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# **Manual of Navigation**

**Napier Robert**

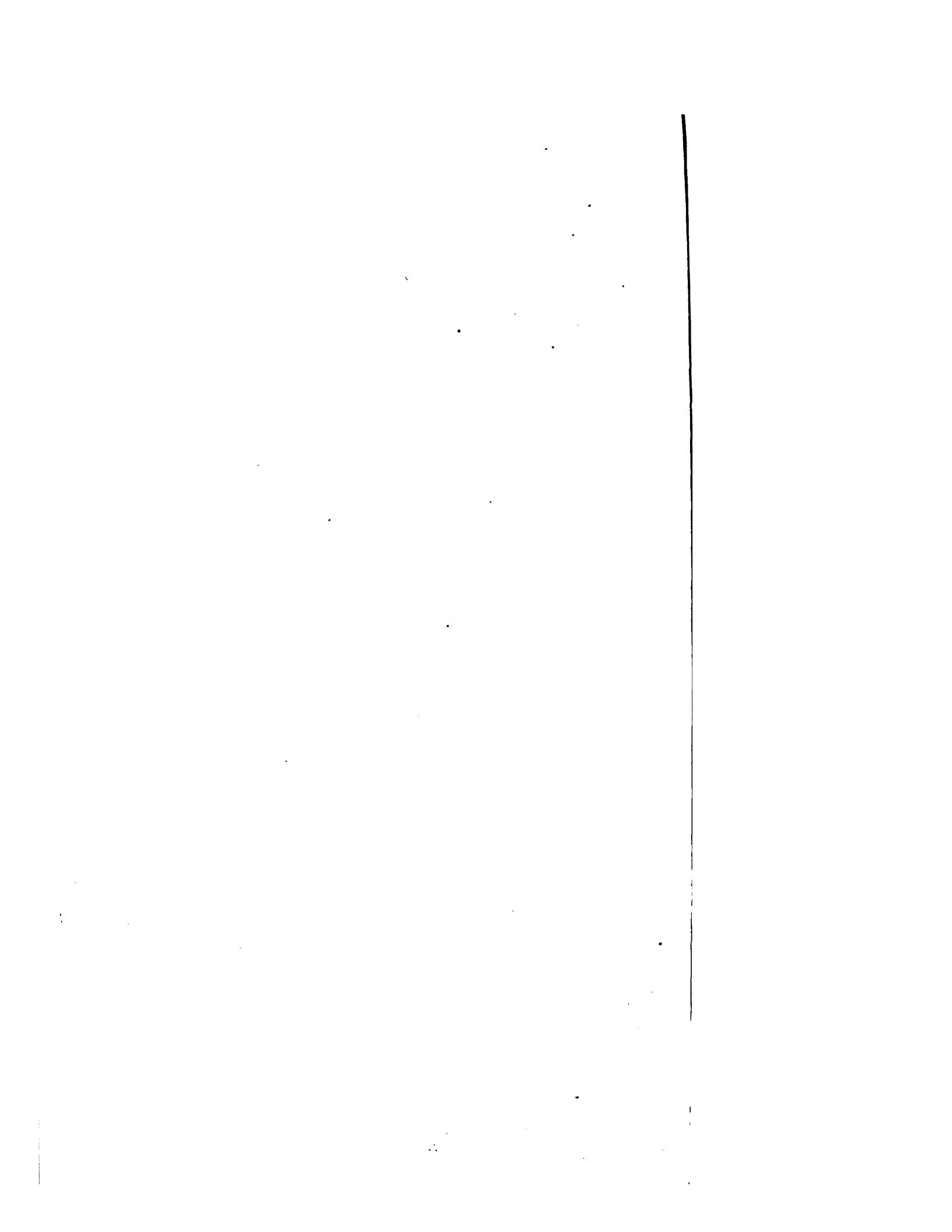
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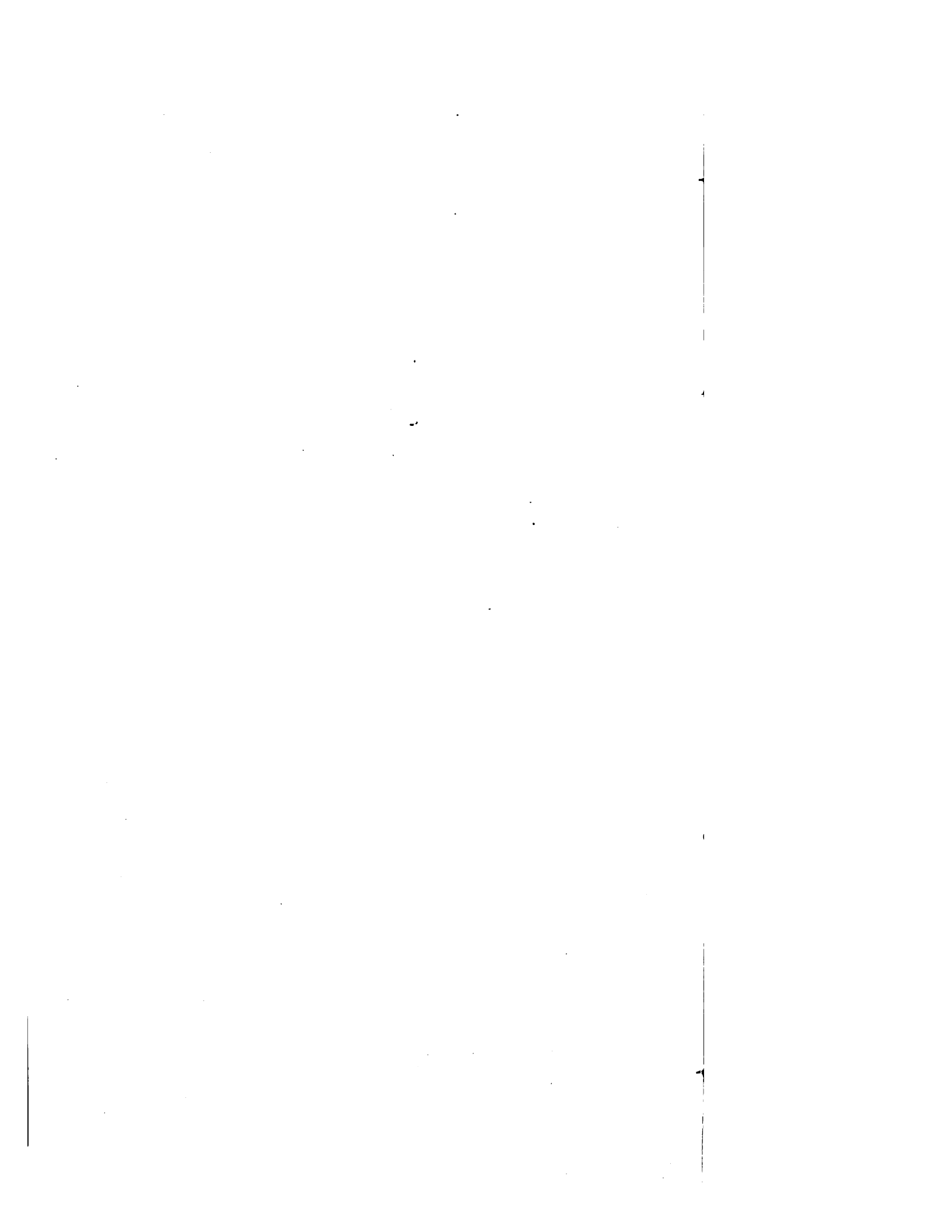
**Author: Napier Robert**

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**MANUAL OF NAVIGATION.**



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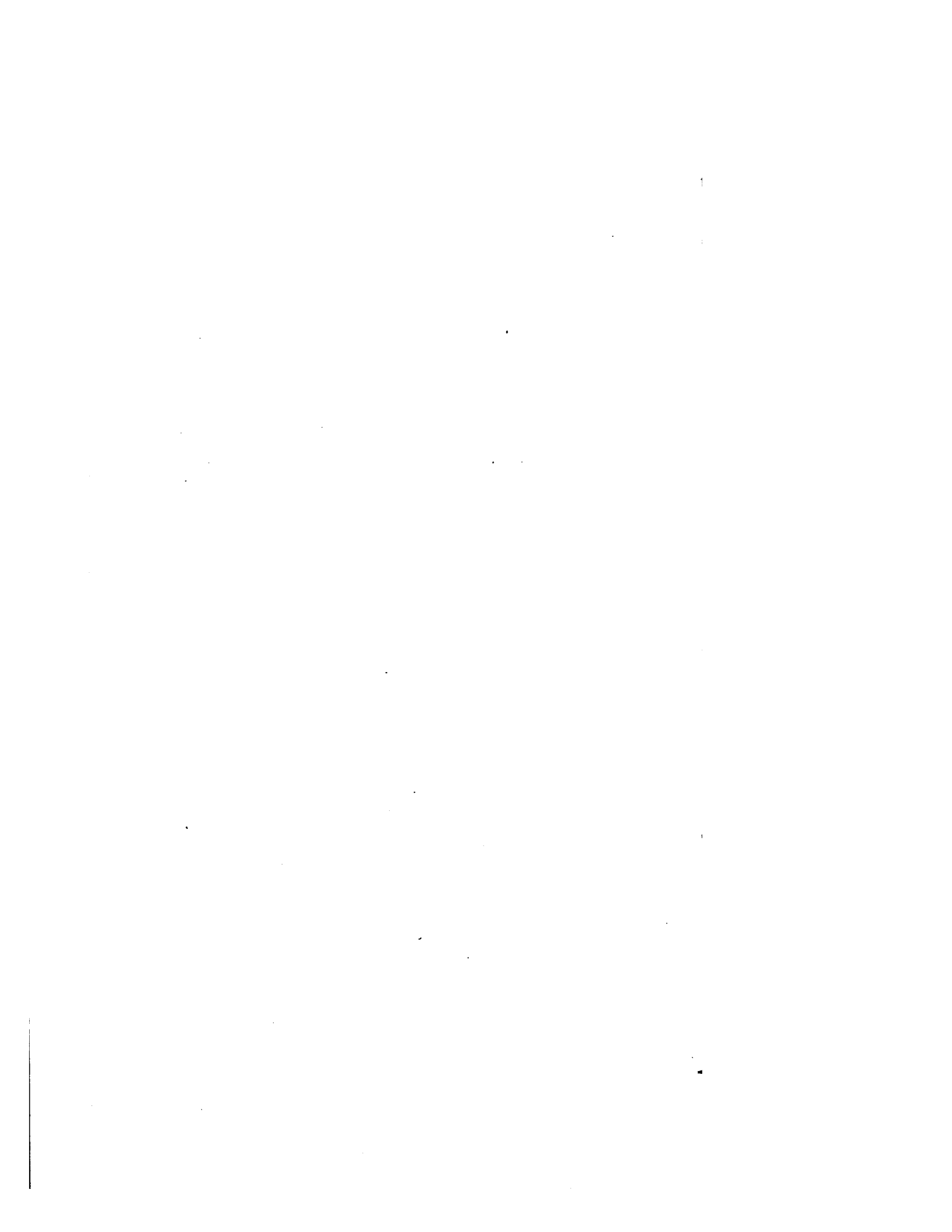
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*SECOND EDITION.*

GLASGOW:  
JAMES MACLEHOSE, ST. VINCENT STREET,  
Publisher to the University.  
1880.

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184. h. 71.



## PREFACE.

THE Author has been induced to publish this Manual owing to the inconvenience he has at different times experienced from the want of a book containing all the rules and examples required for daily use at sea.

The principal object kept in view has, therefore, been to furnish a compact book of reference for all calculations necessary for the efficient discharge of navigating duties, and while there is nothing included in its pages but what will be of use to the careful seaman, it is hoped that nothing has been omitted which might advantageously have been inserted.

The conclusions to be derived from a careful study of the ever-varying signs of the weather have been placed before the reader as clearly and consecutively as possible.

Considerable care has been taken to produce in a concise form rules for finding and applying the Deviation of the compass. Attention is also directed to the practice of reducing the soundings found by the lead in thick weather, at night, or at any time when standing into shoal water, to the mean height of low water at ordinary spring tides, for exact comparison with the depths marked on the chart. Ignorance or neglect of this simple correction too frequently causes a disastrous termination to a hitherto successful voyage.

All that has been undertaken in connection with observations of celestial objects are a few detailed calculations under various conditions, for purposes of easy reference. Obsolete and approximate methods, which tend to retard rather than advance the science of navigation, have been avoided as far as possible.

The Lunar problem for ascertaining Greenwich time, and hence the longitude, is beyond the scope of this manual, and Sumner's method of equal altitudes, used in conjunction with



Azimuth Tables, has been substituted. To a man whose brain is confused by long watching and the anxiety of running into dangerous waters, the increased facility afforded by this method must obviously be of the greatest benefit, and will go far to recommend its general adoption.

Lunars are not so often worked in steamers as formerly, owing to the rapidity with which passages are made from land to land, and the opportunities thereby afforded of ascertaining the error of the chronometer. They are never likely to be entirely superseded in sailing vessels, as chronometers, although compensated, are more or less liable to variation and error, when exposed to sudden changes of temperature and the continued damp of long voyages, such as to the East Indies or China Seas. Although frequently practised, Lunars are not to be absolutely depended upon to within ten or fifteen miles, as an error of only twenty seconds in the Lunar distance will give a corresponding error of about ten minutes of longitude.

As books of some sort are almost indispensable, a list of the best modern works on various analogous subjects is appended for the further study of the reader.

R. A. N.

GLASGOW, October, 1877.

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PREFACE TO THE SECOND EDITION.

THE present edition of this Manual is almost a reprint of that published in 1877, with the exception of sundry additions and re-arrangements to date, and a few pages on the development of the Law of Storms.

R. A. N.

GLASGOW, August, 1880.

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## SEAMEN'S PROVERBS.

A rainbow in the morning  
Is the sailor's warning,  
A rainbow at night  
Is the sailor's delight.

The evening red and morning grey  
Are sure signs of a fine day,  
But the evening grey and morning red  
Make the sailor shake his head.

With the rain before the wind  
Your topsail halyards you must mind,  
But when the wind's before the rain  
You may hoist your topsails up again.

If clouds are gathering thick and fast  
Look out sharp for sail and mast,  
But if they lag upon their road  
Keep your flying kites abroad.

Mackerel sky and mare's tails  
Make lofty ships carry low sails.  
When the wind shifts against the sun,  
Trust it not, for back it will run.

When the glass falls low prepare for a blow,  
When it has risen high let all your kites fly.

First rise after very low indicates a stronger blow.  
Long foretold, long last ; short notice, soon past.