

S U M M A R Y
OF THE PROPOSALS, DISCUSSIONS AND CONCLUSIONS
OF THE VARIOUS INTERNATIONAL CONFERENCES
ON UNIFORMITY IN BUOYAGE & BUOY LIGHTING
WITH DATA OF EXISTING SYSTEMS.

BY DIRECTOR NIBLACK.

I. — INTRODUCTION.

THE INTERNATIONAL HYDROGRAPHIC BUREAU derives its authority to deal with this subject (a) from its organisation to co-ordinate the hydrographic work of its States Members “with a view to rendering navigation easier and safer in all the seas of the world”, as set forth in its statutes (Art. 6, ii), approved by the Governments of all the States Members, and (b) through the resolution passed by the INTERNATIONAL HYDROGRAPHIC CONFERENCE IN LONDON, in 1919, expressing the wish and hope that the “Governments of all countries shall aim at uniformity with respect to buoyage and port signals.” (Report of Proceedings, page 44).

The Conference in London received its own authority to deal with the question through the fact that the INTERNATIONAL MARINE CONFERENCE in WASHINGTON, in 1889, put forward the proposal for “a uniform Systems of Buoys and Beacons”, and the INTERNATIONAL MARITIME CONFERENCE at ST. PETERSBURG, in 1912, took up the proposals of the Washington Conference, made several changes in them, and added a number of further proposals. The International Hydrographic Conference in London, which in 1919, directly succeeded that of St. Petersburg, did not go into the details of uniformity in buoyage and passed the question on to this Bureau as unfinished business.

The INTERNATIONAL CONGRESS OF NAVIGATION has, at its various meetings, considered this question as well as the general one of Lights and Lighthouses, and at its XIIIth Congress in London, in 1923, Mons. F. URBAIN, the Belgian Delegate, said :

“ It is known that some years ago the International Hydrographic Office was constituted with its headquarters at Monaco, today 24 nations have given their adherence. Those who take an interest in the work of the Association of Navigation Congresses will learn without displeasure that this was, at any rate in great part, in consequence of the aforementioned resolution, adopted at the St. Petersburg Navigation Congress in 1908.

“ Such an organism is unquestionably absolutely authorised to push forward and to bring to a conclusion, if the thing is possible, the study of the problems included in the question and there is no doubt that it would take it up, if the Association of Navigation Congresses, whose speciality this is less, would call attention to the great importance which it seems to attach to the solution of the question.

“ It therefore appears useful that the London Congress or the Committee of Direction of the Association examine the opportuneness of taking all the steps necessary to obtain the desired result by approaching the International Hydrographic Office. ”

Dr. LURIA, Colonel of Engineers the Italian Delegate to the same Congress, introduced a resolution “ to bring about the standardisation of characters in maritime signalling ” by :—

“ 8° Through the Agency of the International Hydrographic Office at Monaco, the nations must make one another acquainted with important objects of study, findings and innovations relative to the appliances and engines in lighthouses, luminous buoys and lightships, and those concerning the luminous and geographical ranges of the maritime lights, the transparency of the atmosphere, the illuminant power of the optical instruments and sources of lights, aerial acoustic, submarine and hertzian signals, and experiments of every kind touching the interests of this important service. ”

The CONSULTATIVE AND TECHNICAL COMMISSION OF COMMUNICATIONS AND TRANSIT OF THE LEAGUE OF NATIONS has, among other phases of the question, taken up the study of uniformity in buoyage, and appointed a small COMMITTEE OF THE SUB-COMMISSION ON “ PORTS AND MARITIME NAVIGATION ”, to have charge on this study, which Sub-Commission is now in co-operation with the International Hydrographic Bureau. It intends to hold its next meeting under the auspices of the League of Nations, at Monaco, November, 1925, in order to avail itself of the data which this bureau has at its disposal. If it is decided to call an International Conference on the question of uniformity in buoyage and buoy lighting, this Bureau will, if directed by the States Members, take the necessary steps. Meanwhile it has been thought advis-

able by the Directing Committee to publish the following compilation of the proposals, discussions, and conclusions of the various international assemblages which have so far dealt with this question, supplementing it with such comments as the Directing Committee feels it should make. A study of this Bureau's "*Tabulation of the Buoyage and Buoy Lighting Systems of the World*", printed for it through the courtesy of the HYDROGRAPHIC OFFICE of the U. S. NAVY DEPARTMENT, is a necessary preliminary to a comprehension of the difficulties involved. It is therefore, considered important to give herewith a list of nautical works of reference, and the authorities consulted in the compilation of the Tabulation.

II. — AUTHORITIES QUOTED IN COLLATING EXISTING SYSTEMS.

A list of the nautical publications which were used in compiling the Tabulation follows herewith, together with pages of reference. Other authorities might have been used, such as the various laws and regulations of the different countries defining their systems of buoyage ; a few of the works enumerated are not the most modern ; but those in the list were selected because they contained full descriptions and illustrations more suitable for the purpose of tabulation.

COUNTRIES	REFERENCE'S DOCUMENT	LAST PAMPHLET OF CORRECTIONS ISSUED	PAGES
ARGENTINE	South America Pilot (G. B.) Vol I, 1922.		42-44
AUSTRALIA	Victoria General Notices to Mariners, 1918.		43
	Australia Pilot (G. B.) Vol. I, 1918.	Nº 6 - 1924	10-11
	Australia Pilot (G. B.) Vol. II, 1918. Australia Pilot (G. B.) Vol. III, 1924.	Nº 5 - 1923	21 17
BELGIUM	North Sea Pilot (G. B.) Vol. IV, 1921.	Nº 2 - 1924	23
	Instructions Nautiques (F.) Nº 855 (Mer du Nord, Partie Sud).		
BRAZIL	Elenco de Faroos, 1917.		XVII-XX
	South America Pilot (G. B.) Vol. I, 1922.		41-42

COUNTRIES	REFERENCE'S DOCUMENT	LAST PAMPHLET OF CORRECTIONS ISSUED	PAGES
BRITISH INDIA & STRAIT SETTLE- MENTS	Bay of Bengal Pilot (G. B.) 1921. Instructions Nautiques (F.) N° 311 (Mer de Chine).	N° 2 - 1923	89-90
			14-15
CANADA	St. Lawrence Pilot (G. B.) Vol. I, 1916.	N° 7 - 1924	32-34
CHILE	Derrotero Chileno, Vol. II, 1908.	1913, corrigé au 2-7-1942	40-45
CHINA	List of Lights, Chinese Maritime Customs, 1921.		8-9
DENMARK	Den Danske Lods, 1919. Den Danske Sømaerker, 1922.	N° 2 - 1923	45-47 4-7-8-9 10-11
DUTCH EAST INDIES	Eastern Archipelago Pilot (G. B.) Vol. II, 1923.	N° 1 - 1924	10-11
EGYPT	Red Sea and Gulf of Aden Pilot (G. B.) 1921.	N° 3 - 1924	35
FRANCE	Etat du Balisage des côtes de France. 1915. Instructions Nautiques (F.) N° 983 (Côte Nord de France) 1920.	31 Déc. 1920	6-7 & pl. I
			32
GERMANY	Baltic Pilot (G. B.) Part II, 1914. Instructions Nautiques (F.) N° 855 (Mer du Nord, Partie Sud). Den Danske Lods, 1919. North Sea Pilot (G. B.) Part IV, 1921.	N° 8 - 1924 N° 2 - 1923 N° 2 - 1924	20-24
			49-50
			25-27
GREAT BRITAIN.	North Sea Pilot (G. B.) Vol. II, 1923.		16-17
ITALY	Elenco dei Fari e Signalamenti Ma- rittimi, Vol. I, 1924.		IX-XIV
JAPAN	Liste des Feux Japonaise, 1923. Japan Pilot (G. B.) 1914.	N° 4 - 1920	5
			25-26
MEXICO	West Indies Pilot (G. B.) Vol. I, 1923.	N° 1 - 1924	44
NETHERLANDS ..	Betonningsstaat van Nederland, 1924		1
NORWAY	Norway Pilot (G. B.) Vol. II, 1915.	N° 8 - 1924	20
PORTUGAL	West coast of Spain and Portugal Pilot (G. B.) 1921. Convencões para os desenhos de Trabalhos hidrograficos, 1914.	N° 3 - 1924	Various
			6

NOTE.

It having been realised that the absence of the charts tabulating the systems of buoyage detracted from the value of this Summary of Data, they have been inserted though this has slightly delayed the issue of the HYDROGRAPHIC REVIEW.

COUNTRIES	REFERENCE'S DOCUMENT	LAST PAMPHLET OF CORRECTIONS ISSUED	PAGES
RUSSIA :			
Baltic. { Esthonia. Lithuania Finland.. }	Baltic Pilot (G. B.) Vol. II, 1914.	N ^o 8 - 1924	24-25
Black Sea and Sea of Azov	Black Sea Pilot (G. B.) 1920.	N ^o 4 - 1924	48
Siberia-Kamchatka	Bering Pilot (G. B.) 1920.	N ^o 3 - 1924	67-68
SPAIN	Bay of Biscay Pilot (G. B.) 1921.	N ^o 3 - 1924	15-16
SWEDEN.....	Den Svensk Lots, 1920.		21
	Baltic Pilot (G. B.) Vol. II, 1914.	N ^o 8 - 1924	18-20
	Den Danske Lods, 1919.	N ^o 2 - 1923	47-48
TURKEY.....	Black Sea Pilot (G. B.) 1920.	N ^o 4 - 1924	47-48
U. S. A.....	Pacific Coast of the U. S. Pilot (C. and G. S.) 1917.	10 Sept. 1917	19

III. — TABULATION OF THE BUOYAGE & BUOY LIGHTING SYSTEMS OF THE WORLD. (3 CHARTS).

There are three charts, with explanatory notes only, to accompany this Summary of data, showing in parallel columns the systems of Buoyage & Buoy Lighting in actual use in different countries (or geographical sub-divisions of countries) of the world. Of these only seven use the Compass or Cardinal system of Buoyage, either in conjunction with the Lateral system, or without using the Lateral system. These countries are Norway, Sweden, Northern Russia (2 different systems), Germany, Italy and Turkey. The countries which use only the Lateral system are Argentine, Australia (3 different systems), Belgium, Brazil, British Isles (2 different systems), British India & Strait Settlements, Canada, Chile, China, Denmark, Dutch East Indies, Egypt, France, Japan, Mexico, Netherlands, Portugal, Southern Russia, Spain, and the U. S. of America.

These charts will not be issued, however, with this summary in the "*Hydrographic Review*", but only with its separate publication

where it is intended for a study as a preliminary to, or for use in, any International Conference that may be called. They were printed for this Bureau by the Hydrographic Office of the U. S. Navy in fulfilment of an offer made by the American Delegate to the St. Petersburg Conference, in 1912, to bring up-to-date a similar chart issued in 1902. They are to receive wide publicity by being printed as a supplement to accompany the monthly U. S. Hydrographic Pilot Charts of the five different oceans for the months of June, July and August, 1925.

The Tabulation of the Systems of Buoyage gives no idea of the total number of navigational marks each country provides in the way of light vessels, buoys, beacons, lighted buoys and range marks, nor the spare ones required to be kept on hand to take their places in case of an emergency, or for occasional cleaning or overhauling. For instance, the U. S. Lighthouse Establishment had in 1922 a total of 16,373 navigational marks, exclusive of lighthouses and lighted beacons. Attention is called to this to illustrate that any proposals to adopt a universal system of buoyage and buoy lighting must take into consideration the cost to each country concerned, which cost is necessarily proportional to the number of navigational marks involved. Information has been requested from the various Governments as to the following data :--

I. — Unlighted Buoys.

List (a) Number of buoys actually in position for navigational purposes.

List (b) Spare buoys on hand for replacement for any purpose.

NOTE: Each List should be subdivided so as to show buoys of the following characteristics separately :--

1. Conical,
2. Cylindrical,
3. Spherical,
4. Spar,
5. Bell,
6. Whistling,
7. Special types,
8. Wreck or Obstruction,
9. Submarine Bell.

II. — Lighted Buoys.

List (a) Number of buoys actually in position for navigational purposes.

List (b) Spare buoys on hand for replacement for any purpose.

NOTE : Please state in each case the colour of the light which the buoy displays.

Each List should be subdivided so as to show buoys with the following characteristics separately :—

1. Conical,
2. Cylindrical,
3. Spherical,
4. Spar,
5. Bell,
6. Whistling,
7. Special types,
8. Wreck or Obstruction,
9. Submarine Bell.

III. — Light Ships.

List (a) Number of Light Ships actually in position.

List (b) Number of spare or relief Light Ships.

It is hoped that these data will be available later, in printed form, for study in connection with other data for any conference which may be called to consider the question of uniformity in buoyage and buoy lighting, and the representatives who come from each country to such conference would be expected to bring these data, in case it should not have been previously sent in to this Bureau for tabulation and consideration.

IV. — HISTORY & CHRONOLOGY.

An Inter-Departmental Conference for GREAT BRITAIN AND IRELAND arranged by the CORPORATION OF TRINITY HOUSE, was held in LONDON, in 1882-3, to study the question of uniformity in buoyage. The Conference was presided over by H. R. H. THE DUKE OF EDINBURGH, and various propositions as to the lateral and cardinal (or compass) systems were advanced. The final results are recorded in Parliamentary Paper C. 3622, 1883, in the form of a "*Uniform System of Buoyage for the United Kingdom*", which System was officially adopted May 1st, 1883, and was as follows :—

" 1. — The mariner when approaching the coast must determine his position on the chart, and must note the direction of the main stream of flood tide.

" 2. — The term Starboard Hand shall denote that side which would be on the right hand of the mariner either going with the main stream of flood or entering a

harbour, river or estuary from seaward ; the term Port Hand shall denote the left hand of the mariner under the same circumstances.

“ 3. — Buoys showing the pointed top of a cone above water shall be called Conical, and shall always be Starboard-Hand buoys, as above defined.

“ 4. — Buoys showing a flat top above water shall be called Can, and shall always be Port Hand buoys as above defined.

“ 5. — Buoys showing a domed top above water shall be called Spherical, and shall mark the ends of middle ground.

“ 6. — Buoys having a tall central structure on a broad base shall be called Pillar buoys, and like other special buoys such as Bell buoys, Gas Buoys, Automatic Sounding buoys, etc. etc., shall be placed to mark special positions either on the coast or in the approaches to harbours, etc.

“ 7. — Buoys showing only a mast above water shall be called Spar buoys.

“ 8. — Starboard Hand buoys shall always be painted in one colour only.

“ 9. — Port Hand buoys shall be painted of another characteristic colour either single or parti-colour.

“ 10. — Spherical buoys at the ends of middle grounds shall always be distinguished by horizontal stripes of white colour.

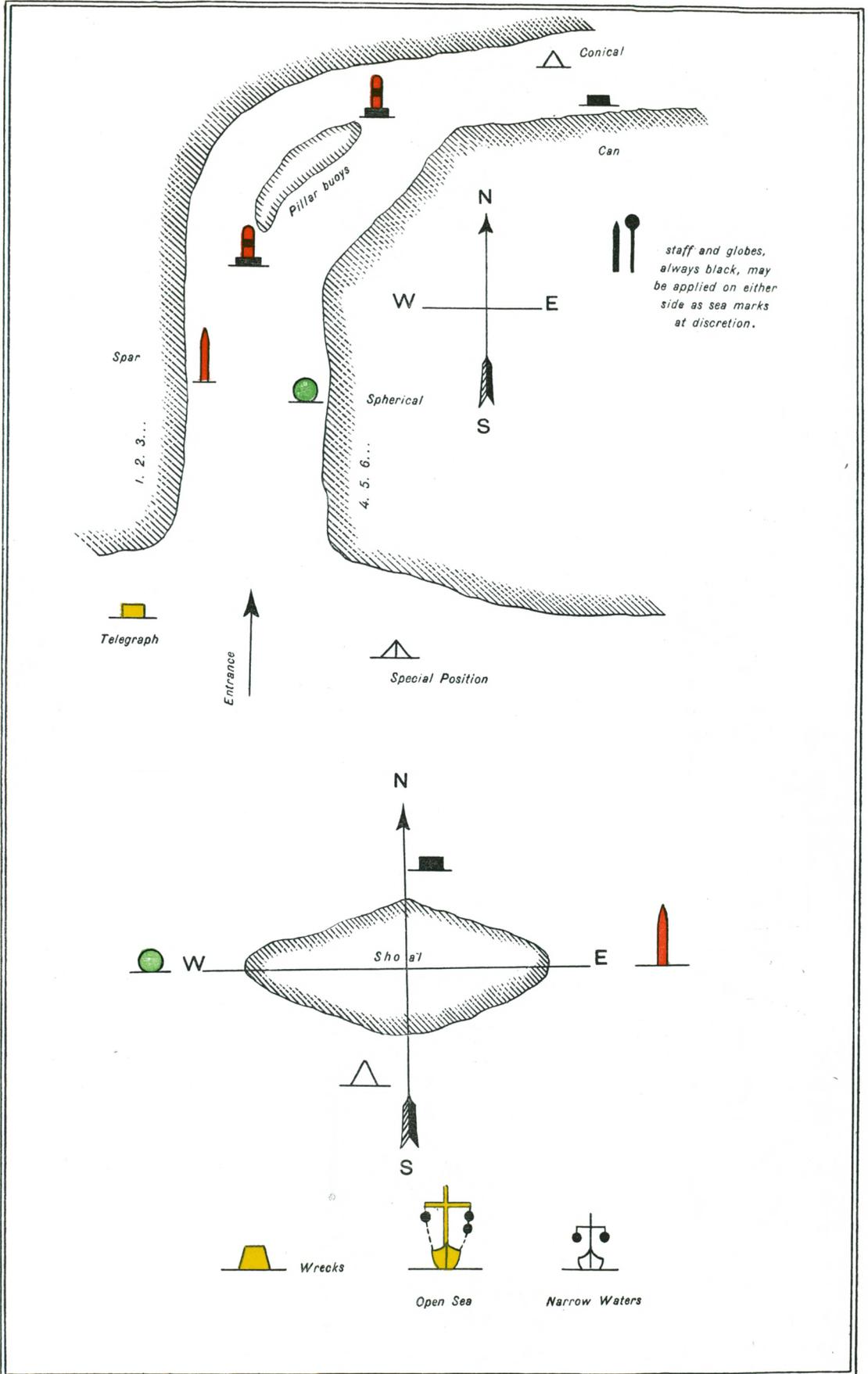
“ 11. — Surmounting beacons such as Staff and Globe, etc., shall always be painted one dark colour.

“ 12. — Staff and Globe shall only be used on Starboard Hand buoys ; Staff and Cage on Port Hand ; Diamonds at the outer ends of middle grounds, and Triangles at the inner ends.

“ 13. — Buoys on the same side of a channel, estuary, or tide way, may be distinguished from each other by names, numbers or letters and where necessary by a staff surmounted with the appropriate Beacon.

“ 14. — Buoys intended for Moorings, etc., may be of shape or colour according to the discretion of the Authority within whose jurisdiction they are laid, but for marking Submarine Telegraph cables the colour shall be green, with the word *Telegraph* painted thereon in white letters. ”

The “*Annalen der Hydrographie*”, in 1887, published in Germany a proposed system of buoyage based on compass bearings using a combination of different forms and colours, and, on July 1st, 1887, and April 1st, 1889, the German Government published regulations establishing a new System of Buoyage. About this time, the U. S. Lighthouse establishment published a pamphlet entitled the “*Law of Beacons, Buoys and other Day Marks*” and Mr. S. A. PHILIPSEN, a Danish Expert, published a pamphlet entitled “*The Beaconage and Buoyage of different Nations*”, containing proposals which were laid before the “*Second Conference of Maritime Countries of the North*”, held in COPENHAGEN in September, 1888, and at which the Delegates from Sweden, Norway, Finland and Denmark were assembled. Mr. PHILIPSEN also attended the International Maritime Conference at Washington, October-December, 1889, where he communicated



the same scheme of buoyage. It was carefully studied by the Conference and is given herewith, with accompanying plan.

“ 1. — The mariner approaching the coast must determine his position on the chart, and must note the direction of the main stream flood-tide.

2. — The term “starboard hand” shall denote that side which would be on the right hand of the mariner, either going with the main stream of flood, or entering a harbour, river or estuary from seaward.

The term “port hand” shall denote the left hand of the mariner under the same circumstances.

3. — Buoys showing the pointed top of a cone above water shall be called “conical” and shall always mark the north side of the channel.

4. — Buoys showing a flat top above water shall be called “can”, and shall always mark the south side of the channel.

5. — Buoys showing a domed top above the water shall be called “spherical” and shall always mark the east side of the channel.

6. — Buoys showing only a mast above water shall be called “spar-buoys”, and shall always mark the west side of the channel.

7. — Buoys having a tall central structure on a broad base, shall be called “pillar-buoys”, and shall mark the outer and inner ends of middle-grounds.

8. — Buoys having a round “conical” structure on a domed “spherical” base shall, like other special buoys, such as bell-buoys, gas-buoys, automatic sounding-buoys, be placed to mark special positions either on the coast, or in the approaches to harbours, river inlets, etc.

9. — Conical buoys, marking the north side of the channel (south side of the shoal), shall always be of white colour.

10. — Can-buoys, marking the south side of the channel (north side of the shoal) shall always be of black colour.

11. — Spherical buoys, marking the east side of the channel (west side of the shoal), shall always be of green colour.

12. — Spar-buoys, marking the west side of the channel (east side of the shoal), shall always be of red colour.

13. — Pillar-buoys, marking inner and outer ends of middle grounds, shall be distinguished by horizontal stripes of black and red colour.

14. — Buoys placed to mark special positions shall be painted in black and white perpendicular stripes.

15. — Surmounting beacons such as staff and globe, etc. shall always be painted of one black colour; they may be applied on either side on the channel seamarks at the discretion of the authority having jurisdiction, e. g. as in section 12, “Uniform System of Buoyage for the United Kingdom”.

16. — Buoys on the same side of a channel, estuary, or tide-way may be distinguished from each other by names, letters or numbers; even numbers 2, 4, 6 &c on the starboard or right hand side and odd numbers, 1, 3, 5, &c on the port or left hand side from seaward.

17. — Buoys intended for moorings, &c., may not be of shape and colour like the sea-marks above described.

18. — Buoys for marking submarine telegraph cables shall be of yellow colour, with the word “Telegraph” painted thereon in black letters. ”

THE INTERNATIONAL MARINE CONFERENCE AT WASHINGTON,
October-December, 1889.

The Washington Conference considered, besides the proposal of Mr. Philipsen, a scheme proposed by Lieut. M. L. WOOD, U. S. Navy, then on duty in the U. S. COAST & GEODETIC SURVEY OFFICE, as shown in plan, as well as one proposed by Ensign George P. BLOW, U. S. Navy, then in charge of the Branch Office in NEW YORK, which is also shown on a plan. Various other suggestions were considered, including a uniform system of marking wrecks by buoys and lights. The discussions and proposals of this important Conference are given herewith. It will be noted that it advocates the general adoption of (a) a Lateral system of buoyage ; (b) a Cardinal (or Compass) system of buoyage under certain conditions, and (c) a uniform system of marking wrecks : —

“ A uniform system of buoys and beacons ”.

“ (a) Uniformity in colour of buoys.

(b) Uniformity in numbering of buoys ”.

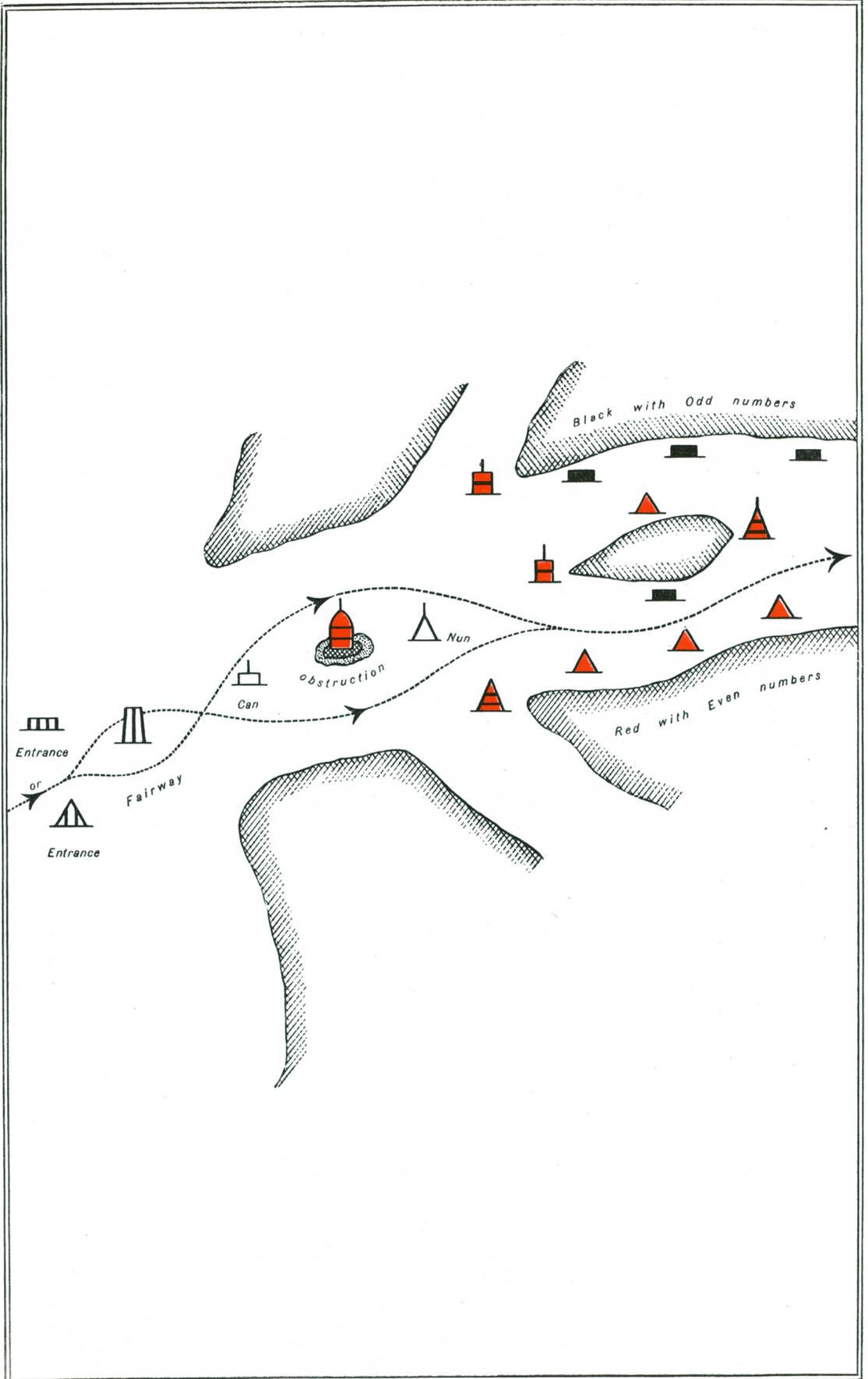
“ Owing to the absence of a uniformity in buoyage, mariners, up to very recent times, seldom attempted to navigate a district by means of the buoyage unless they were specially well acquainted with the local system. But now that a certain degree of uniformity on a fundamental basis prevails, mariners in general are more induced to navigate their vessel, trusting to it and the chart of the district ; it therefore becomes of greater importance that such uniformity should be extended as far as possible.

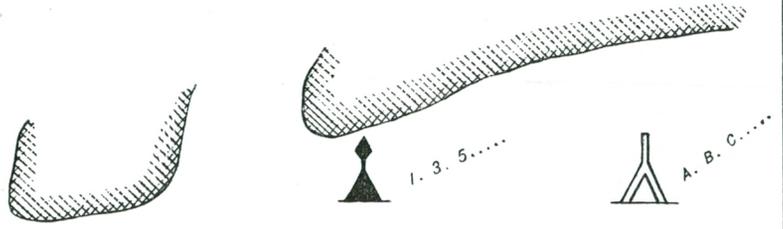
“ Two principal characters are used for distinguishing buoys and beacons— colour and shape.

“ The first object to be attained, from an international point of view, is uniformity. For that purpose colour is the best means, as applying to all systems of whatever kind, while the shape admits numerous exceptions. The colour is also applicable in all countries and with little expense, whereas the immediate adoption of shape would involve changes of several existing systems. Moreover, experience has proved that very many, if not the majority of channels, are now buoyed with sufficient distinctness without resorting to difference of form.

“ For these reasons, and while the opinion prevails that at night and in thick weather difference in form is a better means of distinction than difference in colour, your Committee advise that uniformity in colour should be adopted as a general rule, and that the use of shape should remain optional.

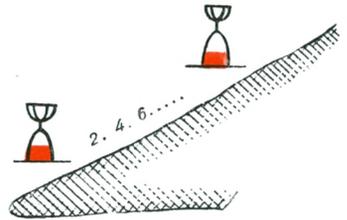
“ While, in the opinion of some members, the single colours of black and red are not so distinctive in contrast as a single colour used in connection with a parti-colour, experienced gained in many buoyage districts, and particularly where used in conjunction with form, has proved that these dark colours are sufficiently distinctive for the safe navigation of districts where a more complicated system is not necessary. Single-coloured buoys are also more readily and cheaply repainted than parti-coloured buoys.



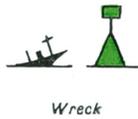


Moorings } White with
Black letters

Mid - Channel

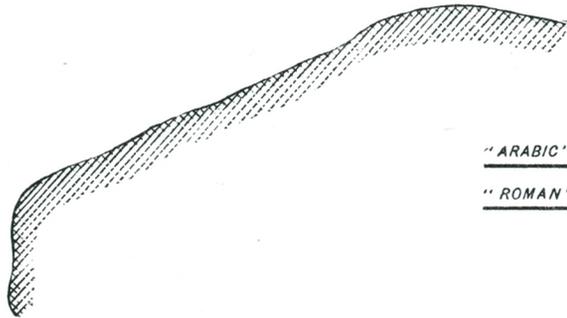


Name in
Large white
letters }
obstruction



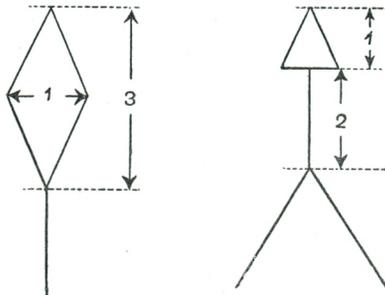
Entrance →

Yellow with
Black letters } Quarantine



"ARABIC" numbers

"ROMAN" letters



Size of topmarks.

We therefore recommend that the largely used red and black colours should be adopted generally for marking respectively the starboard and port sides of single channels.

Many districts, however, require a more complicated system of buoyage to identify the several neighbouring channels one from the other, such as the entrances of rivers with numerous channels like the Thames, the outlying shoals off the coast of the North Sea, the numerous shoals separated from each other by complicated channels such as in the Baltic Sea, etc..

In some such districts a parti-coloured buoy is used, with much advantage, as a port-hand buoy. In a few — notably in England — a single black colour is used as a starboard-hand buoy. Inasmuch as a single black colour is in general use as a port-hand buoy in neighbouring districts visited by the same shipping, we suggest that the authorities of such countries should be invited to consider the great general advantage to shipping that would result from the adoption of uniformity in colour, by discontinuing this dangerous custom of using a black colour to denote a starboard-hand as well as a port-hand buoy.

In some countries white is used as a distinctive colour, and with advantage when contrasted with a dark background. As this practice cannot lead vessels into danger, we hesitate to advise that it should be compulsorily interfered with.

“ We are of opinion that were form is adopted, the two shapes, “conical” and “can”, are appropriate for marking the starboard and port sides of a channel, a spar-buoy taking the place of the can in certain cases.

“ These forms are practically used in the United States, Germany, Canada, India and Great Britain. But the various countries are not all in agreement as to which side of the channel is to be marked by a conical buoy, and which by a can or spar buoy.

“ It follows that one or more of the countries would necessarily have to rearrange their system, but, if the work were done gradually, the Committee believe that this could be performed at a minimum of expense in no way comparable with the great advantage that would result to navigation.

“ In connection with such a change of system we are informed that an extensive rearrangement in buoyage was recently carried out Great Britain, the different shapes being changed from one side of the channels to the other side, the change being brought about without any casualty to navigation.

“ As regards top-marks, we recommend that those countries whose buoyage is based on colour alone should, whenever top-marks are used to denote sides of a channel, use conical or can-shaped marks on the existing buoys or beacons.

“ We are of opinion that the mode of distinguishing buoys from each other by names, numbers, or letters should be left to the decision of the various countries, but that all numbers and letters should be in consecutive order, commencing at the seaward end of the district.

“ The Committee are of opinion that districts where the buoyage is so complicated as to have led the authorities to adopt a compass-system of marking, such as in the Baltic Sea, cannot, with a view to general uniformity, be coupled with the simpler system found sufficient elsewhere; they therefore hesitate to recommend a fundamental change in such districts. But, after studying the “Sailing Directions” and the publication of Mr. S. A. Philipsen, Copenhagen, on “Beaconage and Buoyage of Different Nation”, which presents graphically the plans adopted by several nations, particularly those interested in the navigation of the Baltic Seas, the Committee find that the systems

now in use, so far as colour and top-marks are concerned, are so similar that they recommend the Conference to suggest to the countries interested the desirability of the adoption of one uniform system, at least as regards colour.

“ Owing to the difficulty in choosing a fourth single colour — green being universally used to denote a wreck — it practically becomes necessary, in arranging for a general system, if four distinct modes of colouring are adopted to mark the four cardinal bearings of or from a shoal, to resort to one or more parti-colours to be used in conjunction with red, black and white.

“ On the principle of using four colours to mark the four sides of a shoal, the Committee put forward the following scheme, based on the least change that would be necessary in altering the present systems to a uniform plan ; and they recommend the Conference to bring it to the notice of the countries interested, as an example, showing that uniformity is attainable if they will agree to consider the subject :

“ All shoals, marked on the compass system, to be marked —

“ On the *north* side by a single black or white colour.

south side by red.

east side by half red and half white combined.

west side by half white and half black combined.

“ On rocks in *fairway*, with channels on either hand, to be marked black or red, with horizontal bands.

“ If such colours were adopted, then the following changes of colour would be necessary :

“ The marks on the *north* side of a shoal would remain coloured black or white, as they now are in all countries using the compass system.

“ The marks of the *south* side of a shoal would, in —
Norway, have to be changed from white to red.

“ The marks on the *east* side of a shoal would, in —
Norway, have to be changed from black to half red and half white.
Sweden have to be changed from black and white to half red and half white.
Denmark, have to be changed from red to half red and half white.

“ The marks on the *west* side of a shoal would, in —
Norway and Denmark, have to be changed from white to half white and half ” black.

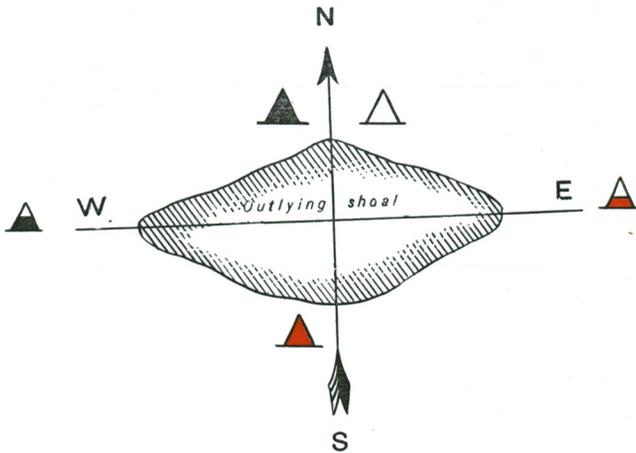
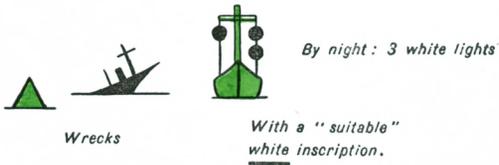
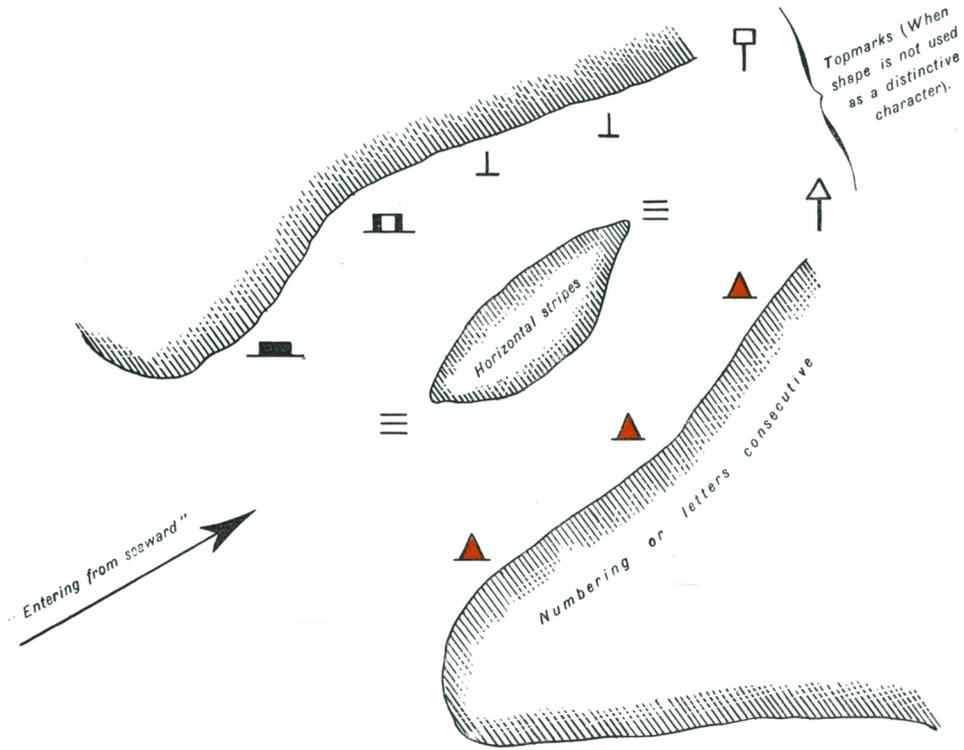
Sweden have to be changed from red to half white and half black.

Finland, have to be changed from white and red to half white and half black.

“ The marks on a rock in *fairway* with channel on either side, if a white horizontal band is generally adopted, would, in Russia, have to be changed from black to black or red with white horizontal bands, in agreement with other countries.

“ The Committee advise the Conference to invite the various Powers interested to consider the following general principles, which they put forward as a basis on which to build up a uniform international buoyage system for districts other than those where the compass system is in use :—

“ The term “ *starboard hand* ” shall denote that side of a navigable channel which is on the right hand of the mariner entering from seaward ; the term “ *port hand* ” shall denote that side which is on the left hand under the same circumstances.



(Compass System)

“ *Colour.* — Buoys defining the starboard hand shall be painted a single red colour.

Buoys defining the port hand shall be painted a single black colour or a particolour.

Buoys defining middle-grounds shall be painted with horizontal bands.

“ *Form.* — Wherever form is used as a distinctive character :—

Buoys defining the starboard hand shall be conical, and those defining the port hand shall be can or spar.

“ *Top-marks.* — Countries where form is not used as a distinctive character for buoys may adopt as another distinctive feature for the buoys on either side of a channel, top-marks resembling a cone, to be used on the starboard side, or a cylinder on the port side of a channel.

“ *Numbers and Letters.* — Numbers, letters, and names may be painted on the buoys, but they must never be so large as to interfere with their distinctive colouring.

Wherever numbers and letters are used, they shall be in consecutive order, commencing from seaward.

“ *Buoying and Marking of Wrecks.* — (a) All buoys and the top sides of vessels used for the marking of wrecks shall be painted green, with a suitable white inscription.

(b) Where it is practicable, by day, one ball shall be exhibited on the side of the vessel nearest the wreck, and two placed vertically on the other side ; three fixed white lights similarly arranged, but not the ordinary riding light, shall be shown from sunset to sunrise. ”

It is important to note that the question of Buoyage was only one of many very important subjects which were considered at the Washington Conference, as the following will show :—

Agenda of the Washington Conference.

- I. Rules for the Prevention of Collisions and Rules of the Road.
- II. Regulation to determine the Sea-worthiness of Vessels.
- III. Draft to which Vessels should be Restricted when Loaded.
- IV. Uniform Regulations regarding the Designating and Marking of Vessels.
- V. Saving Life and Property from Ship-wreck.
- VI. Necessary Qualifications for Officers and Seamen, including tests for Sight and colour Blindness.
- VII. Lanes for Steamers on Frequented Roads.
- VIII. Night Signals for Communicating Information at Sea. (Additions to the International Code Signal Book).
- IX. Warnings of Approaching Storms.
- X. Reporting, Marking and Removing Dangerous Wrecks or Obstructions.
- XI. Notices to Mariners.
- XII. A Uniform System of Buoys & Beacons.
- XIII. Establishment of a Permanent International Maritime Commission.

The Conference adopted resolutions giving satisfactory solutions to all the above questions excepting the following particulars:—

(a) In regard to N° VIII, it adopted all the proposals for modifications of the International Signal Code Book, but declined to recommend a "Revised Edition".

(b) The limit proposals of N° IX were adopted, but the Conference voted "to invite the maritime countries interested to take into consideration the establishment of a uniform system of indicated Storm Warnings by day and by night, and that such a system should, as far as possible, include signals indicating whether the storm is approaching or has passed the station".

(c) N° XIII, proposing the establishment of a permanent International Maritime Commission, was not adopted.

In 1890, the French and American Governments officially adopted the proposals of the Washington Conference as to buoyage, and, in 1891, the Corporation of Trinity House called a British Inter-departmental Conference on this subject and adopted the system of wreck marking, which has remained up to the present with only slight modifications. The report of this Conference and this action may be found in Parliamentary Paper C.6615-1892.

In 1901 a Maritime Conference, held at Monaco, resulted in recommendations as to terminology or definition of lights for coastal and harbour lighting.

In 1902, the U. S. Hydrographic Office, Washington, published a supplement to its Pilot Charts showing a tabulation by Capt. T. A. KEARNY, U. S. N., entitled a "*Uniform System of Buoyage as Adopted by Various Nations*". This gave the results, up to that time, of the action taken by various Governments on the recommendations of the Washington Conference.

In November, 1907, Regulations putting into effect the recommendations of the Washington Conference were published in SPAIN.

In May, 1908, at the XIth Congress of Navigation, held at ST. PETERSBURG, the Russian Admiralty proposed to extend the programme of the Congress to questions relating to security of navigation, but the action of the Congress at its final meeting was to propose (1) that the question should be submitted to the initiative of a Government, which might well be the Government of Russia, to call an international conference composed of mariners and civilian engineers; (2) that this question should be taken up again at the next Congress.

The Russian Government then prepared an Agenda for, and took the initiative in calling, an International Maritime Conference at St. Petersburg, March, 1912, and it invited the nations which had taken part in the said XIth Congress of Navigation of 1908, as follows, — Germany, United States, Belgium, Denmark, Spain, France, Greece, Italy, Japan, Monaco, Norway, the Netherlands, Portugal, Sweden and Turkey. The above countries were the only ones which sent representatives.

THE INTERNATIONAL MARITIME CONFERENCE, ST. PETERSBURG

12th to 18th March, 1912.



AGENDA.

I. — Sailing Directions & Notices to Mariners.

- (a) A Uniform System of issuing Notices to Mariners.
- (b) A Uniform System of drawing up Sailing Directions.
- (c) Certain other desirable international publications :—
 1. Comparative Dictionary in parallel columns of technical expressions used on charts, in Sailing Directions and in Notices to Mariners.
 2. Comparative Tables in parallel columns of conventional Symbols and the different designations found on charts, with explanatory text.

II. — Charts.

1. Inscriptions on Charts.
2. Natural and linear scale.
3. Designations of meridians and parallels.
4. Linear measurements on charts.
5. Planes of reference for depths and heights.
6. Systems of designating the ranges, colours and characters of lights.
7. The designation of bearings.
8. Magnetic declination and the Compass Rose.
9. Currents & Tides.
10. Submarine Relief.
11. The representation of channels and courses recommended.
12. Topography on charts.
13. Conventional lettering and Symbols.
14. Various methods of chart printing.
15. The transcription of Russian names in Roman characters.

III. — Buoyage.

1. Uniformity of the colouring of sea-marks.
2. Uniformity of the numbering of sea-marks.

3. Uniformity of the shape of sea-marks.
4. A uniform system of marking dangers (according to the compass or otherwise).
5. A uniform system of buoyage for channels, canals, and entrances to harbours (with the exception of internal waters).
6. A uniform system of wreck marking.
7. A uniform system for marking telegraph and telephone cables.
8. The uniformity of colour and character of light sectors marking safe channels.
9. Uniformity of colour and character of lighting for marking danger-sector on each side of a safe sector.

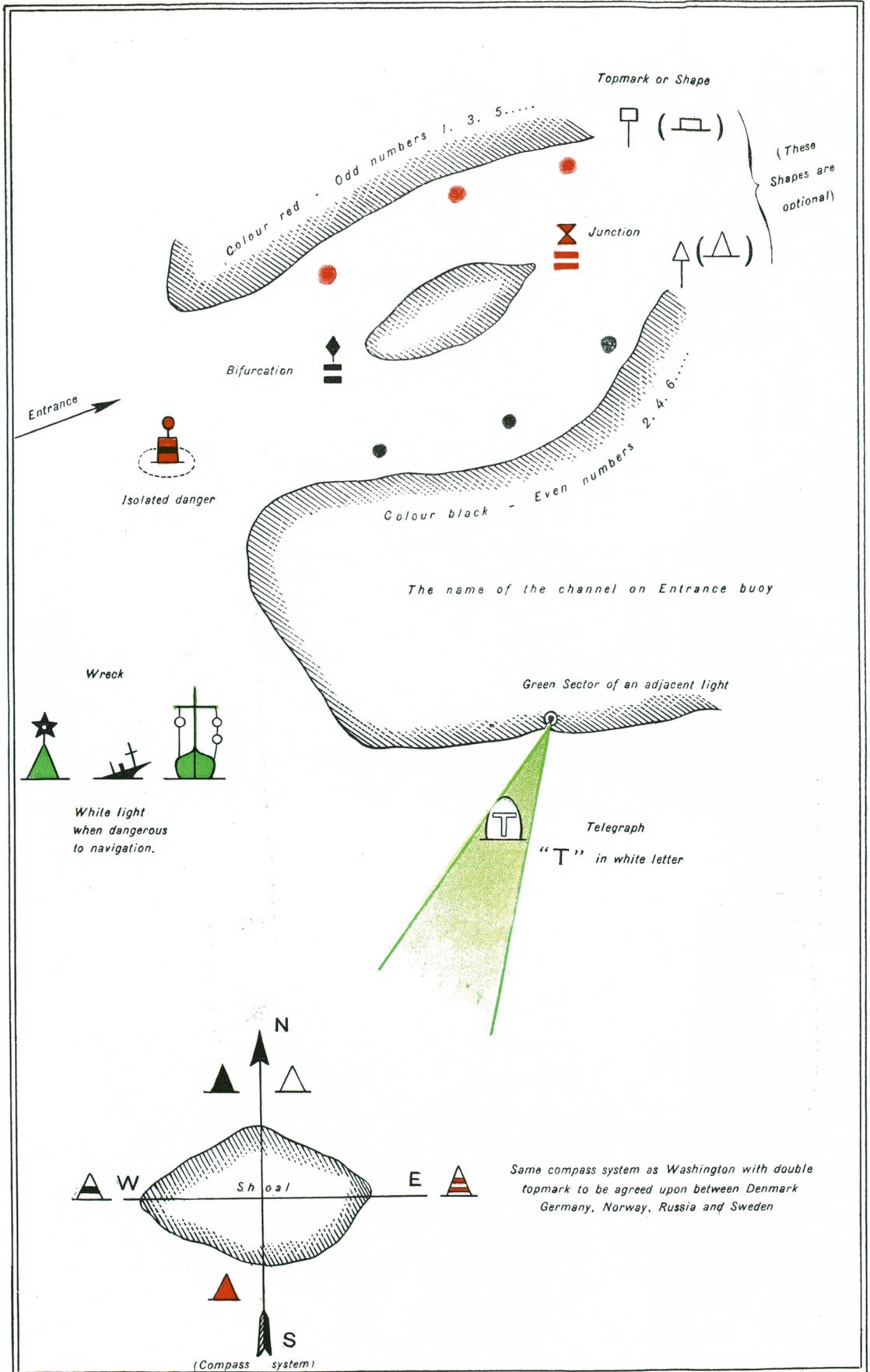
The Conference approved of the recommendations of the Committee which considered Section I of the Agenda except those portions which were in conflict with the resolutions of the International Marine Conference of Washington, 1889, and those of the International Maritime Conference at Monaco, 1901 ; it also approved of the recommendations of the Committee which considered Section II of the Agenda on the subject of Charts. The detailed recommendations of the Committee which considered Section III, on the subject of Buoyage, may be summarised as follows : —

1. *Uniformity of colour.* — The Conference completely reversed the colours adopted by the Washington Conference.

2. *Uniformity of numbering.* — The Conference of Washington had simply recommended that numbers or letters were used on buoys, should be in consecutive order commencing from sea-ward. This Conference recommended that it would be desirable to use numbers only, by placing uneven numbers on the port-side, and even numbers on the starboard-side, it being understood ; (1) that the names of the Channels should, as far as possible, be put in full — at any rate on buoys placed at the extremity of channels (coming in from seaward) ; (2) that, if there exist several channels of approach to a port, the name of the channel, or at least the first letter of its name, should be put on all buoys in the channel.

3. *Uniformity of form.* — This Conference left the question of shape optional, as did the Washington Conference, but reversed the side of the channel on which cylindrical or spar and conical buoys should be placed.

4. *A uniform system of buoyage of dangers.* — This Conference adopted the Compass, or Cardinal, System, using top-marks on all buoys or beacons composed as far as possible of two signals of the same nature, super-imposed so as to ensure the greatest visibility.



5. *A uniform system of buoyage.* — This Conference adopted the same system as the Washington Conference, but, as previously stated, reversed the colours and the forms on each side of the channel, and added three additional buoys — (1) Bifurcation, (2) Junction, and (3) Isolated Dangers, all three having special top-marks to aid in their identification. They left the question of top-marks for channel buoys in the Lateral system exactly where the Washington Conference left it, as follows : —

“ As regards top-marks, recommend that those countries whose buoyage is based on colour alone should, whenever top-marks are used to denote sides of a channel, use conical or can shape marks on the existing buoys or beacons ”.

Also —

“ Countries where the shape of buoys is not employed with a distinctive character can adopt, as a distinguishing mark on buoys on either side of a channel, topmarks which should be conical to starboard and cylindrical to port ”.

6. *Wreck marking.* — This Conference retained the same system as was recommended by the Washington Conference, but prescribed that, —

“ Where buoys only are used for marking wrecks, to fit these buoys with a white light when the wreck marked constitutes a danger for navigation ”.

7. *Telegraph and Telephone Cables.* — This Conference recommended : (1) To mark the line of these cables by buoys or beacons marked plainly with a letter “T” painted in white ; (2) to adopt the colour green for luminous sectors, which can be used for defining this line by night.

8. & 9. *Uniformity in character of lighting for safety and danger sector.* — The Conference adopted the following :

“ The Section considers that it is not possible to propose a general formula to differentiate for safe sectors and sectors covering dangers either by character of lighting or by colour ”.

The grounds on which the Committee recommended and the Conference adopted the change in the colour and shape of the Channel Buoys in the Lateral System were that, in entering from seaward under the Washington System, red buoys were found on the starboard hand, whereas the port-hand light of the ships at night is red. This was held to be liable to cause great confusion.

Among the interesting documents submitted to this Conference was "*A Comparative Table of Buoys & Top-marks used in the Buoyage of Channels, Shoals and other Dangers, adopted in Europe and North America*". This Table was prepared by Messieurs KONDRATIEFF, RUMINE & KOLOKOLTROFF.

Following the St. Petersburg Conference, on May 30th, 1913, the Spanish Government changed its Regulations for Buoyage in conformity with the recommendations of this Conference, and ITALY and PORTUGAL subsequently followed in the particular of using red conical buoys on the port-hand coming in from seaward, and black cylindrical or can buoys on the starboard-hand.

In 1913, the VIth INTERNATIONAL CONGRESS OF FISHERIES at OSTEND (BELGIUM) discussed the question of Buoyage, but arrived at no definite conclusions.

The INTERNATIONAL HYDROGRAPHIC CONFERENCE, which met in LONDON, on 24th June, 1919, did not have on its Agenda the question of Buoyage and Port Signals, but it passed a resolution expressing "the wish that the Governments of all countries shall aim at uniformity with respect to buoyage and port signals".

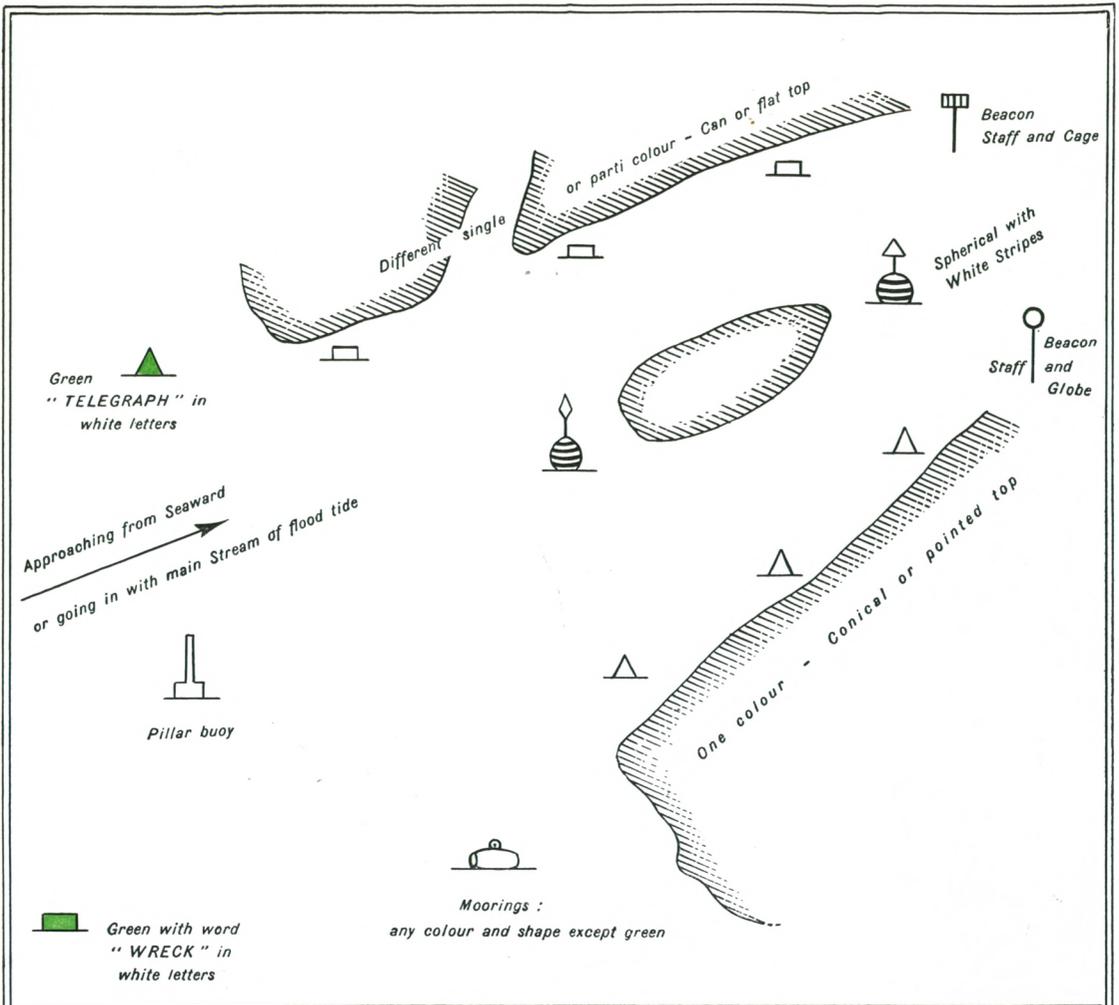
In November, 1922, an Inter-Departmental Conference was held in LONDON under the Presidency of H. R. H. THE DUKE OF CONNAUGHT, at the instance of the Board of Trade and convened by the CORPORATION OF TRINITY HOUSE, to consider the general question of the system of marking wrecks. Its recommendations were adopted by the *Corporation of Trinity House* as the General Lighthouse Authority for ENGLAND and WALES, by the *Commissioners of Northern Lighthouses* as the General Lighthouse Authority in SCOTLAND and the ISLE OF MAN, and the *Commissioners of Irish Lighthouses*, as the General Lighthouse Authority for IRELAND. The shapes and characters of wreck marking vessels, and the sound signals adopted, are given herewith.

"Shapes and Characteristics of Wreck-Marking Buoys."

" 22. When a wreck-marking buoy is used it shall be of one of the following shapes, and (if a light is carried) it shall be lighted in one of the manners following to indicate to the Mariner on which hand he should pass the buoy.

- (a) To be passed on the Mariner's Port hand —
 Shape — Can.
 Light — If lighted a Green Light giving two flashes.

TRINITY HOUSE 1882-1883 & 1891.



BRITISH WRECK MARKING SYSTEM 1922-23

	On starboard hand	On either hand	On port hand	
To be passed				In open sea
Green lights at night				
Green balls by day				
Fog signals: rung in succession every 30 sec.	3 strokes	4 strokes	2 strokes	

At discretion of local authorities provided green ball, buoy or flag is used.

In narrow waters.

- (b) To be passed on the Mariner's Starboard Hand —
Shape — Conical.
Light — If lighted a Green Light giving three flashes.
- (c) To be passed on either side.
Shape — Spherical.
Light — If lighted a Green Light giving one flash.

“Characteristics of Wreck-Marking Vessels”.

“ 23. When a wreck-marking vessel is used it shall carry the lights and shapes and give the sound signals following to indicate to the Mariner on which hand he should pass the vessel, viz. :

(1) *Lights.*

(i) Between sunset and sunrise to carry the following lights : —

- (a) To be passed on the Mariner's Port Hand —
Two green lights in a vertical line not less than 6 feet apart from the end of a cross-yard, the lower light to be of a height not less than 15 feet above the hull.
- (b) To be passed on the Mariner's Starboard Hand —
Three green lights in a vertical line not less than 6 feet apart from the end of a cross-yard, the lowest light to be of a height not less than 9 feet above the hull.
- (c) To be passed on either side —
Four green lights, two in a vertical line one over the other, not less than 6 feet apart, on each side of a cross-yard with a horizontal distance between the lights at either end of the cross-yard not less than 15 feet and not exceeding 25 feet. The height of the two lower lights to be not less than 15 feet above the hull.

(ii) A wreck-marking vessel shall not carry the ordinary riding light for a vessel at anchor.

(2) *Shapes.*

Between sunrise and sunset to carry green balls or shapes corresponding in number and arrangement to the green lights as detailed above.

(3) *Sound Signals.*

A Wreck-Marking Vessel during fog, mist, falling snow, or heavy rain storms, whether by day or night, to ring a deep toned bell at intervals of not more than 30 seconds as follows : —

- (a) To be passed on the Mariner's Port Hand —
Two strokes in succession.
- (b) To be passed on the Mariner's Starboard Hand —
Three strokes in succession.
- (c) To be passed on either side —
Four strokes in succession.

“For Narrow Waters and in Rivers, Harbours, Estuaries and the Approaches thereto”.

“ 24. (1) The Regulations for marking a wreck in the Open Sea should be followed unless the Authority having jurisdiction in the locality should in their discretion determine otherwise, but if so, the provisions of Regulations (Colour for Wreck-Marking Purposes) should be adhered to.

(2) (a) Where in the discretion of the Authority a different method of marking a wreck is adopted, the Authority in the Notice to Mariners which they publish and circulate shall describe the method of marking, with sufficient particulars to enable the Mariner to locate the position of the wreck.

(b) When a different method of marking a wreck is adopted, if any mark, light or sound signal of the description set out in Part II is used it shall have the significance attached to it in that Part”. (See plan).

In 1923, Regulations, adopting a new arrangement for marking wrecks, were promulgated in Germany. (See plan).

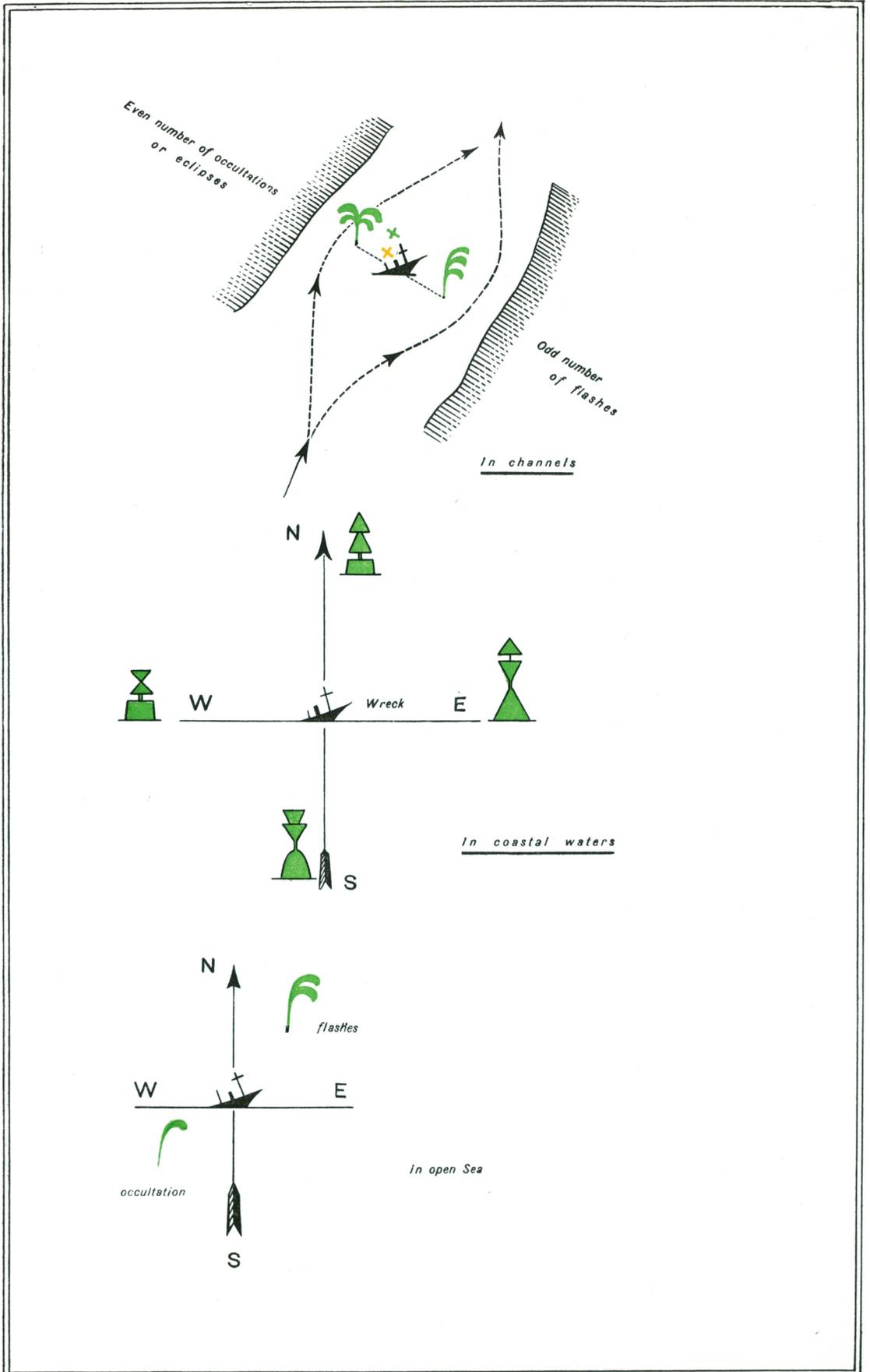
In 1923, the XIIIth INTERNATIONAL CONGRESS OF NAVIGATION was held in London, at which were considered the principal advances made in coast lighting and signalling, and the unification of the languages of maritime signalling. Its Agenda was as follows :—

- “ 1 The uses of reinforced concrete in the construction of Lighthouse towers.
2. Modern ideas on the proper length of the flashes of lights exhibited from lighthouses.
3. A uniform method of the calculation of light intensities.
4. The establishment of combined aerial and maritime light on the coast.
5. Modern lighting equipment for lightvessels.
6. The advantages and disadvantages of dissolved acetylene gas and acetylene gas generated in situ.
7. Primary fog signals and compressing plant.
8. Unwatched fog signals ashore and afloat.
9. The establishment of an International Commission to investigate and consider the most suitable Radio Direction Finding system with the consideration of the most suitable wave length.
10. The re-consideration of the international adoption of a uniform system of buoyage and day marking. ”

Of the fourteen reports, submitted to this Congress for its consideration by the States represented, the following bear directly upon the subject under discussion.

Mr. G. R. PUTNAM, Commissioner of Lighthouses of the United States, gave some interesting data as to the progress made in that country in Lights, Fog Signals, Buoys and other sea-marks in the ten years, 1912-1922, from which the following data is taken :—

GERMAN SYSTEM OF MARKING WRECKS - 1923.



For the United States (not including Philippines and the Canal Zone), June 30th, 1922 :—

Number of aids to navigation, 16,373 ; of these 5,799 are lighted, 8,436 are floating, 1,138 are fog signals including buoys which give forth sounds, and 61 light vessels.

“ There is a great difference today in the manner in which the shores of different seas are lighted. For instance, a study made of the published Light List in 1915 showed for the whole world a total of 13,226 light stations, 290 light vessels and 1,586 fog signals. Of the lights, about 10,000 were on the coasts of Europe, United States and Canada, leaving but a small proportion for all other coast. Some portions where there is considerable passing traffic, are inadequately marked at the present time. An example of international co-operation in this respect is the lighthouse on Cape Spartel, Africa, at the entrance of the Mediterranean, which is maintained jointly by the contributions of eleven nations. ”

Messieurs M. BLONDEL, Ingénieur en chef des Ponts et Chaussées, Attaché au Service Central des Phares et Balises, and A. DE ROUVILLE, Ingénieur en chef du Service des Phares et Balises (FRANCE), submitted a joint paper in which a number of proposals were :—

<i>Port</i>	Red buoy, with red light or red beacon, cylindrical top-mark.
<i>Starboard</i>	Green buoy, with green light or green beacon, conical top-mark.
<i>Bifurcation</i>	Red and White buoy, with red light — or white preferably, top-mark of two red cones with common base.
<i>Junction</i>	Green and white buoy, with green light — or preferably white, top-mark of two green cones, point to point.
<i>Isolated Danger</i> .	Red and green buoy, with white light preferably, red spherical top-mark.
<i>Wrecks</i>	Black buoy with white light. Top-mark of an appropriate shape in the manner directed or recommended for navigation.

These proposals are based on the recommendations of the St. Petersburg rather than the Washington Conference, and are not illustrated with a plan because the proposals by MR. DE ROUVILLE are given hereafter with an appropriate plan.

Mr. A. E. BUTTERFIELD, Engineer in Chief of the Humber Conservancy Board, ENGLAND, submitted a report in the form of a proposal : “ *An Uniform System of Lighting Estuaries and Tidal rivers.* ”

“ The writer has always considered that if it is necessary to provide a navigation mark by day, it is equally, if not more necessary, to make that mark visible by night. Admitting this, it is obvious that if uniformity of buoyage is advantageous during daylight, uniformity or unification of lighting by night must be more so.

“ It was generally admitted during the discussions which ensued at the various meetings of the conference previously referred to, that an uniform system capable of general adoption was a very desirable thing, but when it came to deciding what that system should be, almost everyone consulted preferred the scheme which he himself advocated, against any other scheme.

“ In addition to this difficulty, there is an additional one of expense in the conversion of existing systems to any uniform one and it is for these two reasons that the writer considers that no time should be lost if any general unification of lighting navigation marks is to take place.

“ Now the fundamental requirement of any efficient system of navigation marks is :

“ That the mariner shall be able, without delay, to easily discern on which side of a navigation mark his ship shall pass with safety, whether the navigation marks exist for the purpose of marking a rock or shoal or for the purpose of marking the navigable channel.

“ To do this at night, distinctive lights are required to mark the port and star-board sides of the channel, the points at which the channel divides into two or more channels (such as middle grounds or shoals) and the turning points from the main channel into subsidiary or deviating channels.

“ The recent improvements and developments of unattended lights give us many different methods which may be used in order to satisfy these requirements. These methods may be classified under two headings : (a) Characteristic ; (b) Colour.

“ Let us now proceed to consider these in relation to our requirements.

“ *Characteristic.* — A very wide variation is provided under this heading as follows :

“ *Flashing.* — A single flash occurring at regular intervals, the duration of light being always less than that of darkness.

“ *Occluding.* — A steady light with, at regular intervals, a sudden and total eclipse, the duration of darkness being always less than, or equal to, that of light.

“ *Group Flashing.* — A group of two or more flashes followed by a comparatively long period of darkness and repeated at regular intervals.

As is well known the above distinctions, each with their own variations, provide us with an almost unlimited number of distinct changes, so much so in fact, that it is possible to have a different character for each navigation mark for hundreds of miles of coast line, without causing confusion to the mariner.

“ The only conditions governing this are :

“ (1) That the buoys or marks shall not be too close together so that the flash of one light may be mistaken for the flash of another light ;

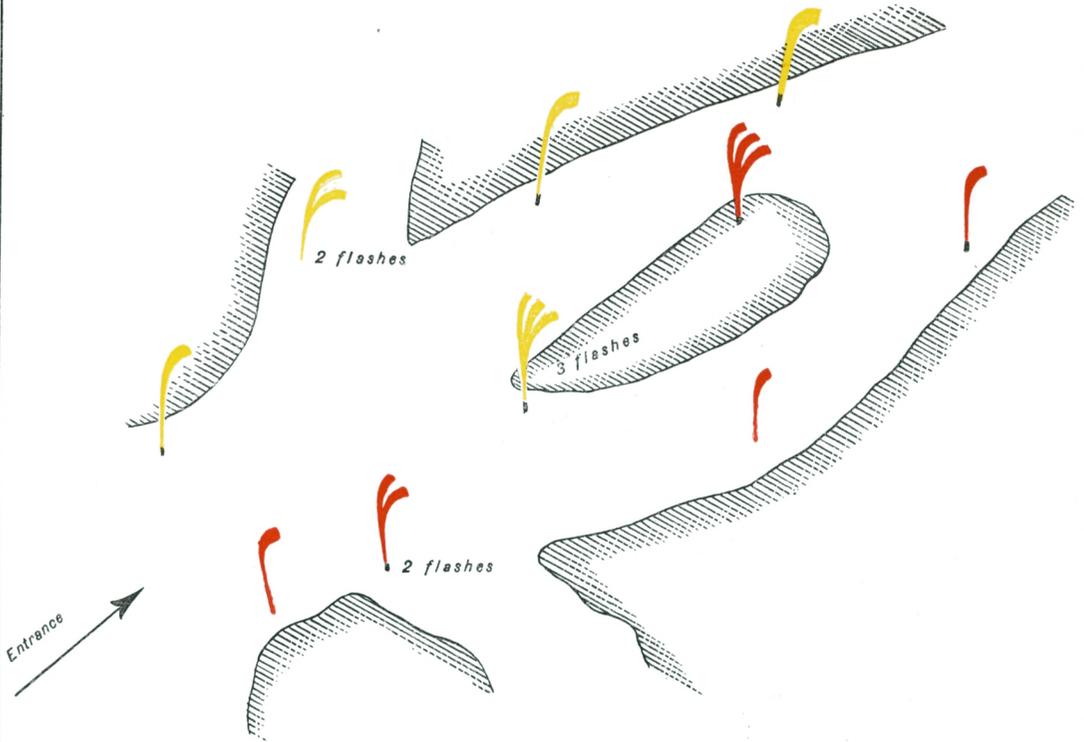
“ (2) That the mariner shall have plenty of time to correctly determine the exact characteristic of each light before he has to alter his course is consequence of it. ”

“ There are only three colours, or more correctly two colours, in addition to white, which are considered of any value for navigation purposes. These are Red and Green.

“ All three, White, Red and Green, are, as every one knows, the regulation lights used by vessels.

“ For this reason fixed lights are nearly always avoided on floating marks or on other marks actually fixed in the water. ”

CHANNEL LIGHTING.



With oil gas

light, 2 sec. ; occult. 4 sec.

With acetylene

light $1\frac{1}{3}$ sec. ; occult. 3 sec.

“ Explanation of Terms. ”

“ *Port hand or side.* — The left hand when coming in from Sea or when navigating in the direction of the Flood Tide.

“ *Starboard hand or side.* — The right hand when coming in from Sea or when navigating in the direction of the Flood Tide.

“ *Middle Ground.* — A sand, shoal or rock, all round which the channel is safely navigable.

“ *Subsidiary Channel.* — A channel running more or less parallel to the main channel and in the same direction.

“ *Branch Channel* — A channel which diverges or branches from the main channel and runs in another direction.

“ Suggested Uniform System of Lighting for Tidal Rivers and Estuaries. ”

“ The Port Side of the navigable channel shall be indicated by marks displaying a *white* single flashing light.

“ The Starboard Side of the navigable channel shall be indicated by marks displaying a *red* single flashing light.

“ The lower and upper ends of Middle Grounds shall be marked by a triple flashing light of either red or white colour depending upon which side of the shoal the better channel exists.

“ Subsidiary channels shall be marked exactly as main channels.

“ Branch Channels. The buoy or other mark, round which the navigator turns, shall be indicated by a double flashing light of the same colour as that used for marking that side of the main channel from which it diverges.

“ It will be seen from the above that the writer has only used white and red lights. The reason is that not only do these lights possess the best actinic properties, but green lights are being now regularly used to mark the positions of wrecks and similar obstructions, and it has been thought best to leave green for this purpose so that no confusion shall arise with the ordinary channel lighting. ”

The following proposals were made by MR. A. LURIA, Lt. Col. of the Italian Engineers, Technical Attaché to the Service of Lights & Buoys of ITALY, regarding the standardisation of maritime signalling : —

“ 1. — Wherever possible the characteristic of fixed light would need to be abolished in lighthouses.

“ 2. — It would be necessary to abolish in lighthouses as occasion arises complex and composite characteristics, and especially those in which there would appear, at the same time as the flash-lights or group of flash-lights, the fixed light and the coloured one, since the latter characteristics appear different on the horizon according to the distance from which the lighthouse is observed. Nowadays the well-defined characteristic flashes (single flashes, or groups of two, three or four flashes), and intermittent (one light, or group of two, three or four lights) are able to meet all the needs of navigation.

“ 3. — Considering the speed of modern vessels it is no longer expedient to employ long periods in the characteristics, on the contrary short periods are necessary such as flash-lights and intermittent.

“ 4. — The duration of flashes should not be less than the determined practical duration for entire perception of the light by the retina of the human eye.

“ 5. — With regard to the colourings, shapes and characteristics of the diurnal and luminous signals, all the nations will have to adopt uniform regulations, such as those which have been established by the International Congresses of Washington and Petrograd, or which may be established by other Congresses in the future.

“ 6. — Uniform International rules must be found for the density of the red and green glasses which are used for colouring the maritime lights.

“ 7. — In lighthouses or lightships where, along with the luminous signalling, there are also aerial acoustic, submarine and hertzian signalling, the characteristics of the different signalings should be rendered uniform between them. For instance, if it is a matter of a light in groups of two flashes, the aerial sonorous and the submarine signalling ought to be in groups of two sounds and the hertzian signalling in groups of two emissions.

“ 8. — Through the agency of the International Hydrographic Office, of Monaco, the nations must make one another acquainted with important objects of study, findings and innovations relative to the appliances and engines in lighthouses, luminous buoys and lightships, and those concerning the luminous and geographical ranges of the maritime lights, the transparency of the atmosphere, the illuminant power of the optical instruments and sources of lights, aerial acoustic, submarine and hertzian signals, and experiments of every kind touching the interests of this important service.

“ 9. — Uniform rules would have to be adopted for the diagrams of the characteristics in such a way as to render them quite clear and exact.

“ 10. — Rules, as far possible uniform, would need to be adopted in compiling the lists of the lighthouses, conforming to those agreed upon at the International Hydrographic Congress of London in 1919.

“ 11. — The Notices to Mariners should as far as possible be rendered international.

“ 12. — It would be necessary to fix the definition of the international photometric practical units.

“ 13. — The classification of the appliances in lighthouses ought to be made, not on the basis of the order (focal distance) but on the basis of the effective powers of illumination.

“ 14. — It would be appropriate if in the new lighthouses (and even in those already in use, whenever possible) optical instruments and characteristics were adopted which may prove of service both to maritime (signalling of the coasts) and aerial navigation (airways).”

It will be noted that no definite action was taken by the Congress and the question of uniformity of buoyage and buoy lighting was left to the International Hydrographic Bureau, which issued a Circular Letter N° 3-H, on February 1st, 1924, asking the States Members whether they were prepared to consider the adoption of a universal

system of buoyage and of port signals, and requesting suggestions and advices on the subject. Favourable replies having been received, the Bureau issued a Circular Letter, N° 34-H, in September 1924, and stated that

“ the convening of such a Conference would take some considerable time and the Directing Committee proposes therefore that the question of the establishment of uniform systems be discussed at the next International Hydrographic Conference and it will appear on the Agenda thereof ”.

In July, 1924, at a Meeting in LONDON of the SUB-COMMITTEE OF PORTS AND MARITIME NAVIGATION OF THE CONSULTATIVE AND TECHNICAL COMMISSION ON COMMUNICATIONS AND TRANSIT OF THE LEAGUE OF NATIONS, the question of uniformity of buoyage was taken up, and it was decided to form a Special Technical Committee for the uniformity in buoyage, the lighting of coasts, port signals, etc. In this connection, in November-December, 1924, various delegates representing the technical side of the Lighthouse and Buoy services, as well as the Hydrographic and Pilot services of France, Sweden, Italy, Holland & Finland, met under the auspices of the French Lighthouse and Beacon Service and the Consultive & Technical Commission of the League of Nations for the purpose of exchanging views on the subject of uniformity of buoyage, to examine the different propositions to be submitted to the various international organisations concerned, and to co-operate with the International Hydrographic Bureau.

At a subsequent meeting which took place in February, 1925, at the International Hydrographic Bureau, Monaco, it was mutually agreed that this Bureau would continue to collate data on the subject of uniformity in buoyage and buoy lighting, and that it should be represented at a meeting at Monaco, in November 1925, of delegates from as many countries as might send them, in order that the representative of this Bureau, in a technical capacity, might present such data as it might then have at its disposal for the consideration of the Conference, at which the Committee would study such proposals as might be presented. This in no way commits this Bureau to any scheme which may be discussed or recommended. The initiative of calling any International Conference to consider uniformity in buoyage and buoys lighting rests with the States Members of this Bureau, and the meeting in November, 1925, under the auspices of the League of Nations, is a preliminary one in the course of these studies of the “ *Technical Committee for Buoyage and Lighting of Coasts of a Sub-Committee for Ports and Maritime Navigation of the Advisory and*

Technical Committee for Communications and Transit of the League of Nations”.

Before summarising the proceedings of the meeting of this Committee in Paris, December 2nd to 6th, 1924, it may be well to say that Mr. DE ROUVILLE was invited to present his views before the HYDROGRAPHIC COMMITTEE OF THE MINISTRY OF MARINE in PARIS, on 29th January, 1925, and that it endorsed the proposals which he then submitted and discussed, and which will now be given in full. In the course of his remarks he said that at the Conference of Washington, in 1889, there were proposed rules for buoyage actually adopted by France, but in which the logical sense was shocked at the anomaly of leaving red buoys on the starboard hand, whereas the ship's red light at night is on the port hand. For this reason the St. Petersburg Conference reversed the colours of the buoys to correspond with the ship's port light, but the regretted that they did not also adopt the colour green for buoys on the starboard hand on entering from seaward.

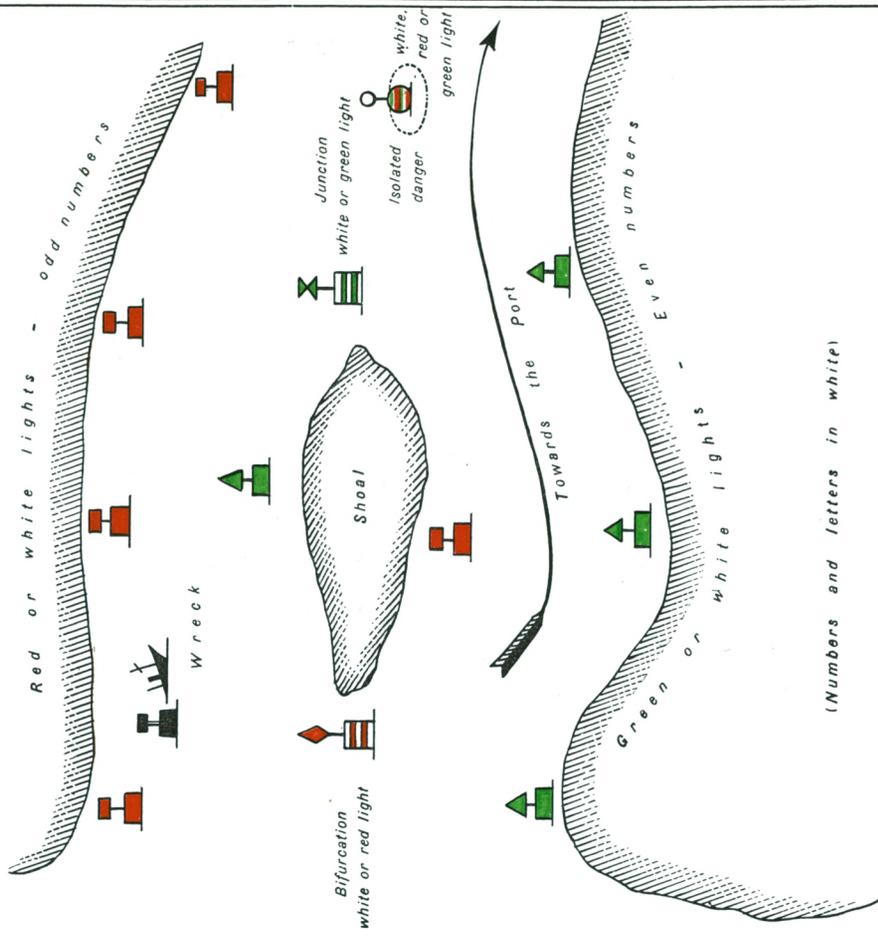
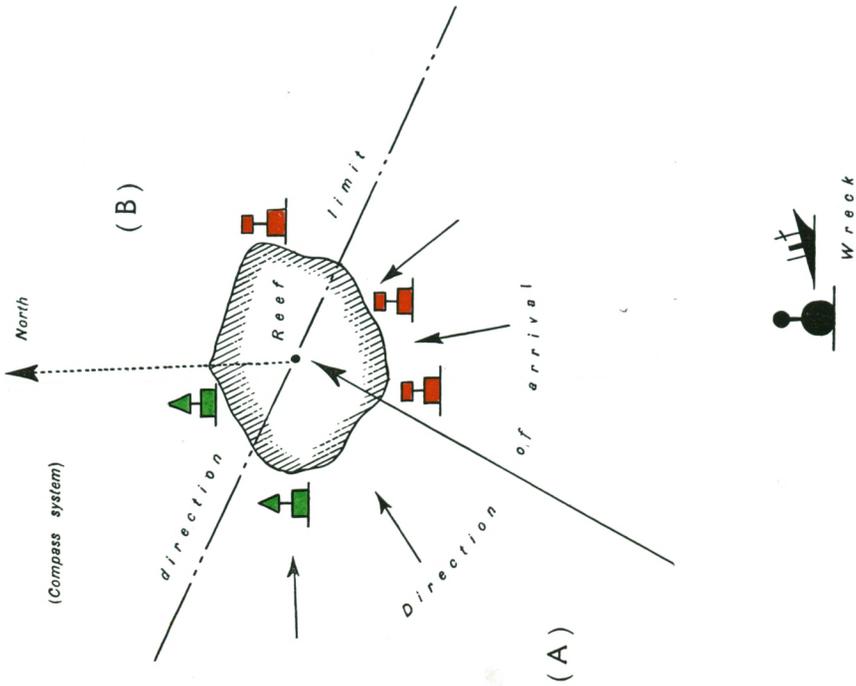
The Technical Committee for Buoyage and Lighting of Coasts above referred to consists of the following members :—

Chairman :

- Mr. H. WATIER, Director of Navigable Waterways and Maritime Ports, Ministry of Public Works, France.
- Mr. VAN BRAAM VAN VLOTEN, Chief Engineer, Technical Lighthouse Service, Netherlands.
- Commander (retired) G. DELANO, Chile.
- Mr. E. HÄGG, Director-General of Pilotage, Lighthouses and Buoys, Sweden.
- Mr. N. NAGAOKA, Secretary, Ministry of Communications, Japan.
- Commander RAZICOTSICAS, Greece.
- Mr. A. DE ROUVILLE, Chief Engineer, Roads and Bridges, France.
- Captain L. TONTA, Director of the Hydrographic Institute, Royal Italian Navy.
- Baron G. WREDE, Director-General of Naval Administration, Finland.

Secretary :

- Mr. J. ROMEIN, Member of the Communications and Transit Section of the Secretariat of the League of Nations.



At the meeting in PARIS, December 2nd to 6th 1924, Mr. DE ROUVILLE proposed the following Agenda for the consideration of the Committee on the subject of Buoyage and Lighting of Coasts :

- I. Unification of lighthouse signs.
- II. Unification of buoyage regulations.
- III. Top-marks on special buoys.
- IV. Wireless or radio beacons.

The proposals submitted to it by Mr. DE ROUVILLE under the subject II. *Unification of buoyage regulations* were as follows :—

“ Rules to be observed in respect of Buoyage. ”

“ ARTICLE I. — All stretches of navigable water and all maritime routes in the neighbourhood of dangerous obstacles, shall be given a direction determining, for each country or each sea, a conventional *principal direction* in which vessels are assumed to *arrive*.

“ This direction shall be that passing from one semicircle A of the horizon to the other semi circle B, the azimuths originating in A being separated from the B azimuths by a *direction limit* chosen in such a way as to include as far as possible on side A the majority of the routes normally followed by vessels arriving from the open sea, and in such a way also as to lie in one of the main directions of the compass. Subsidiarily, this limit itself, whose own direction would thus still remain indeterminate, shall be deemed to have the principal direction of the projection thereon of one of the two cardinal points (north, east, south or west) included in semicircle A, and preferably that which is nearest to the most frequented routes of arrival.

“ This direction limit must be clearly indicated to mariners in the special publications of each State.

“ In order to differentiate the buoyage signals, the tangent to the contour of the obstacle in the neighbourhood of the point to be marked with a buoy shall be given an orientation in the same way as a maritime route according to the above rule, and the right or left of the navigator shall be taken, as explained below, in accordance with the principal direction of arrival thus determined at the circumference of the obstacle.

“ ARTICLE 2. — In clearly defined harbour channels, the principal direction of arrival shall always be that leading to the harbour, irrespective of compass direction.

“ ARTICLE 3. — The signals passed on the left by a vessel following the principal direction of arrival defined above shall be painted red ; they shall be flat or cylindrical in shape or shall be surmounted by cylindrical top-marks ; if necessary, they shall be marked in white figures with odd numbers in ascending order in the principal direction mentioned above.

“ Should such buoys be provided with lights, these should be red or white.

“ ARTICLE 4. — Signals passed on the right by a vessel following the principal direction of arrival defined above shall be painted green, (or with green and white alternating squares). They shall be conical in shape or surmounted by conical top-marks ; they shall be marked in white figures with even numbers in ascending order in the principal direction mentioned above.

“ Should such buoys be provided with lights, these should be green or white.

“ARTICLE 5. — *Bifurcation signals* shall be painted with alternate white and red horizontal bands and surmounted by a *red top-mark* consisting of two cones with the same base.

“Should such buoys be provided with lights, these should, for preference, be white lights, or, failing this, red.

“ARTICLE 6. — *Junction signals* shall be painted with alternate white and green horizontal bands, and surmounted by a *green top-mark* consisting of two cones touching at the apex.

“Should such buoys be provided with lights, these should, for preference, be white lights, or, failing this, green.

“ARTICLE 7. — *Signals marking isolated dangers* shall be painted with alternate red and green horizontal bands. They shall be spherical in shape, or shall be surmounted by a *red top-mark* of the same shape.

“Should such buoys be provided with lights, these should, for preference, be white lights, or, failing this, red or green.

“ARTICLE 8. — *Signals marking wrecks* shall be painted in black; they shall be surmounted by top-marks, and if necessary by lights, having one or other of the characteristics indicated in Articles 3 to 7 above.

“ARTICLE 9. — Every signal shall carry in white letters the name of, or a letter of identification indicating, the geographical feature (channel or obstacle) which it marks.”

(Seen plan).

The Technical Committee, after consideration of Mr. DE ROUVILLE'S proposals, elaborated the following proposals:—

“Guiding Principles adopted by the Technical Committee for Buoyage and Lighting of Coasts in Regard to Buoyage and Lighting Regulations.

“I. — *Unification of Lighthouse Signs.*

“The Committee:

“Recognising the difficulty of establishing perfectly clear distinctions between the various categories of lights and lighthouses which constitute coast lighting and of laying down hard-and-fast rules for the allocation of signs;

“Recognising, however, the importance of allocating the available signs in as judicious a manner as possible:

“1. — Is unanimously of the opinion:

“That, in long or medium-range lighthouses, composite signs (fixed lights varied by flashes or lights with flashes of differing colour) should not be used, as not giving uniform effects at all distances;

“And strongly recommends their abolition in places where they are still used;

“2. Recommends, moreover, wherever it be possible, and when new lights are installed:

“(a) That the principal landfall lighthouses should employ regular single white flashes or groups of two, three or four flashes, or, if necessary, a signal consisting of a group of flashes alternating with a single flash;

“ (b) That landfall lights of lesser importance should employ either red flashes or groups of five white flashes or a white light alternating with occulting lights, the latter being as simple as is compatible with the complexity of the lighting on the coast in question, and being selected, especially in respect of lights of minor importance, in such a way as to differ as far as possible from the type of flashes used by landfall lighthouses, which is governed by the necessity of providing greater range of visibility ;

“ (c) That in no case should the regulations governing navigation lights be transgressed as regards the colours assigned to coast and pier-head lights, it being understood that a white light can be substituted for either of these colours :

“ 3. Recommends that the spacing of lights or groups of lights of the same character be as wide as the density of the coast lighting permits ;

“ 4. Recommends that *aero-lighthouses* should not be installed in positions in which they run the risk of interfering with coast lights, and draws attention to the fact that it is often technically possible and economically profitable to combine coast lighting with aerial lighting on the same structure ”.

“ II. *Unification of Buoyage Regulations.*

“ (1) The Committee takes note :
of the preparatory work carried out before its present session ;
of the information collected in a large number of countries :
and of the unofficial views expressed previous to the session by certain heads of the competent departments in countries not represented at these meetings.

“ It is unanimously of the opinion that a *greater unification* of the regulations for day and night buoyage is highly desirable.

“ (2) *As regards the expediency of unifying and defining the regulations governing the orientation of buoyage and of harmonising, if possible, the compass and lateral systems.*

“ The Committee :

“ Considering that a new system suggested by one of its members, Mr. DE ROUVILLE, in accordance with which a direction limit defining the conventional directions of arrival in the vicinity of dangers, or along channels, should be determined in respect of each coastal section requiring buoyage (*) appears *prima facie* to combine successfully

(*) The regulations governing this system might be as follows :

“ All stretches of sea and all maritime routes in the neighbourhood of dangerous obstacles shall be given an orientation by determining for each country or each sea a conventional *principal direction* from which vessels are supposed to arrive.

“ This direction shall be that passing from one semicircle A of the horizon to the other semicircle B, the azimuths originating in A being separated from the B azimuths by a *direction limit* determined in such a way as to include as far as possible on side A the majority of the routes that normally arrive from the open sea and in such a way also as to lie along one of the principal points of the compass. Subsidiarily, this limit itself, whose own orientation would thus still remain indeterminate, shall be deemed to have the principal direction of the projection thereon of one of the two cardinal points (north, east, south or west) included in semicircle A, preferably that which is nearest to the most-frequented routes of arrival.

“ This direction limit must be clearly indicated to mariners in the special publications of each State.

“ In order to differentiate between the buoyage signals, the tangent to the contour of the obstacle in the neighbourhood of the point to be marked with a buoy shall be given an orientation in the same way as a maritime route according to the above rule, and the right or left of the navigator shall be taken as explained below in accordance with the principal direction of arrival thus determined at the circumference of the obstacle.

“ In clearly defined harbour channels, the principal direction of arrival shall always be that leading into the harbour irrespective of compass course ”.

the compass and lateral systems and to unify the different definitions in force in the various countries as regards the orientation of lateral buoyage, none of which it has hitherto been possible to put into general use ;

“ Considering that this system would probably not in itself appreciably disturb the buoyage arrangements provided that it were properly adapted to the various coasts and to the special circumstances of each ;

“ And that, in the majority of countries, the direction limit would simply express in a clearer and more general way the direction already adopted to guide mariners with respect to the buoyage ;

“ That, notwithstanding its somewhat theoretical and technical aspect, this system can probably be presented to those whom it will affect in a form which they will find easy to understand and which will cause them very little trouble and perhaps leave less room for uncertainty than the systems at present in force ;

“ But, considering that a system of this kind cannot be accepted without a closer study of its consequences by the competent services ;

“ Submits the said system to the consideration of the countries interested before recommending them to apply it.

“ (3) *With regard to the colour of lights on lighted buoyage :*

“ The Committee :

“ Considering that the colours available for maritime lighting are too few in number for it to be possible to reserve one of them exclusively for such a special purpose as the lighted buoyage of wrecks, which only covers a very small proportion of the total number of signals, and the comparative importance of which has greatly decreased since the end of the war :

“ (a) Proposes to maintain the principles already brought into line with the regulations governing lights on ships, *i. e.* to recommend :

“ Red or white lights on the port side of the navigator in channels, to mark obstacles and at the entrances to harbours :

“ Green or white lights on the starboard side of the navigator in the same circumstances ;

“ A colouring of light sectors in harmony with the above rule governing the lights of vessels ;

“ (b) Recommends increasing the use of periodic repeating signals in preference especially to fixed white lights, and even to fixed coloured lights ;

“ (c) Without recommending that the relative position of the lights should be indicated by an odd or even number of flashes signifying the direction in which the vessel must pass — owing to the risk due to possible breakdowns of the eclipsing mechanism and to the difficulty in rough weather of identifying the various and complex combinations of flashes :

“ The Committee recommends that, if recourse be had to such combinations they should follow the system agreed upon at St. Petersburg in respect of the figures on channel signals, *i. e.* that an odd number of flashes should indicate the port side and an even number the starboard.

“ (4) *As regards buoys marking wrecks.*

“ Noting that seamen are somewhat indifferent to the advantages which appear to be attributed by the competent technical services to the specialisation of the day and

night signs on buoy marking wrecks and that their chief desire is to be able to navigate irrespective of whether the obstacle be a rock or a ship at anchor, whereas the technical services think it necessary to guard seamen against possible confusion between a buoy marking a wreck (which is generally unexpected and not shown on hydrographic charts) and an ordinary buoy :

“ And noting that, from the former point of view, it would be possible to dispense with any special day or night colour for buoys marking wrecks and to concentrate on enabling seamen to navigate by means of suitable signs ;

“ Considering, nevertheless, the universal acceptance of the colour green for marking wrecks ;

“ Due account being taken of the first mentioned consideration and of the paragraph (b) of Section 3 above, and further considering that it is difficult to impose combinations of lights for this purpose which demand technical resources not at present available everywhere ;

“ Without attempting to attain perfect concordance between day and night colours — a concordance which, moreover, it does not attempt to secure for the purposes of paragraph 5 below :

“ The Committee proposes :

“ (a) That green should be retained as the colour for marking wrecks by day ;

“ (b) That a white light (which was the only one admitted by the St. Petersburg Conference) or a green light should be used indifferently to mark wrecks which can be passed any side ;

“ (c) And, in the case of wrecks which can be passed on one side only, that attention should be concentrated on indicating both by day and by night the side on which it must be passed, either by means of the shape of the buoy or of its top-mark, or by means of the colour of its light or its periodicity in cases in which the regulation in force, the technical resources available and the nature of the locality and of the surrounding lights permit it ;

“ (d) Recommends that their character should be indicated on wreck buoys by painting thereon in white the symbol accepted for hydrographic charts rather than a written inscription in the national language, and that recourse should be had in the above cases to combinations as different as possible from those of the ordinary marks (cylinder, cone or combination of cones, sphere).

“ (5) *As regards the characteristics of ordinary buoyage by day :*

“ (a) The Committee maintains the rules agreed upon at Washington and confirmed at St. Petersburg in regard to shape of buoys or their top-marks, in respect of which unification is much further advanced than in respect of colour ;

“ In any case it recommends all countries which utilise the shape of special top-marks for giving special or local marks to refrain from using for such purposes the shapes reserved for ordinary buoyage as defined at St. Petersburg.

“ (b) As regards countries which distinguished between their buoys in the latter manner in combination with that of top-marks :

“ The Committee,

“ Considering that unification in this respect would involve little or no expense in view of the virtual necessity of repainting such marks once a year, or once every two years ;

“ Having the choice between three solutions :

“ That of Washington (black on the port side, red on the starboard side),

“ That of St. Petersburg (red on the port side, black on starboard side), which obviates the contradictory meaning of red by day and night respectively,

“ And that suggested to it by one of its members in order to complete the symmetry initiated in 1912 (red on the port side, green, or green and white squares, on the starboard side, black being confined to buoys marking wrecks) ;

“ And considering that it is inadvisable to go back on the decisions taken at St. Petersburg, where three nations assumed definite obligations and a remedy was found for the most serious of the above anomalies ;

“ Considering that green, even when accentuated by a pattern of the chess-board type, would in many circumstances be regarded as less distinctive than black, and would therefore offer fewer drawbacks from this point of view for buoys marking wrecks, as they are not numerous, and are already almost universally painted in that colour ;

“ Proposes to abide by the rules adopted at St. Petersburg in this respect, both as regards the colours of buoys and as regard their numbers and the letters of identification indicating multiple channels, if any (*).

“ (6) (a) The Committee also maintains the rules adopted at St. Petersburg for telegraph cables whose protecting buoys shall carry the letter “T”.

“ (b) It proposes to reserve yellow for quarantine buoys.

“ (7) Lastly, the Committee recommends that every favourable opportunity should be taken to give aerial or submarine sound signals a similar rhythm to that of the light, if any, with which they are associated, an exception being made in the case of combinations of a submarine signal with a Hertzian signal, for the purpose of determining the distance from the transmitting station.

“ (*) The characteristics of normal buoyage may therefore be defined as follows ;

“ 1. *The signals met on the left by a vessel following the principal direction of arrival* defined above shall be painted red. They shall be flat or cylindrical in shape or shall be surmounted by a cylindrical top-mark ; if necessary, they shall be marked in white figures with odd numbers in ascending order in the principal direction mentioned above.

“ If they carry a light, it shall be red or white.

“ 2. *Signals met on the right by a vessel following the principal direction of arrival* defined above shall be painted black. They shall be conical in shape or surmounted by a conical top-mark ; if necessary, they shall be marked in white figures with even numbers in ascending order in the principal direction mentioned above.

“ If they carry a light, it shall be green or white.

“ 3. *Bifurcation signals* shall be painted with alternate white and red horizontal bands and surmounted by a *red top-mark* consisting of two cones with a common base.

“ If they carry a light, it shall be white preferably, or red.

“ 4. *Junction signals* shall be painted with alternate white and black horizontal bands, and surmounted by a *black top-mark* consisting of two cones touching at the apex.

“ If they carry a light, it shall be white preferably, or green.

“ 5. *Signals marking isolated dangers* shall be painted with alternate red and black horizontal bands. They shall be spherical in shape, or shall be surmounted by a *red top-mark* of the same shape.

“ If they carry a light ; it shall be white preferably, or else red or green. ”

III. *Top-marks on Special Buoys (Lighted Buoys, Buoys giving Sound Signals, etc.).*

“ The Committee :

“ Considering the importance in certain cases, particularly in ice-regions, or in situations liable to give rise to uncertainty, of special buoys easier to distinguish (such as lighted buoys, buoys giving sound signals) when they are not distinguishable by their shape but only by their colour ;

“ Considering further, the probable difficulty of ensuring the durability of top-marks either in ice-regions or at points very exposed to rough seas :

“ Recommends as an experiment, in persuance of the Conferences of Washington and St. Petersburg, the placing of top-marks on certain special buoys, such as lighted buoys or sound-producing buoys, particularly at points where their identification by day is difficult and liable to lead to confusion :

“ Requests, lastly, that the results obtained in each country from these experiments be made generally known through the intermediary of the Organisation for Communications and Transit of the League of Nations, to which they shall be communicated in the first instance ”.

“ IV. *Wireless or Radio Beacons.*

“ The Committee :

“ Noting that seamen are showing increasing preference for signals which place upon them the responsibility for the information deduced there from, and in particular that they prefer wireless beacons to direction-finding shore stations ;

“ In view of the fact that the same tendency may be noted in countries which have already made great progress in this direction and also in the equipment of vessels by shipbuilding firms in all countries ;

“ Noting that, under the terms of Appendix 2 of the draft Convention drawn up at Washington in December, 1920, by the Universal Union for Electrical Communications, a wave-length of 1,000 metres is allocated to wireless beacons :

“ Realising, however, that, in view of the varied possibilities of scientific development in the matter of Hertzian waves, it is impossible at present to give too marked a preference to any one method of employing such signals ;

“ Recommends that wireless beacons should be considered as the normal means of transmitting Hertzian signals and that they should retain the wave-length of 1,000 metres ; and further, that they may be supplemented by direction-finding stations at points where these are specially desirable :

“ And also recommends that agreements be concluded directly between neighbouring nations to settle the conditions and periods of operation of the various wireless beacons, particularly in the case of long range beacons which transmit signals at specified hours ”.

V. — DISCUSSION OF THE FOREGOING SYSTEMS.

The International Hydrographic Conference held in London, in 1919, decided to refer the proposal to institute a uniform symbol to show colour and light sectors on charts to the International Hydrographic Bureau. This Bureau in Circular Letter N° 40 of 16th October, 1922, proposed graphic symbols, but this was not approved by the States Members. The Directing Committee then, in Circular Letter N° 15-H of 6th June, 1923, made the following definite proposals:

- “ (a) That those States which can do so shall use colour on their charts to indicate the colours of the sectors of lights, as this method is practically perfect.
- “ (b) That on all charts, whether or not colour is used, the limits of the sectors shall be shown as fine lines, either full or pecked.
- “ (c) That in all cases the colours of the sectors shall be indicated, within the limiting lines, either by the complete words in the language of the State which publishes the chart or by the abbreviation by it ”.

In Circular Letter N° 30-H of 19th September, 1924, the Directing Committee announced that the above proposals had been adopted by the majority of States Members.

“ *The Tabulations of Buoyage and Buoy Lighting Systems of the World* ” (3 charts) compiled by THE INTERNATIONAL HYDROGRAPHIC BUREAU show such close agreement with the recommendations of the Washington Conference (1889) and with the additions made to them by the St. Petersburg Conference, (1912), that in spite of the perplexities introduced by subsequent proposals to unify buoyage, the way is clear to its accomplishment without serious alterations to existing systems, as a study of the Tabulations will demonstrate.

The principal stumbling block is, and has been, the wrong conception of “starboard hand” and “port hand” as unfortunately given by the Washington Conference in defining them in relation to “*the mariner entering from seaward*”. In endeavouring to clear up, or define exactly what should be understood by this phrase, subsequent additions have been made by various countries, as shown by the following extracts taken from the Sailing Directions and Buoy Regulations, to define the direction of the route meant by —

“ *the mariner entering from seaward* ” :—

“ that of the main stream of flood tide ” (Great Britain & Holland) ;

- “ coming from the westward ” or “ coming from the north ”
 (Germany & Denmark) :
 “ that which leads to the chief port ” ;
 “ when entering a harbour, river or estuary from seaward ”
 (Great Britain).

All of the above definitions give RED colour to the buoy on the starboard side, or hand, of the route, whereas the RED light of a ship at night is on the port side, or hand, and it was for this sole reason that the St. Petersburg Conference (1912) reversed the proposal of the Washington Conference (1889) in respect of the colour (and shape), *viz.* the RED coloured channel buoy to be on the same side as the RED side light at night; but it will be noted that the BLACK buoy to starboard does not correspond with the starboard or GREEN side light by night. It will be noted also that in Mr. DE ROUVILLE's proposal the starboard hand buoys are to be in effect GREEN, or, at any rate, not BLACK. He comments as follows on the reversal of the proposals of the Washington Conference :—

“ The conservative attitude of the members of St. Petersburg Conference may be explained, either by reluctance to depart from the characteristic red and black colours already accepted by many countries, or by the wish not to employ green, which is reserved by a large number of countries for wrecks, and which is perhaps less durable at sea ”.

The St. Petersburg Conference, unfortunately, did not propose a new or better formula for what it characterised as “ the ambiguous definition of the Washington Conference ” as to the direction of the route. The first requisite in considering the question of “ Uniformity in Buoyage and Buoy Lighting ” is to be established, with as few ambiguities as possible, a definition of the route along which the colours and or form and channel buoys in the lateral system shall be employed throughout the world. The Directing Committee has given much thought to this question and has unanimously agreed upon the following :—

IV. — PROPOSED INTERNATIONAL SYSTEMS OF BUOYAGE & BUOY LIGHTING

AS DRAWN UP

BY THE INTERNATIONAL HYDROGRAPHIC BUREAU.

The Directing Committee believes that confusion has arisen, and will continue to arise, in adhering for buoyage purpose to the idea of the route as that of "entering from seaward" or "in the direction of the main stream of the flood tide" instead of adopting, as here proposed, the conception of the route as that of "leaving a port" or "the direction of the *ebb* stream", in which latter conception the assignment of colours by the Washington Conference would have satisfied the St. Petersburg Conference, and presumably Mr. DE ROUVILLE. All the larger cities of the world, with very rare exceptions, are located upon navigable bodies or streams of water. The location of any city on a navigable stream, or on tide-water, can be traced by the *débris* which floats down on the ebb tide, which ebb tide tends to carry everything to the open sea. The flood stream, on the other hand, when assisted by the wind, tends merely to beach floating *débris*, and also to arrest the silt carried down by the ebb stream, forming bars or obstructions to navigation at the entrance to rivers or estuaries. The ebb tide is the major tide, the scouring tide, and is always assisted by the current of navigable streams. For this reason the ebb stream throughout the world, prevails for more hours than the flood stream. Theoretically, at least as many vessels proceed to a port to load cargo as to unload it, and the conception of "leaving a port" with deep draught is quite as reasonable as that of "entering from seaward" with deep draught, but much more so when taken in conjunction with the conception of the ebb stream as always struggling to reach the sea, and only being prevented, to some degree, by the less dominant flood stream. Thus the direction of the ebb stream can never be mistaken and it is the sanitary and dredging stream, whereas the flood stream is the unsanitary and shoal-building stream.

The first proposal, therefore, of the Directing Committee is to revise the definition of the Washington Conference as follows: —

I. The navigational marks which a ship should find on its port side, or left hand when leaving a port to proceed to sea or in the direction of the ebb stream in any channel, should be coloured RED, and those on the starboard side or right hand, should be coloured BLACK. In detached navigable channels open at both ends, the port hand or port side should be considered to be that on which the mainland lies.

It will be noted that even in channels with various branches and in estuaries where the tidal currents turn at half-tide, this really does not give rise to any ambiguity, because, in every part of the channel, its outward direction (or seaward mouth) can be determined. Proceeding in this direction, by whatever channel, a ship, going to sea, should always have RED channel buoys on the port hand and BLACK channel buoys on the starboard hand, until she has passed the outer buoy.

Proposal N^o I does away with the necessity for the Compass System of Buoyage in navigable channels, and relegates its use to outlying shoals or dangers.

The Directing Committee recognises the shortcomings of any definition in bodies of water in which there are no clearly indicated tidal currents or where currents are not directly connected with the rise and fall of the water. In these cases a direction must be assigned to represent a *conventional ebb stream*, as Germany and Denmark have done in the case of the Baltic, otherwise the Cardinal System must be applied, but the systems followed should be clearly stated wherever this is necessary. Hence the following proposal:—

II. The direction of the ebb stream, as defined in Proposal I., shall be indicated by an arrow and if necessary by the legend "Direction of the ebb stream", or its equivalent in the language of the chart, on every new chart and on every new edition of an old chart. In channels where there is no tidal current the same arrow and words, or some other appropriate symbol, shall be used as a guide to the system of buoyage in force.

The third proposal is:—

III. That the recommendations of the Washington Conference (1889), as amended and supplemented by the St. Petersburg Conference (1912), be adopted as the International Buoyage System, but that the reversing of the colours (and forms) of the buoys, as recommended by the St. Petersburg Conference, be cancelled.

This embraces three subsidiary proposals as follows:—

(a) That where it be necessary to use the Cardinal (or Compass) System, the direction hitherto referred to as North shall be referred to as "from N.W. to N. E."; East as "from N. E. to S. E."; South as "from S. E. to S.W."; and West as "from S.W. to N.W."

(b) That the buoys of the Compass system should carry such double top-marks as may be agreed upon hereafter.

(c) That the character of a buoy marking a wreck should be indicated, not by the word "Wreck" in the national language, but by painting thereon, in white, the symbol accepted for wrecks on hydrographic charts.

The fourth proposal is : —

IV. That at the next International Conference an attempt be made to come to an international agreement on uniform distinguishing colours for such miscellaneous buoys as those marking the location of : —

Moorings,
 Quarantine,
 Submarine Pipe Lines (such as those carrying oil, water, etc.),
 Areas under hydrographic survey,
 Extension of harbour works (obstructing free navigation),
 Dumping ground for spoil, dredgings, and so forth,
 Target practice or Experimental grounds,
 Fishing grounds,
 Compass adjustment.

The fifth proposal is : —

V. That at the next International Conference the question of the use of top-marks to indicate forms and characters of buoys be definitely settled, having in view the difficulty of maintaining top-marks on certain buoys due to bad weather, ice or other destructive agencies.

The sixth proposal is : —

VI. That, on buoys, the colour GREEN, both by day and night, be reserved exclusively for indicating wrecks or submarine telephone, telegraph or other electric cables, as now more or less generally accepted.

The seventh proposal is : —

VII. That in defining the characteristics of the lights displayed by lighthouses or lighted buoys, as may be agreed upon hereafter, due consideration be given to the provision of vertical lighting with similar or other characteristics to meet the growing needs of aviation at night.

The eighth proposal is : —

VIII. That for buoy lighting at night, except as in Proposal VI, the colours RED and WHITE be used, with such characteristic flashes or occultations as will clearly indicate the exact character of the buoy making such display.

With reference to the proposal of Mr. DE ROUVILLE, the Directing Committee is of the opinion : —

(a) That the so called "*Principal direction of arrival*" and the "*Direction limit*" are unnecessary complications arising from the idea of "*entering*" instead of that of "*leaving*" a port, and —

(b) That the Tabulation of Buoyage, prepared in this Bureau to accompany the present *Summary of Data on Uniformity in Buoyage and Buoy Lighting*", shows that over half of the thirty systems of buoyage conform to the recommendations of both the Washington Conference (1889), and of the St. Petersburg Conference, (1912), (except in its reversal of colours (and or form) of channel buoys), and that the reason given by the Technical Committee for its acceptance of Mr. DE ROUVILLE'S proposals does not seem to be entirely convincing, *viz* : —

“ Having the choice between three solution :

“ That of Washington (black on the port side, red on the starboard side),

“ That of St. Petersburg (red on the port side, black on the starboard side), which obviates the contradictory meaning of red by day and night respectively,

“ And that suggested to it by one of its members in order to complete the symmetry initiated in 1912 (red on the port side, green, or green and white squares, on the starboard side, black being confined to buoys marking wrecks) ;

“ And considering that it is inadvisable to go back on the decisions taken at St. Petersburg, where three nations assumed definite obligations and a remedy was found for the most serious of the above anomalies ; ”

The reasoning that, because Italy, Spain and Portugal changed the red buoys from port to starboard, and the black buoys from starboard to port, therefore all the other countries in the world should do the same thing and a great deal more, is not sound. It is true that the whole question is one of merely repainting buoys and shifting their location from one side of a channel to the other, but the number of hydrographic marks used by these three countries is but a small percentage of that used by the other countries which would be involved in this unnecessary upsetting of existing conditions. The question is one to be settled by an International Conference at which, naturally, financial conditions involved in such changes would be given due weight.

BUOYAGE AND BUOY LIGHTING SYSTEMS OF THE WORLD

Systèmes de Balisage et d'Éclairage des Bouées du Monde

COMPILED BY THE INTERNATIONAL HYDROGRAPHIC BUREAU

Composé par le Bureau Hydrographique International

TABLEAU No. 1
Pays utilisant le Système du Compas, ou Système Cardinal, conjointement avec le Système Lateral, ou n'utilisant pas le Système Lateral: Allemagne, Italie, Norvège, Russie, Suède, Turquie.

IN THREE SHEETS.

SHEET I.

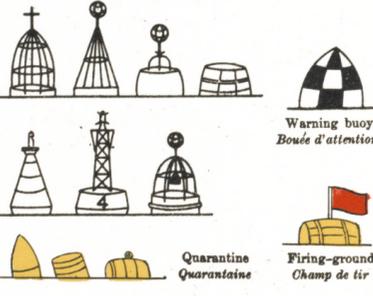
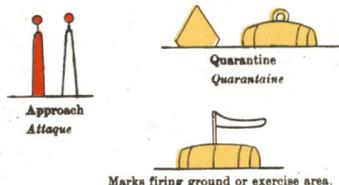
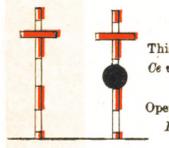
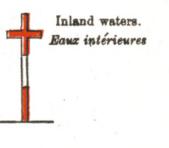
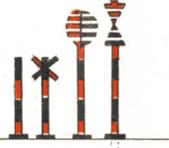
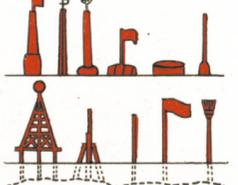
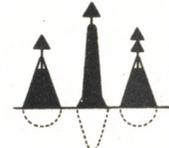
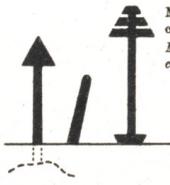
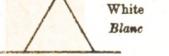
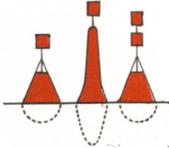
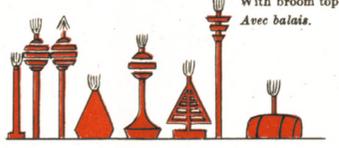
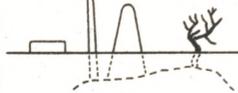
COUNTRY PAYS SYSTEM ADOPTED SYSTÈME ADOPTÉ	GERMANY ALLEMAGNE	ITALY ITALIE	NORWAY NORVÈGE	RUSSIA	RUSSIE	SWEDEN SUÈDE	TURKEY TURQUIE
	LATERAL AND CARDINAL SYSTEMS	LATERAL AND CARDINAL SYSTEMS	CARDINAL	Baltique, Esthonie, Lithuanie, Finlande LATERAL AND CARDINAL	Maritime Province and Kamchatka Province Maritime et Kamchatka CARDINAL	CARDINAL SYSTEM	LATERAL AND CARDINAL SYSTEMS
MISCELLANEOUS BUOYS BOUÉES DIVERSES	 <p>Warning buoy Bouée d'attention</p> <p>Quarantine Quarantaine</p> <p>Firing-ground Champ de tir</p>		 <p>Mooring rings are found at points along the coast distinguished by white and black concentric circles painted round the mooring rings. Des anneaux d'amarrage se trouvent en des points de la côte et sont indiqués par des cercles concentriques blancs et noirs peints autour de l'anneau.</p>			 <p>Light, bell and special buoys are painted black when situated to northward, black with a white belt when situated to eastward, and painted red when situated to southward or westward. Les bouées lumineuses, à cloche, ou spéciales, sont peintes en noir lorsqu'elles sont situées au Nord en noir avec bande blanche lorsqu'elles sont situées à l'Est, et peintes en rouge lorsqu'elles sont situées au Sud ou à l'Ouest.</p>	<p>Lighted bell buoys are used in special places. Des bouées lumineuses à cloche signalent les endroits spéciaux.</p>  <p>Quarantine Quarantaine</p> <p>Approach Attaque</p> <p>Marks firing ground or exercise area. Indiquent champs de tir ou d'expériences.</p>
ISOLATED DANGER DANGER ISOLÉ	 <p>White or white and black vertical striped buoys or beacons mark isolated dangers. Des bouées ou des balises blanches ou à raies verticales blanches et noires marquent les dangers isolés.</p>			 <p>This mark is placed on the danger. Ce voyant est placé sur le danger.</p> <p>Open waters Large</p> <p>Inland waters. Eaux intérieures</p>	 <p>Open waters Large</p> <p>Inland waters. Eaux intérieures</p>		<p>Buoys or beacons of various shapes painted red with one of the N.S.E. or W. top-marks, as given below in the compass system. Bouées ou balises de formes diverses peintes en rouge avec l'un des voyants N.S.E. ou W. indiqués ci-dessous dans le système cardinal.</p>
STARBOARD HAND TRIBORD			 <p>Mark South and East side of a channel. Marquent le Côté Sud et Est du chenal.</p>	 <p>White Blanc</p>		 <p>Without broom top-marks. Sans balais.</p> <p>Mark South or West side of channel. Marquent le côté Sud ou Ouest du chenal.</p>	 <p>Odd numbers Numéros impairs</p>
PORT HAND BABORD			 <p>Mark North and West side of a channel. Marquent le Côté Nord et Ouest du chenal.</p>			 <p>With broom top-marks. Avec balais.</p> <p>Mark North or East side of channel. Marquent le côté Nord ou Est du chenal.</p>	 <p>Even numbers Numéros pairs</p>
MID-CHANNEL OR FAIRWAY MILIEU DE CHENAL							
BIFURCATION OR OUTER- END OF MIDDLE-GROUND BIFURCATION							

TABLE No. 1

Countries using the Compass or Cardinal System in conjunction with the Lateral System, or without using the Lateral System: Germany, Italy, Norway, Russia, Sweden, Turkey.

TABLEAU No. 1
 Pays utilisant le Système du Compas, ou Système Cardinal, conjointement avec le Système Latéral, ou n'utilisant pas le Système Latéral: Allemagne, Italie, Norvège, Russie, Suède, Turquie.

COUNTRY PAYS	GERMANY ALLEMAGNE	ITALY ITALIE	NORWAY NORVÈGE	RUSSIA	RUSSIE	SWEDEN SUÈDE	TURKEY TURQUIE
	LATERAL AND CARDINAL SYSTEMS	LATERAL AND CARDINAL SYSTEMS	CARDINAL	Baltique, Esthonie, Lithuanie, Finlande LATERAL AND CARDINAL	Maritime Province and Kamchatka Province Maritime et Kamchatka CARDINAL	CARDINAL SYSTEM	LATERAL AND CARDINAL SYSTEMS
MIDDLE-GROUND BANC DE MILIEU							
JUNCTION OR INNER-END OF MIDDLE-GROUND JUNCTION							
WRECK ÉPAVE	 Top-marks according to position. Voyants selon position. Generally light buoys show a green flashing light indicating the side on which to be passed. Éventuellement les bouées portent un feu vert à éclats, indiquant le côté où on doit passer.	 At night may show white light if wreck is very dangerous. De nuit, peuvent porter un feu blanc si le danger est grave. Pass this side. Passez de ce côté. By night shows 3 white lights in place of green balls. De nuit, portent 3 feux blancs disposés comme les bouées.				 Wreck on the side where one ball or one green light is shown. S-W N-E, SW-NE, NW-SE, NW-SE. From the wreck NE, 2 green fls. au du feu unique. 2 éclats verts.	 The word "Wreck" in Turkish. Le mot "épaue" en turc.
TELEGRAPH TÉLÉGRAPHE		 Top-marks according to position. Voyant suivant position. By night the bearing of the cable is shown by a green sector. De nuit l'alignement du câble est couvert par un secteur de lumière verte.	 Inscriptions on boards show direction of cable. Des inscriptions sur des pancartes indiquent la direction du câble.				 The word "Telegraph" in Turkish. Le mot "Télégraph" en turc.
CARDINAL OR COMPASS SYSTEM SYSTÈME CARDINAL	 Marks danger. Marque le danger. Top-marks on buoys and beacons are painted white. Les voyants des bouées et des balises sont peints en blanc.	 These buoys are employed in combination with one of the following top-marks. Ces bouées s'emploient avec un des voyants ci-dessous. For outer end of shoals. Pour l'extrémité extérieure des bancs. For inner end of shoals. Pour l'extrémité intérieure des bancs.	 Bouoyage of open sea and sounds. Balisage du large et des passes.	 Bouoyage of open sea and sounds. Balisage du large et des passes.	 Bouoyage of open sea and sounds. Balisage du large et des passes.	 Type used in open waters. Forme utilisée au large.	 On the danger. Sur le danger. Cylinder of the same height as its diameter. Cylindre de hauteur égale au diamètre.
REMARKS OBSERVATIONS	With top-marks cones can be replaced by brooms placed in the same way. Dans les voyants les cônes peuvent être remplacés par des balais disposés de la même façon. Mooring buoys are distinguished by their ring. Les bouées d'amarrage se distinguent par leur anneau. The direction of some channels is indicated in the Sailing Directions. Le sens de certains chenaux est indiqué dans les Instructions Nautiques.	 Mole light at entrance to harbor to be left on the right. Feu maritime à laisser à droite. Mole light at entrance to harbor to be left on the left. Feu maritime à laisser à gauche. These mole lights each have the same characteristics. Ces feux d'accès au port présentent la même cadence.	The buoyage system is based on the general direction of the commencement of the channel. (See List of Channels.) Le mode du balisage est basé sur la direction générale de l'origine du chenal. (Voir Liste des Chenaux.) An arrow indicates the direction of navigable channels. (Une flèche indique la direction du chenal navigable.) The buoyage is supplemented by numerous cairns or piles of stones. Le balisage est complété par de nombreux cairns ou piles de pierres.	Buoys, other than spar, have colors and top-marks the same as above. Les bouées de forme autre que les bouées à espars portent les couleurs et les voyants ci-dessus.	The above top-marks are placed on spar buoys of the same color. Les voyants ci-dessus surmontent des bouées à espars de même couleur.	Spherical top-marks are made of laths, or basket willow. Les voyants sphériques sont faits de lattes ou de paniers d'osier. Shoals which are not in the direction of the channel are marked by special buoys. Les bancs qui ne sont pas dans la direction même du chenal sont balisés par des bouées particulières. The direction of some channels is indicated in the Sailing Directions. Le sens de certains chenaux est indiqué dans les Instructions Nautiques. Light buoys in the Open Sea show generally one white flash. Les bouées lumineuses du large portent généralement un feu à éclat blanc.	The numbering of channel buoys begins from seaward. Le numérotage des bouées de chenaux commence à partir du large. Top-marks are generally painted red. Les voyants sont en règle générale peints en rouge. Names and numbers of buoys are in black. Les noms et numéros des bouées y sont inscrits en noir. A channel may be divided into different zones, which are indicated by the top-mark on the buoy. Un chenal peut être divisé en différentes zones que l'on distingue par la forme des voyants superposés aux bouées. The direction of some channels is indicated in the Sailing Directions. Le sens de certains chenaux est indiqué dans les Instructions Nautiques.
AUTHORITY QUOTED	Baltic Pilot (British Admiralty) Part 2 Supplement No. 8, 1924 Instructions Nautiques Françaises No. 855 Mer du Nord Partie Sud	Elenco dei Fari e Segnalamenti Marittimi Genova, 1924	Norway Pilot (British Admiralty) Part 2, 1915 Supplement No. 8, 1924	Baltic Pilot (British Admiralty) 1914 Part 2 Supplement No. 8, 1924	Behring Pilot (British Admiralty) 1920 Supplement No. 3, 1924	Svensk Lots	Black Sea Pilot 1920 (British Admiralty) (Supplement No. 4, 1924)

BUOYAGE AND BUOY LIGHTING SYSTEMS OF THE WORLD

Systèmes de Balisage et d'Éclairage des Bouées du Monde

COMPILED BY THE INTERNATIONAL HYDROGRAPHIC BUREAU
Composé par le Bureau Hydrographique International

TABLEAU No. 2
Pays utilisant seulement le Système Lateral.
Argentine, Australie, Belgique, Brésil,
Iles Britanniques, Indes Anglaises and
Établissements des Détroits, Canada,
Chili, Chine.

IN THREE SHEETS. SHEET 2.

TABLE No. 2
Countries using only the Lateral System.
Argentina, Australia, Belgium, Brazil,
British Isles, British India and Strait Set-
tlements, Canada, Chile, China.

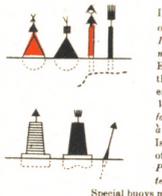
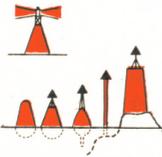
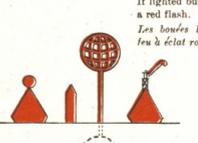
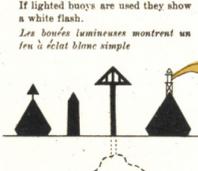
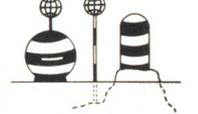
COUNTRY PAYS	SYSTEM ADOPTED SYSTÈME ADOPTÉ	AUSTRALIA A U S T R A L I E			BELGIUM B E L G I Q U E	BRAZIL B R É S I L	BRITISH ISLANDS I L E S B R I T A N N I Q U E S		INDIA & STRAIT SETTLEMENTS I N D E S A N G L A I S E S & É T A B S D E S D É T R O I T S	CANADA	CHILE C H I L I	CHINA C H I N E	COUNTRY PAYS	SYSTEM ADOPTED SYSTÈME ADOPTÉ
		SOUTH AUSTRALIAN PORTS P O R T S D E L ' A U S T R A L I E D U S U D	QUEENSLAND	VICTORIA			NORTHERN LIGHTHOUSE BOARD	CORPORATION OF TRINITY HOUSE & THE COMMISSIONERS OF IRISH LIGHTS						
		LATERAL			LATERAL		LATERAL		LATERAL		LATERAL			
MISCELLANEOUS BUOYS BOUÉES DIVERSES	 Important points, viz. change of route, etc. Points importants; ex: changement de route, etc. Extra top-marks additional to those which indicate the general position. Voyants supplémentaires convenant à leur position. Isolated points of the coast and of the approaches to harbors. Points isolés des côtes et des approches des ports. Special buoys may be replaced by spar buoys. Les bouées spéciales peuvent être parfois remplacées par des bouées à spars.				 Mooring buoys. Bouées d'amarrage.				Whistling, bell and lighted buoys are used at special points on the coast. Light buoys show flashing white, red or green flashes. Des bouées à sifflet, à cloche et lumineuses sont placées aux points particuliers de la côte. Les bouées lumineuses montrent des éclats blancs, rouges, ou verts.	 These top-marks are placed on buoys indicating turning points. Ces voyants sont placés sur les bouées qui indiquent les tournants. Top-marks are used only on special buoys. Les voyants sont utilisés seulement sur les bouées spéciales.	 Special buoys show flashing lights. Les bouées spéciales portent des feux à éclats.	 Hydrographic buoy marking region of surface, painted white. Bouées marquant des emplacements ou limitant des zones d'hydrographie - peintes en blanc.	MISCELLANEOUS BUOYS BOUÉES DIVERSES	
ISOLATED DANGER DANGER ISOLÉ					 Some show two groups of two red flashes. Éventuellement porte au feu à un groupe de deux éclats rouges.							 Obstruction	ISOLATED DANGER DANGER ISOLÉ	
STARBOARD HAND TRIBORD	 These buoys generally show a fixed red light. Ces bouées portent éternellement un feu fixe rouge. Beacons generally show a red occulting light. Les balises portent éternellement un feu rouge à occultations.	 Usually red Ordinairement rouge	 Red with conical top-marks painted same color as buoy. Rouge avec voyant conique peint de la même couleur que la bouée.	 Painted red with even numbers in white. Carry spherical top-marks. Peintes en rouge avec numéros pairs en blanc. Portent des voyants sphériques.	 8	 If lighted buoys are used they show a red flash. Les bouées lumineuses montrent un feu à éclat rouge simple.				 Even numbers. Numéros pairs. Light buoys for channels use occulting red lights. Les bouées lumineuses des chenaux montrent éternellement des feux rouges à occultation.		 Light buoys for channels generally display occulting white lights. Les bouées lumineuses de chenaux montrent éternellement des feux blancs à occultations.	STARBOARD HAND TRIBORD	
PORT HAND BABORD	 These buoys generally show a fixed white light. Ces bouées portent éternellement un feu fixe blanc. Beacons generally show a white occulting light. Les balises portent éternellement un feu blanc à occultations.	 Usually black or parti-colored Ordinairement noir ou mi-partie	 Black or parti-colored cylindrical top-mark painted same color as buoy. Noir ou mi-partie avec voyant cylindrique peint de la même couleur que la bouée.	 Painted black with odd numbers in white. Carry cylindrical top-marks. Peintes en noir avec numéros impairs en blanc. Portent des voyants cylindriques.	 6	 If lighted buoys are used they show a white flash. Les bouées lumineuses montrent un feu à éclat blanc simple.		 Top-mark staff and cage. Voyant mité et cage.	 These buoys are parti-colored. Ces bouées sont peintes mi-parties.	 Odd numbers. Numéros impairs. Light buoys for channels use occulting white lights. Les bouées lumineuses des chenaux montrent éternellement des feux blancs à occultation.		 Light buoys for channels generally display occulting white lights. Les bouées lumineuses de chenaux montrent éternellement des feux blancs à occultations.	PORT HAND BABORD	
MID-CHANNEL OR FAIRWAY MILIEU DE CHENAL	 Generally show a fixed white light. Portent éternellement un feu fixe blanc.				 Generally shows a white light with two white flashes. Éventuellement port un feu blanc à un groupe de deux éclats blancs.							MID-CHANNEL OR FAIRWAY MILIEU DE CHENAL		

TABLE No. 2
Countries using only the Lateral System.
Argentina, Australia, Belgium, Brazil,
British Isles, British India and Strait Set-
tlements, Canada, Chile, China.

TABLEAU No. 2
Pays utilisant seulement le Système Latéral.
Argentine, Australie, Belgique, Brésil,
Îles Britanniques, Indes Anglaises and
Établissements des Détroits, Canada,
Chili, Chine.

COUNTRY PAYS	SYSTEM ADOPTED SYSTÈME ADOPTÉ	AUSTRALIA AUSTRALIE			BELGIUM BELGIQUE	BRAZIL BRÉSIL	BRITISH ISLANDS NORTHERN LIGHTHOUSE BOARD	ILES BRITANNIQUES CORPORATION OF TRINITY HOUSE & THE COMMISSIONERS OF IRISH LIGHTS	INDIA & STRAIT SETTLEMENTS INDES ANGLAISES & ÉTABS DES DÉTROITS	CANADA	CHILE CHILI	CHINA CHINE	COUNTRY PAYS	SYSTEM ADOPTED SYSTÈME ADOPTÉ
		SOUTH AUSTRALIAN PORTS PORTS DE L'AUTRALIE DU SUD	QUEENSLAND	VICTORIA										
		LATERAL			LATERAL	LATERAL	LATERAL	LATERAL	LATERAL	LATERAL	LATERAL	LATERAL		
BIFURCATION OR OUTER-END OF MIDDLE-GROUND BIFURCATION	Beacons generally show a sector light. <i>Les balises portent généralement des feux à secteurs.</i>												BIFURCATION OR OUTER-END OF MIDDLE-GROUND BIFURCATION	
MIDDLE-GROUND BANC DE MILIEU													MIDDLE-GROUND BANC DE MILIEU	
JUNCTION OR INNER-END OF MIDDLE-GROUND JUNCTION	Beacons generally show a sector light. <i>Les balises portent généralement des feux à secteurs.</i>												JUNCTION OR INNER-END OF MIDDLE-GROUND JUNCTION	
WRECK ÉPAVE	"Naufrage - Wreck" in white letters. <i>"Naufrage - Wreck" en lettres blanches.</i> Generally show a green light. <i>Montrent généralement un feu vert.</i>												WRECK ÉPAVE	
TELEGRAPH TÉLÉGRAPHE	"Telegraph" in white letters. <i>"Télégraphe" en lettres blanches.</i>												TELEGRAPH TÉLÉGRAPHE	
REMARKS OBSERVATIONS	Provisional buoy marks any form of obstruction. <i>Bouées provisoires pour marquer toute sorte d'obstruction.</i> Buoys are numbered consecutively from seaward. <i>Les bouées sont numérotées dans l'ordre consécutif à partir du large.</i> Channel buoys which are opposite one another will have the same number whether conical or can. <i>Les bouées de chenal qui se font face portent le même numéro qu'elles soient coniques ou plates.</i> When the shape of the buoy does not follow the rules, the top-marks will always show the correct shape intended. <i>Lorsque la forme de la bouée ne correspond pas aux règles, la forme du voyant correspondra à la règle.</i>	Top-marks are painted the same color as the buoys on which they are placed. <i>Les voyants sont peints de la couleur de la bouée sur laquelle ils sont placés.</i> The numbering of the buoys begins from seaward. <i>Le numérotage des bouées commence à partir du large.</i> In New South Wales the starboard hand buoys are painted red, and port hand black. <i>Dans la Nouvelle Galles de Sud les bouées de tribord sont peintes en rouge et celles de bâbord en noir.</i>	There is no system of buoy lighting in all Australia, except in Clarence Strait, where red buoys generally show flashing white, and black buoys generally show flashing red. <i>Il n'existe pas de règle pour l'éclairage des bouées en Australie. Toutefois, dans les Détroits de Clarence les bouées rouges portent généralement des feux à éclats blancs, et les bouées noires portent généralement des feux à éclats rouges.</i>	Buoys are numbered in white on each side of the channel following the numerical sequence. <i>Les bouées sont numérotées en chiffres blancs de chaque côté du chenal, selon la suite naturelle des nombres, en commençant à partir du large.</i> Top-marks are colored in the same way as buoys on which they are placed. <i>Les voyants ont la même coloration que les bouées sur lesquelles ils sont placés.</i> Spherical buoys always have a top-mark, but other buoys only in special cases. <i>Les bouées sphériques sont toujours munies de voyants; les autres n'en portent que dans des cas particuliers.</i> Beacons follow the same regulations. <i>Les balises suivent les mêmes règles.</i> In winter buoys may be replaced by special spar buoys. <i>En hiver les bouées peuvent être remplacées par des bouées à spar spéciales.</i>	Marked "CASCO SOSSOBRAO" or "C.S." <i>Porte l'inscription "CASCO SOSSOBRAO" ou "C.S."</i> Generally shows a flashing green light. <i>Éventuellement porte un feu à éclats verts simples.</i> Marks temporary obstruction without letters "C.S." <i>Obstruction temporaire sans les lettres "C.S."</i>	Marks fresh water pipes. Generally shows blue flashing light. <i>Signalisation d'eau douce. Éventuellement bouée lumineuse à éclats bleus.</i>	Top-marks are painted black. <i>Les voyants sont peints en noir.</i>	The numbering of the buoys begins from seaward. <i>Le numérotage des bouées commence à partir du large.</i>	Beacons have, as far as possible, the same colors as the buoys. <i>Les balises sont autant que possible colorées comme les bouées.</i> The numbering of the buoys begins from seaward. <i>Le numérotage des bouées commence à partir du large.</i>	Beacons have, as far as possible, the same colors as the buoys. <i>Les balises sont autant que possible colorées comme les bouées.</i> The numbering of the buoys begins from seaward. <i>Le numérotage des bouées commence à partir du large.</i>	The form of top-mark is more important than the form of the beacon or buoy. <i>La forme du voyant est plus importante que la forme de la balise ou de la bouée.</i> The form of beacon is more important than the color which may be modified according to the background. <i>La forme des balises est plus importante que leur couleur qui peut être modifiée pour tenir compte de l'arrière-plan.</i> The name of the danger is painted on the buoys in white letters. <i>Le nom du danger est peint en lettres blanches sur les bouées.</i> For the direction of some channels it is necessary to read the sailing directions. <i>Pour la sens de certains chenaux on devra se reporter aux Instructions Nautiques.</i>	All buoys are conical in shape unless otherwise stated. <i>Toutes les bouées sont de forme conique sauf indication contraire.</i> All buoys bear a plate with their name in English and also in Chinese characters. <i>Les bouées portent leur nom en Anglais et en Chinois inscrit sur une plaque.</i> Beacons painted in a single color have their top-marks of the same color, or in white, or of the color of the beacon combined with white. Parti-colored beacons have their top-marks also painted with the same parti-colors. <i>Les balises peintes d'une seule couleur ont leur voyant peint de la même couleur, ou en blanc, ou de la couleur de la balise combinée avec du blanc. Les balises peintes en deux couleurs ont leur voyant peint aussi avec ces deux couleurs.</i>	REMARKS OBSERVATIONS	
AUTHORITY QUOTED RÉFÉRENCE	South America Pilot Part 1, 1922 (British Admiralty)	Australia Pilot (British Admiralty) Vol. 1, 1920 Supplement No. 5, 1923	Australia Pilot (British Admiralty) Vol. 3, 1924	Victoria General Notices to Mariners 1918	North Sea Pilot Part 4 (Supplement No. 2, 1924) 1921 (British Admiralty) Instructions Nautiques Françaises No. 855 Mer du Nord (Partie Sud)	Eleuco de Farões, 1917 & Lettres	North Sea Pilot, Part 2, (British Admiralty) 1923	Bengal Pilot, (British Admiralty) 1921 Supplement No. 2, 1923 Instructions Nautiques Françaises No. 311 Mer de Chine 1919	St. Lawrence Pilot, (British Admiralty) Part 1, 1916 (Supplement No. 7, 1924)	Derrotero Chileno, 1919	List of Lights Chinoise Maritime Customs 1921	AUTHORITY QUOTED RÉFÉRENCE		

BUOYAGE AND BUOY LIGHTING SYSTEMS OF THE WORLD

Systèmes de Balisage et d'Éclairage des Bouées du Monde

COMPILED BY THE INTERNATIONAL HYDROGRAPHIC BUREAU
Composé par le Bureau Hydrographique International

TABLE No. 2
(continued)

Countries using only the Lateral System.
Denmark, Dutch East Indies, Egypt,
France, Japan, Mexico, Netherlands,
Portugal, Russia, Spain, United States of
America.

TABLEAU No. 2
(continue)

Pays utilisant seulement le Système Latéral.
Danemark, Indes Orientales Néerlandaises,
Égypte, France, Japon, Mexique,
Pays-Bas, Portugal, Russie, Espagne,
États Unis D'Amérique.

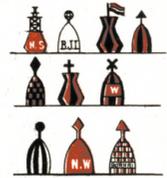
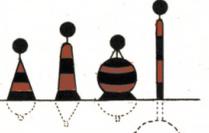
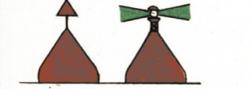
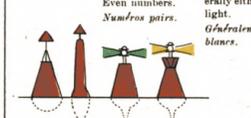
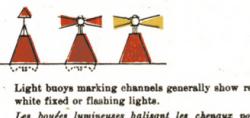
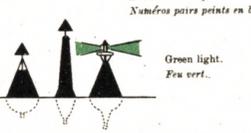
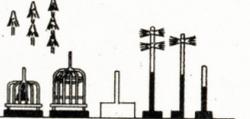
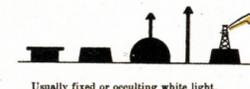
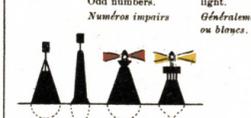
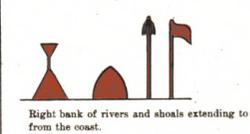
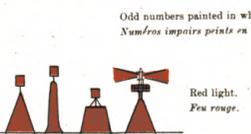
COUNTRY PAYS	DENMARK DANEMARK LATERAL	DUTCH EAST INDIAN ARCHIPELAGO INDES NEERLANDAISES LATERAL	EGYPT ÉGYPTÉ	FRANCE LATERAL	JAPAN JAPON LATERAL	MEXICO MEXIQUE LATERAL	NETHERLANDS PAYS BAS LATERAL	PORTUGAL	RUSSIA RUSSIE Black and Azov Seas - Mers Noire et d'Azov LATERAL	SPAIN ESPAGNE LATERAL	U. S. OF AMERICA ÉTATS-UNIS D'AMÉRIQUE LATERAL	COUNTRY PAYS
SYSTEM ADOPTED SYSTÈME ADOPTÉ	LATERAL	LATERAL		LATERAL	LATERAL	LATERAL	LATERAL		LATERAL	LATERAL	LATERAL	SYSTEM ADOPTED SYSTÈME ADOPTÉ
MISCELLANEOUS BUOYS BOUÉES DIVERSES	 Special light buoys generally show flashing lights. <i>Les bouées lumineuses spéciales portent généralement des feux à éclats.</i>	Approach buoys are used, but not of any special type <i>On emploie des bouées de reconnaissance, mais elles n'ont pas de type particulier.</i>			Special buoys are described in the Sailing Directions. <i>Les bouées spéciales sont décrites dans les Instructions Nautiques.</i>		 Entrance buoy. <i>Bouée d'attache.</i> Mooring buoy. <i>Bouée d'amarrage.</i>	 Entrance buoy. <i>Bouée d'attache.</i> Mooring buoy. <i>Bouée d'amarrage.</i>		 Mooring buoy. <i>Bouée d'amarrage.</i> Painted white unless serving as channel marks, in which case they are painted according to position as above. <i>Peintes en blanc. Si les bouées d'amarrage servent aussi pour le balisage, elles sont alors peintes selon leurs positions respectives.</i>	 Quarantine. <i>Quarantaine.</i>	MISCELLANEOUS BUOYS BOUÉES DIVERSES
ISOLATED DANGER DANGER ISOLÉ											 Mark obstructions. <i>Indiquent les obstructions.</i>	ISOLATED DANGER DANGER ISOLÉ
STARBOARD HAND TRIBORD	 If lighted show white or other colored light <i>Lorsque ces bouées sont lumineuses elles portent un feu blanc ou d'une autre couleur.</i>	 White <i>Blanc</i> Usually fixed or occulting white light. <i>Généralement feux blancs fixes ou occultations.</i>	 Lighted buoys show fixed green light. <i>Les bouées lumineuses montrent un feu fixe vert.</i>	 Even numbers. <i>Numéros pairs.</i> For marking channels generally either green or white light. <i>Généralement feux verts ou blancs.</i>	 Light buoys marking channels generally show red or white fixed or flashing lights. <i>Les bouées lumineuses balisent les chenaux portent généralement des feux rouges ou blancs, fixes ou à éclats.</i>	 Even numbers. <i>Numéros pairs.</i>		 Even numbers. <i>Numéros pairs.</i>	 Left bank of rivers and shoals extending to the northward from the coast. <i>Rive gauche des fleuves et bancs s'étendant dans le Nord de la Côte.</i>	 Even numbers painted in white. <i>Numéros pairs peints en blanc.</i> Green light. <i>Feu vert.</i>	 Even numbers. <i>Numéros pairs.</i> Light buoys for channels use fixed or flashing red lights. <i>Les bouées lumineuses des chenaux montrent des feux rouges, fixes ou à éclats.</i>	STARBOARD HAND TRIBORD
PORT HAND BABORD	 If lighted show red or other colored light. <i>Lorsque ces bouées sont lumineuses elles portent un feu rouge ou d'une autre couleur.</i>	 Usually fixed or occulting white light. <i>Généralement feux blancs fixes ou occultations.</i>	 Lighted buoys show fixed red light. <i>Les bouées lumineuses montrent un feu fixe rouge.</i>	 Odd numbers. <i>Numéros impairs.</i> For marking channels generally either red or white light. <i>Généralement feux rouges ou blancs.</i>	 Light buoys marking channels generally show green or white, fixed or flashing lights. <i>Les bouées lumineuses balisent les chenaux portent généralement des feux verts ou blancs, fixes ou à éclats.</i>	 Odd numbers. <i>Numéros impairs.</i>		 Odd numbers. <i>Numéros impairs.</i>	 Right bank of rivers and shoals extending to the southward from the coast. <i>Rive droite des fleuves et bancs s'étendant dans le Sud de la Côte.</i>	 Odd numbers painted in white. <i>Numéros impairs peints en blanc.</i> Red light. <i>Feu rouge.</i>	 Odd numbers. <i>Numéros impairs.</i> Light buoys for channels use fixed or flashing white lights. <i>Les bouées lumineuses des chenaux montrent des feux blancs, fixes ou à éclats.</i>	PORT HAND BABORD
MID-CHANNEL OR FAIRWAY MILIEU DE CHENAL												MID-CHANNEL OR FAIRWAY MILIEU DE CHENAL
BIFURCATION OR OUTER-END OF MIDDLE-GROUND BIFURCATION												BIFURCATION OR OUTER-END OF MIDDLE-GROUND BIFURCATION

TABLE No. 2
(continued)

Countries using only the Lateral System.
Denmark, Dutch East Indies, Egypt,
France, Japan, Mexico, Netherlands,
Portugal, Russia, Spain, United States of
America.

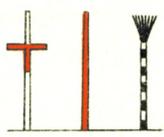
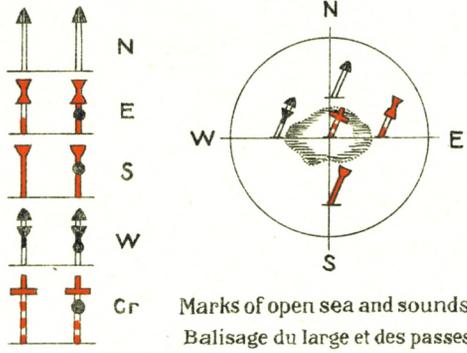
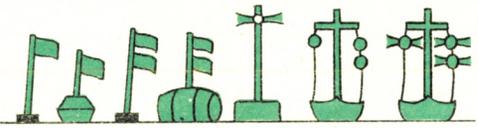
TABLEAU No. 2
(continue)

Pays utilisant seulement le Système Lateral.
Danemark, Indes Orientales Néerlandaises,
Égypte, France, Japon, Mexique,
Pays-Bas, Portugal, Russie, Espagne,
Etats Unis d'Amérique.

COUNTRY PAYS	DENMARK DANEMARK LATERAL	DUTCH EAST INDIAN ARCHIPELAGO INDES NEERLANDAISES LATERAL	EGYPT ÉGYPTE	FRANCE LATERAL	JAPAN JAPON LATERAL	MEXICO MEXIQUE LATERAL	NETHERLANDS PAYS BAS LATERAL	PORTUGAL	RUSSIA RUSSIE Black and Azov Seas—Mers Noire et d'Azov. LATERAL	SPAIN ESPAGNE LATERAL	U. S. OF AMERICA ÉTATS-UNIS D'AMÉRIQUE LATERAL	COUNTRY PAYS
SYSTEM ADOPTED SYSTÈME ADOPTÉ												SYSTEM ADOPTED SYSTÈME ADOPTÉ
MIDDLE-GROUND BANC DE MILIEU												MIDDLE-GROUND BANC DE MILIEU
JUNCTION OR INNER-END OF MIDDLE-GROUND JUNCTION												JUNCTION OR INNER-END OF MIDDLE-GROUND JUNCTION
WRECK ÉPAVE	 Port. Starboard. Port. Starboard. Ébord. Tribord. Ébord. Tribord. In narrow waters. 2 green flashes. 1 green flash. Passages resserrés. 2 éclats verts. Un éclat vert.			 Top-mark according to position. Voyant suivant position.			 Generally bell buoy with green light. Éventuellement feu vert et cloche. "WRAK" in white letters. "WRAK" en lettres blanches. Wreck in a channel. Épave dans un chenal. Wreck in the open sea. Épaves du large. At night, 3 lights. De nuit, 3 feux.			 No top-mark. Pas de voyant. Generally shows a white light. Éventuellement porte un feu blanc. "NAUFRAGIO" in white letters. "NAUFRAGIO" en lettres blanches.	 By night, one red light. De nuit, un feu rouge.	WRECK ÉPAVE
TELEGRAPH TÉLÉGRAPHE												TELEGRAPH TÉLÉGRAPHE
REMARKS OBSERVATIONS	The direction of some channels is indicated in the Sailing Directions. Le sens de certains chenaux est indiqué dans les Instructions Nautiques.	Same remarks as for the Netherlands. Mêmes remarques que pour les Pays Bas. Besides the above system of buoys, there are many small unofficial buoys, beacons and marks on which too much reliance should be not placed. En dehors du système officiel de balisage on rencontre encore de petites bouées, balises ou marques non-officielles, sur lesquelles on ne devra pas trop compter.		Numbering of buoys begins from seaward. Le numérotage des bouées commence à partir du large. Buoys are lettered in white. Inscription en lettres blanches.	Numbers on buoys are painted white. Les numéros des bouées sont peints en blanc. The direction of some channels is indicated in the Sailing Directions. Le sens de certains chenaux est indiqué dans les Instructions Nautiques.		Buoys in channel are numbered from seaward, the starboard and port buoys each having their consecutive numbers. Les bouées de chenaux sont numérotées à partir de la mer, celles de tribord et celles de bâbord ayant chacune leur numérotage particulier. Buoys show the initial letter of the channel. Les bouées portent l'initiale du chenal. Letters and numbers are painted white. Les lettres et chiffres sont peints en blanc. In winter some buoys may be replaced by special spar buoys. En hiver certaines bouées peuvent être remplacées par des bouées à espars spéciales.		Buoys in channel are numbered from seaward, the starboard and port buoys each having their consecutive numbers. Les bouées de chenaux sont numérotées à partir de la mer, celles de tribord et celles de bâbord ayant chacune leur numérotage particulier. Buoys show the initial letter of the channel. Les bouées portent l'initiale du chenal. Letters and numbers are painted white. Les lettres et chiffres sont peints en blanc. In winter some buoys may be replaced by special spar buoys. En hiver certaines bouées peuvent être remplacées par des bouées à espars spéciales.	The numbering of the buoys begins from seaward. Le numérotage des bouées commence à partir du large. Names of buoys are generally painted white in full or abbreviated. Les noms sont généralement inscrits sur les bouées en lettres blanches ou en abrégé. Lighted buoys or bell buoys on the starboard side of the channel do not have top-marks, but those on the port side carry a small cylindrical basket top-mark. Les bouées lumineuses de tribord ne portent pas de voyants, celles de bâbord portent un petit panier cylindrique.	Turning buoys are marked by perches or cages, the color and number indicating on which side they shall be placed. Les bouées de courbes sont surmontées ou de cages, leur couleur et leur numéros indiquant de quel côté on doit passer. Beacons marking channels are painted the same as buoys; other beacons are all designed and constructed to suit the background. Les balises des chenaux sont peintes comme les bouées; les autres balises sont habillées et construites pour se distinguer de l'arrière-plan. Different channels in the same bay, sound, river, or harbor will be marked, as far as practicable, by different descriptions of buoys. Principal channels will be marked with nun buoys; secondary channels will be marked with can buoys, and minor channels with spar buoys. When there is but one channel, nun buoys properly colored and numbered are usually placed on the starboard side and can buoys on the port side of it. Les divers chenaux d'une même baie, passage, fleuve ou port seront indiqués autant que possible par différentes sortes de bouées. Les chenaux principaux seront balisés avec des bouées coniques, les chenaux secondaires avec des bouées plates, et les chenaux de moindre importance avec des bouées à espars. Lorsqu'il y a un seul chenal les bouées coniques, convenablement peintes et numérotées, sont généralement placées du côté tribord du chenal et les bouées plates du côté bâbord du chenal.	REMARKS OBSERVATIONS
AUTHORITY QUOTED RÉFÉRENCE	Danske Sjømærker 1922 Danske Leds T. 2, 1919	Eastern Archipelago Pilot Part 2, 1923 (British Admiralty)	Mediterranean Pilot Vol. 5, 1915 Supplement 4, 1920 (British Admiralty)	Instructions Nautiques (France) No. 923 Côte Nord de France 1920	Japanese Light List 1922 Japan Pilot—1914 Supplement No. 4, 1920 (British Admiralty)	West Indies Pilot (Vol. 1, 1923) (British Admiralty)	Belfoningstaet van Nederland 1924	Convenções Trabalhos Hidrográficos Costa de Portugal, 1914 West Coast of Spain & Portugal Pilot British Admiralty, 1921	Black Sea Pilot (British Admiralty) 1920 Supplement No. 4, 1924	Biscay Pilot 1921 (British Admiralty) Supplement No. 2, 1923		AUTHORITY QUOTED RÉFÉRENCE

FINLAND

FINLANDE

<p>ISOLATED DANGER</p> <p>DANGER ISOLÉ</p>	 <p>Inland waters. Eaux intérieures.</p>
<p>CARDINAL OR COMPASS SYSTEM</p> <p>SYSTÈME CARDINAL OU DU COMPAS</p>	 <p>Marks of open sea and sounds. Balisage du large et des passes.</p>
<p>WRECK</p> <p>ÉPAVES</p>	 <p>By day. By night. De jour. De nuit.</p>

NOTE

This information was received after the other plates had gone to press.

NOTA

Ces renseignements ont été reçus après envoi sous presse des autres planches.