

A TREATISE ON RIFLE PROJECTILES

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649432141

A Treatise on Rifle Projectiles by John Boucher

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

JOHN BOUCHER

**A TREATISE ON
RIFLE PROJECTILES**

A TREATISE
ON
RIFLE PROJECTILES:

IN WHICH

THE APPARENT ANOMALIES AND CONTRADICTIONS
EXHIBITED IN THE PENETRATION OF ELONGATED RIFLE
BULLETS

ARE ACCOUNTED FOR,

THE BEST FORM OF PROJECTILE FOR DEEP PENETRATION

IS DESCRIBED,

AND

THE MOST EFFECTIVE RANGE FOR SINKING AND PREVENTING
THE APPROACH OF HOSTILE BOATS

IS POINTED OUT.

TO WHICH ARE ADDED,
EXPERIMENTAL PROOFS OF THE FALSITY OF THE "MINIÉ"
PRINCIPLE, AND THE UNSOUNDNESS OF THE AMERICAN
"FREED BORE" SYSTEM.

BY

JOHN BOUCHER,

FORMERLY OF THE 5th DRAGOON GUARDS;

AUTHOR OF "THE RIFLEMAN AND THE RIFLE," "RIFLE PRACTICE," ETC.

LONDON:

CHARLES AND EDWIN LAYTON,
150, FLEET STREET.

1856.

[The Author reserves the right of translation.]

231. a. 67.

P R E F A C E.

Having been requested to place upon paper my opinion relative to "the apparent anomalies and contradictions which exhibit themselves in the penetration of elongated rifle bullets," I attempted to do so in the form of a Lecture: but finding, on examination, that my experiments had produced a greater mass of important matter than I had anticipated—and also, that "the best form of projectile" and "the most effective range" were closely interwoven with the subject, I preferred adopting a somewhat more extended form, rather than injure the work by curtailment.

It was impossible, during the early part of my experimental inquiries, not to trace or to imagine, among the variety of facts which presented themselves, certain indications which I believe have served to prop up the strange theories which some writers—through mistaken notions, no doubt—have attempted to establish; and having formed such conjectures, the desire to refute or to verify them gave additional interest to the pursuit. I have not, however, attempted at present to offer a complete enumeration of all the curious and interesting

facts which have come under my notice, as that would have extended the work far beyond the limits I assigned to it; but I have endeavoured to present those which struck me as the most important, either for solving the original question, or for explaining the other subjects which are necessarily connected with it.

J. BOUCHER.

SURREY VILLAS, CAMBERWELL,
June, 1856.

CONTENTS.

- Report of Experiments in 1862, page 1. Question submitted to Professor Narrien, 2; his opinion, 2; inapplicable to the subject, 3; and inconsistent with practice, 3.
- Captain Tamisier's theory, 5. Colonel J. W. Jervis's ditto, 6. The construction and motion of an arrow referred to by both writers in support, 7; their mistaken notions on that subject, 7. Archery authorities quoted to prove they are both in error, 9.
- The motion of a bullet compared with the motion of an arrow, 10: both have the same characteristics, 11.
- Professor Shaw's opinion, 13: partly correct, 13; and partly erroneous, 14.
- The first motions of a bullet supposed by some writers to be irregular, 15; facts prove the contrary, 16; manner of proof, 16.
- The best form of projectile for deep penetration described, 16.
- The Master-General invites the principal gunmakers to submit bullets for adoption, 16.
- Mr. Wilkinson's bullet, 17; its faults, 17.
- Mr. Fritchett's bullet, 18; its faults, 18. Colonel Jervis's description of it, 18. Colonel Kennedy differs from him; but is evidently wrong, 19: faults common to both bullets, 19.
- Mr. Fritchett's bullet, according to certain writers, adopted by the Ordnance Department, in preference to all others, 20; for some reason or other, discarded, 20.
- The "Minié" bullet, 20; a fallacy, 20; a delusion, 21. Colonel Kennedy's description of it, 21; Colonel Maitland's ditto, 21; General Sir Howard Douglas's ditto, 22. Practice and experiments prove them all to be in error, 22: how, and in what manner, 23.

The "Minié" system again in favour with the Ordnance Department, 24.
 Colonel Hay's supposed improvement of the iron cup, 24. Sir Howard Douglas's explanation, 25 : is evidently led into error on the subject, 26.
 Colonel Jervis finds fault with the "Minié" bullet, but mistakes the cause, 25. So does Colonel Kennedy, 26 ; and also Colonel Cheemey, 27.
 The real faults of the "Minié" system not generally understood, 27.
 Bullets with deep hollows recommended, 28 : a mistake, 28 ; grave faults often attend them, 29. Captain Delvigne's opinion, 29.
 Russian and Prussian bullets ; constructed on very unscientific principles, 30. Colonel Le Couteur's experiments, 30 ; of no value, 30.
 The Author's projectile described, 31.
 The principles of elongated bullets cannot be adapted to any weight and still fit the same bore, 32.
 Long ranges the grand proof of a good bullet, 33.
 The heaviest bullet—same bore—ranges furthest, 34 ; but adds to the weight the soldier has to carry, 34.
 The theory of the Small Arms Committee relative to Mr. Wilkinson's and Mr. Lancaster's bullets, 35 : the Author differs from them, 36.
 The theory of a bullet passing through the air, 38.
Resistance common to all bodies, 39.
 Firing through a dense atmosphere, 39 ; firing into water, 40 ; firing into a sand bank, 41 ; firing into wood, 41 ; firing against iron, 42.
 Experiments at Woolwich, worthless, being at too short a range, 42 : erroneous opinions gathered from such experiments, 43.
 Some persons, even military men, think that a bullet *gains* in velocity after leaving the muzzle of the piece, 43. Such opinions contrary to the laws of nature, 43. Dr. Hutton's remarks, 44 : many persons probably led into error by them, 45. The cause explained, 45.
 The direction of motion cannot be altered, unless by external causes, 47.
 The force engendered by the ignited gunpowder enclosed in the bullet, 47 : a one-sided view of the result to be guarded against, 48.
 The destruction of velocity in all cases gradual, 49.
 When one body impinges on another, the action of the particles of the body struck described, 49. The effects of impact modified according to the nature of the substances, 50.

- When a bullet strikes, the sudden loss of momentum accounted for, 51.
The motion of the particles which compose the bullet, on striking, 51 ;
their action illustrated, 52.
- The diminution and extinction of motion depends also on friction, 53 ; its
nature illustrated, 53.
- From all that has been stated, the most effective range determined, 55.
- Difference between the ball-practice of the line and rifle regiments, 56.
No man can be considered a perfect rifleman who has not obtained a
just knowledge of the principles upon which the art depends, 57.
- On the nature and true cause of the expansion of the bullet into the
grooves, 59. Experimental proofs of the falsity of the "Minié" prin-
ciple, 60.
- The unsoundness of the American "*free* bore" system, 69.
- On a vacuum being created behind a bullet in the air, when it moves with
a certain velocity, 83. Density and height of a uniform atmosphere, 83.
Specific gravity of air, water, and mercury, 86. Velocity with which
air rushes into a vacuum, 88.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and government operations. This section also highlights the role of technology in streamlining record management processes and reducing the risk of errors or data loss.

2. The second part of the document focuses on the implementation of robust internal controls and risk management frameworks. It outlines the need for regular audits and assessments to identify potential vulnerabilities and ensure that organizational policies are effectively enforced. This section also discusses the importance of employee training and awareness programs to foster a culture of compliance and ethical behavior within the organization.

3. The third part of the document addresses the challenges of data security and privacy protection in the digital age. It emphasizes the need for strong encryption protocols, secure data storage solutions, and strict access controls to safeguard sensitive information from unauthorized access or disclosure. This section also discusses the importance of staying up-to-date with the latest cybersecurity threats and best practices to minimize the risk of data breaches.

4. The fourth part of the document discusses the importance of effective communication and stakeholder engagement. It emphasizes the need for clear, concise, and timely communication to ensure that all stakeholders are informed and aligned with the organization's goals and objectives. This section also discusses the importance of listening to feedback and addressing concerns to build trust and foster a positive organizational culture.

5. The fifth and final part of the document provides a summary of the key findings and recommendations. It reiterates the importance of a holistic approach to organizational management, one that integrates financial, operational, and human resources management. The document concludes by emphasizing the need for continuous improvement and adaptation to changing circumstances to ensure long-term success and sustainability.