Soldier, Machinist, Inventor, Patriot—

The Legacy of Colonel Lewis McBride

By Mr. Kip Lindberg

Captain McBride is shown with his tear gas gun, Edgewood Arsenal, 1924.

Colonel Lewis McBride was, without a doubt, one of the most interesting and industrious officers in the history of the US Army Chemical Corps. In the formative years of the Corps, then known as the Chemical Warfare Service (CWS), McBride battled his way through red tape to emerge as a central figure on the cutting edge of chemical weapons research and development.

Born in Iowa on 6 August 1879, Lewis Mitchell McBride quickly developed a lifelong fascination with all things mechanical. He began a successful career in electrical engineering, despite the fact that he was largely self-taught. In 1904, McBride accepted a commission in the Colorado National Guard; but after the outbreak of World War I, he transferred to the Corps of Engineers. In 1920, McBride, then a captain, transferred to the fledgling CWS, where his interest in chemistry and knack for invention played a decisive role in weapons development.

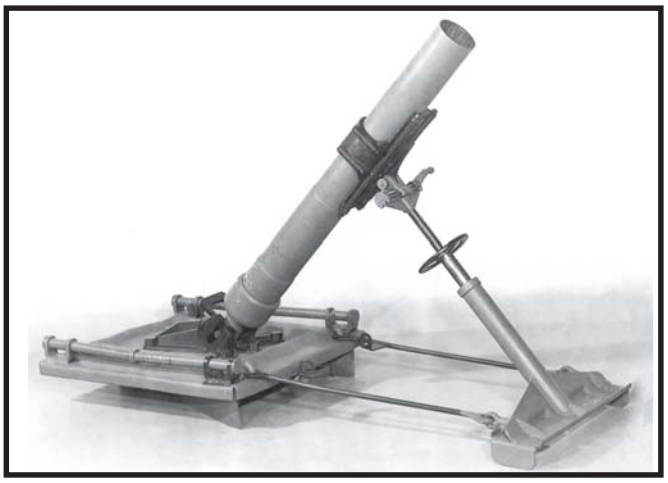
Upon his arrival at Edgewood Arsenal, Maryland, Captain McBride was tasked with redesigning the 4-inch Stokes mortar. Named for English inventor, Frederick W.S. Stokes, the 4-inch Stokes mortar was an effective short-range weapon capable of firing chemical-filled shells at ranges up to 1,000 yards. Adopted by the US Army in 1917, the Stokes was the primary close-support and gas delivery system. However, smoothbore-barrel and cylindrical-shaped projectiles limited the firing range and accuracy of the mortar.

Weapons design normally fell under the auspices of the Ordnance Corps; however, in the opinion of the Chief of Chemical, Brigadier General Amos Fries, the progress of the Ordnance Corps in refining the Stokes was not proceeding at an acceptable pace. "After much debate," wrote Major General John Apple, who preceded Fries as Chief of Chemical, "it was finally decided to let the CWS develop its own delivery system, and the 4.2 [inch chemical] mortar was the result." It was Captain McBride's task to improve the weapon, a feat that would become his greatest achievement.

Using the Stokes as a starting point, McBride devised a process to rifle the mortar tube, thus increasing the range and accuracy. He strengthened the breech to withstand

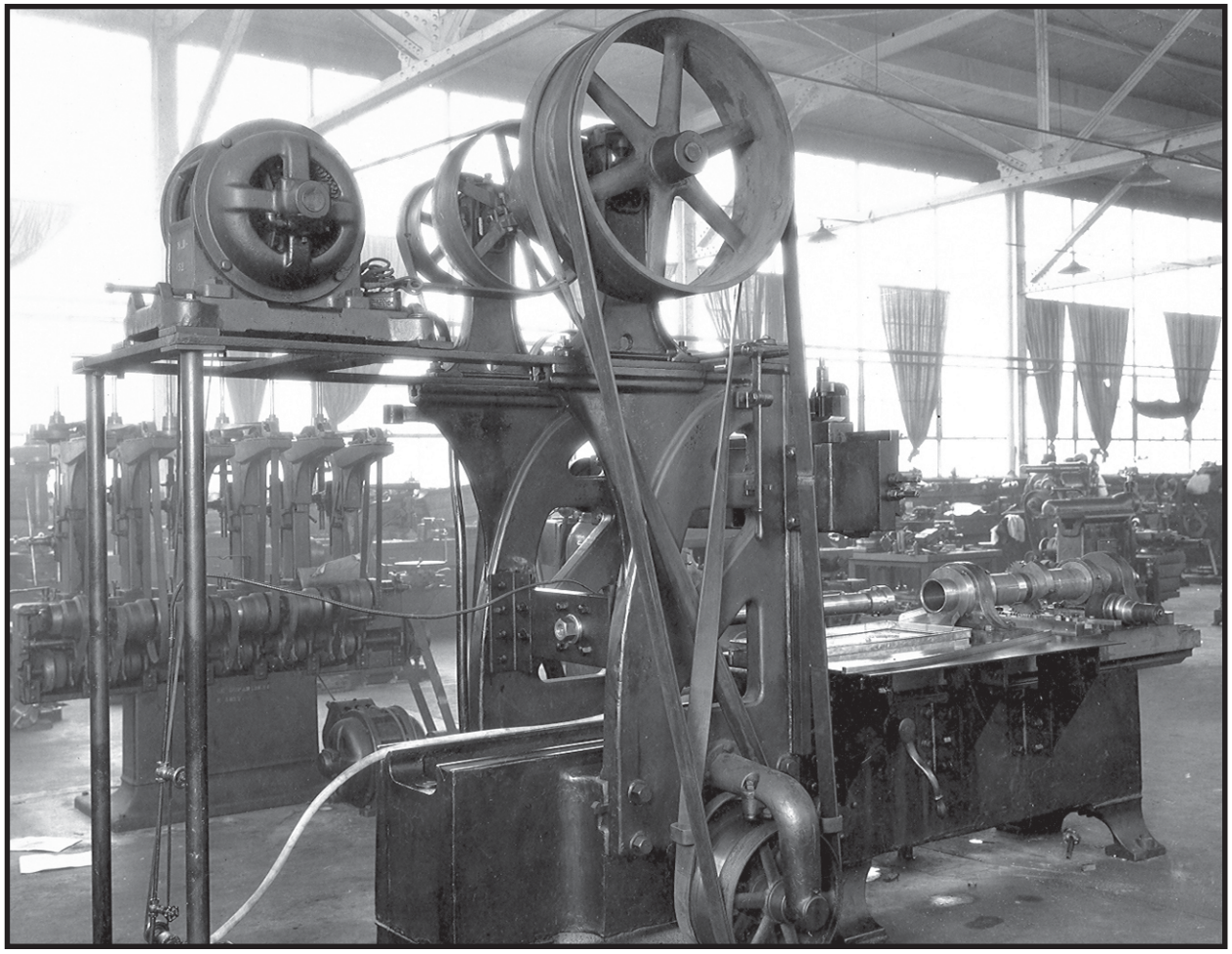
the higher pressure of a larger propelling charge and devised a stronger baseplate. He also designed an aerodynamic mortar round with an integral driving band to grip the rifling and maximize the use of propellant gases. Additionally, McBride made improvements to the liquid containment in the mortar rounds. Previous designs caused the gas shells to miss their targets as the centrifugal force placed on the liquid chemical agents made the flight trajectory erratic and unpredictable. After several years of development and testing, McBride unveiled the 4.2-inch M1 chemical mortar, and it proved to be a triumphal improvement over the 4-inch Stokes. The maximum range of the M1 was 3,000 yards, triple that of the Stokes. At that distance, rounds could routinely be placed within a 50-foot circle.

Further improvements to the M1 (later known as the M1A1 and M2) provided additional range capability and operational flexibility. The M2 saw extensive use in combat during World War II and Korea, providing rapid and accurate support fire with white phosphorous, smoke, and high explosive munitions at ranges up to 5,000 yards.

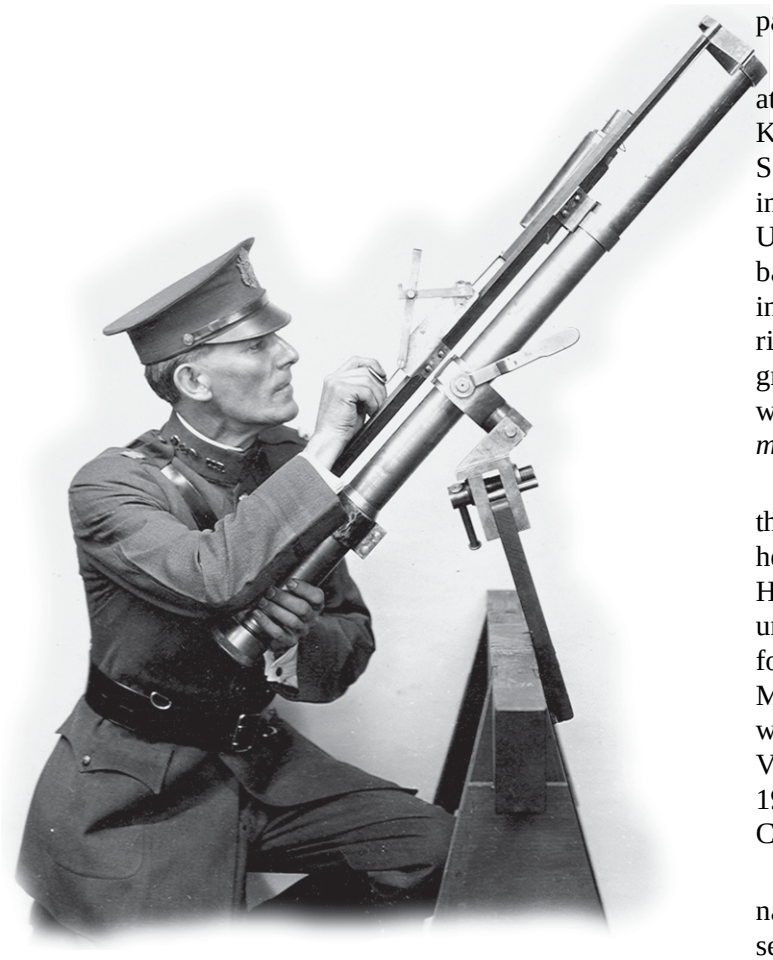


The success of the M2 4.2-inch chemical mortar was due to the ingenuity of Colonel Lewis McBride.

But McBride's efforts were not limited to the M1. Throughout his Army career, McBride packed his personal machine shop, along with his wife and children, to assignments at Edgewood Arsenal; Fort Sill, Oklahoma; and Fort Clayton, Canal Zone, Panama. He was an



Mortar barrels are rifled in McBride's machine shop, Edgewood Arsenal, 1924.



Captain McBride demonstrates his portable 2-inch mortar, 1926.

enthusiastic and industrious inventor who was awarded a dozen patents for chemical and electrical devices. In nearly all of his patent applications, he specified that his inventions ". . . may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon."

The Army used McBride's products to control prisoners at the US Disciplinary Barracks at Fort Leavenworth, Kansas, and as offensive weapons to disorient enemy Soldiers on the battlefield. McBride also designed incendiary grenades and light, portable mortars to give US Soldiers the weapons and mobility necessary to achieve battlefield superiority. But his greatest body of work involved nonlethal agents and their delivery systems. His riot control products (including gas guns, cartridges, grenades, and spray tanks) assisted police departments with combating the scourge of organized crime and the *motor bandits* of the 1920s and 1930s.

In 1936, McBride was assigned as an instructor at the Chemical Warfare School at Edgewood Arsenal, where he remained until his retirement from the Army in 1942. However, wartime necessities brought him back into uniform to resume his work in research and development for the CWS. After retiring for a second time in 1944, McBride continued to experiment and invent at his home workshop. Colonel Lewis McBride passed away at the Veterans Hospital in Long Beach, California, on 30 June 1956. He was buried with honors at Arlington National Cemetery.

Colonel McBride devoted his life to the service of his nation. In recognition of his many years of dedicated service, he was posthumously inducted into the Chemical Corps Hall of Fame in 1990.

Mr. Lindberg is the curator of collections at the US Army Chemical Corps Museum.

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