FOURTH EDITION

BRODIE'S BOMBS *and* BOMBINGS

A Handbook to Protection, Security, Detection, Disposal and Investigation for Industry, Police and Fire Departments

Colonel Jim Smith

BOMBS AND BOMBINGS

Fourth Edition

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By

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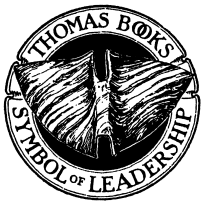

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PREFACE

When asked by Michael Thomas of Charles C Thomas Publisher to update and revise *Bombs and Bombings* by Captain Thomas Brodie, I was pleased to have an opportunity to assist in the process. I had the pleasure of meeting and interacting with Captain Brodie twice during my career. I met him during presentation of research while lecturing at two IABTI conferences. Captain Brodie was the epitome of a professional.

He asked incisive questions regarding the blast and fragment mitigation methods I had researched and tested. He made several suggestions, which were helpful. The research was published internationally and resulted in the issuance of a patent for the process.

I find it an honor to follow in the footsteps of a "giant" in the law enforcement bomb squad community. His work is excellent but following his death had not been updated in several years. My mission was to bring the textbook into the current era of bomb squad operations without compromising operational security. The material presented is open source materials and does not address sensitive law enforcement methods. I am shocked at the volume of sensitive material available on the Internet. If in doubt, perform a search with the term "pipe bomb" or "making TATP" and you will be amazed at the information available, albeit some, which if followed, would result in injury or death.

Captain Brodie was central in the modernization of the law enforcement bomb squad. He contributed ideas he had acquired through practical applications. His ideas were the forerunners of today's bomb squad. However, he paid a serious price for his service. Captain Brodie was injured on several occasions during his career while investigating more than 350 bombings and disposing of more than 4,000 IEDs, along with tons of explosives. His methods following his injuries to prevent such along with his sharing of experiences have no doubt saved the lives of bomb technicians and law enforcement personnel.

Today, bomb technicians stand on the shoulders of such men as Thomas Brodie. His work led to his award as a Knight of the British Empire for his

role in protecting British interests during the Cuban terrorism of the 1960s. He has been called a "hero" by the media and such a description is not unwarranted.

I have worked to revise and update this text to honor Captain Thomas Graham Brodie.

J.S.

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BOMBS AND BOMBINGS

Chapter 1

HISTORY OF BOMBS AND BOMBINGS

The first explosive described is black powder. This mixture was known by a variety of names. Black powder, or as it became to be known later as "gunpowder," is a mixture of sulfur, charcoal, and potassium nitrate. Black powder is extremely sensitive to friction, spark, flame, or heat. Chinese historical documents chronicle several events in which black powder storage magazines exploded with catastrophic results. These are early experiences with the instability of explosives. Gunpowder is mentioned in some Chinese texts as early as the mid-400s BCE. Some sources cite the earliest bombings as military actions in China during the 1200s as bamboo tubes filled with gunpowder. During this period, cast iron containers filled with gunpowder are believed to have been introduced and used in naval warfare in addition to land warfare.

During the 1400s, cannons using gunpowder were coming into common use. Between this time and the 1700s, firearms using gunpowder proliferated and hand grenades using gunpowder were introduced. Evidence exists that pirates used hand grenades in their attacks against merchant shipping during the 1600s and 1700s. During the early 1600s, gunpowder began to be used in mining as a blasting tool. Rockets appeared in the late 1700s and were used by the British in the form of Congreve Rockets against Fort McHenry as noted in America's National Anthem. Paper cartridges for firearms were developed during the 1700s. In 1846, nitrated cotton, called gun cotton, was developed which was smokeless and at the same time, nitroglycerin was developed. Nitroglycerin-based dynamite was developed. Smokeless gun-

powder, the forerunner of modern smokeless gunpowder, is developed in the 1870s. Ammonium nitrate becomes a common component in dynamite by the 1880s. Binary explosives are used in the 1880s. Detonating cord is in use by 1902. By 1914, Germany had developed trinitrotoluene (TNT). Pentaerythritol tetranitrate (PETN) detonating cord is developed in 1938. Other explosives followed in WWII with many plastic explosives developed during this time. Prilled ammonium nitrate (AN) begins to replace dynamite in the 1950s for mining purposes. In 1969, emulsion explosives were marketed for mining. In the 1970s, black powder is supplanted by compounds adding graphite and potassium perchlorate to reduce sensitivity and improve its performance in firearms. Pyrodex® is an example of one of the several black powder substitutes available.

The United States has a long history of bombings and unintentional explosions as do many locales. Some of the more substantial and interesting bombings are discussed below with data drawn from open sources.

Early Bombings

1881–A hand-delivered bomb was used by a left-wing terrorist to assassinate the tsar of Russia. This is an early use of a person-borne, improvised explosive device (PBIED) as the assassin hand delivered the device and was killed in the ensuing explosion. Three bombers were present to assure the murder of the tsar. The tsar is killed after he exits his bombproof carriage.

May 4, 1886–A bomb is thrown at police during a labor rally in Chicago. During the event, seven police officers are killed and 11 others killed with more than 100 injured. The device is an improvised explosive device filled with dynamite encased in a brittle iron container hand delivered.

October 1, 1910–Union members angry at The Los Angeles Times for its supposed antiunion articles planted 16 sticks of dynamite in an alley adjacent to the building. The explosion killed 20 and injured nearly 100 others. Extensive damage to the building was done by the blast.

July 2, 1915–A German professor, Frank Holt, tried to stop American support of the Allies in WWI by detonating a bomb in the US Sen-

ate Reception Room. He used a sulfuric acid delay with high explosive (likely dynamite) to create the bomb. No injuries resulted.

July 22, 1916–The Preparedness Day parade was designed to prepare those living San Francisco for entry of the United States into World War I. Antiwar activists detonated a bomb killing 10 and injuring approximately 40. The bomb was either delivered as an emplaced improvised explosive device (IED) consisting of dynamite in a steel pipe or was alternatively dropped into the parade from a roof top, as accounts vary.

November 24, 1917–A bomb explodes in a Milwaukee police station, killing nine officers and a civilian. Anarchists were suspected. The device was found at a church and was delivered to the police department by the church's janitor. It exploded as officers were examining the package. The bomb was likely a pipe bomb filled with gunpowder.

1919 Anarchists bombings–These occurred during April through June of 1919. The anarchists were targeting important government and business officials. Roughly 30 bombs were mailed during the first attacks. The devices are described as a wooden block with dynamite contained within with an acid initiator activated as the package was opened allowing the acid to discharge blasting caps. Two injuries resulted and the post office was able to impound most of the devices. The June 2, 1919 attacks of the residences of several government officials resulted in minor injuries and the death of one of the bombers when the much larger and more powerful device detonated while in the bomber's possession. One residence was largely demolished. These bombs were hand delivered.

September 16, 1919–A bomb exploded in New York City's Wall Street area, killing 40 and injuring almost 300 people. The bombing is a horse-drawn carriage with an estimated 100 pounds of dynamite and a substantial amount of iron to serve as fragments. Anarchists are suspected in the bombing. This is an early use of a vehicle-borne, improvised explosive device (VBIED).

May 18, 1927–The Bath School is bombed. The school treasurer placed hundreds of pounds of dynamite in the school and detonated it. He drove back to the scene with his car containing a large amount of dynamite and detonated it killing himself and the principal of the school. This blast killed a student who had survived the initial blasts. Reports place the number of deaths at 45 with 38 list-