EXPLOSIVES
AND
BOMB DISPOSAL GUIDE

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Fifth Printing

By

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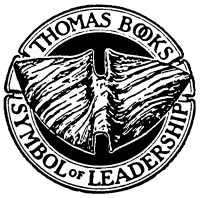

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DEDICATION

This book is dedicated to my family, to the New York City Bomb Squad, and to all Peace Officers who may contact explosive devices in the course of duty.

PREFACE

ON November 24, 1917, a bomb in a suspected package was carried into the Central Police Station in Milwaukee, Wisconsin. The bomb exploded violently as the officers were about to examine it, killing nine policemen and two civilian onlookers.

In February, 1963, a large heavy pipe device was turned over to the Army 61st Explosive Ordnance Disposal Team at Fort Sill, Oklahoma. Examination of the pipe disclosed thirty-five pounds of explosive photoflash powder and two electric igniters capable of detonating the pipe with a damage radius of one-fourth of a mile.

In May, 1963, a Canadian military bomb disposal expert reached into a mailbox to examine a suspected package and was met with a searing blast which completely severed his left arm and immediately terminated his career in Bomb Disposal.

The Canadian incident was not in vain, however, because it served the purpose of reminding all peace officers that the only effective way to combat explosive devices is through knowledge and research, and this book was then conceived for that purpose.

Three wars, compounded, have trained thousands of men in the use of demolitions and mine warfare, and have subsequently released these thousands back to civilian life.

Aggressor nations are training saboteurs and terrorists by the hundreds in the use of clandestine devices and improvised explosives, and they are being sown daily throughout the world.

Many psychotics roam the streets and, to gain attention, have turned to explosives, for there is no better weapon to strike fear and create panic than a carefully placed explosive device.

Saboteurs use explosives and incendiaries as a primary weapon because of their ability to disable or completely destroy the target.

Military, commercial, and "home made" or improvised devices are encountered daily by peace officers the world over. Newspapers headline the terrorists: unions, psychotics, and even teenagers who have utilized explosives as an effective weapon against society.

The author, through years of field experience, research, and teaching background, has attempted to consolidate the essentials needed to combat the ever-present threat of an explosive device or infernal machine. This large exchange and dissemination to the majority of interested parties can only be accomplished through the media of a well-organized publication.

Explosives are an unstable substance which, when subjected to the proper initiation, become stable, by unleashing tremendous power, accompanied by heat, blast, and terror. The damage and psychological effect are tremendous because such a weapon is not selective in its target. Any innocent person within its lethal range becomes a potential victim.

There is no positive or fool-proof way to render safe any and all explosive devices, but this book will certainly afford a positive means of approach towards these deadly devices.

The means of initiating explosives and chemicals are countless in number and each device is limited only by the imagination of the perpetrator.

The subject material presented herein has been carefully planned to indoctrinate and orient all peace officers who may encounter explosive devices now or in the future.

Initially, it was the opinion of many that this book would be dangerous to publish, as it could accidentally fall into the hands of certain undesirable people. Perhaps this is true to some degree, but so is a gun in the hands of one who desires to use it against society.

The peace officer today can effectively combat a gun because he knows its capabilities and limitations through study, but the majority of peace officers have a very limited background in explosive devices because so few people, to date, have studied this subject.

The consolidated data and techniques within this volume should be disseminated to the proper agencies and it is the intent of the author that the book be solely for those agencies who have a "need to know." The agencies who would normally need to know this information would be Peace Officers, Fire Departments, Public Safety Units, Military EOD Units, Civil Defense Groups and certain educational institutions.

This manual combines material which has never before been assembled into one volume. It serves to supply a background of knowledge for any peace officer who does not have the many references, or qualified teachers, for bomb disposal training.

The peace officer with a good background in explosives can at least approach each situation with confidence, and perhaps succeed in his mission of rendering safe a device where previously a mistake through lack of confidence and knowledge could have been fatal to himself and innocent bystanders.

A favorite expression among bomb disposal technicians reads: "There are only two degrees of effectiveness in bomb disposal, initial success or complete failure ! ! "

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R. R. L.

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Chapter I

THE HISTORY OF EXPLOSIVES AND EXPLOSIVE ORDNANCE DISPOSAL

BACKGROUND

"THE unholy desire throughout the centuries for man to implement his belligerent impulses with superior devices for conflict, has provided the science upon which he has patiently constructed the most lethal scourge of the universe today, the high explosive bomb." (G. M. CHINN)

MILITARY AND EXPLOSIVES

A good bomb disposal story could never be told without a brief history of the origin of early crude weapons progressing to modern day explosive ordnance. Starting during the days of the most primitive caveman, we find that the wooden club or "shillelagh" was universally employed for obtaining food, collecting wives, and clobbering his fellow man. Even today, as a reminder of its once devastating force, it is carried by certain high ranking military leaders and is called a "Swagger Stick," a symbol of the past and "A tribute to the man who wields the best club."

However, man in his increasing desire to conquer, progressed from the wooden club to better methods when he discovered that his neighbor retaliated with more effective means by throwing rocks and rolling huge boulders from a remote position in an effort to decimate his enemy remotely. Progress in weapons then began its normal course.

What followed in the early years was inevitable. The stone axes, pikes, metal axes, swords, maces, projectile and fire catapults, cross bows, long bows, and even crude version of germ warfare made their appearance.

About the time of Moses, history shows that the Chinese wrote in their code of laws a passage for thought which read, "The Magistrate will not make war with any deceitful machine, or poisonous weapons, or with cannons, guns, or any kind of firearms."

Early in the year 1252, Roger Bacon described the use of black powder for military use by stating that it could "blow the enemy up or put him to flight by the terror of an explosion." Little did Roger Bacon realize at the time of these writings that the world would progress to the present day "nuclear methods" capable of destroying entire cities.

Records indicate that gunpowder mortars, multiple-barrelled guns, and cannons were in use as far back as the year 1300. History seems a little shady concerning weapons during this period, but we feel the shot used was of the solid type fired from smooth bore guns.

The first use of an explosive missile delivered by air, and not fired by a propellant, was recorded in 1849 when the Austrians used small charges of gunpowder attached to floating balloons against Venice.

The Civil War era, 1861-65, brought to the United States artillery shells, grenades, and crude mines capable of bursting internally in the air or on impact, and throwing fragments with a devastating effect. It is interesting to note that bomb disposal personnel are still recovering Civil War Ordnance, with black powder bursting charges just as effective as the day they were manufactured.

The year of 1866 ushered in a new era for explosives when Nobel mixed nitroglycerin with an absorbent material (binder) making it safer to handle. This new explosive was then classified as the "high explosive family." Further developments on nitration of materials in later years proved that this new type explosive has a more devasting effect when used as a main filler in various munitions, replacing explosive black powder.

The arrival of the aeroplane in 1903 added greatly to the wholesale fast delivery of explosive bombs, as demonstrated by the Italians in 1911, who dropped large containers of raw nitroglycerin on ground forces in Tripoli. (Incidentally, duds were at a minimum and pilots were known to grumble and complain considerably during these rather risky type of missions.)

In 1914, the Germans opened a new epoch in warfare by dropping high explosive bombs on Paris killing nearly one thousand people. Here was destruction indeed!

At this point however, Explosive Ordnance had not created a demand for trained disposal personnel inasmuch as early Civil War and World War I Ordnance were fitted with crude mechanical impact fuzes or powder-train time fuzes which presented no great problems for disposal. The dud ratio on this type of ordnance was relatively high because of the crude fuzing systems used.

Records indicate that regular ordnance personnel of the British Royal Army Ordnance Corps undertook the job of disposing of the unexploded World War I bombs, dropped by Zeppelins from Germany, without much incident.

The year 1931 marked a definite turning point in the evolution of bombs and fuzes, because the German "Reinische Mettallwaren and Maschininenfabrik" applied for patents throughout the world on a range of devices called "electric time and impact fuzes for projectiles and the like."

The Spanish Civil War (1936) presented the German Luftwaffe with the opportunity to estimate the performance capabilities of their new family of explosive bombs on live targets in a tactical situation. Needless to say, the results were successful. This should have been the signal for all countries to train bomb disposal personnel with up-to-date techniques. However, it was only briefly discussed and largely overlooked at this stage.

In February of 1940, the War Office of Great Britain decided to assign responsibility for bomb disposal after a few light bombings by German scout planes. The decision was too late, however. Late in 1940, the Germans cut loose on Great Britain with