

**THE ELEMENTS OF NAVIGATION; A
SHORT AND COMPLETE EXPLANATION
OF THE STANDARD METHODS OF
FINDING THE POSITION OF A SHIP AT
SEA AND THE COURSE TO BE STEERED**

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The elements of navigation; a short and complete explanation of the standard methods of finding the position of a ship at sea and the course to be steered by W. J. Henderson

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W. J. HENDERSON

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Photograph by Edwin Levick

LATEST TYPE SUBMARINE CHASER. SPEED, 30 MILES; HAS THREE 250-HP. ENGINES;
MOUNTS 1-POUND RAPID-FIRE GUN FORWARD AND 6-POUNDER AFT

THE
Elements of Navigation

*A short and complete explanation of the
standard methods of finding the posi-
tion of a ship at sea and the
course to be steered*

DESIGNED FOR
THE INSTRUCTION OF BEGINNERS

NEW EDITION

BY

W. J. HENDERSON, A.M.
LIEUTENANT IN THE FIRST NAVAL BATTALION OF
NEW YORK

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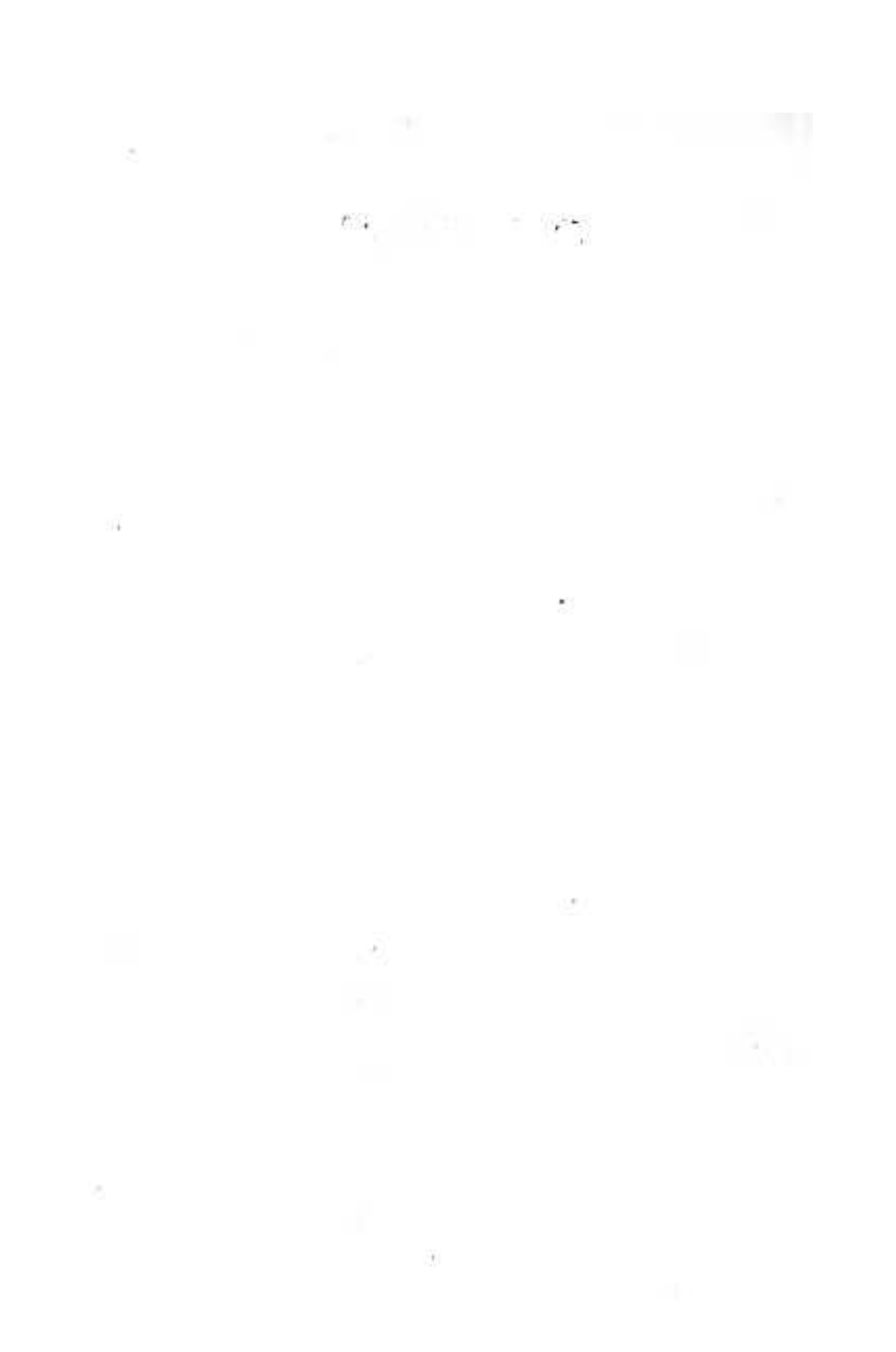
ELEMENTS OF NAVIGATION

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TO
CAPTAIN J. W. MILLER
COMMANDING THE NAVAL MILITIA
NEW YORK

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PUBLISHERS' INTRODUCTION TO NEW EDITION

THE history of the three years 1914 to 1917 has been made with astounding rapidity and no part of it has been more absorbing than that dealing with naval operations. The position of our own country in the beginning of the great European war seemed to the casual observer to be one of perfect security. We had three thousand miles of ocean between us and the warring nations, and all we had to do was to mind our own business and nothing could happen to us.

But it slowly dawned upon all minds that unless we were disposed to mind our own business by withdrawing from the Atlantic Ocean and making no attempt to send our ships into European ports, we should presently be forced either to defend our rights or to admit that we did not have any.

The nature of the naval warfare developed by the skill and daring of the Germans—to take no account of the lawlessness of it—compelled England to invent novel and exciting measures of defense. The submarine

vessel was not new: all nations were acquainted with it. But it had been regarded as a weapon of offense against battle-ships and cruisers.

When Germany disclosed her policy of building these craft in large numbers and using them for the destruction of merchantmen, the world suddenly learned that a new type of commerce-destroyer had come into existence and that new methods of safeguarding the cargo-carriers must be devised. The British coasts are surrounded by a cordon of trawlers used in mine-sweeping and motor vessels designed and operated as submarine-chasers.

In the summer of 1916 the Germans sent to the United States a commercial submarine called the *Deutschland*. She made two voyages, once landing at Norfolk and once at New London. We are told that she was the avant-courier of a fleet of submarine cargo-carriers whose only purpose was to restore commercial intercourse with this country, made impossible for surface ships by the British blockade.

As the relations between the United States and Germany became more and more difficult because of the deaths of American citizens on peaceful merchantmen sunk by German sub-