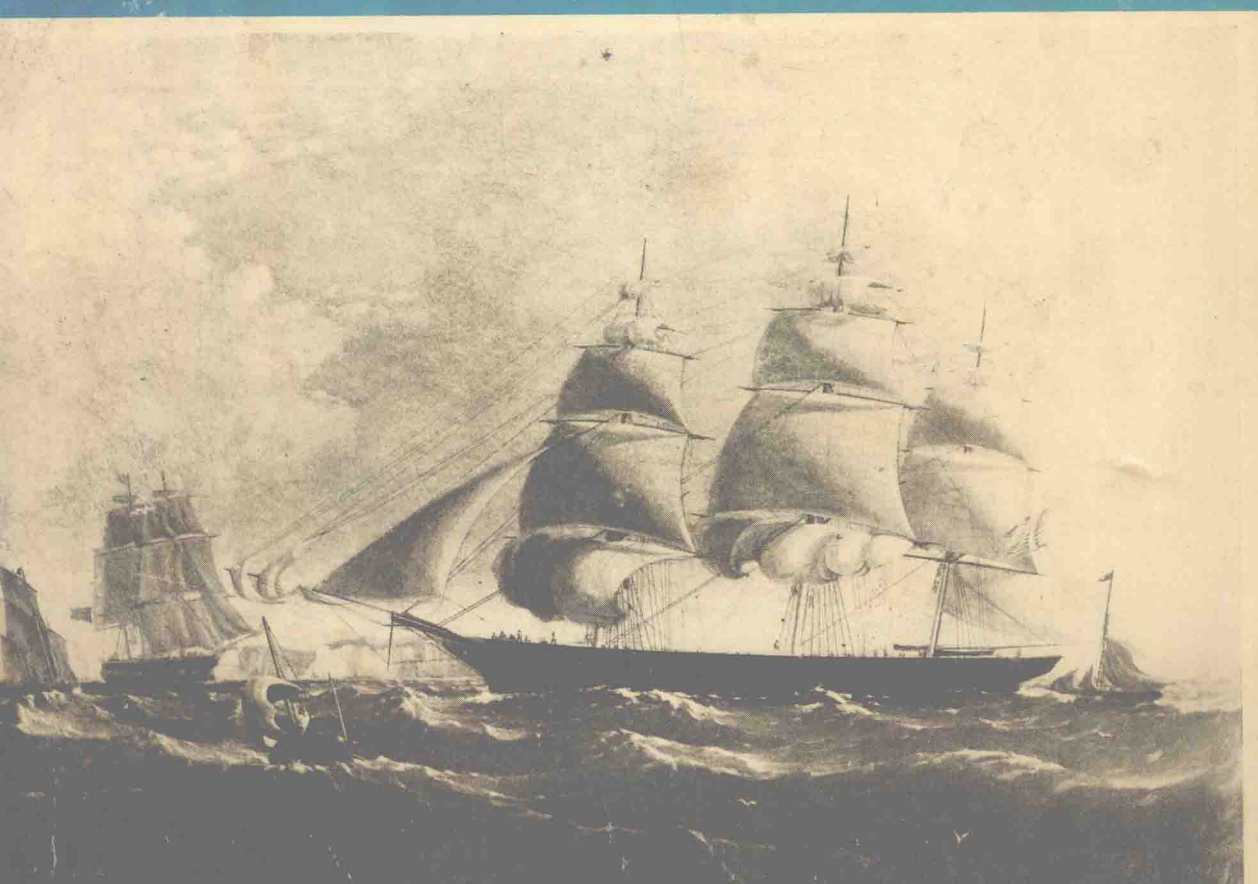


OWARD I. CHAPELLE

THE SEARCH  
FOR SPEED  
UNDER SAIL  
1700-1855



*THE SEARCH  
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UNDER SAIL*

*1700 - 1855*

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*BY* HOWARD I. CHAPELLE

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*THE SEARCH FOR SPEED UNDER SAIL*

OTHER BOOKS BY HOWARD I. CHAPPELLE

THE HISTORY OF AMERICAN SAILING SHIPS

THE HISTORY OF THE AMERICAN SAILING NAVY

YACHT DESIGNING AND PLANNING

BOATBUILDING

AMERICAN SMALL SAILING CRAFT

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# *Introduction*

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THE HISTORY OF THE DEVELOPMENT OF SAILING VESSEL DESIGN IN THE UNITED States is closely concerned with the so-called "clipper" ships. For many reasons, which will be discussed, speed under sail was widely sought and has become the standard by which most marine historians measure progress in American naval architecture during the period of sail.

Speed under sail has commonly been judged solely by "record passages" between ports and by record "day's runs." These take no account of the difference in the size of competing ships, nor of their loadings. Record passages were sometimes made when the fastest hour's run was at a relatively low speed. Such passages were often accountable to exceptionally favorable wind and weather and to good command, rather than to good ship design.

Such modes of judging the progress of American sailing ship design are obviously not accurate. There is need for an examination of what constitutes "speed" under sail; what it is in the design of a sailing vessel that decides the range of speed obtained, and under what conditions speed can be expected. This is not a matter of simple definition, for there are various determinations of what speeds are "fast" under specific conditions of weather, wind, and course. These factors must all be considered.

Speed comparisons of ships and vessels varying widely in size and construction date require a "dimensionless" analysis of each in order to establish an accurate evaluation of relative design excellence.

By applying modern projections and some elementary principles of naval architecture and hydrodynamics to plans of American-built sailing vessels,

## INTRODUCTION

it is possible to explore the development of the art of fast sailing ship and vessel design in North America. The process will produce a more realistic evaluation of competing ship designs. This will require use of mathematics to establish the dimensionless factors necessary. Though this is not, perhaps, a glamorous treatment compared to the "fast" voyage or day's run, technically it is far more precise. What is lacking in thrilling description—of "hard-driving" skippers, desperate crews, and wild weather—is balanced by an interest in the exploration of the real areas of progress in American sailing ship design as an art and science. The relation of hull design and performance is one of the fascinating problems of the naval architect, but one rarely discussed from the historical, technical, and lay aspects. This will be attempted in order to obtain a better understanding and appreciation of the progress made in American naval architecture, from early colonial times to the final development of the clipper ship.

This report has been made not to support or to prove any theory of development in American sailing ship and vessel design, but to record the author's efforts to arrive at some sound conclusions as to exactly what American ship and vessel designers were capable of, in high-speed sailing hull-design during the great period of sail.

The plans used in this study were drawn as accurately as the original sources and skill of the author-draftsman permitted. Where the lines were interpreted in the drawings to any serious degree, the matter will be mentioned. In some instances deck arrangements and external details have been reconstructed from available data, in order that the plans might be used for future scale-model construction, for exhibition in the Hall of American Merchant Shipping, where the drawings will finally be deposited. These superficial additions, however, do not affect the validity of the hull analysis in any case, and they require no extensive description or explanation here. Most of the sail plans are necessarily redrawn from tables of spar dimensions, and therefore entail some reconstruction also.

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