

THE PORTRAYAL OF THE FLOOR OF THE NORTH PACIFIC OCEAN.

by

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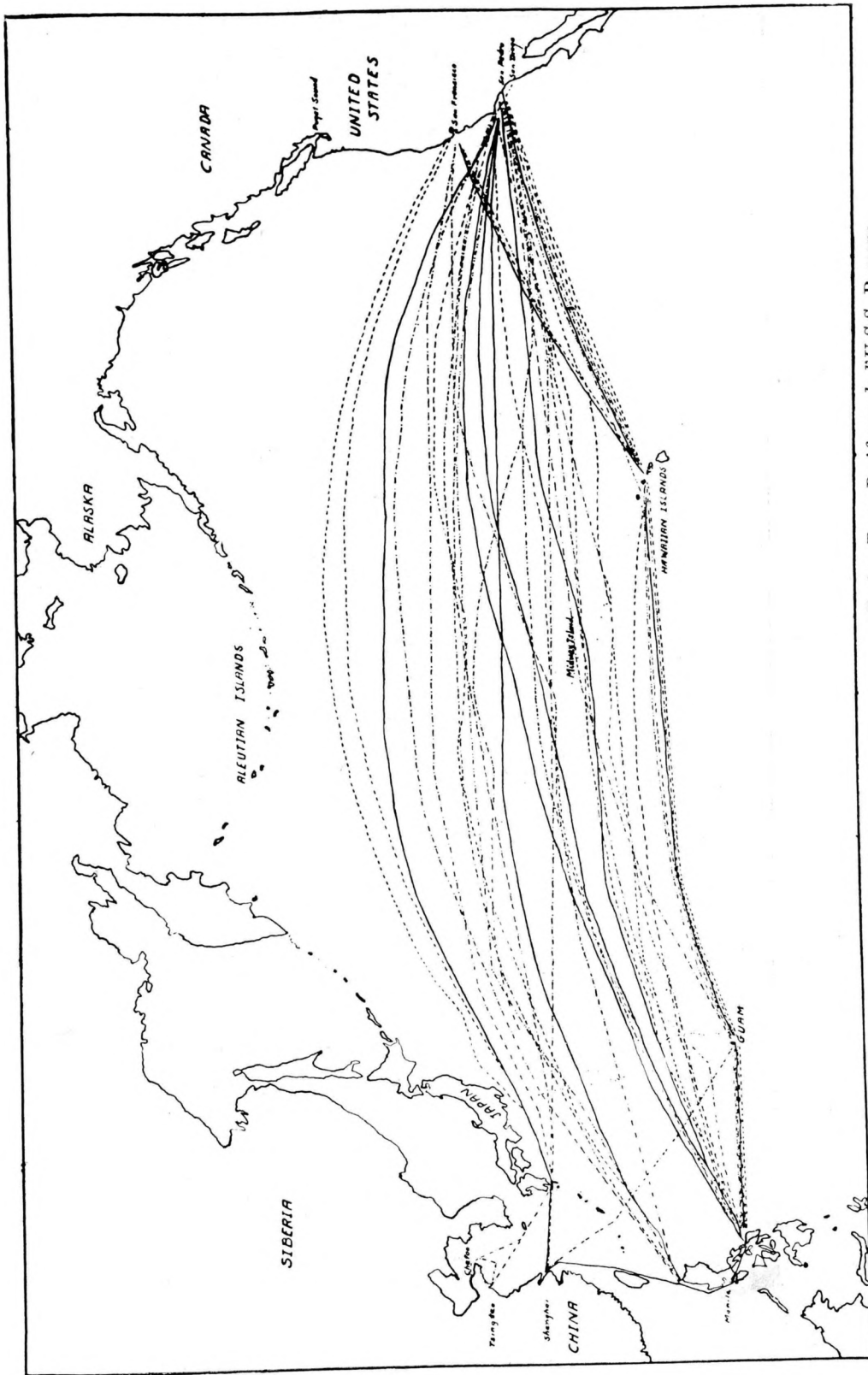
The true basis of discovery or of scientific interest in the unknown is undoubtedly that familiar human trait known as curiosity. One is always interested in what lies just around the corner or in those things close at hand but invisible to the eye. So, to the sailor of even fair intelligence, the floor of the sea over which his vessel is water borne for days becomes a subject of an intense curiosity once he gets a hint as to the infinite variety of the submarine terrain. If he follows his sense of the curious to its logical climax he will translate thought into action and seize upon any means, however crude, of getting a picture of these submerged lands fabled as once great continents. Such was the genesis of the first mapping of the floor of the Pacific Ocean which you see as an accompanying illustration. The reporting by the quartermaster of the watch of some wide variation in readings of the Sonic Depth Finder which occurred many times through the long voyages served to add a new interest to the sea-world and to be waited for as outstanding incidents to break the monotony of the long sea-days.

The United States Ship *Ramapo* during the years from 1928 to 1933 crossed the Pacific Ocean some twenty-eight times from the West Coast of the United States to the Philippine Islands or to China. Soundings were taken at intervals of about every five miles and thus the results of some 17,369 soundings were finally at hand, enough to give a fairly accurate idea of the floor contours of this ocean between Latitudes 10° North and 50° North.

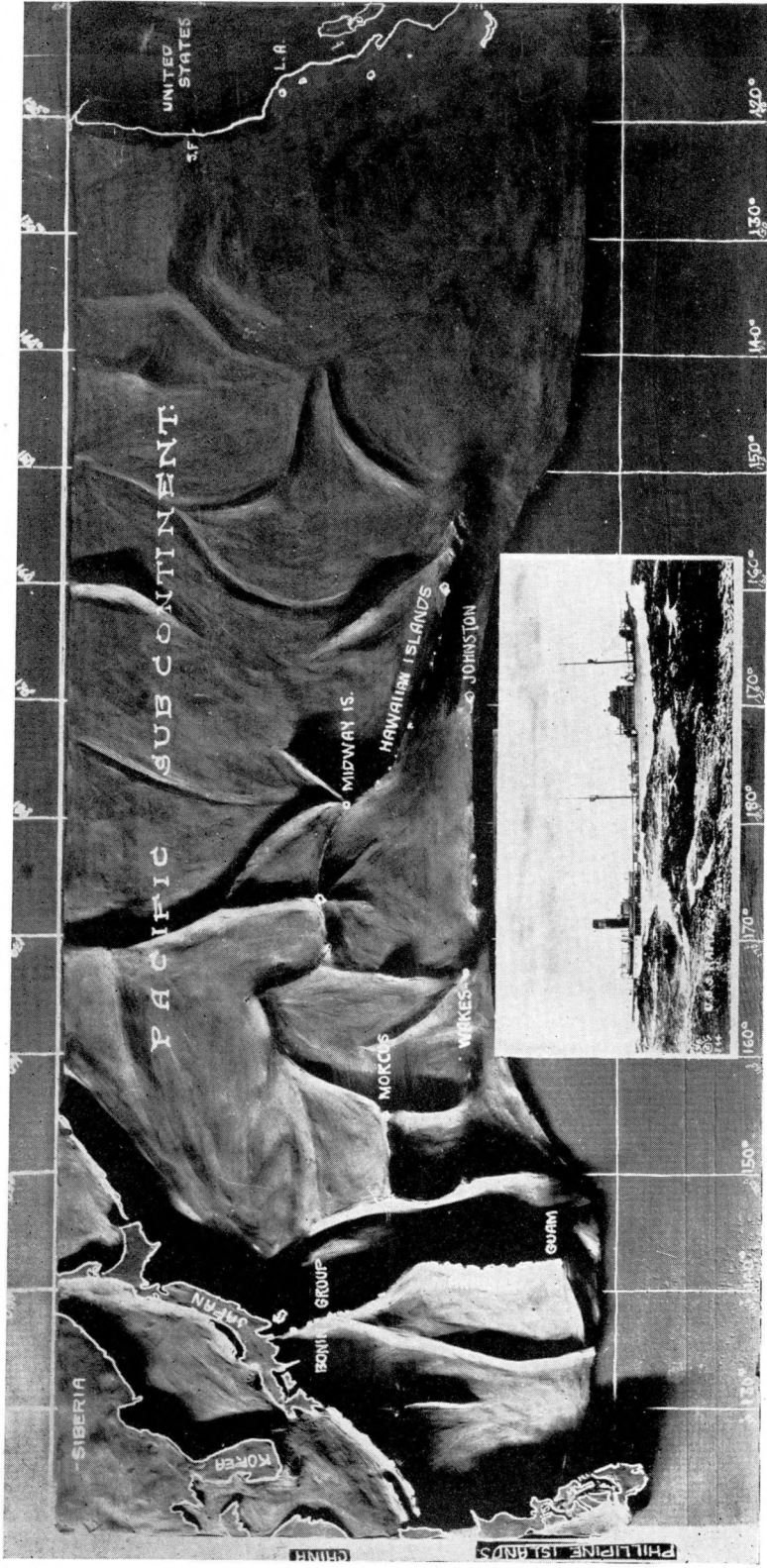
The U. S. S. *Ramapo* is an auxiliary of the U. S. Navy, classed as a fuel ship, of some 16,700 tons displacement, of ten knots speed, officered and manned by regular Navy personnel. Her duty was to transport fuel to the U. S. Asiatic Fleet and she was kept constantly at sea on this duty alone.

The writer assumed command of the *Ramapo* in June 1931 and sailed shortly thereafter for the Orient. Long periods at sea are rare in our latter-day Navies; indeed so crowded are our days in the Fleet that we have scant time for scientific thought or investigation, but in the *Ramapo* spells of continued good weather gave abundant leisure for musing on the sea world all about one. The steady hum of the sonic depth finder every bell throughout the watches and the sound of its signal quickly developed an interest in this sounding routine, quickened by wide variations constantly occurring in the depths recorded. Gradually there grew a desire to see in plotted form these data now accumulated to over 17,000 soundings and the conception of a map to show the hidden lands beneath the sea surface took form.

We were wholly ignorant of bas-relief map construction but sailors are proverbially Jacks-of-all-Trades and, after much experimenting, the following



Trans-Pacific tracks of the U.S.S. Ramapo — Trajets Trans-Pacifiques de l'U.S.S. Ramapo.



The Pacific sub-Continent — Le sous-Continent Pacifique

method for delineation of the sea floor was evolved. Taking the plane of reference as 6000 fathoms, a board four by two feet was made as representing this depth. Pins were driven into the board on the vertical scale $1/4$ in. = 1000 fathoms and on a horizontal scale of $1/4$ in. = 200 miles. Profiles of each voyage track were made and from them lines of pins to appropriate heights were driven in. Sculptor's modelling clay was used to fill in the pin heads and a really quite interesting (though necessarily far from accurate) map of the sea floor between Latitudes 10° North and 50° North from the Coasts of North America to those of the Asiatic mainland was completed.

Almost at once there arose the desire for a larger model showing in more graphic form the submarine terrain beneath our restless keel. The first map served as a model and a much larger board was made using nails instead of pins; vertical scale 1 in. = 1000 fathoms; horizontal scale 1 in. = 50 miles. Great trouble was experienced in securing a suitable medium for filling in up to the heads of the 17,369 nails but finally a mixture of asbestos, water and glue was found efficient and subject to but small shrinkage.

Immediately our interest quickened, for even the skeleton of the bare nails promised tremendous variation in terrain. As the officers and men labored during spare hours at this construction and the map grew under their fingers, there was always a group intent on seeing new gulches and new peaks shaped from our sounding records. Great mountain ranges with peaks higher than that of Mount Everest took form; gulches of such profound depths as to almost awe our imaginations as to what lay in their dark abysses — a new and gigantic world was being brought to our eyes by the echoes of our sonic depth finder; a submerged continent of enormous extent with high mountains, great valleys, plateaux and plains; a submarine continent whose width is twice as great as that of North America and whose infinitely varied contour was even more striking than that of our own land above the sea.

An inspection of the accompanying illustration will readily show the general aspect of the North Pacific floor. Its eastern half is a great plain covered by water of some 3000 fathoms in depth and with few ridges or peaks. The central portion of this vast stretch is broken by the Hawaiian-Laysan ridge running Northwestward all the way to Midway Island and indeed reaching the Kuriles in the extreme Northwest. But it is in the western portion, from Marcus Island to the Philippines and Japan, that occurs so impressive and interesting a terrain. There is nothing so grand yet visible to the eye of man that compares with these enormous heights and profound abysses. Indeed as one labored in the construction of its depiction one became enthralled as one's imagination grasped the immensity of the natural forces necessary for the shaping of such stupendous works.

The work so far accomplished has been crude and of only fair accuracy, but it is hoped that a graphic representation of this hitherto hidden land in all its folds and depths may be of use to the geologist and to the seismologist; to the cable engineer in laying his strands; to the meteorologist; to the zoologist and to oceanographers in general. Our observations show

us that the configuration of the ocean's floor has a distinct effect on surface temperatures and on surface currents; it is believed that even more interesting phenomena may be investigated with a model of the sea floor before one's eyes.

The interest in the science of oceanography of the general public has certainly been stimulated by reports of the modest work accomplished in the *Ramapo* and this new concern in what lies beneath the surface of the sea may bring measurably nearer an intelligent appreciation of this science with its vast potential value to mankind.

