STABILITY AND EQUILIBRIUM OF FLOATING BODIES

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BY

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PREFACE

THE present treatise is an attempt to set forth briefly the principles underlying the stability and equilibrium of bodies floating partially or wholly submerged in water, and in air.

Hitherto published matter bearing on stability has for the most part been confined to ship forms. Submarines and aerial machines claim a more recent development, and problems relating to the stability and equilibrium of these bodies may be said to be still under investigation. It is necessary now to approach the subject in a more liberal manner, treating the bodies as subject to active as well as passive forces, and to call into requisition the principles of fluid pressure—whether liquid or gaseous—in their action upon bodies at rest and in motion. A knowledge of the salient features of rigid dynamics and hydromechanics is required in order to enable the reader to take a comprehensive view of the subject under discussion.

In the introductory chapter the author has endeavoured to set out the essential points bearing upon this phase of the subject, and in Chapter I. discusses generally definitions, the nature and conditions of equilibrium, and the important formulæ, in order to enable the reader to pursue without interruption the chapters dealing with specific types of body, which follow.

Chapter II. treats of the stability of ships, and an endeavour has been made to render the matter comprehensive without touching upon the historical side of the subject; those readers desirous of pursuing to the end the history and development of stability as applied to ships are referred to Sir E. J. Reed's classic work.

The consideration of floating docks is included in Chapter IV., and, so far as the author is aware, has not been dealt with hitherto in any published work.

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Chapters III. and V., treating of submarines and air craft, indicate the manner in which the problem may be attacked without entering into what, to a large extent, could be only approximate data with reference to the forces acting on these bodies. It is hoped that the treatment of the subject may be found instructive to those interested in the study of submarine navigation and aerial flight.

Chapter VI. deals concisely with caissons.

The subject-matter for the most part has been derived from the author's notes culled over a period of intimate association with the scientific side of shipbuilding; the data and experimental results where given are reliable, and no effort has been spared to make the book trustworthy. Where necessary reference has been made to works and papers dealing with the subject.

The author is under obligation to Mr. Lyonel Clark, M.I.C.E., and to Mr. P. Hillhouse, B.Sc., for their patience and kindness in reading over the MS., and to Mr. A. E. Berriman, late Technical Editor of *Flight*, for reading the MS. dealing with air craft.

BERNARD C. LAWS.

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1914.

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