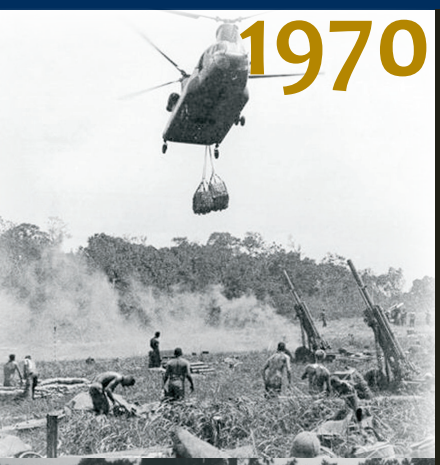
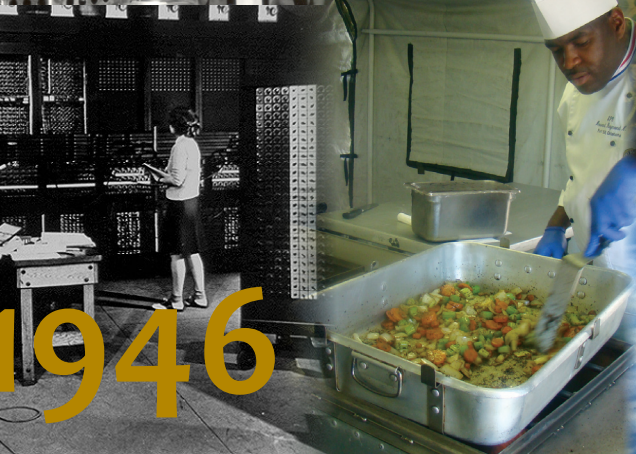
Quartermaster
PROFESSIONAL BULLETIN

Commemorative Final Edition 2009





Celebrating 234 Years & Looking Forward

THE QUARTERMASTER GENERAL, UNITED STATES ARMY
2221 ADAMS AVENUE
FORT LEE, VIRGINIA 23801-2102

Logistics: Bam! This is the core element on which "all operations of an army essentially depend."

The general who wrote this should certainly know. He commanded American troops as the Nation was declaring and fighting for its independence from the British Empire and then became the first US President. George Washington, who appointed the first Quartermaster General on 14 September 1775, knew the importance of his Quartermaster Department first-hand through the hardships his Soldiers faced at Valley Forge and Morristown and the triumphs of Soldiers such as Colonel Henry Knox who led the expedition that dragged 59 cannon and mortars through the snow from Crown Point and Fort Ticonderoga to Dorchester Heights.

This commemorative final edition of the *Quartermaster Professional Bulletin* is a valuable resource, especially for younger Quartermasters and those who will join our ranks in the future. Our historian, Dr. Steven E. Anders, has done a superb job of illuminating our 234 years of history and reporting on the performance of Quartermasters today in Afghanistan and Iraq. A clear understanding of our history and our present circumstances is essential for planning and executing a future that will strengthen the Quartermaster Corps in *Supporting Victory* in 2050 and beyond. This edition also includes information about the Base Realignment and Closure transformations here at Fort Lee and across the spectrum of logistics as well as about how we are now preparing for that future and how it may look.

"Good logistics alone can't win a war," as General Brehon B. Somervell, Commander of Army Service Forces, reminded us in the wake of Pearl Harbor. "Bad logistics alone can lose it." The *Quartermaster Professional Bulletin* has played a significant role for more than 20 years in helping us distinguish between good and bad logistics, as have the professional publications of the Ordnance and Transportation Corps from 1987 to 1994. With this final edition, our *Bulletin* is the last of the three publications to cease production. *Army Sustainment*, formerly the *Army Logistician* that began publication in 1969, will now be the sole voice of the sustainment warfighting function, keeping Soldiers, Civilians, and contractors abreast of lessons learned and new developments in logistics, personnel services, and health service support.

My commendations for a job well done – since the spring of 1988 – go to former editors Barbara A.C. Hennig-Loomis (1988-89), Linda B. Kines (1989-2005), and George Dunn (2005-08); to Martha B. Guzman (1995-2009) who has ably served as electronic publishing and design specialist; to the Command Planning Group; to all those who volunteered to write articles or essays for this edition; and to Kathryn C. Weigel who edited our final two issues.

I am pleased to share this commemorative edition with all of the Quartermaster Corps and other American Soldiers who are performing so admirably in many lands around the globe. I encourage each of you to know your history as we march toward tomorrow and the evolving new ways of *Supporting Victory*!

Jesse R. Cross
Brigadier General, US Army

Quartermaster PROFESSIONAL BULLETIN

The Quartermaster General
Brigadier General Jesse R. Cross

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COVER: The collage of images spanning the history of the Quartermaster Corps and venturing into the future was designed by Dr. Steven E. Anders, Corps historian, and the staff of the *Quartermaster Professional Bulletin*. A key to the images is on Page 2.

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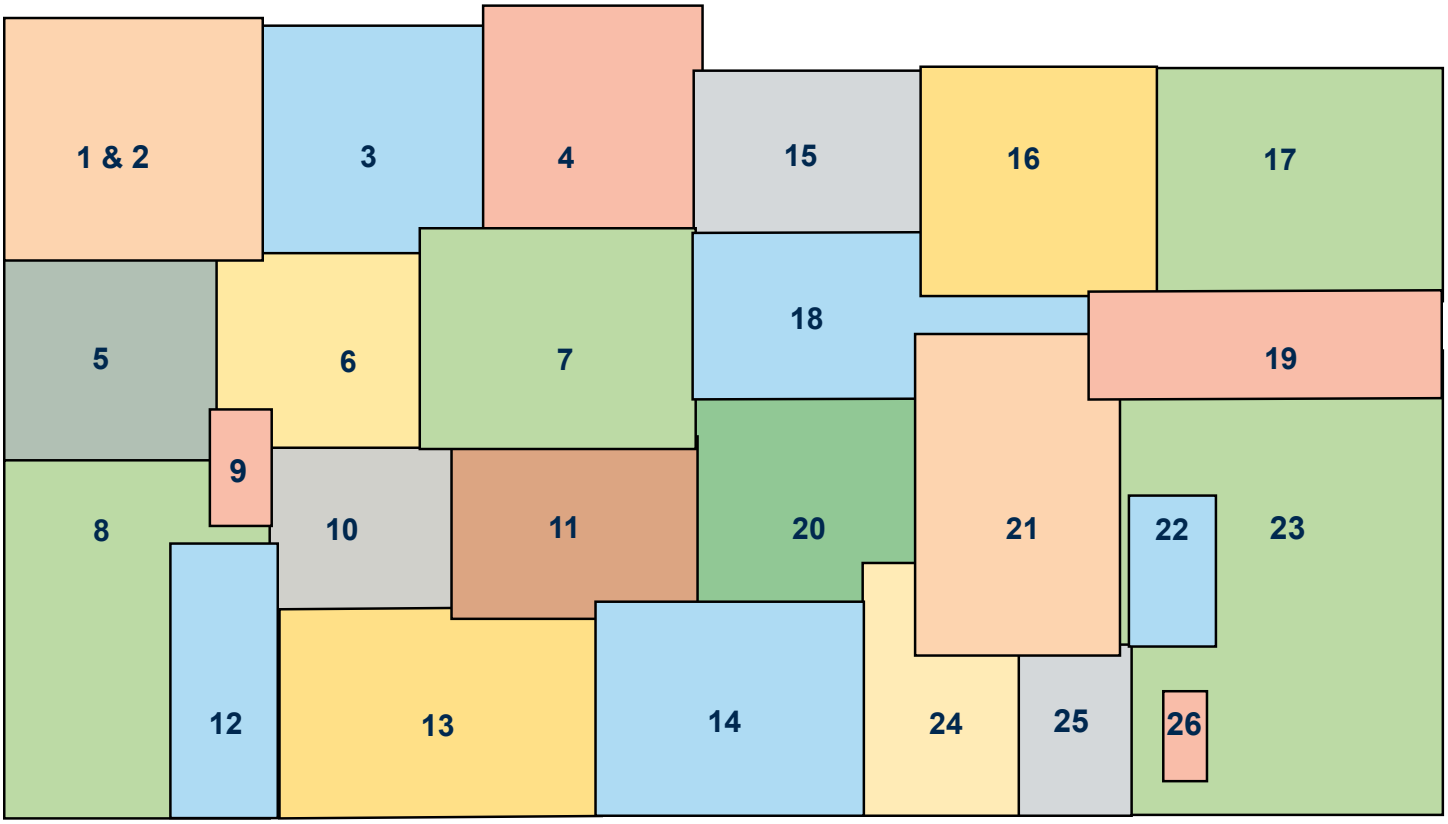

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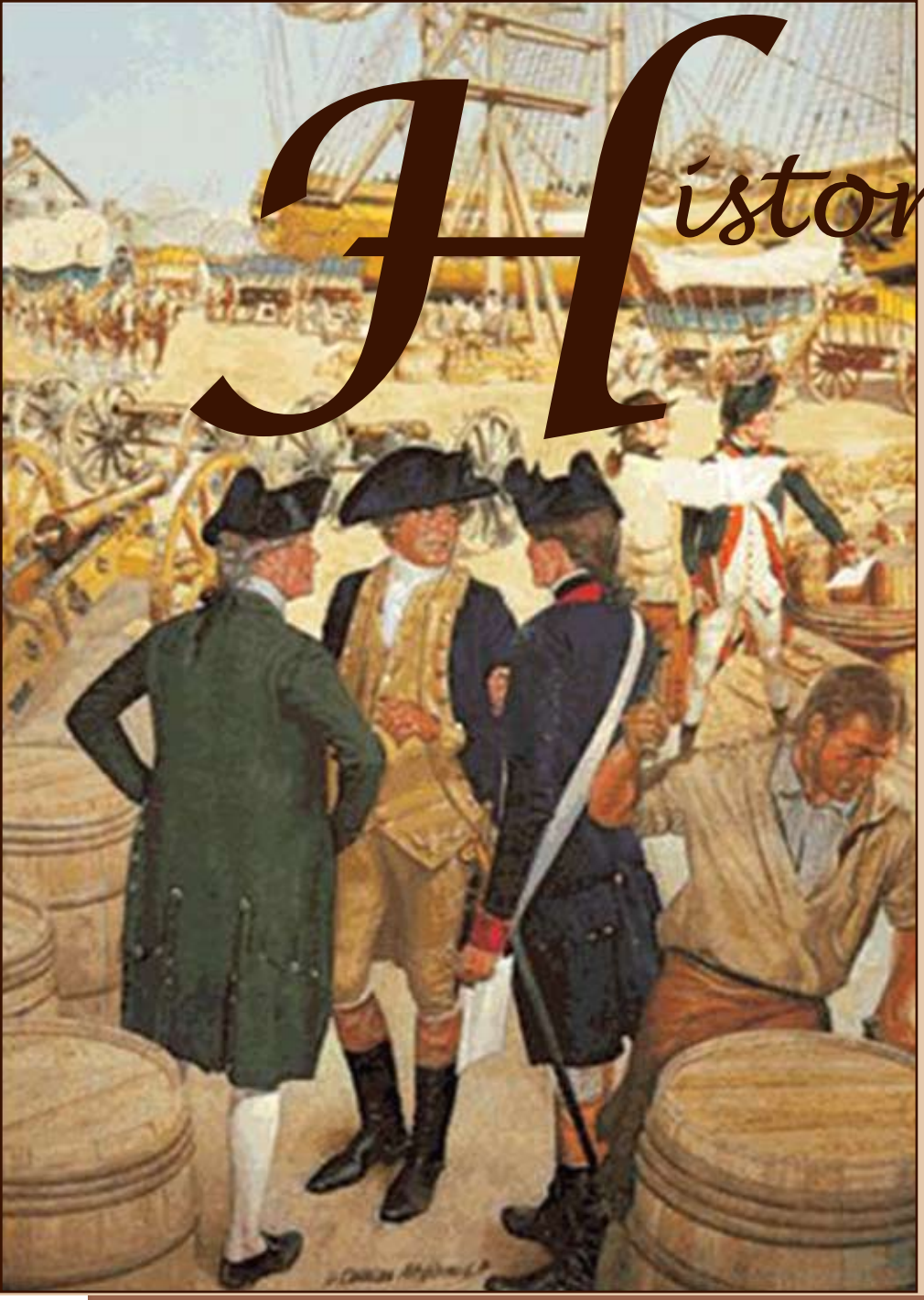


History of the

By Dr. Steven E. Anders

Birth of the Corps

The Quartermaster Corps rightly traces its origins to the very beginning of the American Revolution.

Soon after the first shots were fired at Lexington and Concord, the Continental Congress resumed meeting in Philadelphia and set about the business of organizing a central government – and creating a Continental Army to assist the New Englanders already besieging the British garrison in Boston. On Wednesday, 14 June 1775, members of the Continental Congress read and approved the following resolution: "Resolved, That six companies of expert riflemen, be immediately raised in Pennsylvania, two in Maryland, and two in Virginia; . . . That each company, as soon as compleated [sic], shall march and join the army near Boston." Thus was born the United States Army.

19 April 1775

Battles of Lexington and Concord

10 May 1775

Continental Congress convenes in Philadelphia

15 June 1775

George Washington appointed Commanding General

16 June 1775

Congress establishes Quartermaster Department

Quartermaster Corps

The United States Army Quartermaster Corps is our Nation's oldest combat service support branch. For nearly two and a half centuries its personnel have provided logistical support necessary for victory on and off the battlefield. Its long and proud history is enmeshed in the history of our Nation and of our Army.

Two days later Congress unanimously appointed George Washington Commander of the new Continental Army. And on that same day – 16 June – passed a resolution establishing *"one quarter master general for the grand army, and a deputy, under him, for the separate army."* They were to receive the princely sums of $80 and $40 per month, respectively. With that the Quartermaster Corps had come into being, two days after the Army was created, yet a full year before the signing of the Declaration of Independence and the birth of our Nation itself.

The Pursuit of Liberty

George Washington accepted the commission on 3 July 1775. A week later he wrote the president of the Continental Congress that the selection of a Quartermaster General, a Commissary of Musters, and a Commissary of Artillery was of immediate importance. By the time he had gained authorization to make these appointments in mid-summer, Washington and members of his immediate staff were already en route to Massachusetts. On 19 August he selected one of his aides, the 31-year-old Philadelphia merchant, Major Thomas Mifflin, to become the first Quartermaster General. But for the remainder of that year, neither Mifflin nor the newly appointed Commissary General, Joseph Trumbull, succeeded in establishing an effective system of supply and transportation.

The troops that drove the British out of Boston in 1776 and moved on to New York were as poorly equipped as they were ill-trained. No government issue of clothing was initially provided for. Soldiers arrived in camp wearing mainly homespun hunting jackets and long breeches in a wide variety of cuts and colors. Although Washington and his staff wore the blue and buff colors commonly associated with Revolutionary War uniforms, troop uniforms as such were mainly green and brown.

The Continental Congress did not get around to authorizing a Clothier General until December 1776. Chronic shortages and poorly made clothing and shoes in fact grew steadily worse the next year. In June 1777 Washington complained that lack of shoes made some units "almost entirely incapable of doing duty." And recently imported shoes – which he

17 June 1775

British defeated at the Battle of Bunker Hill (Breed's Hill)

14 September 1775

Thomas Mifflin appointed first Quartermaster General

4 March 1776

Colonel Henry Knox drags 59 cannons 300 miles to Dorchester Heights

17 March 1776

British troops evacuate Boston

referred to as "thin french pumps" – fell to pieces as soon as they got wet.

Indeed by the end of 1777, as Washington's Army moved into its winter encampment at Valley Forge, the supply system had become completely dysfunctional. It was not that troops were starving and freezing because the surrounding states had been utterly drained of food and clothing. Rather the breakdown in *transportation* kept supplies stored in government-owned posts and magazines from reaching the winter camp where they were so desperately needed. When Congress failed to provide funds to hire private wagons and teams, the Army at times resorted to impressing them from local communities, which led to predictable abuses and resentment. Even when Quartermasters got the money to hire local wagonmasters, there was no guarantee they would deliver the goods as promised. Teamsters on occasion simply dumped their load at the side of the road and went home.

The under-staffed and often tenuous condition of the Quartermaster Department unfortunately contributed to the sufferings that troops endured at Valley Forge. Thomas Mifflin was promoted to brigadier general in May 1776 and promptly resigned as Quartermaster General. Replaced by a largely ineffective Colonel Stephen Moylan, who lasted only a few months, Mifflin reluctantly took on the job a second time in October of 1776. But then when promoted to major general the following year, he asked to be relieved of his Quartermaster duties a second time. Congress granted his request in November 1777, on the very eve of Valley Forge, but with the proviso that Mifflin stay semi-involved at least until another replacement could be found. He didn't. Weeks passed without a single responsible Quartermaster officer appearing in the camp.

In his despair Washington at one point wrote that "no Man, in my opinion, ever had his measures more impeded than I have, by every department in the Army." And he specifically singled out the absence of a Quartermaster General in camp as contributing to his many woes. In lieu thereof he was forced to tend to many Quartermaster duties himself.

The certainty of a new campaign in the spring or summer of 1778 made the selection of an energetic Quartermaster General imperative. The choice fell upon Major General Nathanael Greene of Rhode Island. A tactical commander rather than a supply officer, he did not want to be Quartermaster General. As he afterwards explained, no one had heard of a quartermaster in history. He accepted, however, at General Washington's insistence and took office on 2 March 1778.

General Greene, who was permitted to retain his rank of major general, quickly set about wrenching order out of chaos. He used the meager funds available to fill vacant positions and then pushed his agents beyond the immediate vicinity to purchase goods. He also set about building or repairing the roads leading from Valley Forge. Greene laid special emphasis on acquiring tents, horses, wagons, and boats in anticipation of the forthcoming "break-out."

But perhaps Greene's most impressive achievement as Quartermaster General was the establishment of a series of grain depots running from the Hudson River south all the way to Maryland. These small magazines, where considerable amounts of

4 July 1776

Congress adopts Declaration of Independence

29 August 1776

Washington evacuates from Long Island

26 December 1776

American victory over British mercenaries in Battle of Trenton invigorates Revolution

19 December 1777

Patriots winter at Valley Forge

wheat, corn, hay, rye, and oats were maintained, constituted a "line of communication" that, in effect, allowed the Commander logistical flexibility in the wake of Valley Forge.

His able leadership notwithstanding, Greene's Quartermaster Department remained strapped for funds and largely bereft of Congressional support. Indeed, the winter of 1778-79 at Morristown proved worse than Valley Forge. At times the men went without meat and bread for days at time. Depreciated currency and rampant inflation undermined Greene's best efforts to pay for food, clothing, equipment, and transportation. It is a true testament to the Soldiers themselves that the Continental Army stayed together long enough for the war to shift from the northern, to the middle, and finally to the southern colonies in 1780.

Washington's prospects brightened immeasurably as French troops under General Rochambeau began arriving in Newport, Rhode Island, in the spring of 1781; and word came that Admiral de Grasse's fleet was setting sail for the Chesapeake. By that time, Nathanael Greene was already back undertaking his first love, leading troops in a masterful campaign in the Carolinas, and had gladly relinquished his logistical duties to the new Quartermaster General, Thomas Pickering.

In the summer of 1781 when Washington decided to redirect his attack away from British forces in New York City to try capturing Cornwallis on the Virginia peninsula instead, he issued careful guidance on the campaign's logistical aspects and saw to many of the details himself. Washington and Rochambeau moved from Trenton, New Jersey, on 30 August. They continued south through Pennsylvania, Maryland, and Virginia. Their forces split at times, with many troops, supplies, and arms moving in by boat, while the rest continued their steady march overland. Traveling more than 450 miles in four weeks, they arrived at Yorktown on 29 September to begin siege operations. This was a remarkable logistical feat, one of the most successful concentrations of military force in that era. It set the stage for the decisive victory at Yorktown that brought an end to the Revolution.

Quartermaster efforts to sustain the Continental Army throughout America's longest war (prior to Vietnam) proved excruciatingly difficult from beginning to end. Supply officers were hampered in every conceivable manner by circumstances over which they had little control. And it was truly a thankless task, for they were routinely subject to scorn and abuse, with little thought of praise or glory for what they managed to accomplish. Yet looking back, a fairer assessment would have them sharing with line officers credit for achieving victory and establishing our Nation's independence.

The New Republic

With the close of the American Revolution, the Continental Army quickly dissolved and, by the summer of 1784, had all but ceased to exist. State militias were expected to provide for the Nation's defense. Meanwhile, the Quartermaster Department, still seen as a field agency needed only during wartime, was abolished by Congress on 25 July 1785. This meant that officially for the next several years there would be no Quartermaster General.

Of course the New Republic, nonetheless, found itself at times faced with military challenges, and

Winter 1777-78

Friedrich Wilhelm von Steuben forges Continental Army at Valley Forge

2 March 1778

MG Nathanael Greene is appointed Quartermaster General

13 February 1781

GEN Greene crosses the Dan River during the Southern Campaign

19 October 1781

Yorktown victory ends American Revolution

hence the need for logistical guidance and support from quartermaster or quartermaster-like personnel. The earliest challenge emerged as growing numbers of settlers crossed the Appalachian Mountains in the 1780s and 1790s and continued encroaching on Native American territory in the Old Northwest. Two misbegotten expeditions were sent to "pacify" the tribes in the area and secure treaties favorable to the settlers. The first, a combined force of 320 regulars and 1,133 Kentucky and Pennsylvania militiamen, headed by Colonel Josiah Harmar, was utterly routed in October 1790.

Major General Arthur St. Clair, the territorial governor, wasted little time preparing for a second expedition a few months later. Early in March 1791 the Senate confirmed Samuel Hodgdon, a capable and honest businessman, to serve as St. Clair's Quartermaster for the expedition. Charged with providing both Quartermaster and Ordnance supplies, he nonetheless had no military rank, and thus he could not always expect his orders to be properly adhered to. Moreover, Treasury Department strictures forced him to accept low-bid contracts even when his business instincts suggested otherwise. The results were fairly disastrous. He wound up acquiring tents that failed to keep out the rain, clothes that readily fell apart after little use, shoes described as "vile in the extreme," and powder too weak to carry a ball more than a short distance.

Hodgdon could not be in all places at all times, and the War Department kept him fully engaged in Philadelphia for several months, rather than joining with St. Clair on the frontier immediately. It was almost mid-September before he ventured down the Ohio River. In spite of the lateness of the season and inadequate logistics preparations (not to mention St. Clair's own pronounced shortcomings as a military leader), the expedition promptly moved north toward its objective. Caught in a surprise attack, with more than 800 of his 1,400 Soldiers killed or wounded, St. Clair's expedition goes down as one of the worst defeats in American military history.

It was not until Major General "Mad" Anthony Wayne's third expedition in 1793-94 that the Army finally succeeded in establishing the desired forts in the Northwest Territory and opened the way to a more binding treaty with the Native American tribes in the area. By then Congress had replaced Hodgdon with another businessman, 40-year-old James O'Hara. O'Hara had a better understanding of the frontier. He was also slightly better funded than his predecessor, which meant he could pay for more goods and services. But more importantly, General Wayne was quite deliberate in his approach. He carefully planned and trained his troops for the upcoming campaign. This allowed O'Hara the time he needed to collect supplies and build a better logistics structure for the campaign. All these factors combined made possible Wayne's victory at the Battle of Fallen Timbers in August 1795 – which led to the signing of the Treaty of Greenville a year later and the establishment of a secure boundary between the Native Americans and white settlers.

Congress re-authorized the appointment of a Quartermaster General in May 1796, even though after Fallen Timbers the Army was no longer actively engaged in campaigning. O'Hara resigned and was replaced by a 35-year-old Pittsburg businessman and

17 September 1787

Congress signs
the US Constitution

4 November 1791

St. Clair's Defeat
at the Wabash

August 1794

The Battle of
Fallen Timbers

1795

Native Americans sign
the Treaty of Greenville

Revolutionary War veteran, John Wilkins, Jr. As with his predecessor, the appointment carried no military rank. Over the next few years, the Army dwindled to between 3,000 and 5,000 Soldiers, mostly serving in company-sized units assigned to widely scattered frontier outposts. During his time as Quartermaster General, Wilkins had relatively little to do but oversee contracts. Supply operations had become civilian-dominated, with the direction increasingly being centralized in the War Department.

In 1802, during Jefferson's administration, the Congress again abolished the Quartermaster General's office, replacing Wilkins and his assistants with a system of military agents. Three civilian agents were hired – one each for the Middle, Northern and Southern regions – to perform Quartermaster functions at a salary of $76 a month. They were assisted in their duties by Soldiers detailed from the line and paid $8 in addition to their regular monthly pay. Schuylkill Arsenal, founded in Philadelphia in December 1799, became supply headquarters for the Middle Department. From there the chief military agent, William Linnard, and the purveyor of public supplies, Israel Whelan, procured and oversaw the transport of all military and medical stores between the Arsenal and the far-flung outposts of the Middle district. Notably, in the spring and early summer of 1803, under the watchful eye of President Jefferson, Linnard and company assembled, packed, and shipped westward supplies requested for the start of the Lewis and Clark expedition.

Over the next few years, Congress made almost no mention of Quartermasters until, that is, the escalating conflict between Napoleon and Great Britain began affecting American commerce. The Nation's dignity had been assaulted by the so-called *Chesapeake* Affair and subsequent British impressment of American Sailors. There was also continued friction with British forces still stationed along the frontier. In response to these growing tensions, and prompted by a growing band of "War Hawks," Congress granted authority on 12 April 1808 for the raising of two additional military brigades. Interestingly, both brigades were assigned Quartermaster officers, as were each of their eight subordinate regiments. Quartermaster service to the Army was still being performed by military agents, serving under the Paymaster Department and appointed by the President. The brigade Quartermasters were appointed by brigadier generals and the regimental Quartermasters, by colonels of regiments.

On 28 March 1812, just days before war with Great Britain was declared, Congress tried to place the Army's supply system on a more adequate footing by re-establishing a Quartermaster Department on the military staff in place of the inefficient and costly military agent system. The act provided for one Quartermaster General, four Deputy Quartermasters, and as many Assistant Deputy Quartermasters as might be required. The Quartermaster General, with the rank of brigadier general, would procure and provide means of transportation for the Army, its stores, artillery, and camp equipage; and, if directed by the Secretary of War, would purchase military stores, camp equipage, and other articles required by the troops.

The act also created the Office of the Commissary General of Purchases in the War Department, which had the effect of placing the Army's supply system

1799

Quartermaster Depot founded at Philadelphia

6 July 1803

Quartermasters supply Lewis and Clark Expedition

September 1813

Quartermasters build ships for the Battle of Lake Erie

under the exclusive control of the Secretary of War. Unfortunately, this new office added a bit of confusion to the evolving logistical structure because of overlapping missions and uncertain lines of authority with the renewed Quartermaster Department.

Events happened quickly after that. On 4 April President Madison appointed Morgan Lewis of New York as Quartermaster General. A few weeks later a corps of craftsmen was attached to the Quartermaster Department for a three-year period. And on 14 May Congress established the Ordnance Department, which was made responsible for the inspection and testing of all ordnance, cannon balls, shells and shot, the construction of gun carriages and ammunition wagons, and the preparation and inspection of the "public powder." Congress formally declared a state of war on 18 June, and on 6 July added to the Quartermaster Department one more Deputy Quartermaster General and as many as three assistant deputies.

The War of 1812, the first major war fought after the adoption of the United States Constitution, continued the pattern set in the Revolution, namely: initial unpreparedness at the start of hostilities, followed by a series of early reverses and scrambling to fashion a more workable supply organization, and only then moving toward ultimate victory. Far too often the Quartermaster Department found itself plagued by shortages and mismanaged supply efforts, and it received nothing but complaints from commanders in the field. For the most part, the contract system they relied on proved to be a miserable failure. Fortunately, news arrived in February 1814 confirming that a treaty had been signed, so they could suspend efforts to sustain another season of campaigning.

'Father of the Corps'

On 8 May 1818, Brigadier General Thomas S. Jesup was appointed Quartermaster General. A veteran of the War of 1812 and noted for his character and unquestionable integrity, Jesup inherited a department that some consider unnecessary. For almost 30 years, there had been no continuous position of Quartermaster General, but in 1812 Congress enacted a law permanently establishing the Quartermaster Department. Because of his considerable organizational ability and clarity of mission, Jesup molded the Quartermaster Department into an efficient and important organization. He drafted a Code of Conduct for the department that adheres to the highest standards of integrity and accountability. Jesup's Code of Conduct may well have resulted from an experience the Quartermaster General had as a lieutenant – he was charged with a general officer's debt and successfully convinced the War Department it was not his. Jesup served until June 1860, more than 42 years of service. He has been known since as the "Father of the Quartermaster Corps."

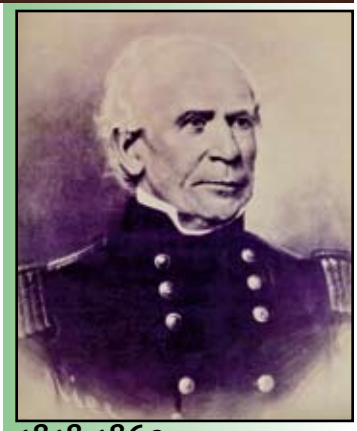
Within a few weeks the Army was reduced from around 60,000 Soldiers to 10,000 men, and again the Quartermaster Department was abolished. In its place were four brigade Quartermasters selected from among line officers. The field Army as a whole was reorganized into two separate Divisions – a Northern and a Southern Division – each with its own

5 July 1814

One of the commanders at the Battle of Chippewa is LTC Thomas Sydney Jesup, future QM General

8 January 1815

US victory at the Battle of New Orleans



1818-1860

BG Thomas Sydney Jesup, 'Father of the QM Corps'

Quartermaster General. But this bipartite arrangement did not last long. Thinking about the many supply problems in the war just ended, Secretary of War William H. Crawford, in August 1815, began arguing for the need to have a *permanent* military establishment stationed in the Nation's capital to facilitate any future transition to war.

Crawford's recommendations did not fall on deaf ears. In fact when John C. Calhoun was sworn in as the new Secretary of War in December 1817, he initiated a thorough reorganization of the War Department, the Army, and the Army's supply agencies. At his urging, Congress abolished the contract system of provisioning the Army that had been in existence since 1781, replacing it with the commissariat system. A Commissary General of Subsistence was authorized on 14 April 1818 and was made the sole agent responsible for the procurement of food.

Secretary Calhoun, applying like principles to the Quartermaster Department, reasoned that there should be one person, instead of two, responsible for all Quartermaster activities; that the Department should be permanently headquartered in Washington; and that the person selected for the position should be accorded the rank, pay, and privileges of a brigadier general.

By a general order dated 8 May 1818, Calhoun appointed Colonel Thomas Sidney Jesup of the Third Infantry Regiment to become the Quartermaster General. Jesup proceeded directly to Washington and set about creating a Quartermaster Department very different from that which had existed previously. In the first place, as he explained to Calhoun, he considered his office "a military one," and thus wished to replace higher level civilian clerks and accountants with young, active, and intelligent subaltern officers who understood all aspects of military service. Moreover, he thought of the Department as a school for young officers, where they cultivated good business habits and learned the basics of supply accountability. In Jesup's view the Quartermaster Department was also as a place where young officers could begin educating themselves on the various duties assigned to the general staff.

Jesup turned out to be a superb choice for the position. As a seasoned combat veteran who had commanded a regiment during the battles of Chippewa and Lundy's Lane, he brought to the job a wealth of firsthand experience. He was also a very thoughtful planner who looked to the past as well as the future. For instance, when he began to think about drafting new regulations for running the Department, he studied how logistics had been handled, or more likely mishandled, during the Revolution. He also looked at how the British, French and Prussians supplied their armies in his own day for any lessons they had to offer.

The far-sighted rules and regulations that Jesup laid down in 1818 ultimately centered around the three following principal objectives: (1) "to achieve an ample and efficient system of supply," (2) "to give the utmost facility and effect to the movements and operations of the Army," and (3) "to enforce a strict accountability on the part of all officers and agents charged with monies or supplies." These aims continued to guide him throughout his subsequent 42-year career as Quartermaster General. As a consequence of his lengthy tenure in office and

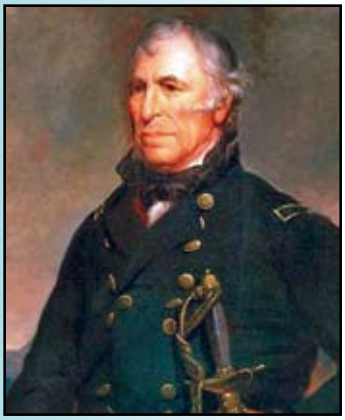
1830s and 1840s Americans migrate westward

March 1836

The Battle of the Alamo

Summer 1845

GEN Zachary Taylor heads to Mexico



many precedent-setting accomplishments, General Jesup has long been regarded as the "Father of the Quartermaster Corps."

The Expanding Frontier

Acquisition of the Louisiana Purchase, coupled with Americans' newfound sense of "manifest destiny," threw open the door to southern and westward settlement in the 1820s and 1830s. It also led to increased friction with Native Americans in those regions. These conditions had Jesup vigorously lobbying for a larger Quartermaster Department. Its true size, he argued, ought not to be based solely on the number of Soldiers to be supported (which throughout this era stayed relatively low); but rather it should reflect the number of new forts needing to be sustained, and the remoteness of their location. From his perspective, the expanding frontier with its associated problems and challenges translated into a much larger mission for Quartermasters.

Events in the 1830s proved the soundness of Jesup's arguments. In 1834 fewer than 4,000 Soldiers of the Regular Army guarded more than 10,000 miles of seacoast and frontier. Such was the case in 1835 when the murder of two officers in Florida, known as "Dade's Massacre," prompted the Army to seek vengeance. Additional troops rushed to Florida, and so commenced the so-called Second Seminole War. Brigadier General Jesup, interestingly, temporarily forsook his supply work in order to take command in the fighting, and left Major Thomas F. Hunt back in Washington as Acting Quartermaster General. This emergency led Congress to restore the size of the Army to 10,000 men.

Unable to transport sufficient supplies to Florida, Major Hunt wrote the Secretary of War on 24 May 1836 that he needed a total of 39 officers. Two years later the Congress authorized the following additions to the Quartermaster Department: two Assistant Quartermaster Generals, two Deputy Quartermaster Generals, and eight Assistant Quartermasters. The Quartermaster General was authorized to appoint as many as 20 forage masters and wagon masters. During the seven years this war went on, practically all officers in the Quartermaster Department served tours in Florida. The experience tested the effectiveness of the Department's new regulations and the efficiency of its personnel.

Around this same time, Jesup's Quartermaster Department also picked up a new mission, namely, procurement of Army clothing. Since 1776 clothing had been successively the responsibility of the Clothier Department, the Commissary and Hospital Departments, military agents, the Purveyor of Public Supplies, and the Commissary General of Purchases. However, in 1842 the position of the Commissary General of Purchases was abolished, and all of his duties were transferred to the Quartermaster Department. With the Subsistence Department still in charge of food and with Ordnance handling weapons and ammunition, the Quartermaster General was left to provide the remainder of Army supplies, including individual and camp equipment, furniture and shelter, animals, and transportation.

First Overseas Expedition

After achieving its independence from Mexico in 1836, Texas was annexed to the United States in 1845. At once a dispute arose with Mexico concerning the indefinite northern boundary of Texas. President Polk

March 1846

GEN Taylor's camp at Corpus Christi, Texas

8 May 1846

GEN Taylor is victorious in the Battle of Palo Alto

6-7 December 1846

Monument commemorates Battle of San Pasqual

ordered General Zachary Taylor to take possession of the disputed territory. At the time war was declared in May 1846, the United States Army numbered just 7,200 men as compared with the Mexican Army's estimated 32,000. Congress called out the militia and easily passed legislation to raise another 50,000 troops. But the many logistical problems this new war entailed would not be dealt with quite so easily.

The newly generated field Army – which in fact became three separate armies – would be required to operate at vast distances from their main supply sources and in relatively uninhabited regions devoid of key resources where Soldiers faced a climate that could be unremitting in the extreme. As usual, the Nation was ill-prepared for such an undertaking. Congress had allowed little more than six months' worth of supplies to be kept on hand for a small standing Army. To get the amounts now needed would prove costly and difficult, and it would take time. The young republic's industrial base was still highly rudimentary and decentralized. And the telegraph, which was still an emerging technology, connected only a few major cities. This meant that the procurement process had to continue its reliance on traditional, and much slower, hand-delivered correspondence -- which often took days, if not weeks, to send and receive messages.

Schuylkill Arsenal in Philadelphia, which for a generation now had stood as the principal Quartermaster Depot, quickly increased its activities. The arsenal's workers were soon procuring, storing and distributing upward of 500 separate items of clothing and equipment. The number of carpenters, packers, shippers, and other employees had to be increased from 400 to 4,000, and a new branch of the arsenal was opened in New York City.

But the many problems associated with procurement paled next to those of transportation and of distribution of men and materiel. Jesup had to contract for the services of wagon trains, pack mules, and primitive steamboats to begin moving those supplies over unprecedentedly long lines. The distance Brigadier General Stephen W. Kearney's Army of the West had to travel to get from Fort Leavenworth to Santa Fe, then to San Diego via the Gila River, for instance, totaled nearly 2,000 miles. To enable him to make that move, the Quartermaster Department furnished 459 horses, 3,658 mules, 14,904 oxen, 1,556 wagons, and 516 packsaddles. The Department also had to purchase or construct more than 70 ships and steamboats to accommodate the other two armies under Zachary Taylor and Winfield Scott. Indeed, the Mexican War is often called "the first steamboat war."

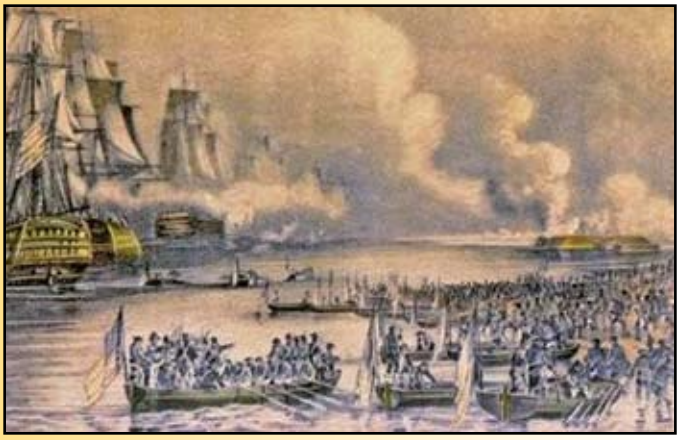
Despite the success of American forces in the desert Southwest and beyond the Rio Grande in northern Mexico, it nonetheless became apparent that the war would not finally be won until the capital itself, Mexico City, was captured. In November 1846, President Polk picked Major General Winfield Scott to command an expedition for that very purpose. The plan, which Scott had been considering for some time, called for an invasion force of perhaps as many as 25,000 Soldiers to sail from the Gulf Coast of the US, land at Vera Cruz, and march overland 300-plus miles west – along Mexico's "best highway" – to capture Mexico City. It was a bold, truly audacious plan that some European critics deemed not just impractical,

1846-1848

LT U. S. Grant serves as Regimental Quartermaster

1846-1848

Mexican War supply train



9 March 1847

Quartermaster-built 'surf boats' land at Vera Cruz, Mexico

but sheer lunacy given the logistics obstacles involved in such a complex operation.

By the time his plans were finalized, the force initially requested had been reduced to around 13,000. It would take an estimated 50 or more sailing vessels and steam-powered ships to transport them from New Orleans and Mobile to the Mexican coastlines. Moreover, to put the men and supplies ashore – in what amounted to the largest amphibious assault in American history – General Scott requested an additional fleet of small assault boats or landing craft. This was something that did not then exist in either the Army or the Navy. These so-called "surf boats" were to take the form of "flat-bottomed, double-ended, broad-beamed rowboats." Each was to be commanded by a naval officer with a crew of eight Sailors and be capable of hauling ashore a platoon of 40 Soldiers. With request in hand, General Jesup immediately ordered the construction of 141 such boats at a cost of $795 apiece.

Owing to various challenges, only 65 of the "surf boats" actually made it to the Mexican coast in time for America's first D-Day landing on 9 March 1847. Fortunately, the weather cooperated, and there was virtually no opposition as wave after wave of US forces, more than 10,000 Soldiers in all, came ashore during the course of several hours. General Jesup had traveled to the site to be on hand, should he be needed to facilitate operations. The initial phase of Scott's plan, with crucial support from the Quartermaster Department, had brilliantly succeeded. More troops and artillery batteries continued pouring ashore in the days following. They soon opened fire and, by the end of March, Vera Cruz had fallen. This victory laid bare the Mexican heartland and the capital that lay beyond.

It took another 5 1/2 months and many hard-fought battles for American troops to finally capture and occupy Mexico City. Such a stunning achievement is all the more remarkable given the level of unpreparedness that characterized the United States Army at the start of the war. Even foreign critics now claimed to be impressed that such a young nation could wind up conquering a land of more than a million square miles in less than a year and half.

Such praise, however, should not be used to suggest that logistics in the Mexican War were flawless. Often it was anything but. Soldiers suffered during their months in the tropical heat. Their clothing was too hot, their food was often spoiled, and their wagons and horses were too few. But the Quartermaster Department worked hard to remedy these situations as they became known. In the end, Jesup could take great pride in knowing that the regulations he promulgated and the organization he had so painstakingly crafted had successfully withstood the test of war – and formed a solid basis on which to grow.

A New Birth of Freedom

General Jesup died on 10 June 1860, at age 72, while still in office. His successor, Brigadier General Joseph E. Johnston, was appointed Quartermaster General a few days later, even as the hotly contested presidential election of 1860 was still being played out and civil war appeared all but imminent. Capable though he undoubtedly was, Johnston's tenure lasted only a few months. After Confederate troops fired on Fort Sumter in April 1861, the native Virginian resigned his commission and offered his services to the South.

14 September 1847

GEN Winfield Scott
captures
Mexico City, Mexico

15 May 1861

BG Montgomery
Meigs appointed
Quartermaster
General

1861-1865

Union Soldiers under arms in Virginia

President Lincoln, on 15 May, appointed Brigadier (later Major) General Montgomery C. Meigs as his new Quartermaster General. Meigs was by any definition, a superbly talented officer and gifted administrator. Looking back, one is hard-pressed to come up with a more able pick for the job at hand.

The Nation in 1861 found itself bitterly divided and again at war, and with a force that had dwindled to around 16,000 officers and enlisted men. Lincoln immediately called for and received 75,000 volunteers to serve for three months. By and large, the states were expected to bear the burden not only of mustering troops, but of provisioning them as well. By July the first battles had been fought, and it was clear this was not going to be an easy or short-term war. Congress passed additional legislation authorizing the number of volunteers to be increased to 500,000 for the duration of the war. In time, the Civil War would become all-encompassing, very nearly approaching what we would think of today as "total war." All things seemed to play out on a scale previously unheard of, including the size of opposing forces, the cost to the Government, the high number of battle casualties, and so on.

The Quartermaster Department under Meigs faced the daunting task of supplying, sustaining, and transporting a force composed of several large field armies operating along thousands of miles of supply lines, often deep inside contested territory. It would take considerable time and effort for Meigs to simply "ready his team." For when the war broke out, the Quartermaster Department had only 35 officers and seven military storekeepers. And nearly a fourth of those did as General Johnston had done; they

Loyalty at bloody Antietam

In June of 1861, 18-year-old William McKinley quit his job as a postal clerk in Poland, Ohio, and enlisted as a private in Company E of the 23rd Ohio Volunteer Infantry. Before his first year of service ended, young McKinley was promoted to commissary sergeant. On 17 September 1862 at the Battle of Antietam – the bloodiest day of the Civil War, in fact the bloodiest day in American military history – SGT McKinley was just to the rear of the battlefield watching over the brigade's food and supplies. The men had eaten only a scanty breakfast, and he knew that as the day wore on the Buckeyes were growing weaker.

SGT McKinley gathered up a handful of stragglers and courageously led two mule teams with wagons of rations and hot coffee into the thick of battle. Working his way over rough ground, through a hailstorm of artillery and rifle fire, he ignored repeated warnings to retreat. He lost one team of mules to Confederate gunners but did not return to the rear of the brigade until his fellow Soldiers had been properly fed under the most adverse conditions.

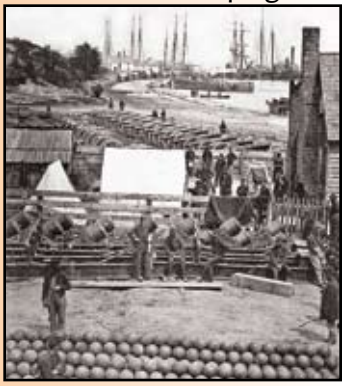
He earned that day the undying gratitude and respect of his comrades. For his coolness under fire, outstanding bravery, and loyalty to the unit and fellow Soldiers, young McKinley was that week promoted to second lieutenant. By the war's end, he was a major – and 30 years later, the President of the United States.

1861

Quartermaster General's staff in Washington, DC

1862

Union supplies at Yorktown, Virginia, for Peninsula Campaign



1862

Wheelwrights craft wagon wheels in northern cities

promptly resigned their commissions in the US Army to join the Confederacy.

There was no end to the amount of supplies that needed to be procured: clothes, blankets, shoes, tents, camp kettles, haversacks, canteens, horses, mules, forage, wagons, ambulances, and the list goes on *ad infinitum*. To handle the increased load, Congress soon authorized Meigs one Assistant and two Deputy Quartermaster Generals, plus additional clerks and copyists for his Washington headquarters. General Meigs, incidentally, took the novel step of hiring the first female clerical workers in the Army's history.

The overwhelming majority of Quartermasters though held positions outside the capital. They were assigned to various districts and military posts, as depot commanders and the like. Still more of them, mainly company-grade officers and junior noncommissioned officers, were assigned to perform Quartermaster functions at all levels within the tactical units themselves. For instance, each field regiment, which on paper at least numbered from 800 to 1,000 Soldiers, had assigned to it one Quartermaster lieutenant and one Quartermaster sergeant who often detailed Soldiers from the line to actually perform logistical duties. Two or more regiments formed a brigade, which was allotted one Quartermaster captain on its staff. Likewise, a major served as Quartermaster at the division level. Colonels and lieutenant colonels, including among them many of the most capable and accomplished supply officers, were assigned to Army- and Corps-level staffs.

Years earlier General Jesup expressed frustration that his hard-working Quartermaster officers failed to get the appreciation *or* the *rank* they so richly deserved, given the huge amount of responsibility with which they were often saddled. That situation continued during the Civil War as junior officers exercised levels of authority far above their assigned rank and allotted pay grade. Fairly typical in this regard is the case of Simon Perkins, Jr., a Quartermaster officer in the Western Theater.

While serving as depot supply officer at various locations in Tennessee and Mississippi, in 1862 and 1863, young Perkins, who was only in his early 20s, contracted and signed for the receipt of millions upon millions of pounds of corn, oats, hay, straw, and forage for Army animals. Once during a three-month period in Nashville, he dispensed nearly $3.5 million to holders of some 9,000 overdue vouchers. Yet, like so many Quartermaster officers, he only held the rank of *captain*. (Note that in 1869, a full four years after the war had ended, Treasury Department auditors thought they had discovered a discrepancy in Perkins' wartime accounts, and ordered him to pay back a whopping $297, 926.18. Fortunately, for him, he managed to clear the account.) Captain Perkins was all too representative of the honest, but usually overworked and underappreciated Quartermaster officers who made possible the victories of Sherman, Grant, Sheridan, and others.

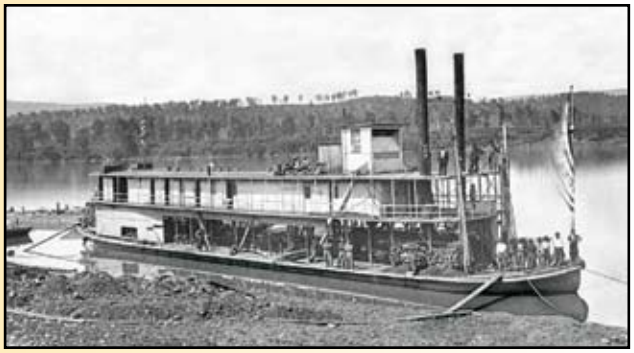
One of the greatest achievements of the Civil War era Quartermaster Department was the establishment of a depot system that connected the large cities of the industrial Northeast and Midwest (the "army behind the army," so to speak) with the field armies campaigning hundreds and often thousands of miles to the South. The chain began with the huge

1863

Soldiers eating in camp

1863

Burial of Union dead after Gettysburg battle



29 October 1863

The USS Chattanooga opens the 'Cracker Line' on the Tennessee River to supply Sherman's Army for its 'March to the Sea'

"general depots" at such major urban centers as Chicago, St. Louis, Cincinnati, Pittsburgh, Washington, New York, and Boston. There, either in the depots proper or the immediate vicinity, one found vast numbers of skilled laborers, craftsmen and factory workers, blacksmiths, wheelwrights, warehousemen, and maintenance personnel; and along with them all manner of supplies being inspected, purchased, and stored for distribution.

Further afield and closer to the armies were "advance depots." These were located at places readily accessible by water, railways, and convenient road networks. They were meant to keep on hand sufficient stocks and services to allow an army on the move to continue operating even when the line of communication was severed and supported units were temporarily cut off from the base. Among the largest of these in the West were the advance depots set up at Nashville and Atlanta.

In the Eastern Theater, certainly no advance depot exceeded in size or played a more critical role than that of City Point Depot, strategically located at the confluence of the James and Appomattox Rivers in present-day Hopewell. It was established in mid-June 1864 to support Grant's two Union armies laying siege to Petersburg and Richmond. For 9 1/2 months City Point was one of the busiest ports in the world. No fewer than 200 to 250 sailing vessels, steamships, and barges could be seen anchored along its shoreline on any given day.

Separate wharves were built to accommodate the various classes of supplies. Thousands of hired stevedores either moved goods into warehouses or prepared them for immediate trans-shipment directly to the Petersburg front in wagons or on the newly re-constructed military railroad.

At the far end of the Union supply chain, nearest the troops, were Quartermaster-run "temporary depots" located right on the Army's line of march or a mere stone's throw from the encampments. It was not uncommon to find temporary depots occupying space provided by abandoned buildings, wharves, and rail sidings. When these did not exist, huge piles of food, clothing, supplies, and equipment were stacked in the open along major roadways, easily accessible to passing wagon trains. In some instances, where the front had become stable, such as at Petersburg, the Regimental Quartermaster had less than a mile to travel to get resupplied – thus completing the "factory to foxhole" supply chain that began deep in the Northern industrial and agricultural heartland.

Of course, coordinating supply and demand between the industrial base and troops in the field in the Civil War was a never-ending battle. To meet the untold demands of such a large and hastily built force, the Quartermaster Department paid a price for its initial unpreparedness. Its agents, especially in the early days of the war, found themselves put upon by unscrupulous contractors and less-than-honest inspectors – whose shenanigans gave new meaning to and spurred widespread usage of the term "shoddy." Despite careful oversight and Meigs' best efforts at reform, the Quartermaster Department in the Civil War could never free itself entirely of waste and scandal. But surely they tried.

It should be noted as well that the Quartermaster Corps picked up a vital new mission in the Civil War, namely, care of the war dead and establishment of the

1863

LT Vogelsang is Quartermaster of 54th Massachussetts Regiment

1864

GEN William Tecumseh Sherman's supply train

1864

Union commissary depot, Petersburg, Virginia

1864

Railroad lines at City Point, Virginia

first national cemeteries. Prior to this time, American Soldiers killed in combat were buried in the hastiest manner possible, often in mass graves and with little thought given to their identification or proper burial in separate graves. The first step was taken in September 1861 when the Quartermaster General was directed to place record books and blank forms in all Army hospitals to keep a permanent record of all patients who had died. That was followed by Quartermaster purchasing of headstones for the Soldiers' graves.

In July 1862, Congress passed legislation for the creation of national cemeteries "for the soldiers who shall die in the service of the country." The first interments began while the fighting continued. But it would take another five years after Appomattox for detailed Quartermaster officers with work crews to scour the length and breadth of Civil War battlefields in search of the remains of the dead. In all, nearly 300,000 Union Soldiers' bodies were recovered and buried in 73 national cemeteries. Too often though, their identities proved elusive. Of the estimated 620,000 Soldiers North and South who perished during the Civil War, fewer than half were ever fully identified.

Across the board, General Meigs had much to be proud of with the way his Department faced head-on the many logistical challenges presented by our Nation's "first modern war." He was a hands-on general and not averse to going to the field when circumstances called for it. Afterwards, he could recall only two occasions throughout the whole war where the Union Army came even remotely close to failure for want of supplies: when Rosecrans' Army of the Cumberland got cut off in Chattanooga in late 1863 and when Sherman's overtaxed Army finally reached Savannah in 1864 with its supplies all but completely used up. And on both occasions, as Meigs never tired of boasting, he was there with the troops, personally working to alleviate their problems.

Meigs did not retire until 1882. His 21-year tour as Quartermaster General was second in length only to that of General Jesup's. During his farewell speech, Meigs looked back to the Civil War days and summarized what he saw as their main achievements. "The Corps," he said, "has seen great changes since I entered it. It has been expanded till, leavened by the knowledge and spirit and integrity of the small body of officers who composed it early in 1861, it showed itself competent to take care of the supplies and transportation of a great army during four years of most active warfare.

"It moved vast bodies of soldiers over long routes; it collected a fleet of over 1,000 sail or transport vessels upon the great rivers and upon the coast; it constructed and equipped a squadron of ironclads which bore an important part in the operations in the West, and after having proved its practical power and usefulness, was accepted by the Navy to which such vessels properly belonged; it supplied them while organizing, and while actively campaigning over long routes of communication by wagon, by rail, by river, and by sea, exposed to hostile attacks and frequently broken up by the enemy; and," Meigs concluded, "having brought to the camps a great army, it, at the close of hostilities, returned to their homes a million and a quarter men." It was indeed a record deserving his pride.

1864

City Point supply wharves

1864

Ordnance wharf, City Point

1865

Supporting Victory
City Point Depot by Civil War artist Don Stivers

The Post-Civil War Era

Once the guns fell silent in the summer of 1865, the public was impatient to see the million-man Union Army rapidly demobilized, almost as impatient as were the Soldiers themselves to be sent home finally. It had been costly not only in lives lost but also in money spent. War Department expenditures had skyrocketed during the four years of fighting – the Quartermaster Department alone spent more than a *billion* dollars – and both Congress and the public were now eager to reduce military spending. Reduction and retrenchment, therefore, became the overriding orders of the day in the postwar decades.

For instance, the government had operated more than 50 railroads with a combined length exceeding 2,600 miles during the war. As quickly as possible, these were all returned to their previous owners or sold at public auction. Moreover, as the size of the Regular Army plummeted to around 25,000, where it would remain for the next three decades, it was assumed the Army would not need to renew procurement operations for years to come. That proved true, for the most part, and the government did save substantial sums. But stored uniforms became unserviceable over time while older equipment on hand (such as knapsacks made of painted cloth) rotted and fell apart. As needs arose, the Quartermaster Department tried replacing materiel with modest improvements. They increased the number of sizes for new uniforms, for example, and added items such as fatigue coats and trousers, winter shoes, "buffalo" coats, and mittens.

The Subsistence Department, which also felt the pinch of retrenchment, recommended no substantial changes to the authorized Soldier's ration in the postwar era. But again some subtle improvements did gradually emerge. In 1879, for instance, a revised list of possible substitutes allowed fish and mutton to take the place of fresh beef in the standard issue. Also new laws passed in 1890 directed the Secretary of War to designate a certain allotment of fresh vegetables such as potatoes, onions, cabbage, beets, and carrots to be included in the Army ration.

Nevertheless, it was commonly understood that even the best food could be ruined or rendered unpalatable if poorly cooked. By century's end, the Subsistence Department made a brief effort to raise the standards of cooking by publishing and distributing Army pamphlets on cooking and bread-baking. Those helped no doubt. Yet the department was well aware that the only real long-term solution lay in training Army cooks to meet professional standards. That recommendation was made many times, but to no avail. It would not be until 1905 that the first Cooks and Bakers School was opened in Fort Riley, Kansas. By then the Quartermaster Department had also succeeded in introducing common mess halls for enlisted men. These provided better cooking and more pleasant service than the old company-level mess halls, and they were seen to be more efficient and economical to operate.

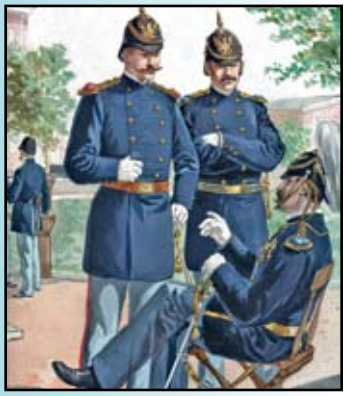
But of course the Army's main focus in the decades between the Civil War and the Spanish-American War was on the western frontier. There the Quartermaster Department's primary role was to collect and ship food, supplies, furniture, and equipment to distant outposts in New Mexico, Arizona, and the territories beyond, all the way to the Pacific Military Divi-

1870s

US Army calvary troops set up camp on the Western Frontier

1874

Pack mules with LTC George Custer's regiment



1884

Field and line officer uniforms

sion. The Department had long determined that the cheapest way to deliver these supplies was through private contracts. They did so by awarding annual contracts to low-bid freight companies. Costs were computed at a fixed-rate of so much per 100 pounds per 100 miles. Longer distances and more difficult or dangerous routes commanded higher prices. It cost even more for pack mules and experienced muleteers when moving supplies into the high elevations of the Rockies. These supply and distribution practices saw major modifications after 1869 with the completion of the transcontinental railroad. As more and more feeder lines spread, the Quartermaster Department relied increasingly on railroad transportation as the more sure and economic means of getting supplies to small companies of Soldiers still scattered across the vanishing frontier.

Overseas Warfare and Reform

For more than a generation after the Civil War, the US Army in its reduced state had, in the words of one account, "resigned itself to the minor glories of Indian fighting and routine garrison life." Most of the 26,000 or so Soldiers who remained in the Regular Army were stationed in some 80 posts. In such a fragmented state, it was nearly impossible to get two companies' worth of troops together for common training and instruction. Predictably, the lessons of large-scale maneuvers were lost, and junior officers in this era received no firsthand experience with planning on a broad scale or handling large numbers of men. This situation applied to young Quartermaster officers as well, who had no opportunity to solve complex logistical problems of the type they might someday be forced to encounter. Unfortunately, those lost lessons of the past and missed training opportunities were about to become glaringly apparent and cause real problems at the close of the century as the Nation entered upon the world stage and began looking outward . . . to the Caribbean and beyond.

Popular resentment against Spain for its poor treatment of the Cubans was already running high in the 1890s long before the sinking of the battleship *Maine*. When that event occurred in February 1898, the resentment instantly turned to white-hot anger and immediate calls for war: "Remember the Maine, to Hell with Spain!" President McKinley succumbed to the outcry and Congress declared war on 22 April. Over the next six weeks, the rush to mobilize was again under way as Congress voted to expand the Regular Army and open the door to tens of thousands of volunteer servicemen.

For more than three decades, the Nation had enjoyed a period of relative peace. Quartermasters in the old Army had long settled into the routine of sustaining a small constabulary force on the distant frontier. The outbreak of war with Spain suddenly made it necessary to arm, clothe, feed, equip, and move a force that overnight expanded to nearly 250,000 Soldiers. Obviously, coming to grips with this unexpected contingency in such a hurried fashion was inevitably going to produce a lot of waste, confusion, and mistakes. And criticism.

The first hurdle to overcome was procurement. Having gone for so many years without needing to purchase new uniforms, the Quartermaster Department had to purchase more than a half-million shirts and trousers and some three-quarters of a million shoes in a matter of weeks. The Subsistence Depart-

Spring 1898

Volunteer regiments with supplies arrive in Tampa, Florida, for the Spanish American War

1898

Cavalry troops deploy to Cuba

August 1898

Loading cannons aboard ships at Tampa

ment, likewise, began buying millions of rations, enough to meet current demands, plus another 60 days' worth in reserve. That both Departments were able to accomplish this on such short notice reflected the vast improvements in American industry, transportation, and communication since the Civil War.

Ultimately though, the biggest problem came not from procurement but from distribution – the need to move, store, and account for such a vast influx of new goods. Nor did it help their effort that Tampa, Florida, was made the main staging area and port of embarkation for the coming Santiago campaign. When Quartermasters received notice to send supplies directly to the port as quickly as possible, it led to massive congestion. All classes of supplies belonging to different units got packed in the same railway cars, making it impossible to know what was supposed to go where and which things needed to be removed first. As more and more loads got side-tracked or backed up and storage space ran out, this confused situation threatened to bring the entire supply effort to a standstill. It was only through hard work and dogged persistence that the depot Quartermaster managed to avert disaster.

Stevedores worked around the clock to move supplies from the overcrowded docks onto waiting vessels. They gave no thought to combat loading. At times ships pulled away from the wharves, only to find that they soon had to return to complete the loading process. Some items, notably rations, had to be handled several times. In the midst of these preparations, General Shafter ordered on 6 June that everyone get onboard immediately or risk being left behind. This was followed by a mad 40-hour headlong rush of troops to get to the docks, which only added to the confusion.

For sure, neither the embarkation at Tampa nor the debarkation at Daiquiri, Cuba, two weeks later qualifies as a textbook case on how Quartermaster logistics ought to be handled. Part of the force never did deploy on time, cavalry horses had to be left behind, and the Army lacked adequate transportation once it landed in Cuba.

And certainly troop health in the tropics offers up a miserable set of statistics. These and other shortcomings can be easily seized upon to denigrate the logistics effort *en toto*. It is tempting indeed to draw a caricature of supply operations in the Spanish-American War – what with hundreds of mules drowning while swimming ashore and veterans bemoaning the ill-effects of "embalmed beef." Nonetheless, any account that focuses solely on the Army's unpreparedness obscures a much broader picture of success.

After all, the war was brought to a successful conclusion just 110 days after it had been declared – a feat virtually unrivaled until *Operation Desert Storm* a century later. And the bottom-line rule in military affairs remains -- namely, that results are what matter most . . . more even than orderliness and efficiency. What the logistical shortcomings of the so-called "Splendid Little War" mainly did was point out the need for reform.

If the United States Army aimed to support the Nation now emerging as a global power, it required the creation of a general staff for better planning, coordination, and intelligence-gathering. And it clearly needed a set of measures aimed at modernizing logistics.

Summer 1898

Camp scene at Tampa

August 1898

Loading camp supplies at Tampa port

1898

Moving supplies to the front in the Philippines

The Dodge Commission, which held hearings to investigate the war's conduct, ultimately praised the Quartermaster Department for having pulled off such a "herculean task" in so little time. Among other things the commission's report recommended that the Department keep on hand and in working order enough provisions to sustain a 100,000-man Army for at least four months. (This recommendation, as one historian has noted, in effect officially sanctioned the "priority of materiel preparedness over manpower preparedness.") Elsewhere, the commission report suggested that three of the supply bureaus – the Quartermaster, Subsistence, and Pay Departments – ought to be consolidated, and that perhaps a separate Transportation Division should also be created. These and other reformist ideas were taken up and discussed with a vengeance during the reign of Secretary of War Elihu Root. But it would take a decade and more for some reforms to become reality.

On 24 August 1912, Congress folded the Subsistence and Pay Departments in under the Quartermaster Department – and redesignated the whole of it as the Quartermaster *Corps*. This same act also "militarized" the Corps by allowing it to replace hired civilians with skilled uniformed servicemen to perform the duties of carpenters, clerks, engineers, firemen, blacksmiths, teamsters, packers, and the like. The new enlistees (as many as 6,000) had to pass certain exams in order to hold these positions. This move marked the beginning of a new manpower system that would, over time, morph into the Quartermaster technical MOSs, or military occupational specialties, that have defined the Corps' primary functions and areas of logistical expertise ever since. To ensure that future training needs would be met, the Quartermaster School was founded at Schuylkill Arsenal in Philadelphia in 1910.

One might assume that the years between the Spanish-American War and World War I were largely uneventful. On the contrary, Quartermasters supported the Philippine Insurrection (1899-1902), the Chinese Boxer Rebellion (1900), the Occupation of Vera Cruz (1914), and the Punitive Expedition (1916) during that period. The Department also organized and ran the Army Transport Service. This began with a few hired vessels at the turn of the century and grew to include 200 Government-owned tugs, lighters, launches, and miscellaneous small craft – a virtual "Quartermaster Navy" – servicing the farthest reaches of the Pacific Ocean on the eve of World War I.

The Department/Corps during this period did other things as well. It fielded new khaki-colored uniforms and improved rations, established the Remount Service to keep the Army plentifully supplied with horses and mules, experimented with motorized vehicles, and drafted the first specifications for an all-purpose Army truck. The Construction Division also built or repaired, both in the US and the Philippines, a number of barracks, quarters, storehouses, hospitals, and other facilities. "It is safe to say," as the Quartermaster General, Brigadier General Marshall I. Ludington, reported at the time, "that a vastly greater amount of construction work was planned, undertaken, and contracted for during fiscal year 1902-03 than during any previous year in the history of the Army." The new permanent military posts constructed at this time were a far cry from the old frontier outposts. Increasingly, they were furnished with public utilities. Many had libraries, schools, gymnasiums, reading rooms,

1 March 1910

Quartermaster School founded in Philadelphia

March 1916

Trucks in Punitive Expedition to Mexico

1916

Army cook using field range in Mexico

and swimming pools to help improve troop morale and Soldier well-being.

World War I

In all previous wars going back to the Revolution, Quartermaster officers in the field primarily accomplished their mission by supervising civilian employees. When these were not available, they used detailed combat detachments from the line. The 1912 reorganization and accompanying "militarization" of the Corps made possible the establishment of an actual service corps – with trained units and technically skilled personnel. A subsequent reorganization in 1916, on the very eve of World War I, led to the creation of the first four Quartermaster field units: bakery, pack, wagon, and auto-truck companies.

When war broke out in Europe in 1914, few on this side of the Atlantic showed any interest at all in getting involved. President Wilson's 1916 campaign slogan, "He Kept Us Out of War," pretty much summed up the opinion of most Americans. But opinions can change quickly. Alleged German atrocities, their policy of unrestricted submarine warfare, and news of the so-called "Zimmerman Telegram" pushed the Administration out of its neutral position. By early 1917 hostility toward Germany had grown sharply, and calls for war became widespread. The celebrated evangelist Billy Sunday, for example, captured the new mood perfectly in a fire-and-brimstone address to a packed crowd in Times Square, when he exclaimed, "If hell could be turned upside down, you would find stamped on its bottom, 'Made in Germany!'" Congress was listening and declared war on 6 April.

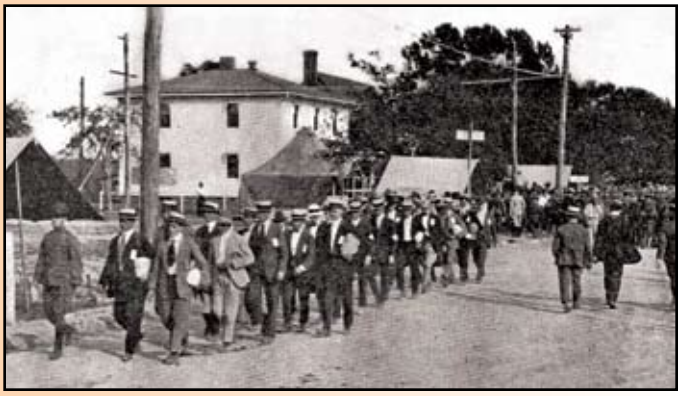
Less than a month later, 57-year-old General John J. "Black Jack" Pershing, only a few months removed from the Punitive Expedition, was summoned to Washington to become Commander of the American Expeditionary Force (AEF). He and a party of 191 officers and men had left New York for Europe by 28 May. On the Fourth of July, Pershing's 1st Division troops, 28,000 strong, paraded down the streets of Paris. Soon after he wired back to the War Department that he would need another *million* troops come the following spring.

Now deep into the organization and training process, General Pershing also began sending back messages requisitioning specialized supply troops like those he had seen in use in both the British and French armies. New weapons and equipment (such as tanks, trucks and other motorized vehicles, airplanes, gasoline, machine guns, and long-range artillery) had changed the nature of war – and as a result, the type and nature of logistical support needed as well. The Quartermaster Corps in the zone of interior responded by fashioning a host of new specialized units and sending them abroad as quickly as possible. Eventually, 26 different types of Quartermaster service units arrived in France. Some were modeled after Allied units; others were created to provide American Soldiers with more of the comforts and amenities they were used to at home.

Nearly two-thirds of the Quartermaster supply and service units (444 of the 706 in Europe by war's end) had been created stateside and sent abroad. The remainder had been pulled together in-theater. Some still lacked official tables of organization and equipment (TO&E) at the time of the Armistice. The most important of these were depot, supply, refrigeration, laundry, sterilization and bath, gasoline supply, graves

Spring 1917

WWI recruits arriving at Camp Lee , Virginia



1917

Camp Lee is home of 80th Division

1917

Mail arrives at Camp Lee

registration, salvage, remount, and an assortment of maintenance or repair type units.

At first the flow of supplies across the Atlantic was but a trickle. Only around 16,000 short tons a month made it over in the summer of 1917. But that grew to more than half a million tons monthly in the summer of 1918 and hit a peak of 829,000 tons a month by the Armistice on 11 November.

Going into the war, logistics supply planners assumed this would be a straightforward "pipeline" and "spigot" structure: Quartermaster officers in the communications zone would supervise the filling of base depots and overseas distribution. In the forward area, tactically based officers would draw unit supplies at the depots or railheads and issue them for consumption in battle. Instead, the AEF found it advantageous to create a separate administrative command, the services of supply (SOS), to plan and coordinate the functions of all the overseas technical branch chiefs at the general staff level. Prior to World War I, the Quartermaster General had to act as a G-4 staff planner as well as the chief field supplier and transporter. But with this new SOS command and staff arrangement, Quartermasters in-theater could focus more directly on operations down to the lowest level.

Transportation remained one of the biggest logistics headaches throughout the war. It took time, for instance, to figure out how best to handle the use of motor trucks. The Quartermaster Corps had sole responsibility at first and ordered four truck companies and a repair unit to France in June 1917. By December they had formed a separate motor transport service within the Quartermaster Corps in the AEF. This, in turn, was transferred to the SOS in February 1918 and re-designated the motor transport corps. Thereafter, all operational responsibility was passed to the SOS that saw to the pooling of vehicles, the organization of

Running the gauntlet -- twice

Once materiel for American troops reached Europe for "The War to End All Wars," as World War I was known at the time, Quartermasters had to move the supplies into position.

One exceptional Quartermaster noncommissioned officer was SGT Laurence M. Lumkin. Assigned to a Quartermaster Pack Train, Lumkin and his Soldiers were supporting the 1st Infantry Division (the "Big Red One") near the French village of Exermont on 4 October 1918.

Lumkin's 10 mules were loaded with barbed wire and other barrier material that was badly needed at the front when, without warning, German batteries opened fire on the mule train that was caught in the open. Machine gun and sniper rounds picked off five of the mules.

Knowing how badly the supplies were needed, Lumkin rallied his troops and pressed on through the killing zone and reached the front. Later that day, he made a return trip and led yet another mule train of barrier material to the front, running the same gauntlet of enemy fire a second time.

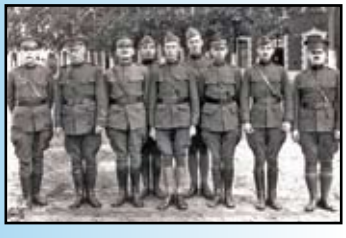
For his extraordinary heroism, Lumkin was awarded the Distinguished Service Cross, the second highest combat honor.

1917

Doughboy with rations on Western Front

1917

COL Charles Pierce establishes Graves Registration Service in France



1918

Quartermaster laundry and sterilization unit in France

1918

Taking water to troops on Western Front

transportation type units, the routing of convoys, and the scheduling of pick-ups. This move foreshadowed the eventual loss of the Quartermaster transportation mission and establishment of the United States Army Transportation Corps.

Another Quartermaster mission, however, made great strides and truly came of age in World War I, namely, care of our fallen comrades. New regulations adopted in 1913 affirmed the Army's strong commitment to positive identification and proper burial of the dead. Soldiers going into combat were now required to wear metal disks stamped with pertinent information, and newly trained Quartermaster service personnel were taught new procedures for collecting, identifying, and burying the dead. Major Charles C. Pierce trained the first such Soldiers in Philadelphia before moving them to Tours, France, where he set up headquarters for the first Quartermaster Graves Registration Service. From this location, 19 graves registration companies were dispatched to every section of the combat zone during the next year and a half. Recall that during the Civil War fewer than half of the bodies recovered were ever identified. By contrast, during World War I the Quartermaster Graves Registration Service reduced the percentage of unknowns to fewer than three bodies for every 100 found.

The Quartermaster Corps unveiled several other key initiatives and provided many previously untried services during the course of the war as well. Among the innovations were the following: The Corps introduced a system of automatic resupply of standard items that eliminated some of the more cumbersome monthly requisitioning procedures. It engaged in an aggressive policy of local procurement in Europe to help mitigate the perennial crisis in shipping, and it even set up a Quartermaster Garden Service Branch in France to grow fresh vegetables. The Corps contracted with local woodcutters and cooperated with the French Forestry Service to obtain wood for winter fuel and purchased more than a million tons of coal from Great Britain during the last 12 months of the war.

Certainly one of the major accomplishments of the Quartermaster Corps in World War I was the establishment of in-theater salvage operations on a fairly monumental scale. These operations extended from base depots to front-line trenches and retrieved both serviceable and unserviceable items by the millions – in the process saving American taxpayers millions of dollars. The salvage facilities also often included Quartermaster laundry, bath, and sterilization units that provided those vital field services to the Soldier that had been invariably neglected in most of America's previous wars.

In the end, World War I marked a new phase in the modernization and professionalization of the Quartermaster Corps. Both its mission and organization had changed substantially – marking the way for even greater changes in the decades ahead. The combination of technically trained Soldiers going to war in specialized units laid the groundwork for logistic success in the Great War. The Commander of the SOS, Major General Johnson Hagood, in his final report, gave witness to the Corps' effectiveness. "In the matter of supply," he wrote, "the operation of the Quartermaster Department in the Great War was not only far superior to anything that we had in any previous war, but, as a rule, throughout the [AEF]

1918

Quartermaster Remount Service in France

1918

79th Infantry Division rolling kitchen in France

1921

Aisne-Marne Cemetery near Belleau Woods, France

the service was more efficient and more satisfactory to the individual than it had been at home in time of peace."

The Interwar Period

In a pattern which by now had become entirely predictable, the country rapidly demobilized in the wake of World War I. In an effort to "Get the Boys Home by Christmas!" troops were out-processed as quickly as possible, and the size of the Army was drastically reduced almost overnight. Many of the recently built cantonments were dismantled. And the gigantic industrial machine that had only just reached its peak, was suddenly ordered to shut down as the government now raced to rid itself of all surplus property at home and abroad.

In the 1920s and 1930s, the interwar years, the Quartermaster Corps, like the Army as a whole, felt the continued effects of reduction and retrenchment. Both the construction and transportation missions, which had been largely removed from the Corps' hands as a wartime expedient, were returned during the interwar period. But only marginal developments occurred in these two key areas, owing to the lack of funds and the overall decline of interest in military matters at this time.

Even during this period of relative quiescence, with the Army's standing at such low ebb, the Quartermaster Corps had some notable achievements. Two in particular bear mentioning. The Graves Registration Service stayed on in France after the war to continue collecting the dead, either to be shipped home or buried in military cemeteries in Europe. Eight permanent cemeteries (six in France, one in England, and one in Belgium) were later constructed. In them would be buried 30,000 American Soldiers, nearly 40 percent of all those who had fallen in the war.

A remarkable thing happened in 1929, the year of the Great Crash of the American stock market, when Congress passed legislation to pay for widows and mothers to go abroad to pay their last respects. The mission went to the Quartermaster Corps, which was charged with overseeing the so-called pilgrimage of "Gold Star Mothers." Between 1930 and 1933, during the very depths of the Great Depression, the Graves Registration Service arranged for nearly 7,000 mothers and widows to visit the sites where their loved ones were buried in European cemeteries.

During the 1920s and 1930s, the Quartermaster Corps showed a side of its mission the public might not always appreciate, namely that of furnishing material aid and humanitarian relief during times of crisis and natural disaster. In fact, over the course of its long history (going back at least to the pre-Civil War days), the Quartermaster Corps has routinely aided victims of tornadoes, cyclones, hurricanes, epidemics, fires, floods, and other natural and man-made disasters.

So, not surprisingly, they stood ready to afford relief in the Great Depression as well. When President Roosevelt signed legislation in March 1933 to help the unemployed by creating the Civilian Conservation Corps, the mission to feed, clothe, transport, and equip this new "Army of workers" went to the Quartermaster Corps. It soon turned into an enormous undertaking, which saw the construction of more than 1,400 camps nationwide and the support of tens of thousands of civilian "troops."

28 January 1921

Quartermasters aid victims after Knickerbocker Theatre roof collapses under heavy snow

January 1927

Quartermaster Corps provides relief to victims of flooding along the Mississippi River

1920s

Quartermasters operate depot at Schenectady, New York

May 1930

Gold Star Mothers visit WWI graves in France

Honored for loyalty to others

US Army PVT George Watson was a member of the 2nd Battalion, 29th Quartermaster Regiment during World War II when the ship on which he was serving was hit by Japanese bombers off the coast of Porlock, New Guinea on 8 March 1943. Soldiers and Sailors were ordered to abandon ship, and many could not swim. PVT Watson could and he did. Declining a life preserver, he repeatedly left the safety of his life raft to rescue several fellow Soldiers. Weakened and tired from his exertions, PVT Watson drowned. His body was recovered but he could not be revived. He was buried at sea.

Posthumously, he was awarded first the Distinguished Service Cross for his heroism, becoming the first African-American to receive the honor during World War II.

He was later one of seven black Americans whose World War II Distinguished Service Crosses were upgraded to the Congressional Medal of Honor. Those medals were presented in January 1997 at the White House. In July 1997, a Navy large medium-speed roll-on/roll-off (LMSR) ship was christened the *USNS Watson* in San Diego, California.

Fort Benning, Georgia has a field named in Watson's honor. Since he has no known next of kin, his Medal of Honor and Medal of Honor Painting are in the collection at the US Army Quartermaster Museum at Fort Lee, Virginia.

World War II

In September 1939, the German army rolled into Poland, marking the beginning of World War II. The United States Army – with less than 200,000 Regulars on active duty and only three functioning divisions – was ranked about 17th in overall effectiveness among the world's major powers, just behind Rumania. As war clouds drifted across the Atlantic, much work needed to be done to prepare the Nation for war.

Congress approved the call-up of nearly 300,000 Guardsmen and Reservists in late August 1940. In September, they passed a Selective Service Act that allowed the drafting of up to 900,000 more men for one full year. Throughout the emergency period, mobilization planners in Washington were suddenly abuzz with activity. Strategic plans, long since drafted, had to be dusted off and revised. Large-scale training exercises were conducted to test new weapons and equipment and to help begin the process of adapting old doctrine and organization to the perceived new ways of war.

The Quartermaster Corps, at this time still in charge of construction, had to come up with blueprints for new barracks, BOQs (bachelor officers' quarters), mess halls, supply rooms, military theaters, chapels, warehouses, garages, hospitals, and headquarters facilities – all the buildings needed to house, train, care for, and equip a million-man army about to engage in modern "total" warfare on a global stage. The Corps also turned to the business of procurement. Logisticians in the 1940s were fond of saying "supply wins wars," and the supply needs of World War II quickly dwarfed those of any other war in our Nation's history, before or since.

Spring 1941

Camp Lee reopens on the eve of WWII

5-6 October 1941

Quartermaster School moves from Philadelphia to Camp Lee

1941-1945

Camp Lee instructors give hands-on supply training

Early on, The Quartermaster General, Major General (later Lieutenant General) Edmund B. Gregory, sounded the keynote and the high standard to which the Corps held itself throughout the war. "Let me make this simple promise to the American people," he said. "The Quartermaster Corps will never fail your boys! We will deliver the goods. Wherever they go – to whatever point American fighting men penetrate – Quartermasters will be by their side to 'Keep 'em Rolling to Victory!'" He further vowed that this would be the "best fed, best clothed, and best equipped" Army *ever*.

The huge volume of Quartermaster supplies amassed, stored, and distributed during the course of World War II fairly boggle the mind -- 29 million pairs of combat boots, 70 million khaki shirts and trousers, 80 million pairs of service shoes, more than 500 million pairs of socks, and on and on. Housing all those goods required 60 million square feet of depot storage space – a figure that represented about one-third of the total available space in private warehouses in the United States at that time. At the peak of their activities, *on a single day* in May 1945, Quartermaster agents procured 1.7 million tons of supplies, an amount worth more than a *billion* dollars.

Army supplies at that time were cataloged under an elaborate system of categories and subcategories, and assigned to one or another of the seven technical branches. As early as 1942, the Quartermaster Service Branch found itself accountable for no fewer than 70,000 separate items. The other, broader system of supply categories (carried over from World War I) had everything divided into five classes, each designated by a Roman numeral: Class I (subsistence), Class II (clothing and individual equipment), Class III (solid and liquid fuels), Class IV (general supplies), and Class V (ammunition and chemicals). Of those, only Class V did not include any Quartermaster items. Food and fuel items in particular were deemed essential -- indeed, they were seen as bona fide "war stoppers."

Soldiers must eat every day or suffer the consequences. With more than eight million mouths to feed in the Army alone, this amounted to a tall order. By the time of the Japanese surrender in 1945, the Corps was buying, storing, and issuing some 41 million pounds of foodstuffs a day, while Quartermaster bakers were turning out no fewer than 3 million loaves of bread daily. And to make sure that Soldiers received the proper type and amount of food, whatever the environment or tactical situation, the wartime research and development branch of the Office of the Quartermaster General, in conjunction with civilian scientists and technicians, developed a wide range of regular and special rations.

Regarding fuel, Winston Churchill, then Britain's First Lord of the Admiralty, said at the end of World War I, we floated to victory "on a sea of oil." The French, who called it *le sang rouge de guerre* (the red blood of war) claimed that petroleum was "as necessary as blood" for defeating the Germans. On the modern, thoroughly mechanized battlefields of World War II, the need for petroleum, oil, and lubricants – or POL as it had now become known – had grown exponentially. About 50 percent of all the storage space in ships going overseas was reserved for POL. Even the relatively small North African invasion of 1942 required 10 million gallons of gasoline. Two years later, the 1st and 3rd Armies crossing France in

1941-1945

Women's Army Corps Detachment at Camp Lee

1941-1945

Quartermasters supply troops in Pacific Theater

February 1942

12th Quartermaster Regiment baker cooks biscuits, Bataan, Philippines

1943

Quartermaster laundry units work in the Southwest Pacific

Cook, rifleman, and scout – personal courage under fire

When the 30th Infantry Regiment hit the beach at Anzio, Italy, in January 1944, one of those to go ashore as a Quartermaster-turned-Infantryman was India Company's first cook, Technician Fifth Grade Eric G. Gibson. In the months before the invasion, Tech 5 Gibson worked out a deal with his commanding officer that whenever the company went into battle, he would serve as a rifleman in one of the Infantry squads. But as soon as B-rations were available, he would return to his duties in the kitchen.

Later as company scout, Gibson located several enemy positions and managed to kill one German soldier and wound another in succeeding firefights. While continuing as company cook and number one scout in the wake of Anzio, Gibson repeatedly distinguished himself in combat. On 28 January 1944, he joined the ranks of the immortal. Around 1200 hours, near the village of Isola Bella, India Company came under withering enemy attack. Gibson, with a tiny squad of replacements, rushed out to secure the unit's right flank.

The squad destroyed four enemy positions, killing five and capturing two Germans. Gibson then went out a full 50 meters in front of the squad and running, leaping, and dodging automatic weapons fire, he single-handedly knocked out another position with his pistol. He kept moving toward other bunkers, firing a submachine gun with almost every step forward as enemy artillery began to zero in on his position. Nonstop automatic weapons rounds passed within inches of his body, yet he never paused in his forward movement. He crawled much of the last 125 meters right through a concentrated artillery and small arms barrage and dropped two hand grenades into a German machinegun emplacement – killing two more and wounding another. Gibson was in one final face-to-face engagement when an enemy round finally cut him down.

For his conspicuous gallantry and personal courage under fire, Tech 5 Gibson was posthumously awarded the Army Congressional Medal of Honor – one of 33 Quartermasters to receive that high honor to date.

the summer of 1944 were using upward of 800,000 gallons a day. In the end, it took an estimated 1 *billion* gallons of gasoline, 75 million gallons of lubricating oil, and 45 million pounds of grease to keep US planes, tanks, trucks, jeeps, and other vehicles moving on the road to victory.

During World War II the Quartermaster Corps' policy was to train Soldiers first as combat fighters, then as individual supply and service specialists. The Corps then assigned them to work as teams within one of many specialized units. Between 1939 and 1945, the Corps fielded more than 40 different types of

November 1943

Fifth Army troops
get turkeys
for Thanksgiving

6 June 1944

SGT Elbert Legg
crash-lands glider
in Normandy to begin
graves registration work

1944

German and Italian
POWs are confined
at Camp Lee during
the last year of the war

July 1944

Miles of 5-gallon
jerricans line the roads
across France

divisional and non-divisional units to carry out all the many supply and service functions. Once designed, Quartermaster TO&Es were constantly being revised to make them more flexible and efficient. In addition to the regular depot, service, supply, and truck companies, the Corps fielded vast numbers of special-purpose groups, battalions, companies, platoons, teams, and detachments. These included everything from railhead and refrigeration companies, to office machine repairers, butchers and bakers, pack-mule handlers, and scout dog detachments.

World War II also saw the first significant use of "supply by sky" or aerial delivery techniques. In early 1943, "Air QMs" packed rations and clothing inside "belly tanks" attached to the bomb racks of A-36s and successfully dropped them to 5th Army troops cut off in the Italian mountains below. More importantly, during the Battle of the Bulge in the winter of 1944-45, "Flying Quartermasters" in C-47s delivered more than 850 tons of ordnance, medical, and food supplies (with about a 95 percent accuracy rate) to help save the day for Brigadier General Anthony McAuliffe's 101st Airborne Division trapped at Bastogne, Belgium. They employed even more sustained use of airdrop techniques during the Pacific island-hopping campaign and with Special Forces-type troops operating in the China-Burma-India Theater and other places behind enemy lines. This ready ability to create a "vertical line of communication" added a whole new dimension to the art of logistics that was destined to play an important role in the Quartermaster mission from there on out.

Quartermasters in World War II also received well-earned praise and recognition for the caring and respectful manner in which they handled the war dead. The Corps had primary responsibility for search and recovery, establishment of collection points on the battlefield, initial identification of the deceased, laying out cemeteries, and overseeing proper interment. Of the estimated 359,000 Americans who died in the war, 281,000 of them were recovered by Quartermaster Graves Registration personnel and buried in more than 250 temporary cemeteries around the world.

It took almost another six years after the war (until the close of 1951) for the final disposition of remains to be accomplished. In all, some 171,000 sets of casketed remains were delivered to next of kin in the United States. In accordance with the wishes of their next of kin, another 97,000 dead were buried in 12 permanent cemeteries established around the globe for that purpose. Ten thousand "unknowns" likewise found their final resting place on foreign soil. Upon its completion, this worldwide Graves Registration Service program marked the largest re-interment operation ever. The search for the World War II era's missing in action continues to this day.

Korea and Vietnam

Wedged between America's "Biggest War" (World War II) and its "Longest War" (Vietnam), the Korean War far too easily becomes America's "Forgotten War." In fact the early 1950s and the start of the Cold War marked an important period in the evolution of Quartermaster service that very much needs to be remembered.

Barely had World War II ended when tensions between former Allies, the United States, and Soviet Union escalated into a stand-off in places as far afield as Berlin, East Europe, Iran, Greece, Turkey – and the

Autumn 1944

Red Ball Express delivers fuel to US troops, France

December 1944

Rations served during the Battle of the Bulge

1945

An American Soldier kneels at graveside in Europe

April 1950

Camp Lee is redesignated as Fort Lee

Korean peninsula. A fragile peace existed between a Soviet-backed Korean government in the north and US-backed one in the south. For two years the UN-sanctioned border along the 38th parallel had kept the two sides apart. But the peace was broken at exactly 0400 hours on Sunday, 25 June 1950, as artillery shells rained down on Kaeson, the ancient Korean capital. North Korean forces quickly followed with a full-scale invasion across the 38th parallel into South Korea.

The next day President Truman authorized General Douglas MacArthur, Commander of the Far Eastern Command in Tokyo, to launch air, naval, and ground attacks against the North Korean aggressors. In the weeks following, Task Force Smith failed to turn back the much larger and better equipped Communist forces. As fighting increased in the summer of 1950, another UN resolution brought more nations into the conflict. MacArthur's brilliant success at Inchon in September turned the tide in favor of the Allies, but, unfortunately, it also prompted a massive surprise counter-attack by Chinese Communist forces. The vicious fighting that ensued over the next two years led only to a stalemate, as peace talks eventually got under way.

Throughout the conflict, the Korean landscape posed enormous challenges for the US Army in general and for the Quartermaster Corps in particular. "If the best minds in the world had set out to find us the worst possible location to fight a war," Secretary of State Dean Acheson once remarked, "the unanimous choice would have to have been Korea."

How was such an operation to be supported? To begin with, it should be noted that World War II was an absolute "prerequisite" for the Korean conflict. For without the leftover supplies still remaining in the Pacific Islands and in US-occupied Japan, operations in Korea simply could not have been supported. Nor could Allied forces have been sustained for any length of time, had not the technical service branches earlier developed procedures for massing great quantities of goods and filling requisitions.

Depot commanders racing to build up their initial stocks of supplies drew heavily from Japan and the surrounding islands. Even so, over time most needed supplies would have to come all the way from continental US-based ports via ocean transportation, which routinely took about 120 days to arrive. After playing catch-up for months, supplies finally flowed more smoothly into the theater. (Overall more than 31 million measured tons reached Korea from the US during the course of the war. This was nearly double the amount shipped to AEF forces in France during World War I, and 82 percent more than what went to US air and ground forces in the Southwest Pacific during World War II.) Another set of difficulties arose once supplies reached the initially confused, overcrowded, and understaffed port of Pusan. There Quartermasters waged a never-ending battle against excess, waste, and poor record-keeping, in hopes of improving supply accountability.

Distribution of supplies from the main depot was sorely hampered by a chronic shortage of trucks and labor. Moreover, there was only one dilapidated road running north. The few roads that existed were both primitive and subject to frequent enemy attacks. The rugged, mountainous terrain often prevented even small trucks and jeeps from delivering supplies over the "last tactical mile." At that point, Army

Summer 1950

US troops board ship to deploy to Korea

1950

US Soldiers carry supplies with Korean A-frames

1950-1951

Temporary cemetery during Korean War

1950-1953

55-gallon drums of petroleum off-loaded in South Korea

Quartermasters relied on companies of Korean hand-carriers. They also soon discovered that helicopters could cover in minutes the ground it took hours to climb and then descend with a net full of supplies sufficient to maintain an isolated unit for a full day. This pointed the way for new uses of aviation for logistics support.

In fact, "supply by air," which made its debut in World War II, truly came of age during the Korean War. Just weeks before the outbreak of war, the Quartermaster Corps was formally given the aerial delivery mission. That is, it assumed responsibility for the storage, issuance, and maintenance of all parachutes used by the Army; as well as rigging to standard all the supplies that needed to be dropped. The Corps welcomed the mission, quickly established new TO&Es, experimented with new techniques and equipment, drafted the required manuals, and began training parachute riggers at Fort Lee, Virginia.

The 8081st Airborne Air Supply and Packaging Company was the first Quartermaster aerial delivery company sent to Korea. It arrived at Kimpo Airfield in September 1950 and immediately set about making history. Over the next two years, this resourceful and hardworking unit airdropped no less than 12,000 tons of supplies of all types – including jeeps, trucks, and fairly large howitzers. In perhaps its most notable mission, the 8081st successfully dropped a 40,000-pound M-2 treadway bridge to members of the 7th Infantry and 1st Marine Divisions who had gotten cut off near the Chosin Reservoir and were on the verge of being captured or annihilated.

The Corps introduced yet another innovative concept during the Korean War with the advent of the Quartermaster Service Center. The service center is a grouping, in one area, of separate units charged with providing a variety of Soldier support services. The first to arrive in-theater, Quartermaster Service Center No. 3, was set up on 1 May 1951 to support the X Army Corps. It included companies, platoons, and detachments of laundry and bath specialists, maintenance and reclamation teams, and office machine repairmen. Notably, during its first 19 weeks, the laundry section washed more than 1.9 million pounds of clothes. In the same period of time, shoe repairmen fixed nearly 10,000 pairs of shoes, and the attached shower unit proved capable of serving 4,400 men in a 10-hour day.

The Korean War also experienced the first use in combat of a high-level, theater-wide logistical command structure organized under an approved TO&E. The 2nd Logistical Command was set up in Pusan in September 1950 to receive, store, and forward goods and services to 8th Army units and personnel throughout Korea. After the successful Inchon Landing, the 3rd Logistical Command, modified to meet corps-level demands, was established to do the same for the X Corps. These events brought new order and a more holistic approach to the way supply, service, and transportation functions were handled in the war zone.

The back and forth movement of lines during the first year in Korea created enormous challenges for Quartermaster graves registration (GRREG) units. They established temporary cemeteries in-theater, only to have them subsequently overrun by enemy forces. Thousands of bodies had to be exhumed and reburied in safer areas to the rear. With the stabilization of battle lines in mid-1951 and the arrival

August 1951

First riggers graduate from Fort Lee course

1951-1953

Quartermasters rig supplies for airdrops over Korea

1952

C-46s move remains from Korea to Japan

1953

Testing petroleum at 55th Quartermaster Base Depot in Inchon, South Korea

in-theater of additional GRREG units, a more orderly system was put in place. Thereafter, the dead were systematically recovered, moved to collection points, and then taken by refrigerated train cars to a freshly built UN cemetery for final burial.

As armistice talks got under way, the Army instituted a new policy of shipping collected remains to Pusan, flying them to Kokura, Japan, for final processing, and sending them directly to waiting next of kin in the United States. The entire procedure was not to take more than 30 days. This policy of returning the remains of the fallen has been followed ever since. The assiduous care with which GRREG personnel tended to their duties resulted in more than 97 percent of the recovered American dead being positively identified.

Of course, the Cold War did not end with the Korean Armistice. Within a decade, US Soldiers were again being deployed across the Pacific, this time to Southeast Asia to fight the spread of Communism in Vietnam. The harsh climate and dense tropical jungles, coupled with a tenacious foe in the Vietcong guerillas and North Vietnamese Army regulars, posed a very different set of challenges from those faced in Korea.

Certain things though never seem to change. The rush to build up logistical stores in South Vietnam in 1963-65 saw the usual cycle of initial shortages, followed by massive excess, waste, and a thorough lack of supply discipline and accountability. The situation at port facilities along the Vietnamese coastline was all too reminiscent of the early days of the "frantic buildup" in Korea. (Then again, the same problem had plagued earlier generations of Quartermasters in France in World War I and during the Normandy Invasion of World War II.)

Before those first large shipments of supplies had begun arriving in Vietnam and before any of the great ports such as Da Nang, Qui Nhon, and Cam Ranh Bay had been built to receive them, the US Army was deep in the throes of re-examining and reorganizing its whole approach to logistics, from the top down. Indeed, the Army reorganization of 1962 did what some critics thought was impossible. It *abolished* all seven of the traditional technical service branches. That included the Office of the Quartermaster General, which had been in existence almost continuously since the earliest days of the American Revolution. As the Army's premier supply and service department, which had been a key player in the Washington bureaucratic military establishment since 1818, here it was suddenly and without warning – *gone!* Ardent critics long after referred to this as "Black Tuesday."

Most of the Quartermaster Corps' traditional responsibilities went to other high level agencies. Depot storage and supply procurement, for instance, went to the newly created Army Materiel Command and to the Defense Supply Agency, later renamed the Defense Logistics Agency. Quartermaster research and development activities were assigned to either Natick Laboratories in Boston, or to the new Combat Developments Command at Fort Lee. After Major General Webster Anderson, the last Quartermaster General, closed up shop in Washington in 1962, Fort Lee was designated the new "Home of the Quartermaster Corps."

The reformers had won the day by successfully arguing the need for a "functionalized" approach

July-December 1954

'Operation Glory' returns remains from South Korea

October 1954

Natick Quartermaster Laboratories established in Boston

Welcome, Alaska!

3 January 1959

MG Andrew T. McNamara, the Quartermaster General, presents 49-star flag to President Eisenhower

to logistics. And *that changed everything* -- from the organizational structure of the Army General Staff; to an assessment of which supply and service specialties should be kept or combined, and where and by whom they should be taught; right down to the creation of new "functionalized" logistical units at all levels preparing for action in Vietnam.

Obviously, the idea of a centralized logistical command had passed muster in Korea. So in April 1965, the 1st Logistical Command was activated in Saigon to take over the direction for all logistical support in Vietnam. Support would be going to the newly designed and fielded armored cavalry, airmobile, aviation, and other units created under the restructured ROAD Division concept. Once "pure" Quartermaster units now found themselves either part and parcel of or subordinate to "functionalized" units bearing such names as Army support commands, general support groups, supply and service battalions, supply and transportation battalions, and the like.

Quartermasters not only went to war in Vietnam in changed units, but they also employed new types of equipment and worked out innovative ways to provide supply and service support. Korean War logisticians may have pioneered the use of container express (CONEX), but in Vietnam the Army took containerization to a new level. By 1967 the SeaLand Corporation's containerized semitrailers had become a regular feature around the docks and storage areas, moving goods from ship to shore and into Vietnam's main distribution centers.

Helicopters too had made their debut in Korea, but they enjoyed far wider use in Vietnam. In fact, the thump-thumping sound of rotating helicopter blades became, in effect, the most recognized iconic feature of the war. As a rule, the large CH-47 Chinook helicopters were used to move artillery, ammunition, personnel, and bulk supplies to battalions and companies on the battlefield. Hueys delivered smaller size loads to scattered elements down to the platoon level. Helicopters proved essential for sustaining units in what everyone recognized as a "frontless" war. But even these new tools of war and the units they belonged to had to be supported, as they too came with a logistics price tag attached.

The Quartermaster challenge in Vietnam was to provide steady and dependable support to a highly complex and sophisticated force operating in a remote, relatively primitive environment at the end of an attenuated line of communication. Quartermasters met that challenge, improved communications, expanded logistics airlifts, increased containerization, streamlined ship loading and discharge, and improved materiel-handling equipment. Into that mix was added new technology that not only helped in Vietnam, but has also had the effect of revolutionizing supply procedures ever since – namely, computer technology.

The first units arriving in Vietnam in 1965 had to be "self-sustaining" for 180 days or so. Then the so-called "PUSH" system kicked in – whereby supplies were "pushed" directly to them from the US, until large depots could be built and stocked with levels of supplies sufficient to fill in-country requisitions. The build-up was dramatic.

By 1967 more than 550,000 short tons of general supplies and 86,000 tons of ammunition per month were being distributed to units throughout Vietnam

1961-1962

Secretary of Defense Robert McNamara reorganizes the Army

25 July 1962

Breaking ground for Quartermaster Museum

1963

Red Hat dedicated at Airborne Department

1965

Logistics build-up for Vietnam War

109th Quartermaster Company supplies Marines trapped at Khe Sanh

One of the most bitterly fought battles during the Vietnam War was the siege of Khe Sanh. Toward the end of 1966, numerous large scale North Vietnamese Army (NVA) units began consolidating around the demilitarized zone that separated North from South Vietnam. The Commander of US forces in Vietnam, GEN William C. Westmoreland, ordered Marine units northward – into a string of fire support bases just south of the DMZ. One of those bases was Khe Sanh. By January 1968 more than 6,000 Allied troops were on hand – dug in, ready to fight. But US intelligence reports indicated that some 15,000 to 20,000 NVA regulars had them surrounded, virtually cut off from the outside world. The siege had begun.

At approximately 0530 on 21 January 1968, Communist gunners began hitting the camp with hundreds of rounds of rockets, mortars, and artillery fire. One of the incoming rounds scored a direct hit on the camp's main ordnance dump – destroying nearly 1,500 tons or ordnance in a few minutes. The Marines immediately requested an emergency resupply of ammunition. But the only way in was by airdrop.

Members of the 109th Quartermaster Company (aerial delivery) began round-the-clock operations. Quartermaster riggers loaded C-123s and delivered more than 130 tons of supplies during the next 36 hours – even flying and unloading at night by the light of Marine artillery flares. The operation became even more perilous as NVA antiaircraft guns opened fire. Between January and April 1968, when the siege was finally broken, Quartermaster riggers delivered nearly 12,500 tons of supplies, without which the Marines could never have survived.

There were many Quartermaster heroes during that tense period. One was Specialist Fourth Class Charles L. Baney, a 20-year-old parachute rigger whose C-130 crashed, killing him and all others on board during a low-altitude supply drop at Khe Sanh. Spec 4 Baney's overwhelming sense of duty and eagerness to help those trapped on the ground below, place him in the finest tradition of Quartermaster Soldiers supporting Soldiers.

by highway, intracoastal waterway, and air. Petroleum storage capacity leapt from 750 million barrels in 1965 to more than 3.6 *billion* barrels by mid-1968. The flood of supplies begged the question of how to keep track of all those supplies. What equipment and procedures evolved to allow Quartermasters to provide a continuous, up-to-date inventory accounting of all stocks within Vietnam? The answer: automated data processing equipment, or computers, and a centralized inventory control center.

To meet the growing need for computer-oriented, "functionalized" supply specialists, the Quartermas-

1966

Cake is served . . . even in the field in Vietnam

1966

POL distribution and storage in Vietnam

1966

Quartermaster Officer Candidate School (OCS) resumes at Fort Lee for first time since WW II

1966-1967

OCS students train for Vietnam War

ter School's Enlisted Supply Department at Fort Lee rapidly expanded between 1965 and 1967. It began training not just Quartermaster stock control and accounting specialists, but signal, ordnance, automotive, aircraft, and missile and munitions supply and parts specialists as well. The revised "76 Supply Series" included 17 supply MOSs, steeped in and dependent upon the use of computers.

Early in 1967 a large fleet of 9-foot by 22-foot vans containing state-of-the-art NCR computers (valued at more than $20 million) arrived in Vietnam and were assigned to logistical units across the theater. The new systems used both punch cards and magnetic ledger cards to automatically track in-country inventories. Computer also helped personnel make sure that the supplies arrived on time.

By the end of that year, a fully automated 14th Inventory Control Center had been established in Long Binh. This unit, slowly and over time, began to tabulate in-country requirements, establish priorities, and curb duplicate requisitions pouring in from the 2nd Logistical Command in Okinawa. Full supply accountability would remain an ever-elusive goal during the Vietnam War, but certainly these years saw revolutionary advancements with promise of more improvements to follow.

With its ups and downs, controversy, and protests, "America's Longest War" will no doubt be a source of debate for years to come. But there is no debate about the improved nature of Quartermaster support for Soldiers during the war. Wherever they were, storage facilities were always subject to attack. Yet even in triple-canopy jungles and across the guerilla-infested countryside, the supplies flowed. POL specialists, for instance, ran pipelines through those jungles and drove tanker trucks down those perilous roads to ensure that Class III support was available. Food service specialists constantly worked to improve on-base mess facilities, and they used air assets when necessary to deliver hot meals to isolated units in the field.

This war also witnessed the same commitment to caring for the dead, but with the introduction of much better techniques and equipment. The use of helicopters in particular allowed for speedy recovery from the battlefield, sometimes within minutes. Collection points were established in areas readily accessible to combat units. After initial processing, the remains were sent to one of two in-country mortuaries – Da-Nang in the far north or Tan Son Nhut outside Saigon – for further processing and temporary identification, before being shipped directly back to the United States. New laboratory procedures supplemented dental and fingerprint comparison.

Ultimately the remains of more than 96 percent of those who had fallen were recovered. The 4 percent not accounted for translates to about 2,300 Soldiers. GRREG personnel usually succeeded in having bodies sent from the field to next of kin at home within seven days. By war's end only 28 of the American bodies recovered were still unidentified. And, over time, *all* of those too were subsequently identified – which is an unprecedented achievement in modern times.

Riggers in Vietnam scored history-making achievements as well, none more so than the 109th Quartermaster Company. When 6,000 Marines got cut off and isolated at Khe Sahn, just south of the demilitarized zone in January 1968, the supply situation

1966-1968

109th Quartermaster Company delivers supplies by air from Cam Rahn Bay, Vietnam

January-April 1968

The 109th keeps trapped Marines supplied at Khe Sanh, Vietnam

4 July 1971

Parade ground at Mifflin Hall dedicated in honor of SGT William W. Seay, a Soldier who died in Vietnam

rapidly deteriorated. By February bad weather and enemy gunners had made airdrop the only viable means of supply. To supply the Marines, the riggers of the 109th Quartermaster Company worked around the clock to rig ammunition, rations, fuel, and other supplies. They then often accompanied the flights to supervise the drops. In all, more than 8,000 tons of supplies were delivered during the 11-week siege. One shutters to think what might have happened to those troops on the ground had this type support not been available.

Post-Cold War Era

In less than a decade and a half after the fall of Saigon, the Berlin Wall – which had been the focus of East-West tension for nearly a half-century and had always loomed as a potential flashpoint for nuclear war – suddenly came down as well. That, followed by the collapse of the Soviet Union, meant the Cold War had ended, leaving the US as the sole remaining superpower.

In the wake of Vietnam, the Army had already begun putting itself on a fast track toward modernization. A new generation of weapon systems was unveiled, including the M1 Abrams tank, the Bradley Fighting Vehicle, and the Patriot missile system. These depended heavily on new computer technology and enhanced communication techniques. The late 1980s signaled the coming of the Information Age. Looking ahead, strategic thinkers spoke openly of a "Revolution in Military Affairs."

Training techniques also took on a decidedly different cast with the addition of high-tech simulators, computerized war games, and force-on-force exercises at the newly developed joint and national training centers. Much as in the days immediately preceding World War II, the US Army was again learning how to conduct and sustain large-scale battle maneuvers. Doctrine and force developers did their part too by creating new organizations and techniques for division, corps, and echelons above corps levels of fighting.

The reformers of the 1970s and 1980s employed a "threat-based" approach to modernization. They took it very much for granted that the main danger would continue to come from large Soviet forces still massed in Eastern Europe. The US Army that was reconstructed, retrained and redirected between 1973 and 1990 – and armed with unprecedented capabilities – was specifically designed to take on that threat. It was, therefore, unexpected and a bit ironic that the US and its NATO partners instead found themselves deploying to the Persian Gulf region for the startup of *Operation Desert Shield/Storm*.

In August 1990, President George H. W. Bush "drew a line in the sand" and signaled that coalition forces were preparing to eject Saddam Hussein's occupying army from Kuwait. Over the next six months, 296,000 US Soldiers and 2.3 million short tons of Army equipment and supplies were sent to Saudi Arabia. That was nearly six times the number of Soldiers sent to Korea in a similar timeframe and far more than those sent to Vietnam in all of 1965. It also doubled the amount of supplies and equipment shipped to Korea and Vietnam during the first six months of those conflicts.

With the Nation sending more than a half million American Soldiers to the desert, poised to attack, meant the Quartermaster Corps had much to do. It

13 June 1986

Quartermaster Regiment is established at Fort Lee

1989

Allied colors are furled as the Berlin Wall is torn down

1991

Purifying water for Operation Desert Storm

also meant that recent force structure decisions were about to be tested. Implementation of the Total Army concept after Vietnam, for example, resulted in most Quartermaster units and personnel being placed in the Reserves and National Guard. With the announced mobilization for the Gulf War, many of the units had to go through hurry-up, refresher training at Fort Lee and elsewhere before they could deploy. A case in point is the 14th Quartermaster Water Detachment.

The 14th Quartermaster Detachment is a Reserve Component water purification unit based in Greensburg, Pennsylvania. Its members were called to active duty on 15 January 1991, just one day prior to initiation of air strikes against Baghdad. They spent the next 30 days at Fort Lee learning to use the newest and most advanced ROWPU (reverse osmosis water purification unit) equipment, before arriving in Dhahran, Saudi Arabia, on 19 February. The next six days were spent on continued training as the detachment prepared to move down range.

On their seventh night in-country, while resting in their temporary home, at about 8:30 p.m., an Iraqi Scud missile slammed into their quarters – with horrendous effect. Afterwards, amid the wreckage and debris lay 28 dead American Soldiers, 13 of them from the 14th Quartermaster Detachment. An additional 43 suffered grievous injuries. As it happened, this unit suffered a higher proportion of casualties than any other during the war.

The following year at a dedication ceremony, Chief of Staff of the Army, General Gordon R. Sullivan, said, "The Soldiers of the 14th Quartermaster Detachment were not battle-hardened warriors. On the contrary, they were in a unit whose mission was to preserve life by purifying water. The product of their labors would have sustained life. This quality – the ability to have compassion, the desire to help others – is the true essence of our Nation.

"And the 14th Quartermaster Detachment has become a symbol of the broader sacrifice of our Nation for what we believe. We must remember, heroism is not measured only by bravery in battle. Heroism is measured as well by a willingness to serve, is realized in the striving, and is proven by the risk of being in harm's way when you are most vulnerable.

"Make no mistake. The Soldiers occupying a barracks in far-off Dhahran a year ago, especially those who made the supreme sacrifice, are heroes.... They answered the call of duty. They paid the ultimate price for freedom."

New doctrine relied heavily on host nation and contracted support for laundry and bath service, bottled water, dining facilities, maintenance personnel, and the like. Nevertheless Quartermaster support for *Operation Desert Storm* proved record-setting in a number of ways. Food Service specialists (MOS 94B), for instance, set up mobile kitchen trailers throughout the theater and served mixtures of fresh food, B-rations, MREs (Meals, Ready-to-Eat), and T-rations (tray packs), even in the most isolated areas. More than 94 million meals were provided from all sources during a six-month period.

Unsanitary conditions and Southwest Asia's harsh environmental conditions raised the specter of food-related sickness and disease. Yet during *Operation Desert Shield/Storm*, the US Army experienced the lowest rate of food-borne and waterborne illness in any war up to that time. Indeed, there were no

1991

Homecoming for the 14th Quartermaster Detachment

1991

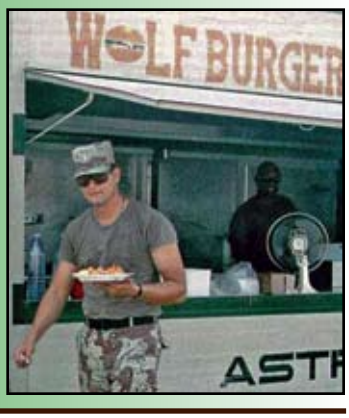
Monument to members of 14th Quartermaster Detachment killed in Saudi Arabia

1991

Field Services specialist washes out the Desert Storm dust

1991

Food Service personnel create the Wolfmobile



reported incidents of hepatitis A (which is common in the region). Nor were there any cases of bacillary dysentery or shigellosis ("bloody diarrhea"), or of cholera, typhoid, or brucellosis (which comes from infected milk and other dairy products). Expert food handling and preparation, coupled with vigilant oversight by preventive medicine and Army food service personnel won the "microbial war" in the desert just as convincingly as Allied troops had done with the larger shooting war.

When General Patton's thundering Third Army came to a screeching halt in its race across France in the summer of 1944, he is said to have uttered a sad refrain: "My troops can eat their belts, but my tanks gotta have gas!" During *Operation Desert Shield/Storm*, more than 1,800 helicopters, 12,400 tracked vehicles, and in excess of 117,000 wheeled vehicles were brought into the theater – and all of them "hadta have gas!" The VII Corps alone had more than 7,000 tracked vehicles and 40,000 wheeled vehicles. This created an enormous need for POL.

This monumental thirst for fuel in *Operation Desert Shield/Storm* was quenched by moving, storing, and distributing an estimated 2 *billion* gallons of bulk petroleum. Doing so required not only the extensive use of host-nation refineries and storage facilities but also the unique capabilities and services that could only come from the 240th Quartermaster Battalion. The 240th Quartermaster Battalion set up an inland petroleum distribution system (IPDS) that consisted of a series of aluminum "snap-joint" pipelines and high-pressure pump stations leading to several 210,000-gallon collapsible fabric storage tanks. The IPDS eventually ran 175 miles north from the Kuwaiti coastline.

The battalion had hoped to build it all the way to the Iraqi border (nearly 260 miles) but did not quite make it before the war ended. With the aid of this pipeline and its subordinate truck companies, the 240th Quartermaster Battalion moved upward of 900 truckloads of fuel each day during the active phase of the campaign. Throughout the campaign this versatile unit used practically every storage and distribution tool in its inventory: the portable tank farm facility, refuel on the move system, fuel system supply point, tactical petroleum terminal (TPT), and forward area refueling equipment. They helped make it possible for Allied forces to "float to victory," figuratively speaking, "on a sea of petroleum."

Owing to reports that Iraqi forces possessed chemical and biological weapons and had actually used them in the past, coalition planners expected that there might be heavy casualties in the initial phase of combat. This raised a threat that US forces had not faced since World War I. As a result, all personnel in-theater had to stay abreast of security procedures, exercise due caution, and keep their protective gear close by at all times.

Under the circumstances, Quartermaster GRREG personnel prepared for the worst. They created a theater-level mortuary in-country and gathered the specialists and equipment needed to process large numbers of remains. The doctrine at that time said contaminated remains were to be decontaminated before being sent home for burial. But no one knew exactly how that was to be accomplished – or how human remains might be safely handled, or even if it was likely that they could *ever* be shipped home without putting others at risk.

1991

M1A1 Abrams battle tanks in Operation Desert Storm

1991

POL specialist with 49th Group in Iraq

April 1992

Fort Bragg, North Carolina, families welcome home the 407th Supply and Transport Battalion

Within days a team of GRREG experts drafted an updated doctrinal response to all these questions, developed new decontamination procedures, and sent them along with the necessary equipment to the theater shortly before the war began. Fortunately they never had to be used. Instead of the thousands that many feared would become casualties, official reports at the war's end listed 382 as the total number killed in *Operation Desert Storm*.

Bringing the 20th Century to a Close

In the immediate aftermath of the first Gulf War, the Kurdish population in northern Iraq staged an uprising again Hussein's weakened regime. They failed in that attempt. Fearing reprisals, hundreds of thousands fled toward the Turkish border but were driven back into the mountains instead. By early April 1991, more than half a million Kurdish refugees were trapped on the barren, now freezing mountainsides. Without food, water, shelter, clothing, medicine, or other vital supplies, upward of 800 to 1,000 refugees were dying weekly. President Bush, with United Nations backing, ordered humanitarian aid to be sent in and a demilitarized zone established.

This marked the beginning of *Operation Provide Comfort*. Among the first to respond with life-giving support was the 5th Quartermaster Detachment (aerial delivery), which flew from Germany to Turkey to commence rigging operations. During a three-week time period, from 7 April to 1 May, this hardworking unit rigged 7,600 bundles – nearly 8,000 tons of supplies – for the beleaguered Kurds.

This was the first of many such humanitarian relief efforts that the Quartermaster Corps was called in to support during the course of the 1990s. In August 1992, for instance, Hurricane Andrew struck south of Miami Beach, Florida, killing 60 people and injuring hundreds more. Nearly 120,000 homes were destroyed or seriously damaged, and 2 million residents had to be evacuated. Active, Reserve and National Guard Quartermaster units joined the vanguard of relief workers. They used their technical warfighting skills to set up tents for the dispossessed, turned empty warehouses into distribution points, and ran field feeding centers as well as laundry and bath facilities. Further instances of *Operation Provide Comfort* and Hurricane Andrew-style relief assistance in the 1990s, at home and abroad, led to a new entry in the Army's doctrinal lexicon: OOTW, for operations other than war. And in these, clearly, the Quartermaster Corps played a dominant role.

Early in 1993 the 5th Quartermaster Detachment was again called from its base in Germany to bring relief to sufferers, this time in the war-torn former Republic of Yugoslavia (Bosnia-Herzegovina). Codenamed *Operation Provide Promise*, it lasted nearly two years and turned into the largest humanitarian airdrop in US history. More than 30,000 bundles of humanitarian supplies – rations, canned goods, penicillin, surgical tools, and more – were dropped almost daily to the battered, needy, and increasingly desperate population below.

Army technical manuals can never be expected to cover every situation. In Quartermaster circles, where doctrine ends, improvisation often begins. That certainly was the case with the 5th Quartermaster Detachment in Bosnia. Presented with an unusually wide variety of items to be dropped, they routinely experimented with dozens upon dozens of new

1991

C-130s supply Kurds during Operation Provide Comfort

24 August 1992

Field Service units deliver supplies to victims of Hurricane Andrew

1996

Operation Provide Promise airlifts relief supplies to Bosnians

1998

Quartermasters deliver humanitarian aid to residents of Honduras

rigging techniques. They found that with proper padding and a dose of ingenuity even the most fragile supplies can be dropped without damage.

The US Army had conducted its first major post-Vietnam deployment back in 1983, *Operation Urgent Fury*, to Grenada in the Caribbean. Many more contingency-type deployments followed in the decade and a half after it: *Just Cause* (1989), *Desert Shield/Storm* (1990-91), *Provide Comfort* (1991), *Restore Hope* (1992-93), *Provide Promise* (1993-95), and *Uphold Democracy* (1994-95).

By the mid-1990s, it had become abundantly clear that the US Army needed to be fully capable of conducting a wide range of contingency-type operations, often on short notice. The then Army Chief of Staff, General Gordon R. Sullivan, launched yet another round of changes that became encapsulated in the phrase "Army Transformation." The need for change stemmed from the new post-Cold War global challenges and was a result of lessons learned from recent contingency operations.

The Quartermaster Corps spent the last years of the 20th century much as it had done during the first years – by engaging in wholesale reform and reorganization while maximizing the use of new technologies. Back then motorized vehicles, radio communication, and the advent of airplanes had Quartermasters thinking about new and better ways to support Soldiers in combat. Now it's the "digital revolution"– along with advancements in satellite and telecommunications technology and vastly improved air, land, and sea transportation – that feeds the call for change.

Army Vision 2010, published in 1997, introduced a new operational concept, "focused logistics," and defined it as "the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical level of operations."

It may well have suited Confederate General Nathan Bedord Forrest's supply needs back in the Civil War to simply get there the "firstest with the mostest." But that is not the case today, where the goal and the expectation are to get the *right amount* of supplies to the *right place* at the *right time*.

The turn of the present century found the Quartermaster Corps still deep in the throes of logistics transformation. Lessons learned from *Desert Storm* had laid bare the necessity for a distribution-based supply system to replace large stockpiles of material that had been stored in the battle space. Likewise faulty storage and inventory practices – whether seen on the congested beaches of Normandy or the over-crowded docks of Saigon or the acres of stacked CONEXs in the Saudi Arabian desert – pointed to the critical need for total asset visibility and in-transit visibility.

The many difficulties and delays experienced by Army logisticians in Hungary, during 1996's *Operation Joint Endeavor*, showed that more changes were needed. *Operation Joint Endeavor* demonstrated that, above all, for force projection to succeed in a timely manner, its logistics structure needed to be leaner, more efficient, and far more readily deployable. These qualities would make the Army capable of providing expeditionary-style logistics almost on a moment's notice.

2002

5th Quartermaster Detachment riggers support Operation Enduring Freedom from Turkey

2002

C-130s deliver supplies in Operation Enduring Freedom

March 2003

US supply convoy crosses the border into Iraq

The new transformational goals for 2000 and beyond looked toward radically reducing the "logistical footprint." These goals called for "modularized," multifunctional units armed with the latest technology and best business practices in order to throughput supplies effectively and efficiently "from factory to foxhole." They also required the alignment of logistics processes with operational demand to create a level of agility and flexibility that, hopefully, would render Quartermaster support to the warfighter more responsive than it had ever been before.

Such was the mission and the immediate goal of the Corps when other events – world-shattering events – intruded and took center stage.

9/11 to the Present

Like the attack on Pearl Harbor and the Kennedy assassination, those old enough to remember the terrorist attack on the World Trade Center and the Pentagon on 11 September 2001 are apt to carry that memory to the grave. Although the Nation was caught off-guard, the US Army was quick to respond with *Operation Noble Eagle*. All civilian air traffic was temporarily suspended, and a series of measures was taken to secure the homeland. The Army called up nearly 10,000 Reserve and National Guard Soldiers while placing active duty units on high alert and sending them where they were needed.

Obviously, the Pentagon was one such place. The attack had killed 125 people on the ground, plus all those onboard the plane. Within hours the 54th Quartermaster Company (Mortuary Affairs) travelled to Arlington to begin search and recovery operations at the crash site. These Soldiers climbed through the rubble and worked around the clock to recover remains and personal effects in the still-smoldering building. When they redeployed to Fort Lee at the end of September, their place was taken by the 311th Quartermaster Company (Mortuary Affairs) from Aguadilla, Puerto Rico.

Rarely has the United States Army in its long history been more active than in the years since 9/11. The pace of transformation and the number of ongoing deployments has not let up. And that is not the end of it. Beginning in 1988 and continuing to the present, the Army has also had to contend with stiff challenges brought about by the Base Realignment and Closure (BRAC) process. Several key military institutions have been closed or consolidated. Legislation has dictated that whole Branches be moved and that their headquarters and training facilities be set up elsewhere. Any one of these events – BRAC, transformation, and ongoing deployments – might constitute having a "full plate," especially in light of the new homeland security demands wrought by the attacks of 9/11.

But there is more. Starting in November 2001 and continuing non-stop to the present, the Army has been fighting *two* very difficult wars simultaneously – *Operation Enduring Freedom* and *Operation Iraqi Freedom* – in Afghanistan and Iraq, respectively. Together they have required untold commitment and sacrifice on the part of Soldiers, some of whom have experienced nearly back-to-back deployments and long-term service not seen since World War II. The Quartermaster Corps has been a stalwart participant throughout the "Long War" by ensuring that needed supplies and services make it to the farthest reaches of Southwest Asia, no matter the difficulty or obstacles presented.

2003

49th Quartermaster Group sets up IPDS pipeline in opening phase of Operation Iraqi Freedom

September 2003

612th Quartermaster Company distributes supplies in Afghanistan

April 2004

SGT Donald Walters, QMC, is awarded Silver Star for heroism in Iraq

When, for example, 950 paratroopers of the 173rd Airborne Brigade jumped into Bashur, Iraq, on 26 March 2003, to set up positions in the north, Quartermaster Soldiers with the 501st Forward Support Company flew in two days later and immediately began issuing thousands of MRE rations and bottled water. Four days later their Quartermaster logistics automation specialists (MOS 92As) had their SARSS-1 computer systems up and running, and a functioning supply support activity was well on the road to success. They met every challenge even as the weather grew worse and the number of units needing supplies increased daily.

Similar stories played out across both theaters of operation in the early days of the war. The 229th Quartermaster Company (Field Services) deployed to Uzbekistan in October 2001, and thus became the first conventional combat service support unit to arrive in theater. The Quartermasters had with them three LADS (laundry advanced system) trailers, three 12-head shower systems, and a clothing renovation shop. In early December two members of the unit crossed the border into Afghanistan to set up the first shower point in Bagram. More logistics elements arrived in early February, bringing with them Quartermaster-trained fuel, warehouse, maintenance, water, and food service specialists.

By the time US and Allied forces crossed the Kuwaiti border into Iraq for the drive to Baghdad in late March 2003, the 240th Quartermaster Battalion had already seen to it that they would have sufficient fuel. Before the war's outset, the battalion had created a series of IPDS pipelines and pump stations and used a large fleet of tanker trucks to move and store massive quantities of JP-8 fuel from the Kuwaiti coastline all the way to the Iraqi border. The tactical petroleum terminal (TPT) called Breach Point West, or BPW, was built just six miles south of the Iraq border. It turned out to be the largest TPT established during the war with a storage capacity of 4.4 million gallons of fuel.

In the first four weeks of the war (from 22 March to 20 April), the 240th Quartermaster Battalion laid down another pipeline, stretching from BPW 80 miles into southern Iraq. Between February and September 2003, the unit's IPDS terminals pumped more than 80 million gallons of fuel. At the same time, Quartermaster-run commercial lines added another 115 million gallons while truck companies distributed nearly 40 million more gallons of fuel to forward locations. The 240th Quartermaster Battalion is thus credited with handling more than 233 million gallons over all, an impressive achievement to be sure.

Over the last eight years that Quartermaster Soldiers have been supporting the US Army and its coalition partners in Iraq and Afghanistan (from 2001 to 2009), each of the other Quartermaster functional areas has demonstrated similar skill and commitment, and all have left their own lasting record of achievements. Water purification units have worked tirelessly to provide potable water, which is the most essential of all items needed for survival in the parched Near Eastern desert. Mobile kitchen trailers and portable showers continue to be set up in the most extreme and isolated locations to provide on-the-spot support for the warfighter's health and well-being.

Quartermaster supply personnel continue to use every means possible to deliver the goods: from the

2006

1st Infantry Division food service specialists prepare to serve a meal in Iraq

2006

Field Service specialist trains for laundry duty at Quartermaster Center and School, Fort Lee

2006

Reverse osmosis water purification units serve Operations Enduring and Iraqi Freedom

latest satellite tracking equipment that provides an unprecedented level of asset visibility, right down to the pack mules that are still used on occasion in the Afghan mountains to haul materiel over the most difficult of last tactical miles. And when other means seem impossible, Quartermaster riggers continue to deliver logis- tics support from above. In 2007, moreover, the 11th Quartermaster Detachment at Bagam Air Base in Afghanistan made history using the newest Joint Precision Airdrop System with steerable GPS-guided containers (so-called "screamers") to deliver food, water, and ammunition to US forces in two remote locations.

As they have from day one, Quartermaster Mortuary Affairs specialists continue caring for the remains of the fallen. There are more than 120 Quartermaster Soldiers among the 4,000-plus service members who have so far lost their lives in *Operations Iraqi Freedom* and *Enduring Freedom*. Mortuary affairs specialists made sure that they too were treated with dignity, reverence, and respect as they were returned home so their families could "lay them down in fields of honor."

It should be readily apparent that The Quartermaster Corps indeed has a long and proud history of support to the Army and to our Nation. "More than any other military organization in the world, America's armed forces place primary emphasis upon the efficiency and well-being of the individual fighting man," wrote Secretary of the Army Frank Pace, Jr. on the occasion of the Corps' 175th anniversary in 1950. "No service of our Army," he went on to state, "is more intimately concerned with supplying the individual needs of the [S]oldier than is the Army Quartermaster Corps."

That statement is as true today as it was 60 years ago. And there is every reason to believe that the Corps' unswerving commitment to ***Supporting Victory*** will continue well into the distant future.

QMC&S historian preserves our past as instruction for the future

Dr. Steven E. Anders has been the Command Historian for the US Army Quartermaster Corps for more than 25 years. He advises the Quartermaster General on all matters pertaining to military history, develops history courses to teach at the Quartermaster School, conducts historical staff rides, researches and writes history, and collects documents for the Quartermaster Center Archives.

He has often recorded history in the making by conducting in-depth exit interviews with Quartermaster Generals and serving as an official eyewitness for ceremonies and events within the Quartermaster Center and School.

His areas of expertise include US military history, the American South, and the American Civil War. Dr. Anders earned his bachelor's, master's, and doctor of philosophy degrees in history from Miami University in Oxford, Ohio. He has been a frequent contributor to the *Quartermaster Professional Bulletin* as well as to *The Fort Lee Traveller* and other publications.

2006

Hot refueling of helicopters in Afghanistan

26 February 2006

94th Brigade Support Battalion unfurls its colors in Afghanistan

2003-2009

Quartermaster Mortuary Affairs Soldiers ensure that the fallen are treated with respect and all due honor

US Army Quartermaster Corps
Congressional Medal of Honor Recipients

Civil War

1st Lt Charles J. Murphy
21 July 1861, Bull Run, Virginia

Sgt George C. Williams
27 June 1862, Gaines Mill, Virginia

1st Lt John W. Clark
28 July 1863, near Warrenton, Virginia

Lt Col Richard N. Batchelder*
13-15 October 1863, between Catlett's and Fairfax Stations, Virginia

1st Lt Noble D. Preston
11 June 1864, Trevilian Station, Virginia

Sgt Ambrose Porter
7 August 1864, Tallahatchie River, Mississippi

Sgt Andrew J. Lorish
19 September 1864, Winchester, Virginia

Sgt Joel H. Lyman
19 September 1864, Winchester, Virginia

Capt Andrew J. McGonnigle
19 October 1864, Cedar Creek, Virginia

Sgt David H. Scofield
19 October 1864, Cedar Creek, Virginia

Lt Col Joseph S. Smith
27 October 1864, Hatchers Run, Virginia

Maj Horatio C. King
31 March 1865, near Dinwiddie Courthouse, Virginia

Sgt Stephen E. Chandler
5 April 1865, Amelia Springs, Virginia

Sgt Walter F. McWhorter
6 April 1865, Saylor's Creek, Virginia

Sgt John Galloway
7 April 1865, Farmville, Virginia

1865 and Contemporary Army Medals of Honor shown above

Indian Wars

Julius H. Stickoffer, Saddler
11 November 1868, Cienaga Springs, Utah

Mosher H. Harding, Blacksmith
20 October 1869, Chiricahua Mountains, Arizona

Griffin Seward, Wagoner
20 October 1869, Chiricahua Mountains, Arizona

Christian Steiner, Saddler
20 October 1869, Chiricahua Mountains, Arizona

David Larkin, Farrier
29 September 1872, Red River, Texas

James Pratt, Blacksmith
29 September 1872, Red River, Texas

John Sheerin, Blacksmith
8-11 July 1873, near Fort Selden, New Mexico

Nest Veuve, Farrier
3 November 1874, Staked Plains, Texas

Albert Glavinski, Blacksmith
17 March 1876, Powder River, Montana

Henry W. B. Mechlin, Blacksmith
25 June 1876, Little Big Horn, Montana

Otto Voit, Saddler
25 June 1876, Little Big Horn, Montana

William H. Jones, Farrier
7 May 1877, Little Muddy Creek, Montana and 20 August 1877, Camas Meadows, Idaho

1st Lt Charles F. Humphrey**
11 July 1877, Clearwater, Idaho

Wilhelm O. Phillipsen, Blacksmith
29 September 1879, Milk River, Colorado

John Schnitzer, Wagoner
23 April 1882, Horseshoe Canyon, New Mexico

Richard J. Nolan, Farrier
30 December 1890, White Clay Creek, South Dakota

World War II

Pvt George Watson
8 March 1943, aboard ship off the coast of New Guinea

Tech 5 Eric G. Gibson
28 January 1944, near Isola Bella, Italy

* *Lt Col Batchelder was later promoted to Brigadier General and served as the 18th Quartermaster General from 1890 to 1896.*

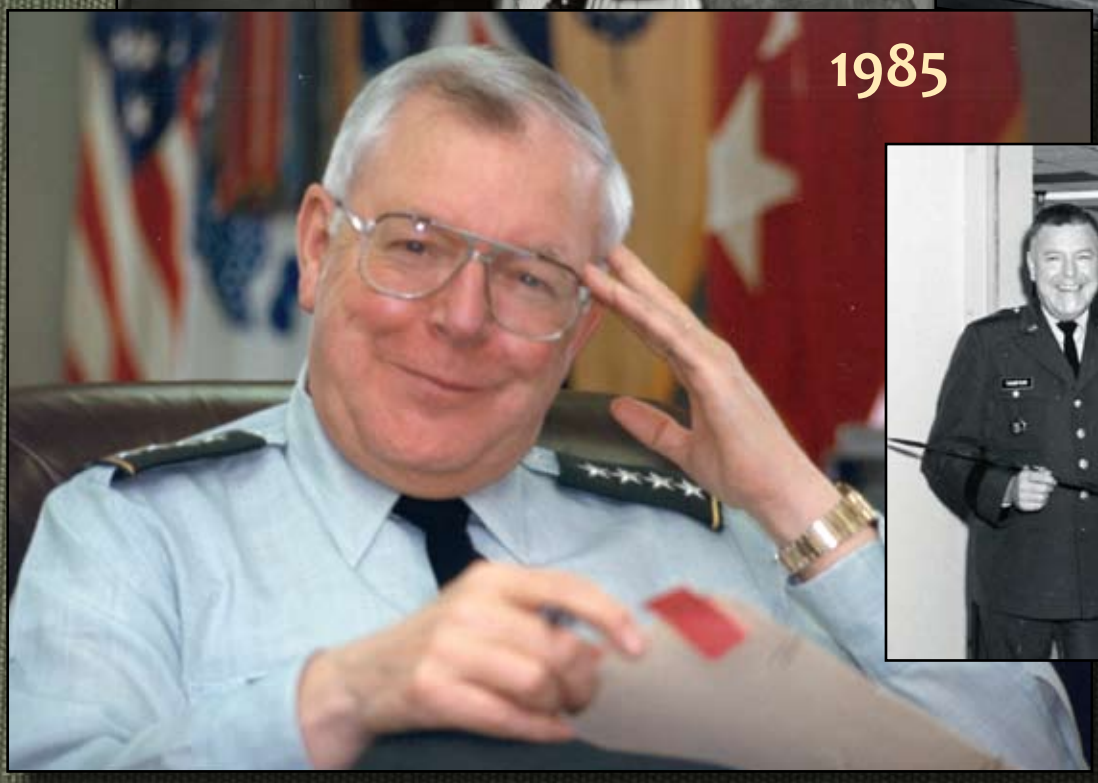
** *1st Lt Humphrey was later promoted to Brigadier General and served as the 22nd Quartermaster General from 1903 to 1907.*


1945


1970


1972


1971


1985


1973

From Private to General: Richard H. Thompson

The Revolutionary War Commander, General Henry Knox, once wrote that, "officers can never act with confidence until they are masters of their profession." From Knox's day forward, the US Army has sought to identify those among its officer class who are truly gifted in the profession of arms and to assign them the rank and responsibility commensurate with their perceived skill and leadership. In 1866, Ulysses S. Grant became the first four-star general in the United States. A century and a quarter later, the first Quartermaster officer was promoted to full General.

A veteran of three wars -- World War II, Korea, and Vietnam -- General Richard H. Thompson began his military career as a private in the US Army in 1944. He retired 43 years later as a four-star general, the first Quartermaster officer in the Corps' history to achieve the rank of General. GEN Thompson, who was appointed General on 29 June 1984, was also the first Quartermaster to serve as Commander of the US Army Materiel Command. As the Assistant Deputy Chief of Staff for Logistics and later Deputy Chief of Staff for Logistics, he was the senior logistician at a critical time in the Nation's history -- and was a central figure in the restructuring of logistics in the post-Vietnam era. His many positive contributions continue their lasting impact on Army logistics.


1975


1975


1994

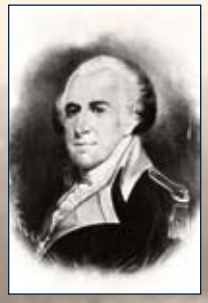

1990-91


2000

4 Stars for Ann Dunwoody

Making history seems to be natural for General Ann E. Dunwoody. On 14 November 2008 she became the first female Soldier in the history of the US Armed Forces to be promoted to the rank of four-star General, and she became the first female to take command of the US Army Materiel Command (AMC). Earlier in her career she was the first female to serve in these capacities: Deputy Commanding General and Chief of Staff of AMC, Deputy Chief of Staff of Army Logistics, and Commander of the US Army Combined Arms Support Command at Fort Lee, Virginia. Deployed as a division parachute officer in Desert Shield and Desert Storm, GEN Dunwoody is now overseeing the AMC headquarters' move to Huntsville, Alabama.

Saluting Our 50



Major General
Thomas Mifflin
1775-76; 1776-77

Colonel
Stephen Moylan
1776

Major General
Nathanael Greene
1778-1780

Colonel
Timothy Pickering
1780-1785

Samuel Hodgdon
1791-1792

James O'Hara
1792-1796

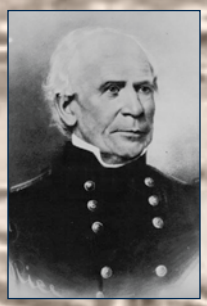
Major General
John Wilkins, Jr.
1796-1802

Brigadier General
Morgan Lewis
1812-1813

Brigadier General
Robert Swartwout
1813-1816

Colonel
James Mullany
1816-1818

Colonel
George Gibson
1816-1818



Brigadier General
Thomas S. Jesup
1818-1860

Brigadier General
Joseph E. Johnston
1860-1861

Brigadier General
Montgomery C. Meigs
1861-1882

Brigadier General
Daniel H. Rucker
1882

Brigadier General
Rufus Ingalls
1882-1883

Brigadier General
Samuel B. Holabird
1883-1890

Brigadier General
Richard N. Batchelder
1890-1896

Brigadier General
Charles G. Sawtelle
1896-1897

Brigadier General
George H. Weeks
1897-1898

Brigadier General
Marshall I. Ludington
1898-1903

Brigadier General
Charles F. Humphrey
1903-1907

Major General
James B. Aleshire
1907-1916

Major General
Henry G. Sharpe
1916-1918

Major General
Harry L. Rogers
1918-1922

Quartermaster Generals

Major General
William H. Hart
1922-1926

Major General
B. Frank Cheatham
1926-1930

Major General
John L. DeWitt
1930-1934

Major General
Louis H. Bash
1934-1936

Major General
Henry Gibbins
1936-1940

Lieutenant General
Edmund B. Gregory
1940-1946

Major General
Thomas B. Larkin
1946-1949

Major General
Herman Feldman
1949-1951

Major General
George A. Horkan
1951-1954

Major General
Kester L. Hastings
1954-1957

Major General
Andrew T. McNamara
1957-1961

Major General
Webster Anderson
1961-1962

Major General
Harry L. Dukes, Jr.
1981-1984

Major General
Eugene L. Stillions, Jr.
1984-1987

Major General
William T. McLean
1987-1989

Major General
Paul J. Vanderploog
1989-1991

Brigadier General
John J. Cusick
1991-1993

Major General
Robert K. Guest
1993-1996

Major General
Henry T. Glisson
1996-1997

Major General
James M. Wright
1997-1999

Major General
Hawthorne L. Proctor
1999-2001

Major General
Terry E. Juskowiak
2001-2003

Brigadier General
Scott G. West
2003-2005

Brigadier General
Mark A. Bellini
2005-2007

Brigadier General
Jesse R. Cross
2007-Present

TODAY
AT HOME AND DEPLOYED

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Quartermasters Through the Centuries
Illustration by Lieutenant Colonel (Retired) Keith K. Fukumitsu
Follows Page 94 and can be removed at perforation

The Miracle of Army Logistics

By Mr. Pete Geren, Secretary of the Army

The following is an excerpt from a speech that Secretary Geren made to the Association of the United States Army on 6 October 2008:

In 1944, LTG Somervell wrote a timeless piece about logistics. He said, "No one has ever painted an inspiring picture of a general brandishing a requisition . . . and . . . the prancing charger is longer remembered than the pack mule. "Well, this morning I'm going to talk about the requisition and the pack mule, and the men and women who fill those requisitions and pack those mules. And in parts of Afghanistan today, they do, in fact, still pack mules, and pack everything else that rolls, flies, or walks, but hardly anyone ever talks about it.

We have 250,000 Soldiers in 80 countries, and we've been at war for seven years, with 140,000 Soldiers in theater today. And nobody ever asks, who feeds those guys? Our logisticians are victims of their own success. Their work is so good it is invisible -- it's a given. Wherever our Army goes, whatever our Soldiers need, whenever they need it, they get it. The miracle of Army logistics.

The papers are filled with accounts of the movement of Soldiers, but no one ever mentions how they move. [Or] that Army logisticians repair over 14,000 vehicles every year -- a number equal to the number of Yellow Cabs in New York City.

Every year, Army logisticians move more than 700,000 personnel in and out of theater, equal to the entire population of Charlotte, [North Carolina].

Every day, Army logisticians provide 750,000 meals in Kuwait, Afghanistan, and Iraq. And every day, 3,000 Army trucks travel 600,000 miles in Kuwait, Afghanistan, and Iraq, equal to crossing the United States from Washington to California 200 times every day. Every day, Army logisticians dispense enough fuel in theater to fill up 750,000 cars, nearly four times the number of vehicles registered in Washington, D.C.

We talked much about the surge -- 15,000 more Soldiers in Iraq - but nobody ever mentioned that Army logisticians would serve 45,000 more meals each day, and ship 120,000 more gallons of water each day.

And every day, Army logisticians strap on their body armor, they grab their weapons, and supply our Soldiers, Sailors, Airmen, and Marines - and they take the fight to the enemy. And tragically, on too many days, our logisticians have made the ultimate sacrifice -- over 619 sustainment and support Soldiers have given their lives in [Operation Iraqi Freedom and Operation Enduring Freedom].

Army logisticians -- invisible, because they're so good at what they do, and absolutely indispensable. Retired Lieutenant General Gus Pagonis told us that "every war that was ever lost, every war that was ever won, was because of logistics."

I'd like to ask the invisible men and women of our logistics community -- all of our supporters and sustainers -- who are with us today, Soldiers and their Family members, and the contractors that work with them, please stand up and let us recognize you as the unsung heroes, and let us say thank you. Thank you for your great work.

Mr. Geren has been the Secretary of the Army since 16 July 2007. He has statutory responsibility for all matters relating to the United States Army: manpower, personnel, reserve affairs, installations, environmental issues, weapons systems and equipment acquisition, communications, and financial management. He had been serving as the 28th Under Secretary of the Army, when he was named the Acting Secretary of the Army on 9 March 2007. Mr. Geren joined the Department of Defense in September of 2001 to serve as Special Assistant to the Secretary of Defense. He also served as Acting Secretary of the Air Force from July to November 2005. Prior to joining the Department of Defense, Mr. Geren was an attorney and businessman in Fort Worth, Texas, who had served as a member of the US Congress from 1989 until his retirement in 1997. Mr. Geren attended Georgia Tech and received his bachelor's degree from the University of Texas and his juris doctor from University of Texas Law School.

Quartermaster Soldiers in the Long War

By Dr. Steven E. Anders

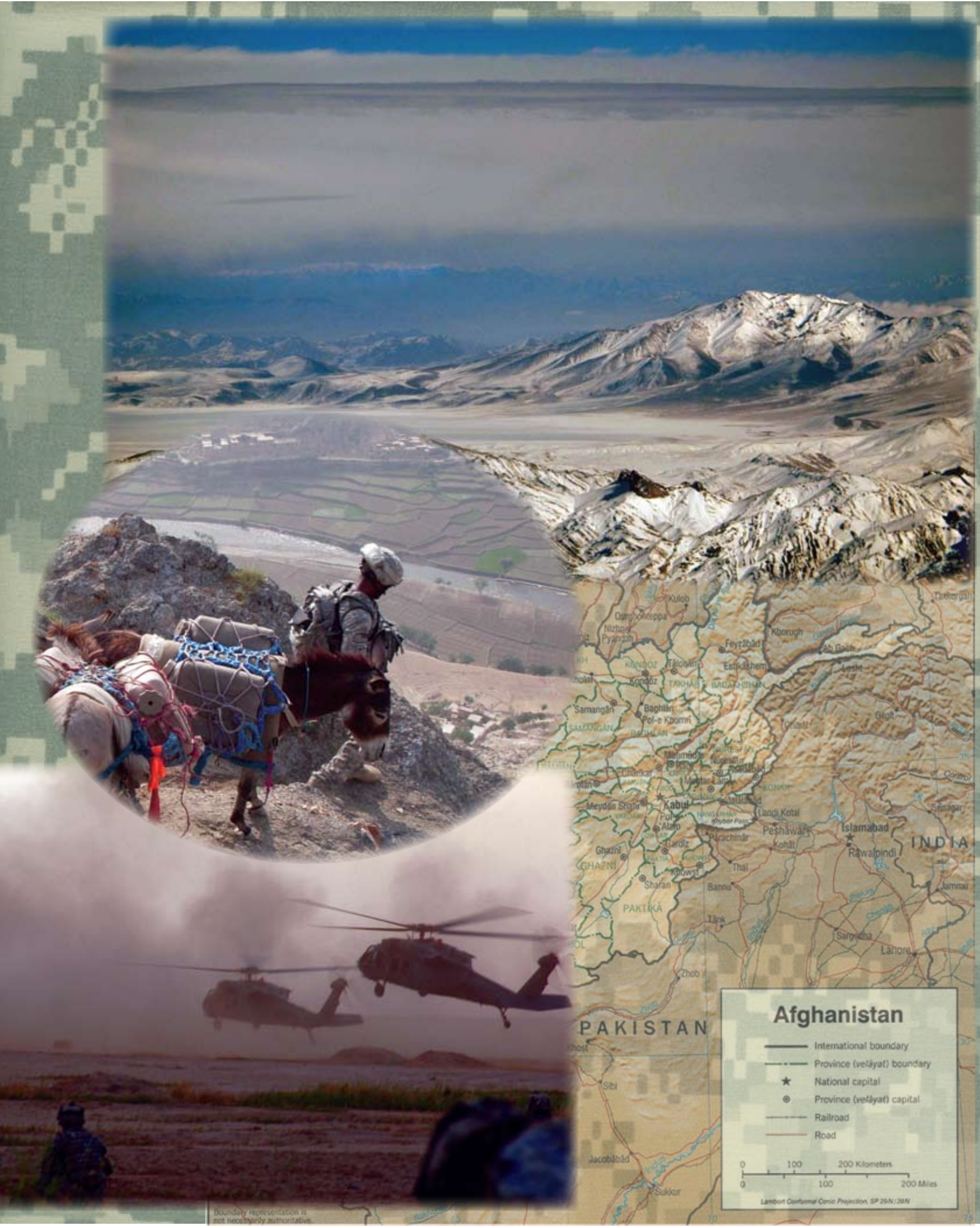
The year 2009 marks the 234th anniversary of the US Army Quartermaster Corps. Throughout its long proud history, the Quartermaster Corps has seen its Soldiers serve in *every* war, in *every* major campaign, and in *every* theater of operation where US troops have been deployed. Their duties have evolved continuously. At times there were dozens of Quartermaster military occupational specialties (MOSs) – including everything from mule skinners and dog trainers, to heraldry experts and typewriter repair specialists. Today there are nine Quartermaster MOS's.

Currently all Quartermaster Soldiers above a certain level are trained to perform as "multi-functional logisticians." They are highly adaptable and skilled at working with other combat service support specialists, with combat arms units and personnel, in a Joint arena. Yet regardless of the setting, the Corps retains primary responsibility in a few key areas, namely: petroleum, water treatment, mortuary affairs, parachute rigging, food service, shower, laundry and clothing repair, unit supply and automated logistics. It is in these areas of responsibility in particular that Quartermasters Soldiers are readily seen *Supporting Victory* on today's battlefield.

The ongoing wars in Afghanistan and Iraq (*Operations Enduring Freedom* and *Iraqi Freedom*, respectively) have tested the Quartermaster Corps' mettle from Day One. It was a major challenge, for instance, to fuel the force that crossed the Iraqi border in March 2003 and then exceedingly difficult to keep pace with that force as it raced on to Baghdad and beyond. And it was harder still to maintain a steady flow of petroleum – and all other critical supplies and field services – during the insurgent uprisings in Iraq in 2004 and 2005. Logistical challenges in Afghanistan have been equally daunting because of a dangerous and tenacious foe and the unremittingly harsh terrain and hostile climate in which our Soldiers have performed their duties.

US Army Special Forces troops launched their first strikes in Afghanistan a mere six weeks after the 11 September 2001 terrorist attacks on New York

See The Long War, Page 56


Afghanistan
International boundary
Province (velâyat) boundary
National capital
Province (velâyat) capital
Railroad
Road
0 100 200 Kilometers
0 100 200 Miles
Lambert Conformal Conic Projection, SP 29N / 39N
Boundary representation is not necessarily authoritative.
PAKISTAN
INDIA
PAKTIKÁ
GHAZNI
Kabul
Islamabad
Rawalpindi
Peshawar
Lahore
Jacobábád
Sukkur
Sibi
Zhob
Tank
Bannu
Thal
Kohát
Jamrud
Srinagar
Gilgit
Kunduz
Faizábád
Kulob
Kborugh
Samangán
Baghlán
Pol-e Khomri
Meydán Shahr
Ghazni
Sharan
Khowst
Sardiz
Alamo
Parachinár
Landi Kotal

Delivering supplies in Afghanistan

The Long War, continued from Page 54

and Washington. Fighting alongside Afghan units already there on the ground, they quickly defeated the Taliban and their al Qaeda allies. A year later the liberated people of Afghanistan had elected their own government. But the fighting did not end.

Operation Enduring Freedom has now entered its eighth year. As the search for lingering Taliban and al Qaeda operatives continues, so do Allied efforts to support the fledgling government in Kabul and the Afghan people as a whole. Quartermaster Soldiers played a key role during the earliest days of active combat in Afghanistan. Who doesn't need supplies, parts, petroleum, water, and food? Likewise, Quartermasters have been a dependable, ever-present factor throughout the transition to Phase IV stability and support operations. Today they are still fully engaged in *Operation Enduring Freedom* support and are plainly visible executing their mission throughout the country.

At bases such as Bagram or Kandahar, Quartermaster Soldiers can be seen managing large supply support activities and small unit supply rooms – receiving, organizing, storing, and distributing countless items of supply. They use satellite technology to requisition from afar and laptop computers to handle inventory.

Bagram Air Base, for example, is the central logistical hub for Afghanistan's Regional Command East. Looking about that key facility on any given day, one sees abundant evidence of Quartermaster activity on display in all directions. Quartermaster Food Service personnel run the 101st Division's East Wing dining facility and are busy at all the other on-base DFACs (dining facilities). At the bustling air base nearby sits a mortuary affairs collection point and a team of 92M's charged with caring for the dead. Bagram's rigger shed is where 92R's have been setting airdrop records for the last couple of years and are making great use of LCLA (low cost, low altitude) parachutes.

Quartermaster units and personnel also routinely find themselves on convoys carrying supplies from Bagram to the outlying forward operating bases (FOBs) in the area. It is at these more remote sites, at the FOBs and occasionally the tiny combat outposts, that one encounters yet more Quartermaster supply and service personnel – fuel handlers, SLCR (shower, laundry, and clothing repair), field feeding, and water purification specialists –plying their skills to take care of fellow Soldiers.

Even in the remotest parts of this harsh and mountainous landscape, Quartermasters are about the task of sustaining Soldiers through whatever means possible, regardless of the risks. Oftentimes that means travelling down dangerous roads in combat logistics patrols, or if roads are impassible,

readying supplies for sling load delivery. In a few noted instances, they have even taken a page out of history – ancient history, as in the days of Alexander the Great – and will be seen moving supplies up narrow, treacherous mountain paths on *pack mules and donkeys*.

Back in Kuwait and Iraq, where the larger US and Allied commitment has been, the logistics picture has changed dramatically in the six years since *Operation Iraqi Freedom* began in 2003. The scope and scale of activities is so much greater now, and the situation far more settled, than in those first few years. The original bases have expanded and new facilities have been added, and everywhere it seems, the methods of support have matured. Where highly rudimentary or makeshift temporary storage facilities once stood, today one sees large permanent warehouses and highly efficient means of stock control and distribution. And Quartermaster Soldiers are deep in the process of training Iraqis how to run those facilities.

Moving "down range" from Kuwait, across the border, into and up through Iraq – from Camp Arifjan to Buerhing, to Joint Base Balad and Victory Base Camp, on up to Contingency Operating Base (COB) Speicher and Q-West, all the way to the northern regional capital of Mosul and beyond – it's Quartermaster support the whole way.

At Camp Buerhing, for instance, there is an inland petroleum distribution system laid out with 210,000-gallon POL bags that appear to stretch as far as the eye can see. Scores of US, Allied, and contractor-owned tanker trucks pull up around the clock, fill their tanks, and join a steady convoy delivering the Class III supply wherever it's needed in Iraq.

Joint Base Balad, located in the heart of Iraq, current home to the 3rd Sustainment Command (Expeditionary) and its subordinate units, functions as "Log Central." This is where logistics activities are controlled and directed for the entire theater of operations. And here, of course, one finds more Quartermaster units and personnel instrumental in taking care of Soldiers. The 259th Combat Sustainment Support Battalion (CSSB), formerly the 259th Quartermaster Battalion, served as the largest multifunctional sustainment battalion in-theater from the fall of 2008 to the summer of 2009.

One of its units, for instance, the 356th Quartermaster Company, ran the largest corps distribution center in the theater, while making full use of a newly constructed 160,000-square-foot forward distribution point building. They shipped and received more than 44,000 containers, successfully completed more than 1,400 material-handling equipment missions, and reclaimed tens of millions of dollars of "serviceable excess." Another of its units, the 20th Quartermaster Company, used its 14 reserve osmosis water purification units to provide hundreds of thousands of gallons of potable water to several FOBs in the area.

At COB Speicher, near Tikrit in northern Iraq, the 391st CSSB, during its 15-month tour, conducted multiple "non-lethal engagements" – training, teaching, guiding, and assisting Iraqi nationals in various occupations. Construction of a $17 million Class II steel-bolted tank fuel farm was completed and construction of a new Class I climate-controlled facility was begun between spring 2008 and summer 2009.

The message is clear. All across Kuwait, Iraq, and Afghanistan, logistical challenges (some of them decidedly unique) have constantly arisen for eight long years. Those challenges none-the-less have routinely been met head-on. And they are continuing to be successfully dealt with as the final edition of the *Quartermaster Profession Bulletin* goes to press in July 2009.

Of course such service has not come without sacrifice. Through June 2009, 127 Quartermaster Soldiers have died in defense of our Nation. Many more have been seriously wounded. Their dedication and commitment will forever be remembered.

A picture being worth a thousand words, perhaps the better way to convey current Quartermaster accomplishments in *Operations Iraqi* and *Enduring Freedom* is with recent photographs. The following photo essay is meant to furnish a snapshot of Quartermasters in the Long War.

During February and March 2009, Dr. Anders spent three weeks in Kuwait, Iraq, and Afghanistan. He took many of the photographs while touring Quartermaster facilities and interviewing Quartermaster Soldiers.

92G
Subsistence


ARMY

92F 92L
Petroleum Supply and Laboratory


M.GEE
U.S.ARM


U.S.ARMY


EL

92W
Water Treatment

92R
Aeriel Delivery

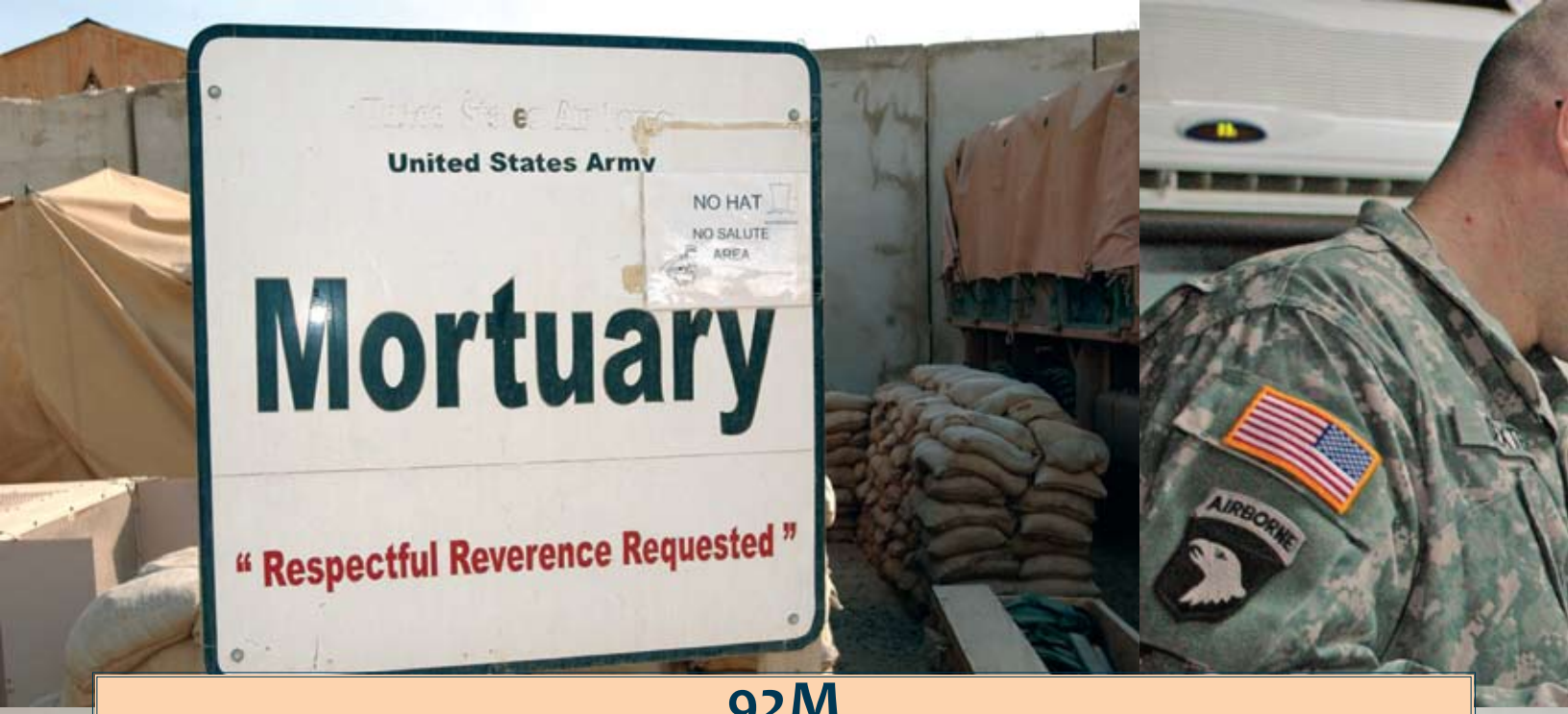
92S
Field Services
Shower, Laundry and Clothing Repair

92A 92Y
Automated Logistics and Unit Supply

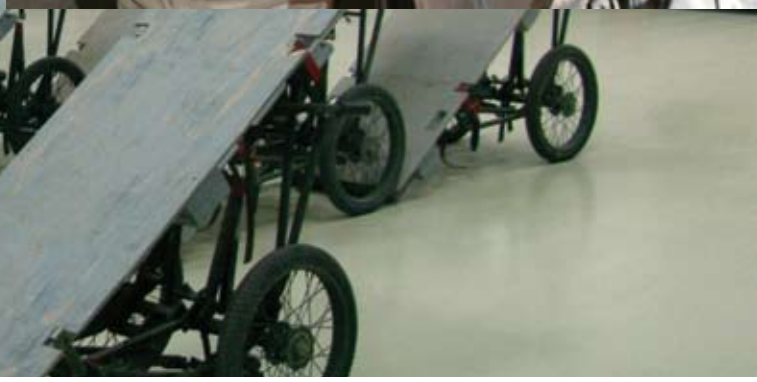

GREGOR

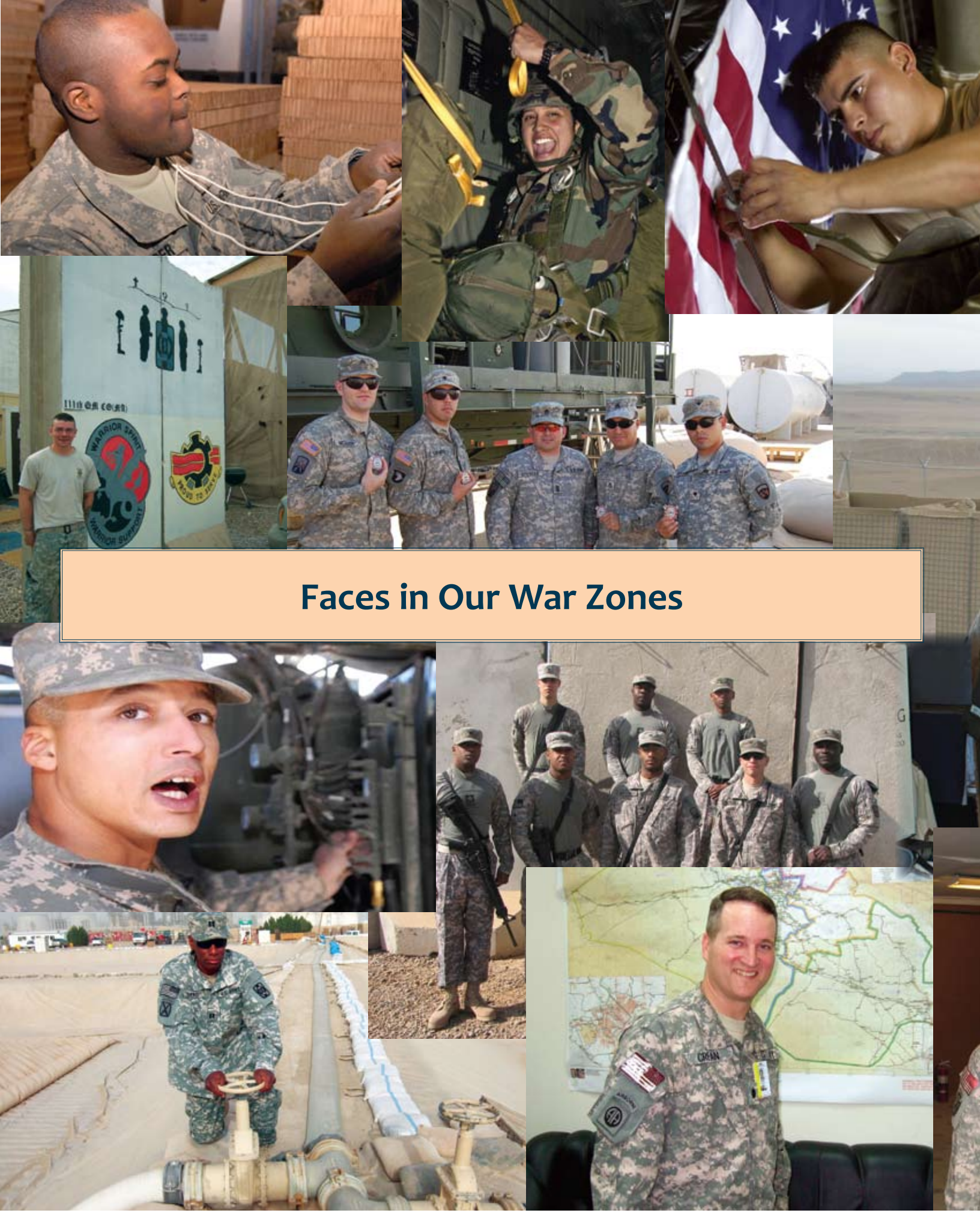

UGR-A


UGR-A
BRK MENU 3
STEAK & EGGS
8970-01-525-6733
BOX 3 OF 3



92M
Mortuary Affairs





Faces in Our War Zones


MORTUARY AFFAIRS

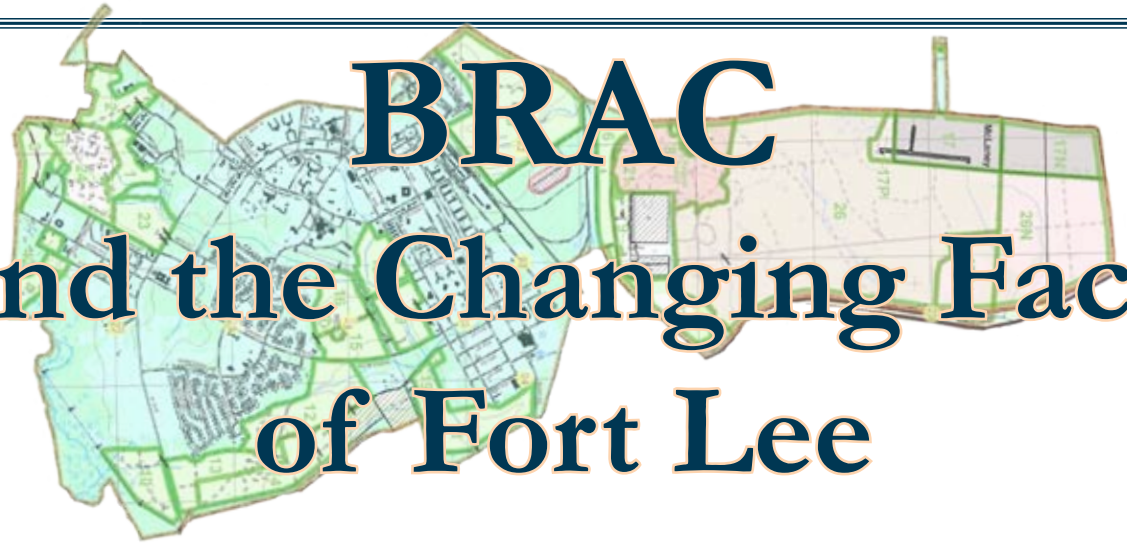
Faces in Our War Zones, continued


U.S.ARMY

Geography of Our War Zones


UNITED STATES ARMY

Geography of Our War Zones, continued



BRAC and the Changing Face of Fort Lee

Fort Lee is experiencing significant and rapid growth as the result of the 2005 Base Realignment and Closure (BRAC) legislation signed into law by then-President George W. Bush. Some 30 buildings, costing nearly $1.3 billion and adding 6.5 million square feet of new facility space, are to be completed by 2011. A number of organizations are relocating to and/or consolidating their operations on Fort Lee as new tenant organizations. When BRAC is fully implemented, Fort Lee will train more than 11,000 service members a day, a significant increase from the 4,100 trained daily in 2008. Fort Lee's total daily supported population is expected to climb from 31,545 in 2008 to 46,763 in 2011.

Moving to Fort Lee as part of the 2005 BRAC are the Ordnance Center and both its schools (Mechanical Maintenance School at Aberdeen Proving Ground, Maryland, and Munitions and Electronic Maintenance School at Redstone Arsenal, Alabama), the Transportation Center and School (Fort Eustis, Virginia), the Air Force Transportation School (Lackland Air Force Base, Texas), Air Force Culinary Schools (Lackland Air Force Base), Navy Culinary Schools (Great Lakes, Illinois), Defense Commissary Agency offices (Hopewell and Virginia Beach, Virginia, and San Antonio, Texas), and Defense Contract Management Agency (Alexandria, Virginia).

Fort Lee is the beneficiary of significant physical improvements to its housing facilities, administrative and headquarters facilities, training and Soldier support facilities, and quality-of-life improvements. BRAC has also brought major changes to the basic organization and functions of the Combined Arms Support Command (CASCOM), transforming it and its subordinate schools into the Sustainment Center of Excellence (SCoE) to meet the challenges of the 21st century Army and the realities of a leaner and more efficient operating environment. The SCoE's organization is leaner and more compact, and it will leverage its new structure to achieve the efficiencies made possible by consolidation of combat service support (CSS) training.

The 2005 BRAC law means much more than just new construction and renovation for Fort Lee, and nowhere is that more evident than in the reinvention of CSS training. The Quartermaster Corps, like both the Ordnance and Transportation Corps, is adapting to the requirements and constraints of the Army of the new century. The functional and organizational restructure of the Quartermaster Corps within the SCoE reflects new approaches in training consolidation, training management, and Joint training philosophy.

The training focus for Quartermaster School (QMS) will be on advanced individual training (AIT) and functional AIT follow-on courses. Joint training will become a hallmark of QMS operations with the advent of the Joint Culinary Center of Excellence and the Joint Mortuary Affairs Center. These new training elements will feature combined and co-located training for elements of the US Air Force and US Navy. Both services will relocate selected training courses to Fort Lee. CSS training for the US Marine Corps is already an integral part of the QMS curriculum. The move to more Joint-oriented

See BRAC, Page 86

CASCOM
The Sustainment Center of Excellence

Army Approved
TDA Effective
30 Mar 09

Commander

Special Staff

CSM

Senior Master WO

DtCG

Chief of Staff

DCG RC Mob & Tng

AL&T

DL2/QA

Army Civilian Logistics Career Mgt Office

Knowledge Management

ESD/TCM Sustainment C2

DCG/Cmdt

DCG/Cmdt

DCG/Cmdt

SSI Cdr

Army Logistics University

Logistics Leadership College

Army Logistics Mgt College

Technical Logistics College

Logistics NCOA

Student Bn

CGSC- ILE Satellite

Quartermaster School

Training Departments

Proponency

QM Museum

Army Women's Museum

AIT Brigade

Joint Culinary Center of Excellence

Joint Mortuary Affairs Center

Capabilities Dev & Integration

Program Integration

Force Development

Concepts & Doctrine

Materiel Systems

TCM-Trans

Sustainment Battle Lab

Ordnance School

Training Departments

Proponency

OD Museum

AIT Brigade

OEMTD, Gordon

94M/94S, Sill

EOD, Eglin AFB

Training Dev & Integration

Collective Training Cell

Training Dev Directorate

Training Dev Support Dir.

LESD

Transportation School

Training Departments

Proponency

TC Museum

DPMO

Joint CoE for Trans Mgt Training

Adjutant General School

Financial Management School

Recruiting & Retention School

School of Music

Postal School

NCOA

Original MOS Producing Schools
Dual Hat Responsibility
Center Level Functions
Senior Commander
Joint

Support Starts Here

Earlier Modernization

1980s
1990s
2000s

Between 1985 and 2005, the Logistics Training Department (LTD), Aerial Delivery and Field Services Department (ADFSD), Petroleum and Water Department (PWD), and the Noncommissioned Officer Academy (NCOA) each moved into permanent facilities. The first permanent 'brick and mortar' building constructed on Fort Lee was the Post Theater, built in 1948. The first permanent barracks and housing units were built in the 1950s and 1960s.

Memorial moves to make way for progress

The First Logistical Command Memorial was dedicated on 25 May 1974 to honor the hundreds of logisticians who lost their lives during the Vietnam War. The plaque inside begins, 'We Pledge Continuing Support to Fellow Soldiers as a Living Memorial,' and ends, 'May Their Souls Rest in the Bonds of Eternal Life.' On 10 February 1992, the Memorial was re-dedicated to 'all combat service support Soldiers who have made the ultimate sacrifice supporting their fellow comrades in the defense of freedom.' When initial construction began on Sergeant Seay Field in the summer and fall of 2007, the renamed 'Logistics Warrior Memorial' was carefully unmoored from its original location, and moved to a prominent position in front of the new Sustainment Center of Excellence Headquarters building facing the entrance to Fort Lee.

Sustainment Center of Excellence

The $50 million Sustainment Center of Excellence (SCoE) Headquarters Building is the first of more than 30 new structures projected to be built at Fort Lee as part of BRAC. This 218,579-square-foot, four-story building sits on 11 acres, directly in front of Mifflin Hall on what was Sergeant Seay Field. Construction of SCoE took 18 months to complete. The SCoE building houses the Combined Arms Support Command (CASCOM), logistics combat and training developments, and command group headquarters for the Quartermaster, Ordnance, and Transportation Corps. The Sustainment Center of Excellence transforms Fort Lee into the third largest training installation in the Army, in terms of student numbers, after Fort Jackson, South Carolina, and Fort Benning, Georgia. The 'new' Fort Lee under SCoE is already being called the 'lifeblood of Army logistics.'

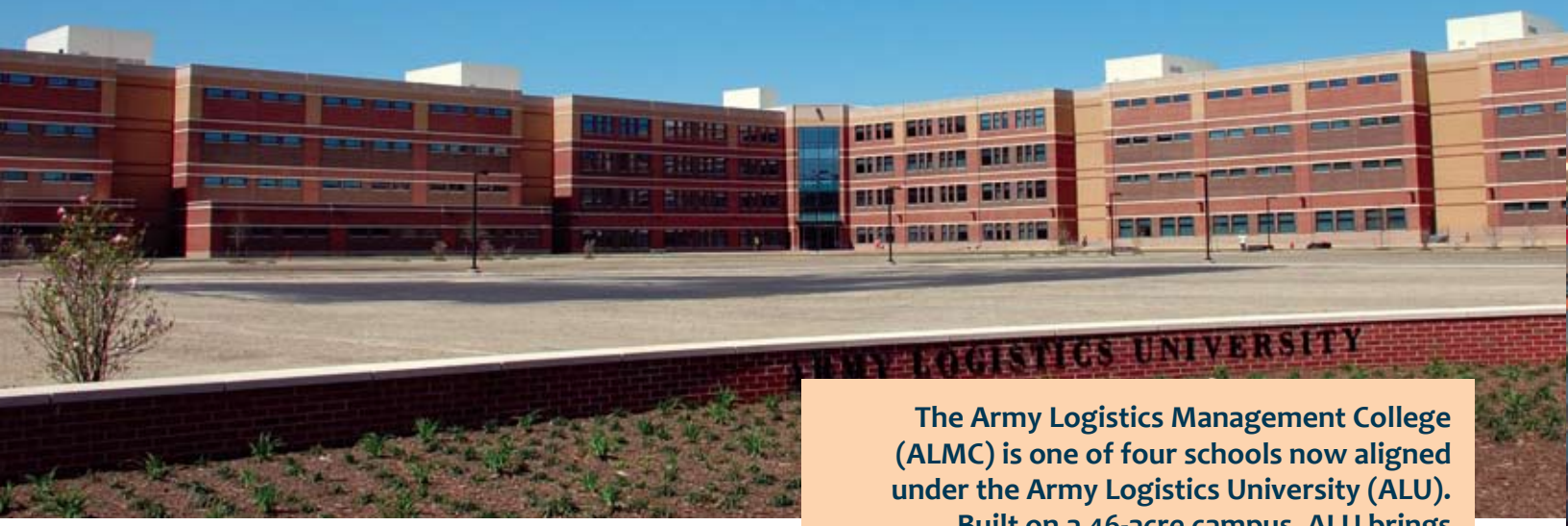
'The SCoE creates a combat service support training center unlike any before . . . '

MG James E. Chambers, Commander
9 January 2009
Ribbon Cutting Ceremony

Virginia Governor Tim Kaine, right, congratulates MG James E. Chambers, Commander of the US Army Combined Arms Support Command Sustainment Center of Excellence and Fort Lee, left, and GEN Martin E. Dempsey, Commander of the US Army Training and Doctrine Command and Fort Monroe, Virginia, at the January 2009 SCoE ribbon-cutting.

Army Logistics University

Army leaders in logistics will come back to Fort Lee throughout their careers as they further their educations



The Army Logistics Management College (ALMC) is one of four schools now aligned under the Army Logistics University (ALU). Built on a 46-acre campus, ALU brings together four distinct colleges, each with unique responsibilities: the Army Logistics Management College, the Logistics Leader College, the Technical Logistics College, and the Logistics Noncommissioned Officer Academy. With 500 staff and faculty members, ALU is to offer more than 200 courses and be able to train an estimated 2,300 military and civilian students daily. The main academic building has 400,000 square feet of space in four stories and includes more than 100 fully automated, state-of-the-art classrooms. ALU also features a large, two-story research library with an expanded collection plus automated data bases and wireless Internet connection. Adjacent to the original ALMC building and the new ALU facility is a new 67,000-square-foot simulation center. The 'Sim Center' allows students to input data, generate realistic 'war game' scenarios, and practice the art of logistical decision-making in a highly interactive environment. This new facility, which opened its doors in July 2009, cost nearly $136 million.

BRAC, continued from Page 80

training is a particularly exciting aspect of the changes within the Quartermaster School. Not only will there be development of world-class training facilities, but the focus on Joint training is also recognition of the preeminent role of the Army and the Quartermaster Corps in culinary, mortuary affairs, aerial delivery, and petroleum operations and doctrine within the Department of Defense.

Several significant changes will be made within the instructional departments of the Quartermaster School as a result of training realignments in support of the new Army Logistics University (ALU). Consolidation of officer, warrant officer and non-commissioned officer professional military education (PME) training will be accomplished by the transfer of the Quartermaster NCO Academy organization and personnel (along with those of the Ordnance and Transportation Schools) to ALU to form the Logistics NCO Academy. MOS- and Branch-specific technical training classes will still be taught within the technical

See BRAC, Page 88


ARMY
LOGISTICS
UNIVERSITY
ALU Lobby
OPES TRACTARE
SAPIENTER
Cafeteria
Library

Reference Section


Classroom


Sim Center Lab

Fort Lee North

BRAC, continued from Page 86

training departments of each particular school; however, instruction in core leadership and other general subjects will be the responsibility of ALU.

PME consolidation will have the greatest impact on the QMS Logistics Training Department (LTD). All Quartermaster officer PME, to include the Quartermaster Basic Officer Leadership Course and Combined Logistics Captains Career Course, along with all warrant officer PME courses, selected functional and faculty development courses (including structure and personnel) will move to ALU. Additionally, the Quartermaster Distribution Management Exercise will fall under ALU management.

AIT will remain "Job # 1" of the QMS. There will be some minor structural changes to the 23rd Quar-

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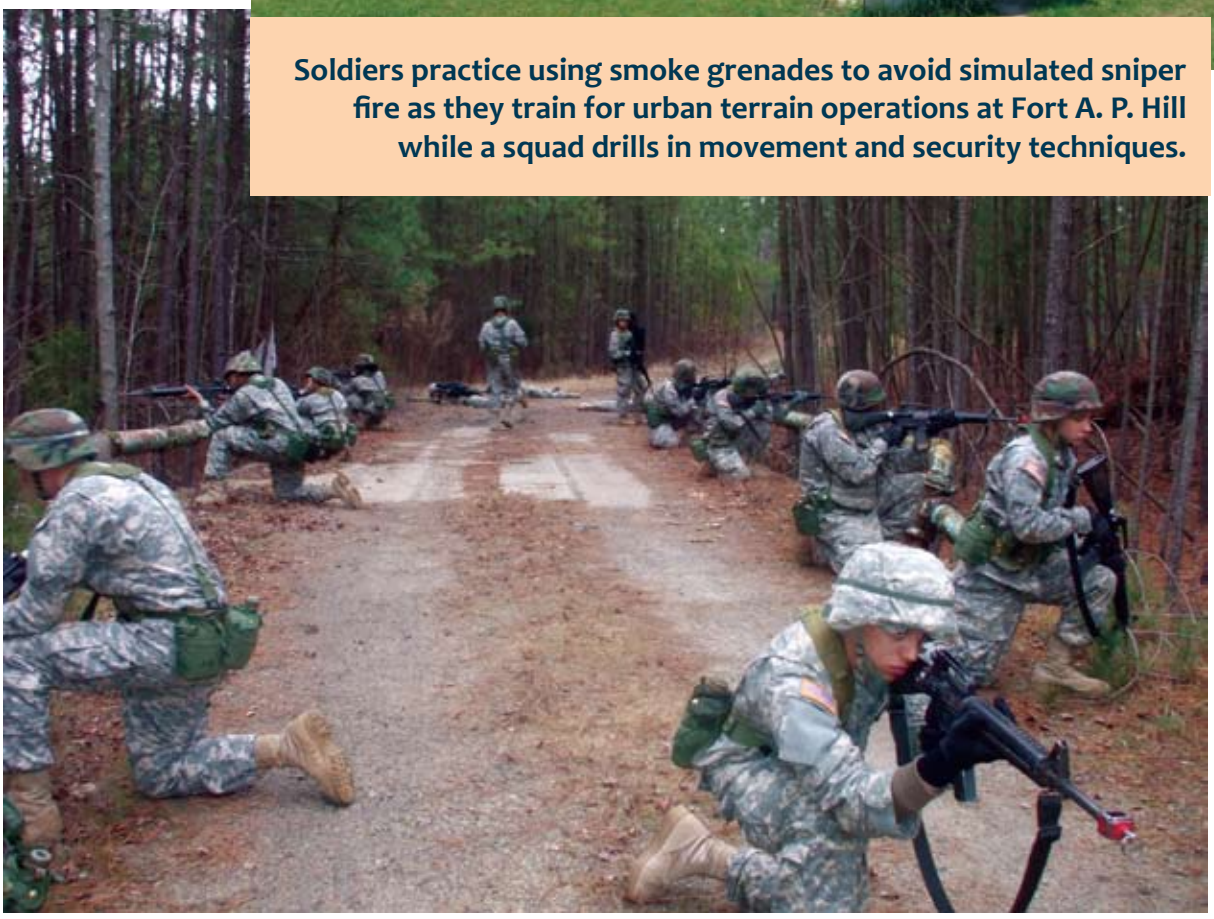
At far left is an aerial view of construction underway at 'Fort Lee North' for the US Army Ordnance Center and School. Above is the Tactical Support Equipment Division. The flyover bridge, at center left, will link Fort Lee North and the traditional campus across state Route 36. In August 2007, a fleet of heavy equipment began clearing, grubbing and grading the wooded area once known as Training Area #5 and the site of the Quartermaster School 'Log Warrior FTX.' This 200-plus-acre site is being transformed into the new Ordnance home. When the 27 buildings of this $722 million state-of-the-art training campus are completed in 2011, they will support an average of 4,500 military students and instructors daily. Fort Lee North will include a headquarters building, five multi-storied barracks, a post exchange, clinic, gym, 10 training bays, and, at 75,000 square feet, the second largest dining facility in the Army. Additionally, the North Range Training Site, pictured at lower left, will also have a series of 'mire pits' used to practice rescue operations for both wheeled and tracked heavy vehicles such as tanks and Humvees.

BRAC, continued from Page 88

termaster Brigade (Echo Company, 244th Quartermaster Battalion will transfer to ALU as the nucleus of the Student Battalion), but its training and support mission will remain unchanged. The consolidation of the CSS AIT training mission at Fort Lee will, however, provide the 23rd QM Brigade with expanded responsibilities. Transportation Soldiers coming to Fort Lee for 88N AIT will be incorporated into the existing battalion structure for command and control.



Soldiers practice using smoke grenades to avoid simulated sniper fire as they train for urban terrain operations at Fort A. P. Hill while a squad drills in movement and security techniques.

Additionally, the QMS will assume overall responsibility for planning and executing the combined Logistics Warrior Exercise. Log Warrior, as the exercise has been known for years, has been the seminal Quartermaster AIT training event, providing the opportunity for AIT Soldiers to train in their warrior tasks and battle drills and in their MOS-specific technical tasks in a field environment. Each of the CSS schools has conducted its own version of Log Warrior. The relocation of the schools to Fort Lee will enable these separate exercises to be combined in an over-arching field training venue under a single standard and a single training management structure. A distinct Warrior Training Support Office, managed by the Quartermaster Director of Training Management, will execute exercise planning, coordinate logistics support, manage facility utilization, and provide other management support as required.

The training will be supported by new and existing facilities on Fort Lee itself, and by specially designed facilities being built at Fort A. P. Hill, located approximately 75 miles north of Fort Lee. The large training areas and numerous range facilities available at Fort A. P. Hill provide a safe, rigorous, and realistic field training environment to complement the world class CSS training Soldiers will receive. These changes, and others to come, will fundamentally alter the way the QMS does business.

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BG Jesse R. Cross, the Quartermaster General, right, observes Log Warrior training from a helicopter above Fort A. P. Hill as Soldiers practice a convoy live fire exercise and ground maneuvers.

BRAC, continued from Page 90

As the way Soldiers are trained at Fort Lee changes, so do other aspects of life on post and the surrounding cities and counties change. The cities of Hopewell, Petersburg, and Colonial Heights and the counties of Prince George, Dinwiddie, and Chesterfield face the challenges of increased traffic volume and classroom populations, for example. But the localities of the Tri-City region also look forward to FY 2013 when Fort Lee's impact on the regional economy is expected to have grown from $860 million in FY 2003 to $1.7 billion. Tax revenue to the region is expected to grow from FY 2003's $57 million to $93 million in FY 2013.

Because BRAC will bring more military families to Fort Lee, improvements are being made to family housing areas. Military construction funds and Army operations and maintenance funds are paying for improvements to existing barracks and other buildings so they will comfortably accommodate more personnel and operations that are expanding and/or moving because of BRAC-related changes. BRAC funding is adding a post exchange facility, the Army's second largest dining facility, a chapel, and a health clinic on the Ordnance campus, for example.

The Ordnance Corps' museum will also move from Aberdeen Proving Ground, Maryland, to Fort Lee,

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BRAC, continued from Page 91

joining the Quartermaster Museum and the Army Women's Museum in a complex on A Avenue that will provide military visitors and the general public with easy access to all three facilities.

Change is never easy. The changes in organization and functions necessary to support implementation of BRAC 2005 decisions will undoubtedly disturb the comfort that comes with tried and true methodology and practice. The Quartermaster Corps will, without question, adapt to the changes and new challenges ahead. The traditions and standards of excellence that have always been a hallmark of the Quartermaster Corps will never change. We will continue to provide our Army with highly trained and motivated Quartermaster Soldiers, who for more than 234 years have been committed to a single goal . . . Supporting Victory!

A new four-story, 90,000-square-foot separate addition, pictured above right, is being constructed for the Defense Commissary Agency Headquarters Building, which was built in 1990-1991 and expanded in 2001. This $21 million addition is to house administrative offices, a cafeteria, several multi-purpose rooms, and a warehouse when it is completed in 2010. The new Soldier Support Center, above center, is an 84,000-square-foot building between B and C Avenues. This $23 million edifice is to replace the Soldier One-Stop facility currently being used to process Fort Lee personnel. The new center, which is to be occupied later this calendar year, is to have five large classrooms as well as office space for more than 200 Civilian employees and an auditorium. The center is expected to process more than 72,000 military students and 11,700 Soldiers and Civilians a year. The photo and inset at lower right are of the $35 million Air Force/Navy dormitory under construction near the new US Air Force culinary addition.

At left is the site plan for the Ordnance campus.


Design and Construction Supervised by:
US Army Corps of Engineers
Norfolk District
Construct Air Force / Navy Dormitory
Project W91236-08-C-0062
Air Force / Navy Dormitory
Fort Lee, Virginia
Contractor:
WM Jordan COMPANY
Richmond, VA
Architect:
Wiley & Wilson
FRACO
MQ POWER
United Rentals
G85

The NCO Creed

No one is more professional than I. I am a Noncommissioned Officer, a leader of Soldiers. As a Noncommissioned Officer, I realize that I am a member of a time-honored corps, which is known as "The Backbone of the Army." I am proud of the Corps of Noncommissioned Officers and will at all times conduct myself so as to bring credit upon the corps, the military service and my country regardless of the situation in which I find myself. I will not use my grade or position to attain pleasure, profit, or personal safety.

Competence is my watchword. My two basic responsibilities will always be uppermost in my mind -- accomplishment of my mission and the welfare of my Soldiers. I will strive to remain tactically and technically proficient. I am aware of my role as a Noncommissioned Officer. I will fulfill my responsibilities inherent in that role. All Soldiers are entitled to outstanding leadership; I will provide that leadership. I know my Soldiers, and I will always place their needs above my own. I will communicate consistently with my Soldiers and never leave them uninformed. I will be fair and impartial when recommending both rewards and punishment.

Officers of my unit will have maximum time to accomplish their duties; they will not have to accomplish mine. I will earn their respect and confidence as well as that of my Soldiers. I will be loyal to those with whom I serve: seniors, peers, and subordinates alike. I will exercise initiative by taking appropriate action in the absence of orders. I will not compromise my integrity or my moral courage. I will not forget, nor will I allow my comrades to forget, that we are professionals, Noncommissioned Officers, leaders!

2009

The Year of the NCO

TOMORROW
LOOKING TOWARD 2050

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Logisticians Remain Indispensible

By General George W. Casey, Jr.

You are part of an Army that is the most combat-seasoned, professional, resilient force I've been associated with in more than 38 years of service. As logisticians, you sustain that force in outposts around the globe. The demands on our Army remain high in this era of persistent conflict. And these demands will likely continue in the decades to come. Yet, I have no doubt our magnificent logisticians will meet them with the same professionalism that characterizes your efforts now.

As we build an Army capable of meeting the diverse challenges of the future security environment, we continue to rely on the expertise of leaders and Soldiers dedicated to providing world-class logistical support under the most difficult conditions. As we transform our Army into an agile, disciplined warrior team that is dominant across the spectrum of 21st century combat – make no mistake – our logisticians remain indispensable to the success of that team.

Army Strong!

GEN Casey is the 36th Chief of Staff of the US Army after serving for nearly three years as the Commander, Multi-National Force – Iraq, a coalition of more than 30 countries. He has served in operational assignments in Germany, Italy, Egypt, Southwest Asia, and the United States. GEN Casey was commissioned an Infantry second lieutenant at Georgetown University School of Foreign Service in 1970. He earned a master's degree in international relations at the University of Denver.

Keeping Soldiers well supplied and well fed are among Quartermaster responsibilities.

General Casey connects with children -- the future of our Nation, our Army and our Quartermaster Corps.

The Future of Logistics and Operational Adaptability

By Mr. Roger Houck

While we cannot predict the future, we can ascertain trends and examine them through the use of alternative futures methodologies and tools. From a logistics perspective, we know that many different futures are possible, all of which are obviously dependent on decisions we make in the present. As professional logisticians, we are obligated to provide the field – our Soldiers – with our best professional determination of what will succeed on the battlefield. We will need capabilities and solutions that are constantly evolving – and improving – to match the operational tempo of a radically changing threat environment. For those who provide Quartermaster services, this article will briefly examine what this means from the perspective of creating what might be termed a *preferred future*.

Future Environment

There are numerous visions and writings offering descriptions of the emerging future strategic operating environment. Typically, they all acknowledge a number of trends – globalization, rapid technological change, unprecedented demographic changes, increased demands on resources, the proliferation of weapons of mass destruction, and increased incidences of failed or failing states. They note that scientists and engineers are expanding the limits of our understanding of what is possible. Futurists say we are on the verge of reaching an *inflection point* in history, where the advancement of technology and the convergence of scientific and engineering disciplines are such that our world will fundamentally change. Within this environment of change, military challenges will be enormously complex and diffuse. The Army commander of tomorrow will need to deal with high demands on the force, operations with Joint and multinational forces, a mix of current and future organizations, systems with varying degrees of interoperability, and making sense of vast amounts of information. For the Quartermaster, execution of functions involving petroleum, water, unit and automated supply, subsistence, mortuary affairs, aerial delivery and field services such as rigging,

showers and laundry, and clothing repair will be viewed from the perspective of the integrated application of these capabilities across the range of the operations and Joint operating area. These functions may also include support to natural disasters and other civil support roles in which the Army's extensive sustainment capabilities can be brought to bear. The Army Quartermaster will be able to quickly diagnose any condition confronted and then quickly *adapt*, leveraging potentially unprecedented improvements in logistics planning, execution, and control. Both derivative and entirely new capabilities will become available.

Future Logistics: The Big Ideas

In describing the future of military logistics, among the most important yardsticks we will use to measure success is the extent to which we are operationally adaptable, able to plan for and manage operational transitions over space and time, and leverage unity of effort to ensure freedom of action. This suggests the following logistics imperatives that allow us to achieve operational adaptability.

Force Projection and Operational Mobility

The US in the future will require the capability to project power rapidly from the continental US and forward locations. While the Air Force and Navy have inherent capabilities to do this, the Army does not. It is dependent upon others for strategic mobility. A key operational challenge will continue to be gaining access to a theater of operations and establishing a sustaining capability for the deployed forces. Improvements in intermediate staging bases, more and improved force and sustainment pre-positioning and high-speed intra-theater vessels, potential high-speed transoceanic ships, and high-capacity super-short take-off and landing platforms all have the potential to let us get to the fight faster and flow forces more effectively. This includes a critical need for the ability to quickly move sufficient heavy and/or medium land forces into the conflict area, and the capability to move beyond the points of debarkation to the fight through mounted vertical maneuver. It also includes the use of Joint-capable systems that fuse operational and logistics information that is critical to pushing combat power to the point of need.

Common Logistics Operating Environment

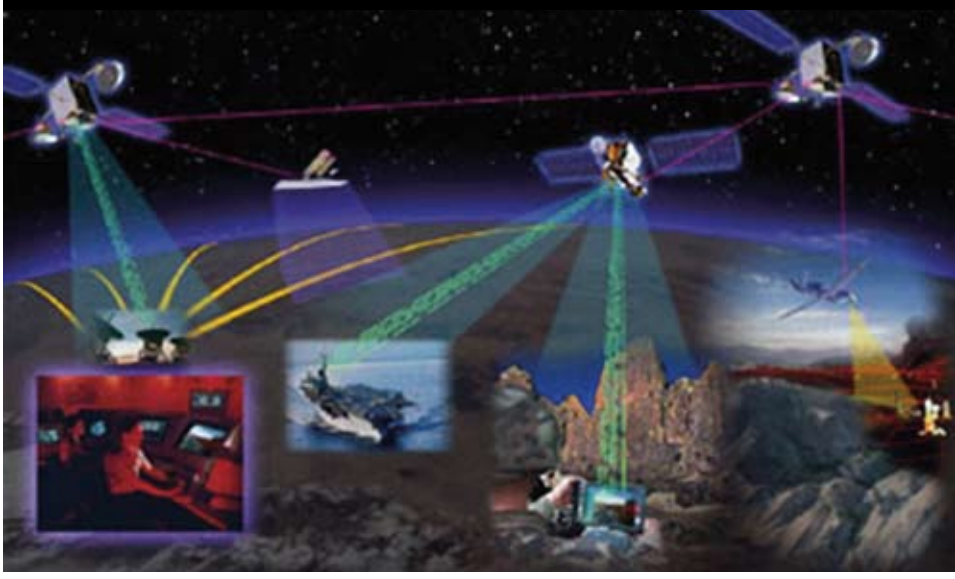
Logistics organizational approaches, information, and technologies will in the future come together in a single architecture that enables the warfighter and logistician at all levels to have total situational awareness within a common operating picture. This will be the catalyst for changes in our sustainment processes. These changes will range from calls for support, requisition of items from supply, and in-transit visibility to fleet-trending and analysis, reliability, adjustments to maintenance programs, and prognostics capabilities that serve to improve the availability of weapon systems throughout their life cycle and reduce costs.

Decision Superiority

The future will see a compression in the military decision-making process. The Army, as a component of Joint forces, will accomplish operational and tactical missions at higher tempos while distributed across much larger operational areas. This will require logistics command and control capabilities that allow us to share information across the force, unhindered by distance, terrain, weather, or hostile activity. These capabilities will include improved information processing, automated updating and distribution, filtering, fusion, and course of action development across functions and levels that help ensure that the volume of information does not overwhelm commanders and staffs. First and foremost is the need for connectiv-

See Operational Adaptability, Page 100

Accelerated business processes, information sharing, operational decision-making, and subsequent actions require visible, understandable, and accessible logistics data across strategic-national and operational-tactical levels.



Operational Adaptability, continued from Page 99

ity, with satellite and sensor data fully interpreted and understood, greatly increased data storage and processing, increased ability to transmit information, both wireless and other means, and flexible, mobile, and easily deployable communications.

'Intelligent' Supply Chains

Future supply chains will be characterized by advanced, sophisticated business intelligence tools integrated with predictive analysis and other capabilities to preempt requirement needs. This will cover the waterfront of how we employ things like robots to replenish the force, both ground and air. Self-healing qualities will automatically adjust and reconfigure the supply chain, reroute information flows, and execute immediate action measure. Central to this capability is the need for always-on, secure communications and standardization of supply chain business processes, rules, and systems. The availability of multisource, multipath information will lead to greater shared awareness and understanding.

Reduce Logistics Demand

From the perspective of future logistics, we can imagine systems that never fail during an entire mission because of their advanced materiel design, faultless assembly, and ability to detect impending failure. Batteries might last days and weeks instead of hours. Power may be created by turning human waste into a usable resource. Logistics demand is more than power, fuel, energy, water, munitions, and big loads. It also encompasses supporting force structure, organizations, and a host of other factors. The Army's efforts to reduce logistics demand through the Condition-Based Maintenance Plus program will continue to refine and expand maintenance capabilities and procedures by real-time assessments of weapon system condition obtained from embedded sensors and/or external testing and measurement. Over the long-term, investments in technologies that have logistics applications offer the potential to make further reductions in demand and improve life cycle management.

With rapid improvements in robotic technologies come new opportunities for such systems to provide improved logistics support.

Science and Technology

Over the next two decades, it is likely that profound advances will be made in a number of select technology areas that have the potential to improve logistics effectiveness and efficiency. These include artificial intelligence, robotics and autonomous systems, immersive environments, energy-on-demand, designer materials, and advanced computing and communications. Space does not permit a lengthy description of each, but a few illustrative examples are worth talking about.

If we project ourselves into the future, what do we see? The capability for on-demand energy and power systems that satisfy all mission requirements and minimize the need to transport energy sources significantly changes the nature of what flows through the logistics pipeline. Water sustainment operations are characterized by a greater degree of self-reliance, forward mobile storage capabilities, improved distribution systems, and more modular and capable sustainment organizations to which water capabilities are attached. Technologies allow the extraction of water from ambient humidity and have the potential to reduce resupply and storage requirements significantly, enabling the force to operate three to seven days without resupply. Capabilities are further enhanced through processes and technologies that make possible improved recycling and reuse of wastewater produced by field feeding operations, including mobile kitchens and associated sanitation centers. Technological advances in food preparation, packaging, distribution, and contamination-avoidance technologies help ensure that required subsistence supplies and equipment are available when and where needed. Supply data and transactions are transparent and

Logisticians must provide responsive sustainment to a rapidly deployable Army to meet threats worldwide while applying the lessons from Iraq, Afghanistan, and future conflicts.

accessible across enterprise-wide sustainment business operations. Integrated sensors and identification tags maintain inventory and monitor equipment condition and status. When supplies are moved, movement occurs with leader/follower convoys tracked and managed in real-time by logisticians using a common operational picture shared with the supported warfighter. Decision-making is applied in the context of next-generation supply chain operations, business forecasting, and behavioral risk management with automated pallet assembly, improved global inventory tracking and control. Robotics improve warehouse operations beyond the automated material handling equipment of today by incorporating sensors that improve inventory accuracy and monitor the condition of material in storage. While delivery of supplies and equipment by air-land and airdrop is routine, unmanned systems operate in a network. Unmanned platforms incorporate advanced designer materials, have a high level of onboard computational speed and magnetic storage capacity, weigh less, and are capable of sustained operations spanning five to 10 days or longer. These illustrative examples will result only from having identified and understood the implications of new approaches to resolving enduring problems, testing, and retesting those approaches to make sure that we get it right.

Conclusion

The pace of change that is upon us will continue, perhaps even more intensely. A distinct strategic, operational, and tactical advantage can be achieved by developing, integrating, and synchronizing solutions across the range of logistics and Quartermaster functions. The introduction of new technologies, and the changes to business processes, doctrine, tactics, and techniques that they enable, may ultimately help us mitigate the effects of current decision-cycle lags and the tyranny of time, distance, and mass. We stand at the threshold of an opportunity to apply innovative solutions that cover the waterfront for logistics. This waterfront may reach out to include functions and capabilities rendered in support of humanitarian missions, disaster relief, pandemic-type health crises, terrorist attacks on US soil, and other events sometimes categorized as "strategic shocks." This means that we must look outside our own experiences and comfort zones and find the innovative ideas. In the futures-focused articles that follow, it is hoped that the reader will come away with a clear understanding of the scope of changes occurring in the Army logistics community and how those changes will improve our ability to both deploy and sustain the force.

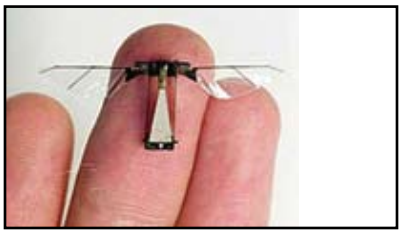
Mr. Houck is a retired Air Force officer with a background in operations, intelligence, and competitive strategies. He has a master's degree from the University of Southern California and graduated from the Air Command and Staff College and Air War College. Mr. Houck is an employee of the Department of Energy's Pacific Northwest National Laboratory and supports the US Army Logistics Innovation Agency as a futures analyst through the Intergovernmental Personnel Act Mobility Program.

Logistics by Robot: Imagine the Possibilities

By Mr. Alan Wyatt

Consider this vignette. 2025 off the coast of a country involved in a brutal civil war, thousands of tiny insects are released from a nearby ship. They travel a short distance to land, navigating the desert, the trees, then the town. They are searching for the enemy, searching building by building, room by room. As the insects locate the enemy, they descend upon them and, like a mosquito, bite and inject them with a substance potent enough to incapacitate or, if necessary, kill the enemy.

By the time the mechanical mosquitoes have suppressed the enemy, a ship has docked and cargo vehicles are rolling off. The vehicles operate autonomously, receiving route and destination data via satellite communications. The only passengers in these unmanned ground vehicles (UGVs) are casualty extraction robots (CERs). The UGVs arrive at their destination, a town of sleeping enemy. The casualty extracting robots dismount and begin locating and recovering enemy combatants, placing their limp bodies in the UGVs. The adversaries will later wake up in a cell wondering what happened to them.



The robots of tomorrow will come in many sizes and logistical functions as technology continues to evolve.

After the robots clear the town of the enemy, humanitarian relief to the civilian population becomes the priority. A Soldier peers at a video screen to remotely guide an entire convoy of UGVs delivering relief supplies. As the convoy travels, a sensor in one of the vehicles determines that its oil needs to be changed. The vehicle stores the information in its data bank. Once the convoy stops at its next scheduled destination, the UGV's automated maintenance system activates and the vehicle changes its own oil. That night, a parachute lands just yards from the petroleum supply point with 13 quarts of oil to replace the 10 used by the UGV and three that a Soldier removed from the shelf for other maintenance.

An enterprise system monitors the status of provisions through logistical data transmitted automatically. Unmanned systems and the enterprise network take care of monitoring supply levels and issuing replenishments. The enterprise system knows exactly how many quarts of oil are on the shelf at Location "X" at any given time. It also knows that the cargo vehicle will use 10 quarts to change its own oil. The supply system communicates this information and triggers a robotic picker to remove needed quantities of oil from the shelf, place the goods on conveyers, and move the oil to waiting aircraft for delivery. The aircraft -- an unmanned aerial vehicle -- flies autonomously to the location and drops the supplies. A self-guiding parachute lands the oil within yards of the petroleum point.

Clearly, it would not be practical to airdrop a quart of oil each time someone removes one from the shelf. However, in the future, we will monitor the health of our systems with sensors placed throughout the operating environment. Commanders will have real-time access to critical logistics information such as fuel and water levels, operating temperatures of engines, viscosity levels of oil, and air temperature. The enterprise systems will routinely query these sensors, reconcile the data, and provide solutions using logistical algorithms. Once the enterprise system has resolved the algorithms, robots receive specific tasks to carry out autonomously or semi-autonomously. For example, as a water point issues water to units filling their water buffalos, sensors in the main water tanks track the dropping water level and transmit that

Human hands may be on many robots' controls today (above left), but robots that transport items, as above, handle ordnance disposal, or transmit video images (at left) will be replaced with more evolved autonomous models.

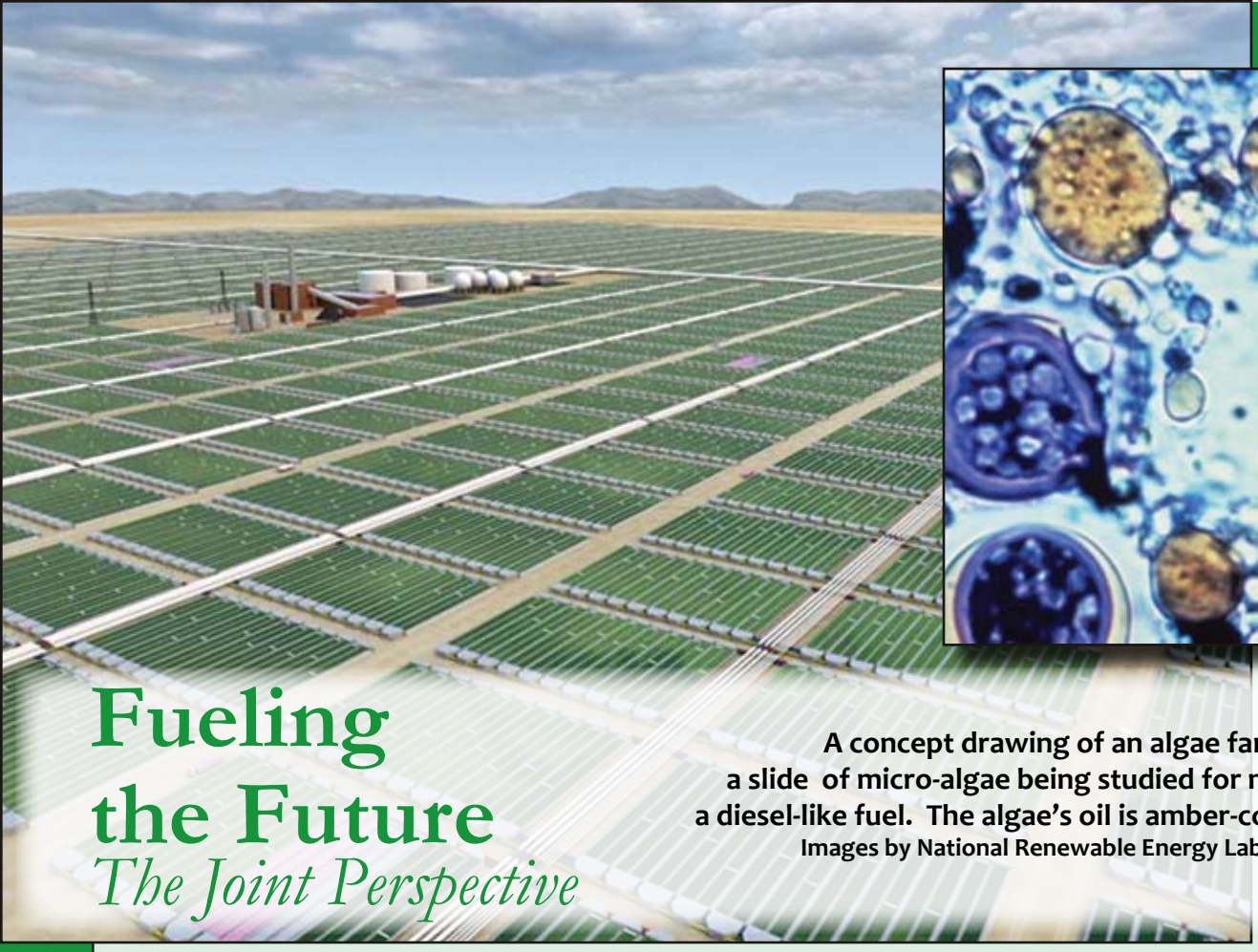
data to an enterprise system. The network transmits this information to the main water supply point in another geographic area. The enterprise system then automatically activates robotic water supply trucks that autonomously move fresh water to the water point.

Robotics and "sense and respond" technologies are part of the Future Combat Systems concept scheduled for fielding in 2015. The number of robotics used in military applications will increase significantly over the next decade. The 2001 National Defense Act mandates that one-third of the operational ground combat vehicles be unmanned by 2015.

The Robotics Systems, Joint Program Office, estimates that 162 unmanned ground vehicles were in use, primarily in Iraq, in 2004; their focus was explosive ordnance disposal. Now in 2009 the US Army has deployed more than 35 times as many unmanned ground vehicles. These approximately 6,000 robots in the global war on terror serve in a multitude of roles besides ordnance disposal. We see from the growth of unmanned systems they are proving their effectiveness. Unmanned capabilities will continue to expand both in quantities deployed and mission areas supported. Robotic systems currently in use include a mix of prototypes, commercial off-the-shelf purchases, and specialized equipment fielded for a variety of mission areas.

Logistical applications are not currently listed in the priorities for ground, aerial or marine robotics. Only one platform in the Future Combat Systems group is a logistical platform, the Mule-T cargo vehicle. If you search for unmanned systems among the many private companies currently developing robotic prototypes, you will find some logistical systems in development. Industry understands there will be a need. The logistical folks should engage themselves in the acquisition and development of unmanned systems to ensure proper provisioning, as we will be required to sustain these systems, and to ensure senior Department of Defense and service officials understand the benefits of using unmanned logistical systems.

Mr. Wyatt is a General Dynamics Information Technology employee working as a combat developer in the US Army Sustainment Center of Excellence, Fort Lee, Virginia. He is a retired chief warrant officer three.



Fueling the Future

The Joint Perspective

A concept drawing of an algae farm and a slide of micro-algae being studied for making a diesel-like fuel. The algae's oil is amber-colored.
Images by National Renewable Energy Laboratory

By Colonel Shawn P. Walsh

About a century ago the first motorized vehicles were tested by the United States Army and then employed in 1916, when the Army was called to stop Mexican rebel leader Pancho Villa's raids in the American Southwest. With the new motorized capability, Quartermaster Soldiers shifted from providing feed for horses and mules to providing gasoline for vehicles. Thus, the military's thirst for, demand for, and dependence on oil began and the POL Soldier was born. But how much longer until global oil production enters terminal decline and oil fields become depleted? How long will the POL Soldier stay in business pumping liquid fuels?

When global oil production will peak is an uncertainty debated by oil scholars. Pessimists, such as Kenneth S. Deffeyes in his book *Beyond Oil: The View from Hubbert's Peak,* argue that global oil production peaked in 2005, and optimists, like Daniel Yergin, believe that with advances in oil production technology, global oil production may not peak for another 20 to 40 years. Regardless, oil's yield will peak if it hasn't already, and statistics show great potential for growing world oil demand to outstrip supply in the next 25 years. Once it peaks, production curves decline permanently in a relatively sharp downward arc.

The United States imports approximately 12.6 million barrels of oil per day from foreign sources. This equates to about 60 percent of the country's daily need. In 2008, United States' military forces purchased more than 122 million barrels of petroleum products from the Defense Energy Support Center (DESC). This equates to more than five billion gallons or consumption that exceeds 14 million gallons per day.

With the operational life expectancy for many of today's gas-guzzling military systems extending as far as 2050 and with the next generation of gas-gulping systems in development, what fuels could potentially "drop in" to existing platforms and fuel-handling systems? What does the future hold for military fuel-handlers, and which energy supplies will fuel the United States' military forces as we move from the current petroleum era into a future of dwindling global oil supplies?

Alternative Bridges to the Future

Technologies exist today to produce synthetic fuels or synfuels. Coal, natural gas, or biomass

feedstocks such as plants, wood, grass, agricultural residues, or municipal or industrial wastes, are used to produce synfuels. Through chemical conversion, the feedstocks are gasified and then converted to a liquid synthetic fuel product. Synfuel products include naphtha, kerosene, diesel, and jet fuel. The best known synfuel production process is the Fischer-Tropsch process, invented by German scientists in the 1920s and used by oil–starved Germany and Japan during World War II.

Use of synthetic fuel conforming to jet propulsion-8 (JP-8) fuel standards and blended with JP-8 is the current military strategy to begin the evolution toward reducing demand for petroleum-exclusive fuels. Synthetic aviation fuel, derived from the Fischer-Tropsch process, is purchased today by the Defense Energy Support Center to support ongoing military testing programs.

The Air Force, which consumes more aviation fuel than the other services combined, started testing synfuels in 2006 and continues to evaluate and certify aircraft using a 50/50 mixture of synthetic fuel and JP-8. This fuel mix can "drop in" to existing systems without major equipment modifications. To date, the Air Force has certified the B52, B1, and C17 aircraft on the 50/50 fuel blend and is working to certify its entire fleet of aircraft and ground support equipment within the next few years. The goal of the Air Force is to have 50 percent of its domestic aviation fuel coming from alternative sources by 2016. While Army and Navy testing programs are not as advanced, they are expected to follow the Air Force lead.

Large-scale synthetic fuel production facilities currently do not exist in the United States; however, conditions for venture capitalists to build such plants may soon change. First, there must be demand for synfuel products. The federal government, led by the Department of Defense, could generate this demand if testing and economic conditions are met: Military testing must first certify that synfuels meet military requirements and that the life cycle greenhouse gas emissions from synfuels are less than those of conventional petroleum sources, a requirement of federal law. The right economic conditions must also exist. With global oil demand forecasted for continuous growth and with peak oil production somewhere on the horizon, supply-and-demand economics will make costs of operating synfuel plants competitive when compared to the relative higher costs of crude oil.

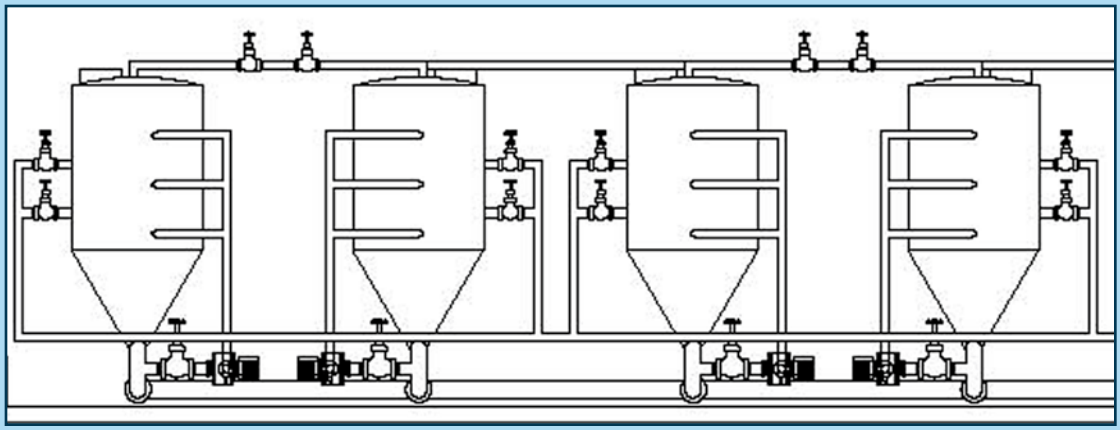
Ethanol and biodiesel are other alternative fuels available today. Ethanol is currently produced in the United States using corn; however, cellulosic ethanol technology that uses fast-growing plants is in development for mass production. Most ethanol produced in the United States is used as a drop-in fuel, blended up to a 10 percent mix with gasoline, and found in approximately two-thirds of retail gasoline stations around the country. This 10 percent ethanol mix reduces smog-producing emissions and stretches gasoline supplies.

E85, an 85 percent ethanol and 15 percent gasoline mixture, is sold at less than 1 percent of gas stations around the United States and is hard to find outside the Midwest. E85 is used in flexible fuel vehicles that are designed to use any combination of gasoline and ethanol up to 85 percent ethanol. E85 emits fewer smog-causing pollutants than gasoline but is also less efficient than gasoline, meaning fewer

See Joint Perspective, Page 106

An early US Army truck, circa 1912..

Joint Perspective, continued from Page 105



Bell BioEnergy Inc. is providing biomass test units like this to six Army sites to test an initiative to turn waste into fuel. The units employ new technologies to turn biodegradable waste into fuel, soil, and other marketable products. DESC will test and evaluate these products to determine their potential uses.

miles per gallon with E85 than with standard gasoline.

Biodiesel fuels are produced with fatty substances, such as soybean oil, canola oil, animal fats, or recycled cooking fats. Biodiesel is available in pure form or as a blend with traditional diesel fuel. Diesel vehicles can operate by burning a blend of 20 percent biodiesel blended with conventional diesel with no engine modification

The Department of Defense uses ethanol and biodiesel as a result of the Energy Policy Act of 2005, which requires federal fleets use alternative fuels in dual-fuel vehicles where those fuels are "reasonably available." Due to this legislation, the Defense Energy Support Center became the largest single buyer of E85 and B20 in the United States in order to support military installation requirements. These fuels are used today in non-tactical vehicles and equipment; however, these fuels have not been proven compatible with JP-8 for use in tactical platforms and are not promising for wider military use in the future. Ethanol could potentially be blended with AVGAS for smaller unmanned air vehicle; however, AVGAS represents a very small percentage of military fuel usage. Ethanol is also not likely to be an enduring fuel of the future, as substantial production requires huge amounts of feedstock. Corn as an ethanol feedstock creates an unwise competition between using corn for fuel or for human and animal food.

On the Horizon - Truly Green Energy

One of the most promising future fuel sources is also one of the oldest forms of life: algae. Algae offer great potential to be an affordable feedstock and alternative to petroleum-derived JP-8. Within the Department of Defense, the Defense Advanced Research Projects Agency (DARPA), DESC, Air Force, and Navy are testing to determine if refined algae oil meets the specifications of JP-8 and other military fuels. Initial results of algae-based drop-in fuels are favorable.

Department of Energy (DOE) data show that micro-algae are capable of producing 30 times more oil per unit of land, when compared to other potential biofuel feedstock crops such as soybeans or corn. DOE also estimates that if algae fuel replaces all petroleum-based fuel in the United States, approximately 9.5 million acres of algae "fields" are required. In comparison, there are approximately 450 million acres used for growing crops and animal feed in our country.

The good news is that algae production would not compete for precious farmland, as algae grow well in arid environments. Looking at Pancho Villa's former area of operations in the American Southwest, the United States has plenty of land for algae to thrive. Water, sunlight, and carbon dioxide are all algae need to grow. In the right conditions and with the right strains of the tens of thousands of algae species known to science, this renewable future "green crude" grows amazingly fast and produces lipids that store oil in about half of algae's body weight. When harvested, the "green crude" can then be refined, using existing oil refinery technology, to produce military specification fuels. Since algae require carbon dioxide to grow, algae-based fuels are considered carbon neutral and thus relatively better for the environment.

While algae's oil-producing capabilities sound too good to be true, much research and development are required before our country sees large-scale algae farms and subsequent fuel production. From 1978 to 1996, DOE funded a program to develop algae-based renewable fuels. Due to funding constraints, the program was terminated. The summary of DOE's Aquatic Species Program highlights the fact that algae technology faces many research and development hurdles in order to be feasible. Private ventures, however, continue to aggressively pursue this energy source, as its possibilities are huge.

Logo on this B-52H shows it flies with 50/50 'drop-in' fuel.

The Future with Hydrogen

Hydrogen offers great potential to revolutionize military and America's energy demands over the next 40 years. As a renewable energy source, hydrogen can be replenished at the same rate it is used, and hydrogen-fueled vehicles are environmental friendly since the only emission is water vapor. Hydrogen-powered concept vehicles are available today; however, these vehicles have special engines and storage tanks, so hydrogen is definitely not a drop-in fuel. Significant research and development are required to make hydrogen feasible and cost effective for widespread use.

There are various methods to produce hydrogen, with many in early stages of development. These include nuclear, renewable, gasification, and other chemical processes. Currently, the cost to produce hydrogen is much higher than that of conventional petroleum products.

When compared to gasoline, hydrogen has less energy by volume; therefore, with current technologies, hydrogen-powered vehicles require a very large storage tank to have a range comparable to gasoline-powered vehicles. Hydrogen also requires special infrastructure for refueling.

Research and development by the government and private sector continue to improve hydrogen production, storage, and infrastructure capabilities. Advances in hydrogen technologies, coupled with future crude oil economic factors as described earlier, should reduce hydrogen's costs, lead to large-scale production and use, and make it the most feasible fuel of the future. As hydrogen technologies advance, we can expect military equipment developers to produce concepts and start development of hydrogen-based military platforms and support equipment.

Conclusion

In the near-term and for some time to come, military fuel handlers will continue pumping liquid fuels. While the products may not be petroleum-based fuels, they will be similar or identical in specification to fuel products of today. Ironically, the fuel sources could be some of the same feed Soldiers provided for horses and mules a century ago.

When hydrogen technologies advance, we will see a significant change in battlefield equipment and in relative refueling techniques and procedures. So, a century from now we can expect "H Soldiers," in place of the legacy POL Soldier, producing, storing, and issuing hydrogen to future tactical equipment.

Regardless of what alternative military fuels come in the future, our tanks should sport a bumper sticker similar to the one found on the car belonging to James Woolsey, former CIA director and now alternative energy advocate. Woolsey's Toyota Prius has a bumper sticker that reads "Bin Laden hates this car." With persistence and evolving technologies, our military and country can wean away from foreign oil to use cleaner energy produced in the United States. Technologically, we are not there just yet, but the time is near.

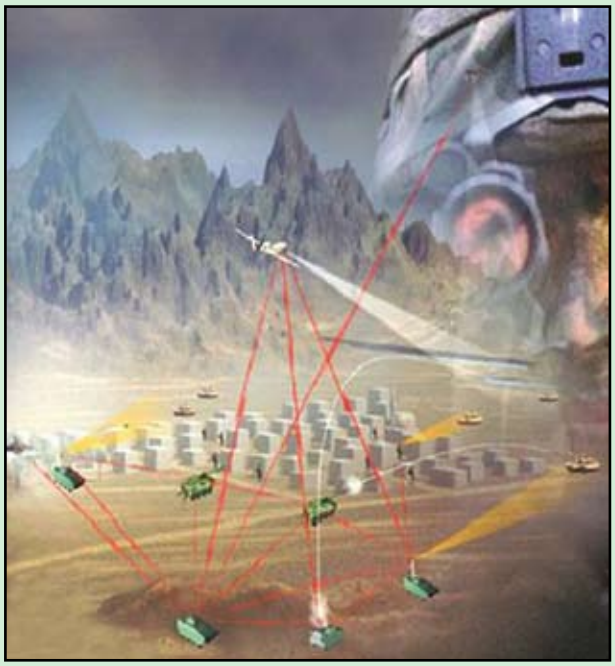
COL Walsh is the Commander, Defense Energy Support Center (DESC) – Americas, the mission of which is to provide the Department of Defense with comprehensive energy solutions. Walsh deployed in support of Operation Iraqi Freedom. In addition to a bachelor's degree in business administration, he earned a master's in strategic studies from the US Army War College.

Fuel and Energy

Embracing the Revolution in the Army

By Ms. Christine J. Myers

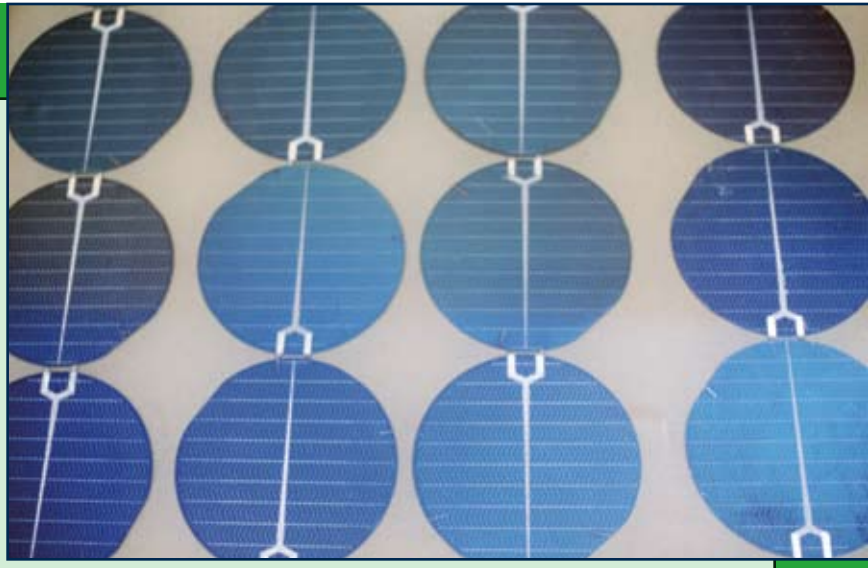
Close your eyes and mentally transport yourself to the year 2030. Imagine yourself as a deployed Soldier living in the base camp pictured here. Your adaptive camouflage uniform is lightweight, ballistic protective, and contains mini power cells, re-charged by your body heat or solar energy, that can be used to power your individual Soldier systems. Your helmet contains long-range telemetry, infrared, night vision, and access to an array of systems that provide linkage to data systems for asset visibility and orientation, as well as communication capability – all powered by tiny solar rechargeable batteries or cells. Your vehicle is powered by a fuel cell, possibly a hydrogen fuel cell, so that if you are thirsty, you can drink the exhaust. If you are hungry, you can prepare a meal by pulling a tab that triggers an internal chemical heating/cooling system providing both hot and cold menu items. Your weapons are made of a lightweight composite material and require no bullets. Due to reduced heat signatures and adaptive camouflage surfaces, convoys and unmanned aircraft systems move stealthily to deliver supplies. Your sleeping module maintains a comfortable temperature due to superior insulating properties and efficient heating and cooling systems that require minimal external energy sources. Your shower water is heated and re-cycled, also using minimal external energy. This future base camp is powered by solar, wind, battery, power cell, co/tri-generation and perhaps nuclear energy. In the year 2030, fossil-based fuels such as diesel and JP-8 are both scarce and expensive. The world has changed. The Army has adapted, and the US remains the premiere fighting force in the world.



Now open your eyes and be aware that to get to the year 2030, we have to start now! We are facing a global oil crisis that affects all of us, including the Army. As global sources of fossil-based fuels dwindle and developing nations increase the global demand, cost stability and product availability are at increased risk. This lack of energy security poses a threat to the Army's ability to defeat the enemy and win wars. Industry has already begun to respond to this crisis by developing alternative fuel and energy sources and introducing them to the public. President Obama emphasizes the need for the development and implementation of alternative energy sources in both the private and public sectors. As a result, the President has included alternative energy initiatives as part of his stimulus package to boost the economy. To remain relevant and ready, the Army must incrementally transition the existing fleet of tactical generators, tactical vehicles, aviation platforms, and combat systems to reduce costs, energy demand, and reliance on fossil-based fuels.

The fuel and energy revolution has begun!

Recognizing the need for a more focused look at the tactical fuel and energy requirements, the US Army Combined Arms Support Command (CASCOM) initiated a study, sponsored by the Army G-4, to establish a Future Tactical Fuel and Energy Strategy and Implementation Plan. This strategy and plan provide the Army with an overarching road map as well as specific goals and recommendations for tactical fuel and energy transformation through the year 2024 and beyond. The strategy portion, completed in May 2009, establishes the following five goals for tactical fuel and energy efforts:



Solar cells are among alternative energy sources.

- Goal 1 – Reduce dependence on fossil fuel.

The US currently uses 22 million barrels of oil per day, while it only produces approximately 8.5 million barrels per day. As a result, the US and the Army are considerably dependent on foreign countries for the majority of their energy requirements. To relieve the pressures of this nation's dependence on foreign oil, we must reduce consumption, use new energy sources as industry develops them, and, where possible, make maximum use of renewable resources.

- Goal 2 – Reduce consumption while maintaining current tactical capabilities.

In order to achieve this goal, careful consideration needs to be given to what the future Army tactical capability requirements are in a joint operating environment. This goal can then be achieved by aggressively pursuing various energy- and fuel-saving initiatives, including the development of fuel-efficient engines, energy awareness programs, fleet maintenance programs, and tactical vehicle weight reduction programs, as well as the pursuit of alternative energy production and sources. The ability to measure fuel and energy consumption to determine a baseline and track progress is paramount to achieving this goal.

- Goal 3 – Find alternative fuel/energy sources that are feasible and suitable to maintain operational reach, operational endurance, and support the Soldier in a joint and coalition operating environment.

While it is uncertain which technologies will enter the marketplace, it is a safe assumption that a portion of the tactical fuels of the future will be derived from non-petroleum sources. The Army cannot drive the developmental effort, but it must position itself to be able to take full advantage of these fuels as they become available. To do this in a cost-effective manner, the Army must develop cost effective test and certification protocols that can be used to approve alternative fuels for tactical systems. Final selection of fuels will take place in a collaborative environment with consideration given to joint and coalition requirements.

The term "operational reach" is used to describe the distance and duration across which a platform can successfully employ its military capabilities. The term "operational endurance" is used to describe the time a platform can continue operating without refueling. This goal can be reached via an incremental approach of incorporating near-, mid-, and far-term strategies that do the following: reduce the operational fuel and energy consumption of existing platforms through selective technical retrofit or of new platforms through application of technological enhancements; make platforms lighter, without increasing their vulnerability; increase the efficiency of propulsion/engine systems; exercise more conscious maintenance considerations; design future systems with more effective fuel/energy efficiencies throughout the drive train; use more lightweight materials in the manufacturing process to extend operational reach without reducing the capability of the platform; supplement current battery systems with fuel cell technologies that reduce consumption and prolong the life of the battery; and ensure items that are not needed for the current mission are not carried in the vehicle, thus reducing the overall weight.

- Goal 4 – Reduce resources required for fuel/energy support to the tactical force.

From World War II to today, we have seen an ever-increasing need for fuel/energy to support a fighting force that continues to increase its capabilities as new technologies and automation are developed. In order to reduce support requirements, we must reduce consumption while maintaining current and future capabilities. Alternative fuels and renewable fuels have the potential to reduce the quantity of fuel required to support today's operational battlefield. Developing new equipment and/or modifications to current equipment to achieve

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Army Perspective, continued from Page 109

fuel/energy economies takes time and a great deal of investment. Additionally, reducing the weight of weapon systems, developing more fuel-/energy-efficient engines, fuel cell technologies, increasing solar energy use, and developing waste-to-fuel capabilities where applicable are all possibilities for reducing overall fuel consumption.

Wind + sun = generator

- Goal 5 – Establish improved distribution methods while maintaining safety and environmental standards.

Fuel cells, solar energy, and waste-to-fuel capabilities, while not immediately available in the capacity we require today, could be the answer to tomorrow's energy needs, all of which will reduce the distribution requirements substantially. The push to develop alternative fuels, although driven by energy security concerns, has been aided by concerns about the environment because many alternative fuels lead to reductions in emissions of toxic chemicals, ozone-forming compounds, other pollutants, and greenhouse gases.

To support these goals, the Future Tactical Fuel and Energy Strategy (Phase I) makes seven specific recommendations that will be further delineated and incorporated into the Future Tactical Fuel and Energy Implementation Plan (Phase II).

First, alternative fuel and renewable energy solutions should be researched and developed on an aggressive time line for implementation to the degree possible in the future modular force. Second, the Army should invest in the development and fielding of solar solutions to supplement existing power generation systems and in an intelligent power program to centrally manage power-generation platforms in base camp-type locations.

Third, the Army should institutionalize fuel/energy savings procedures and concepts across all levels. Every effort must be made to reduce the number of fuel grades required on the battlefield. Fourth, the Army should continue efforts toward field automation to allow for both asset visibility and accountability of fuel on the battlefield.

Fifth, as global demand for fuel increases and petroleum-based fuel production decreases, the relative shortage poses an increasing supply risk. We can mitigate this risk by maintaining current levels of prepositioned war reserve material stocks and peacetime operating stocks of fuel; continuing to partner with other countries to purchase and store fuel; and investing in research and development for modernizing fuel-consuming vehicles and equipment and introducing alternative and renewable sources to reduce reliance on and consumption of petroleum-based fuels. Sixth, the Army should consider establishing a Tactical Fuel and Energy Office to serve as the focal point and advocate for current and future energy initiatives, across the doctrine, training, materiel, leadership and education, personnel and facilities domains, which support tactical requirements and capabilities. Seventh, the Army should re-evaluate all applicable fuel standards to ensure the standards are still valid for today's operational practices and global conditions.

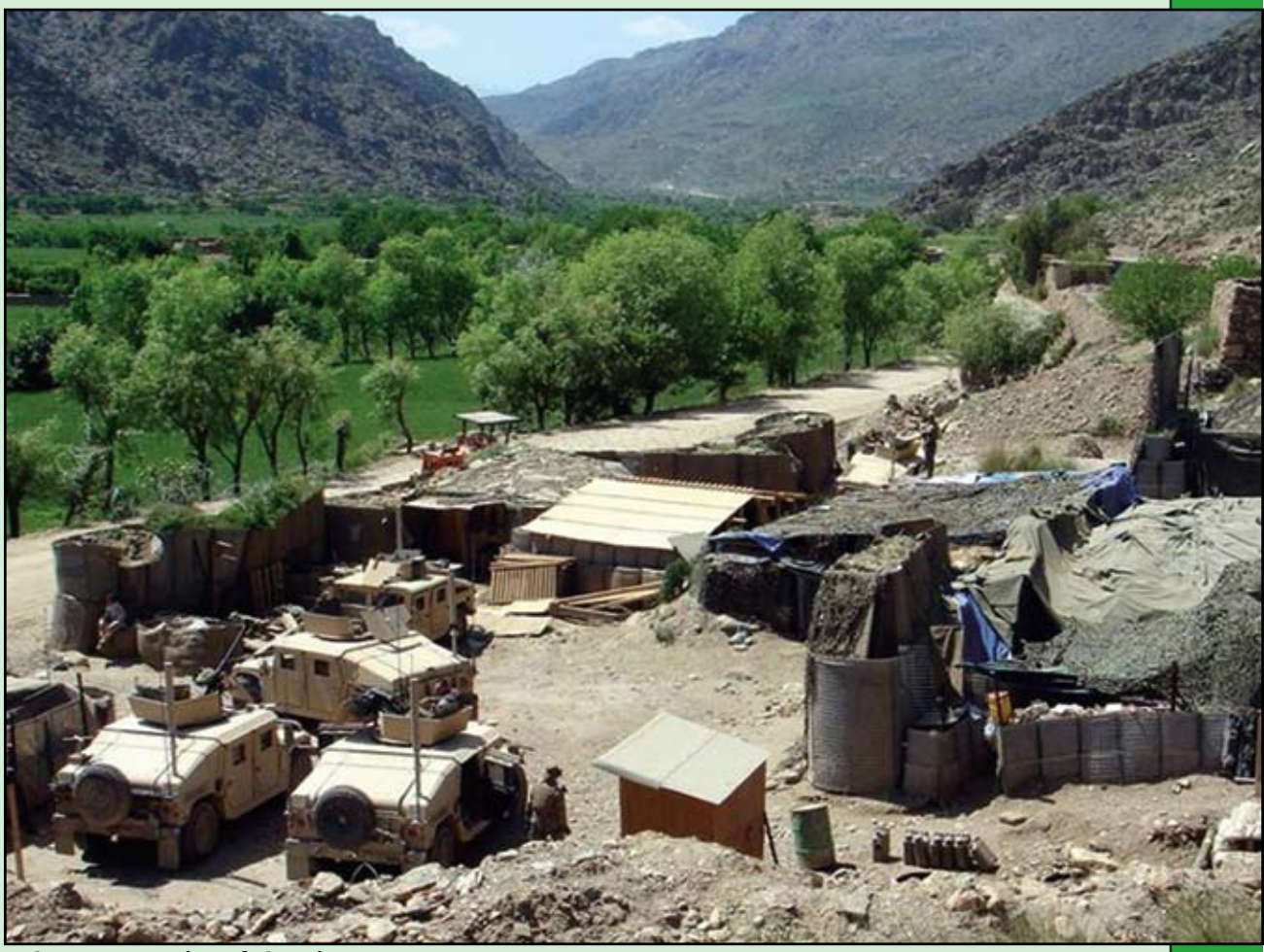
The fuel and energy revolution has begun! As a steward of good citizenship, the Army will set the standard for adopting alternative fuels and transform the way we use existing resources to consume fuel and energy responsibly in the coming years. The Army leadership has taken important first steps to position the Army for the future, but the success of these efforts depends upon us – the Soldiers, Civilians, and contractors who consume the fuel and energy every day.

Ms. Myers, a certified professional logistician, is Chief, Quartermaster Concepts Branch, Concepts and Doctrine Directorate, US Army Combined Arms Support Command, Fort Lee, Virginia. She earned a master's degree in business administration, Boston University; a bachelor's in economics, Indiana University of Pennsylvania; and an associate degree in accounting, University of Maryland.

Going 'Green' at Base Camps

By Mr. Kurt Kinnevan

Although the lexicon of the current Joint and Army doctrine does not define "base camp," the term is generally understood to include any contingency or deployed operations location where support services and functions for Soldiers are established either on a temporary, intermediate, or long-term basis. Having base camps be "green" means that Soldiers, whether in a company or a brigade, receive all the services they need in a way that reduces rather than adds to the combat commander's operational and administrative burdens. The delivery of services, in other words, is optimized to the most efficient levels. I think of "green" in the green-amber-red traffic signal context where "green" means "good to go." While the concept of green base camps is not based on environmental concerns, such camps do benefit the environment.



A base camp in Afghanistan.

After the Cold War, forward-positioned continental US (CONUS) installation-type facilities were replaced by expeditionary armed forces. US forces must now be able to deploy anywhere and establish the requisite operational support capabilities to conduct successful Joint military operations and then return to their "home stations." Since 1991, the US has engaged in military operations in the Middle East, Central Asia, Africa, Europe, the Pacific Basin, and the Caribbean – many times for extended operations. Protecting the Nation also requires integrating military capabilities with other government and law enforcement agencies to manage the consequences of an attack or natural disaster. Stability operations are also a core US military mission that has a priority comparable to combat operations.

Base camps support full-spectrum operations by providing the platform from which to execute

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offensive/defensive operations, stability operations, and humanitarian or civil support missions. Army base camps also provide sites for other US military, multinational forces, governmental agencies, and non-governmental agencies. The ability to establish and provide base camp operations in a contingency environment is essential to the success of any mission.

At present, the Department of Defense (DOD) does not have an effective means to systematically control logistics requirements. DOD lacks an effective way to implement fuel-reduction initiatives and maintain sustained attention to fuel demand management at its forward-deployed locations. The same can also be said for water and waste management.

But why "green" base camps? The green base camp is all about how to manage power (fuel), potable water, and waste (solid, sanitary, and hazardous). As the Army transforms, its power projection platforms also need to transform. Deployed forces will need to evolve into more self-sufficient organizations. Base camp footprints will need to shrink correspondingly.

Greening Power Management

Green power management requires several functional areas be addressed systematically. These areas are generation, load requirements, transformation, distribution, storage, and recharge. Simply generating more power is not the answer any more than just reducing loads would be. The modern Army requires energy to operate effectively, thus energy/power must be managed effectively.

The use of alternative energy-generating capabilities has several benefits: reduced fuel storage requirements (smaller footprint for base camps, less flammable storage, less potential for spills), reduced resupply requirements (fewer convoys, less exposure to enemy combatants, increased flexibility due to less commitment to supply lines), and more fuel for tactical operations. The use of alternative energy programs also proves a potential to leave behind a sustaining capability to support the local population when Soldiers depart.

Alternative energy could also include the conversion of combustible or carbon-based waste to energy. Waste-to-energy processes are able to extract the energy potential of materials that the Army has been burying, burning (without capturing the energy) or disposing of by other methods (sanitary solids or hazardous waste). Waste-to-energy provides a means to reduce the base camp size since the solid, sanitary, and hazardous wastes would not have to be stored on site while waiting for disposal or elimination. This, in turn, would reduce the number of local contractors needed to manage the waste (without receiving any benefits from the waste) as well as reduce the security risk of having contractors enter the base camp.

Controls for power distribution, transformation, and storage provide a means to reduce waste of existing power. For example, diesel generators would be used at their most efficient levels, thus reducing fuel storage and shipment requirements. Controls would also manage power distribution to reduce or control peak-load requirements. Controls systems would be an integral part of any grid system employed for power distribution.

Greening Water Management

Green potable water management includes reducing waste, recycling where possible, and generating as much water on site as possible. Because bottled water has become the norm for deployed operations, one solution was to develop portable water bottling plants. While this eliminated the need to ship bottled water, a water bottling plant is only functional if a water source is present. Green base

camp capabilities will generate the water it requires locally, without impacting the local water supply. This will require systems to minimize the camp's use of water (waterless urinals, composting toilets, low-flow showers, steamers instead of boilers for cooking, recycled water for washing cooking equipment, waterless or reduced-water wash racks, reduced-water dust suppression, etc.). At the same time, it will require the use of systems that provide water through wells, through the recycling of gray (non-sanitary used water) and black water (sanitary wastewater), and through the capture of water from the air or combustion gases.

Greening Waste Management

Green waste management will need to address elimination or significant reduction of waste. This reduces the base footprint and eliminates the need for contractors to cross the fence line. Waste has two main attributes that can become resources for the sustainable green base camp – fuel and water. The energy component of waste is significant. Solid waste (paper, wood, and plastics, for example) has typically been eliminated through burn pits or incinerators that reduced the volume without capturing any of the heat or energy content. Systems that convert this waste to energy will also reduce the volume of waste in a more controlled format with more complete destruction and fewer emissions.

A large volume of the waste generated by a base camp is sanitary waste. This liquid sludge is either trucked off the base by a contractor or treated on site, usually in settling ponds or lagoons. These methods require large amounts of water. If the water can be captured, then the solids, which are predominantly carbon-based, become another resource for waste-to-energy conversion.

Finally, hazardous waste has been a logistics bottleneck

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A burn pit, above left, reduces waste in Iraq as a Soldier burns human waste in camp -- without producing any usable energy. A gasification unit, at right, converts waste into 'syngas' that can be burned to generate electricity or heat.

Plasma arc equipment, at left, creates 'fire' that is used to generate syngas and heat.

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for most contingency operations. Most hazardous waste is in the form of hydrocarbon liquids, the greatest percent of which is used oil. These hydrocarbon liquids have the potential to be a significant resource of energy for a waste-to-energy system.

Taking a systems approach to addressing self sufficiency and sustainability issues is the most critical issue in establishing green base camps. The inter-relationships of the systems and the potential second-, third- and fourth-order effects of changes must be identified and understood. For example, creating an energy capability that increases waste generation or water consumption is not promoting the development of a sustainable, green base camp. More importantly, the same can be said if the complexity of the systems requires additional resources (manpower, money, time, space) or reduces the operational flexibility of the base camp.

Sustainable systems must be integrated into the planning, design, construction, operations, and management programs of base camps to make them green. To meet the needs of the current and future force, base camps and their systems must be modular, scalable, portable, versatile, flexible, cost-effective, interoperable and interdependent with other US armed services (as well as other governmental agencies, allies or coalition partners), and they must use sustainable processes and systems to the greatest practical extent. The interdependence of these capabilities must be recognized to provide the combat commander with force multiplying effects which are seen through the following results:

- Reduced threat due to a smaller logistics footprint to maintain the same level of operational capabilities and readiness (fewer fuel and water shipments).
- Increased flexibility in base camp operations through improved standardized designs that are modular, scalable, and adaptable.
- Decreased construction/deconstruction requirements (time, material, equipment, personnel).
- Improved operations management (power, water, waste) which requires less Soldier, Civilian, or contractor oversight and/or support.
- Improved design of major utility backbones that never hinder operations nor compromise agility because they are sized for maximum occupancy and duration.
- Improved environmental safety and occupational

This artist's drawing depicts a concept of a solar panel package.

health elements such as fire protection for all aspects of base camp planning/design; construction/deconstruction; operations/management to prevent and minimize loss of Soldiers' lives and damage to property.

- Decreased construction operations and maintenance costs over time.

For those interested in saving money or "greenbacks," consider that the potential savings are in the billions of dollars. The magnitude of the potential savings is illustrated by looking at the possible impact on the Force Provider System. The life-support area for one 600-Soldier Force Provider System (housing, food service, showers and latrines, laundries, and some medical capabilities) costs between $40 million and $80 million a year to operate. These costs do not reflect the requirements of Civilian support and their sustainment criteria. Assuming green capabilities could decrease operational costs by 5 percent, the expected savings would be $2 million to $4 million a year. With Civilian support services currently at a 1-to-1 ratio of Civilians to Soldiers, then the savings would be doubled to $4 million to $8 million a year per deployed 600-Soldier battalion. If 5,000 Soldiers are deployed per brigade combat team (BCT) (3,500 Soldiers per brigade plus 1,500 in augmentation units) with an equal number of Civilians, then the potential saving (for 10,000 personnel) would be between $34 million and $67 million per year per BCT. Assuming 24 BCTs are deployed, the savings for an operation similar to our current deployments would be in the range of $0.8 billion to $1.6 billion dollars per year. These potential savings reflect only those associated with a 5 percent reduction to operate the life-support area of the Force Provider, but they clearly show the potential for going "green" at our base camps.

Remember, "green" – just as it does in a traffic signal – means "good to go."

Mr. Kinnevan, a professional civil engineer, works for the US Army Corps of Engineers, Engineering Research and Development Center – Construction Engineering Research Laboratory. He has deployed to assess environmental issues and address power, water, and waste management at contingency base camps and has lead efforts for the Chief of Staff of the Army, the Training and Doctrine Command and NATO to address contingency base camp issues. He earned a bachelor's degree in chemical engineering from the University of Missouri-Rolla and a master's degree in environmental engineering from the University of Alaska-Anchorage.

Fast Forward 10 Years . . . Can You See the Future?

By General Ann E. Dunwoody

The success of Army logistics operations in the next decade and beyond hinges on how well we as an Army – in particular, the readiness side – adapt to keep pace with the increasingly complex demands on our warfighters.

Gone are the days of massive "iron mountains" of equipment awaiting reset and re-issue to units. In 2020, commanders will possess decision-making enablers that transcend "line and block" organization charts. These emerging logistical tools will offer our fighting forces, at every level, unprecedented control, thereby increasing the velocity and precision of resupply, reset, and force regeneration.

This comprehensive, collaborative approach to sustaining Soldiers and equipping units is dependent on potent cyber technologies, our imaginations and our will.

Realizing this future will require a holistic, 360-degree readiness perspective. Working from a *virtual common operating picture* achieved through interactive information systems, future logisticians and supported commanders will have real-time visibility of all assets, and dynamic status updates as never before. They will see and track readiness throughout a sprawling, interactive, global network -- not just as individual units but across the formations.

Commanders will calibrate their readiness through the use of an all-inclusive dashboard that provides an immediate assessment of current and projected readiness. This dashboard will do everything from enabling reset management, to integrating and synchronizing the fielding of new equipment. Commanders will be seeing into every phase of the materiel life cycle, all mapped to unit training and deployment plans.

In achieving success, we will generate operational efficiencies through inventory-in-motion systems and precise delivery mechanisms, such as the ever-expanding precision airdrop systems. We will relentlessly push our logistical boundaries by incorporating waves of anticipated innovation that will enable us to do the following:

- Reduce our dependence on liquid fuels by utilizing alternative energy sources to power high-performance, low-maintenance equipment.
- Grow condition-based maintenance systems and other predictive diagnostics capabilities that more accurately build packages of spare parts and deliver them when and where maneuver forces are best positioned to employ them.
- Leverage nanotechnology and composite materials to build-in feather-weight capability, strength, and durability.
- Improve precision and visibility, allowing for compression and streamlining of distribution layers in our logistical task-organization.

Future logisticians will be ready to maintain and sustain evolving battlefield systems that provide unmatched situational awareness – especially suited to asymmetric ground warfare and full-spectrum operations.

These systems that will define the modernized Army will be comprised of unmanned aircraft, manned and unmanned ground vehicles, and sensors linked by an intricate wireless network. Our information-rich systems will confer two advantages – a "see first, know first, act first" capability when we are in offensive postures. And when our forces are in a defensive mode, we will have a "keep from being seen" and a "keep from not knowing" capability in place and ready for deployment.

With multiple partners and state-of-the-art information technology tools and integrated battlefield systems working in concert, it's easy to see how we will have to adapt concepts that mirror the social media now dominating web-based communications.

Future logistics will rely on strong relationships, rich interactions, greater transparency, and a secure stream of shared, readily accessible information. Commanders will have the ability to make better informed decisions based on their needs with regard to time and space. Both vertical and horizontal transparency

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will ensure sustained readiness, synchronized reset cycles and command input into the requirements-generation process.

So let's fast forward 10 years.

From concept to combat, from factory to foxhole, seams in the life cycle management of critical materiel our Soldiers depend upon are now gone.

Our nation's industrial engine is optimized to support the warfighter and poised to rapidly and efficiently ramp up to a wartime footing.

Our acquisition process is streamlined, responsive and timely.

Our combined logistical and acquisition systems are truly collaborative and structured to deliver the best value to the American taxpayer.

This future will not happen by accident. We must all work to bring about this new reality. As we achieve success, no longer will we use the phrase "tooth to tail" but instead "tooth to muscle" when we talk about the future of Army logistics.

GEN Dunwoody is the Commanding General of the US Army Materiel Command. She deployed as the division parachute officer for the 82nd Airborne Division in Desert Shield and Desert Storm. GEN Dunwoody earned a bachelor's degree from the State University of New York where she was commissioned at Cortland and later earned two master of science degrees, one in logistics management from the Florida Institute of Technology and the other in national resource strategy from the Industrial College of the Armed Forces.

Redesigning the Quartermaster Force

By Mrs. Marella R. Akridge

The Combined Arms Support Command (CASCOM) Force Development Directorate at Fort Lee recently completed Force Design Update (FDU) Cycle 08-02. The proposed updates have been submitted for Army-wide field staffing and are pending approval by the Department of the Army. An FDU creates a change in an existing organization, or it develops a new organizational design. These changes result from combat command needs or shortfalls and gaps identified by Army field units, major commands, Army service component commands, proponent schools, or anywhere changes are justified. Gaps are most often caused by changes in the operational environment, doctrine, or new missions.

Quartermaster units will likely begin to feel the impact of proposed changes between 2012 and 2017 as part of Total Army Analysis (TAA) 12-17 resourcing. Changes proposed for Quartermaster organizations are centered on building the future force to be more modular and multifunctional, and efficient, and to synchronize these organizations with the Army force generation model.

Organizations updated in the recent FDU cycle include the Quartermaster common company headquarters, mortuary affairs company, force provider company, petroleum support company, theater petroleum management redesign, water company, brigade water distribution augmentation platoon, and water packaging platoon.

Mortuary Affairs

Under the proposed new design, the mortuary affairs company will transition to standardized, modular platoons capable of performing all aspects of mortuary affairs operations. By utilizing these multifunctional aspects, one company should be able to establish, operate, and maintain mortuary affairs collection points, mortuary affairs decontamination collection points, personal effects depots, and theater mortuary evacuation points. Each mortuary affairs platoon will have one cook and four mechanics. When deployed independently from the company, the platoon retains the cook and mechanics, augmenting the assets of the unit to which the platoon is attached. When mortuary affairs platoons are broken down into teams, the teams require support from the other unit.

Changes to the mortuary affairs company are proposed because lack of resources hampered companies' ability to conduct multiple operations simultaneously and deal effectively with decontamination

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and mobility issues, as well as organizational design flaws and obsolete equipment. New technologies and organizational redesign should reduce these gaps and allow these companies to be more multifunctional. New technologies will reduce the logistical footprint. Overall, collection points will be increased from 20 to 24 under the new design. This reorganization will better prepare mortuary affairs for major combat operations, small scale contingencies, and a wide variety of conflicts through modularity and modernization.

Force Provider

The Force Provider company has also been redesigned to be more modular and expeditionary in nature. The proposal reconfigures it into heavy and light platoons capable of supporting large staging bases and small forward units. The heavy platoon is capable of supporting 600-person modules, while the light platoon can support either a 600-person module or four separate 150-person increments.

The 150-person module is capable of functioning independently for long-term, remote customer support. The service support platoon will retain all construction, plumbing, electrical, and maintenance capabilities. Although this requirement will cause platoons to lose some capability to move rapidly within the theater, this reorganization will allow for more efficient use of construction and maintenance assets. Overall, reorganizing the Force Provider company into a more modular configuration will better support the force generation cycle.

Petroleum, Oils and Lubricants

The petroleum, oils and lubricants (POL) support company will be standardized, much like the other Quartermaster companies, with forced entry capabilities across all brigade combat team configurations. It can deploy independently of the parent organization and can operate remotely from the headquarters. The platoons will contain two cooks for field feeding support and maintenance personnel. In order to increase flexibility in the platoons, each company is to get one bulldozer per platoon. These changes will allow the POL support company to provide support for all units within the area of operation and to operate one to three independent platoons in multiple locations within the sustainment brigade's area of operation.

There are separate POL support platoons that use either 50,000- or 210,000-gallon collapsible fabric tanks. The platoon that uses 210,000- and two 800,000-gallon fuel system supply points, which was originally intended for use at theater level, would be placed into operational stocks and used when requested by planners. Furthermore, the advanced aviation forward area refueling system would be eliminated in the new design. Under the proposals, redesign of the water, POL, and supply companies are very similar in terms of modularity and capabilities. All three companies will be the same in terms of providing "forced entry" capability, support to all units, and operation of one to three independent platoons at multiple locations.

Water Company

The current concerns within the water company mirror issues within the POL support company. The main purpose of reorganizing is to scale down from the Force XXI water purification and distribution units that maintain separate capabilities in each platoon to a modular design that combines capabilities. For example, rather than requiring separate platoons for purification, storage, and distribution, each multifunctional platoon would encompass all those capabilities. Also like the POL company, the water platoons will be streamlined into one type for ease of planning.

Water Distribution, Packaging

The new brigade water distribution platoon augmentation would increase water support to the brigade combat team and support brigade in an arid (hot and dry) environment. Typically, water platoons are designed to operate in a temperate environment rather than arid one. Studies have shown that water consumption increases in arid environments so water distribution is a major concern because of transportation and packaging issues. These distribution problems are addressed by proposing that this platoon use six HIPPO water storage containers and

ROWPUs like these at left are to produce bottled water in the area of operation.

operators to store and distribute bulk and bottled water. The new design will better implement standardized Quartermaster structure and the force generation cycle.

The water packaging platoon has been redesigned to provide better water support to a modular force. Typically, this expeditionary platoon operates forward in the theater during combat operations to produce and distribute bottled water. Contractors, rather than Soldiers, are often responsible for water packaging. This platoon will be co-located with the water support platoon and possibly the supply platoon. By redesigning the water packaging platoon, bottled water can be produced from reverse osmosis water purification units (ROWPUs), which are devices that produce potable water from various water sources in the area of operation.

Theater Petroleum Management

The Army continues to have the responsibility for the accountability of fuel in the theater of operations and is expending force structure to oversee government contractors in the management of fuel. In theater, the POL group provides centralized petroleum and water planning, the POL lab for movement of fuel from commercial vendors to Army fuel farms, technical assistance, and command and control functions for POL operations.

Petroleum planning and execution that currently resides in the POL groups will move to the theater support commands, expeditionary sustainment commands, and sustainment brigades. By transitioning the responsibility for petroleum to other logistical organizations, the force generation cycle will be better supported through a more streamlined, in-house process.

Headquarters Companies

In order to meet the requirements outlined in the force generation cycle and Total Army Analysis (TAA) 10-15, the Quartermaster common company headquarters has been redesigned to handle all Quartermaster functional areas. This proposed reorganization allows for transformation into a modular force that can respond more quickly and appropriately to combat commanders' mission requirements and provide unity of command from the strategic to the tactical level.

Currently, headquarters companies are functionally designated and do not train and deploy in standard configurations. The proposed redesign will allow for a Quartermaster multifunctional headquarters organization that can command and control various mission sets. The Quartermaster organizations will train and deploy as a standard organization, but they will have the capability to reconfigure based on the specific needs of the mission while maintaining technical competencies. For example, a supply company at Fort Hood and a POL company at Fort Bragg could deploy separately and then reorganize to form two multifunctional supply and POL units in the sustainment brigade's two subordinate battalions.

Conclusion

The changes proposed in these Force Design Updates have been submitted for Army-wide field staffing and are pending approval by the Department of the Army. These updates will modernize the Quartermaster Corps into a more modular, multifunctional, and efficient organization that is ready to meet the challenges of the future as we move toward the mid-21st century. The changes implemented will synchronize Quartermaster units with the force generation cycle and the Army's vision for the future, as well as meet current capability gaps that will allow warfighters to more effectively meet future challenges.

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Materiel Systems Being Redesigned to Sustain Our Forces

By Mr. Charles E. Burden, Jr., Mr. Paul Fournia, Mrs. Jeannie Livingston, Mr. Albin R. Majewski and Mr. Darrell Stoker

Many equipment changes and upgrades to Quartermaster systems have been accomplished in the past 10 years. New capabilities, designed to function for the next two decades, will interface with the primary distribution truck, the HEMTT LHS (heavy expanded mobility tactical truck load handling system). Being fielded across the Army are the modular fuel system, multi-temperature refrigerated container system, mobile integrated remains collection system, tactical water purification system, and the LHS water tankrack (a.k.a. Hippo). These systems will provide enhanced capability across the realm of Quartermaster functions for the next 10 to 20 years.

While we have had some recent success in updating equipment, there are still many existing and projected operational gaps that can only be satisfied by fielding a new materiel capability. Many of the solutions will require investments in science, technology, research, and development. The resulting solutions will be employed to sustain Army and Joint forces well past 2020.

The sections that follow provide a brief synopsis of the type of capabilities by functional area necessary to support Soldiers anywhere in the world they may be operating. The overall vision of the future is to provide superb support using the fewest possible resources. Many of the future initiatives seek to reduce the logistics footprint through efficiency improvements, technology insertion, or demand reduction. Plans and programs are in place to achieve this goal.

Field Feeding Equipment

Our future field feeding systems must continue to sustain the individual warfighter if the Department of Defense is to retain the most effective weapon systems in the global arsenal, the Soldier. The goal of the future field feeding system is to fuel and sustain that individual warfighter through dramatic and revolutionary changes in field feeding technologies in both rations and equipment.

Commanders will have flexible, innovative ration support and technologically advanced field feeding systems that can be tailored to tactical situations and unit missions in both training and operational environments to meet the nutritional requirements of Soldiers. The new system will support Class I supply and distribution systems as it reduces requirements for labor, water, and fuel. When using options of the family of unitized group rations, commanders will increase kitchen mobility, effectiveness, and responsiveness. In turn, these improvements will reduce the administrative burden on unit commanders and food service personnel. To assist in maintaining troop health and readiness, our feeding equipment will continue to sanitize food preparation areas and serving equipment. As field feeding generates a significant amount of waste, we will continue to research, develop, and implement technologies that convert waste into usable energy.

Our future field feeding equipment must also provide the capability to receive, store, issue, refrigerate, and deliver perishable subsistence in a joint operational environment to provide distributed sustainment in full spectrum

Future field feeding equipment needs more capabilities to increase effectiveness and decrease use of resources.

operations. Supporting the future modular force with the capability to receive, store, build, and coordinate distribution of mixed ration loads tailored to customer requirements will eliminate the need for ration break points in the maneuver brigade combat teams' areas of operation. These systems must also allow the Army's subsistence platoons to deploy and operate independent of parent organizations in support of the future modular force.

Field Services

To support the future modular force through 2025, our future field services capabilities and systems must continue to provide laundry, shower and latrine services and facilities support to Soldiers across the range of military operations and under all geographic and operational conditions. Field hygiene is essential to protect the force from disease and provide for increased morale and welfare. Equipment must enable Soldiers and organizations charged with field hygiene operations to execute sustainment operations on a non-linear, non-contiguous battlefield.

Having clean laundry boosts the morale of Soldiers serving in the field.

Future field hygiene systems will provide the commander with flexible, innovative hygiene support and technologically advanced systems that can be tailored to tactical situations and unit missions in both training and operational environments. These systems must be flexible enough to react to changes in the strategic environment and potential enemies to take advantage of new technologies and to account for variations in the pace of change. They will reduce requirements for labor, water, and fuel as they increase field hygiene effectiveness and responsiveness. This will reduce the unit commander's administrative burden. Future hygiene equipment will continue to integrate a water recycling system to capture and recycle wastewater to reduce water demand and consumption. The capability to provide private and timely shower and latrine support with the ability to regulate internal temperature and a ventilation system to reduce odor and water drain-off channels; regulation of water temperature sent to shower heads; and water shut off at each shower head will present Soldiers with a clean, sanitary environment anywhere our military operates. This will allow our warfighters to be more responsive to fast-paced deployments. These systems must also give the operator and maintainer a more user-friendly interface with which to operate, troubleshoot, and diagnose any issues. They must also incorporate increased mobility and continue to support deployments and split-based missions.

In addition to basic field hygiene functions, the Army will continue to improve its premier base camp life support capability – Force Provider. Recent changes to improve mobility (Triple Container-based sub-systems) and flexibility (150-person sub-modules) of the Force Provider have had significant operational impact. However, continued improvement is necessary to ensure the best possible living experience is available. New technologies planned for Force Provider to improve sustainability, reduce footprint, and improve the quality of life for Soldiers include the addition of a shower water reuse system that recycles up to 75 percent of shower water. This will reduce the shower water requirement per Force Provider from 12,000 to 3,000 gallons daily. An expeditionary water packaging system to produce bottled water on site will reduce the number of convoys and trucks required

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Future shower equipment will recycle water to reduce waste and consumption while providing private showers in the field.

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to haul bottled water. This portable, containerized capability is projected to produce more than 10,000 bottles per day. A containerized ice plant capable of making 10,000 pounds of ice per day will reduce the need to transport ice and make ice available to Soldiers leaving the Force Provider on missions.

A significant issue when large numbers of Soldiers are deployed is the disposal of all types of waste. The Force Provider generates more than two tons of solid waste and a few thousand gallons of liquid waste per day. Efforts are being made to develop methods to convert the waste into usable energy. This capability has the potential to have a significant impact on the sustainment footprint of Force Provider.

Force Provider is used to support a variety of operations including locations where the probability of encountering ballistic threats is high. To address this threat, Force Provider will integrate ballistic protection for billeting tents and some containerized service systems. The increased protection will allow the Force Provider modules to be deployed in higher risk locations. Many of these capabilities will also be incorporated into field service companies to improve the services they are able to provide.

Fuel

The ultimate fuel distribution goal is to meet warfighter requirements using the most efficient and effective assets while considering mission, enemy, terrain, troops, time, and civilians. Energy efficiency and alternative fuel research will have an impact on future fuel demand. Initial reductions will likely be accomplished through employment of alternative power sources like solar, wind, battery and, potentially, nuclear technology. For the next 20-plus years, the Army will continue to use vehicle platforms powered by internal combustion engines operating on liquid fuels. The introduction of hybrid systems and new combustion technology will allow current engines to be more fuel-efficient, but the primary energy source will continue to be a petroleum or synthetic fuel with similar components to what we use today.

A robust bulk liquid fuel line haul distribution capability will continue to be required to move large quantities of bulk fuel throughout the battlefield in the next 20 years. Improved larger petroleum semi-trailers may be developed to reduce the line haul distribution footprint. Capacities up to the limit of the tow tractors will be pursued. Other bulk distribution enablers such as a rapid expeditionary flexible pipeline system will also significantly reduce the distribution footprint and free up main supply routes for other commodities.

As we transition to alternative liquid, gases and solid fuels, our distribution network will transform to accommodate distribution of multiple fuel and energy products. Special distribution methods, to include manned and unmanned aircraft systems, will be adapted for specialized products and much of the fuel may be distributed as dry or packaged cargo. Bulk fuel will continue to be a product requiring storage at well-positioned points throughout the modular and future battlefield.

A fully automated fuel management capability will improve asset visibility, command and control, and accountability. The system will include automated accountability and management software, automated tank gauging for tankers and collapsible tanks, automated metering, and automatic identification technology for customer identification. This will enable distribution managers at all levels to have asset visibility and provide command and control. These innovations will fully automate petroleum transactions. An added benefit of fully automating fuel management is that it provides detailed records that can be used in performing causative research for losses as well as support follow-on fuel consumption analysis that will measure progress in meeting the Army's energy goals.

Water

The most significant change in water operations will be the production of bulk potable water from non-

> "In fact, the battle is fought and decided by the storeman and quartermasters before the shooting begins."
>
> German Field Marshal Erwin Rommel
> World War II

traditional sources. Technology that extracts water from air provides the opportunity to produce water from equipment on a combat platform or incorporate a higher capacity system into a traditional bulk storage and distribution platform such as the Camel. This significantly reduces the need to transport and distribute water. For areas with large populations, an expeditionary water packaging system will bottle purified water as close to the point of consumption as possible. Bottling forward eliminates potential transportation losses as well as ensures a continuous source of approved bottled water. All of these enablers will also serve to significantly reduce the distribution requirement, removing Soldiers from the dangers associated with convoy operations.

Fuel and Water Quality Surveillance

Quality surveillance for fuel and water in the future will include small, operator-friendly, state-of-the-art systems that provide near real-time results. This capability will be usable at the lowest possible level in the distribution system, eliminating the need to draw large samples and transport them to a tactical or fixed laboratory. Water quality surveillance kits will quickly provide the chemical, biological, radiological and other results necessary to certify a water source as well as certify the acceptability of use of the product water. The ultimate goal is to develop an "in-the-stream" automated testing capability for fuel and water that constantly checks the quality of the product and alerts the user to any problems.

Fuel and water operations will continue to be challenging in the future expeditionary environment. However, these challenges will be met through innovations in technology and doctrine and the winning spirit of logistics Soldiers.

Materiel Handling

Overall, future materiel-handling equipment will be similar in appearance to the forklifts and container handlers in use today. Capability improvements will be primarily in reducing operator fatigue, increasing operator protection from ballistic threats, improving reliability, enhancing maintainability, and improving self-deployability. Increases in delivery of sustainment via airdrop doctrine and air-land supply methods will dictate the development and fielding of a small, lightweight, airdrop capable materiel-handling device that can safely lift and move repetitively items weighing less than 1,000 pounds.

Additional future focus areas include the development and/or improvement of realistic training aids that allow Soldiers to experience the challenges of operating materiel-handling equipment in all types of environments under different threats. Improved training aids will ensure operators are proficient prior to being thrust into a potentially hazardous situation while operating an expensive piece of equipment.

Aerial Delivery

While continuing to be recognized as niche capability, cargo airdrop fills a number of niches for it has a number of applications. Vertical maneuver, the deep attack, airfield seizure, early entry, and the ability to sustain Soldiers once inserted are but a few. Now, knowing that an extended ground line of communication can be easily targeted and that deliveries are uncertain, airdrop is being used to a greater extent to ensure re-supply to a number of smaller teams and organizations that are far removed from their normal supply bases and in areas unreachable by ground. The future of cargo airdrop appears bright and, in many instances, is looked upon as a growth industry. Always, however, there are improvements that must be made, needs that must be anticipated, and some future predictions and expectations to be considered.

For operational flexibility, we must exploit all future air carriers as potential cargo airdrop platforms. This includes hybrids and rotorcraft. The Army Joint Cargo Aircraft and Joint Heavy Lift will be

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A firefly parachute delivers its load.

A complete load-out of a 150-person increment of the Force Provider module is ready for delivery by a single C-17 aircraft.

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welcome additions enabling the logistician to better support the Soldier on the ground. Our precision airdrop capabilities will continue to increase accuracy. A specific rooftop will be necessary instead of just within 50 meters of the planned point of impact. Recovery of airdrop equipment for possible re-use will remain problematic. Because of this, we will pursue the development of safe, reliable, and inexpensive capabilities requiring no recovery.

Although the future of cargo aerial delivery whether it be air-land, sling-load or airdrop will remain a niche capability in the big scheme of things. Its ability to go where trucks can't and rapidly support Soldiers on the ground is being recognized as a significant enabler for the maneuver commander. The aerial delivery community will continue to pursue accuracy, reduced cost, and increased payload weights within the limits of the receiving units' capability. Look to the sky for your resupply!

Conclusion

While many of the improvements to Quartermaster materiel systems in the future appear minor on the surface, many will have a significant, lasting effect on the distribution system and the Soldier. The future focus, across all functional areas, will be on improving productivity, reducing energy consumption, incorporating realistic training, and enhancing the quality of life for all Soldiers. The entire Quartermaster materiel acquisition team is dedicated to achieving these goals.

The writers are staff members in the Sustainment Division of the Materiel Systems Directorate at the Combined Arms Support Command at Fort Lee, Virginia. Mr. Burden, a retired Quartermaster officer, has more than 10 years experience in combat developments and is currently the team leader for Petroleum, Water and Material-Handling Systems. Mr. Fournia, a logistics management specialist, is a retired Armor officer whose primary focus is materiel-handling equipment for all Army Tables of Organization and Equipment. Ms. Livingston, who earned a bachelor's degree in criminal justice, retired from the paralegal profession to be a combat developer. Mr. Majewski, the Sustainment Systems Team Leader, is a retired Quartermaster officer and a Certified Professional Logistician who earned a bachelor's degree in human resources management and a master's in business administration. Mr. Stoker, a combat developer in aerial delivery, retired from the Army after 23 years with service as a Transportation Corps and dual-rated Aviation officer.

Sustainment Division writers are, from left, Mr. Fournia, Mr. Stoker, Mrs. Livingston, Mr. Majewskl, and Mr. Burden.

Multinational Logistics

By Lieutenant General Kathleen M. Gainey

We currently have a remarkable opportunity to shape the future of Joint Logistics as we have several important documents being rewritten that will shape and inform Joint Logistics for the next generation. There are three components that are creating this unique opportunity: the National Security documents that change with each Administration; the Defense documents that are in rewrite; and in the new Joint Logistics White Paper and the Supply Joint Integrating Concept we are writing in the Joint Staff J4.

One of my top priorities on the Joint Staff is to promote and enhance multinational logistics. We have come a long way in establishing partnerships and formal agreements that have raised coalition support to its highest level ever. However, we still have a long way to go. For the multinational logistics community to effectively support our global security objectives in 2050, we must consider what the challenges will look like in 40 years. I believe we are seeing a glimpse of what this logistics support will require.

As the warfighting landscape continues to evolve from a Cold War-type build-up to a Three Block War engagement, the need to factor in our inter-agencies, non-governmental and inter-governmental organizations, and commercial partners is essential. In my view, this will become our greatest challenge in the next generation of multinational logistics. How do we integrate these disparate organizations into an effective and agile network of support that can handle a firefight, rebuild roads, and improve the local economy at the same time? Think about the AFRICA Command model. General Ward talks about developing African Capabilities for Africans. What does this mean for logistics? We must develop a structure to integrate beyond the Department of Defense logistics community and capitalize on the competencies that other agencies and nations offer.

I am confident that we are thinking of this challenge at the right levels of our government and within our multinational partners. We must address this issue now in order to establish the rules, procedures and agreements in order to lay the framework for the next generation.

LTG Gainey is the Director for Logistics, J4, the Joint Staff. She has deployed to Saudi Arabia and Iraq. Commissioned through the Reserve Officers Training Corps, LTG Gainey earned a bachelor's degree at Old Dominion University in Norfolk, Virginia, and a master's of business administration at Babson College in Wellesley, Massachusetts.

"We all prefer to see evolutionary change. But we must be equally prepared for the revolutionary. In our own lifetime, as military men, we have seen both. And we have seen the Army contain and benefit from both. [Change] is the perpetual bedfellow of logistics."

Major General Andrew T. McNamara,
36th Quartermaster General
speaking to the1958 National Quartermaster Conference

Keeping Pace With the Modern Military

By Major Sarah Marsh Read

Author's Note: As a concepts combat developer for the Combined Arms Support Command (CASCOM), my focus is generally the future – usually from 2015 to 2024. When I was asked to write an article on future logistics for the last edition of the Quartermaster Professional Bulletin, I immediately thought about one of my current projects: writing the concept capabilities plan for supply support and materiel management (S2M2) for the future Modular Force of 2015 - 2024. While this official document is still in draft form and not officially publishable in this venue, I have used a modified executive synopsis to give readers a taste of what may come. "Supply support" in this article includes (but is not limited to) activities such as maintenance while in storage, salvage of supplies, and requirements forecasting. "Materiel management" here concentrates on activities associated with (but, again, not limited to) stockage planning (as derived from requirements determination), stockage managing, retrograde and/or disposal of materiel, and monitoring/ control of on-hand stocks.

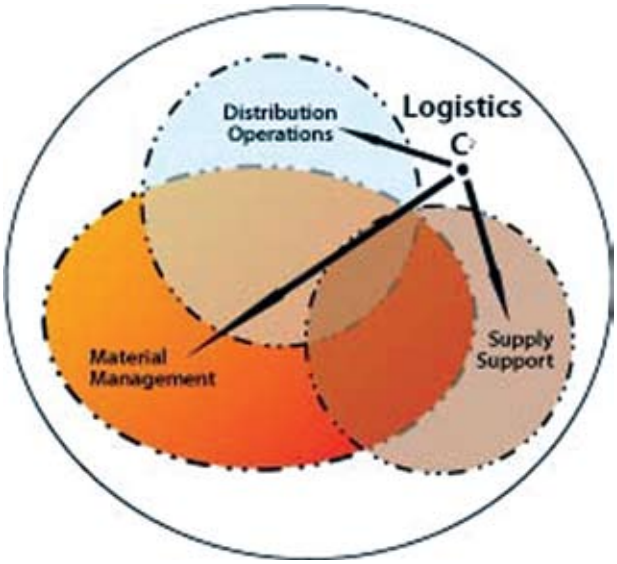
Evolving joint and US Army concepts increasingly outline the future Modular Force of 2015 - 2024 as a highly agile, adaptive, and responsive force comprised of joint and/or coalition forces that can be rapidly deployed across strategic distances, possibly into austere environments, with the intent to be immediately engaged on arrival. This kind of future Modular Force, with blurred distinctions between the operational and generating forces, must be capable of controlling and maintaining large, complex areas of responsibility while simultaneously responding to constantly changing mission parameters. To this end, future supply support and materiel management (S2M2) concepts and capabilities are important focal points, but they must be highly integrated into the distribution operations change process. This integration must occur across the doctrine, organizations, training, materiel, leadership and education, personnel, and facilities construct in order to be the most efficient and effective force in the future.

The Army has always "made mission happen"; very few will argue that point. But how well and how seamlessly mission happens is another story altogether. The Army does not currently have the comprehensive ability to provide an efficient S2M2 capability. The Modular Force needs an S2M2 capable of supporting a joint future force that is knowledge-empowered, networked, interoperable, expeditionary, agile, adaptable, and tailorable as well as enduring and persistent, precise, and lethal. The S2M2 enterprise capability of the future must be a single system of seamless support from point of need to source of supply and back. It must also operate across full spectrum operations in a joint operating environment. The S2M2 future capability must have the ability to align seamlessly, integrate, and synchronize S2M2 actions in concert with joint development of network-centric operations and warfare capabilities. It must support interoperability of current service, joint, or multinational forces and capabilities with those of the future as well.

Simply adapting current S2M2 concepts and capabilities to the future Modular Force will only constrain operations to exclusive, outdated, and cumbersome supply chain management. The problem facing the Army is that current S2M2 practices tend to create service-exclusive and complex supply sources. Materiel management methods still have redundant tasks, roles, and responsibilities from strategic down to theater levels. An added limit is that visibility of these assets is not evident to the commanders, staffs, and key decision-makers. S2M2 is currently controlled through many automated systems and tools, which are not always interactive or interoperable. Department of Defense (DOD), service, or national financial implications and constraints create obstacles to service, joint, and multinational interoperability. In current operations and current S2M2 practices, retrograde and disposal are secondary or tertiary concerns in the macro view – consequences of which are now becoming more and more evident. There are repercussions throughout DOD, not just the Army. Constantly updating temporary solutions to long-term S2M2 problems will retain many of the historically systemic issues and constraints. It will create a more modern, yet still inefficient, sustainment force that must continue to deal with the old problems.

Future distribution operations concepts are set against how the Army -- in conjunction with partners and other services -- synchronizes and manages the multidirectional flow of theater distribution operations (delivering the "right things" to the "right place" at the "right time"). S2M2 concepts for the future Modular Force are more specifically oriented toward those supply and materiel management operations

that trigger, influence, or impact the synchronization mechanisms within distribution operations. Logistics command and control, in various forms, is the constant oversight and control for all three types of operations. This creates an external influence over each of the separate operations, while maintaining control and overall management during the confluence of these sustainment functions (supply support, materiel management, and distribution operations). These interrelationships create the seamless and



highly responsive face of sustainment, critical to the future forces. The supply support and materiel management functional areas often overlap to the point where boundaries are very difficult to define in black and white.

Supply support and materiel management for the future Modular Force are important and integral parts of deployment and sustainment operations, supporting the realm of Army, Joint, interagency, and multinational forces. The paradigm shift toward the future requires an S2M2 system -- adopting common rules, tools, and processes with Joint services -- that provides a continuous sustainment loop, which is a constant stream of forward, lateral, and rearward movements. The concept and capabilities shift toward the future must accomplish three things within S2M2 to afford commanders a number of critical capabilities. They must do the following:

1. To clear the battlefield, create a more effective operational capability, maximizing force structures, equipment, stocks, and prioritizing all aspects of retrograde constraining critical movement and assets.
2. Streamline commodities and commodity management for greater operational flexibility between joint forces and strategic partners -- creating and implementing common rules, tools, and processes for seamlessness.
3. Expand on the capabilities of the operational net-centric environment, enabling commanders to fully integrate the concept of support into the concept of (maneuver) operations, creating rapid and precise response to fluid warfighter requirements.

Modernizing both S2 and M2 functions to keep pace with the development and employment of the future Modular Force inherently means supporting the evolving shifts in characteristics and conduct of US joint warfare and methods of crisis resolution.

The ideas presented in this document are fully nested in the Army Concept Strategy concepts, focusing on Sustain, and are consistent with the Focused Logistics Joint Functional Concept, as well as the broader planning and modernization guidance of the Army Campaign Plan Logistics Governance Annex I, the Army Modernization Strategy, the Army Strategic Planning Guidance, and Interim Guidance for Development of the Force. The article is also set against multiple related concept and capabilities efforts, such as distribution operations, logistics command and control, and seabasing, among others. S2M2 concepts, as an enterprise, encompass the strategic, operational, and tactical levels; the physical domains and cyberspace; and the full range of logistics capabilities, stakeholders and processes. Understanding this enterprise and its characteristics is essential to planning, executing, and controlling supply support and materiel management activities, both now and in the future.

MAJ Read is a Logistics Group Officer currently serving as a concepts combat developer, Quartermaster/ Sustainment Concepts Branch, Concepts and Doctrine Directorate, CASCOM at Fort Lee, Virginia. She deployed twice in support of Operation Iraqi Freedom. MAJ Read earned a bachelor's degree in international relations and English, with minors in French and political science, from the University of Dayton in Dayton, Ohio, where she was commissioned.

A Salute to Our Sustainers

By Lieutenant General Mitchell H. Stevenson

First, congratulations to all the marvelous Soldiers and Civilians of the Quartermaster Corps for your sustained period of outstanding service to our Nation! Since 1775, your steadfast support has often been the difference between success and failure.

While all that we do in the logistics business is important, Quartermasters are most directly responsible for taking care of our most precious resource -- our Soldiers. And in the wars in Iraq and Afghanistan, Quartermaster Soldiers have been exposed to the battlefield as never before, in a variety of missions, including the critically important task of convoy protection.

The war in Iraq was only three days old when SGT Donald Walters, a cook, was taken prisoner and killed, but not before he bravely provided covering fire for others in his convoy to escape a deadly ambush. He ultimately received the Silver Star for his actions. He, along with more than 120 Quartermaster Soldiers, have given their lives answering our Nation's call, and numerous others have been decorated with valorous awards. During a recent trip to Iraq, I witnessed first-hand Quartermasters and other sustainers working tirelessly to ensure our Army, sister services and coalition partners received what they needed, when they needed it. Leaders, Soldiers and Civilians alike were extremely complimentary of your herculean efforts. Commanders reported they were able to execute their operational missions completely unencumbered by logistics constraints. As the Deputy Chief of Staff, G-4, I couldn't be more proud.

The seamless interaction between Active, National Guard and Army Reserve support units, and our implementation of the new logistics modular construct is equally impressive. We began this conversion more than five years ago, and frankly, there was risk in undergoing such a large-scale project in the midst of supporting combat operations. Nonetheless, you made it a success. I communicate daily with commanders and senior leaders across the Army, and they never fail to pass along their sincere gratitude.

The alignment of brigade support battalions under brigade combat teams; the transition from division support commands and corps support groups to sustainment brigades; the stand up of special troops battalions; the transition from corps support battalions to combat service support battalions; and the integration of the human resources and finance functions have all been extremely successful. With more than 70 percent of our logistics forces in the Reserve component, this massive undertaking has truly been a team effort. Finally, the establishment of the Logistics Corps, joining all Transportation, Quartermaster, and Ordnance Soldiers and Civilians together into a single unbeatable team represented another significant milestone.

The future for sustainers is extremely bright, despite the many challenges that lie ahead. The drawdown of forces in Iraq and the simultaneous build-up in Afghanistan will test our distribution, supply, maintenance, and logistics information systems as never before. Furthermore, the never-ending and critically important task of property accountability in both theaters and at home station, the daunting tasks associated with equipment reset, and the many other contributions that Quartermaster Soldiers and Civilians make will remain essential to meeting the Army's strategic imperatives of prepare, reset, transform, and sustain. From the continental US industrial base to the foxhole of every deployed Soldier, you will remain the critical link.

Finally, I would be remiss if I failed to recognize the contribution of our Families and loved ones. They too are a huge part of our unbeatable team. Our Nation and our Army will continue to rely heavily upon the entire Army team, and I know they will respond in the same supportive manner.

Today, I salute all sustainers and their Families -- Sustain the Force!

LTG Stevenson is the Army Deputy Chief of Staff for Logistics. Previous commands include Commander, Division Support Command, 3d Infantry Division, Germany; Commanding General, US Army Ordnance Center and Schools, Aberdeen Proving Ground, Maryland; and Commanding General, US Army Combined Arms Support Command, Fort Lee, Virginia. LTG Stevenson earned a master's degree in logistics management at the Florida Institute of Technology.

Trusting the Leadership

By Lieutenant General (Retired) Arthur J. Gregg

I have been a proud Quartermaster for 63 wonderful years, and I am intensely proud of our Corps' history, tradition, and excellence in "supporting victory." I view the men and women of the Corps with the admiration and the respect they richly earned over the last 234 years.

Like most Quartermasters, I would like to see the Corps continue as an element of the logistics triad, along with the great Soldiers of the Ordnance and Transportation Corps. The nostalgia, the pride, and the satisfaction of serving as a Quartermaster say – no change.

But, I also recall that most rewarding assignment of my career was command of the 96th Supply and Service Battalion in Vietnam, 1966-67. At its peak, it was an oversized battalion of 18 companies and eight detachments – 3,600 officers and Soldiers – a mixed battalion of Quartermaster and Ordnance units. The performance of this mixed battalion was conspicuously outstanding. Its composition suggests that the Logistics Corps has been evolving over many years.

The battlefield has changed, and is changing, and so are the Soldiers and the equipment we provide and support. Army leaders have, over many years, advanced the concept of a Logistics Corps ascending from the traditional technical service branches of Quartermaster, Ordnance and Transportation. Empirical data, experience, and judgment tell them that the time has come for a Logistics Corps. I trust them.

While members of the Quartermaster, Ordnance, and Transportation Corps will always be proud of their rich histories, we must be prepared to embrace the evolution to a Logistics Corps. The intense pride of serving in those honored branches must give way to a new order – a new order of mixed skills of logistic warriors focused on supporting victory on the 21st century battlefield. Logisticians must support the transition from the separate technical branches to a Logistics Corps believing that it will best serve the needs of our Army and Nation.

LTG (Ret.) Gregg is Honorary Colonel Emeritus of the Quartermaster Regiment. He enlisted in the United States Army in January 1946 and was commissioned through Officer's Candidate School in May 1950. He served for more than 35 years and his most significant assignments included Commander, Army and Air Force Exchange System, Europe; Deputy Chief of Staff for Logistics, United States Army, Europe; Director for Logistics in the Organization of the Joint Chiefs of Staff; and the Army's Deputy Chief of Staff for Logistics.

General Eisenhower used to demonstrate the art of leadership with a simple piece of string. He'd put it on the table and say: "Pull the string, and it will follow wherever you wish. Push it, and it will go nowhere at all. It's just that way when it comes to leading people."

Mortuary Affairs Updates Keep Families in Mind

By Mrs. Lee Green

Small, specialized and unique, mortuary affairs is a sustainment functional area often overlooked, little discussed, and little understood. Mortuary affairs has long been in need of modernization. Several significant changes will be fielded this autumn with others to follow in the near future.

No one likes to talk about death -- thoughts of mortality and the horror of modern warfare make people uncomfortable. Mortuary affairs specialists (92Ms), though, must be comfortable with death on the battlefield and must have unique equipment in order to perform their vital and difficult job. The Army, as the Department of Defense (DOD) executive agent for mortuary affairs (MA), has the responsibility to modernize capabilities to support current and future joint MA missions across the full spectrum of military operations. Because of the nature of the mission and the small number of units, modernizing MA holistically has posed a special challenge. However, in the coming years, the Army's MA modernization efforts will result in a significant leap forward in capabilities.

A key driver in modernization is DOD's commitment to the families who lose their loved ones. While protecting the living takes precedence, DOD requires remains be given "the highest priority" and handled with the utmost dignity, reverence, and respect, while we make every effort to return the fallen to their loved ones in the best possible condition. In spite of DOD's commitment, obtaining support to modernize MA capabilities has not been easy. With only two MA companies in the active force and three in the Reserves, it is expensive to develop new systems, especially in a fiercely competitive environment where money is tight. Obtaining support for development efforts is also difficult, as those unfamiliar with the MA field often believe the work requires no unique skills or training. Being able to handle remains and personal effects of fellow Soldiers is, however, one of the toughest jobs on the battlefield.

Stressors are extremely high for 92Ms. Warfare can cause horrific injuries to which MA specialists are exposed. MA sites must be open always because casualties do not happen at regular intervals or during regular duty days. Deployed personnel operating MA sites cannot plan down time or leave their site unstaffed. When remains are received, they must be handled immediately, thoroughly and accurately. There is no room for error. Forensic evidence and critical information must be protected. Chain of custody must be maintained, and remains must be properly stored. The 92Ms must have precise knowledge about handling remains. Their efforts directly affect the Armed Forces medical examiner's ability to establish accurate identity and determine cause and manner of death. Any error involving fallen service members is not only detrimental to DOD, but it also causes further pain to families. The 92Ms operate under intense scrutiny not seen in other functional areas. Rates of post-traumatic stress disorder are so high in MA specialists that the Army has recognized the need to limit their deployments to six months.

To put the Army's modernization efforts into perspective, it helps to understand current MA operations. Here is what happens in theater today. MA teams of six Soldiers operate mortuary affairs collection points where they receive remains in tents or other austere semi-fixed facilities that take up a lot of space and are not mobile. Their equipment has changed very little in the past 20 years. No MA automation system supports the detailed documentation process, so many forms are prepared one at a time. Once 92Ms complete their processing tasks, the remains are placed in refrigerated containers, designed for perishable food, that cannot cool while in transit. The MA specialists coordinate sending remains to the theater mortuary evacuation point where they are placed in Vietnam-era transfer cases with 40 to 90 pounds of ice to deter decomposition during their return to the United States. These aluminum cases were originally designed to protect embalmed remains during transport. The MA infrastructure and equipment are outdated and bulky – clearly not designed for 21sr century warfare.

Starting this fall, however, the first major program upgrade will provide an exponential increase in ca-

The new Mobile Integrated Remains Collection System (MIRCS) can be trucked to a site where it is needed (left) so MA Soldiers (at right) may carry out their duties near the tactical operations they support.

pabilities with the fielding of the Mobile Integrated Remains Collection System (MIRCS), which was approved for initial development in April 2002. Combat developers at the Combined Arms Support Command (CASCOM), supported by subject matter experts from the Joint Mortuary Affairs Center (JMAC) and engineers from the program manager for Force Sustainment Systems, developed the MIRCS. The MIRCS is a 20-foot trailer that expands to provide additional space and can be hauled by several different military vehicles. It has state-of-the-art refrigerated storage compartments to hold up to 16 remains, which can be loaded in minutes if the situation dictates. For the first time, mortuary affairs teams will be mobile and can keep up with the unit they are supporting in tactical operations. The MIRCS provides a sanitary, environmentally controlled area for 92M Soldiers to care for our fallen service members.

Later this year, MA Soldiers will also finally have a formal automation system to support their mission. The mortuary affairs reporting and tracking system (MARTS) has been completed by the program manager for the Defense Casualty Information Processing System. In development for several years, MARTS was approved by the Army G4 in March 2009 as the mortuary affairs system of record, and will soon be fielded to deploying MA teams. For the first time, the many MA forms are automated and integrated into the casualty and logistics systems.

Another significant event this year is the establishment of the Joint Mortuary Affairs Center under the Quartermaster Center and School (QMC&S) at Fort Lee, Virginia. As the executive agent, the Army also has the responsibility for developing joint MA doctrine and training and for monitoring readiness to support military operations. Stood up provisionally in October 2008, the JMAC expands the QMC&S's joint training and doctrine mission to enable the Army to perform the full range of executive agent functions under the oversight of the Army Deputy Chief of Staff for Logistics. The JMAC will monitor MA readiness and capabilities, respond to congressional and senior leader inquiries on MA matters, perform analyses and report to the Army and Joint staffs, operate a 24-hour help line, develop and maintain a lessons learned and historical database, and deploy technical assistance teams when requested in support of all military services. In addition, the JMAC will work with DOD and national agencies to develop MA capabilities for homeland defense and civil support operations. Over time, the Army hopes to expand the JMAC to include other service and agency representatives. Many other

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modernization initiatives are in development. Starting in 2012, MA units are expected to start reconfiguring to one standard design, replacing two types of units designed for the legacy linear battlefield. The new MA company will be modular and multifunctional with "building blocks" of teams and platoons configurable to support any of the range of MA missions, from tactical to theater support missions. At about the same time, instead of placing remains in Vietnam-era transfer cases, 92Ms will place remains in the new human remains temperature-controlled transfer case (HRTC2). The HRTC2, built of composite materials with various methods of insulation, will have both active and passive cooling to maintain remains at an optimal temperature. In addition, 92Ms will be able to track remains in transit using standard automatic identification technology integrated into the case, which will record not only location, but also senses the temperature inside the case and alerts MA personnel when the temperature is outside the acceptable range. The 92Ms will have the ability to track remains and ensure preservation of remains during their journey home.

Vecna's BEAR robot is being developed to recover casualties.

Jump ahead to 2020 when unmanned systems will assist in recovering remains. Many additional casualties and fatalities occur when Soldiers or medics try to assist fellow service members. MA combat developers are working with the medical community to leverage existing efforts in robotic recovery of casualties on the battlefield. By developing unmanned systems to recover remains from dangerous environments, such as from threats of small arms fire and a chemical, biological, radiological, or nuclear environment, combat developers hope to reduce risks to Soldiers. Unmanned systems will eventually be able to search for casualties, detect vital signs, and recover remains to an evacuation site, where an unmanned ground or air vehicle will subsequently return remains to a processing point for contaminated remains.

At the processing point, 92Ms will document identifying information, obtain DNA samples, and mitigate the hazard. The Human Remains Decontamination System (HRDS) Family of Systems is currently in development by the Joint Program for Decontamination Systems and includes systems that will assist units and MA personnel in handling, transporting, and processing contaminated remains safely. The contaminated human remains pouch is a robust pouch designed to keep contamination inside the bag for 96 hours, reducing risk to those handling and transporting remains. Another HRDS system, the Remains Decontamination System, will have a suite of equipment that allows the 92Ms to safely perform their mission on contaminated remains while reducing the contamination levels. Also part of HRDS is a specially designed transfer case that will support movement of remains regardless of contamination levels. For the first time, the Army will have equipment and processes to allow MA specialists to safely perform their mission on contaminated remains and return those remains to the US.

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Looking Beyond the Horizon in Mortuary Affairs

By Mr. Tom Bourlier

I don't believe you can look forward and see very much of significance without, at least for a moment or two, looking back to see where you came from. Twenty years ago, care for our fallen was called "Graves Registration," a title held over from World War II when temporary burial was the norm. There were no company-sized units, only small collection point sections in other companies. Once deployed, these sections were largely on their own. Their company and battalion higher headquarters did not have the expertise to provide proper guidance and oversight. Graves Registration collection point personnel were often not school trained, but learned on the job.

Union Army BG Daniel Butterfield composed the bugle call that became known as "Taps" in 1862 while commanding the 3rd Brigade, 1st Division, V Army Corps, Army of the Potomac, at Harrison's Landing, Charles City County, Virginia.

In the years since WWII, monumental strides have been made. Graves Registration has become Mortuary Affairs (MA) because the emphasis is now on returning our fallen rather than temporary burial on the field of battle. We return our fallen so that their Families may lay them down gently in fields of honor. Yes, there has been much change, because change is inevitable. So here we are in 2009, and we wonder, what lies Beyond the Horizon for Mortuary Affairs? How will we be caring for our fallen in 2030 or 2040?

Inter-Service Mortuary Affairs

Within the next 20 or 30 years, we are going to see unprecedented cooperation among the services in the field of Mortuary Affairs. This will be driven, in part, by our services becoming smaller and, therefore, more efficient. A Joint Mortuary Affairs program will replace each service's MA program. The Joint program will, however, allow each service the latitude to honor their fallen service members in a manner consistent with service tradition. MA institutional training will become completely "Joint" with a jointly staffed training center operated by the Department of the Army. This Joint training center will incorporate courses of instruction currently taught by the services at their individual locations. The curriculum will be developed from Joint doctrine that will address the operational needs of each individual service.

In theaters of operation, the task of caring for our fallen will be shared among our services as we work together for the common good. It will not be unusual to see jointly staffed MA facilities.

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Over the next 15 years, the mortuary affairs field will experience significant improvements in force structure, automation, and equipment that will forever change the nature of Army MA operations. Mortuary affairs will shift from bulky, static field sites and antiquated equipment to a modern modular, automated, and well equipped force. And lastly, this difficult and vital mission will have an executive agent office supporting and advocating for this small group of specialized Soldiers, helping to thrust mortuary affairs capabilities into the 21st century.

Mrs. Green is the director of the Joint Mortuary Affairs Center. A combat developer at the Combined Arms Support Command , Fort Lee, Virginia, since 2000, she led the mortuary affairs modernization efforts for the past three years. Retired from the Army Reserves as a Quartermaster lieutenant colonel, Mrs. Green has a bachelor's degree in political science from the University of New Hampshire and a master's degree in public administration from Western Kentucky University.

Preserving 'Dignity, Reverence and Respect' for the Nation's fallen.

nology will bring about significant reduction in size to make chemical and biological decontamination more viable.

On the other hand, radiological contamination is much different. Once remains become radioactive, only the half-life decay time of the radioisotope can alter the contamination level. Not all remains will be radioactive though. Most may only be contaminated with radioactive "fallout," which may be washed off.

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Technology Drives the Future

Believe it or not, there are people alive today in America who did not have color television – or any television -- when they were children. Technology is a fast moving train, and the future of mortuary affairs will be greatly affected by what technology brings.

Preservation of human remains by refrigeration has been the norm, but that may not be so in the future. Today's large and bulky refrigerated containers may very well be replaced by chemical refrigerants or a topical chemical application that retards decomposition for an indefinite period of time.

Identification and the management and transfer of information pertaining to each individual case file will be much faster and more accurate. DNA matching will be done in a matter of hours, not months. Service members will wear global positioning system type locators that will speed the recovery of a fallen, injured or captured service member.

The long-time problem of returning the remains of our service members who have died as a result of chemical or biological exposure will be a problem of the past. Again, technology will be the answer. Chemical and biological remains will be made completely safe for handling and return to family members through the use of X-Ray or similar technology. X-Ray has been shown to have great potential for decontaminating remains externally and internally. The drawback has been that the size of the X-Ray device made it impractical for transport. It is likely that tech-

The MA Force

The Army will continue to maintain a military occupational specialty (MOS) for Mortuary Affairs, and it will not be combined with any other MOS. To do otherwise would be to turn our backs on our fallen and the American people who trust us with their loved ones. A modular force design will continue to provide the flexibility necessary to meet most any requirement. All MA companies will be designed in this manner, which provides a capability of being tailored to meet any requirement.

So now we have walked over the hill and looked "beyond the horizon" at what lies ahead for Mortuary Affairs. We prefer a world where our forces are no longer needed, but reality tells us that we have been needed from the Civil War to the present day and will be needed in 2050 and beyond. Rest well, America. Your fallen loved ones will receive the utmost in "Dignity, Reverence and Respect" from Mortuary Affairs.

Mr. Bourlier is the Director of Training of the Joint Mortuary Affairs Center after serving as the Director of the Mortuary Affairs Center for the past 14 years. He began his service in Mortuary Affairs in 1967 in Vietnam. In 1990 he was recalled to active duty as a Lieutenant Colonel and served as the Central Command Joint Mortuary Affairs Officer during Operation Desert Shield/Storm.

Corps Is Rooted in Multifunctionality

By Lieutenant General (Retired) John J. Cusick

I first thank, compliment and bless the wonderful men and women of our Armed Forces and our Quartermaster Corps for their historic and incredible service to the Nation since the founding of this great country of ours, but most particularly for those who have served during the post 9/11 time period and participated in *Operations Iraqi Freedom* and *Enduring Freedom*.

Your skill, sacrifice and dedication cannot be clearly measured, nor properly rewarded, but please know how grateful the American people are for your service and sacrifices. History will record your contributions and those of the Quartermaster Corps as truly heroic.

The Quartermaster Corps and Quartermaster Soldiers have served our country since the beginning of our fight for independence. The Corps has always had its mission focused on the care and equipping of American Soldiers, and that mission has always been accomplished.

It is interesting to note that in this era of multifunctionality that we are actually returning to the roots of the Quartermaster Corps. The Corps served as America's single combat service support organization from 16 June 1775 until 1814, when the Ordnance Corps was established, followed about 128 years later in 1942, by the creation of the Transportation Corps. So our participation as leaders in combat service support missions is not only an important concept for our Army but also a historic one for our Corps.

One last thought for the men and women who are currently on active duty in the US Army and are now members of the Quartermaster Corps -- you could not have made a better decision for your future. Regardless of whether you serve one tour or remain until retirement, you have stepped up and taken responsibility as a citizen and defender of our Nation and that is something that will remain part of your basic fiber for your entire life. It will give you a basis for personal success in whatever you decide to do. Honorable service to our Nation is a recognized and respected achievement on every scorecard, and it is an accomplishment you should feel proud of attaining.

In closing, I'd like to wish all our Quartermaster Corps Soldiers -- past, present and future -- the very best. God bless the United States of America, our Armed Services and our Corps.

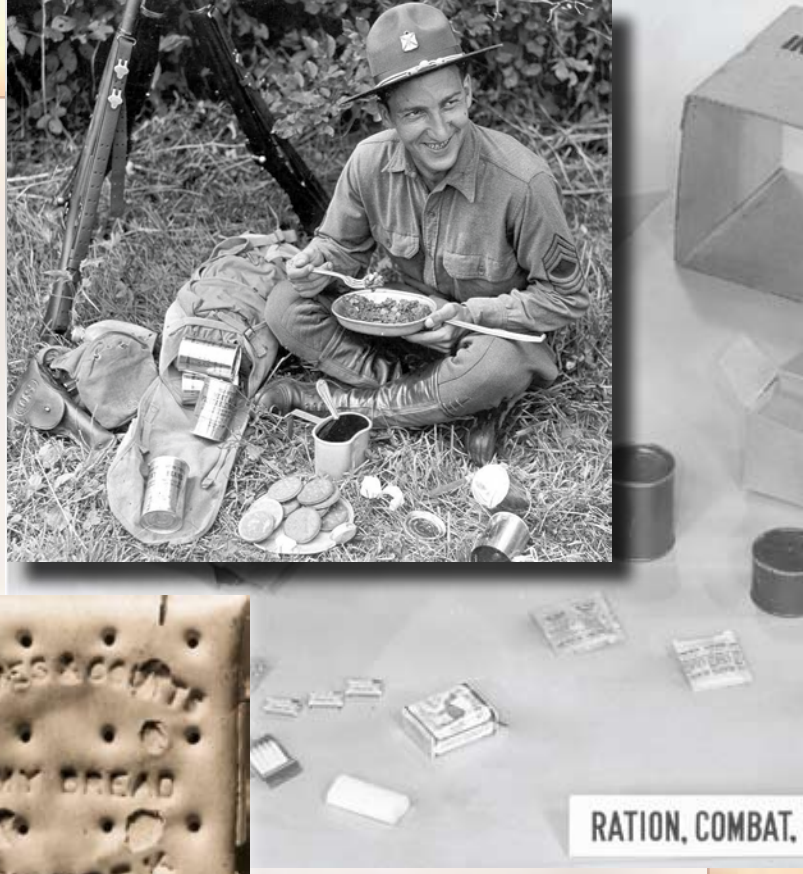
LTG (Ret.) Cusick was the 42nd Quartermaster General in 1991-93. His final assignment in more than 34 years of service was as Director of Logistics, J-4, for the Joint Chiefs of Staff before retiring in 1998. He had two deployments to Vietnam. LTG Cusick earned bachelor's and master's degrees in history and a master's in management.

"It is to the great credit of the Quartermaster Corps that on this Christmas Day every Soldier has turkey. …I know of no army in the world that would have done such a thing."

General George S. Patton, Jr., 1944

Traveling on Our Stomachs Into the Future

By Lieutenant Colonel Robert L. Barnes, Jr.



Just as the muskets of long ago were replaced by automatic weapons, laser-guided missiles and smart bombs, food service has advanced from hardtack and beans during the Civil War to unitized group rations (UGRs) that have innovative systems to prepare them for Soldiers to consume in any environment.

The old adage "an Army travels on its stomach" is as true today as it was in the past, and it will be true 25 years and further into the future. Our Army is only as good as the morale of its most cherished possession, the American Soldier. A hot meal that's well prepared and served at the right place and time provides an enormous boost to a Soldier's morale and well-being. The Army food service operations will continue providing nutritious meals; however, technology is expected to bring changes in packaging, equipment and sanitation. How Soldiers consume meals may even change. Who knows, robots like Rosie the maid on "The Jetsons" cartoon may cook and serve Soldiers some day.

A look at history proves that technological advances have driven the evolution of food service just as operational mission requirements drive the type of support that troops receive. Combat operations and food service are, in a sense, symbiotic because technological breakthroughs drive changes and adjustments in both. Food service Soldiers, 92Gs, have always supported combat commanders' initiatives by using the doctrinal assessment of mission, enemy, terrain, troops, time and civilian considerations (METT-TC). As a consequence, we are the best fed and equipped Army in the world.

Changes in food service operations are also tied to constraints. Look at current operations in support of the global war on terrorism. In order to maintain support of Soldiers and allow more personnel to enter into combat arms operations, our support requirements such as water, food, fuel and transportation, to name a few, are contracted to civilian companies operating at primary log bases within war zones under the Logistics Civilian Augmentation Program. This allows commanders to minimize the number of military personnel who perform these services and to redirect those Soldiers to the battlefield. What long-term impact this use of contractors will have on the number of 92Gs we train is yet to be seen. It is clear, however, that 92Gs are needed to oversee work done by contractors to ensure dining facilities and kitchens meet the Army's standards. Our 92Gs continue to provide food service in forward operating bases and combat operating posts.

Within the food service community, we have often made jokes about the future of rations. Perhaps a "patch" stuck on the arm will supply all of the essential nutrition to support life while the Soldier continues to fight. Ah, the aroma and flavor as the nutrients pass through the skin! This culinary "delicacy" may be one way, in the future, we sustain our

Combat rations, from left, have evolved from hardtack during the Civil War (background and sample at left) to K and C rations during World War II, to MREs (meals ready to eat), to unitized group rations that virtually heat themselves. Vietnam era Soldiers endured MCI (meal, combat, individual) rations as well. During the Civil War, Soldiers sang, 'Hard tack, hard tack, come again no more. Many days you have lingered upon our stomachs sore.'

Soldiers and meet their nutritional needs. Another alternative might be chewing gum, similar to the gum in the "Willy Wonka and the Chocolate Factory" movie that delivers a five- to seven-course meal as the Soldier simply chews.

It's anyone's guess what technology may make possible for food service 25 years from now. Regardless of the products, surely the operational environment will continue shaping the outcome. Each combat scenario explores limitless possibilities for development of concepts and equipment that meet challenges. From industry to academia, crucial lessons learned must be studied and used whether on our front lines or in garrisons. Our Soldiers must be adequately resourced to fight and win tomorrow's conflicts and battles.

Civilian food service trends are likely to greatly influence our military food operations through cooking methods, better packaging, genetically modified food, and sustainability improvements that meet environmental concerns. Commanders of the future will likely need to think in terms of "METT-TEC," with the second "E" being environmental concerns. As our Nation proceeds down the path of green practices, food service equipment will likely become more efficient and more self-contained. Each item will serve multiple functions like a Leatherman knife while it creates an ever smaller logistical and environmental footprint.

Will the feeding operations of the future still require military food service professionals? The future may bring about more contract cooking and pre-prepared food items for many different ethnic and cultural tastes. What will food look like in the future? Perhaps food will come in the form of a complete meal to heat and eat, or maybe as a pill or a patch. Perhaps individually wrapped salads will be available in vending machines while flavor pills will be available for the Soldier to dissolve in a bottle of water. The future is hard to predict, and technology changes every day.

Future dining facilities will probably not need headcounts due to improved specialized identification cards or implanted microchips. The new technology may determine who you are, whether you are entitled to use a dining facility, what payment options you have, and your dietary limitations or restrictions based on religion or health. What the future holds is limited only by imagination, by the technology of the future, and by what Soldiers will accept.

So, 25 or more years from now, many of today's futuristic concepts may materialize. Historically, science fiction has predicted inventions so we may live to see food replicators like the ones used in *Star Trek: The Next Generation*. Or perhaps Edgar Rice Burroughs

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Training and Leadership: Imperatives for the Future

By Major General Scott G. West

First, allow me to express to all of you how honored I am to have the opportunity to write a short essay for the final edition of the *Quartermaster Professional Bulletin*. From my earliest experience as a second lieutenant in the Quartermaster Officer Basic Course to my tour of duty as the 48th Quartermaster General, I have been proud to be a part of this Corps and the Quartermaster Regiment.

For 234 years the US Army has been in near constant transformation. That quality is the hallmark of all great, enduring organizations. The absence of that quality has led to the demise of many organizations that failed to remain relevant in the world. Change is constant, and only by embracing it can you remain relevant and help shape the future operating environment. Likewise, our Quartermaster Corps has mastered the transitions, staying ready and relevant in Supporting Victory. Although we remain in a changing world and ever-transforming security conditions, this will not change.

We must remember always that the Quartermaster functions are as important today as they have ever been in the history of our Army and, because they are important, our Corps remains as important today as it has ever been. Don't lose sight of the fact that our Quartermaster enlisted Soldiers, noncommissioned officers (NCOs) and warrant officers represent the huge majority of our Corps, and they MUST remain competent in their core Quartermaster skills. We also must recognize that because of the advanced capabilities of our officers, such as greater agility and adaptability, the time has come to fully embrace the concept of multifunctional sustainment leadership and management.

Our warfighting formations, particularly our brigade combat teams, rely heavily on Quartermasters to provide general supply, repair parts, food, fuel, water purification, field services, aerial delivery, mortuary affairs, and materiel management to succeed on the battlefield. This has been the case throughout our history and will be the case for the foreseeable future. Therefore, it is imperative that we continue to provide well-trained and well-led Quartermaster warriors to those formations. Critically important, we must continue to develop the finest Quartermaster NCOs for our Army. It is equally critical that we continue to build a strong cadre of Quartermaster warrant officers. All too often ignored, our Quartermaster Civilians are a critical component of our branch as well as being increasingly important to mission success.

Likewise, we must continue to assess young officers who train as Quartermaster leaders and ensure they become strong multifunctional sustainment leaders. For almost as long as I can remember (and I've been hanging around for awhile now), every senior Quartermaster officer I knew was actually a leader who was well-schooled in many sustainment functions, not just logistics. In the officer ranks, we have been a successful Logistics Corps for many years.

Leader development is as important today as it has ever been, maybe more so in consideration of an Army engaged in persistent conflict. Although we are ending the *Quartermaster Professional Bulletin*, we owe it to the Army and the Logistics Corps, as well as our Quartermaster leaders (junior officers, warrant officers, NCOs, and Civilians) to continue writing for professional journals such as *Army Sustainment*, formerly *Army Logistician.*

Finally, I absolutely must tell you that, above all else, you must continue to be an *American Soldier, a warrior and a member of a team. Serve the people of the United States of America and live the Army Values.* You know the creed . . . live it! Stay Army, stay Army Strong, stay safe, and know that I am very proud of

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Bidding Farewell to a Mainstay

By Major General James E. Chambers

Since the first publication in 1988, the *Quartermaster Professional Bulletin* has played a vital role and been a steady and reliable source of information for members of the Corps. Indeed, it is always a sad day when a mainstay for any organization ends its run; however, the *Bulletin* is leaving its readers with an incredibly rich history and legacy of the Quartermaster Corps. The *Bulletin* consistently told the story of countless men and women of the Corps who have been tested in the crucible of combat and whose extraordinary accomplishments contributed immeasurably to our Nation's defense. Please know that the same information that made the *Bulletin* so valuable will be available in other publications and media such as the *Army Sustainment* magazine (formerly the *Army Logistician*) and the *Traveller* newspaper that will reach many more readers. Indeed, these publications will provide the Corps the opportunity to share its stories of "Supporting Victory" through its actions on a much broader stage.

As we end one proud era, we begin anew with the history-making establishment of the new Logistics Corps and the Sustainment Center of Excellence (SCoE), both of which emphasize the multifunctional nature of Sustainment. By 2011, all training developments and combat developments for Army logistics will take place at Fort Lee. Also, the integration of combat developments for sustainment will be centralized in the SCoE. We will become the BEST training institution in the world for sustainers! With the Home of Sustainment as our mantra, we are the Center of Excellence for education, technical training, and reach-back for sustainment operators in the field. The sustainment community has embraced the vision, and we are well on our way to executing consolidation in accordance with the Base Realignment and Closure Law and meeting our milestones. The legacy that was begun with the first publication of the *Quartermaster Professional Bulletin* will continue, albeit in a different form. I know that I speak for thousands of past readers when I say it has been a pleasure to have had this great magazine reporting Quartermaster contributions to "Supporting Victory" for more than two decades.

MG Chambers is Commanding General, United States Army Combined Arms Support Command and Fort Lee, Fort Lee, Virginia. He was deployed to Saudi Arabia in Operations Desert Shield and Desert Storm. MG Chambers earned a bachelor's degree in physical education from Southeastern Oklahoma State University and a master's of business administration in logistics management from the Florida Institute of Technology.

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you Quartermasters and all you have done for our Nation throughout our 234-year history.

MG West is Commanding General of the Tank-Automotive and Armaments Command Lifecycle Management Command. While serving as the 48th Quartermaster General and Commanding General, US Army Quartermaster Center and School, MG West also served with command, control, communications and computers, Combined Joint Task Force 7 and Multi-National Force – Iraq. MG West graduated from Eastern Washington University and Florida Institute of Technology.

Reflections on Change

By Major General (Retired) Eugene L. Stillions, Jr.

Quartermasters have supported our Army for 234 years. I have seen almost 53 years of it, and every time our combat units were redesigned, we revised our Quartermaster (logistics) units, equipment and training to support new requirements.

Over the last 50 years most of the redesign was on our Army divisions and their support. Our division structures were altered to embrace new technologies, improve command and control, and increase flexibility. The search for personnel and dollar efficiencies was also a driver.

Our latest transformation focused on the combat brigades. Army brigades are now designed to be more self-sufficient and to fit the military challenges of recent wars and the foreseeable future. These changes require that the various functions of battlefield logistics be integrated at lower levels than before. Company level modular support organizations caused a new approach to training our logistics captains and a new Army career branch to manage their development and utilization.

Over my years of service, our field grade Quartermaster leaders served many tours in logistics and general staff assignments. In those positions, they gained the skills needed to command battalion and division support command, brigade, and group level organizations, providing the full range of battlefield logistics. The Department of the Army Logistics Officer Program and the establishment of a Logistics Career Management Division were enablers, supporting the development and utilization of logistics officers over the last 40 years.

The new logistics branch is a step toward earlier functional management of the careers of logistics officers. Many of today's Quartermaster captains will become the logistics colonels and generals of our Army during the next 15 to 20 years. They need to step up and assume responsibility for some oversight and advocacy for our serving lieutenants, warrant officers, noncommissioned officers (NCOs), and Soldiers. Our branch warrant officers and senior NCOs will have to provide that linkage.

Since most of the changes in officer advanced training were made earlier, new branch insignia will not drive much change in how logistics officers are developed and utilized. Senior warrant officer and senior NCO training will need review as the new logistics organizations mature. Our Quartermaster Soldiers will continue to learn their combat and technical skills at Fort Lee along with the logistics warriors of the other logistics branches and many from the other services. If our senior Quartermaster logistics officers fulfill their traditional responsibilities to our branch Soldiers, they will embrace the change, serve proudly as Quartermasters and provide more years of responsive support to Soldiers and their equipment.

Fort Lee is the logical place to consolidate Army logistics training and common logistics training for all the services. However, the lack of adjacent space for field training presents some challenges. Generals Washington and Mifflin might have trained their support forces at a major training center in Southside Virginia if they had today's means of communication and modern means for movement of Soldiers. In their time, the feasibility was supported by almost unlimited acreage available for field training and parking areas. Another advantage was that it was not very far from Yorktown. I doubt that they would have needed the effort and expense of a BRAC (Base Realignment and Closure legislation) to point the way.

MG (Ret.) Stillions was the 39th Quartermaster General. He then served as Director of Logistics and Security Assistance, US European Command before his retirement in 1988. MG Stillions deployed to Korea and Vietnam during his career. Commissioned through the Reserve Officers Training Corps as he graduated from Arkansas State University with a bachelor's degree in agriculture, he also earned a master's degree in management from Cornell University.

Commitment to Our Legacy Mission

By Major General (Retired) Hawthorne L. Proctor

First, let me thank the 50th Quartermaster General for letting me have this opportunity to express my thoughts on our great Quartermaster Corps as we move further into the 21st century! Let me say that I feel that we are now at one of the significant "watershed" events in our Corps' 234 year history! With the introduction of the Logistics Corps, we now have our officers matriculating to that Corps as a result of our Army's transformation. One could argue the need for this change, but at this point, that is all academic.

My point is that the Corps loses its senior leadership from the officer ranks, but not its critical mission to sustain the warfighter! We must not lose sight of this as we proceed toward an uncertain future. What we must ensure is that officers who start out in the Corps remain committed to ensuring that the remaining members of the Corps carry out its legacy as mentioned above. There is little doubt that those remaining in the Corps will continue "Supporting Victory" as it sustains our Army in joint and combined warfighting venues!

MG (Ret.) Proctor served as 46th Quartermaster General, US Army Quartermaster Center and School, Fort Lee, Virginia. His overseas assignments included South Korea, Vietnam and Thailand. MG Proctor earned a bachelor's degree in agricultural economics at North Carolina Agricultural and Technical State University where he was commissioned and a master's in public administration at Central Michigan University.

'If you can't pick it up . . .'

An unknown wag once noted the Army has this rule: "If it moves, salute it. If it doesn't move, pick it up. If you can't pick it up, paint it." Perhaps that's why Soldiers have long been painting their unit logos on rocks.

Preparing for What We Can't Imagine

By Major General (Retired) Terry E. Juskowiak

When I was asked to write a brief statement about my vision or hopes for the future of the Quartermaster Corps as far out as 2050, I first thought back 50 years to where our Corps was in 1959. I was a young Army dependent of a Quartermaster executive officer serving with a supply and services battalion in Germany. World War II had ended only 14 years earlier, and much of Europe still lay visibly in ruins. The Korean Conflict had reached a cease-fire six years earlier, and the Cold War was heating up in earnest. Vietnam was not yet a prominent spot on the Nation's radar screen. Our Corps was significantly larger than it is today, and many aspects of the Quartermaster Corps had changed as a result of the new geopolitical environment, along with the lessons of WWII, Korea, and an Army designed and postured for Cold War missions in the dawn of the nuclear age.

By the time I joined the Army in May 1973, many progressive, evolutionary changes had occurred, almost all as a result of our Corps' experiences in Vietnam and the beginning of widespread automation. Essentially, what we automated were the old WWII manual processes and procedures. We made them faster, but we didn't necessarily make them better at first. We, as a Corps, were fortunate to have great thinkers in the early years of automation who knew that with new technology came the requirement for a new mind-set. Thus, the Corps was quick to think ahead about how to harness the emerging technologies that were beginning to open to the military and commercial markets. My contemporaries and I, from the 1970s until the early 2000s, were fortunate to be able to work with and build on the work of these pioneering Quartermasters of all ranks and military occupational specialties. Ours was certainly a turbulent time with the ending of the Vietnam War, the fall of the Berlin Wall, the end of the Cold War, and the dramatically increased operational tempo of our Army and our Corps. The new Quartermaster operating environment faced a significant number of combat and humanitarian deployments, large and small, short and long, around the world – all while increasing our use of automation. But I dare say in 2009, that we have not seen anything yet; so hold on to your helmets for a fast ride in the decades ahead.

Predicting the future is always risky business. If I posture myself out to 2050, I believe some things will be constant – above all, "change." While change will be a constant, the rate of change will be exponential over anything we have ever witnessed. Expect revolutionary game changes, not evolutionary progression. The operating threat environment for our Corps will not so much be defined by several identifiable nation-states as it will by the actions of non-nation organizations and other shadow groups. Such enemies will attempt to attack and exploit the perceived weaknesses of our cyber-based, technologically superior, and heavily automated force as it performs its global missions.

We live in an increasingly instrumented, interconnected, and intelligent world. According to many published sources, technological advances are expected to double every few years. We can expect our Corps' use of and our reliance on technology to increase dramatically. What we train our Quartermaster professionals on today will quickly be outdated tomorrow. It sounds trite, but we truly will need to train our Quartermasters not "what to think" but rather "how to think." They will need to be equipped with the skills that will allow them to think how best to use rapid advances in technology to constantly and consistently improve Quartermaster mission support.

Most importantly, we as a Corps will need to understand how to effectively and efficiently prepare the Quartermasters of the future for specialties not yet even envisioned, using technologies not yet invented, to complete Quartermaster missions not yet identified for an Army not yet designed to face foes who have not yet emerged. This is an awesome, formidable task in itself, but couple this task with the realization

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Where Is Our Parade Field?

By Brigadier General Mark A. Bellini

It seems like a long time ago, but it really was not that long ago, when I looked outside the window from my former office in Mifflin Hall. What I saw brought a slight tear to my eye as I witnessed the graders and dozers digging up the parade field that so many thousands of Quartermasters had marched across during the past 45 years. It didn't take long for the construction crews to dig up part of Fort Lee's past. Debris from buildings demolished long ago and old utilities systems piling up on the parade grounds was proof that buildings were there long before it was a Quartermaster parade field. Maybe, just maybe, the construction crews were digging up remnants of my grandfather's barracks.

During World War I, Carmine Bellini was one of thousands who entered the Army at Camp Lee. Back then, the 80th Infantry Division enlisted, trained and deployed *Infantry* Soldiers to the trenches in France. The past being dug up and piled up on the parade field, that many of us considered to be Quartermaster, reminded me what's really important about our Corps and our Army. It's not the buildings or land or force structure or even military occupational specialties (MOSs), but rather the people and the enduring roles, missions, functions, and important tasks they have performed for our Army since its inception.

We use and reuse buildings and land in an endless cycle. We change the force structure Quartermasters are assigned to, we change some of their tasks, we change their MOSs, but we continue to ask of them the same fundamental thing - Support our Army. Just consider the number of redesigns in the last 50 years of the Army Division. Want a shorter timeframe or smaller unit? Consider the number of major changes in combat service support formations since the late 1970s. We had supply and transportation battalions, then forward support battalions, which then gave way to brigade support battalions and modular combat service support units.

Our officer corps has changed as well with the recent advent of the Logistics Corps. Quartermasters have always been the center pillar of logistics, so the transition was a natural one. To those of us now in the Logistics Corps, remember your roots. Remember your Quartermaster Soldiers, and let them know you share a heritage and history with them. They need and deserve a connection to officers.

The constant in all this transformation is our people, our Soldiers. Our profession is all about people, not places or things. We need and must continue to leverage equipment, like computer systems and software. However, our most important resource today and in the future remains our Soldiers. Embrace change, seek innovations, leverage technology, but remember, core to our Corps is – and will still be in 2050 – our Soldiers. Look to the future; help guide it and shape it. Remember the past; remember where you came from, but don't get stuck in it.

If Carmine Bellini were alive and returned to Camp Lee, he might ask, "Where is my old barracks?" When I go back to Fort Lee, I will not look for the parade field to find the Quartermaster Corps, and neither should you. It's easy to see our Corps wherever you are. Our Corps is in the hearts, minds, commitment, and energy of our Soldiers around the globe as they continue the everlasting tradition of the Quartermaster Corps: Supporting tactical commanders, their Soldiers and their equipment!

BG Bellini, the 49th Quartermaster General, is Deputy Chief of Staff, G4, US Army Europe and 7th Army, Heidelberg, Germany. He has been deployed to Somalia, Yugoslavia and Turkey where he served in support of Operation Iraqi Freedom. BG Bellini earned a bachelor's degree in economics and three master's degrees – in business administration, military arts and science, and strategic studies. He has also attended the John F. Kennedy School of Government at Harvard University.

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got it right in *A Princess from Mars* published in 1912 where his characters dine in "one of these gorgeous eating places where we were served entirely by mechanical apparatus. No hand touched the food from the time it entered the building in its raw state until it emerged hot and delicious upon the tables before the guests, in response to the touching of tiny buttons to indicate their desires." While what science and technology will bring to the table in the decades ahead is uncertain, it is certain, however, that our Soldiers will be eating nutritious meals prepared on or for a futuristic battlefield by food service professionals. Whether it's a "patch" or sustenance that arrives via a "molecular transporting beam" or the 2050 version of unitized group rations that are trucked to the site, our Soldiers will receive hot meals, well prepared and served when and where they need them.

LTC Barnes is Director of the Joint Culinary Center of Excellence, Quartermaster Center and School, Fort Lee, Virginia. He has deployed twice to Iraq as well as to Afghanistan. LTC Barnes earned an associate degree from North Greenville Junior College in Tigersville, South Carolina; a bachelor's degree in computer information systems from Jacksonville State University in Jacksonville, Alabama; and a master's degree in administration from Central Michigan University.

Hooah

Just what does "hooah" mean?

Pundit Rod Powers offers 16 different definitions:

1. Referring to or meaning anything and everything except "no."
2. What to say when at a loss for words.
3. a. Good copy. b. Roger. c. Solid copy. d. Good. e. Great. f. Message received. g. Understood. h. Acknowledged.
4. a. Glad to meet you. b. Welcome.
5. "All right!"
6. a. I don't know the answer, but I'll check on it. b. I haven't the foggiest idea.
7. I am not listening.
8. "That is enough of your drivel; sit down!"
9. Yes.
10. "You've got to be kidding me!"
11. Thank you.
12. Go to the next slide.
13. You've taken the correct action.
14. I don't know what that means, but I'm too embarrassed to ask for clarification.
15. Squared away as in "He's pretty hooah.
16. Amen!

"I always considered statesmen to be more expendable than Soldiers."

President Harry S Truman

33rd US President

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that we are asking a whole new generation of Quartermaster professionals, many whom have not yet been born, to lead our Corps.

The future of our Corps has never been brighter. I foresee a continuing need to train Soldiers in the basics of our Corps' ever-changing missions. They will need to be prepared so Quartermasters remain invaluable members of the Logistics Corps and the Army in the dynamic environment of 2050 – just as they are in today's dynamic environment Supporting Victory.

MG (Ret.) Juskowiak, the 47th Quartermaster General, is a partner at IBM where he is responsible for IBM's Global Business Services Army Account. A graduate of The Citadel, he earned a master's degree from Florida Institute of Technology. His deployments included Panama, Haiti, Bosnia, Operations Desert Shield and Desert Storm, and Kuwait. MG Juskowiak was the Training and Doctrine Command Deputy Commanding General for Logistics / Commanding General of the Combined Arms Support Command and Fort Lee, Virginia, at the time of his retirement.

Remember the Mules

By Command Sergeant Major David M. Bruner

Factors in the art of warfare are: First, calculations; second, quantities; third, logistics; fourth, the balance of power; and fifth, the possibility of victory is based on the balance of power . . . the line between order and disorder lies in logistics.

—Sun Tzu, The Art of War

Every serious leader knows logistics is the heart of war fighting. GEN George Patton, during his fast advance across Western Europe, said, "My men can eat their waist belts but my tanks need gas." Alfred Thayer Mahan, one of the most influential thinkers in the US Navy, called logistics as "valuable to military success as food is to daily labor." In ancient warfare, logistics meant the difference between victory and defeat. Alexander the Great took his forces on a 4,000-mile march of conquest across Asia based not just on his tactical genius, but also on his logistical acumen. "My logisticians are a humorless lot," he is often quoted as saying; "they know if my campaign fails, they are the first ones I will slay." In a stunning feat of military movement, Hannibal crossed the Alps with a force of 60,000 men and 37 elephants to attack Rome with incredible success until he was eventually forced to retreat to Carthage, not because of a successful Roman counterattack, but because he lacked reinforcements and supplies. Each of these leaders lived in a different time and place; they fought different wars with different technology and strategy. Yet each recognized the singular importance of one of the immutable facts of war: logistics.

In the years to come, the importance of logistics will surely remain an immutable fact of war. I have confidence that the warriors of the Quartermaster Corps, from the newest private in a field laundry to the most seasoned staff sergeant in a major headquarters, will remain one of the greatest assets of the United States Army. We will need these assets because our enemies have their own logistical professionals. Supplying our troops in Afghanistan is constantly a thorny problem for the North Atlantic Treaty Organization. Yet heroin grown and refined in Helmand province, where the majority of the population lives in poverty, with electricity and running water a luxury, can reach the streets of London within 48 hours of production. The profits from these sales can then feed into the $10 billion dollar illicit arms market, buying and smuggling rocket-propelled grenades and AK-47s used to attack our Soldiers.

Our enemies understand the power of efficiently moving men and supplies, and they understand how to do it creatively and stealthily. As leaders, one of our challenges in the future is to ensure that we recognize the importance of creativity and adaptability in thinking about logistics. I will leave the discussions of new technology – unmanned delivery vehicles or advanced computer supply chain managements – to the real experts. Instead, I want to talk about something I know a little more about. I want to talk about mules.

Many years ago, as a new sergeant in the Special Forces, I stood around a blackboard with my team members. We had a specific mission and needed to formulate a plan for inserting and extracting our small team. The terrain was treacherous, so wheeled vehicles were out. Fixed and rotary wing resupply would be difficult or impossible for a variety of reasons. We needed a lot of supplies to accomplish our mission, but we also needed to move quickly, so simply carrying the supplies on our backs was not an option. We were stumped.

Another sergeant in my team had grown up on a ranch, and every year during leave, he would lead civilian hiking expeditions for city slickers who wanted a taste of the West. Quietly he asked, "Why not use mules?" We laughed at first – after all, the only people

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The View From My Foxhole

By Command Sergeant Major (Retired) Don E. Wells

I have the distinct honor and privilege of serving as your Honorary Regimental Command Sergeant Major and would like to share my vision of the roles and responsibilities of the Quartermaster Noncommissioned Officer (NCO). This is the view from my foxhole.

It is very fitting that in recognition of your commitment to service and willingness to make great sacrifices on behalf of our Nation, the Secretary of the Army, Chief of Staff of the Army, and Sergeant Major of the Army have proclaimed 2009 as the "Year of the NCO." It's no secret that our Noncommissioned Officer Corps is the premier body of leadership in our Army and serves as the thread that holds it all together in this very turbulent period in our Nation's history. The Quartermaster NCO is the anchor of our Corps. Through your strong leadership and contributions, our Corps continues to provide great logistical support to our Army around the globe.

We are a Nation at war, and the Quartermaster NCO fully realizes and acknowledges the challenges associated with engaging a non-linear, asynchronous war while simultaneously transforming and modernizing equipment, unit formations, structures, and training. There is no "I" in team . . . and I am a huge advocate of the team. No one person travels the path to victory alone. Each of you must orient yourself with your fellow NCOs and Soldiers to ensure they are all fully incorporated members of the greater Army team. Our Quartermaster NCOs number nearly 119,000, and frankly there is no challenge which cannot be quickly handled by the depth and breadth of our tactical, operational, and strategic team!

The 21st century Quartermaster NCO is a multifunctional teacher, mentor, trainer, and coach and is tactically and technically competent across the logistics field. Quartermaster NCOs are a significant combat force generation enabler to commanders and are an integral member of the unit's and command's planning and execution team. First, and foremost, commanders demand premier technical expertise to ensure that emerging information systems are integrated correctly into the fabric of the operation and that proper policy, procedures, and practices are followed in support of the unit's logistical mission.

The Quartermaster NCO, along with his/her officer teammate, interprets the commanders' intent and ensures the guidance, resources, and direction is firmly appreciated by the logistics teams. You are expected to be fully joined at the hip with the officer in charge and subordinate Soldiers to ensure that requisite training, standards, and quality controls are in place to set conditions for successful mission accomplishment.

Additionally, you set feedback mechanisms, ensure safety awareness, risk mitigation, and accountability of resources. Quartermaster NCOs exist fundamentally in the implied task zone . . . scan your lanes and do what is right always to the professional standard that commanders require and our Corps and Army demand. Remember, the only constant is change and hence you must be flexible. Attributes and characteristics most valued in our great Noncommissioned Officer Corps is our ability to ensure success for the commander and to harness the tremendous talents of the team toward the stated and shared objective.

Each of you possesses tremendous knowledge, skills, abilities, and experiences that impact every segment of our Army. To serve our Nation, our Army and our Soldiers is a tremendous privilege and opportunity. Continue to think and lead your Soldier teams through the challenges you encounter. I look forward to seeing you on the high ground in the near future. Success is an engaging sport and Quartermaster noncommissioned officers are truly engaged!

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in the United States who still used mules regularly were Amish – but as he explained further, this suggestion made more and more sense. The Army had long used pack animals for resupply and transport – even into the 20th century. During World War I, the majority of artillery and cavalry units relied on horse-drawn equipment. The Army units who specialized in pack-animal logistics also proved some of the fiercest warriors of World War II. Merrill's Marauders, the Raiders of the 6th Ranger Battalion who rescued 500 prisoners of war at Cabanatuan, and the alpine troops of the 10th Mountain Infantry who fought in the bitter campaigns of the war in Italy all had a common ancestor. Before their designation and retraining as elite infantry units, they were called Muleskinners – units trained extensively in the use of pack animals for logistical transport. But as the 21st century drew to a close, this was all obsolete methodology. Or so we thought, until our mission was successful – because of mules.

Soon after September 11, 2001, that sergeant's idea again proved useful. Since that quiet suggestion in the team room, he had become the subject-matter expert in the U.S. Military on pack animal tactics and techniques. Special Forces Major Gary M. Brennis wrote, "This is just another one of those skills that we may not use that often . . . we have to pull it out and dust it off . . . that was the case with Afghanistan," in an article published in 2002 about the initial rout of the Taliban. "We had to kind of reach into our kit bag, and luckily we had in Special Forces several guys who had already been trained in this."

Guess who those guys were? The same Special Forces Soldiers who had initially heard that sergeant's suggestion for how to conduct resupply and had then taken it seriously. When thinking about the challenges we face in military logistics, we must recognize how easy it is to be blinded by technology or standard ways of operating. We must constantly strive to see all dimensions of a problem and all creative solutions, old or new. As that sergeant said, "In all of the Third World countries we operate in, 90 percent of the local supplies . . . are moved not by motorized vehicles, but by animals. If you plan on going to a Third World country to conduct operations, you need this type of training. We need to move like the locals."

This is not to say that we must now use mules for everything, all the time. My point is that a noncommissioned officer brainstorming in a room at Fort Campbell came up with a solution to a tough problem – the same type of tough problem facing our Quartermaster Corps warriors on a daily basis. Over a decade later, Secretary of Defense Rumsfeld would praise that sergeant's team room suggestion, telling reporters how the teams on the ground leading Northern Alliance troops and directing air strikes were able to move. They "heavily pack [the mules] and move equipment, ammunition, food . . . we have some terrific young people."

In the Year of the NCO, I take pride in recalling that the highest echelons of government were listening to and praising a solution to a sticky problem formulated by a noncommissioned officer with the guts to propose a creative solution. I firmly believe any logistical challenges we face in the future will be met by the minds of our Quartermaster Soldiers – as long as we leaders are willing to listen.

CSM Bruner is the command sergeant major of the Training and Doctrine Command, Fort Monroe, Virginia, and also served in that capacity at the Combined Arms Center, Fort Leavenworth, Kansas. His deployments include assignments in Pakistan, Saudi Arabia, Somalia, Kuwait, Afghanistan and Iraq. CSM Bruner has bachelor's degrees in sociology and psychology.

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Supporting Victory!

CSM (Ret.) Wells, a retired Quartermaster command sergeant major and the *Honorary Regimental Command Sergeant Major, is the Executive Officer for the US Army Logistics Management College, Fort Lee, Virginia. He earned a bachelor's degree in liberal arts from the University of Chicago. While on active duty, he was deployed to Saudi Arabia and was Quartermaster Regimental Command Sergeant Major, US Army Quartermaster Center and School at Fort Lee.*

Sighting the Future

By Captain Jeremiah L. Starr

The Army Logistics Corps, like a Soldier in basic rifle marksmanship training, must focus its sights on the future. Logisticians must continuously focus and refocus on future targets such as the many monetary, technological, social and systematic hurdles that we must overcome to continue our success on future battlefields.

Let us first address the 50-meter targets within the logistician's sight. Needless to say, the future will undoubtedly bring a change in the composition of our pre-positioned supplies, allowing our units to better accommodate future prisoners of war and civilian populations in a given theater of operations. The Army Logistics Corps must be prepared to operate with a limited logistical footprint in both Iraq and Afghanistan. We will repeatedly be asked to share our expertise with other host nations, allowing those nations to meet their logistical demands on their own, thereby diminishing the constant need for American logistical support.

We now push our sight picture forward to our logistical 150-meter targets. Warrior logisticians must continue to see themselves as Soldiers first and skilled logisticians second. All combat service support institutional training must expose our warrior logisticians to the same warrior tasks and battle drills that the Army warfighters receive. Future battlefields will continue to lack distinct front lines, and Army logisticians must be prepared to seize an objective if called upon. Logisticians will be asked to work more efficiently by consolidating similar military occupational specialties (MOSs) and continue to work with civilian contractors within a theater of operations.

Finally, let us focus down range to the 300-meter logistical targets. During this period, Army logisticians will be forced to not only create but also effectively implement state-of-the-art logistical technologies. The future Army warfighter will demand a synchronized logistical support system that is both mobile and versatile. Army logisticians will undoubtedly implement unmanned mobile feeding systems, unmanned re-supply drones with sensor technology, unmanned part fabrication systems, and much needed lifetime fuel cell advances. Those technological advances must be implemented one step ahead of the Army warfighters.

We must now seize the future logistical objectives and fire for effect on all our logistical targets. The foundation of the future Logistics Corps is, without a doubt, the skillful warrior logistician. Warriors serving in 2015 to 2050 must be prepared to meet these challenges head-on. Logisticians will continue to be exposed to tough training. They will be asked to think critically while operating in unfamiliar battlefield scenarios. Log warriors will utilize technological advances to anticipate demand and put needed resources on time and on target for our Army warfighters. We must continue to brave every hardship with the warfighter and never allow mission failure due to a logistical shortfall. The future is bright for Army logisticians. We will be asked to arrive in theater before the Army warfighter and remain in theater after the Army warfighter has departed. We will be wholeheartedly Supporting Victory!

CPT Starr enlisted in the Army as a dental specialist after high school and was commissioned as a Quartermaster officer eight years later. He deployed to Tallil, Iraq with the 7th Transportation Battalion and is now Commander, Charlie Company, 16th Ordnance Battalion, 61st Ordnance Brigade, Aberdeen Proving Grounds, Maryland. He has earned an associate degree, a bachelor's in history and a master's in American history. His wife, CPT Nicole R. Starr, whose essay is on the next page, is stationed at Fort Lee, Virginia.

Army Strong! -- Not Just a Slogan

By Captain Nicole R. Starr

For more than 20 years the Army's slogan was "Be All That You Can Be." The Army has become an environment where anyone can do exactly that. Just recently the Nation's first female four-star general was selected to command the U.S. Army Materiel Command. The small window of opportunities for women in the military, logisticians and "soccer moms" like me, was just replaced by double French doors.

As an "Army of One," our focus as Quartermaster, Transportation and Ordnance Soldiers was to support the main efforts of the global war on terrorism in both Iraq and Afghanistan. The focus of the combat service support community has clearly shifted over time and, with the change of the current battlefield, has added requirements for our warriors. Logistical warriors are now required to analyze, think critically and become proficient in the warrior tasks and battle drills. Although not everyone appreciates our versatility and importance, we are expected to repair the M1117 armored security vehicles, provide 5.56mm ammunition, and ensure "Hot A" rations are at the ready line. But as logistical warriors -- and at a moment's notice -- we are also expected to clear buildings, detain prisoners of war and be expert shots with our individual weapon.

The Base Realignment and Closure Act is the roadmap to becoming the future Army's Logistics Corps. Although Army slogans have changed through the years, the mission of logisticians will continue to 2050 and beyond, regardless of what slogans come and go. Our warriors will continue to excel and grow strong. They will always grow "Army Strong!"

CPT Starr is S3 of the 16th Ordnance Battalion, 61st Ordnance Brigade, Ordnance Center and School, Fort Lee, Virginia. She deployed as Battalion S3 to Tallil, Iraq. CPT Starr earned an associate degree in arts and a bachelor's degree in psychology and German. Her husband, CPT Jeremiah L. Starr, whose essay is on the preceeding page, is stationed at Aberdeen Proving Grounds.

"We need not just a new generation of leadership but a new gender of leadership."

President William Jefferson Clinton
42nd US President

A Milestone Matrix for Deploying Logistical Units

By Captain(P) Sherdrick S. Rankin

The Army has transformed from the Army of Excellence model where logistics units in a division deployed together to the new modular concept. Now the sustainment brigades, combat service support battalions, and brigade support battalions deploy separately in a plug-and-play method. The company-level logistics units in these organizations receive deployment orders from Forces Command and are serving under brigades from other installations.

I developed this essay because I have deployed twice with the Sustainment Brigade, and there were significant differences in the two deployments. Lessons learned from the Afghanistan deployment in 2006-07 as a Brigade S4 helped me to plan and coordinate more efficiently in the pre-deployment phase for my 2008-09 deployment to Iraq as a company commander. During the first deployment, there were a number of Soldiers who did not receive any rapid fielding initiative equipment at home station or received only part of it. The second problem in the first deployment was that some needed equipment had been left at home while theater-provided equipment had been brought with us. The guidelines I have developed help avoid these and other pitfalls.

Before a deployment, commanders must ensure that their Soldiers receive the necessary pre-deployment training and operational equipment and that their units receive required authorized personnel to conduct their wartime missions. These unit commanders need a first-class model pre-deployment plan to ensure they are able to rapidly deploy while providing quality, seamless support to the warfighter. This cannot be done to standard if preparation at home station is not conducted according to a synchronized road-to-war time line. A system of checks and balances must also be in place to make sure this happens.

The first thing that needs to be created is a warning order and road-to-war milestone matrix that lays out a detailed time line of key events that are listed and explained to every Soldier in the unit. All of the tasks need to be completed to standard by the established date for final certification by the commander. The time line needs to start at least 120 days from the latest arrival date, which is set by planners, so that unit personnel can arrive and complete unloading at the port of debarkation and support the operations.

During the 130- to 120-day range, the unit must accomplish the following key tasks: All Soldiers must qualify on small arms and some need to qualify on crew-served weapons. Soldiers receive their anthrax shots and have isolated personnel report photos taken. The supply sergeant takes refresher property book training.

During the 120- to 110-day range, the unit movement officer needs to identify all shipping and container requirements and submit the surface vessel equipment listing. Equipment and personnel operational needs statements must be submitted. Soldiers complete all theater-specific required training and combat lifesaver training. Units never know if they will have the good fortune of having medics attached to them, and the basics of lifesaving measures should be known by all Soldiers.

During the 110- to 100-day range the supply sergeant will need to get the sizes of every Soldier in the unit so they are outfitted with rapid fielding equipment. The operations noncommissioned officer will need to submit the names of the Soldiers in the unit to the medical treatment facility for medical screening. Also during this time, personnel must complete host nation language training. Strategic airlift requests must be made for all sensitive items to be sent to the theater of operation. Soldiers who will need courier cards for handling sensitive or classified items must be identified.

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Educational Keys for Warrant Officers

By Mr. Michael E. Toter

The future of the Quartermaster Corps warrant officer is a good one if training is restructured to add more technical training and sufficient time to complete a college degree. At no time in our history has the need for technical experts been greater. With the creation of the Logistics Corps, consisting of Quartermaster, Ordnance, and Transportation branches, our officer and noncommissioned officer training is now broader in scope. This leaves only the warrant officer as the technical experts in specific fields. In no way can the Army afford any erosion of the depth of training provided for the warrant officer as we move toward the middle of the 21st century.

This does not mean there will not be changes affecting the Quartermaster warrant officers and their counterparts of the Logistics Corps over the next few years. Two key areas stand out, a better understanding of how the Army works, especially within the Logistics Corps, and better civilian education. The creation of the Army Logistics University (ALU) is significant. Under the ALU is the Technical Logistics College designed to support the needs of Logistics warrant officers. Each branch will continue to provide the in-depth technical training of our warrant officers required to support the commander in the field. Additionally, each branch will provide needed training across the spectrum of Quartermaster, Ordnance and Transportation warrant officers.

We must develop a better understanding between the warrant officer branches on how we do business. For example, as I review the many times I have had the privilege as a Quartermaster warrant officer to work with Ordnance and Transportation warrant officers, I realize something was missing. I would like to have had a better understanding of what Ordnance and Transportation do or at least have had a better rapport with those warrant officers. My job would have been made easier and, in turn, I would have better supported my commander. The creation of the Technical Logistics College and an environment that encourages interaction will promote discussion, awareness, and appreciation for technical requirements of other military occupational specialties.

We can no longer afford to continue to train our branch warrant officers in a vacuum. This is going to require a cultural change among the Quartermaster, Ordnance and Transportation branches. This is probably the most controversial piece of this article. The idea that warrant officers of all three branches cannot train under one college and keep the highest of standards of individual technical skills is simply false. On the contrary, combining the resources and developing synergy will not only save money but will also recoup valuable training hours that can be better spent in technical training. Also, developing a training strategy that supports college accreditation will not only enhance the individual Soldier, but it will also allow for a degree program that is being designed in partnership with local colleges. Only two of the 1,058 Quartermaster warrant officers hold doctoral or terminal degrees. The largest percentage – 38 – have only a high school diploma while 21 percent have associate degrees, 25 percent bachelor's degrees and 7 percent master's degrees. As commissioned officers, warrant officers, with an ever-expanding role in the Army, must be able to develop better cognitive abilities. The current Army operation tempo makes it difficult to complete a college degree. This program will help significantly.

Warrant officers also need to become more self-reliant and trained at an earlier stage as senior staff officers. In the past, most new warrant officers' first assignments were at company or battalion level with easy access to senior warrant officer mentorship. As a result of the Army restructuring, most warrant officers in logistics are now assigned directly at brigade

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A European Perspective on Coalition Logistics

By Major Peter Schreuders

The Army Chiefs of Staff of France, Italy, the Netherlands, Belgium and Luxembourg took the initiative to form Europe's FINABEL Committee in October 1953. Germany joined FINABEL in 1956, the United Kingdom in 1973, Spain in 1990, Greece and Portugal in 1996. In 2006, FINABEL decided to enlarge itself to include the whole European Union (EU). This is a dynamic process and more than two thirds of the land forces of the EU members have already joined. Poland and Slovakia became members in 2006, and Cyprus, Romania and Finland are new members since April 2008.

FINABEL initially focused on cooperation in armament programs but quickly shifted to the harmonization of land doctrines, starting with the statement that a common vision of ground force engagement should be obtained before hoping to reach a shared capability approach and the realization of joint equipment. FINABEL is a tool that will help Europe's American allies work together effectively well into the future.

The heart of FINABEL is its working groups and their studies. The working groups' delegates are knowledgeable staff officers who, over the years, have developed an extensive body of European doctrine in the fields considered a priority by the Chiefs of Staff in the full spectrum of military operations. The flexible operation of the institution and the rapid production of studies allow the Chiefs of Staff to take into account urgent topics.

Charlie is one of the seven working groups. It carries out studies and exchanges views with the aim of ensuring the success of operations carried out by FINABEL nations in an increasingly complex environment. Working group Charlie's focus is effective logistics.

Working group Charlie is working on a study that aims to describe principles and procedures for developing a model for a generic logistics memorandum of understanding, a logistics technical arrangement and a logistics statement of requirements for multinational logistics planning and execution. The results of the study will be useful for operations by both the European Battle Group and the North Atlantic Treaty Organization Response Force because they have similar characteristics.

The study contains four steps, three logistics planning conferences and a final analysis. The first step is the Initial Planning Conference and will describe the draft of the Logistics Memorandum of Understanding. The content will include multinational logistics support arrangements, contractor support, Host Nation Support, levels of stocks and the use of a common supply chain management tool.

The second step is the Main Logistics Planning Conference and will conclude the draft of the Logistics Technical Arrangement that will include definitions, scope and duration, security and force protection, medical support, logistics planning of operations, and training and education.

The result of the Final Logistic Planning Conference is the agreed Statement of Requirements, which will include all classes of supply, transportation, accommodation, services and a 3-D model of "the Cube," a network-centric and scenario-based logistics tool developed with consultation by Jaap Willem Bijsterbosch, managing director of Tru Economy. The 3-D model provides options for both the type of mission for a unit and the equipment the unit will have to use.

Finally, and the last step will be an analysis of the principles and procedures for gathering logistics capabilities in support of multinational operations carried out by FINABEL members. We hope this study will establish a logistics planning/executing tool and generic procedures for FINABEL nations as they conduct multinational supply chains, maintenance, logistics

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Milestone Matrix, continued from Page 150

During the 100- to 90-day range the supply sergeant needs to ensure all equipment is inventoried, split the hand receipt with the rear detachment commander, and turn in remaining equipment to the Army Materiel Command left behind equipment team.

During the 90-to 75-day range some key tasks that must be completed include profile certification to ensure personnel on profile are deployable. This is the ideal time to conduct an organizational day with Families and host a deployment briefing with installation agencies to explain all resources available to Families while their loved ones are deployed.

The final two months should consist of staging and loading equipment; receiving chemical, biological, radiological, nuclear and high-yield explosive equipment; completing administrative and medical standard readiness checks (DD93, Servicemen's Group Life Insurance); enjoying block leave with Families; conducting a deployment ceremony; and storing the Soldiers' private vehicles.

Finally the day comes when the unit departs the installation for deployment. This time line is not all-inclusive but if followed to standard it will reap benefits in the combat theater and ensure the unit is not ill-equipped or unprepared during the deployment.

CPT(P) Rankin is currently deployed in Operation Iraqi Freedom as the S-3 Officer in Charge for the 10th Sustainment Brigade Troops Battalion in Camp Taji, Iraq. He previously deployed as the 10th Joint Logistics Command J-4 in Operation Enduring Freedom. CPT Rankin has a bachelor's degree in history from Fayetteville State University and a master's of business administration in human resource management from Baker College.

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level. We are now pulling Soldiers from ranks as low as E4 to E6 and making them warrant officer ones. In as little as 16 weeks, we are putting them on a brigade staff and expecting them to perform at that level. There is a Warrant Officer Staff Course, but it is not normally attended until the warrant reaches the grade of chief warrant officer four. There must be a greater emphasis placed on communication skills at an earlier time in the QM warrant officer's career.

As I wrote earlier, the future of the Quartermaster warrant officer is a good one. If training is properly structured, hours for technical training will increase and a college degree will be much easier to complete.

Mr. Toter, a retired chief warrant officer five, is currently working at the Army Logistics Management College assisting in the development of the Army Logistics University. He has served in a variety of assignments worldwide. Mr. Toter earned a bachelor's degree from the University of Maryland.

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capabilities in support of multinational operations carried out by FINABEL members.

MAJ Schreuders is an officer in the Royal Netherlands Army and was a student in the Theater Logistics Studies Program at the Army Logistics Management College, Fort Lee, Virginia, when he wrote this essay. A graduate of the Royal Netherlands Military Academy and of Rijksscholengemeenschap College where he studied languages, MAJ Schreuders has had international assignments in Germany, Greece, Iraq (with a NATO training mission) and Sudan (as a joint logistics planner) during his 24 years of service.

Legendary diligence

The great care with which the Quartermaster Corps accounts for government property is legendary. During World War II, an employee in the Office of the Quartermaster General came across an old report on lost property and shared it with the *Army Times*, which published the report on 2 May 1942.

According to War Department records, "On 21 November 1924, at Noame Harbor, New York, about 8 o'clock A.M., Mrs. Lillian Stevens, cook, while emptying coffee pot from rear of Quarterboat No. 6, fell from the boat into the bay and the coffee pot was lost. Mrs. Stevens was drowned. Efforts were made to recover the pot, but [it] could not be located."

Precision Required for Logistics

By Captain Evan H. Buckler

Every successful military leader understands that you cannot win without logistics. That is evident if you've ever read quotes from successful military leaders. Everyone from the ancient masters of war such as Sun Tzu and Alexander the Great, to the great flag officers of World War II such as Generals Patton and MacArthur, and Admiral Nimitz, to contemporary leaders such as Admiral Rickover and General Franks have commented on the undeniable necessity of logistics.

But the nature of logistics is changing. The US Army is now a lighter, brigade-centric, rapidly deployable fighting force. The transition has been ongoing for the last decade and is nearly complete. So what does this new force structure mean for the Quartermaster Corps and logistics?

Revolutionary War Quartermaster, General Nathanael Greene said, "Logistics is the stuff that if you don't have enough of, the war will not be won as soon." Unfortunately, in this day and age a delay because of logistics does not mean a delay in victory; it most likely means failure. What this means is that we need to be anticipatory and precise.

Quartermasters and logisticians need to be true masters of their trade. Adaptability is the key to success. Quartermasters and logisticians at the lowest levels need to be able to work not only within the Army systems, but also with other services, allied personnel and agencies, and non-governmental organizations. No longer do commanders have the luxury of waiting while an intricate concept of support for an operation is developed.

With Army logistics being focused on precision, small oversights and miscommunications are no longer small mistakes. The loss of one fuel tanker, a 5-ton truck of Class I or V supplies, or even one high-priority Class IX part, could mean mission failure for a unit. No longer can we rely on volume as our safety net.

Quartermaster and logistical units have come a long way over the past decade. Brigade support battalions and forward support companies are supporting the force and fighting alongside their combat arms brethren on the front lines. And as the 21st century unfolds, Quartermasters and logisticians will continue to provide the vital support that the US Army requires.

CPT Buckler is Commander of D Company, 58th Transportation Battalion, Fort Leonard Wood, Missouri. He has had two deployments in support of Operation Iraqi Freedom. A graduate of the University of Portland, he holds a bachelor's degree in sociology with a criminal justice emphasis and a minor in German.

"There are no secrets to success. It is a matter of preparation, hard work, and learning from failure."

General (Retired) Colin L. Powell
Former US Secretary of State

An Integrated Future

By Chief Warrant Officer Four Joel L. Lockhart

What will the future be like for Quartermaster Soldiers? In a word: Integrated. Quartermaster, Ordnance and Transportation Soldiers will train, serve and grow together like never before. From branch insignia to schoolhouse training to logistical systems, integration will touch every aspect of our Quartermaster Corps in the years 2015 to 2050.

Our officer community has begun the transition by creating the Logistics (LG) Corps at the captains' level. Beyond the symbolism of the new LG Corps insignia, LG officers' utilization will merge Quartermaster, Ordnance, and Transportation. In other words, our logistics officers will be integrated.

Our Ordnance and Transportation schoolhouses will relocate to the new Army Logistics University (ALU), where all traditional logistics branches, including the Quartermaster Corps, will conduct training -- both figuratively and literally -- under one roof at Fort Lee, Virginia. In other words, our logistics schoolhouses will be integrated.

Currently, our logistical systems are stove piped, meaning they are separate operating systems; however, in the future, Soldiers will utilize an enterprise system that will merge supply, maintenance and property book into one system called the Global Combat Support System - Army (GCSS-Army). In other words, our future logistical systems will be integrated.

Our senior logistics leadership has relocated to the Sustainment Center of Excellence at Fort Lee, Virginia. In similar fashion as training under ALU, our branch commanding generals and their staff members will hang their berets under one roof. In other words, our senior logistics leadership will be integrated.

Although future Quartermaster Soldiers will continue to "Support Victory" as always, they will "Support Victory" alongside Ordnance and Transportation Soldiers, from training to utilization, in unprecedented fashion. But what is the primary difference between the Quartermaster Corps' past and future? In a word: Integrated.

CW4 Lockhart currently serves as a senior supply technician with the Project Manager, Global Combat Support System – Army at the Combined Arms Support Command, Fort Lee, Virginia. He earned a bachelor of science degree in liberal studies. His deployments include Panama, Saudi Arabia, Iraq, Kuwait and Afghanistan.

"With malice toward none, with charity for all, with firmness in the right, as God gives us to see the right, let us strive on to finish the work we are in, to bind up the Nation's wounds."

President Abraham Lincoln
16th US President

Second Inaugural speech

The World Is Our Drop Zone

By Chief Warrant Officer Four Georgene F. Davis

Paratroopers in today's 18th Airborne Corps believe "the world is our drop zone." In the year 2025, the world will be our seven drop zones.

By then, air drop technicians are expected to be using satellite connections to capture real-time records of individual Soldier's expenditures of all classes of supplies. The distribution frame or supply chain will calculate the amounts of each class of supply to be delivered to specific global positioning system (GPS) coordinates. Supplies, packed and coded for specific Soldiers, will then be delivered to air drop elements that group packages for Soldiers located within a 100-meter perimeter. The supplies will then be loaded in autonomous turbo-guided pods.

Designed for one-time use, the pods of the future will be ultra-lightweight and super durable because they will be made of atomic polymer material developed by the American scientific community. A pod will have the capability of providing three-day bursts of total re-supply to an individual or a team of up to 12 Soldiers. Each will deliver 400 gallons of petroleum products and will accommodate all other classes of supply. The GPS-guided pods will be turbo-powered, high-glide rigid pods with landing abilities.

The autonomous pods will be programmed or activated by the air drop riggers for their destinations. The activation will begin a continuous communication process, sending information to both the supply depot and the intended recipients. Both parties will know the pod's real-time location, estimated time of arrival, approach speed, approach direction, and contents.

The pods will then be loaded onto Army air transporters and flown to altitudes of up to 35,000 feet mean sea level where, with their high-glide ratio, the pods will be virtually undetectable and unexposed to harm. The pod will determine the optimum approach based on terrain and dispersion of the cargo recipients within the assigned perimeter. The system will have achieved mission-complete status when the recipients' transponder/receiver is verified at a distance of less than one meter or deactivated by the designated and verified team leader. Once the pod completes its mission, its micro intelligence will self-destruct, and the pod can be used for multiple purposes based on the mission profile or simply destroyed.

Use of the autonomous turbo-guided pods by air drop elements in the future force will eliminate the need for supply convoys and limit the battlefield risks to sustainment Soldiers. Pods will conquer any terrain and reduce the sustainment force footprint in the Army and on the battlefield by increasing the accuracy and efficiency of supply distribution. The innovation of pods will transform the earth's surface into seven drop zones and manifest the phrase "The World Is Our Drop Zone" in a new way.

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"It is morale that wins the victory. With it, all things are possible; without it, everything else – planning, preparation and production – count for nothing."
General George C. Marshall

Science, Technology and Transformation

By Mr. John Kim

Allocations of responsibilities and resources for the Army science and technology program must be commensurate with their overall importance, contributions and increasing relevancy to mission success. Science and technology are the enabling engine for critical operational and logistics transformation capabilities, and will play an active role in the Army's continued efforts to defeat a constantly adaptive and resourceful enemy.

The contributions by science and technology during the global war on terrorism are clearly demonstrated, especially the breakthrough capabilities provided by the rapid fielding initiative in responding to demands of current operations. They have also been important in anticipating new technologies that will ensure revolutionary and transformational capabilities for the future force.

Logistics footprint reduction is a key aspect of logistics transformation and can be best addressed through implementation actions. Not only one of the Army's top priority logistics goal, footprint reduction is clearly documented in the Joint Operations Concepts as a critical component of focused logistics. The Army Science and Technology Master Plan (ASTMP) also documented the need to leverage science and technology in mitigating this complex issue.

The logistics footprint covers a wide range of products and services, but recent data indicates more than 80 percent of theater sustainment requirements are for water, fuel, and maintenance. Armed with this information, organizations such as the Army Materiel Command are re-engineering and redesigning food and hydration technologies, as well as anticipating other future requirements as part of the Future Soldier 2030 Initiative.

A more aggressive approach to demand reduction is needed in addition to enhancing the supply-side and the distribution-based concepts. The most cost effective approach to demand reduction will be engineering design changes that take demand for logistical support out of combat systems. Design changes to improve reliability will reduce requirements for mechanics and repair parts. Finally, the ASTMP reports that "design changes will direct paradigm shifts from huge consumers of logistics to highly reliable, energy-efficient, self-sustaining, self-prognostic, self-healing, and self-reporting systems."

Other alternatives include the increased use of robotics, as well as assessing the feasibility of tailoring logistics support to the individual Soldier. For example, threshold and objective values would be assigned to a Soldier for the allocation of daily combat rations and water based on a variety of factors, such as a Soldier's weight, height, body metabolism, work performed, and environmental considerations.

Logistics footprint issues could be mitigated also by enabling production of consumables closer to the point of use. An example of this approach would be to look beyond the groundwater source, which is susceptible to easy contamination. Science and technology offer the possibility of extracting critical water supply from multiple layers of the Earth's atmosphere. Operational assets such as the unmanned aerial vehicles and satellites could be leveraged to augment capabilities in this area.

In summary, science and technology can provide significant technical advances to satisfy the Army's logistics transformation requirements. It is critical, however, that science and technology strategy be comprehensive and part of a broad paradigm shifting strategy which implements enterprise-wide changes. This will ensure that organizational structures, processes, and procedures effectively

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Petroleum Needs to Be Replaced

By Major Jennifer Karim

Since its establishment in June 1775, the Quartermaster Corps has been an integral part of the United States Army's history. The diverse tasks and numerous functions of the Quartermaster Corps have been and continue to be paramount to the success of the various branches of the Army. Petroleum remains one of the most essential assets. As a Quartermaster officer, I foresee the Army reducing its substantial dependency on fossil fuel.

Fuel constitutes approximately 70 percent of the bulk tonnage shipped and supplied to military forces in our current operations. Therefore, a federal program has been instituted to improve truck fuel efficiency, reduce operating costs and emissions, and improve safety. Additionally, the US Army's Army-After-Next calls for a "75 percent reduction in battlefield petroleum usage, as part of overall goals to make the Army's future logistic operations and infrastructure lighter, less costly, more flexible, and less susceptible to interruption or attack."

Currently, the US Army is heavily dependent on fossil fuel to include jet propulsion-8, motor gas, and diesel fuel. The three types of petroleum are mainly used in support of military ground vehicles, aircraft, and generators, with the ground vehicles consuming the most fuel. In 2006, the US Army was estimated to consume approximately 40 million gallons of fuel in three weeks of combat in Iraq. In an effort to reduce fuel consumption, the US Army, along with US Departments of Energy and Transportation and the Environmental Protection Agency, have partnered with 16 industries to develop better engine systems, heavy-duty hybrids, parasitic losses, idle reduction, and safety. President Richard Nixon's goal of developing the potential to meeting our own energy needs without depending on any foreign energy source has not been met, but it's on our horizon.

If the M1A2 Abrams main battle tank, a heavy equipment transport system, or a Stryker vehicle could travel without burning as much fuel as they currently do, the Army could drastically reduce the amount of funds spent on fuel, storage, shipping, and delivery assets as well as reduce fuel consumption. This would ultimately reduce the workload of petroleum Soldiers in the Quartermaster Corps.

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support the Army's strategic direction. Additionally, user requirements, risks, and trade-off considerations between cost, performance, and schedule must be fully understood and addressed by science and technology developers. Finally, science and technology implementation strategy must strive to adopt new, evolving, and mature technologies that can be effectively nurtured and exploited through cooperative arrangements with industry partners, and the international community.

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How 'More With Less' May Look

By Major Larry D. Moore

As it is becoming more and more evident that the Army philosophy of "More with Less" is here to stay, it is evident too that there must be a fundamental change in the very way we operate. Modular systems, real time asset auditing, instantaneous requisition, and unmanned materiel transportation are concepts that will soon step out of the realm of science fiction onto the battlefield of tomorrow. How might this futuristic system look? And is it even possible?

Imagine an Infantry Soldier on patrol in downtown Sadar City. His squad is fired on, and they engage. With the first round fired from his new smart weapon, a cascade of actions is triggered, and all without any further action on the part of any human. His weapon conducts a real time audit of the rounds being used via an onboard computer. The weapon identifies the round that fired, sends the national stock number and the number of rounds fired to the battalion S4. Simultaneously, a request is sent to the local supply support activity (ammunition holding area).

A fully automated assembly-line style system in the warehouse in the support area receives the automated request. Robotic arms search out the stock number of the expended rounds. The system pulls the rounds from the shelf and generates an order for replacements. It then places the pulled rounds on the conveyor belt that moves it to the loading dock. An automated forklift loads the rounds onto a totally unmanned truck. This vehicle joins a convoy of other unmanned vehicles filled with equipment and supplies ready to be transported to front lines.

The unmanned supply train is fitted with the latest in up-armor and weapons. Censors mounted on the truck provide it with 360-degree visibility, and the new boomeranged weapon system repels any rocket-propelled grenade or rocket attack it may encounter. This highly mobile and defensive convoy makes its way to the local supply collection point that supports our young warfighter. The ammunition and supplies are scanned, then off-loaded by an automated forklift and placed on a computerized and unmanned remote-controlled, all-terrain vehicle, where they are delivered to the rally point identified by the team leader.

What do we bring away from this glimpse of a possible future? We know that no longer will there be a need to place a Soldier's life in danger unnecessarily. Does this technology exist? Yes, there are airports that use unmanned vehicles to move passengers between terminals. Assembly lines that quickly transport massive parts over great distances are commonplace in the auto industry. Even in our local supermarket, once we select that loaf of bread and the bar code is scanned, a computer counts the item and eventually generates an order.

Advancements like these could one day combine to reduce the current requirement for the large number of Soldiers needed to put their lives in harm's way. We will be able to reduce the operational footprint and increase our operational effectiveness. These are all very real applications that will, no doubt, with the rapid advancements in technology, cause the year 2050 to look as alien to us as 2009 would have looked to our great-grandfathers. "More with Less" – bold moves like these will ensure the US remains the paragon of military force around the world.

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The Future Quartermaster Role

By Major John W. Quinene

Logistics today is very different than it was during the American Revolution, but the mission remains the same -- get the needed items to the right place at the right time. In this essay I will focus on the Quartermaster role in the future by examining two areas: battlefield array and adaptability.

Today's Quartermaster systems have evolved from horse-drawn wagons to vehicular and airborne modes of transportation. The basic essentials of materiel, subsistence, fuel, and ammunition are still moved. The Quartermaster Corps has evolved how supplies are tracked, who tracks them, and where they are stored or originate from on the battlefield.

This brings us to the first focus area on how the Quartermaster Corps is arrayed on the battlefield. Sustainment brigades are now the heavy lifters and movers in an area of operation. Now brigade combat teams are supported by brigade support battalions that are robust and can sustain themselves for several days. These brigade combat teams became the Army's choice for fighting today's battle, and all this change was part of the Army's transformation for added speed, flexibility and the medium firepower just below that of heavy brigade combat team.

Doctrine was geared toward a fight on a linear battlefield during the Cold War. With today's current operating environment and how the enemy operates, doctrine has logistics units operating in a non-linear or fluid battlefield, still supporting the customer and defending itself to meet the goals set by our Nation's leaders.

My second focus area is adaptability. The first element is the enemy. With *Operation Enduring Freedom* and *Operation Iraqi Freedom*, the enemy has used many unconventional ways to attack our forces and inflict casualties. As with the combat forces, Quartermaster Soldiers continue to adjust training to stay abreast of current enemy tactics. This includes not only being able to do their technical jobs, but also defending themselves on the move and in their operating bases. At the same time, they are continuing to sharpen their technical skills, which have drastically changed due to technological advances in the way we do our logistics business. These advances range from how we transport materiel to how we account for supplies by streamlining software to make it more Joint force user-friendly and, eventually, coalition user-friendly.

Since World War II, coalitions have helped bring victory to our battles, and they continue to do so today. Today's Quartermaster Soldiers are members of the Millennial Generation. These Soldiers are so very connected to the global internet that they understand coalitions through their internet experience as well as their military experience. This is evident in all the systems they use to support the fight.

The future of the Quartermaster Corps is a long and transforming one. The Army will still need to use Soldiers to cook food for combat forces in hostile locations, purify water in unstable environments, support coalition forces, and provide fuel to tanks and wheeled vehicles. With today's economic uncertainty, contracting out services may not be as easy in the near future. Quartermaster Soldiers will continue to be the baseline for providing logistical support to the fight as we move toward 2050.

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The Basics: Communicate, Manage

By Major Ryan L. Reid

The current operating environment has seen significant changes in the way we as leaders do business. In the logistics community, we have made a major shift to a more tactical training focus and a push to make our company grade officers more skilled in staff operations with a focus on new automated tools. This shift has paid great dividends on today's battlefield by giving tactical commanders a logistics support capability unparalleled in history.

However, this shift has come at a significant loss in the basic administrative skills required of the Logistics officer corps and the officer corps in general. Our leaders must have the ability to train Soldiers for combat, but they also must manage the overall operation of the organization, including Soldier care.

Natural leaders are a very rare jewel whom we are lucky to encounter. Because natural leaders are scarce, it is imperative that our officer education and assignment systems be the very best they can be at creating quality leaders. This will ensure our Soldiers receive the best leadership possible as we move toward mid-century. We have gotten away from the real basics of good leadership: communicating and managing.

Communication needs to be effective when a leader is counseling Soldiers and when he or she is writing. Counseling is a skill that has greatly diminished with the past generation of leaders, and it has had an impact on building future leaders. We have become dependent on forms and time lines for counseling, or we focus on negative counseling and have lost the ability to provide constructive feedback in an informal setting. Counseling should take place daily as leaders mentor junior and future leaders, not just during mandatory quarterly or officer evaluation report counseling sessions.

Written communication is another aspect that we rarely focus on in our modern world of text messages and e-mails. Due to this, our company grade officers have a very weak understanding of how to use the written word. I have watched over the years as performance evaluations and award submissions have become ineffectively written. This has created a need for senior leaders to critique documents and train junior leaders on skills that should have been taught as part of their institutional curriculum.

The need to re-emphasize management skills is seen today in supply accountability. My experience in the last several years has included participation in many change-of-command inventories at two US installations and there has been a significant increase in lost property during this time. The idea of "wartime accountability practices" is greatly misinterpreted and misused and has resulted in a large number of commanders paying for lost items upon leaving command. When I assumed command of a company following *Operation Iraqi Freedom I*, a large number of items were missing from each of the three companies in my battalion. I commanded a maintenance company and discovered that property was left in our shop for months after units were notified to pick it up, even during change of command inventories. My experience tells me that our company grade officers need better preparation to manage the supplies and equipment assigned to them to better serve as good stewards of government property and ensure they are successful as commanders.

We need to re-examine the way we train our company grade officers and attempt to set them up for success by creating a balance between communication and management as well as tactics. Without the basic skills coming from the institutional training base, our leaders in 2015-2050 will not have the skills necessary to properly lead and manage our Army beyond the current fight and into the future.

MAJ Reid currently serves as S3 for the 23rd Quartermaster Brigade, Quartermaster Center and School, Fort Lee, Virginia. He has deployed three times to Iraq. He earned a bachelor's degree in physics at North Georgia College and a master's of business administration at Cameron University.

Compressed Natural Gas: Our Future Fuel

By Major (Retired) George Mekis

Alternate fuels are the future of the Armed Forces. Compressed natural gas is, in my opinion, the leading contender to replace oil-based fuels as gasoline becomes cost prohibitive. How we store, handle and distribute fuels will significantly impact the future training and mission of the Quartermaster warrior.

As the world continues to consume oil and oil-based products at an accelerated rate, the potential for radical change in energy production and management will become one of the United States' top priorities. Experts estimate that the world supply of cheap oil will run out in the next 32 years. As the cost to extract oil from the earth increases, the switch to alternative fuels will become a main focus for the United States. During the jump in fuel prices in the summer and fall of 2008, the call for alternate sources of energy gained significant momentum. Interestingly, the government began to show interest in the various options to replace oil-based fuels. One of the plans that gained the most traction in government and private circles was the Pickens' Plan. The Pickens' Plan called for the use of compressed natural gas (CNG) as the sole fuel to power motor vehicles.

CNG is not a new source of fuel for motor vehicles. Many city buses across the United States are running on CNG now. I believe it will be the likely future alternate fuel for military vehicles. It is a relatively cheap fuel and large reserves of natural gas exist in the United States. CNG will have an impact on how we store, manage, and distribute fuel in the future. The fact that natural gas is in a gaseous state will require new or modified vehicles for storage and distribution.

How we plan for fuel requirements will also fundamentally change. Instead of gallons of fuel, we will track pounds of fuel. Gauging and testing of the fuel will also be completely different.

The Quartermaster Corps will once again be at the forefront of change as we embark on a new fuel strategy for the future.

MAJ Mekis (Ret.) was the S4 for 23d Quartermaster Brigade, Quartermaster Center and School, Fort Lee, Virginia, when he wrote this essay. He deployed to Iraq as a logistics trainer. MAJ Mekis earned a bachelor's degree in biology at Penn State University, University Park, Pennsylvania.

"It is clear our Nation is reliant upon big foreign oil. More and more of our imports come from overseas."
President George W. Bush
43rd US President

Embracing Modularity Totally

By Major Ambrose U. Mbonu

With the Army's transformation initiative from legacy force doctrine and structure to the modular concept, it is imperative that the Quartermaster Corps remain relevant by embracing modularity in totality. From my perspective as a petroleum officer, I see a need for transformation and modularity in the petroleum equipment arena as we prepare for life in the mid-21st century.

I believe that the Quartermaster Corps must take ownership of our petroleum equipment fleet in order to remain relevant. In his farewell address on 17 January 1961, President Dwight D. Eisenhower said of the military industrial complex, "... we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military industrial complex. The potential for the disastrous rise of misplaced power exists and will persist. We must never let the weight of this combination endanger our liberties or democratic processes. We should take nothing for granted."

The purpose of modularity is to modernize and transform the Army's legacy structure (from Cold War posture) to a plug-and-play (able to fight multiple wars anywhere in the world) modular force structure. The concept envisions shifting the Army's stockpiling mentality to a "just in time" logistics doctrine, where supplies flow from the factory to the foxhole, thereby eliminating redundancy in organizations, personnel and equipment.

We have not yet done this with petroleum equipment. Our inventory includes redundancies in aviation refueling operation equipment and in the petroleum tank vehicle fleet, for example. We Quartermasters must consider what is needed to remain relevant with regard to petroleum equipment procurement and utilization throughout the life cycle management process.

Our aviation refueling operation equipment inventory includes the heavy expanded mobility tactical truck tanker aviation refueling system, the forward area refueling equipment (FARE), and the advanced aviation forward area refueling (AAFARE) system. We are getting ready to field a new generation of the FARE system with unisex connectors, adapters, and more gadgets. However, Soldiers coming from the field tell us they are still using their FARE system instead of the newly fielded AAFARE that are still in storage.

A similar situation exists in our petroleum tank vehicle fleet. We have eight variations of the 5,000-gallon tanker. The only major differences among the tanks are the valve, compatible overfill monitor, and adapter, and one model has all the bells and whistles.

To be relevant, to eliminate redundancy, to save taxpayers' dollars, we must, like President Eisenhower, "take nothing for granted" as we transform the Quartermaster Corps into an enterprise that wisely fuels the force in the years to come.

MAJ Mbonu, a native of Nigeria, was the Deputy Director, Petroleum and Water Department, US Army Quartermaster Center and School, Fort Lee, Virginia, when he wrote this essay. He has deployed to Kuwait and Bosnia. MAJ Mbonu earned a bachelor's degree in management from St. Francis College, and a master's degree in political science from the City University of New York, Brooklyn College, both in Brooklyn, New York.

"Perpetual optimism is a force multiplier."
General (Retired) Colin L. Powell, Former US Secretary of State

Quality of Leadership Keeps Corps Pertinent

By Major Jeffrey Christian Knight

The future of the Quartermaster Corps between 2015 and 2050 depends solely on the quality of leadership, as always. There is no technological substitute, nor is there a checklist for success. As we move further into the digital age, we must not lose sight of this simple concept. I am confident the warfighters will get the support they need, but how painful the process is, time and time again, depends on the quality of logistics leaders.

What makes good logistics in 2050? Logisticians! In my former life as an Armor Officer, I learned one concept (from a Marine no less) that I believe is universal to any leader: Bring your expertise to the fight. In other words, a logistician should bring answers to the unit he or she supports. Short of having the answers, embrace the issues and problems as yours to solve. Bottom line: Give your commander and supported units the tools they need to move forward and NEVER be the reason a unit fails.

What makes a good logistician? Fundamentals. This cynical answer has a gray area that individual leaders need to reflect on as they answer the age-old question, "What are my strengths and weaknesses?" The fundamentals I believe are important may differ from those others value, but here are the highlights:

1. Do not be intimidated into making bad decisions. Understand that telling your boss "no" is sometime necessary, but always have an alternative course of action to achieve the end-state. Make sure you are right and be able to justify your reasons. Always have the courage to take a stand. Note: If you can get in front of issues and prove yourself competent, your boss will eventually let you run your lane without getting into your business . . . so I'm told.

2. Keep yourself in good physical condition, specifically running. This leaves a good impression with all subordinates, and leaders who are fit do not have to prove or justify anything outside of their own performance.

3. Learn how to become a good writer. If you cannot effectively relay your thoughts or intent in writing, you have severely handicapped yourself as a leader. Learn to get to the point and make sure it's right.

4. Develop your sense of what "right" looks like. This is especially important in terms of accepting risk. Leaders must understand they will not have a safety net, nor will they have a textbook answer. Leaders must embrace these truths and move forward.

5. Know what's important. Nobody can do it all. Make sure you do the best you can on the issues that impact your mission. As for the rest, go for the B grade, but don't lose sleep over a C+.

We must foster logistics leaders who put themselves in pivotal positions, aren't afraid to make decisions and refuse to be left out of "the fight." The more leaders we have who are willing to live up to and beyond expectations, the more the Corps will be useful and keep us pertinent to the success of the Army and the Nation.

MAJ Knight is Executive Officer of the 23rd Quartermaster Brigade, Quartermaster Center and School, Fort Lee, Virginia. He was deployed in support of Operation Enduring Freedom VI in Afghanistan. MAJ Knight earned a bachelor's degree in political science.

"We are not creatures of circumstance; we are creators of circumstance."
Benjamin Disraeli, British Prime Minister

The JPADS Revolution

By Major Jason J. Hanifin

Now is the time to turn upside down the view of supporting logistics through ground movement. The world is no longer flat, and information is no longer static. Neither can military operations confine their focus to one area of a conflict while remaining oblivious to interconnections with the larger strategic picture. The new Joint Precision Air Drop System (JPADS) is a pillar in the support by the Quartermaster Corps from the years 2015 and beyond. The JPADS is a precision aerial delivery method for providing supplies. This system is critical in the current operating environment and will only increase in use in future missions.

The JPADS is a guided, high-altitude system that provides controlled flight on release from the aircraft and has superior landing accuracy to reduce load dispersion on the ground. The JPADS operates from altitudes up to 24,500 feet mean sea level and is far more accurate than conventional aerial delivery methods. The JPADS interfaces with a common mission laptop that has appropriate software. Additional equipment includes a meteorological data gathering kit, a global positioning system re-broadcast kit, and four air vehicles offering various weight capabilities.

The primary mission of the JPADS is to deliver supplies and equipment to personnel on the ground when standoff and/or high altitude release is required due to ground threat, terrain, winds, accuracy needs, or inadequate or compromised ground lines of communication. The JPADS is successfully used today in both Iraq and Afghanistan. With minimum exposure of troops to the enemy, it is providing the timely resupply of equipment and supplies to challenging areas. In addition, the JPADS is re-shaping battlefield geometry by reducing the number of vehicles on the road and denying the enemy the ability to predict tactical movements.

In the years ahead, the JPADS will complement the Joint force command's ability to supply and project forces via strategic maneuver, vertical maneuver, assault, infiltration, and combat power employment (force application). The system will supplement the forward logistics presence. Supplies and equipment will arrive via focused logistics. Accurate airdrop will continue to minimize the need for ground line communication, relieve additional ground security requirements, and reduce Soldier vulnerability to enemy attack. Airdrop from high altitude and from standoff distance mitigates threats to aircraft, aircrew, and all payloads. Airdrop also increases force protection by reducing convoy exposure to land mines, improvised explosive devices, and other tactics used against ground movement in asymmetric, non-contiguous operating environments.

In conclusion, the current and future operational environment demands an increased reliance on aerial delivery of supplies. Cargo aircraft offer the speed and range necessary to reduce the time/distance paradigm associated with global, dominant, full-spectrum operations. Airdrop is employed from strategic and operational distances, delivering loads directly to warfighters. The JPADS utilizes an optional force projection sustainment capability that will be crucial to the support of multiservice and multinational ground forces.

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Multifunctional NCOs, Joint Education Are Critical

By Major Samuel A. Burns

The Quartermaster Corps began its transition into the Logistics Corps over the past few years. The initial focus was directed toward the commissioned officer. The officer education system, deployments and the diversity of the operational assignments were the primary tools used to assist in this officer transition.

As we look toward 2050, I feel the focus will transfer to the professional development and training of the Noncommissioned Officer (NCO) Corps. Today's NCOs specialize in tasks associated with their military occupational specialty. As NCOs progress through the ranks in the future, they will be required to be "multifunctional" NCOs. The NCO Education System program of instruction will need to be retooled and restructured in order to address the future responsibilities of the multi-functional senior NCO during peacetime operations and expeditionary endeavors. This logistics training will initially be introduced during the basic NCO course in order to capture young leaders early and set the stage for success in future operations.

I also envision the Army continuing to move to a more Joint-focused logistics base. Currently, this Joint training is being conducted within the food service and mortuary affairs divisions. In the future all services will train logistics operations in a similar manner, with differences geared toward the uniqueness of service specific equipment and specialized missions. This logistics transition has the potential to decrease the amount of equipment and the number of component items in the military's inventory. In turn, this will increase equipment and component availability and allow for intra-service equipment transfers. There will be a Joint automated materiel management system to keep assets visible and manage the service inventory. The most significant and immediate impact will be in the decreased time to order and ship critical components, thus increasing logistics flexibility and responsiveness. Just as in today's operations, Civilians will continue to play a critical role in assisting in the sustainment of our troops, working hand-in-hand with their military counterparts.

Educationally, the Logistics Corps will also benefit from the assistance and academic training provided by the nation's universities. Global supply chain management and supply chain leadership certifications and degrees will be offered as part of the professional development of officers and NCOs. These Joint-focused programs will be facilitated through a central hub such as the Army Logistics University. These endeavors will improve the competence and leadership abilities of our forces and also improve relations between the government and the supporting academic institutions. These efforts will serve as a great retention tool for the services and ensure that the military has the "right" logistics personnel with the "right" skill-sets executing critical logistics-related missions.

In conclusion, I feel that the future of the Quartermaster Corps and Logistics Corps, as we move beyond 2015, is limitless. Our future will be one of growth, development and opportunity. Future sustainment efforts will continue to improve and evolve, and we will continue to provide first-class combat service support to the warfighters: Right Product -- Right Place -- Right Time!

MAJ Burns served 11 years as an enlisted Soldier, rising to the rank of Sergeant First Class before being commissioned through Officer Candidate School. He is currently Deputy Director, Aerial Delivery and Field Services Department, Quartermaster Center and School, Fort Lee, Virginia. He holds a master's degree in counseling with a higher education concentration.

Adapting to Constant Change

By Major Erik Dye

The future of logistics lies in the Army's ability to adapt principles of logistics to ever-changing battlefield environments around the world. The overall mission of the Army – to fight and win our Nation's wars – has not changed. However, where the Army fights and how it fights have changed drastically. As the Army transforms itself into a smaller, self-contained fighting force with the ability to fight faster and longer, logistics will become more critical in helping combat Soldiers accomplish their objectives.

A smaller fighting force demands logisticians be more precise in executing their fundamental mission of providing the right item to the right location at the right time. Technology will continue to be the centerpiece that allows logisticians to accomplish their mission – no matter the battlefield environment.

For example, the mountainous terrain of Afghanistan initially presented the Army with logistical challenges. In response to these challenges, the Army fielded unmanned aerial and ground vehicles to assist logisticians with supply and resupply operations.

In addition, the Army developed the Joint Precision Air Drop System (JPADS) – a high-altitude, all-weather capable, global positioning system-guided, precision airdrop system with the ability to precisely drop supplies to multiple locations. JPADS brings another capability to the fight that saves lives and provides everything from ammunition to food for combat Soldiers in remote, hard-to-reach places.

Another example of the Army's ability to adapt occurred in response to reports that combat Soldiers were being injured because the combat loads they carried were too heavy. The Army provided equipment that is lighter and developed unmanned ground vehicles (UGVs).

One such vehicle is the XM1217 Transport Multifunctional Utility/Logistics and Equipment (MULE-T) – a 2.5-ton UGV that supports dismounted and air assault operations. Rotary-wing aircraft transport the MULE-T via sling load. This rugged vehicle has the capability to traverse diverse terrains and can transport 1,900 to 2,400 pounds of equipment and supplies for combat Soldiers engaged in dismounted operations.

As the Army marches toward the year 2050, state-of-the-art equipment and new technology will continue to assist logisticians in providing reliable supply support to combat Soldiers worldwide. The development and fielding of the JPADS and the MULE-T are two tangible examples of the Army's ability to adapt logistics principles to the battlefield environment. Army innovation and dedicated logisticians make the future brighter for logistics, but more so, perhaps, for combat Soldiers who form the tip of the spear.

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"To be prepared for war is one of the most effectual means of preserving peace."
President George Washington
1st US President
Commander-in-Chief, American Revolution

Maintaining Our Relevance

By Major Walter Llamas

The Quartermaster Corps is and will remain relevant as it influences the logistics environment for many years to come. For as long as I can remember, the Quartermaster warrior has been a true multifunctional logistician. We are the oldest logistics branch. Long before the other two branches were formed, the Quartermaster Corps provided all ammunition, maintenance and transportation support to the units. We continue to cover so many different military occupational specialties (MOSs) within the Logistics Corps and provide the most versatile support of all. Now that I am assigned to the 23rd Quartermaster Brigade, I see perfectly clearly that we provide the best logisticians to the operational Army through our training. We train nine different MOSs within the Quartermaster Corps. More than 4,000 Soldiers are in training any given day, and we are graduating hundreds of Soldiers every week on their way to the operational Army to perform as true logistics warriors.

I know and understand that some of the MOSs are no longer as relevant as others. Some may disappear, and some may be consolidated. As the Army, the Logistics Corps and the Quartermaster Corps evolve through the years, we will see changes that may or may not make sense to most of us. We have to focus on the big picture and understand that decisions made at levels above us result from years of planning and research to employ the best practices possible to benefit our great Army.

Everywhere we look around Fort Lee, we see transformation and consolidation happening. Consolidating the logistics schools in one place and establishing the Sustainment Center of Excellence not only make sense but also emphasize and prove that the logistics family is stronger than ever.

We will train together and learn from each other as we would in a regular unit, but we will maintain the unique personalities and characteristics of our basic branches. I am extremely proud to have served with so many Quartermaster warriors and logisticians in the last 15 years, but nothing compares to the satisfaction of seeing motivated young warriors graduating and saying that they are ready to contribute to our Army. This assignment is a fulfilling experience. It offers many challenges daily, but rewards me as I see Soldiers become better individuals and citizens.

The Quartermaster Enterprise, as some refer to our Corps, is based on the values that make this Nation great. It is charged with transforming normal citizens into Soldiers who are technically and tactically proficient so they can face any challenge with a positive attitude. We, the sons and daughters (officers, warrant officers, NCOs, Soldiers and Civilians) of our Corps, will continue to provide effective and efficient logistics support to our customers for as long as we have an Army. As we look toward the future, I envision the logistics warrior 20 years from now providing more automated support. I believe that logistics will really be in real time for all support needed. Our Army will still have to use some type of fuel in 2050, it will require parts for equipment, and Soldiers will need rations. We will always be relevant and ready to support the victory.

MAJ Llamas is currently serving as the Executive Officer of the 262nd Quartermaster Battalion, 23rd Quartermaster Brigade, Fort Lee, Virginia. He deployed in support of Operation Iraqi Freedom with the 15th Sustainment Brigade, 1st Calvary Division. He holds a master of science degree in logistics management.

Evolving Technology Does Not Change Basic Mission

By Major Amanda Parkhurst

Many try to predict what the future holds for the Quartermaster Corps and Army logistics with ideas of technological improvements. Yes, just as the Corps has evolved over the years with changes in technologies and advancements in the sciences, the Quartermaster and Logistics Corps of the future may look much different.

Quartermasters of long ago may never have envisioned the systems we use today, nor can we predict what is to come.

I foresee two areas in particular that will continue to evolve: the composition of Quartermaster personnel and technological advances in equipment.

Our military occupational specialties and unit functions have evolved over the years to support the changing nature of the force. We have created new specialties to support new equipment and concepts. We created petroleum specialists in the modern age of the internal combustion engine and parachute riggers to support the airborne concept. It is, however, important to note that many Quartermasters' missions have not and will not change. For example, we have always and will always provide subsistence for our most important assets, our Soldiers.

Our combat units use technology to increase their lethality and effectiveness on the battlefield. We utilize technology to increase our responsiveness in our job of providing supplies and services. By decreasing the amount of time between the identification of a need for supplies or services and the time that supply or service is delivered to the customer, we enhance their ability to conduct operations. This has never been more important than now as we embrace our role in "full spectrum operations." Stability operations and civil support operations are often logistical missions and we as Quartermasters are prepared.

Although we cannot fully predict *how* things will be done in 2015 and beyond, we know what *shall* be done . . . the Quartermaster Corps will always be the enabler of our combat force. What we provide and supply will evolve, but we will always support the force.

MAJ Parkhurst is the Chief of the Quartermaster Basic Officer Leaders Course, Army Logistics University, Fort Lee, Virginia. She is a graduate of the US Military Academy at West Point, NY, where she studied law and engineering.

"[W]hether you are in for two years or 20 years or 30 years, the experience of being part of a values-based institution will make you a better person."

General Ann E. Dunwoody
Commander, US Army Materiel Command

Logistics Corps Takes Shape

By Major Leona M. Brown

Logistics has changed a great deal since I entered the military in 1990. And from my non-Quartermaster perspective, I do believe logistics will continue to evolve. In 1990, our three functional logistics capabilities (Transportation, Quartermaster, and Ordnance) were separate branches and, in my mind, the Transportation Corps was the *only* branch. So when I entered the officer ranks in 1995, I was honored to pin on the Transportation Corps insignia and begin the process of learning transportation responsibilities. As I single-tracked as a Transportation officer, I witnessed the evolution combining the three branches into the Logistics Corps.

The birth of the Logistics Corps was a long time coming, and I believe it is an awesome change for our military. Now that we have combined the capabilities of officers at the captains' level, I don't believe we will stop the merger here. The future of Logistics depends on our quickly transforming to keep pace with the changes in how we operate in war. I venture to say that in another 10 to 15 years, the separate functional branches will no longer exist. I foresee that all officers will enter the "Logistics Corps" and receive a skill identifier to denote their individual specialty areas. We will all be Logistics Corps officers or should I say, "jacks of all trades but masters of none." We currently operate as "jacks of all trades" so it might as well be official. Warrant officers will continue to be the subject matter experts or masters of their trade, providing the specialty expertise required in the functional areas.

As for the Logistics enlisted corps, I believe they will transform in a way similar to the officer corps. Currently, the proponents are looking at merging all military occupational specialties into a Logistics Corps. Soon, the senior noncommissioned officers (NCOs) will perform the multifunctional duties as "jacks of all trades" while the junior enlisted and mid-grade NCOs will provide the technical expertise. They will remain the functional backbone of the Corps and Army.

When it's all said and done, Logistics will have an entirely new face for officers and enlisted. We have evolved due to operational changes in order to survive on the battlefield. Evolve is what we as Logisticians do and will continue to do in order to support our Soldiers and win wars in 2025 and beyond.

MAJ Brown was National Guard Liaison, Total Force Integration Office, Quartermaster Center and School, Fort Lee, Virginia, when she wrote this essay. She is now deployed to Afghanistan as National Guard Liaison for the Reserve Affairs Office. MAJ Brown earned a bachelor's degree from the US Military Academy, West Point, New York.

"To overcome extremism, we must also be vigilant in upholding the values our troops defend – because there is no force in the world more powerful than the example of America. . . . because living our values doesn't make us weaker, it makes us safer and it makes us stronger."

President Barack Obama
44th US President

Managing Our Human Resources in the Future

By Major Samuel Chisolm, Jr.

As the military continues to evolve in the 21st century and the challenges increase for Soldiers to perform and for the Army to transform operations to combat the dangers of global terrorism, the responsibility of human resources professionals in the logistics arena will become even more significant.

From recruitment and training to the first assignment, the role of human resources professionals must become an integral component to ensure full capacity of the logistics core as well as non-traditional training of logistics personnel.

From the perspective of recruitment, greater emphasis must be placed on recruiting people who demonstrate a set of organizational skills that predispose them to be effective logistics personnel. This will be increasingly relevant because of today's asymmetrical warfare. The need for multiple personnel dispersed over a larger region requires more Soldiers proficient in the various logistical functions to ensure that units are sufficiently equipped with the necessary resources to perform their combat missions.

Additionally, following recruitment, it will be critical for the military to engage in non-traditional and differential training for the logistics personnel because of the new type of warfare. No longer should logistics Soldiers consider themselves "in the rear with the gear." Given the omnipresence of the enemy, the dispersal of personnel, and the need to ensure adequate preparedness, Soldiers must be prepared to engage the enemy over the entire spectrum of the battlefield, including supply routes.

As the framework of war continues to change in the fight on global terrorism, the recruitment of personnel to fill key logistical roles and the training of these personnel in non-logistical functions will be vital for the future of the military to ensure our continued superior prowess on the battlefield.

MAJ Chisolm is Brigade Adjutant, 23rd Quartermaster Brigade, Quartermaster Center and School, Fort Lee, Virginia. He has deployed to Iraq twice and to Somalia and Haiti during his career, which has included time in the Navy Reserves. MAJ Chisolm earned a bachelor's degree in political science from Morgan State University where he was commissioned and a master's degree in human resources from Troy State University.

"We look forward to a world founded upon four essential human freedoms. The first is freedom of speech and expression. The second is freedom of every person to worship God in his own way. The third is freedom from want. The fourth is freedom from fear."

President Franklin Delano Roosevelt

32nd US President

Use Our War Experience to Support Peace

By Captain Terrance R. Latson

Operation Iraqi Freedom and *Operation Enduring Freedom* have challenged logisticians to transform from a linear battlefield to an asymmetrical theater of operations while simultaneously being involved in conflict. As logistics has become more modular, sustainment brigades, brigade support battalions, combat sustainment support battalions, and forward support companies have blazed the trail for future logistics operations. These organizations are today providing immense capability in every battlefield scenario.

In the future, I would like to see the capabilities developed in our military logistics be broadly available for global assistance in logistically challenged areas. Some current examples of where our logistics expertise could be employed include water purification in Africa and South America, mortuary affairs support to austere foreign locations, and aerial delivery services to approved countries.

Quartermasters have historically provided support during conflict as well as during natural disasters at home and abroad, and we also possess the ability to broaden support relationships to aid in global resource management. I would like for the Army to consider an initiative to promote an international logistics support corps to assist other countries in acquiring knowledge, equipment, and training in state-of-the-art logistics. Completion of modularization will result in our having expanded ability to provide logistical support during peacetime operations as well as during combat.

In the year 2025, I see the logistician maintaining the ability to respond to international logistics crises, whether in war or peace. Sharing our logistics knowledge with United Nations member countries will build relationships with other governments and build trust in America among their citizens.

CPT Latson is currently serving at the Joint Readiness Training Center, Fort Polk, Louisiana. He deployed as Battalion S4, 2nd Forward Support Battalion, 2nd Infantry Division, Operation Iraqi Freedom II. CPT Latson earned a bachelor's degree in biology/pre-medicine.

"My dream is of a place and a time where America will once again be seen as the last best hope of earth."
President Abraham Lincoln, 16th US President

The Quartermaster Creed

I am Quartermaster.
My story is enfolded in the history of this Nation.
Sustainer of Armies . . .

My forges burned at Valley Forge.
Down frozen, rutted roads my oxen hauled
the meager foods a bankrupt Congress sent me . . .
Scant rations for the cold and starving troops, gunpowder, salt, and lead.

In 1812 we sailed to war in ships my boatwrights built.
I fought beside you in the deserts of our great Southwest.
My pack mules perished seeking water holes, and I went on with camels.
I gave flags to serve. The medals and crests you wear are my design.

Since 1862, I have sought our fallen brothers from Private to President.
In war or peace I bring them home and lay them gently down in fields of honor.

Provisioner, transporter. In 1898 I took you to Havana harbor and the Philippines.
I brought you tents, your khaki cloth for uniforms.
When yellow fever struck, I brought the mattresses you lay upon.

In 1918, Soldier . . . like you.
Pearl Harbor, too. Mine was the first blood spilled that day.
I jumped in darkness into Normandy, D-Day plus 1.
Bataan, North Africa, Sicily. I was there.
The 'chutes that filled the gray Korean skies were mine;
I led the endless trains across the beach in Vietnam.

By air and sea I supported the fight for Grenada.
Helicopters above the jungles of Panama carried my supplies.
In Desert Storm, I was there when we crossed the border into Iraq . . .
sustaining combat and paying the ultimate sacrifice as we liberated Kuwait.

I am Quartermaster. I can shape the course of combat,
change the outcome of battle.
Look to me: Sustainer of Armies . . . since 1775.

I am Quartermaster. I am Proud.

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