

**AN INTRODUCTION
TO
METAL-WORKING**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649463954

An Introduction to Metal-Working by J. C. Pearson

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.

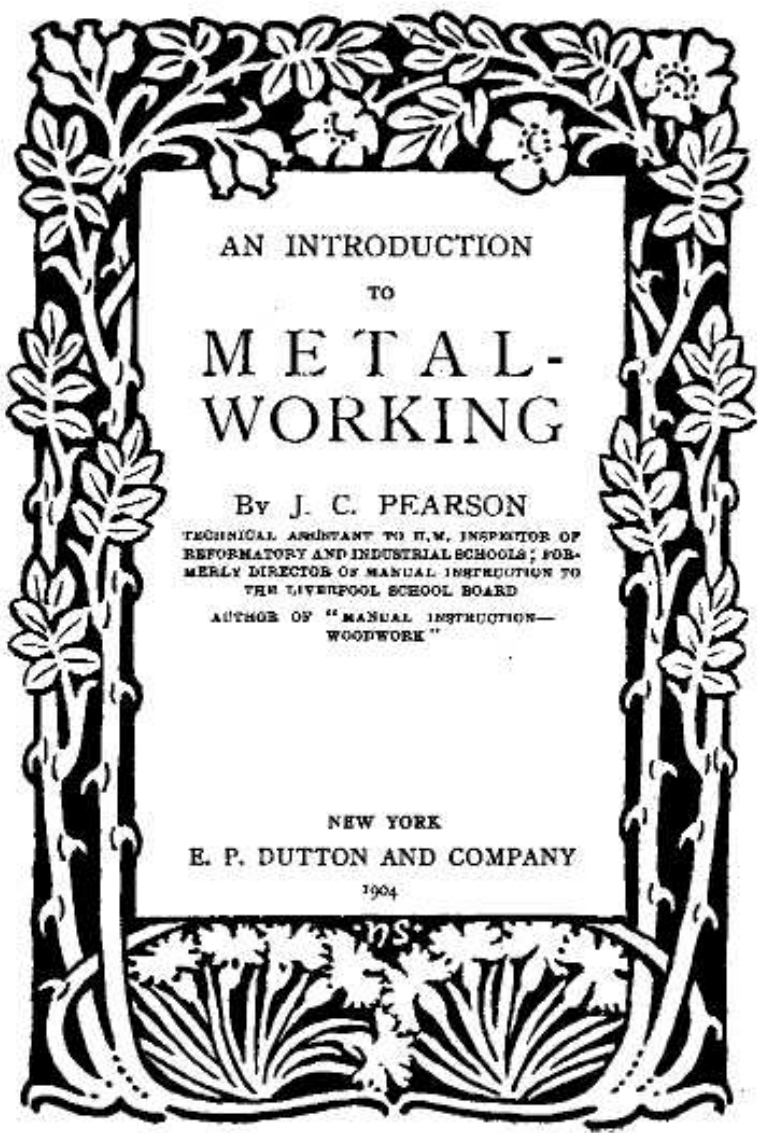
Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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

J. C. PEARSON

**AN INTRODUCTION
TO
METAL-WORKING**



AN INTRODUCTION
TO
METAL-
WORKING

By J. C. PEARSON

TECHNICAL ASSISTANT TO H. M. INSPECTOR OF
REFORMATORY AND INDUSTRIAL SCHOOLS; FOR-
MERLY DIRECTOR OF MANUAL INSTRUCTION TO
THE LIVERPOOL SCHOOL BOARD

AUTHOR OF "MANUAL INSTRUCTION—
WOODWORK"

NEW YORK
E. P. DUTTON AND COMPANY

1904

HARVARD UNIVERSITY
GRADUATE SCHOOL OF EDUCATION
MONROE C. GUTMAN LIBRARY

SEP 31 1937

TT205
.P36a

PREFACE

My thanks are due, and are hereby tendered, to Mr Sidney Wells, Principal of the Battersea Polytechnic, for kindly reading the manuscript and making certain valuable suggestions; to Messrs J. C. Rawling and J. N. Davies (of the Liverpool Education Committee's Department) for revision of the proof-sheets and the provision of the photographs of operations, respectively; and to Mr J. H. Mathieson (Alex. Mathieson & Sons, Glasgow) for further revision of the proof-sheets and the loan of blocks for illustration of certain of the machine-tools.

J. C. P.

LONDON, *February* 1904.

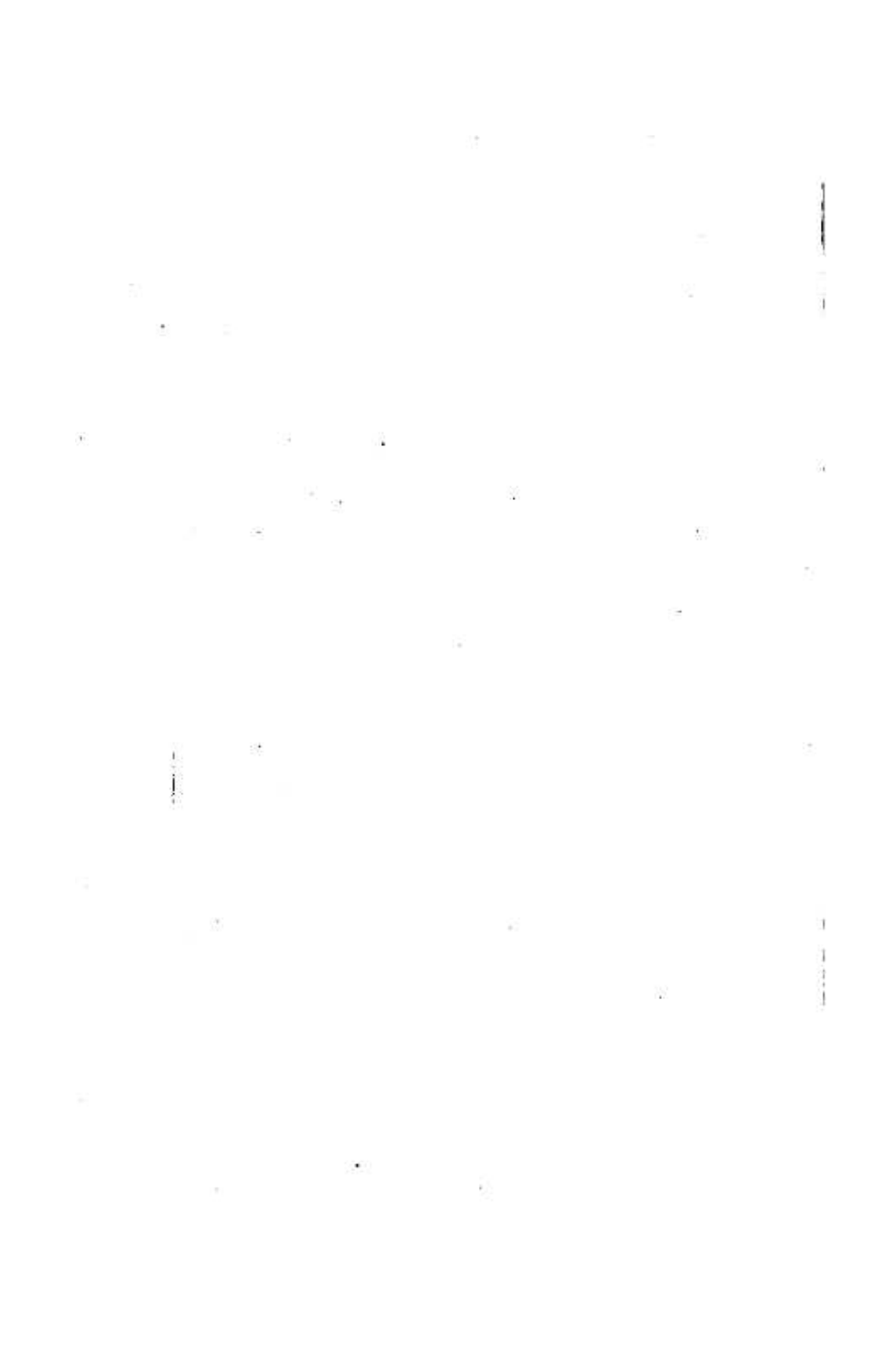


TABLE OF CONTENTS

CHIPPING

	PAGE
Chipping Chisels—'Flat' and 'Cross-cut' Chisels— 'Round-nosed' and 'Diamond-point' Chisels— Cutting-angles of Chisels—Rounded Chisel-edges— 'Breaking-out'—Lubrication—Weight of Hand- hammer, Freedom from Grease	1-4

FILING

Distinguishing Characteristics of Files—'Cuts' of Files— Sectional forms of Files—'Parallel' and 'Taper' Files—'Safe' Edges—Use of Files on different Metals—Fixing Work in Vice—Removal of 'Dirt' and Scale—Cross-filing—Draw-filing—Pinning— Polishing	5-9
---	-----

SCRAPING

Forms and Uses of Scrapers—Testing Scraped Surfaces —The Surface-plate and Bar—Scraped Surfaces not to be polished	9-12
--	------

VICES

The Leg Vice—The Parallel Vice—Instantaneous Grip— Height of Vice—The Hand Vice	12-17
--	-------

VICE-CLAMPS AND FILING-BOARDS

Metal Clamps—Wooden Clamps—Filing-boards—Filing- block	17-19
---	-------

CALLIPERS; CENTRE-PUNCH; SCRIBING-BLOCK; V-BLOCKS; TRY-SQUARE AND FOOT RULE		
'Outside' Callipers — 'Inside' Callipers — 'Jenny' Callipers—The Centre-punch—The Scribing-block— V-Blocks—The Try-square and Foot Rule		PAGE 19-24
SOLDERING		
'Hard' Solders—Spelter Solder—'Soft' Solders—Fluxes —Preparation of 'Chloride of Zinc' Flux—'Hard' Soldering or Brazing —'Soft' Soldering		25-30
RIVETING (COLD-HAMMERED)		
'Lap' and 'Butt' Joints — 'Chain' and 'Zig-zag' Riveting—Countersinking—Proportions of Rivets— Riveting Sheet Metal		30-34
DRILLING		
The Bench Drilling Machine—The 'Breast' Drill-brace— The Archimedean Drill Stock—Drills—Drilling in the Lathe—Points to observe in Drilling		34-39
SCREW-CUTTING		
Stock-and-Dies—Method of using Stock-and-Dies—The Screw-plate—Taps—The 'Taper' Tap—The 'Inter- mediate' Tap—The 'Plug' Tap—Tapping—The Cutting-edges of Taps—Table of Whitworth Taps and Tapping Holes		40-46
THE SIMPLE LATHE		
The Parts of the Simple Lathe—The Mandrel Head- stock—The Mandrel Pulley—Relation between Mandrel and Driving Pulleys—Rule for calculating Speed of Mandrel Pulley—Balance of the Driving Pulley—Lathe 'Centres'—The Poppet or Back Headstock—Connection of Headstocks to Lathe-bed —The Tee-rest—Simple Power Lathe		46-53

TABLE OF CONTENTS

xi

TURNING

	PAGE
Plain Cylindrical Turning—Centreing—Proving the truth of the Centreing—'Drawing-over'—Face-plate and Carriers—The 'Heart'-carrier—Chucks—The Four-jaw Chuck—The Self-centreing Chuck—The 'Bell' Chuck—Removal of Rough Casing before Turning—Annealing Steel before Turning—Turning Tools—The Three-square Tool—The Graver—The Flat Tool—The Round-nosed Tool—The Parting Tool—Cutting-angles of Turning Tools—Sharpening—Management of the Tee-rest—Manner of holding Turning Tools—Testing Dimensions and Parallelism of Turned Work—Speed of Work—Lubrication—Filing and Polishing Turned Work	53-65

SCREW-CHASING

Outside Chasing—Lubrication—Speed Relation of Tool and Work—Method of Using Chaser—Lessening Diameter of Screw Thread—Finishing-off of Thread—Inside Chasing—Table of Screw-threads	66-68
---	-------

THE SCREW-CUTTING LATHE

Parts of the Screw-cutting Lathe—The Mandrel-pulley—Back-gear—Effect of the use of Back-gear—Relative Speeds of Pulley and Work—Throwing Back-gear in and out of Gear—Adaption of Back-gear Lathe as Simple Lathe—The Slide-rest—The Tool-holder—Slide-rest Tools—The Leading Screw—Rack and Pinion—The use of the Slide-rest—Hand-traversing Motion	69-81
--	-------

SCREW-CUTTING

Relation between Leading Screw and 'Pitch' of Threaded Screw—Use of Change-wheels—Transmission of Motion from Change-wheels to Leading Screw—Use of Quadrant—Arrangement of Change-wheels	
---	--