

# **THE RIFLE SIMPLIFIED**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649248339

The rifle simplified by James Dalziel Dougall

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](http://www.triestepublishing.com)

**JAMES DALZIEL DOUGALL**

**THE RIFLE  
SIMPLIFIED**



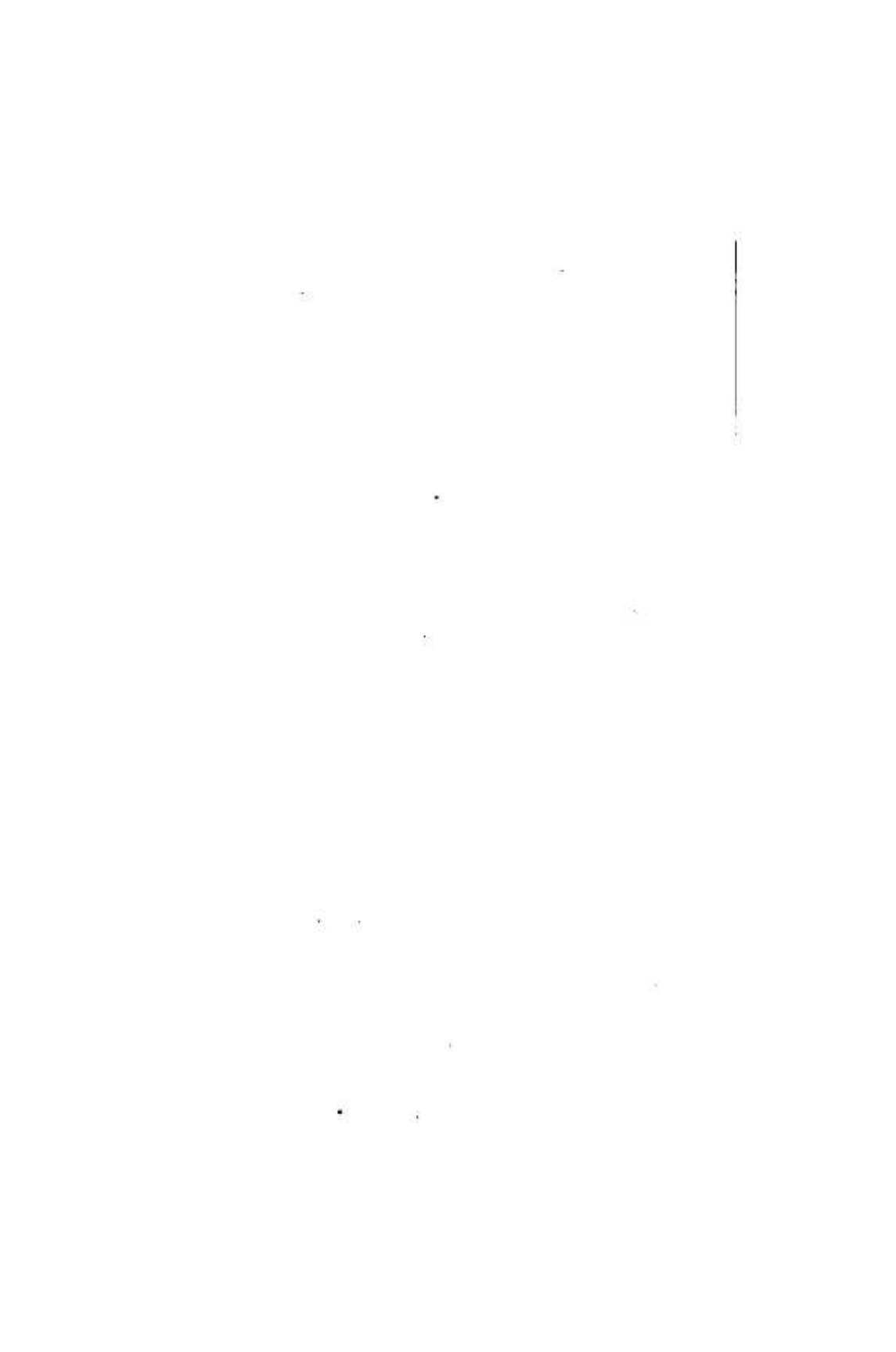
THE  
RIFLE SIMPLIFIED;

BEING A  
FAMILIAR AND INSTRUCTIVE TREATISE  
ON THAT  
IMPORTANT WEAPON, AND ON ITS EFFICIENCY  
FOR NATIONAL DEFENCE.

BY  
JAMES DALZIEL DOUGALL,  
Author of "Shooting Simplified," etc., etc.

GLASGOW:  
THOMAS MURRAY AND SON.  
EDINBURGH: A. AND C. BLACK.  
LONDON: ARTHUR HALL, VIRTUE AND CO.  
1859.

*231. C. 112.*



## THE RIFLE SIMPLIFIED.

---

THE Science of Projectiles includes so wide and argumentative a field, and its true principles are even to this day so far from being correctly ascertained, that I shall in the following remarks avoid as much as possible theoretical or scientific disquisition. The rifle is an instrument, apparently in itself so simple, as to permit little or no room for difference in opinion. Yet it would be perhaps impossible to point out any other mechanical contrivance, on which so much variety and even antagonism of opinion exists; and I frequently have been repelled from studying the writings of authors on the subject, by their uncalled-for display of virulence towards each other. Avoiding this argumentative spirit, I shall therefore treat as clearly as I can of the leading modes of construction of this deadly weapon, and beginning at the very A B C of projectiles, endeavour to explain—

First, What a rifle is; next, In what a Minie rifle differs from, and for general military purposes excels, all other weapons hitherto invented.

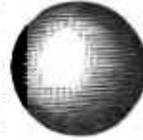
I shall therefore begin by explaining what may at first appear a superfluous fact, that the whole science of projectiles is based upon one prime moving power—

Elasticity. But there is an analogy in all the modes of gaining and applying this elasticity, which is very striking and interesting, viz., That it must be comparatively slow and accumulative, propulsive in its character, and not sudden, rending, or violently explosive. This elasticity, then, we first find called into play by the action of the muscular fibre, as in throwing a stone, a dart, or combined with additional power gained by the use of a sling, which was the first implement by which such additional force was attained. And let us not, in the plenitude of our inventions, under-rate the efficiency of that simple instrument, by means of which David slew Goliath. We have the authority of Sir Archibald Alison for stating that the modern Patagonians, the inhabitants of the most southern districts of America, "mounted on their small but hardy horses, discharge their slings loaded with stones, with such address as to hit any animal at the distance of four hundred yards," i.e., nearly a quarter of a mile! We again find this elasticity in the spring of wood or metal, as in the cross-bow and long-bow, the weapons of our ancestors. And, lastly, up to the present time, without taking into account Perkin's steam-gun, or that toy, the air-cane, we find this elasticity obtained from the very air itself, for gunpowder is nothing else than air in a condensed state, which is suddenly freed and expanded by combustion. Sad paradox, that constituent parts of that vital principle by which all men live, should be used for the purposes of destruction, and the giver of life be thus turned into the sender of the swift-winged messenger of death! At this point, then, we reach the first rude application of elastic air, and in the simple tube of the untutored Indian,



through which he sends his light and poisoned dart, is the germ of all fire-arms, small and great.

The musket ball is a sphere. This is the bullet which has been in use for centuries, and this is also that projectile with which all the comparative merits of the Minie or other balls are to be considered. A gun, under any denomination, musket, fusil, or carbine, but which is not a rifle, has the interior of the tube or barrel perfectly smooth, and from such smooth barrel this spherical ball was projected. Now, it is absolutely impossible, in the moulding or construction of this ball, to give it equal density in all its parts—some air-hole, some fault somewhere will exist. The gun is loaded and fired. The ball, acted upon by this inequality, and from irregular contact with the sides of the barrel in its passage outwards from the breech, will almost immediately begin to deflect from the line of aim, and this deflection will increase rapidly and immensely as the bullet speeds upon its way. Its action is, therefore, beyond a very close range, certainly not over one hundred yards, uncertain and capricious. Not but that its initial velocity and its power of range, except for the disturbing influence of irregularities in density, is very great; and it used to be a common saying in the army that a musket could kill at a mile's distance. To give as much force as possible to this imperfect bullet, a very heavy charge of gunpowder was used—as much, I believe, as four a-half drachms avoirdupois—the result of which, like all attempts at a cure on wrong tactics, would only be in most cases to increase the irregularity.



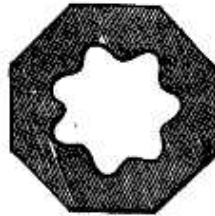
The calibre of this old musket was fully 11, or .760

of an inch; the bullets were  $\cdot 701$  of an inch, or 14 to the lb. This disproportion was permitted for the sake of ease in loading, but it still further increased the eccentricity of the ball's flight. I remember being told by a veteran of the Peninsular war, that once on his regiment going into action, the very last man in the column was wounded by a musket ball, which must have reached him after performing some strange vagaries, to the intense astonishment of his brethren in arms. You will thus perceive that the smooth-bore gun has no power of throwing a projectile with any degree of accuracy beyond a very limited range, and I shall now proceed to explain what a rifle is.

It is now nearly four hundred years ago since an attempt was made to get quit of, or rather to make room for, the great residuum left by the combustion of the then rudely manufactured gunpowder, by means of longitudinal grooves in the interior of the gun-barrel. Like many other inventions, this failed in itself, but led to a most important and unexpected result. Whether accidentally, or by *à priori* reasoning, it struck some gunsmith that if these grooves were made, *not longitudinally*, but *spirally*, the ball would receive a rotatory motion, and thus the inequalities in its density would be compensated. The most simple and apposite illustration of the effect upon the ball of these spiral grooves is that of a boy's common spinning-top—Scottic's *peerie*. A boy takes this top, and winds round it a piece of cord, so that, when he throws it upon the ground in such a way that the unrolling of the cord is in a direction perpendicular to the axis of the top, the latter lights upon its point, and has acquired so rapid a rotatory motion that

the laws of gravity are for a time suspended, and the top continues to revolve upon its iron-shod apex. Now this is exactly the quality imparted to the rifle ball by the spiral grooves of the barrel; and just as certainly as it would be utterly impossible, by any amount of practice or dexterity, for the boy to cause the top to stand upon its apex without rotation upon its axis, will it be impossible for the most highly-trained marksman to propel a bullet accurately from a smooth-bored barrel. A rifle, then, is a gun whose barrel has its interior divided into several depressions, termed grooves, and several parts or eminences equal to, or rather level with, its calibre, called "lands," which grooves and lands, being formed spirally, impart a spinning motion to the bullet, which continues so to spin, upon an axis coincident to its line of flight, during the whole period of that flight. Accuracy is thus gained by the transverse centre of gravity being thrown for the time being into the very axis of the bullet, so that there is no tendency to deflect from its line of aim, which is the same as that axis. Here is the muzzle of a polygrooved (i.e.,

many grooved), rifle barrel. One might suppose, that rotation once gained, there was little or no room for further improvement, and it consequently took nearly



350 years before a farther step was made, as if the mighty wars which are foretold in prophetic writ are to be fought with a means of destruction hitherto undreamt of, and whose power has already been likened by Dr Russell of the *Times* to that of "*the destroying angel*."