

**THE ELEMENTS OF
GEODETIC ASTRONOMY,
FOR CIVIL ENGINEERS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649494668

The Elements of Geodetic Astronomy, for Civil Engineers by H. C. Lord

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

H. C. LORD

**THE ELEMENTS OF
GEODETTIC ASTRONOMY,
FOR CIVIL ENGINEERS**

**He who would measure the Earth must
first measure the Stars.**

W. J. Hussey
Nov. 20, 1905,

THE ELEMENTS

OF

GEODETTIC ASTRONOMY

FOR CIVIL ENGINEERS

BY

H. C. Lord
H. C. LORD

PROFESSOR OF ASTRONOMY AT THE
OHIO STATE UNIVERSITY
AND DIRECTOR
OF THE
EMERSON McMILLIN OBSERVATORY

Comet Press
Columbus Ohio
1904

*Circulatory
Hessley
1-11-29
16348*

CONTENTS

59-8-3/11EM

CHAPTER	PAGE
Preface	
I Fundamental Co-ordinates	1
Celestial Co-ordinates. Terrestrial Co-ordinates.	
II Transformation of Co-ordinates	9
Theory. Example. Remarks on Methods of Computation. Problems.	
III Refraction and Parallax	18
IV Time	22
Different Kinds. Rules for Conversion of Time. Examples. Problems.	
V Reduction of Star Places	36
Precession. Nutation. Aberration. Proper Motion. Star Catalogues. Examples. Problems.	
VI The Sextant	51
Theory. Adjustments. Hints on Observing.	
VII The Theodolite	59
Adjustments. Vertical Angles. Horizontal Angles. Value of one Division of the Level. Hints on Observing.	
VIII Azimuth	83
From the Sun. From Polaris.	
IX Time	94
Single Altitudes. Double Altitudes.	
X Latitude	102
Star on the Meridian. Circum-meridian Altitudes. Latitude from Polaris.	
XI The Astronomical Transit	115
Theory. Inequality of Pivots. Example. Wire Intervals.	
XII The Zenith Telescope	126
Theory. Level. Determination of the Value of one Revolution of the Micrometer, and of one Division of the Level.	
Tables	137

PREFACE

This book was written for the students in the course in civil engineering at the Ohio State University and to put in permanent form the author's manner of presenting this subject. After an experience of over sixteen years in teaching geodetic astronomy to engineering students, he is firmly convinced of the value of this subject as a training for the young engineer. Practical astronomy gives, as nothing else does, experience in precise measurement and in handling long and intricate calculations.

The equipment which this book presupposes is not expensive. An investment of \$4000 would be sufficient to provide amply for a class of twenty.

In the derivation of formulæ, the author has sought directness of method rather than elegance of mathematical analysis. In the numerical examples, taken from observations made at the Emerson McMillin Observatory, he has aimed to furnish the student with models of correct forms for note-book record as well as of correct forms for reduction sheets. He has placed much emphasis upon the theodolite, as that is the instrument of the engineer and the one above all others with which he should become familiar.

Though, in a work of this kind, it is impossible to state all sources which have been consulted, the author

GEODETIC ASTRONOMY

wishes to mention the classics of Chauvenet and Doolittle, and Professor Perry's gem of popular exposition "Spinning Tops". He also takes this occasion to express his obligation to his assistant, Mr. B. F. Maag, who has not only gone over all the proof and checked all the calculations and formulæ, but has also made many valuable suggestions during the progress of the work.

H. C. LORD.

EMERSON McMILLIN OBSERVATORY
OHIO STATE UNIVERSITY
JUNE, 1905.

GEODETIC ASTRONOMY

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent data collection procedures and the use of advanced analytical techniques to derive meaningful insights from the data.

3. The third part of the document focuses on the role of technology in data management and analysis. It discusses how modern software solutions can streamline data collection, storage, and processing, thereby improving efficiency and accuracy.

4. The fourth part of the document addresses the challenges associated with data management, such as data quality, security, and privacy. It provides strategies to mitigate these risks and ensure that the data remains reliable and secure throughout its lifecycle.

5. The fifth part of the document concludes by summarizing the key findings and recommendations. It stresses the importance of a data-driven approach in decision-making and the need for continuous monitoring and improvement of data management practices.