Yongxiang Lu Editor

## A <u>History</u> of Chinese Science and Technology

Volume 1







#### **Contents**

Vertical and Horizontal Beginnings		Į
D	un Liu	
1	Lecture 1: Several Important Frames of Reference in the	
	Development of Human Civilization	1
2	Lecture 2: Overview of Ancient Chinese Science and Technology	19
A:	stronomy	41
X	iaoyuan Jiang	
1	Lecture 1: The Study of Heaven in Ancient China: An Overview	41
2	Lecture 2: Astronomical Observation and Calendar	76
3	Lecture 3: Exchange and Comparison of Chinese	
	and Foreign Astronomies	91
Re	eferences	119
G	eoscience	121
Qi	ianjin Wang	
1	Lecture 1: Overview of Ancient Geoscience and Views	
	of Geological Disasters and Abnormalities	121
2	Lecture 2: History of Ancient Maps and Concepts	
	of Military Geography	143
M	athematics	203
Sh	nuchun Guo and Miao Tian	
1	Lecture 1: Overview and Features of the Development	
	of Traditional Chinese Mathematics	203
2	Lecture 2: "The Nine Chapters of the Mathematical Art,"	
	Liu Hui and Mathematics in the Song and Yuan Dynasties	234
3	Lecture 3: Classicality Mathematics in Europe	
	and Dissemination of Modern Mathematics in China	269
Re	eferences	284

xii Contents

Ph	ysics	289
Ni	anzu Dai	
1	Joy at Probing into Physics	289
2	Lecture 1: The History of Mechanics	290
3	Lecture 2: The History of Optics	302
4	Lecture 3: The History of Acoustics	319
Αį	griculture	351
Xi	iongsheng Zeng	
1	The Foundation of Livelihood—Agriculture in Ancient China	351
Re	eferences	428
Bi	ology	431
Gı	uihuan Luo	
1	Lecture 1: Compendium of Traditional Biology in China	431
2	Lecture 2: Origin and Development of Cultured Plants in China	460
3	Conclusion	490
Re	eferences	490

Yongxiang Lu Editor

# A History of Chinese Science and Technology

Volume 2







## **Contents**

M	Medicine	
Yı	ıqun Liao	
1	Lecture 1 Overview of Traditional Chinese Medicine	1
2	Lecture 2 TCM Classics and Celebrated Masters	57
3	Lecture 3 Sino-Overseas Exchanges of Medicine	96
	eferences	157
T	he Four Great Inventions	161
Jia	alu Fan, Qi Han, Zhaochun Wang and Nianzu Dai	
1	Lecture 1 Invention, Development, and Influences	
	of Papermaking Technology	161
2	Lecture 2 Printing	194
	Lecture 3 The Invention of Gunpowder and Its Influence	
	on the World	239
4	Lecture 4 The South-Pointing Needle and Compass	270
C	eramics Technology	301
	enjie Li	
1	Preface	301
2	Lecture 1 History of Pottery-Making Technologies	
	in Ancient China	302
3	Lecture 2 History of Porcelain-Making Technology	
	in Ancient China	354
4	Conclusion	376
	eferences	

xii	Contents
11	Contents

W	eaving Technology	379
Fe	ng Zhao	
1	Lecture 1 Overview of Weaving Technology in China	379
2	Lecture 2 Looms and Fabric Varieties	404
3	Lecture 3 The Silk Road and Textile Culture	
	Exchange Between East and West	459
R	eferences	493

Yongxiang Lu Editor

# A History of Chinese Science and Technology

Volume 3







### **Contents**

<b>A</b> :	rchitecture Technology	1
X	inian Fu	
1	Lecture 1 Overview of Architectural Development in Ancient China	1
2	Lecture 2 Capital Palaces in Ancient China	43
3	Lecture 3 Defensive Structure in Ancient China—the Great Wall	84
4	Lecture 4 Ceremonial Buildings in Ancient China	97
5	Lecture 5 Religious Buildings in Ancient China	107
6	Lecture 6 Folk Residences in Ancient China	144
7	Lecture 7 Ancient Chinese Gardens	175
	lining and Metallurgical Technology	195
Ju	eming Hua	
1	Foreword	195
2	Historical Stages of Mining and Metallurgy in China	196
3	Lecture 1 Copper Metallurgy	198
4	Lecture 2 Iron Metallurgy	239
M	lechanical Technology	277
B	aichun Zhang	
1	Lecture 1 Introduction to Ancient Chinese Machinery	277
2	Lecture 2 Typical Chinese Machinery	286
3	Lecture 3 Armillary Spheres, Celestial Globes, and Timers	315
R	eferences	345
W	/ater Conservancy Technology	349
	uiyi Zhou	
1	Lecture 1 An Introduction to Chinese Ancient Water	
	Conservancy Science	349
2	Lecture 2 Holistic, Comprehensive, and Dialectical Scientific	
	Thinking of Ancient China and Its Modern Advantages	380

xii Contents

Communication Technology	
Lecture 1 Ancient Roads and Bridges	405
2 Lecture 2 Boat Culture in China	
3 Lecture 3 Vehicles for Land Transportation in Ancient China	
References	
Military Technology	515
Shaoyi Zhong	
l Cold Weapon Era (Ancient—Sui, Tang and the Five Dynasties)	515
2 Military Technology in the Era of Coexisting Fire Arms	
and Cold Weapons	544
References	602
Conclusion	605
Dun Liu	
1 Some Theoretical Problems About the History of Science	605