

## BRIEF HISTORY OF THE HYDROGRAPHY IN THE KINGDOM OF THE NETHERLANDS

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The history of Netherlands hydrography grew as any history did, closely interwoven with the march of events in the home country ; it followed, at least in previous centuries and before the consolidation, the ups and downs of the great historical record of the Netherlands at sea.

Such a country as the Kingdom, with its long coastline and vast interests overseas, is, so far as its prosperity and continuance are concerned, in the fullest measure dependent upon safe shipping.

It is the Hydrographic Department of the Royal Netherlands Navy, which, acting since its foundation in 1856, as a purely Governmental enterprise, makes safe navigation possible both in the Netherlands and in its extensive overseas territories.

During four centuries in Holland and three-and-a-half in the East and West Indies, Dutch surveyors have mapped and charted the coasts, fairways, rocks and reefs. The charts gradually improved along with the methods of surveying and charting and as the instruments became more ingenious and useful.

The present Dutch chart is a result of the tradition and the experience gained during these years.

The Netherlands and the East Indies each have their own history, which only at a later stage join up. Owing to the huge distance between the two parts of the Empire and their widely differing nature, diverging measures had to be taken.

If the hydrography in the Netherlands could suffice with one or two surveying vessels, four or even six of them were necessary to meet the requirements in the vast archipelago.

The development of the history of hydrography, which actually has another source, will be followed for each area separately, while the hydrographical activities in the Neth. West Indies will be mentioned in the chapter concerning the home country.

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### NETHERLANDS EAST INDIES.

Neither charts nor maps of the Archipelago have come down to us from the very old days. It is however generally accepted that the maps belonging to the oldest manuscripts of the Egyptian geographer Ptolemaeus, go back to the maps of the first Century, either reconstructed according to indications of places, or following the maps of Ptolemaeus himself.

The oldest maps of Ptolemaeus known to us, showing the East Indies, date from the second half of the 13th Century.

Concerning ancient Arabian cartography, we can state that three charts of the Indian Archipelago still exist in the original ; the principal of these being a chart of that part of the world, in al-Hwarismi's handwriting. (To be found in the Strasbourg Univ. Libr.).

Marco Polo was the first European who crossed the waters of the Indian Seas. He travelled in about 1292 from Amoy through the China Sea and Straits of Malacca, Westward. During his stay in Sumatra, which lasted five months, he collected the data needed for an extensive itinerary. He gathered descriptions of the coast and safe fairways from the Javanese sailors. Consequently the hydrographical knowledge of the Indies does not begin with Marco Polo, but with the science of the local seafaring population.

From old Javanese writings, (e. g. by Nagarakertagama) we know that they had a certain knowledge of the whole Archipelago, which covers a distance equal to that of from England to Siberia. They practised a primitive sort of cartography of which the Portuguese and Spaniards later took great advantage.

During the second half of the 15th Century, the Italian town of Venice was a centre of trade which spread out in all directions over land and sea and soon its merchantmen began to ask for charts. No wonder that gradually, with town and trade the hydrographical charts came to development. In the year 1459, a fine circular map of the world appeared by Fra Mauro, a Venetian priest, on which, though rather transformed, the so-called spice-islands in the Moluccos were to be found.

This map gives a painstaking collection of information known at that time of the East Indian Archipelago, and the way to the attractive spice-islands once being known, the race to their fervently desired articles of commerce could start.

After the voyage of discovery of Vasco de Gama, during the years 1497-98, the whole island-group came into the hands of the Portuguese and the greater part of it was charted by their capable seamen. With the Portuguese, the real hydrographic charting of the East Indies actually started and was developed along an uninterrupted line.

The first Portuguese world-map, by Cantino Carnerio appeared in 1501. It only gives the fairway around Malacca to China, but in 1516, as a milestone in hydrography, the first real printed chart on which one finds the Archipelago, the "Carta Marina", was published.

With the arrival of the Spaniards in the East (1521), new activity started. We see their first chart turn up at Turin in 1523. It is limited but correct for the time. It shows the big islands Java, Sumatra and Borneo, the peninsula of Malacca, the small-Sunda-islands, Moluccos and the Sangir-group. In 1595, at Amsterdam, Jan Huygen Van Linschooten published his famous "Itinerario". It contains the first Dutch picture of the Portuguese voyages in which the author took part. It appears that still very little

was known to the Portuguese about the waters to and in the Moluccos. We should remember however that the East Indian Archipelago was only a small part of the then Portuguese possessions since 1493 (the papal bull of the 4th of May of that year, adjudged and reserved to Portugal an entire hemisphere), and it must be admitted that the Portuguese have produced a great quantity of chart-work, shown for instance on the fine charts of Bartholomew de Lasso, published in 1591, a convenient source, from which our fellow countryman Petrus Plancius borrowed his knowledge a few years afterwards.

Gradually we come to the activities proper to the Dutch cartographers themselves, which in the beginning was compiled from the work of the foreigners. The first atlases published in the Netherlands still give the Portuguese view of the East Indies (see : Ortelius, Mercator, de Jode). The image is far from complete, the Southcoast of Java is "terra incognita" whilst the knowledge of the Moluccos was still restricted and hazy.

There was no question about any knowledge of the island countries. The most detailed charts of this period were to be found in Jan Huygen van Linchootens' collection.

Petrus Plancius (1552-1622) a minister at Amsterdam, was very talented in nautical science and a great geographer. He collected as many data as possible from the coasting seamen and instructed them in the art of navigation and astronomy.

In 1594 he made a fine world-map. Due to his knowledge and energy the cartography in the Netherlands reached a higher level.

Without any doubt he may be called the founder of Netherlands colonial cartography.

An interesting way of charting, which has fallen into oblivion, was the system of the so-called "Embossed Charts" (French : Cartes en bosse). Adriaen Veen, the Dutch inventor, got a patent of 12 years in 1594. He gave his charts the shape of a segment of a sphere and avoided the mistakes of other projections.

On board the ships they were put upon a thick paper foundation or form and the chart work was done by a pair of strong compasses with three legs. Obviously the system as a whole did not work out satisfactorily, for, though several ships (as under the command of Adm. V. Neck in 1598) received these charts on board, in the following years there use was altogether out of the question and even a museum specimen is unknown at present.

With regard to the globes, however, matters stand better, as many excellent samples of the terrestrial and celestial globes of this period enrich the museums. In the year 1600 a fine celestial globe was brought before the public by Jodocus Hondius, showing the results of the *first* observations of the southern sky. They concern those of the mate Pieter Dirksz. Keyser, made on board one of the ships under Adm. Cornelis de Houtman in 1595.

In 1602 the Dutch founded the V.O.C. (United East Indian Coy), a very influential commercial house, that could immediately command a considerable fleet and that, owing to its monopoly and discipline, was able to gather and

chart with the help of its own chartmakers all data and information contributing to the safe navigation of the Dutch and it took care that its charts remained a secret as long as possible. The Company's first chartmaker was August Robaert, followed by Gerritsz, the Blaeus, de Graaff and the van Keulens. Several beautiful charts and atlases, made by these very capable cartographers, were published and many of them are now to be found in the museums of the Netherlands and foreign countries.

In the middle of the 17th century, we possessed in the Netherlands a chart of a certain *Dutch type*, a sort of chart which could maintain its reputation till the end of the next century and which was readily used and copied in foreign countries. Waghenaer ("*wagoners*" were famous in England), Plancius, Wm Blaeu, to name a few of them, all produced *chartwork* which may be looked back upon with justifiable pride. Towards the end of the 18th century, the power of the V.O.C. was diminishing and during this depression of the empire, hydrographic work also declined. The Netherlands could not keep up with the British pace. The British Admiralty had founded its "Hydrographic Department" in the year 1795. This bureau was run efficiently and could make accurate surveys, performed with modern instruments. In the year 1824 the use of British Sailing Directions was recommended even in the Netherlands.

Stirred a little into activity, the nation started in 1821 a "Commission to correct and improve the East Indian sea-charts" a useful institution but not yet a real bureau; but a beginning was made with systematic surveys. In '22 the brig "Jacoba Elisabeth" was commissioned to undertake the survey of the Strait of Sapoedi and the corvette "Courier" was instructed to chart the coast of Biliton. During the year 1847 the first special surveying-vessel, H. N. M. "Pylades", was put into service and with this brigantine the Royal Netherlands Navy began an uninterrupted series of surveying-vessels which gradually would rechart the whole Archipelago. Thanks to surveys carried out and interpreted on a scientific basis Netherlands hydrography resumed its honourable place amongst the first colonial nations.

In 1860 a Hydrographic Bureau was founded in Batavia as a department of the Royal Netherlands Navy, which after having been ordered to Holland in 1871 and back to Batavia in 1875, finally was transferred to the Hague, to be united with the Hydrographic Bureau in the Home-country and placed under the single management of the Hydrographer. (It can be compared with the Brit. Indian Hydr. Bureau at Calcutta in the years 1862 and 1874).

In 1899 H.N.M. "Siboga" was fitted out for oceanographical work, for the use of a scientific expedition concerning deep-sea research. Besides oceanographical, zoological and botanical research, valuable data were gathered for hydrographic purposes.

The research of the Royal Magnetic and Meteorologic Observatory at Batavia also contributed to the increase of hydrographic science. The important study on tides and naval meteorology by Dr. J.P.v.d. Stok, published

in his work : "Winds and Weather, Currents, Tides and Tidal Streams in the East Indian Archipelago" (Batavia 1897) is worth mentioning, as well as the publication by Dr. van Bemmelen, a few years later, called : "Magnetic Survey of the D.E.I.". In the year 1929 the Snellius Expedition took to sea. This expedition also had in view the enrichment of oceanographical knowledge. Extensive reports are summarized in the work "Scientific Results of the Snellius Expedition" by van Riel. (E.J. Brill-Leiden edit.).

The ever-increasing shipping in the East Indian Archipelago, where, in addition to more intensive foreign activity, the Royal Packet Company (K.P.M.) enlarged its fleet to over 120 ships and maintained services between most of the islands, made the highest demands upon the charts.

To keep pace with them, about six surveying-vessels were needed at the beginning of the 20th century. Reinforcements were supplied through the activity of the "Governmental Navy" (a non-military colonial navy dating from the middle of the 19th century), of which the commanding officers received special training in the Royal Netherlands Navy.

As banks, river mouths and coral islands are subject to continuous changes, it is imperative that surveys always be continued. That this work can only be done by experienced personnel with a scientific background in order to obtain favourable results, is well known in this circle.

This task was accomplished by the Netherlands during their government over these territories with scrupulousness and devotion, the same scrupulousness and devotion that characterized their whole period of government.

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### THE NETHERLANDS.

The oldest known maps of Europe, the so-called "*wheel-charts*", appeared at the beginning of the Middle Ages, around the 10th century.

The earth is pictured in the form of a wheel, with the Holy City Jerusalem as the axis. Principal parts of the image are representations of Adam and Eve, Mount Sinai, the Caucasus and the rivers of Paradise. A part of Europe extends from the Mediterranean vertically and horizontally which does not only give evidence of the piousness of the maker (usually a conventual) but certainly also of his solid geographical knowledge.

Those kinds of maps are still to be found in old manuscripts carefully kept in the monasteries of Spain.

For the invention of the compass, in Europe dating from the beginning of the 14th century, we have the charts to thank. The compass which was already known in a certain form by the ancient Chinese, was disclosed by the Italian Flavio Gioia of Amalfi, between the years 1302 and 1320 ; he fixed a needle on a piece of cork, which floated on the water. It was during these years that the first Indian coast and sea-charts, the "*portulanes*" were brought before the public. Actually they more closely resemble the old charts of Ptolemaeus than their immediate predecessors, the above-mentioned wheel-

charts. Owing to the void in the department of cartography, which exists between the 10th and the 14th century, the correct sources from which the makers of the portulanes gathered their knowledge cannot be stated.

The first really good world map on which Europe is also to be found, is the one by the Italian priest already mentioned, Mauro (1459). It is by no means inferior to the best Italian maps which appeared a hundred years later.

About fifty years afterwards, in 1507, a big, printed world-map was published in Germany by Walseemüller. This map gives the latest discoveries made on the East-coast of North and South America. At this time Netherlands shipping begins to increase. The skippers begin to put in writing their own practical knowledge and experiences of the Dutch coast, and much information about local conditions, dangers in the gateways, banks and currents, was assembled which finally found its way to the desks of the authors of the so-called "*reading-charts*", a typical Dutch sort of chart and, in our country, being the direct predecessor of the sea-chart. The oldest one is probably the "*reading-chartbook*" by Jan Zeverszoon Cruipel van der Schellinge, anno 1531, entitled (in old Dutch) "The chart of the Sea". These books give a description of coasts, often reaching from Spain to the Baltic. Of such we know several editions, among which may also be mentioned the one printed in the year 1540 by Jan Jacobszoon at Amsterdam. The front page, translated from old Dutch, reads: "This is the chart of the sea/to sail East and West / and is that of the best pilots / and corrected from the very best charts / that could be found / and every coast being charted".

In 1568 the Spanish governor, the Duke of Alva, ordered the copper-engraver Christiaan Sgrooten, in the name of the King of Spain, to make: "La description des villes et pays de Sa Majesté, de leurs limites et frontières"; the result of this gigantic commission is a very fine collection of maps, bound in an atlas comprising the whole of Europe, and even more the entire realm of Philip II. This complete set is now to be found in Madrid. The famous cartographers Ortelius and Mercator were succeeded by Waghenauer and many others, but the charts did not become any more accurate until the well-known Dutch mathematician Willebrord Snellius revealed his new triangulation methods in the year 1617.

In 1621 the West Indian Company was founded. The common interests of several Netherlands merchants had increased in such a way, that, as had been done in the East, the proverb "Union is strength" was acted upon. This company held a Netherlands monopoly to colonise during 24 years the West coasts of Africa and the long coasts between the Southern part of Newfoundland and the Strait of Magellan. It was authorized to conclude treaties, to declare war... etc. A need for good charts followed instantly.

The first Dutch ship had dropped anchor at Curaçao already in the year 1586, and as a powerful navy could support the wishes of the W.I. Coy, Curaçao was occupied in 1633, the islands Aruba and Bonaire followed soon, whilst Suriname and the Windward islands were annexed between the years 1616 and 1643. Furthermore the Company had settled at New Amsterdam

(New York) while also four provinces (captaincies) of Brazil, which had originally belonged to Portugal and since 1580 to Spain, were occupied.

Provisionally old Spanish sailing directions were used, but already in 1630 good Dutch charts appeared, such as the one by Henricus Hondius, which shows the Bermudas, New England, Florida and Cuba. From 1660 the Netherlands naval cartography improved quickly. Important servants of the W.I. Coy were the chart-makers : Hendrik Donker, Johan van Loon and Peiter van Alphe. The firm of van Keulen, which published much fine chart-work of the East-Indies, had set itself to the no lesser task of publishing charts of the West-Indies, whilst of course, the coasts of the Home-country were surveyed repeatedly and edited in an extensive and accurate way. A monumental "Paskaart van West Indie" compiled by Johannes Blaeu was published in the year 1680. At about this time, the cartography in the Netherlands reached its zenith. As regards maps, charts and town plans, it was far ahead of other countries. In Germany, after Mercator, who emigrated from Flanders to the Rhineland (Duisburg), there was only imitation and England also produced Dutch translations and copies.

After this flourishing period, the hydrography in Holland kept on developing, but the art of maps and topography came to a standstill. Towards the end of the 17th century the Netherlands charts were superseded by those of the French, who began to practice a better theoretical knowledge (see : de l'Isle, Cassini, Picard and La Hire) and at the turn of the century the initiative of the Dutch was gone. Gradually towards the middle of the 18th century and by following foreign countries : Great Britain, France and Spain, hydrography in the Netherlands, which became the task of the Royal Netherlands Navy, began to develop systematically. The survey of the Texel-gateway in the year 1760 by Lt. Cdr. A.A. Buyskes, according to then modern principles, ushered in a new era. After this, the surveys of capable hydrographers of the R.N.N. were regularly charted, and in this connection the name of a French naval Lieutenant, C.-F. Beautemps-Beaupré, who made two excellent charts of the river Scheldt during the years from 1799 to 1811, should not be omitted. After a special committee had been set up in 1787, for the determination of the longitude at sea and the correction of the charts, to serve the interest of hydrography at home as well as in the colonies, the year 1856 saw the appointment of Lt. Cdr. A. van Rhijn as "Hydrographer of the Netherlands Coasts" ; with this measure, the government function officially acknowledged since 1787, was simplified and the task became that of the hydrographical department of the Royal Netherlands Navy.

In the course of years this bureau developed into a great and efficient concern, directing the surveys of the Netherlands coasts and the numerous fairways of the overseas territories, on a scientific basis, using the latest methods employed by hydrographic services.

