Lithuania, Monaco, Norway, Netherlands, Poland, Roumania, Sweden, Union of Soviet Socialist Republics, Yugoslavia.

The most comprehensive reports are those forwarded by the United States of America and the United Kingdom of Great Britain and Northern Ireland.

For particulars interested parties are referred to the official document N° C. 458.M. 240.1935.VIII (C.C.T./19th Session/P.V.) published by the League of Nations, Geneva, 20th November, 1935, which gives the results of the enquiry. (N° VIII Transit 1935, VIII. 8. of the series of the League of Nations publications).

The results of that enquiry show that the situation is approximately the same as at the time of the Lisbon 1931 Conference, that is to say, that a group of States, most of which are European, is prepared to conclude an agreement, whereas certain other States particularly those of North America, are not ready to accept standard buoyage regulations on the proposed basis. Some of the States, although favourable to the proposed draft, have nevertheless proposed certain amendments to it. 13 replies are favourable and make no reservations; 9 are favourable. but make more or less important reservations; 3 are negative; one, that of the Norwegian Government, is more or less negative, but says that if the Convention is accepted by the majority of European countries and particularly by countries that are neighbours of Norway, the Government of that country will endeavour gradually to put as many as possible of the regulations into force; 3 Governments have made no comments on the matter.

In these circumstances, at the proposal of its President, the Committee has decided to set up a committee of experts instructed to frame a new text, having regard to the various amendments and modifications proposed by the Governments. Should the Committee think fit, this text will be communicated to those Governments which have made known their readiness, in principle, to conclude an agreement on the basis of the Preparatory Committee's proposals. The Advisory and Technical Committee is of opinion that, for this purpose, a Protocol of Signature should be opened at Geneva at such time as shall be subsequently fixed.

H. B.

THE METHODS OF MODERN NAVIGATION

by

EDWARD J. WILLIS, M. E. Virginia, U. S. A.

(165 pp. - ill. - Pr. 5s. 6d. net from the Publishers : BROWN Son & FERGUSON Ltd., Glasgow, 1935).

This in an interesting book which is characterised by "the use of differential calculus in navigation" and also by the extensive use of graphs and diagrams in the solution of the problems of navigation.

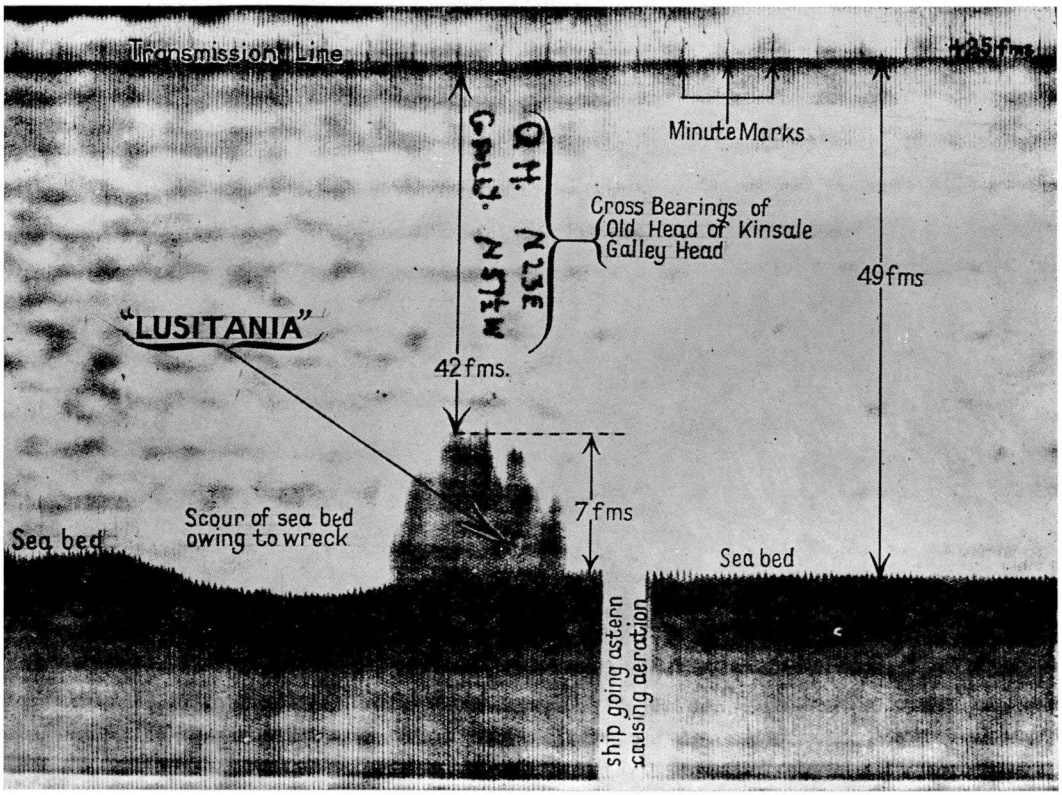
A number of mechanical calculators, including the Willis Altitude-Azimuth Instrument and the Willis Navigating Machine are briefly described, as being valuable aids to navigation in saving a great deal of laborious calculation. The book ends with a short but very interesting chapter by the author entitled : *Navigation - A Guess at the Future.*

It is believed that this publication will be useful in scientific libraries and to professors of navigation, but it is doubtful whether it will be accepted by the great body of practical navigators on the surface of the sea and in the air, who are looking, naturally, for the quickest and easiest method of solving their problems and determining with accuracy their positions.

A. T. L.

HISTORY OF THE MAGNETIC COMPASS

Commander J. HENNESSY, R.D., R.N.R., of the Marine Division of the British Meteorological Committee, has published in *The Marine Observer*, Vol. XII, N° 120, London, October 1935, page 149, a very interesting article on the history of the magnetic compass. This digest is based on an important documentation on this subject particularly Captain A. SCHÜCK's work *Der Kompass*, Hamburg, 1911. To this should be

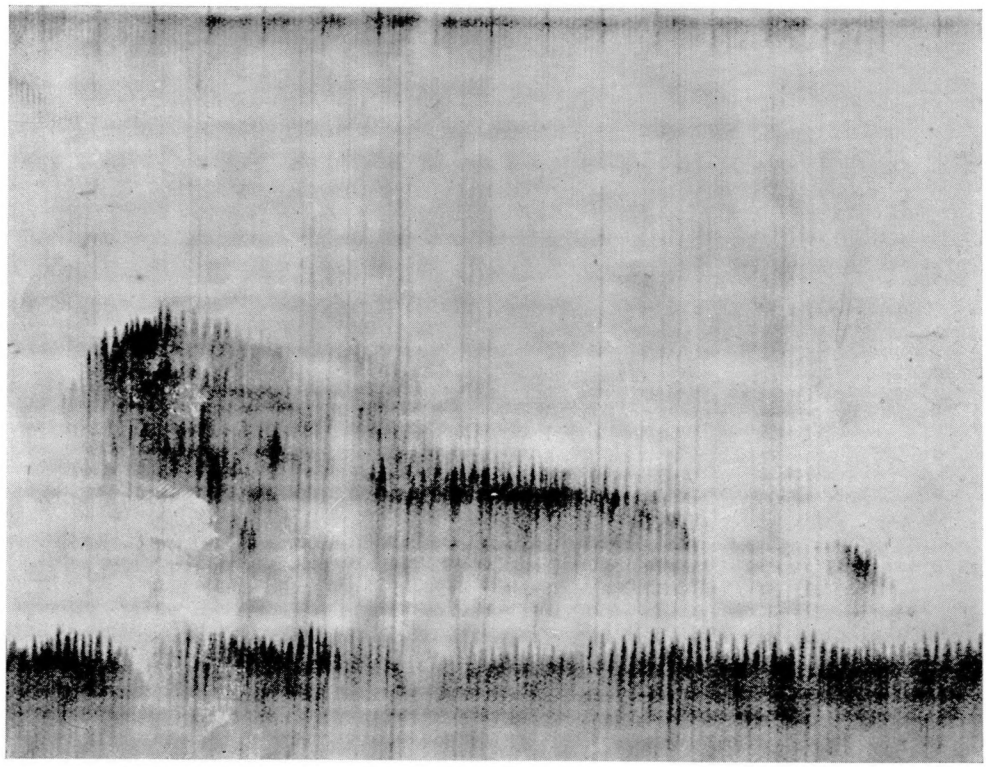


WRECK OF THE "LUSITANIA"

ECHO SOUNDING RECORD

ÉPAVE DU "LUSITANIA"

ENREGISTREMENT OBTENU AVEC L'ÉCHO-SONDEUR.



GRAPH OF THE LUSITANIA MADE BY ADMIRALTY PATTERN ECHO SOUNDER AS THE S. S. ORPHIR DRIFTED SLOWLY ABOVE THE WRECK FROM STEM TO STERN.

ENREGISTREMENT DU LUSITANIA RELEVÉ PAR L'APPAREIL DE SONDAGE PAR LE SON, MODÈLE DE L'AMIRAUTÉ BRITANNIQUE, PENDANT QUE L'ORPHIR SE DÉPLAÇAIT LENTEMENT AU-DESSUS DE L'ÉPAVE DE LA PROUE A LA POUPE.

added the information to be found in Commander FONTOURA DA COSTA's *A Marinharia dos Descobrimentos*, pages 157 and 192, and in an article by H. WINTER which appeared in the *Annalen der Hydrographie und Maritimen Meteorologie* of 15th September 1935, page 352 et seq.

HOW THE WRECK OF THE "LUSITANIA" WAS FOUND.

(Summary of an article published in *The Nautical Magazine*, Glasgow, January 1936, page 33).

In the course of her search, carried out in June 1935, around the wreck of the *Lusitania*, torpedoed in 1915 off the South West coast of Ireland, near the Old Head of Kinsale, the S. S. *Orphir* developed a method of location of the wreck the success of which is due to the use of a recording echo-sounder. Without this valuable auxiliary the wreck of the *Lusitania* could not have been found so quickly. The *Orphir* was equipped with two echo-sounders : the French Langevin-Chilowsky pattern and the British Admiralty M. S. II model. Both are supersonic in operation. The Admiralty pattern however employs a recording device with an accuracy of inches, while the French pattern registers soundings by flashes on a transparent scale. Some idea of the accuracy of this latter machine may be gathered from the fact that as the anchor cable ran out those on the bridge clearly saw its outline registered on the chart.

On 6th October the *Lusitania* was definitely found. Shortly after 2 p.m. the British Admiralty echo-sounder apparatus charted an enormous wreck at least 600 feet long rising 84 feet above the bottom of the sea. Nine times the *Orphir* was taken over the spot and each time the long bulky outline was recorded, while the sea bottom in the area was recorded as being perfectly flat. A close reading of the chart indicated that the wreck was fairly deeply embedded in sandy clay and was lying at a depth of 309 feet at 11.6 miles 164° from Old Head of Kinsale Lighthouse. During the course of the search, over 2000 miles of the sea-bed was surveyed. A clever system of buoying was adopted and one square mile was surveyed at a time.

The appended photograph shows the trace of the record obtained over the wreck of the *Lusitania*. The soundings on this chart correspond to the second phase of the recorder ranging from 25 to 60 fathoms, with the result that the zero of the chart corresponds to a depth of 25 fathoms. The echo-sounder had been working during a period of 32 days ; the machine ran from 12 - 14 hours daily and produced altogether 47 charts of an average length of eight hours. 240 soundings were made each minute, giving a total of over 6,760,000 echo-soundings.

On the chart, above the wreck of the *Lusitania*, one notices two bearings which were scribbled hastily by means of an "electric pencil". The blank space on the record corresponds to a gap in the soundings at the moment when, the ship having gone beyond the wreck, the engines were moved astern, thereby causing air to be mixed with the water below the transmitter.

THE TIDES OF PUERTO PIZARRO

by

LIEUTENANT COMMANDER VICTOR CORTEZ M. OF THE PERUVIAN NAVY.

The *Boletin de la Sociedad Geografica de Lima*, Tomo LII, 4th Quarter, 1935, page 307, publishes a very comprehensive study of the tides of Puerto Pizarro (3° 31'S. - 80° 23'W.). The tides are influenced at this place by the hydraulic action of Rio Tumbes and its bar. This region has formed the subject of a special study ; a series of 240 tide-gauge observations was carried out in the port during September, 1934. The study was continued throughout the lunar month and has enabled tidal curves to be drawn from which the ranges, mean sea level and various intervals have been deduced.