

# **THE PHYSICAL GEOGRAPHY OF THE SEA**

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The Physical Geography of the Sea by M. F. Maury

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**M. F. MAURY**

**THE PHYSICAL  
GEOGRAPHY  
OF THE SEA**



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PHYSICAL GEOGRAPHY  
OF  
THE SEA.

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AS

A TOKEN OF FRIENDSHIP, AND A TRIBUTE TO WORTH,

This Volume is Dedicated to

**G E O R G E M A N N I N G,**

OF NEW YORK.

WASHINGTON OBSERVATORY, December, 1854.





## INTRODUCTION.

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§ I. THE primary object of "The Wind and Current Charts," out of which has grown this Treatise on the Physical Geography of the Sea, was to collect the experience of every navigator as to the winds and currents of the ocean, to discuss his observations upon them, and then to present the world with the results on charts for the improvement of commerce and navigation.

II. Accordingly, when this object was made known, and an appeal was addressed to mariners, there was a flight up into the garrets, and a ransacking of time-honored sea-chests in all the maritime communities of the country for old log-books and sea journals.

III. It was supposed that the records therein contained as to winds and weather, the sea and its currents, would afford the information requisite for such an undertaking.

IV. By putting down on a chart the tracks of many vessels on the same voyage, but at different times, in different years, and during all seasons, and by projecting along each track the winds and currents daily encountered, it was plain that navigators hereafter, by consulting this chart, would have for their guide the results of the combined experience of all whose tracks were thus pointed out.

V. Perhaps it might be the first voyage of a young navigator to the given port, when his own personal experience of the winds to be expected, the currents to be encountered by the way, would itself be blank. If so, there would be the wind and current chart. It would spread out before him the tracks of a thousand vessels that had preceded him on the same voyage, wherever it might be, and that, too, at the same season of the year. Such a chart, it was held, would show him not only the tracks of the vessels, but the experience also of each master as to the winds and currents by the way, the temperature of the ocean, and the variation of the

needle. All this could be taken in at a glance, and thus the young mariner instead of groping his way along until the lights of experience should come to him by the slow teachings of the dearest of all schools, would here find, at once, that he had already the experience of a thousand navigators to guide him on his voyage. He might, therefore, set out upon his first voyage with as much confidence in his knowledge as to the winds and currents he might expect to meet with, as though he himself had already been that way a thousand times before.

VI. But, to show the tracks of these vessels on a chart, a line had to be drawn for each one; now this, for so many, and all in black or blue, and on the same sheet of paper too, would present, it was perceived, a mass of lines in inextricable confusion. Moreover, after these tracks were projected, there would be no room left for the name of the month to show when each one was made, much less for any written account of the winds and currents daily encountered by each vessel of the multitude. After the tracks were projected, there would, it was found after trial, be barely room left on the chart to write the name of the vessel, much less the direction and set of the winds and currents.

VII. An appeal, it was consequently decided, should be taken to the most comprehensive sense of the five, and it was thereupon resolved to address all those tracks, and winds, and currents, with their strength, set, and direction—in short, all this experience, knowledge, and information—to the eye, by means of colors and symbols.

VIII. The symbols devised with this view were a comet's tail for the wind, an arrow for currents, Arabic numerals for the temperature of the sea, Roman for the variation of the needle, continuous, broken, and dotted lines for the month, and colors for the four seasons.

IX. A continuous line was used to show that the track was made during the first month; a broken, the second; and a dotted line, the last month of each season: black standing for the winter, green for spring, red for summer, and blue for autumn.

X. The comet's tail, and the arrow, and the numerals, were also in colors, according to the seasons. The force and direction of the wind were indicated by the shape and position of this tail; while

the flight and length of the arrows designated the velocity and set of the currents.

XI. Thus the eye was successfully addressed; for, by a mere glance at the chart, the navigator saw in a moment from what quarter he might expect to find the wind in any part of the sea to prevail for any month; and he thus had to guide him across the pathless ocean, not theory or conjecture, nor the faint glimmerings of any one man's experience, but the entire blaze and full flood of light which the observations of all the navigators that had preceded him could shed.

XII. Thus, while the young ship-master, with these charts before him, would be immediately lifted up and placed on a footing with the oldest sea-captains in this respect, the aged might see in these charts also the voyages made in their young days spread out before them. There, on the chart, was the ship's name, her track, the year; and, by the color and fashion of the line (§ IX.), the month might be told. There, on that day, in that latitude and longitude, these charts would remind the old sailor that he had encountered a terrible gale of wind; there, that he had been beset with calms; how here, with fair winds and a smooth sea, he had made a glorious run. Here, he had first encountered the trades; and there, lost them. At this place, he had met with a "hawsing current." Here, the winds were squally with rain; and there, it was he had been beset with fogs; here, with thunder-storms. All this was seen on paper, and so represented as to recall the reality vividly to mind.

XIII. Such a chart could not fail to commend itself to intelligent ship-masters, and such a chart was constructed for them. They took it to sea, they tried it, and to their surprise and delight they found that, with the knowledge it afforded, the remote corners of the earth were brought closer together, in some instances, by many days' sail. The passage hence to the equator alone was shortened ten days. Before the commencement of this undertaking, the average passage to California was 183 days; but with these charts for their guide, navigators have reduced that average, and brought it down to 135 days.

XIV. Between England and Australia, the average time going, without these charts, is ascertained to be 124 days, and coming,