ples of the calculation of latitude and time, a theory of errors of the sextant, and the practical rules to be followed in using the instrument for precise observations ashore.

An appendix contains a description of a sextant mounted on a stand for shore observations with the artificial horizon, fitted with a high-power glass and with its various parts specially designed with a view to precise observations. This instrument, constructed by T. COOKE and Sons of York, has been used by Count de CAÑETE DEL PINAR for numerous determinations since 1900.

The diameter of the object glass of the telescope is 49 mm. (1.93 in.) and the focal length is 400 mm. (13.75 in.). Its reticule consists of four vertical and two horizontal threads and is provided with electric lighting. Two eyepieces give magnifications of × 14 and × 75 respectively. The small mirror has been replaced by a reflecting prism with a hypoteneuse of 122 mm. (4.80 in.). The graduated limb has a radius of 150 mm. (5.91 in.). The instrument is also provided with a level and is adjusted by three set screws.

AS CARTAS DE MAREAR

(A STUDY ON OLD SEA-CHARTS).

In the January-February 1934 number of the *Anais do Club Militar Naval*, Lisbon, the series of interesting articles on the "Navy of the Epoch of Discoveries" (*A Marinharia dos Descobrimentos*) is continued by a study furnishing some very curious details on old sea-charts (*As Cartas de Marear*, pp. 5-63) written by Captain FONTOURA DA COSTA. The article embraces the method of establishment of these charts; rectangular and squared plane charts; the globes; units of measurement used; rhumb-lines; *cartas reduzidas* (Mercator charts); and a detailed study, by the author, of Mercator's World-map of 1569 should be specially noted. Numerous bibliographic articles are quoted.

NEW PROJECTIONS FOR WORLD MAPS.

by

R. V. PUTNINS.

(Extract from the *Geografiski Raksti*, Parts III and IV, published by the *Societas Geographica Latviensis*, Riga 1934, pp. 180-209, 16 figs.).

This article is a summary of the "Cartographic Studies" which the author proposes to publish as a separate work.

The author describes the construction of new map systems with elliptical, parabolic and hyperbolic meridians. He suggests 6 projections representing the pole by a point, and 6 others representing it as a line, and he concludes with a comparative table of these "mericylindrical" projections.

THE CARTE DU MONDE AU MILLIONIÈME (*)

by

COLONEL SIR CHARLES CLOSE.

(Extract from *The Geographical Journal*, Vol. LXXXIII, No. 4, London, April 1934, page 323).

Twenty years have passed since the INTERNATIONAL CONFERENCE ON THE CARTE DU MONDE met at Paris and passed its unanimous resolutions, and we may now conveniently

(*) *See also* Hydrographic Review, *Vol. VI, No. 2, November* 1929, *page* 181.

take stock of the results of this international effort. And, in taking stock, we shall not be likely to forget that the War and its aftermath had a generally depressing effect upon all international schemes, though in one respect it provided a stimulus.

A study of the Reports issued by the CENTRAL BUREAU for 1931 and 1932 gives good ground for hoping that this excellent undertaking will be completed, at least as regards three continents, in a reasonable period of time. For if we include not only those sheets which are in strict conformity with the official resolutions, but also those which, though on the same scale and bounded by the correct sheet-lines, differ in other particulars from the standard, we shall find that Europe is practically covered, and Africa and South America are more than half covered, with sheets of the series.

The empty spaces are chiefly North America, Northern Asia, and Australia, though even in these areas a few sheets are available. Or, to look at the matter from another point of view, out of the total number of 840 sheets which will cover the land surface of the globe, somewhat more than 300 have been completed in one form or another, and this number covers some of the most densely inhabited parts of the Earth, such as Europe and India, whilst the remaining areas include the inhospitable polar regions. Of the 300 completed sheets more than 200 conform, with some degree of strictness, with the official standard.

Amongst the more important blocks of sheets may be mentioned those which cover Western Europe (except southern Portugal); a block including Lower Egypt, Mesopotamia, and Northern Arabia; a magnificent block of 21 sheets covering the Indian Empire (except northern Burma); one including Siam and Indo-China; and an immense block covering Brazil.

Of sheets published according to the official resolutions during the past few years may be mentioned 4 of Egypt, 2 of Norway, 1 of New Zealand, 5 of Australia, and some interesting sheets issued by the AMERICAN GEOGRAPHICAL SOCIETY of areas in Mexico and South America. There were in hand 2 new sheets of Roumania, 3 of Egypt, 3 of the Dutch East Indies, 1 of Siam, and no doubt there are others. Eleven new sheets made their appearance in 1932. Little by little the world is being mapped on this uniform scale, and we may hope that the most important blank space, namely North America, may one of these days be taken in hand by the countries concerned.

These reports show how wise was the Paris Conference to advocate the establishment of a CENTRAL BUREAU for the World Map. The functions of this Bureau are, according to the original resolution, now twenty years old, the publication of an annual report; the organization of a service of exchange of information; and the distribution to the adhering States of copies of all the sheets, as they are published. The Bureau carries out these useful functions very efficiently. The Central Bureau is the ORDNANCE SURVEY OFFICE at Southampton, and the "Auxiliary Office" is the ROYAL GEOGRAPHICAL SOCIETY.

The Report for 1932 justly remarks that "The production of special sheets of the International Million type, but bounded by sheet-lines most suitable for the assembly and production of national data, is a point which should be kept well in mind. The eight international sheets covering Great Britain have now been compiled into two larger sheets which will shortly be distributed to all adhering countries, and it is hoped that this example, together with that provided by the single sheet covering Denmark, will serve to emphasize this further application of the existing material". In all these matters and in small cartographic details, like the use of black or brown contours, the Central Bureau will, no doubt, use the excellent rule of keeping the mean between the two extremes, of too much stiffness in refusing, and of too much easiness in admitting any variation.

The INTERNATIONAL MAP is of more than cartographic value; it serves as a uniform basis for technical maps or a great variety of kinds. Thus it will serve as an admirable foundation for population maps. We have an example of this use in the new Population Map of Great Britain, northern half, recently published by the Ordnance Survey. Then it has been used to show the magnetic variation over the British Isles; the results of the Gravity Survey will be shown on this scale, and it has formed the basis of the Ordnance Map of Roman Britain and of the Map of XVII Century England. Its most striking, international, technical use is its application to the Map of the Roman Empire which is being produced by agreement between the authorities of France, Germany, Great Britain, Italy, Portugal, and Spain. Six sheets of this special series are in hand.

At the invitation of the Italian Government a Conference was held in Rome in November 1932, which was attended by delegates of all the countries above mentioned. A unanimous agreement was arrived at as to the lines on which the work should proceed.

PIRI RE'IS' WORLD MAP AND COLUMBUS' CHART OF 1498

by

ROBERTO ALMAGIA.

(Extract from the *Bolletino della R. Società Geografica Italiana*, No. 6-7, Rome, June-July 1934, p. 442).

In September 1931, at the 18th International Congress of Orientalists held at Leiden, the well-known orientalist Prof. P. KAHLE of the University of Bonn brought to the notice of his learned audience a singular cartographic document of considerable interest with regard to the discovery of America; to wit, a chart found in the library of the Old Seraglio at Istambul, drawn in 1513 by the celebrated Turkish navigator PIRI RE'IS. This chart shows almost in their entirety the coasts of the New Continent known at that time. The discovery, announced for the first time in an Italian periodical (1) and particularly interesting to us because, according to KAHLE, the outline of the West Indies and the coasts of Paria (South America) is of Columbian cartographic origin, immediately attracted the attention of scholars; but it did not seem possible to broach a discussion worthy of the great importance of the document until a good photographic reproduction of it had been published (2). Such a reproduction, accompanied by numerous illustrations, has only quite recently been put at the disposal of scholars by KAHLE (3) himself; it shows above all, according to the author, that the representation of the West Indies must be considered not only as borrowed from a drawing by COLUMBUS but directly as a faithful and integral copy of the chart made by COLUMBUS on his third voyage and sent to Spain in 1498.

PIRI RE'IS' chart is on a parchment measuring about 85×60 cm. (33 ½×23 ½ in.) and bears a legend giving the author and the date (March 1513). The author is well known for his *Bahrîye* containing a valuable description of the coasts and islands of the Mediterranean, published some time ago (4); he is a navigator and geographer of the first order. The parchment is only the western sheet of a large world map of the nautical type (as is shown by the first glance at the interlacing of the roses), and must probably be identified with that which, as PIRI RE'IS himself states in the *Bahrîye*, he presented to the Sultan SELIM at Cairo in 1517. The other sheets of the world map have not hitherto been traced (5). A long legend on the sheet which remains to us explains that the world map was designed by culling information from a score of charts and world maps compared and reduced to a uniform scale; among the latter, eight are of Ptolemaic origin, one Arab, four Portuguese, and "one chart which COLUMBUS

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(1) P. KAHLE: Impronte colombiane in una carta turca del 1513: *La Cultura Milano-Roma*, 1931, *pp.* 774-85.

(2) *The* Illustrated London News *published a rather mediocre reproduction of it in its issue of* 27th *February* 1932.

(3) P. KAHLE: Die verschollene KOLUMBUS-Karte von 1498 in einer türkischen Weltkarte von 1513. *Berlin-Leipsig* 1933, *with* 9 *plates. Cf.* (*also by Kahle*) A Lost Map of COLUMBUS *in the* Geographical Review, *New York*, 1933, *pp.* 621-38. *For the discussion*, cf. *among others K. Kretschmer*, Die verschollene KOLUMBUS-Karte von 1498 in einer türkischen Weltkarte von 1513 *in Petermanns Mitteilungen*, 1934, *pp.* 48-50.

(4) Cf. *P. Kahle*, PIRI RE'IS Bahrîye, 2 *Vol., Berlin* 1926; *and* PIRI RE'IS und seine Bahrîye *in "Beitr. zur hist. geogr. Kulturgeogr. Ethnogr. etc." published by M. v. Mzik, Vienna*, 1929, *pp.* 60-75.

(5) *Further information now exists about the chart and other jewels of the library of the Seraglio, published by A. Deissmann*, Forschungen und Funde im Serai, *Berlin*, 1933. *It was Deissmann who brought the chart to Kahle's notice.*