TOWARDS A PROGRESS IN NAUTICAL INFORMATION (*)

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1. — THE PROBLEM OF NAUTICAL INFORMATION

There are few human activities today which are not international in character. In maritime navigation this international character is particularly pronounced. Ships of all nations pass each other on the oceans that belong to all. For safe navigation each requires the same information. This is the reason why since the beginning of the 20th Century several maritime nations have felt the need to standardize nautical documentation through an association of the Hydrographic Offices responsible for supplying this documentation. From this need the International Hydrographic Bureau was born. With the impetus given at quinquennial conferences the Bureau has for 50 years coordinated hydrographic activities in such a way that the work of each conutry is made available to all in the form of publications and above all of charts, devised and set out to smooth away the difficulties of language.

Complete and full description of the seas and coasts calls for around a hundred volumes and thousands of charts whose principal improvement is in the inclusion of work carried out by the various hydrographic surveys. Such a task is long and exacting and its stages are marked in particular by the publication of charts that are either entirely new or else more complete than previous ones. In this respect it is not of much importance whether the dissemination of information takes two months or two years, the essential is that it be disseminated. It is consequently normal that International Hydrographic Conferences have not put the time required for circulation of information to the forefront of their preoccupations. Even when such frequently published periodic works as, for instance, the Notices to Mariners have been studied the Conferences have above all sought to define their substance and their form. There had to be a serious accident due to a flaw in the transmission of information to show that delays in dissemination had in themselves a great importance.

This accident was the loss in 1952 of the French liner *Champollion* which confused a new light of whose existence it was unaware with an

(*) The article "The New Golden Age of Hydrography", published in November 1956 in the *International Hydrographic Review* discussed among other matters the problem of nautical information such as it appeared at the time. Taking the progress achieved since then into account, the present article studies those problems whose solution now appears desirable and possible.

older light which it was seeking but had not seen. There is no point in examining here all the problems raised by the loss of the *Champollion*. An accident is due to a certain number of coincidences where the technical and the human element are inextricably mingled under conditions which have never arisen in the past and will never again arise in the future. However, the study of accidents is of great interest because each one throws a particular light on certain shortcomings which had a predominant place in the events. In the case of the *Champollion* the predominant shortcoming can be briefly stated as follows. The light had been functioning for a month, but the *Champollion* was unaware of the fact because information about it had not been published. If the ship had known about the light the accident would not have happened.

The loss of the *Champollion* has permitted a distinction — as concerns hydrography — between 'information' and what up to then had tended to be confused with 'documentation'. This distinction is not new, nor is it peculiar to hydrography. Forming one's aptitudes and informing oneself are two quite different matters. In days gone by formal knowledge was the prerogative of an elite. Today man does not content himself with the formal knowledge acquired at school or in his books. He needs to be informed, and he listens to the radio while dressing and buys the paper on the way to work. In a rapidly developing world information is a necessity.

Taking the lessons learnt from the loss of the *Champollion* into account, succeeding International Hydrographic Conferences have adopted three resolutions (numbers F 31, F 32 and F 33) concerning " coordinating radio navigational warnings ", the method of despatching notices, and particularly the use of airmail. These resolutions chiefly recommend countries whose broadcasts cover only "local areas" to inform by telegram one of the three countries maintaining a " wide broadcast coverage ". Furthermore they recommend the exchange of information between neighbouring countries. These resolutions are complemented by another important resolution which, although not directly concerning the pace of distribution, emphasizes the notion of time by recommending an advance notice of at least two months for all work on installation of, or modification to, any important aid to navigation. These various resolutions now date back some years, but they are only very imperfectly followed and the efforts made to obtain a better application have only just resulted in " strongly recommending " at the time of the 1967 Conference something that up to then had been but simply " recommended ". How this situation arose and how to put matters on the way to developing on the right lines, these are the points we should examine.

2. — THE CAUSES OF THE STANDSTILL

When an event that concerns the safety of navigation takes place navigators must be informed about it in advance so that the danger of

surprise can be avoided. Thus the lighting of a new and unknown light can be more troubling — as the case of the *Champollion* has demonstrated — than the extinction of a known light. In the form of printed warnings such information can take several months to reach navigators. In order to cover this delay, recourse is made to the broadcasts of coastal stations. These, however, can only be picked up within a limited range, and one which is less than the day's run of a ship. In order to be certain of reaching by this means all the ships concerned it would be necessary to repeat the information daily for several months. The procedure would be a sure one, but it would be impracticable for it would overload transmissions intolerably. Therefore we must call in such rapid and long-range means of communication as telegraph, radio and airplane which are capable of reaching ships wherever these may be. Ships spend only part of their time at sea, where they keep limited radio watch, and the rest of their time in port, where they do not keep watch but where they can be reached by telegram or by airmail. If they are not yet reached rapidly and reliably when in port this is essentially because the implementing of the means of reaching them is outside the domain of hydrography, being as much, if not more, the concern of telecommunications specialists.

For the moment the usefulness of progress is masked by the failure of a previous endeavour. In large ports there formerly existed in the Harbour Master's Office a Centralization Office for Notices to Mariners, and here were assembled the groups of periodical notices — generally issued weekly — published by the principal maritime nations. Consulting these notices meant an appreciable reduction in the delay of dissemination of the information, that is the interval of time separating the publication of the original notice and the publication of the same notice translated into the mariner's own language. In order, however, to obtain the benefit of this reduction it was necessary to make a strict rule of consulting a mass of notices written in languages which might be unfamiliar. Furthermore the system meant that delays in the drafting, printing and routing of these Notices to Mariners still subsisted. Finally, as the Centralization Offices were sometimes far from the ships' berths they were very seldom patronized. Their disappearance is therefore not a matter of great regret. On the other hand, we would do well to retain their principle which was good. Similarly, the Information Bureaus at railway stations and in travel agencies, being well adapted to the needs of their clients, render great service.

In view of the fact that promulgation of Notices to Mariners by Centralization Offices did not render much service, international radio broadcasting of important information is certainly more valuable even at the elementary stage in which it still remains. A number of countries, however, decline to participate in this service because they consider it would be costly, entail red-tape, and would not be practical. Effectively, this is what is to be feared if the international broadcasts were obliged to repeat everything put out on the national scale. But we shall see later that there is no question of this. National broadcasts are a fundamental and basic essential for urgent information for navigators. International broadcasts have a different role, and concern a particular category of information.

When this distinction of function has been clearly made it will be easy to see that the importance of international broadcasts fully justifies the expense involved which is much smaller than ordinarily imagined.

This importance is as yet little sensed. As the question is not well known conservative minds question the utility of an innovation which the circumstances do not seem to dictate. After all, the *Champollion* accident was 17 years ago, and there has not been one since then to demonstrate the inadequacy of the existing network of information. On the other hand, since the loss of the *Champollion* a multitude of accidents or incidents due to a want of information have taken place, and no account has been taken of these. Moreover very often the witnesses themselves have been indifferent to the role played by this inadequacy of information, or else have neglected to lay stress on it.

This is why countries not participating in the effort to improve international nautical information have an easy conscience and can say to themselves with some semblance of reason that their systems of information are satisfactory. Their satisfaction is expressed in one of the following ways :

— The broadcasts from our coastal stations are sufficient;
— The countries that reckon they have an urgent need of our information have only to listen in to our broadcasts;
— We have long-range broadcasts, and ships making for our coasts can listen in to them from as far away as they wish.

Regarding this last argument, it should be remarked that the resolution on radio navigation warnings now in force (F 31 I) confuses the range of broadcasts with the extent of the zones that these broadcasts concern. When the expression " wide broadcast coverage " is used, or where reference is made to warnings which navigators need to know about before entering a local area then the resolution seems to refer to range. On the other hand it states that only three countries (Great Britain, U.S.A. and France) have a wide broadcast coverage, whereas many other countries have long-range stations. What distinguishes the three countries mentioned is that they publish radio warnings concerning such wide areas as the Atlantic and the Pacific, and sometimes even the whole world. It is therefore obvious that the aim of resolution F 31 I is not merely to entrust international radio broadcasts to long-range transmissions but also to limit its choice to those long-range broadcasts that are of concern to large areas, or even to the whole world.

Furthermore it is not range of transmission that suffices to assure complete circulation of information. Let us assume that each maritime nation possesses a radio station whose transmissions can be received the world over. This would theoretically allow ships to receive all necessary information in good time, but in practice they would not be capable of this. Take for example the case of a Greek ship leaving Buenos Aires for Stockholm. Apart from its cross-ocean passage it sails along the coasts of the following countries : Argentine, Uruguay, Brazil, Portugal (the Cape Verde Islands), Spain, France, England, Belgium, Holland, Germany, Denmark and Sweden. The information contained in the latest Notices of Mariners it has received is sometimes three months old. To be certain of

obtaining all the required information it would have been necessary for the ship to have kept tuned in, even when berthed, to the transmissions of these twelve countries for three whole months. And even this would not be sufficient, because after this voyage it would undertake others, so that it would have constantly to listen in to the transmissions of all the countries along whose coasts it is to travel within the next three months. But it is not even known which these will be.

Concerning the possibilities a country has of picking up the transmissions of another country, we have here a most important matter. It is in fact normal that the measures taken with the object of ensuring a distribution which goes beyond the national scale should be entrusted to radio. But to take charge of the circulation of foreign information is to assume a responsibility in the name of the originating country. It is for this last to both choose the information which it wishes to spread rapidly via the radio stations of another country and also to notify this information to that country, mentioning its purpose. The three countries making world-wide radio broadcasts of information can only give complete distribution if the support given by each of the other countries is positive.

3. — THE TRUE NATURE OF THE PROBLEM

In order to understand fully exactly what international nautical information consists of it will be useful to eliminate what it does not concern. Here it would appear that there is in fact a tenacious confusion. International dissemination appears at first sight to be an amplification of national dissemination. Although the resolutions concerning " international coordination of radio navigational warnings " specify that it is a question of " particularly important warnings " it is obvious that many countries imagine that this concerns a large part of the information they put out over their radio. This is not so. This information for the most part concerns temporary occurrences — among them malfunctionings of navigational aids, such as extinguished lights or drifting buoys — which take up almost the entire space. They are broadcast by coastal stations, and it is necessary to broadcast them daily, several times a day, during the whole time these announced irregularities exist. Like weather forecasts, these occurrences are ephemeral in character and it is useless to have them broadcast on a world-wide basis. They do not interest the distant mariner any more than the weather in the Atlantic when he is in the Pacific.

All international dissemination of information must be based on rigorous selection. Superfluous dissemination is not only costly, as was to be feared, but it is also detrimental since important information is swamped among many other items which are unimportant, and amongst which it risks passing unnoticed. If the percentage of secondary information is high in relation to important information this last becomes devalued and risks not receiving the attention it merits. The selection of information

for international radio broadcasts should take account of its importance, urgency and duration of validity. Viewed objectively this last element is not the principal one. However it plays a predominant role. In principle international broadcasts should be reserved for permanent information : in practice they can be employed as relays of national broadcasts so as to avoid having to continue these last for several months. A validity of three months seems to be a minimum, and in any case this approximate duration should be included in the broadcast information.

Whether information be temporary or permanent, its international broadcast over the radio cannot likewise be continued for long. It cannot cover the three months' delay necessary for distribution of printed notices to mariners. Moreover, although the radio is the most rapid means of dissemination, like the spoken word it has the inconvenience of leaving no trace : " Verba volant, scripta manent ". Radio broadcasts must be complemented by a written circulation which should supersede the broadcasts as soon as possible. Long-range stations broadcasting information concerning the whole world, or at least large areas of it, repeat the information for from 10 - 15 days. This interval is sufficient for distributing by air mail over the whole world rapid written bulletins published at a maximum interval of a week. This distribution by airmail — the subject of resolution F 33 — reduces the time Hydrographic Offices require to transform an item of information into a notice correcting nautical documents and to print an issue of Notices to Mariners. Furthermore, on account of their weight the groups of Notices are generally forwarded by surface mail and accordingly the time required is to be counted in weeks. The time required for airmail despatches is to be counted in hours, for less than two days are needed to reach the Antipodes.

Regarding the nature of information meriting rapid international transmission, Resolution F 31 simply states that it should be particularly important. It is probably not possible to make a clear definition of the criteria to which an item of information should answer in order to be important. However, in a study which among other things proposes that existing prejudices regarding international broadcasts be dropped, it will not be a bad idea to indicate which is the most often the information that by its tardiness creates a danger to navigation. In the List of Radio Signals giving stations that transmit Notices to Mariners this kind of information is defined as " irregularities in navigational aids affecting landfall ". In effect, any information whose delay jeopardizes navigation almost always belongs to one of the following categories :

(*a*) Landfall marks : alterations, shifting, new installations. (The unexpected shifting of aeronautical radiobeacons used by ships should in particular be noted).
(*b*) Open sea fairways : shifting or modification to beacons.
(*c*) Banks : changes in depth, or to beacons.

To this list should be added alterations to the pilotage system for ports, which although not creating dangers nevertheless often lead to delays with which navigators are very concerned.

Comparing these different categories of information with the criteria for selection given in Resolution F 31, it is seen that these criteria define

the nature of the information to be broadcast in a rather complex manner. It would appear that the resolution adopts as principal element of appraisal the comparison between an area covered by a broadcast and an area that is covered or affected by the information that this broadcast transmits. These are somewhat abstract notions which can give rise to misconstruction.

In order to try to make things clearer let us take an example. Let us assume that following a collision a ship sinks in the Le Havre roads, thus becoming a danger to navigation. This is obviously an important occurrence, knowledge of which must promptly go beyond the range limit of the French coastal station entrusted with the initial radio broadcast. However this incident occurred within the range of its broadcasts, and moreover it cannot be said that ships bound for Le Havre will be influenced by this incident before finding themselves within range of the coastal station, or that this is one of the occurrences — to use the words of the resolution — " that need to be brought to the attention of navigators before entering that local area ".

If the coastal station is still broadcasting the news when the ship comes within range it will be received in good time. However it is here that the need for international broadcasts is felt. If ships arrive in the vicinity of the French coasts a month or two after the incident the coastal station will have ceased broadcasting the information.

As well as its nature, it is also clearly the duration of validity of this information that justifies international broadcasts. It would seem that the two criteria could be combined to form the following simple definition : changes of a lasting character in the siting of both dangers and aids to navigation on shipping routes and in landfall areas.

4. — THE IMPROVEMENT PROGRAMME

What has just been said about the current resolutions tends to indicate that a textual revision is desirable. However this work is not a first imperative. Resolutions are concise texts constituting the law for cooperation between the Hydrographic Offices. In the domain of rapid information this cooperation has already yielded a certain number of results, but many obstacles have stopped it developing, and for several years no progress has been made. The most urgent task is to sweep away the obstacles and to put on foot a new advance, thereby making the means of attaining the final goal more easy to discern.

Furthermore the work to be undertaken is very modest in basic concept — it is contained in the 1967 resolution which "strongly recommends" that which up to then had been but "recommended". This is not a decision to direct efforts towards a specific goal, it is merely the implied acknowledgement that there is progress to be made, and an invitation to make the necessary effort to achieve this progress. In these circumstances it would seem suitable in the first place to make an inventory of the situation setting out the time that each country requires for the dissemination of its printed Notices to Mariners, its air-mailed

notices and its radio warnings. On the subject of printed notices we should note that what has to be studied is not the time required for a notice to reach any ship whatever. Most countries only publish very little information in addition to their own national items of information. These last are only given wide distribution when they are published in the weekly editions of the notices of those countries publishing information relating to the whole world. However, even for a country like France that publishes this world-wide information, the time required for the dissemination of printed notices must also include the time necessary for their insertion in the weekly British or American notices since these are the only ones that the navigators of a great many countries use for obtaining their international information.

Let us take the case of an important item of information concerning Angola. The time required for normal written dissemination can be analysed as follows :

— Routing from the locality of the incident to the local authority;
— Routing from this authority to the Portuguese Hydrographic Institute;
— Drafting and printing of a group of Portuguese Notices to Mariners (fortnightly);
— Routing to a Hydrographic Office publishing information on the whole world (for example to the American authorities);
— Drafting and printing of a group of American Notices to Mariners;
— Routing to the remotest ships.

The time required for rapid dissemination by radio or by airplane can be analysed in the same manner, only the time necessary for routing, drafting and printing will be less. It should be noted that a country's items of information can also benefit from rapid dissemination at an intermediary stage. Thus, in its bulletins for rapid dissemination (DIFRAP), the French Hydrographic Office publishes information taken from the printed notices of all countries. Angola was chosen as example since in that region there have recently been several alterations to the positions of important lights. These alterations which had not had the initial benefit of a world-wide rapid dissemination were notified in a DIFRAP bulletin less than a week after their notification to Paris. They were thus made available to Hydrographic Offices and in large ports all over the world two days later. The time necessary for dissemination was thus reduced by several weeks. However we cannot be certain whether this rapid dissemination has benefited other mariners besides the French.

These remarks show that the inventory will be difficult to make because there will be a lack of basic elements for replies. For example, it is probable that it is not known by what routes and within what interval — by either normal or rapid means — Turkish information reaches Japanese navigators or Chilean information Finnish navigators.

During a second enquiry — which could start at the same time as the first — navigators would be invited to make known any difficulties experienced owing to delays in the receipt of information. The nature of such belated information will make it possible to confirm, and probably to complete, the list given above. The scene of the event will be of help in

determining the origin of the shortcomings. It would be most advisable to obtain dates to corroborate this enquiry on the time necessary for information to reach the navigator. It is, however, unlikely that navigators could give exact dates for past events. It would therefore be as well not to question them only on past events and to prolong the enquiry for a certain time, asking them to note :

— Date and place;
— Nature of the unexpected incident;
— The resulting inconvenience;
— Date of receipt of information announcing the incident by either normal or rapid channels.

In laying stress on the gaps in the present organization these enquiries will provide the necessary basis for revising resolutions on nautical information. However it is desirable to instigate a better application of the existing regulations without any further delay, in particular regarding those matters on which progress can be made without great expense. This is notably the case for Resolution F 15 concerning preliminary notice that is insufficiently applied. What more simple than to announce : "We intend on such a date at such and such a place to put into service, or to alter, such and such a light in order to give it such and such distinctive characteristics." ? Such information is known before the work is started. Nevertheless we frequently learn about it only after the event, and by that time the information has become an urgency. There is a maxim which runs — there is no such thing as urgent affairs, only affairs that are behindhand. This is often the case for nautical information. If such events were anticipated every time this was possible, and with all possible advance notice, the number of information items justifying rapid international dissemination would not rise above approximately 10 per week for the whole world. This shows how desirable it is to develop this announcing of anticipated events so as to reduce the cost of rapid world dissemination which is considered too expensive, and so reserve this for unforeseen events. In general, information delays arise because beaconage services are not in a position to evaluate accurately the time necessary for the completion of their work. It is necessary to convince them that rigorous accuracy is not important, an estimate of magnitude will suffice. Even if it were impossible to give this estimate it would still be preferable to announce the expected event without giving any indication as to date. Better a year in advance than a day too late.

The second progress that must be made at the earliest opportunity is in rapid dissemination by airmail. The relevant resolution (F 33) is applied by countries maintaining a wide broadcast coverage. However, apart from their own international information items, these countries are too often obliged to draw on the Notices to Mariners of other countries for information meriting rapid world distribution, and this results in delays. So as to avoid such delays, and in order that the air-mail bulletins are kept supplied with recent news from all countries, these countries must help in drawing up the bulletins by themselves selecting and telegraphing or airmailing to the editors the information items they consider should receive rapid world dissemination.

In order that this kind of information should reach all navigators the information bureaus which existed in the larger ports at the time when the Notices to Mariners were centralized there must be re-established. However, instead of these notices, whose dissemination is slow and where the essential is buried under a mass of minor details, must be centralized bulletins for rapid dissemination, regional bulletins and world bulletins. Moreover, navigators must not be obliged to go to these offices to seek these bulletins. These bureaus must themselves publish local bulletins expressly for maritime agencies and for the Press, giving the regional and world information they have received.

The expense to the Hydrographic Offices incurred by the adoption of these different measures would only be negligible. Hydrographic Offices could be urged to put these measures into force by considering the risks that failure to appreciate the existing resolutions is causing them to run. If an accident were to occur as a result of a delay in dissemination of their information we should have the right to name them responsible, telling them that "the accident occurred because the resolutions had not been applied". (*).

However, as concerns information, navigational safety will not be completely assured until the day when the entire planned organization is officially implemented. It is not yet possible to specify what these measures will be, but we may repeat what we said on the subject in 1956.

"The world area would be divided into a certain number of zones and all maritime nations would agree to transmit rapidly their important items of information from a point in their zone which would be chosen for its advantages as regards telephone, radio and air communications. From that point they would be transmitted as already said throughout the whole world. The number of zones should be fairly restricted so that navigators do not have to follow too many broadcasts. The centralization in a single place — a solution consistent with the speed and range of the networks of communication — would risk overloading these networks. Even if the number of important items of information were only in the region of twenty per week consideration would have to be given to the fact that the organization charged with making the selection would actually receive more than it would transmit, and crowding the network through which it is supplied would have to be avoided. Furthermore, selection is a delicate matter which must be based on a perfect knowledge of the region concerned and of the information already published. For these various reasons, it would seem preferable to envisage between five and ten information zones. It should be noted that as the radio transmissions would necessarily have world coverage it would be of advantage if radio were also used for

(*) The British review *Safety at Sea International* in its Sept.-Oct. 1967 number published a remarkable article by Lieutenant Commander D. R. Benson, R.N., of the British Hydrographic Department, in which the interest of the rapid dissemination of nautical information is stressed. The article closes with an account of the conditions in which a British freighter sunk off the German coast in April 1951 after having hit the wreck of a ship that had sunk there a month earlier, an event about which the freighter could have known had it used the means of obtaining rapid information which were available to it. This example provides matter for reflection for those countries which have not yet troubled to assure for their own information a rapid dissemination system such as is described in the article.

communication between zones. In this way, each centralization organization would ensure world radio transmission of the information regarding its zone, and written transmission within its zone of world information. This procedure would multiply the number of printings, but as it would reduce proportionally the air transmission required for each it would be both rapid and economical."

It is possible to envisage the establishment of a detailed plan for this world organization within the next two or three years. By that time the enquiries and the immediate improvements advocated above will have led to a documentation which is lacking at the present moment. In order to take full advantage of this documentation it will no doubt be well to convene a conference of specialists in nautical and in general information. In the field of nautical information, members of the various Hydrographic Offices would represent local, regional and world interests. For general information the Hydrographic Offices would be able to call upon the services of specialists in the techniques of broadcasting, the press and telecommunications. Plans and resolutions could thus be worked out for anticipating at each level the use of means for assuring the widest and most rapid dissemination at the lowest possible cost.