NEW FRENCH SAILING DIRECTIONS

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In August 1958 the French Hydrographic Office published a new edition of sailing directions for the north and west coasts of France which differs from both the previous edition and other sailing directions issued during past years. For the first time in 40 years, the publication is presented in two volumes, one containing the text and the other consisting of plates. The volumes of plates which accompanied the 1915 and previous editions contained only sketches of coastal views, but in the new volume, the views are photographed, and are moreover supplemented by other types of illustrations, the principal category consisting of harbour plans. We propose to justify and explain these innovations for the benefit of foreign hydrographic offices.

REVISION

It may seem odd in presenting a new publication to begin with a discussion of its revision. But the necessity of keeping a volume up to date strongly influences its conception. Careful presentation would be useless were the volume rapidly to become buried under corrections that made it illegible.

A century ago, Ingénieur Hydrographe GIVRY edited three volumes of sailing directions describing the French coast between Dunkerque and Barfleur. These were never intended to be corrected. They had been patiently compiled over a ten-year period, and were not to be replaced by an entirely new work until 40 years later, no apparent necessity for material revision having occurred in the interval. But modern sailing directions, which are drawn up in a single year, are corrected so often that they must be replaced at the end of ten years. This not only applies to French sailing directions covering the French coasts; regardless of nationality and the area described, sailing directions are subject to the same conditions everywhere, with the result that several countries are now making efforts to renovate revision methods.

There is one well-known method which frees reference to a publication from a separate correction volume : this consists in binding the publication in loose-leaf form and in changing the pages containing corrections. The French Hydrographic Office, and offices in many other countries, have been applying this solution for several years now to various publications, such as lists of radio signals, which require correction with particular frequency. Some countries have extended this solution to their

sets of sailing directions. We have not considered it advisable to imitate them : correction by means of change pages is a heavy task for the hydrographic office involved, and although the publication may be read with greater ease by the mariner, the pages to be changed must be carefully checked, and hand corrections are not obviated.

Rather than adopt a laborious system of revision, it may well be asked whether the number of corrections might not be reduced, and whether information inherently subject to frequent correction should not be withdrawn from the sailing directions.

The solution is so simple that it may strike one as being too elementary : if the information is contained in the sailing directions, it must be useful, and therefore cannot be taken out. Yet for the information to be of real value, it must primarily be valid for the day it comes to the knowledge of the mariner. If it is obsolete, it is valueless and may even be harmful. Now sailing directions consist of a great deal of information which, in spite of its usefulness, does not warrant the publication of notices in the weekly groups of Notices to Mariners. In such cases a minimum time of 18 months must elapse before a national item of information reaches the mariner in a correction pamphlet, which is issued yearly. For information originating in foreign pamphlets, which are issued at approximately two-year intervals, and are reproduced in the French pamphlets at a similar rate, the total intervening time easily reaches 3 or 4 years.

Under such circumstances, the necessity of careful scrutiny will readily be admitted before information of a transitory character can be included in sailing directions. During the thorough revision under discussion, this information was examined with particular care and handled in different ways according to its nature.

Various items were subjected to qualitative changes which gave them the stability they lacked. Such is the case of an important category, i. e. maintenance of depth by dredging. The international hydrographic conferences devoted two technical resolutions to this subject (Charts : No. 127; and Sailing Directions : No. 14). In compliance with the latter, the previous edition of the volume covering the north and west coasts of France showed the date and depth of each dredged area.

For each important port, a book of sailing directions contains at least ten items of this type, which are valueless the following year. To bring them up to date each year, two corrections are needed : one for depth and one for the date. In order to avoid this subjection, the information has been deleted and replaced as follows : in each area maintained by dredging, the depth which the responsible authority endeavours to maintain is indicated; the rate of decrease in the depth or silting, and the dredging schedule. For the sea reaches of rivers, the new publication supplies information in graphic form, and cuts taken lengthwise of the rivers have been inserted showing the theoretical depth of sills and their mobility at a glance. Information of this kind no longer requires correction — a great convenience to the Hydrographic Office. But vastly more important is the fact that instead of precise but invariably obsolete data the mariner should possess stable, though possibly inexact, information, provided the degree of inexactness corresponds to actual conditions.

Although certain data can be stabilized, many others cannot. When

an attempt is made to locate those which inevitably are temporary, it is soon noticed that the distribution is uneven. Little information of this kind applies to coasts affected only by natural processes : even though action may be intense, its consequences are already known, and may have been for centuries, so that they can be predicted correctly ten or fifteen years beforehand. In such areas, only accessory events such as the construction of a building forming a landmark or the improvement of beaconage can require correction of sailing directions. But coastal regions do exist which are unceasingly affected by change : these are the harbour areas. It is true that such changes are the subject of lengthy investigation beforehand, which results in predictions as to their accomplishment; but the predictions are difficult to apply in our particular field. They may be accurate in space, but not in time owing to budget difficulties, with the result that data regarding work under way or projected necessitate frequent amendment.

To conclude, the text of sailing directions is usually stable, and consequently does not warrant the use of a loose-leaf binding. Yet parts of such works, notably those which contain harbour data, are subject to extensive correction. For this reason such information has been eliminated from the text of the new publication and is presented in loose-leaf form as later described in this article.

PRESENTATION

Sailing directions are often criticized as being a holdall in which information is hard to find. In order to meet this criticism, graphic representation has been adopted whenever possible in the new edition. A prewar French daily, which specialized in the illustration of current events, used as its slogan the following saying attributed to Napoleon I : « The briefest sketch teaches me much more than a long report ». What was true in Napoleon's time is even more true today, owing to the advances made in the presentation of « sketches ». On a plan of given size, the improvement and development of symbols enable both the quality and quantity of information to be increased to an extent unthought of in Napoleon's time.

When a publication contains numerous illustrations, including some which refer to several pages of text, it may then with advantage be separated into two parts, one containing the text and the other the illustrations. This division enables the reader to place an illustration beside any part of the relevant text and thus facilitate reference to the work. When a decision has been taken to group the illustrations in a special volume, there is every good reason to make use of a loose-leaf format, especially to facilitate correction. And once adopted, it lends itself to various uses. Thus the new « illustrations » volume contains a series of current charts of format 52×75 cm. The advantage of these reductions is that the mariner can remove them from the binder, lay them on a corner of the chart being used, and refer to them at a glance as required. The same holds true for measured distance plans, which may be regarded as actual complements to the nautical chart.

The systematic presentation of harbour plans in sailing directions

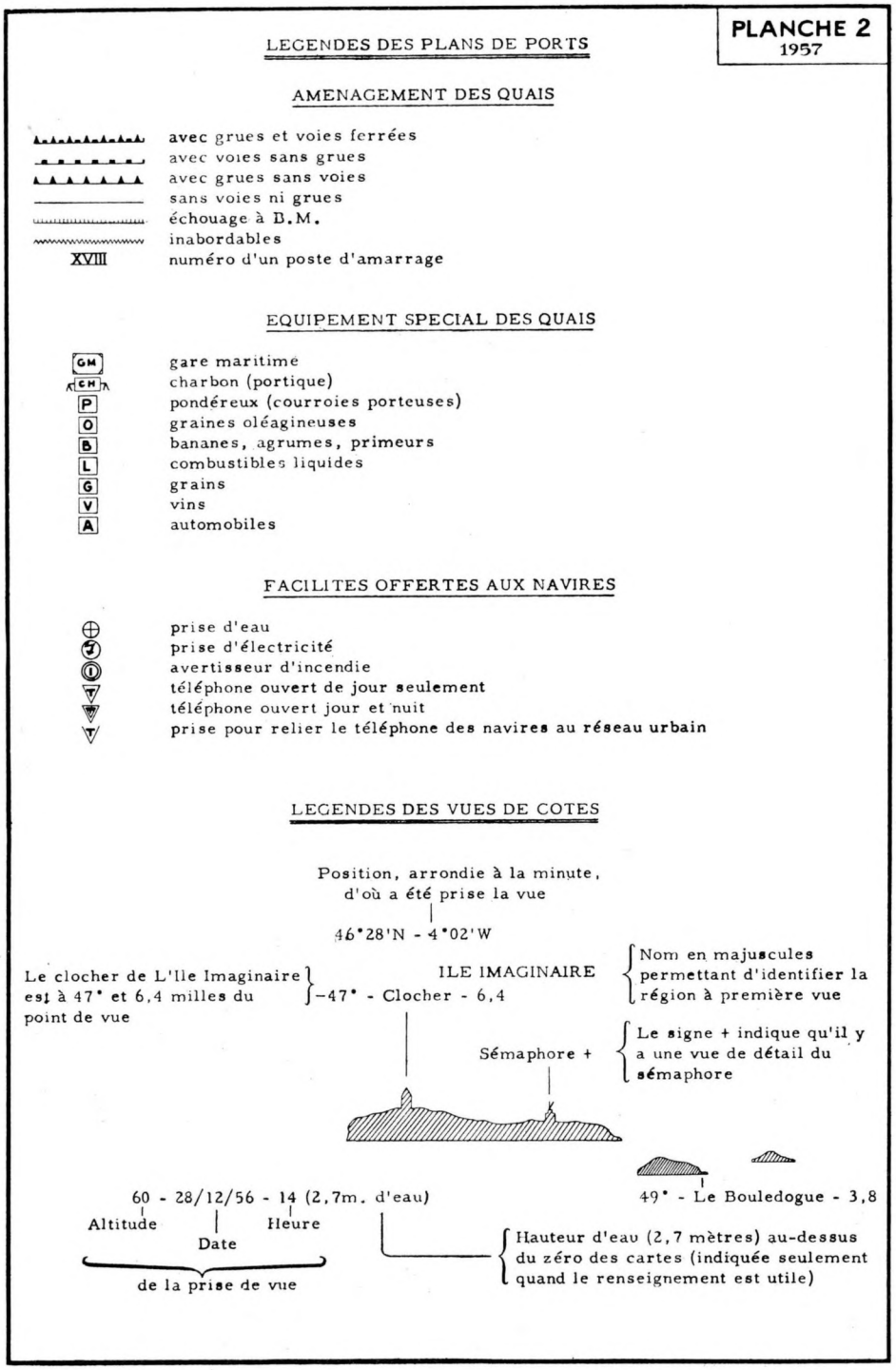

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FIG. 1. — Legends of Sailing Directions of north and west coasts of France. No. 313 A (Plates)

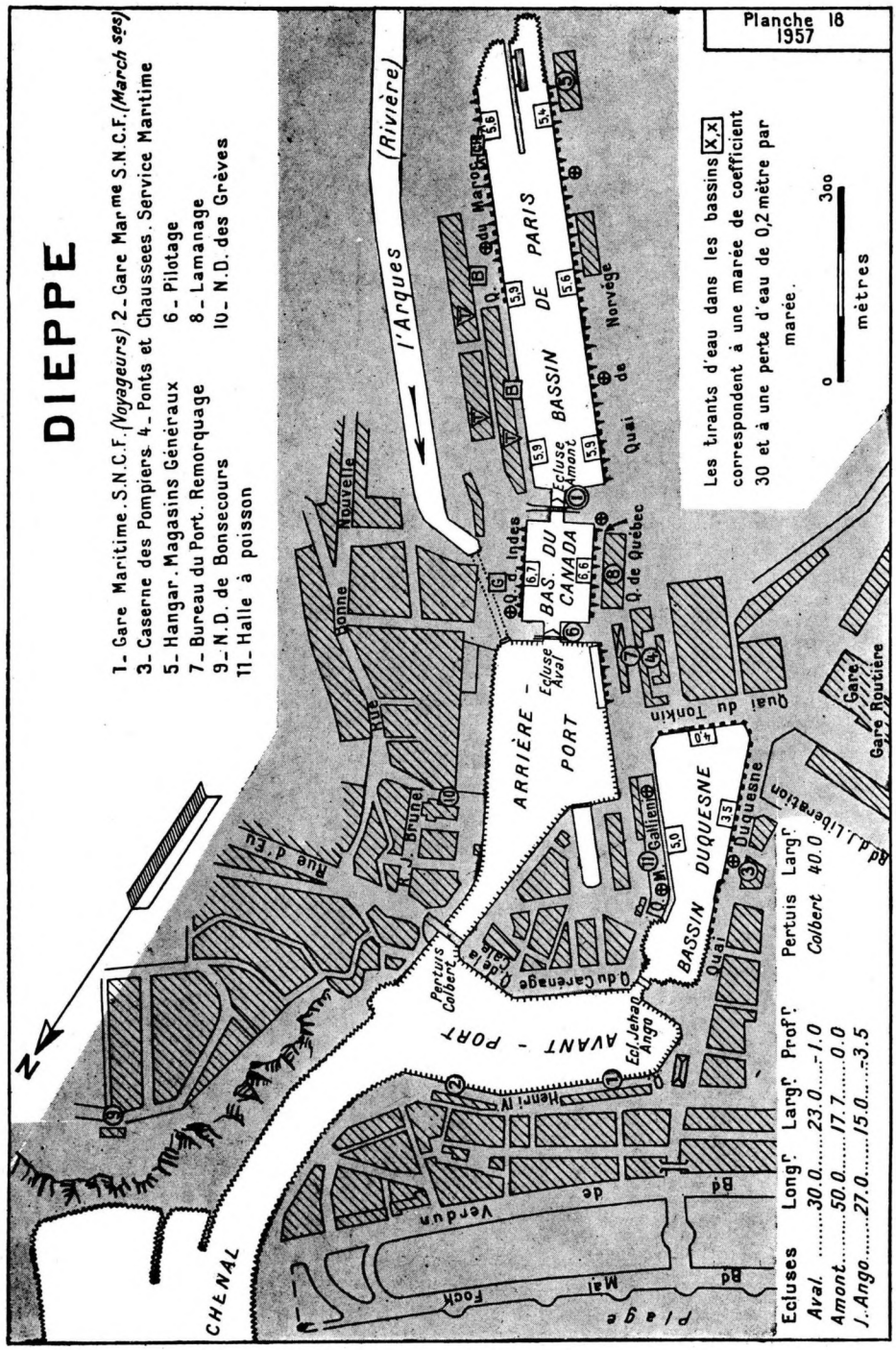

FIG. 2. — Plan of port (Sailing Directions, No. 313 A).

raised a more delicate problem. The first doubt to be voiced was that such plans might unnecessarily compete with nautical charts. To allay such fears, it suffices to note that the concept of harbour plans originates from former editions of sailing directions. Some of the harbour data contained therein, although not appearing on the charts, clearly lent themselves to graphic representation, such as names of quays and berth numbers. Basically, therefore, the harbour plan is revealed as an adjunct and not a rival of the chart.

Upon application, this principle proved of great benefit. The most important innovation consisted in supplying details regarding quay and port facilities. It was considered of particular importance to draw a distinction between the various rectilinear structures, some of which are built to accommodate ships alongside, whereas others, such as those on a riprap foundation, are not. Moreover, graphic representation has enabled extension without trouble of the field of application of technical resolution 12 (Sailing Directions) : « It is desirable that each country should include in its Sailing Directions information giving all possible details with respect to port accommodation and facilities. »

With reference to the various items discussed above, it is a relatively simple matter to discriminate between the harbour plan and the chart since each represents different things. This is less simple where depths are concerned. The description of underwater relief is the reason for a chart's existence, and it is important, particularly in this respect, that the harbour plan be free from any possible confusion. To avoid this, numbers appearing in the untinted areas of harbour plans, that is those which represent the water areas, are enclosed in rectangles : these numbers indicate draft. The majority of the rectangles are moreover affixed to the quays and show the amount of draft accepted alongside.

The draft idea has enabled information that previously was practically non-existent to be given on conditions governing access to wet docks. The depths of wet docks do not appear on charts, where the area concerned is left blank. Such depths were given in the text of the previous sailing directions. By combining these depths with data furnished by the tide tables, the mariners were able to figure the height of water in the docks during the brief periods when the docks communicated with the sea with all the gates open. But outside of these periods, there was no way of knowing the water level in the basins, since the level depended both on the tide and the harbourmaster's instructions, which were not mentioned in nautical documents. Each harbour plan in the new publication shows, for each independent dock, the datum for which the drafts are given. The presentation of this information has been left to the initiative of the port authorities, so that mariners are informed as to port usage and know how to interpret the draft data.

COASTAL VIEWS

Whereas the various volumes issued by the Hydrographic Office, such as tide tables, light lists, lists of radio signals, etc., are used momentarily, the chart is permanently kept within view by the mariner : it is the principal document used on the bridge. But it represents the coast in horizontal

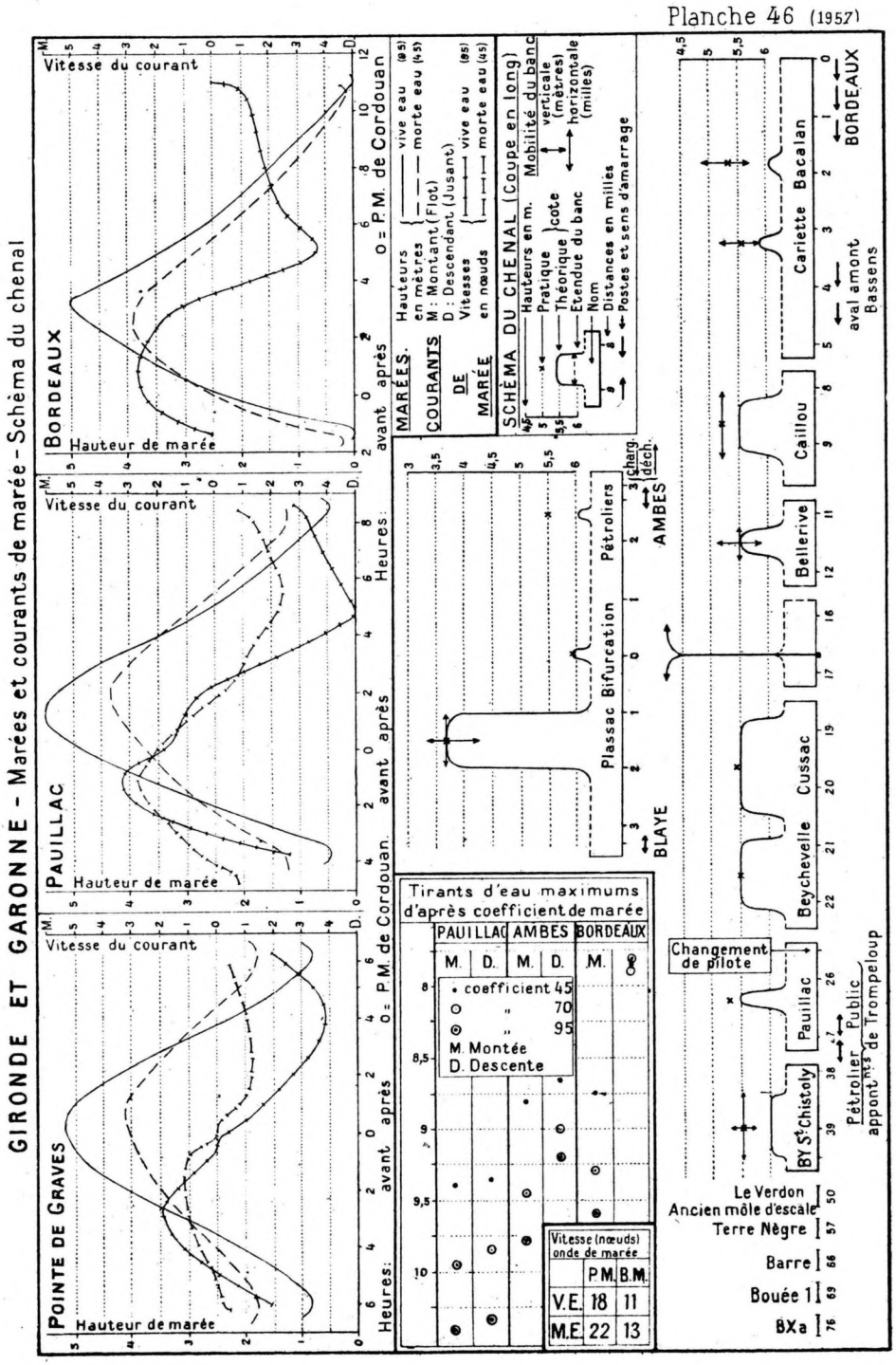

FIG. 3. — Diagram for river navigation (Sailing Directions, No. 313 A).

projection, whereas the eye sees the shore in vertical projection. The description of the coast in sailing directions, or better, its representation in vertical projection, i. e. the coastal view, is a complement to the chart. This complement is particularly useful in landfall areas where the identification of landmarks is both difficult and essential for navigational safety.

The revision of sailing directions posed an important problem in this respect. Whereas the text of sailing directions usually is only subject to progressive change from one edition to the next, in the revised work practically all the coastal views had to be abandoned. In the first place they related to pilotage much more than to landfall. Furthermore, regardless of the area concerned, presentation of the views was poor. Some of the originals were over a century old, and although they supplied excellent reproductions by engraving, they were no longer suited to modern reproduction processes. These processes, derived from photography, tended to cause the engraver's art to disappear, and in turn that of the draftsman, whose technique required adaptation to the method of reproduction.

New views were therefore needed, and since the depreciation of the old view was at least indirectly due to photography, it was natural to resort to photography for the new ones. The problem had barely been studied, and the selection of an appropriate camera was a matter for hesitation. Around 1950, a large number of photographs of the coast had been taken for piloting purposes, but in order to obtain sufficiently detailed representation at long range, telephoto lens were used. Results were poor. The telephoto lens does not reproduce the landscape as seen by the naked eye, but as seen through field glasses or even a telescope, that is, magnified and limited to a narrow field. Coastal views, especially in landfall areas, should present the landscape in a wide field, in a way as close as possible to direct vision.

To solve this problem the Hydrographic Office called upon the Navy air arm. Apart from practical considerations, the air arm's assistance was indispensable for the fulfillment of a requirement which, although never previously met by coastal views, was believed to be highly important, i. e. discrimination between planes. In the views obtained at sea level, the planes so overlap as to form a practically flat, depthless view. When the observer's location is away from the camera station, the landscape becomes distorted and there is no possible way to reconstruct in the mind's eye the coastal view from what the eye actually sees. In a view taken at a certain height, however, the planes become detached from one another in elevation, and the observer can distinguish at a glance the plane containing each landmark he sees. He can thus easily reconcile the actual landscape and the image supplied by the coastal view.

This advantage of the oblique view was not an actual discovery. Our ancestors had no aircraft but did have horses, and lacking *birdseye* views obtained *horseback,* i. e. slightly oblique, views. The use of aircraft must not increase obliquity : if it is exaggerated, the views lose all relationship with the landscape as seen from the bridge. After a certain amount of trial and error, a standard height of 40 metres, the minimum margin of safety for aircraft, was adopted. This altitude gives adequate plane discrimination at the ranges concerned, i. e. between 2 and 5 miles. Beyond 5 miles, the view appears to be practically horizontal, but this is unimportant since at

long range only the shape of the relief rather than landmarks need be shown.

In addition to the possibility of obtaining the views at a specified altitude, aircraft offered considerable practical advantages. Photographic views of the coast require excellent visibility conditions, which are infrequent and difficult to forecast long in advance. To take advantage of them, a vessel must either be permanently on the spot or seize such opportunities as come along. Aircraft, however, can rapidly reach the desired location and obtain optimum results from the brief periods of good visibility. In practice, it would have been impossible to assign even a small vessel to take photographs of the north and west coasts of France. Such a mission would have required several years, whereas an aircraft squadron did the work in less than one year on 3 % of its total working schedule.

The assistance of the Navy air arm was also valuable from another all-important practical aspect : the selection of the camera. The Hydrographic Office's specifications were that the camera should supply satisfactory views, regardless of the mountainous or flat appearance of the coast, and that the range between the point of view and the shore might vary between 4 and 8 miles. Thanks to its competence and resources, the air arm was able to pick out equipment which probably it alone possessed and was familiar with throughout France, and which met all specifications : an American camera known as U.S.A.F. type K-18, with the following characteristics :

Format	Focal length
9 × 18 inches	24 inches
228.6 × 457.2 mm	609.8 mm

From these the following characteristics can be derived, as being of greater convenience for solving problems relating to coastal views :

Field : 41° Length corresponding to 1° : 11.14 mm

The views obtained from this equipment clearly show at a 7-mile range principal landmarks such as steeples, water towers and lighthouses.

It is interesting to compare this camera with the one specially developed by the Japanese Hydrographic Office for its own coastal views (see this Review, November 1957) :

Format	Focal length
45 × 273 mm	120 mm

Field : 137° Length corresponding to 1° : 2 mm

The differences compared with the equipment used in France are enormous. It is difficult to understand how both offices claim to be satisfied. Until we are more completely informed, we suggest the following explanation : the Japanese Hydrographic Office exhibits photographs of mountainous coasts taken with its camera, and it is likely that it concentrates on representation of strongly marked relief without attaching the same importance to landmark identification at long range. In order to represent much larger objects, it was able to accept a much shorter focal length.

Although the K-18 was perfectly suited to its task, a number of difficulties arose in carrying out the photo project. We shall limit discussion to the main problems. First, vertical stripes occurred which spotted the nega-

tives. These were attributed to developing conditions. The equipment used was intended for treating 150 metres of film per hour. The film baths were maintained by pumps which at this speed of development projected with great force a highly concentrated solution on the gelatin : the vertical stripes were the result of this violent, discontinuous procedure. To adjust this, the technical section of navy ordnance constructed a developer with the speed reduced ten times and the concentration of solution reduced accordingly.

Visibility, which is often mediocre on the coasts of the Atlantic, gave rise to other fears. These were in fact realized, and necessitated the retaking of certain photographs. It would be needless to mention them if far greater difficulties had not later been encountered in the south of France. Actually, contrarily to expectations, photography on the Atlantic shore is relatively easy, because the coast is fairly low-lying and there seldom exists a remotely distant background. In addition, the development of types of weather is regular, thus facilitating weather forecasts : one can be fairly certain of a good period of visibility after the passage of a depression. This does not hold true for the south, where the distant background may be 20 miles away from the coast, and where the weather varies with disconcerting rapidity from one hour or from one locality to the next. After several unsuccessful attempts, special weather coverage had to be organized to enable photography of Corsica.

To facilitate use by mariners, the photo views have been supplied with extensive legends. The essence of a legend is the definition by azimuth and range of the camera station in relation to a point on the photograph. In spite of the care taken by the aircraft to occupy the required stations, their navigational facilities afforded an accuracy to within only half a mile. This required recomputing of the exact camera station. To this end the distances between landmarks on the photographs were converted into angles, and the angles used to plot the position on the chart by protractor. An accuracy of a tenth and occasionally a hundredth of a nautical mile was thus easily obtained.

Although not strictly relevant to the present article, it is interesting to note that a number of conspicuous points on the photographs did not appear on the charts, to which they have been or will be added. It even happened that various circles plotted to restore the camera point did not all intersect at the same point on the chart. The deduction was that one of the landmarks was in the wrong position on the chart. Comparison with other documents enabled the error to be located and corrected. Generally speaking, it may be stated that a vertical photograph intended to complete the chart can also be used to improve it.

Regardless of the operators' qualifications, some photographs have worse visibility and lighting than others. Yet the original prints of the published photographs were at least satisfactory, and most were excellent. Unfortunately, in the printed reproductions, the pictures lost much of their quality. This loss is partially unavoidable, but may be reduced by improving reproduction processes and the quality of the paper. The Hydrographic Office is giving close attention to this question, and expects progress to be made in clarity of coastal views in future revisions of sailing directions.

The project carried out in connection with the first volume to be published with photographs is of course not completed. During years to

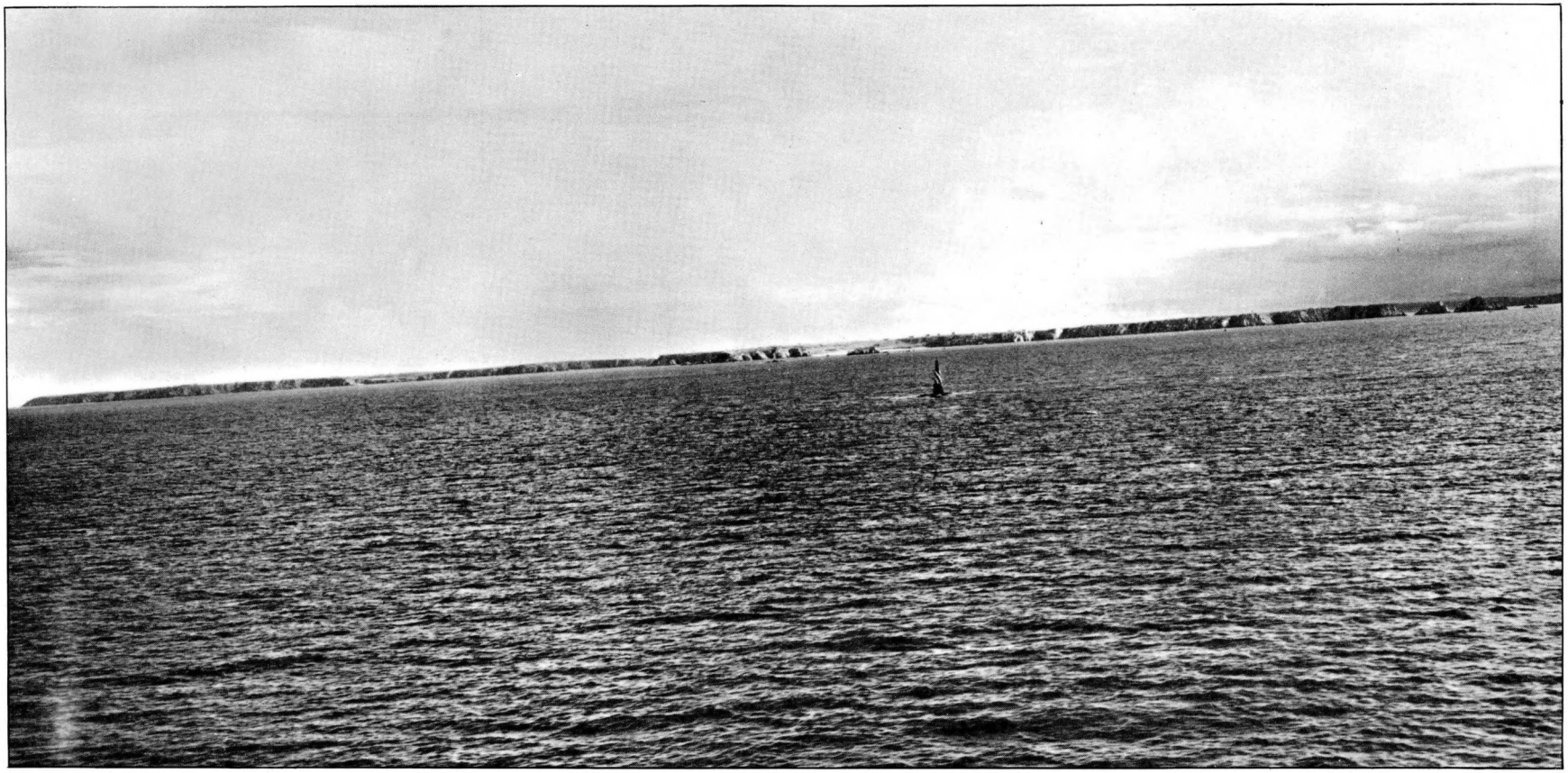

FIG. 4. — View of Brittany coast (Sailing Directions, No. 313 A).
Distance of foreground (turret) : 1 mile;
Average distance of coast : 6 miles;
Distance of mountains in background (at far right) : 21 miles.

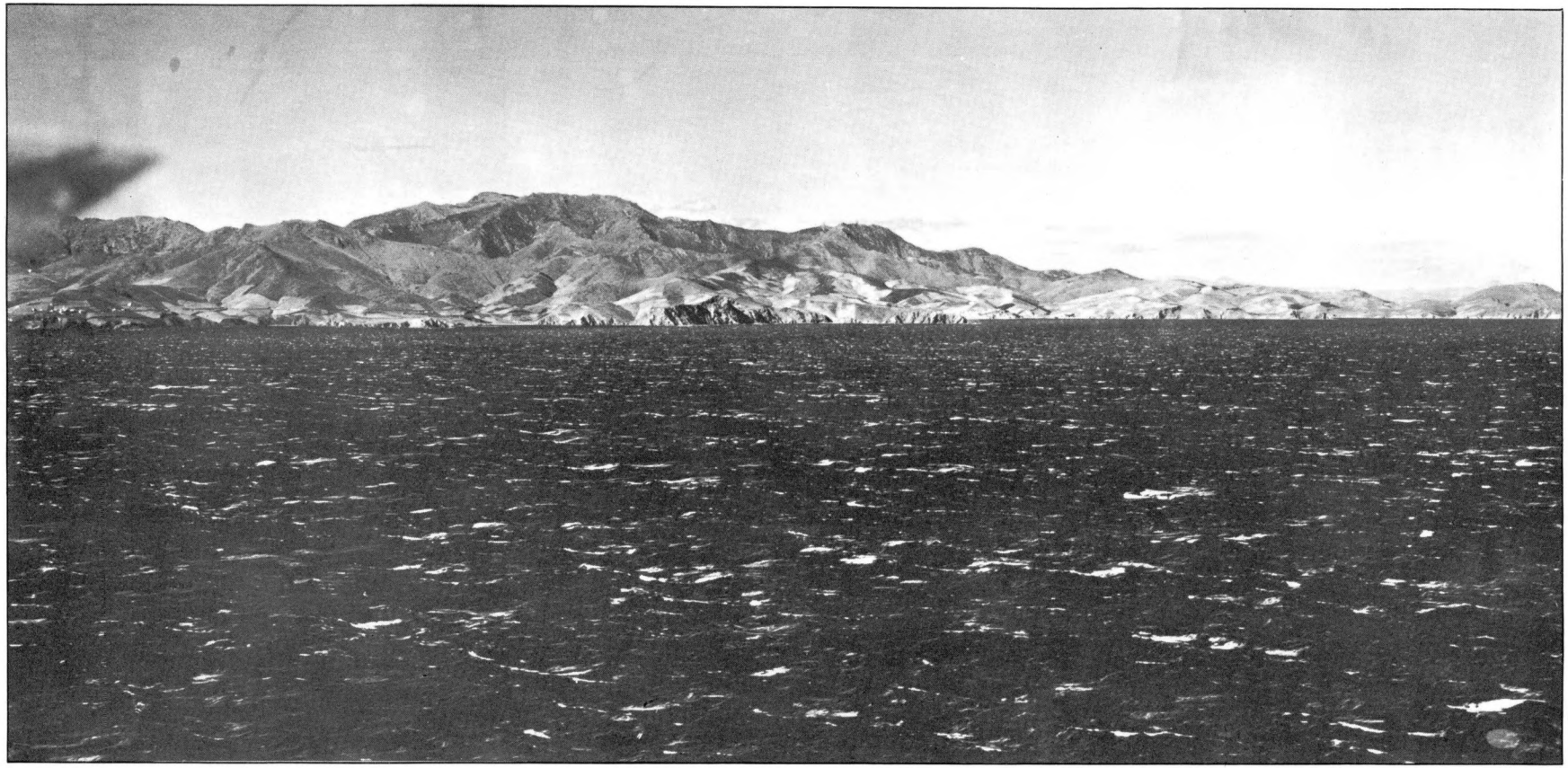

FIG. 5. — View of eastern Pyrenees coast (Sailing Directions, No. 319 A).
Average distance : 6 miles.

FIG. 6. — View of eastern Pyrenees coast (Sailing Directions, No. 319 A).
Average distance of foreground : 24 miles;
Distance of snow-capped mountain : 49 miles.

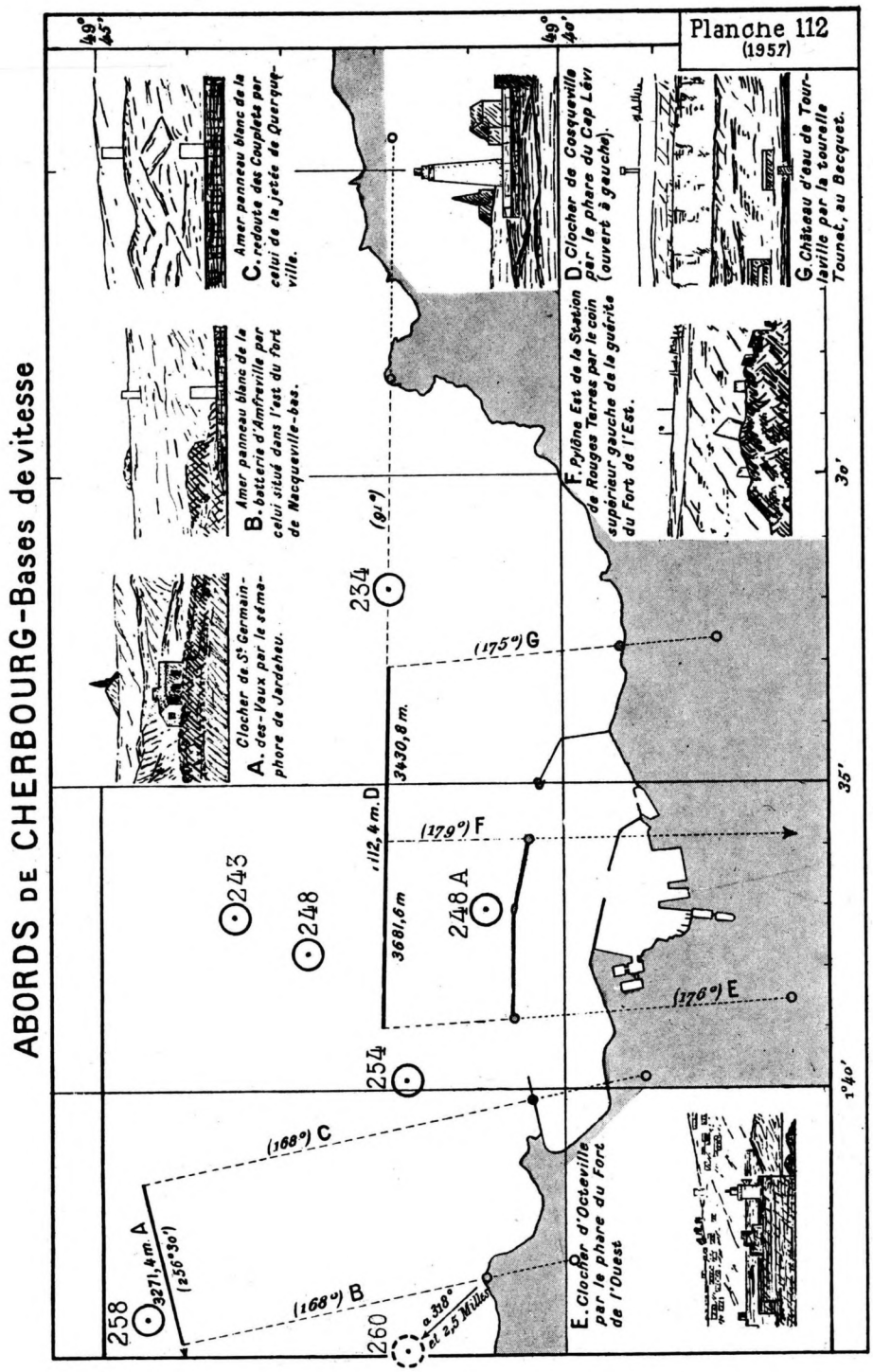

FIG. 7. — Sketch of measured miles (Sailing Directions, No. 313 A).

Note. — The figures indicate the observation points of the currents; the corresponding current tables are given in the text of the Sailing Directions.

come, the sketch views in the previous sailing directions will be done over in photographic form. These views were less important than the landfall views recently published, although they had a certain significance. The photographs by which they are to be replaced will be taken by surface vessels. There is no question of using a large camera such as the K-18 on the small coastal vessels to be assigned for this work. Instead a camera of three times less focal length, which should be adequate for photographs taken at an approximate three-mile range, will be used.

CONCLUSION

Most hydrographic publications, such as light lists, are highly specialized, and their arrangement hardly changes from one edition to the next. But sailing directions contain diversified information, the extent, relative importance and grouping of which are constantly changing with the methods and needs of navigation. This is the underlying cause of the innovations that have been described and affect the major original publication issued by the French Hydrographic Office. But as we had occasion to note in a previous article (*), the sailing directions for the French coasts are of relatively limited interest for the French mariner, who knows his country's coastline well and often better than the sailing directions. They reach maximum interest when translated for the use of foreign navigators who frequent our coasts. It follows that the innovations should be explained to the hydrographic offices which translate this work.

But the activities of the French Hydrographic Office are not limited to its own relatively narrow field. As a member of the International Hydrographic Bureau, it desires to contribute its share to the effort required for the constant improvement of navigational security. If it has been instrumental in arousing the interest of other hydrographic offices and in sparing them some degree of useless experimentation; if it should in some measure help in the accomplishment of their individual efforts, then this initial attempt will have fulfilled its purpose.

(*) *International Hydrographic Review*, November 1956 : The New Golden Age of Hydrography.