. "A Look at Some NATO Veterinary Services - The US Army Veterinary Service - A Vital Part of the Army Medical Department." *Journal of the US Army Medical Department* PB 8-90-2 (February 1990): 20-21.
- Cope, Captain Stanton, Colonel Daniel Stickman and Graham White. "The Deployed Warfighter Protection Research Program: Finding New Methods to Vanquish Old Foes." *Army Medical Department Journal* PB 8-08-4/5/6 (Apr-Jun 2008): 9-20.
- Davis, Diana K. "Prescribing Progress: French Veterinary Medicine in the Service of Empire." *Veterinary Heritage* 29.1 (2006): 1-7. Accessed October 14, 2013. <http://www.utexas.edu/depts/grg/davis/PrescProgress.pdf>

- Department of the Army Headquarters. "Chapter 4 - Specific Functional Area Considerations in Stability Operations And Support Operations." *FM 8-42 Combat Health Support in Stability Operations and Support Operations*. Washington D.C.: 27 Oct 1997.
- "Dog gone it!" *The Maple Leaf* 13 (2010): 1.
http://publications.gc.ca/collections/collection_2010/forces/D12-7-13-14.pdf
- Dunton, Lieutenant Colonel Raymond F. and Major Gerald R. Sargent. "Addressing Feral and Wild Animal Threats During Deployment: The Distinction Between Animal Control and Rabies Control." *Army Medical Department Journal* PB 8-09-7/8/9 (Jul-Sept 2009): 33-39.
- Durant A. J. "Veterinary Military History of the United States, With a Brief Record of Veterinary Education, Practice, Organization and Legislation." *American Journal of Public Health and the Nation's Health* 26 (1936): 36-37.
- Evans, Major Kelley L. "Military Working Animal Chemical, Biological, Radiological, and Nuclear Protection and Medical Countermeasures." *Army Medical Department Journal* PB 8-09-1/2/3 (Jan-Mar 2009): 38-41.
- Finnegan, Lieutenant Colonel Niall B. "Military Veterinary Medicine in Disasters." *Journal of the US Army Medical Department* PB 8-92-5/6 (May/June 1992): 24-26.
- Foata, General Inspecteur J.D. "Organization and Functions of the French Army Veterinary Services." *Journal of the US Army Medical Department* PB 8-90-8 (August 1990): 22-25.
- Fogelman, Vicky L., Joanne Brown, George E. Moore, W. David Goolsby, Randall Thompson and Paul L. Barrows. "The Role of Veterinary Public Health and Preventive Medicine During Mobilization and Deployment." In *Military Preventive Medicine: Mobilization and Deployment*. Volume 1. Washington: TMM Publications, 2003.
- Germiniani, Clotilde de Lourdes Branco. "Veterinary Education in Brazil: Past History, Current Issues." *Journal of Veterinary Medical Education* 31 (2004): 28-31.
- Gleditsch, Nils Petter and Indra de Soysa. "To Cultivate Peace: Agriculture in a World of Conflict." *Environmental Change & Security Project Report* 5 (Summer 1999): 15-25. Accessed October 14, 2013. <http://www.wilsoncenter.org/publication/to-cultivate-peace-agriculture-world-conflict>
- Hanna, Major Scott, Major Margery Hanfelt, Major Kelley Evans and Lieutenant Colonel Robin King. "Army Veterinary Food Analysis Laboratories: Past, Present, and Future." *Army Medical Department Journal* PB 8-07-7/8/9 (July-Sept 2007): 12-16.

- Harmon, Lieutenant Colonel Joseph M. III. "Operation Provide Comfort, A Cry for Help: The Military Role in Humanitarian Aid." *Journal of the US Army Medical Department* PB 8-92-11/12 (November/December 1992): 31-37.
- Hausmann, Walter and Wolfgang Jochle. "The Discovery of Chiron's Cave: A Prehistoric School of Medicine for Animals and Humans." *Canadian Veterinary Journal* 29 (1988): 857-860.
- Heeren, Stijn. "New Views on the Forfex of Virilis the Veterinarian: Shears, Emasculator or Twitch?" *Journal of Archaeology in the Low Countries* 1-1 (May 2009). Accessed October 14, 2013. <http://dpc.uba.uva.nl/jalc/01/nr01/a05>
- Hildinger, Erik. "Nomads" and "Horse and Bow". In *Warriors of the Steppe: A Military History of Central Asia, 500 B.C. to 1700 A.D.* Cambridge: Da Capo Press, 2001.
- Hultsvet, Colonel Viktor. "The Swedish Military Veterinary Organization and its Main Tasks." *Journal of the US Army Medical Department* PB 8-90-2 (February 1990): 26-27. Accessed October 14, 2013. <http://cdm15290.contentdm.oclc.org/cdm/singleitem/collection/p15290coll3/id/255/rec/19>
- Jones, Archer. "Ancient Warfare." In *The Art of War in the Western World*. New York: Oxford University Press, 1987.
- Karom, A., C. Girardet, M. El Allouchi, E. Athias, G. Bornert, P. Ulmer. "Zoonoses et contexte opérationnel : facteurs de risque et prévention." *Médecine et Armées* 38/3 (2010): 213-220. Accessed October 30, 2013. <http://www.calameo.com/books/0003547852df7fd8485a6>
- Koeller, Major Craig A. "The Hidden Work of a Laboratory Animal Veterinarian." *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 26-27.
- Kohnen, Major Bettina. "German Veterinary Service Effective Food Control: Future Requirements" *Journal of the US Army Medical Department* PB 8-90-2 (February 1990): 22-25. Accessed October 14, 2013. <http://cdm15290.contentdm.oclc.org/cdm/singleitem/collection/p15290coll3/id/301/rec/70>
- Kuz'min, N.K. [Unforgettable Pages From the History of Soviet Veterinary Science (recollections of a participant in the Great Patriotic War)]. *Veterinariia* 6 (1971): 116-8. Accessed October 14, 2013. <http://www.ncbi.nlm.nih.gov/pubmed/4942594>
- Licina, Major Derek J. "Level III Preventive Medicine in a Counterinsurgency Environment." *Army Medical Department Journal* PB 8-08-4/5/6 (Apr-Jun 2008): 25-35.

- Lieutenant-General J.H.P.M Carron. *Managing the Army's Readiness* 3350-1 (CLS) 25 November 2005, para 5. CAF internal document.
- Lundquist, Arthur H. "Adapting Military Field Water Supplies to The Asymmetric Battlefield." *Army Medical Department Journal* PB 8-11-7/8/9 (July – Sept 2011): 62-69.
- MacKenzie, P.Z. "The Part Played by the Animals of the Sudan with the Allied Armies, 1940-46." *The Journal of the Royal Army Veterinary Corps* 19 (1947): 13-17.
- McCoy, Major Jessica. "Veterinary Civil Action Programs in Afghanistan: Pros, Cons, and How." *Army Medical Department Journal* PB 8-09-1/2/3 (January – March 2009): 25-32.
- McPhatter, Captain Lee, Walter Roachell, Farida Mahmood, Lauren Hoffman, Neal Lockwood, Angel Osuma, Major Jorge Lopez and Colonel Mustapha Debboun. "Vector Surveillance to Determine Species Composition and Occurrence of *Trypanosoma cruzi* Infection at Three Military Installations in San Antonio, Texas." *Army Medical Department Journal* PB 8-12-7/8/9 (July – Sept 2012): 12-21.
- "Military Working Dog." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 28-33.
- Mitchell, Staci L., Staff Sergeant Katasha T. McCline and Lieutenant Colonel Margery M. Hanfelt. "Veterinary Surveillance Laboratories: Developing the Training Program." *Army Medical Department Journal* PB 8-10-10/11/12 (Oct-Dec 2010): 22-24.
- Monthei, Captain Derek, Captain Scott Mueller, Jeffery Lockwood, and Colonel Mustapha Debboun. "Entomological Terrorism: A Tactic in Asymmetrical Warfare." *Army Medical Department Journal* PB 8-10-4/5/6 (April – June 2010): 11-21.
- Moore, Melinda, and Gail Fisher. "Toward the Effective Use of Military Veterinarians in Stability Operations." Arroyo Center and The Rand Center For Military Health, 2008. Accessed October 30, 2013.
http://www.rand.org/pubs/documented_briefings/DB560.html
- Morrison, Andrew. "The Case for Reactivating the Royal Canadian Army Veterinary Corps." *Canadian Military Journal* 12 (2012): 28-36. Accessed October 14, 2013. <http://www.journal.forces.gc.ca/vol12/no2/28-morrison-eng.asp>
- Mortensen, Lieutenant Colonel Einar. "The Norwegian Veterinary Corps: Tasks and Organization." *Journal of the US Army Medical Department* PB 8-90-2 (February 1990): 28-30. Accessed October 14, 2013.
<http://cdm16379.contentdm.oclc.org/cdm/singleitem/collection/p15290coll3/id/256/rec/16>

- Nevin, Stanley M. "U.S. Army Veterinary Service In Australia." *Bulletin of the U.S. Army Medical Department* 81 (Oct 1944): 113-119.
- O'Brien, Colonel Robert M. and Lieutenant General Alexander M. Sloan. "Medical Support to Desert Shield/Storm: The USEUCOM Surgeon's Perspective." *Journal of the US Army Medical Department* PB 8-92-3/4 (March-April 1992): 3-9.
- Office of Military History, United States Army Medical Department. "History of Veterinary Corps, A. E. F., From August 24, 1918 To March 1, 1919." *Reports of the Commander-in-Chief, Staff Sections and Services, Volume 15*. Washington, D.C.: 1991. Accessed October 14, 2013.
<http://history.amedd.army.mil/booksdocs/wwi/VetCorpsAEF.htm>
- "Organization and Functions of the French Army Veterinary Services." *Journal of the U.S. Army Medical Department*. PB 8-90-8. August 1990. Accessed October 14, 2013.
<http://cdm15290.contentdm.oclc.org/cdm/singleitem/collection/p15290coll3/id/281/rec/14>
- Parker, Geoffrey, editor. "The Age of Mechanized Warfare." In *Cambridge Illustrated History of Warfare*. New York: Cambridge University Press, 1995.
- Perrin, Terri. "The Business of Urban Animals Survey: The Facts and Statistics on Companion Animals in Canada." *The Canadian Veterinary Journal* 50 (2009): 48-52.
- Pfau, Esther, Lieutenant Colonel Jerrod Killian, Carrie Kilby and Karen Deaver. "Communicating Local Food Risk During Counterinsurgency Operations: Development and Evaluation of a Risk Communication Campaign." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 51-62.
- Plaideux, Hugues. "L'inventaire Après Décès de Claude Bourgelat." *Bull.soc.fr.hist.méd.sci.vét.* 10 (2010): 121-154.
- Poppe, Brigadier General John L. "The US Army Veterinary Service 2020: Knowledge and Integrity." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 5-10.
- Reakes, C.K. "Chap IX: New Zealand Veterinary Corps." In *The War Effort of New Zealand*. Auckland: Whitcombe and Tombs Limited, 1923. Accessed October 14, 2013. <http://nzetc.victoria.ac.nz/tm/scholarly/tei-WH1-Effo-t1-body-d9.html>
- Reeves, W.K., K. Yore, R. Paul, and L. Lloyd. "Veterinary Diseases Review for Mainland Japan, 2000-2010." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 38-44.
- "Royal Canadian Army Veterinary Corps." *The Canadian Journal of Comparative Medicine and Veterinary Science* 5 (1941): 92-93.

- Sames, Lieutenant Colonel William J., Lieutenant Colonel Thomas C. Delk and Major Paul J. Lyons. "Field Preventive Medicine: Challenges for the Future." *Army Medical Department Journal* PB 8-06-4/5/6 (Apr-Jun 2006): 40-45.
- Scheirer, G.A. "The Caduceus." *The Army Medical Bulletin* 32 (July 1935): 26-33.
- Schreuder B.E.C., H.A.J. Mollb, N. Noormanc, M. Halimic, A.H. Kroesea and G. Wassinkc. "A Benefit-Cost Analysis of Veterinary Interventions in Afghanistan Based on a Livestock Mortality Study." *Preventive Veterinary Medicine* 26 (1996): 303-314. Accessed October 14, 2013. [http://dx.doi.org/10.1016/0167-5877\(95\)00542-0](http://dx.doi.org/10.1016/0167-5877(95)00542-0)
- Smith, Lieutenant Colonel John C. "Stabilization and Reconstruction Operations: The Role Of The US Army Veterinary Corps." *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 71-80.
- Spicer, Major Kenneth D. "Army Transformation and Level II Preventive Medicine Within a Deployed Division Task Force." *Army Medical Department Journal* PB 8-09-4/5/6 (Apr-Jun 2009): 58-61.
- Steele, Colonel Keith E., Major Derron A. Alves and Major Jennifer L. Chapman. "Challenges in Biodefense Research and the Role of US Army Veterinary Pathologists." *Army Medical Department Journal* PB 8-07-7/8/9 (July-Sept 2007): 28-37.
- Stratford, Colonel D. O. "Military Veterinary Services in South Africa." *Military History Journal* 1 (June 1970). Accessed October 14, 2013. <http://samilitaryhistory.org/vol016ds.html>
- The Surgeon General's Office. *The Medical Department Of The United States Army In The World War, Volume I*. Washington, D. C.: Government Printing Office, 1923. Accessed October 14, 2013. <http://history.amedd.army.mil/booksdocs/wwi/VetDivWWI.htm>
- The Surgeon General's Office. *The Medical Department Of The United States Army In The World War, Volume II: Administration- American Expeditionary Forces*. Washington D.C.: United States Government Printing Office: 1927. Accessed October 14, 2013. <http://history.amedd.army.mil/booksdocs/wwi/VetServiceAEF.htm>
- Todd, Frank A. "Veterinary Preventive Medicine in Civil Affairs and Military Government (G-5) in Northwest Europe From D-Day To V-Day." *Yale Journal of Biology and Medicine* 19 (Mar 1947): 563-569.
- Todd, Major F. Arnold. "Veterinary Service in Iceland." *Bulletin of the U.S. Army Medical Department* 73 (Feb 1944): 85-90.

- Ugalde, Rosemarie M., and John J. Resta. "The US Army Public Health Command Initiative: Transforming Public Health Services for the Army." *Army Medical Department Journal* PB 8-10-4/5/6 (April – June 2010): 4-10.
- United States Africa Command Public Affairs. "U.S. Army Civil Affairs VETCAP & Community Animal Health Worker Training Programs Make An Impact in Uganda." *U.S. Africa Command Vignette*. October 2010. Accessed October 14, 2013. www.africom.mil/NEWSROOM/Document/7785
- United States Department of Agriculture. "Veterinary Services: Protecting Animal Health and Promoting Trade." Animal and Plant Health Inspection Service, Miscellaneous Publication No. 1550, December 2001.
- "The Veterinary Service." *The Army Medical Bulletin* 19 (1926). 1-219
- "Veterinary Inspection of Oysters." *Bulletin of the U.S. Army Medical Department* 8 (February 1948): 85-86.
- "Veterinary Service For The K-9 Corps." *Bulletin of the U.S. Army Medical Department* 7 (April 1947): 347-349.
- Vincent-Johnson, Lieutenant Colonel (Ret) Nancy A. "The Role of the US Army Veterinary Corps in Military Family Pet Health." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 69-80.
- Vogelsang, Colonel Robert. "Special Operations Forces Veterinary Personnel." *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 69-70.
- Volpe, Major General Philip. "Perspectives: Commander's Introduction." *Army Medical Department Journal* PB 8-13-1/2/3 (Jan-Mar 2013): 1-4.
- Vroegindewey, Colonel Gary. "Emerging Roles of the US Army Veterinary Service." *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 8-11.
- Watkins, Lieutenant Commander Kathleen L. "Policy Initiatives for the Use of Canines in Army Medicine." *Army Medical Department Journal* PB 8-12-4/5/6 (Apr-Jun 2012): 8-11.
- Whitfield, Colonel L. C. "The Veterinary Services In The Australian Military Forces." *Australian Veterinary Journal* 27 (1951): 226–236.
- Wilson, Colonel William L. "Medical Aspects of Government Services in Time of National Emergency." *Bulletin of the U. S. Army Medical Department* 8 (July 1948): 493-498.
- Yenovkian, Warrant Officer First Class Philip J. "Foodborne Bio-Terrorism." *Army Medical Department Journal* PB 8-00-10/11/12 (Oct-Dec 2000): 16-24.

- Yingst, Major Sam. "A Veterinary Comparative Medicine Officer's Dream Assignment." *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 38-43.
- Young, Captain Christopher A. "The US Army Veterinary Corps Reserve Component." *Army Medical Department Journal* PB 8-07-7/8/9 (July – Sept 2007): 66-68.
- Young, Helen, Abdal Monium Osman, Ahmed Malik Abusin, Michael Asher and Omer Egemi. "Livelihoods, Power and Choice: The Vulnerability of the Northern Rizaygat, Darfur, Sudan." Medford, MA: Feinstein International Center, Tufts University, 2009. Accessed October 30, 2013.
http://wikis.uit.tufts.edu/confluence/download/attachments/21931179/Darfur_livelihoods.pdf?version=1

C. Other: Websites, Online Documents, Presentations, Theses, Finding Aids

- "Afghan veterinarian, civil affairs team helps ranchers." October 14, 2103.
<http://www.defenselink.mil/news/newsarticle.aspx?id=49561>
- "Afghan veterinary association finds its way." Accessed October 14, 2013.
<https://www.avma.org/News/JAVMANews/Pages/071115c.aspx>
- "Argentine Army - Army General Staff." Accessed October 14, 2013.
http://en.wikipedia.org/wiki/Argentine_Army#Army_General_Staff
- "Army ranks and insignia of the Austro-Hungarian Army – Examples." Accessed October 14, 2013. http://en.wikipedia.org/wiki/Army_ranks_and_insignia_of_the_Austro-Hungarian_Army#Examples
- "Army Ranks and Insignia of the Russian Federation." Accessed October 14, 2013.
http://en.wikipedia.org/wiki/Army_ranks_and_insignia_of_the_Russian_Federation
- "Army South Soldiers, veterinarians help partner nations build, sustain working dog programs." Accessed October 14, 2013.
http://www.army.mil/article/108795/Army_South_Soldiers_veterinarians_help_partner_nations_build_sustain_working_dog_programs/
- "Army vets wage unconventional campaign abroad." Accessed October 14, 2013.
<https://www.avma.org/News/JAVMANews/Pages/060615g.aspx>
- "Bangladesh Army Administrative Branches." Accessed October 14, 2013.
http://en.wikipedia.org/wiki/Bangladesh_Army#Administrative_Branches
- "Bangladesh Military Forces." Accessed October 14, 2013.
http://www.bdmilitary.com/?option=com_content&view=article&id=68&Itemid=92%20Bangladesh%20Army%20-%20Overview%20

- “Brazilian Army - Jungle Warfare Brigades.” Accessed October 14, 2013.
https://en.wikipedia.org/wiki/Brazilian_Army#Jungle_Warfare_Brigades
- Canadian Veterinary Medical Association. “A Career in Veterinary Medicine.” Accessed October 14, 2013. <http://www.canadianveterinarians.net/about-veterinary-medicine/career.aspx>
- “Canadian Veterinary Medical Association and Canadian Food Inspection Agency Establishing Veterinary Reserve.” Accessed January 3, 2012.
<http://www.canadianveterinarians.net/Documents/Resources/Files/508newsreleaseCVR E.pdf>
- Catanzaro, Lieutenant Colonel Thomas E. “A Vertically Integrated Manpower Management Model for Military Veterinary Services.” Graduate Research Project. Waco, TX: Baylor University, 1985.
- Centre for United Nations Peacekeeping (CUNPK). “UN Peacekeeping Missions Monthly Update, October 2009.” Accessed October 14, 2013.
<http://usiofindia.org/CUNPK/UNPKO/Journals/200910.pdf>
- “Centre of Competence for Veterinary Service and Army Animals.” Accessed October 14, 2013.
http://www.he.admin.ch/internet/heer/en/home/themen/kompetenzzentrum.html&usg=ALkJrhEjUiKKhvPwJTsfacnjp_z_6JnPA
- Chase, Steven. “Forces planning to expand use of sniffer-dog teams,” *The Globe and Mail*, accessed November 7, 2013,
<http://www.theglobeandmail.com/news/politics/forces-planning-to-expand-use-of-sniffer-dog-teams/article1206842/>
- “Chief of Defence, Medical Directorate.” Accessed October 14, 2013.
<http://www.kormany.hu/en/ministry-of-defence/news/chief-of-defence-medical-directorate>
- Colorado Division of Animal Industry, Department of Agriculture. “Annex XI: Agricultural Emergencies - Appendix A: Animal Health Emergency.” September 1, 2003. Accessed October 14, 2013.
http://www.pathobiologics.org/btac/ref/agriculture_conplan.pdf
- “Community Pet Preparedness.” Accessed October 14, 2013.
http://www.oes.ca.gov/PlanningandPreparedness/Documents/PetPreparednessToolkit_100429.doc
- Corettie, Medjo Byabot. “Evaluation des Besoins pour la Creation du Service Veterinaire des Forces de Defense du Cameroun.” 2009. Accessed October 30, 2013.
<Http://theses.vet-alfort.fr/telecharger.php?id=1073>

- “Corps Colours Waffen SS.” Accessed October 14, 2013.
[http://en.wikipedia.org/wiki/Corps_colours_\(Waffen-SS\)](http://en.wikipedia.org/wiki/Corps_colours_(Waffen-SS))
- Curca, Dumitru. “Romanian Veterinary Medicine In The First World War” Accessed October 14, 2013. <http://www.scribd.com/doc/147794734/ROMANIAN-VETERINARY-MEDICINE-IN-THE-FIRST-WORLD-WAR>
- “Department of Foreign Affairs and International Trade.” Accessed October 14, 2013.
<http://www.international.gc.ca/international/index.aspx?lang=eng>
- “Emergency plans ensure pets aren’t left behind.” Accessed October 16, 2010.
<http://www.zogby.com/soundbites/ReadClips.cfm?ID=14961>
- “EXCLUSIVE: A lasting legacy from the Herriot of Helmand.” Accessed October 14, 2013. <http://ukforcesafghanistan.wordpress.com/page/234/?archives-list&archives-type=cats>
- Gemmill, Barbara and Abimbola Bamidele-Izu. “The Role of NGOs and Civil Society in Global Environmental Governance.” Accessed October 14, 2013.
<http://environment.research.yale.edu/documents/downloads/a-g/gemmill.pdf>
- Gilberd, Jim G. “NZ Veterinary Corps.” In *Boot and Saddle*. 1989. Accessed October 14, 2013. <http://riv.co.nz/rnza/hist/boot/bs17.htm>
- “History of medieval Arab veterinary medicine.” Presentation, Faculty of Veterinary Science, Szent Istvan University, Budapest, Hungary. Accessed October 14, 2013.
www.univet.hu/sc1/feltoltott/23_1318404132.pdf
- “History of the South African Military Medical Service 1913 to 1994.” Accessed October 14, 2013. <http://www.mhs.mil.za/aboutus/history.htm>
- “Imperial Japanese Army Veterinary School.” Accessed October 14, 2013.
<http://ja.wikipedia.org/wiki/陸軍獣医学校> 陸軍獣医学校
- “ISAF Provides veterinary care to nomadic tribes.” Accessed October 14, 2013.
<http://www.nato.int/isaf/docu/pressreleases/2008/10-october/pr081031-577.html>
- Jech, Ronald. “US Army Veterinary Service Food Protection Programs.” Presentation to NATO Workshop *Advances in Food Security and Safety Against Terrorist Threats and Natural Disasters*, April 13-15, 2010, Cairo, Egypt. Accessed October 14, 2013. http://agtechint.com/uploads/Risk_Management_as_it_Relates_to_Food.pdf
- “Joint Electronic Library, UJTL Tasks.” Accessed October 30, 2013.
http://www.dtic.mil/doctrine/training/ujtl_tasks.htm

- “K-9 Canines Aren’t Pets.” Accessed October 16, 2010. <http://www.vcds-vcemd.forces.gc.ca/dsafeg-dsg/pi/sd-dsg/1-07/article-11-eng.asp>
- “Korean army veterinarian returns home.” Accessed October 14, 2013. <http://www.aetc.af.mil/news/story.asp?id=123276831>
- Library and Archives Canada. “Guide to Sources Relating to Units of the Canadian Expeditionary Force: Canadian Army Veterinary Corps”. Undated. Accessed October 14, 2013. www.collectionscanada.gc.ca/the-public/005-1142.29-e.html
- “List of Military Veterinary Services.” Accessed October 14, 2013. http://en.wikipedia.org/wiki/List_of_Military_Veterinary_Services
- “Marine Mammal Program.” Accessed October 14, 2013. <http://www.spawar.navy.mil/sandiego/technology/mammals/veterinary.html>
- “Marjan, The Lion of Kabul Kabul Zoo & Brooke Hospital 2005 Updates - Afghanistan.” Accessed October 14, 2013. <http://animom.tripod.com/kabulzoo.html>
- McEwen, Andrew. “‘On the go all the time’: The Canadian Army Veterinary Corps in 1918.” Military History Podcast Series. The Laurier Centre for Military Strategic and Disarmament Studies. Accessed November 8, 2013. <http://www.canadianmilitaryhistory.ca/on-the-go-all-the-time-the-canadian-army-veterinary-corps-in-1918-by-andrew-mcewen/>
- “Mestrado em Saúde Militar na Especialidade de Veterinária (Exército e GNR)” Accessed October 14, 2013. <http://www.academiamilitar.pt/medicina-veterinaria.html>
- “Mexican Army Ranks.” Accessed October 14, 2013. http://en.wikipedia.org/wiki/Mexican_Army#Ranks
- “Military Medical Agency.” Accessed October 14, 2013. <http://www.army.cz/scripts/detail.php?id=87181>
- “Military ranks of the Soviet Union - Colors of the rank insignia.” Accessed October 14, 2013. http://en.wikipedia.org/wiki/Military_ranks_of_the_Soviet_Union#Colors_of_the_rank_insignia
- “Military veterinarians assemble in Belgium - August 15, 2007.” Accessed October 14, 2013. <https://www.avma.org/News/JAVMANews/Pages/070815q.aspx>
- “Military veterinarians meet in South Korea, France.” Accessed October 14, 2103. <http://www.avma.org/News/JAVMANews/Pages/090715o.aspx>
- “Military Veterinary Services In South Africa - South African Military History Society” Accessed October 14, 2013. <http://samilitaryhistory.org/vol016ds.html>

- “Ministerio de Defensa - Centro Militar de Veterinaria.” Accessed October 14, 2013.
<http://www.defensa.gob.es/oodd/veterinaria/>
- “New Zealand Vet Corps.” Accessed October 14, 2013.
<http://www.diggerhistory.info/pages-badges/nz-corps3.htm#vet>
- “Nunavet Animal Hospital.” Accessed October 14, 2013. <http://www.nunavet.ca>
- “Official Website of Indian Army - Remount And Veterinary Corps.” Accessed October 14, 2013.
<http://indianarmy.nic.in/Site/FormTemplate/frmTempSimple.aspx?MnId=fes+8u1fKh491av1B/Uylg==&ParentID=klFaNb6BboTm2179syUowA==&flag=wCvDBK9flg28LVKJMvPiRg>
- “One Health Event Highlights Ugandan Military, CJTF-HOA Veterinary Care.” Accessed October 14, 2013. <http://www.hoa.africom.mil/getArticleFresh.asp?art=8577>
- “One Health Initiative will unite human and veterinary medicine.” Accessed October 14, 2013. <http://www.onehealthinitiative.com>
- “One Health.” Accessed October 14, 2013. http://en.wikipedia.org/wiki/One_Health
- “Organization Veterinary-Sanitary department: Ministry of Defence of the Russian Federation.” Accessed October 14, 2013.
http://eng.mil.ru/en/structure/ministry_of_defence/details.htm?id=9750@egOrganization
- Parsonson, Ian. “The Australian Army Veterinary Corps.” Accessed October 14, 2013.
<http://sydney.edu.au/vetscience/avhs/milestones/aavc.pdf>
- People's Dispensary for Sick Animals (PDSA). “Animal bravery awards.” Accessed October 14, 2013. <http://www.pdsa.org.uk/about-us/animal-bravery-awards>
- “People's Liberation Army.” Accessed October 14, 2013.
http://en.wikipedia.org/wiki/People%27s_Liberation_Army
- “RCMP Musical Ride.” Last modified April 18, 2007. Accessed October 14, 2013.
<http://www.rcmp-grc.gc.ca/mr-ce/index-eng.htm>
- “Report of the 55th International Military Veterinary Symposium.” Accessed October 14, 2013. <http://www.cimm-icmm.org/page/anglais/rapportcongresvetoANG2009.php>
- Rodriguez, Patricia. “Healing Afghanistan.” *Veterinary Practice News* 22.10 (2010): 55. Accessed October 14, 2013. <http://www.veterinarypracticenews.com/vet-industry-people/profiles-in-medicine/healing-afghanistan.aspx>
- “Royal Army Veterinary Corps.” Accessed October 14, 2103.
<http://www.army.mod.uk/medical-services/veterinary.aspx>

- “Royal Thai Army Veterinary & Remount Department.” Accessed October 14, 2013.
<http://www.vetdept.com/en/>
- “Structure of the Pakistan Army – Services.” Accessed October 14, 2013.
http://en.wikipedia.org/wiki/Structure_of_the_Pakistan_Army#Services
- “Symposium - Contributions of Scientific research to the Progress of Veterinary Medicine.” Accessed October 14, 2013.
http://www.fmvb.ro/fisiere/file/SW2010xyztuvxzaaa/simpozion_rezumate.pdf
- “Turkish Army Administrative Branches.” Accessed October 14, 2013.
http://en.wikipedia.org/wiki/Turkish_Army#Administrative_branches
- “United Nations Millennium Goals.” Accessed October 14, 2013.
<http://www.un.org/millenniumgoals/>
- US Army Medical Department, Office of Medical History. “World War I.” Accessed October 14, 2013. <http://history.amedd.army.mil/corps/veterinary/wwi.html> .
- US Army Medical Department, Office of Medical History. “World War I Training Camp.” Accessed October 14, 2013.
<http://history.amedd.army.mil/corps/veterinary/history/training.html> .
- US Army Medical Department, Office of Medical History. “World War I Veterinary Hospital.” Accessed October 14, 2013.
<http://history.amedd.army.mil/corps/veterinary/history/hospital.html> .
- “US Veterinarians help jump-start Afghan animal health clinic.” Accessed October 14, 2013. <https://www.avma.org/News/JAVMANews/Pages/060315a.aspx>
- “US Army veterinarian killed in action.” Accessed October 14, 2013.
<https://www.avma.org/News/JAVMANews/Pages/060715c.aspx>
- “US Army Veterinary Corps.” Accessed October 14, 2013.
<http://veterinarycorps.amedd.army.mil/index.htm>
- “Vétérinaires des armées.” Accessed October 14, 2013.
http://fr.wikipedia.org/wiki/Service_de_sant%C3%A9_des_arm%C3%A9es
- “Veterinarians needed to develop comprehensive animal protection, decontamination plans.” Accessed October 14, 2013.
<https://www.avma.org/News/JAVMANews/Pages/050701m.aspx>
- “Vietnam veterinary adventure.” Australian Army. Accessed October 14, 2013.
<http://www.army.gov.au/Our-work/News-and-media/News-and-media-2012/News-and-media-August-2012/Vietnam-veterinary-adventure>

“Welcome to the U.S. Army Veterinary Corps” Accessed October 14, 2013.
<http://veterinarycorps.amedd.army.mil/>

“Zentraler Sanitätsdienst der Bundeswehr.” Accessed October 14, 2013.
http://de.wikipedia.org/wiki/Zentraler_Sanitätsdienst_der_Bundeswehr