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THE CHART TRADE IN EUROPE FROM THE MIDDLE AGES TO THE 20TH CENTURY

Compared with the situation of ca. fifty years ago, we know today much more about the variety and number of charts and sailing directions, produced by various nations in various periods of history. This variety and numbers form the base for an approach similar to the approach made by economists, dealing with "goods". Because today we possess sufficient knowledge of sailing directions and charts printed in England, the Low Countries, Italy, France, Sweden and other seafaring countries, we are in position to put interesting specific questions to the process of trading in maps and charts like in the following

- were the 16th and 17th century marketing methods efficient or not?
(we will see they were, to a very high degree)
- did the reduction of production costs have an impact on sales figures?
The answer is: in the 16th century yes. In the 17th and mainly in the 18th century no, because labour became extremely cheap
- did the customer always get what he needed? Definitely not, but before the 18th century, critical appraisal was limited to the intelligentsia. Afterwards, complaints by chart users were almost permanent.

By going into detail, the answering of these questions will reveal some most curious and often most unwise relations between mapmaker, mapdealer and customer.

In case that some might doubt whether charts, in their early stage are comparable to "goods" in the meaning used by economists, I should like to point to the following:

- Similar to the first printed books: the first printed charts and maps were mature from the outset. The Gutenberg bible of 1456 was just perfect, the large woodcut view of Venezia of 1500 by Jacopo di Barbari was a fully mature wall map; the first printed world maps, i.a. the wall map called Carta Marina of 1516 by Martin Waldseemüller were masterworks, both from a technical and scientific point of view.
- Another first in cartography: the late 16th century printed pilot guide with charts: the "Wagoner" immediately was a perfect product.

These three examples will demonstrate how maps and charts have possessed the characteristics of desirable goods, appealing to customers, from the very beginning. Early printed charts and maps were well-made goods, fine material for trading against good money. As soon as the printing press produced them in great numbers, the term "goods" was all the more applicable to multi-sheet maps and charts. Quantities of some hundreds and even a thousand copies were not exceptional. These figures are surprising and demonstrate courage and confidence of the entrepreneur in the early sixteenth century.

Before the use of the printing press, book- and chart production by scribes was a time consuming process and consequently the selling price was very high. Because manuscripts possessed a very high level of calligraphic art, the first printed books and maps also possessed a very high level of typographic art. One inconvenience remained: colours could not be applied mechanically.

Therefore, illuminated maps and charts were reserved for connoisseurs, made to order or at the chart-makers own risk.

The manufacturing of costly mappae mundi and portolan atlases by manual techniques has continued till the 17th century. But after ca. 1600 the

contingent of hand-drawn mappae mundi, hand-drawn illuminated charts and sea atlases in the chart-trade was not important any more. Presumably, their prohibitive price was the main reason for their extinction. Concerning portolan atlases, we will have to face the question whether they have been used on board or not.

Because most of the portolan atlases that survived have been executed in a fine hand, delicately coloured and drawn on the finest parchment, it is not likely that these have been ordered by pilots or shipmasters to be used at sea. Because none wear traces of use at sea, their use on board is unlikely. But other, less costly portolan charts will certainly have been used at sea. Copies, prepared in a simplified style will have been discarded after the picture had faded away. Therefore very little or no proof of their use at sea has remained. Portolan charts, pasted on boards were made on purpose for use at sea. Folded, their reduced size suited the narrow cockpit.

Generally speaking, pilots were not charmed by the extravagant decorative manuscripts, often in an awkward size. Pilots preferred handsome pilot-books, oblong size, with a clear depiction of coasts and coastal profiles and legible information. Later, at the end of the 16th century, pilots on West-European trading vessels required large scale charts, bound together in a logical geographical order: an eastern rutter for the German Bight and the Baltic, a western rutter for the coasts of England, France and Portugal till the Cape Verde Island. In the 17th century these chartbooks were in demand in great quantities because of the great number of trading vessels in the ports along the North Sea. Separate charts on vellum printed or handdrawn were in great demand for crossing the Atlantic and for navigation to the east Indies. This, in broad strokes, is the history of the development of a product, called portolan chart or mappae mundi. Unique is the phenomenon of their transition from a large wallmap of great calligraphic beauty into a pragmatic shape, suitable for mass production.

As an aside we want to put the question: why did mediaeval mappae mundi have such colossal dimensions? (150 x 300 cm).

To answer this question means throwing a side-glance over the domain of art-history. We should bring the wall maps and the multi-coloured charts into the context of the history of wall-decoration in private homes.

When seen in this context, it is easy to explain why the wall maps have appeared so surprisingly early on the scene of woodcut printing, late 15th, early 16th century. Materials used for wall decoration, in chronological order, were: fresco, mosaic, tiles, tapestry, oil painting on wood. By the emergence of woodblock printing, the multisheet mappae mundi (Martin Waldseemüller's Worldmap, 1507, 12 sheets, 136 x 248 cm) and town views (Jacopo di Barbari's view of Venezia, 1500, six sheets, 133 x 280 cm) and charts (Waldseemüller's Carta Marina, 1516, 12 sheets, 136 x 248 cm) became a profitable substitute for the expensive tapestry or oilpainting.

Suddenly, less wealthy house owners could afford themselves wall decorations, in a size and in a style they had never dreamt of. This explains the success of the earliest multi-sheet wall maps. Of course, the subject "mappae mundi" was already a traditional item on the walls of the houses of the nobility. Traditional for them, but rather unusual and rare for the majority. From 1500 onwards, various kinds of wallmaps became everyman's tapestry for interior decoration.

Returning to the early period of European navigation, it should be clear that chartsellers as such did not exist before the 16th century. Information

on chartmakers of the Venetian, Majorcan and Portuguese schools of the 14th and 15th centuries has been profusely spread. Chartmaker and chart-seller usually were one and the same person, a talented artist of high intellectual level. Quite often this person manufactured his charts on order, like the scribes did.

Let us answer the question whether marketing methods in the 14th, 15th and 16th century were efficient. Judged by the great number of portolan atlases and charts that have found their way to an owner, I should say they were. Italian chartmakers have traded their products rather well, in contrast to Portuguese chartmakers who seem to have worked for a highly selective clientèle: customers in the circles around the court and the clergy. Majorcan chartmakers took advantage of the Italian's their dominating position of trading all over Europe. The Venetian merchant fleet not only visited the ports in the mediterranean, but also sailed to Brugge and to London. In the ports at the North Sea it became apparent the Italian and Majorcan portolan charts did not meet the requirements of local clientèle. Customers in Northern Europe did not get what they needed: a true portrayal of the Western and Eastern Sea. In their portolan atlases, the Italian and Majorcan chartmakers failed to incorporate a reliable chart of the North Sea and consequently failed to establish a market for their products in northern Europe.

Did the graphic artists in the Low Countries and in Northern France fill the gap in the market? No, they did not. This absence in imitations of southern portolan atlases has never been explained. The scribes and miniaturists in Belgium or in France never drew portolan charts. Industrious Flanders, centre of the crafts, also failed to produce mappae mundi, charts and portolan atlases.

This gap in the historical cartography of France and the Low Countries in the 15th century has, to my knowledge, never been recognized.

Historical cartography of the Low Countries and northern France can point to the following paradox: printed mappae mundi and printed charts antedate handdrawn mappae mundi and manuscript charts.

It is most curious that a full-fledged chartmakers school in the Low Countries flowered as late as the last quarter of the 16th century (see further)¹).

The characteristic difference between the developments in Italy and the Low Countries lies in the use of the printing press. The reduction of production costs and its impact on salesfigures was in the North better understood than in the South. True, Italy readily printed an Isolario (which was poor in hydrographical information) in 1528, without follow up. The follow up came from Amsterdam in 1595: Willem Barentz' chartbook of the Mediterranean printed by Cornelis Claesz. Although Italian printers were the main suppliers of maps till about 1560, charts and pilot guides were neglected. With the exception of just five items, named hereafter, there was no market for these maritime prints. The shift of the Venetian merchant fleet in West-European waters to the merchant fleet of the southern Netherlands has influenced the trading of Italian craft, as well as the emergence of a printing industry in France, in Antwerp and in the Dutch towns. Local printers had noticed a great demand for almanacs and rutters. Their appearance coincides with the taking over by Antwerp and Amsterdam of the hegemony in shipping between the Baltic and the Cape Verde Islands. The first efforts to sell printed charts also fell in this period: Cornelis Anthonisz' Caerte van Oostland of 1543. Here again the same remark as before should be made: the incunables of printed wall maps were just perfect. Cornelis Anthonisz' chart for navigation into the Baltic was an incunable in its kind and perfect as well.²)

Neither in Spain, nor in Portugal, charts and rutters have been printed in the 16th century. Roteiro's for the African, Asian or American Coasts were produced in manuscript, not accessible to foreigners. Not until war with Spain was waged, (after 1570) could pilots from the Northern Provinces lay hands on Spanish manuscript roteiro's and charts, after they had taken Spanish ships.

No more than in Italy, printers in Southern Germany, diligent as they may have been, could supply the pilots and merchants in the North with the printed charts and rutters they wanted. Consequently without competition, the chart trade firmly established itself at Antwerp and Amsterdam with a most remarkable branch towards the north, namely along the Zuiderzee.

2. The chart trade in the Low Countries (after ca. 1570).

First, an explanation of a remarkable branch of chartmaking should be given here. The earliest reference is found in a letter by Lucas Janszoon Waghenaeer from Enkhuizen, dated 1591, where-in he announces that he has been selling two portolan charts of his own make, since 1580.³) So chartmaking by him began four years before the epochmaking publication of his *Spieghel der Zeevaerdt*, the world's first printed pilot-guide with coastal charts. In a second letter, dated 1586, Lucas Janszoon Waghenaeer expresses his concern about certain charts and rutters being prepared by a competitor in Amsterdam. Although no charts by Waghenaeer or by his competitors dated before 1583 have survived, proof is given of a chartmakers activity in Enkhuizen and Amsterdam between 1570 and 1583 (an engraved townplan of Enkhuizen, signed and dated 1577 by L.J. Waghenaeer also belongs to this period). In one of his letters, Waghenaeer advertised his charts to be obtained at his house in Enkhuizen.

Surviving charts on vellum, both in manuscript and engraved dated between 1583 and 1636 demonstrate an activity not limited to Amsterdam and Enkhuizen. Chartmakers have also been active in the town of Edam and in Wardeer, a small fishing port between Edam and Hoorn. Over 30 charts on vellum, both engraved and in manuscript, belonging to what we in Utrecht have labelled: the "Noordhollandae kartografenschool", have recently been discovered, the majority by Gunter Schilder. A most peculiar aspect of this school of chartmakers is the out-of-dateness of some of the charts. Between 1599 and 1607 planispheres and charts of the oceans have been drawn by Maerten & Herman Jansz., Evert Gijsbertsen a.o. in an extravagant style showing some affinity with the older style of the Dieppe-school. These elaborate products have more in common with early 16th century decorative art than with the late 16th century chart-style. Their makers must have worked in poorly illuminated fisherman houses under the gray sky of a Dutch winter. That these, still brilliant, copies were preserved can only be explained by assuming that their function was mainly decorative. (Waghenaeer's straight-forward charts from his early period did not survive). One may wonder how many (or how few) decorative manuscript charts have been sold at that time. In spite of the out-of-dateness of their extravagant illumination, these charts demonstrate an ability and an artistic taste which one would not expect in small fishing-ports along the Zuiderzee.

In the period when they were drawn, the chart-trade had concentrated in Amsterdam. To buy charts and rutters one had to visit the printers "at the Water" (Damrak). But the discovery of the illuminated handdrawn charts lead to the conclusion that not only Amsterdam but the wider area of North Holland was the cradle of the chart trade in the Low Countries. After

1630, as far as we know, chartmaking activity had faded away in the ports north of Amsterdam, though mathematical practitioners have continued their activity during the 17th and 18th century. Speaking about the earliest charts printed in the Low Countries, one aspect is easily overlooked: Waghenauer and Doetsz were the first Dutch chartmakers whose portolan charts were printed on vellum. When was copper plate printing on vellum first applied? This question has never been raised, as far as I know.⁴⁾ Still it is an important question because production costs are involved. With the application of the printing press, the chart came within reach of the average pilot. The question was: how does the good old vellum react to the printing ink? How does a sheet of calf behave under the pressure of a copper plate? Letterpress from a raised surface has been applied to print on flexible thin parchment since Gutenberg's time. Intaglio printing (from an engraved copperplate) on parchment (or on vellum) was not practised before the end of the 16th century. Intaglio printing on the stiff and repellent vellum did not look promising at all. Before the successful Dutch printing about 1580, not one engraved portolan chart was printed on vellum.⁵⁾ Neither in Italy, neither in Germany nor England intaglio printing on vellum has ever been practised. In France a few examples dating from the 18th century are known to exist. Catalogues of charts on vellum⁶⁾ do not reveal earlier products than the impressions from Amsterdam, late 16th century.

In the Low Countries ever since that time, both charts and geographical maps (most polder-maps) have been printed on vellum. Later, in the 17th and 18th century, selected customers were presented with copies printed on vellum. It became a tradition too, to print a dedication copy on vellum. Only the printers in Amsterdam seem to have known the secret of intaglio printing on vellum.

Let us now view the chart trade in Europe at the turn of the century about the year 1600.

The trading area of the Venetian merchantfleet, already reduced to the Mediterranean Sea, had to be shared with French, English, Dutch and Spanish vessels. For the benefit of non-Italian pilots, in 1595 a chart-book and rutter for the Mediterranean Sea had been printed at Amsterdam by Cornelis Claesz., with text in Dutch and French. Its author was Willem Barentsz., who managed to bring out this rather voluminous chartbook in between his two expeditions in search of a Northeast passage. Neither in Italy, nor in France any competitive printing of that kind occurred. However, beautiful manuscript-charts and portolan atlases of the Mediterranean could still be bought in Italy. Their price was a multiple of the price of Willem Barentsz's chartbook. No doubt the most famous chartmaking centres of the 16th century were found in Portugal. Many excellent cosmographers and pilots have collaborated in the production of portolan charts and atlases of great beauty. Not only in Lisboa, also in India, the Portuguese had established chartmakers offices which have served as examples for other rulers in Asian waters: the Dutch. Cartographic activity of the Portuguese was mainly intended for overseas territories. Their charts and rutters were exclusively intended for use on board the Kings vessels. A similar situation was valid for the chartmaking in Spanish ports in Europe and overseas.

In exceptional cases, desirable rutters for navigation in Asian or in South American waters came into the hands of English and Dutch pilots. Not by the normal way of trading, but through irregular actions. Famous

as the Portuguese and Spanish cartographic centres may be, we should not label them as centres for the chart-trade, though there always were foreign customers lingering about, trying to acquire by irregular action what they could not get by means of open trade.

But not only in Lisboa or in Sevilla or Cadiz, also in England clandestine actions took place. In 1596, Thomas Harriot wrote as follows to Sir Robert Cecil concerning the cartographic documents, collected by Keymish on his voyage of discovery along the coast of the Guyana's, following Walter Raleigh's track in search of the riches of El Dorado:

"the master of the ship with captain Keymish is somewhat careless of his by giving and selling copies of his travelles and plottes of discoveries " ⁷⁾

As a further example, mention should be made of an irregular action committed in 1593 by the Dutch pilots Cornelis en Frederic de Houtman. At the instigation of the calvinist minister Petrus Plancius of Amsterdam, De Houtman went to Lisboa "for secret inquiries" and returned home in possession of a detailed roteiro, incorporating detailed charts of the Portuguese possessions in the East Indies. ⁸⁾ Petrus Plancius, being a cosmographer and cartographer as well, has used these Portuguese charts for the compilation of sailing charts, used by De Houtman and his fleet on their first voyage around the Cape of Good Hope to the East Indies in 1597-1598. Typical of their commercial approach to chartmaking, Dutch printers had these portolan charts soon engraved in copper and printed as wall maps or as separate maps, i.a. for the illustration of Jan Huygen van Linschoten's Itinerario.

In this field of chart printing, very little or no competition at that time was met from English or French printers. To cover the French and English market, Linschoten's Itinerario was printed both in Dutch, Latin, French and English.

Continuing our survey of the chart trade about 1600, brings us to England, France and the Low Countries. At the Thames, in Dieppe, Brest and Le Havre, chartmakers were active but there is no trace of a well-established chart-trade. Certainly, manuscript-charts were freely sold to anyone who could spend the money. But printers had not ventured themselves on the market. The printer's assortment was limited to tiny almanacs and tiny rutters. Similar small stuff was printed in the ports along the German Bight and in Lübeck. The only place between Lisboa and Stockholm, where printers did specialize in charts and rutters was Amsterdam, with Antwerp as a poor second, still, about the year 1600, business at Amsterdam was rather modest. Only three printers of a certain fame can be listed: Willem Janszoon (his house was founded in 1599), Cornelis Claesz. (1582-1609) and Harmen Jansz. Muller (1572-1600). Actually, only one comprehensive rutter surpassed all the smaller rutters: Waghenaers Thresoor der Zeevaert (first edition 1592). ⁹⁾ When in 1608 its copyright had expired, Willem Janszoon published his own rutter: Het Licht der Zeevaert (Light of Navigation) ¹⁰⁾ copied after the contents and form of Waghenaer's Thresoor.

3. The chart-trade in Europe after ca. 1600

Soon after the year 1608, and with increased violence after 1630, competition between printers, so characteristic of a capitalistic society with free enterprice, caused a surplus of chartbooks and rutters of various quality. One may wonder whether that surplus (a surplus indeed because plagiarism caused duplicates wherein only the name of the printer was different) has effected the standard of quality. It is a generally known fact that the quality of Dutch charts and rutters has dropped after the middle of the 17th century. About 1670, six firms at Amsterdam

produced rutters with charts for navigation in European waters, but none of these rutters was noticeable better than the others. Also by this example it is proved that free competition did not improve quality. Till about 1670, Amsterdam dominated the world trade in charts, sea atlases and rutters. Editions printed in Dutch, English French and later also in Spanish and Italian were sold all over Europe. However, revision of the text and of the charts was often neglected being a most serious defect of hydrographic publications. But for over half a century this defect did not effect the sales. It did not even effect foreign reprints as is demonstrated by John Seller's *Sea-atlas*, printed in 1669 from old plates, obtained from Pieter Goos.¹¹⁾

In Amsterdam, after 1680, the publication of pilot guides and hydro-graphic charts was concentrated into one firm, or better shipchandler, Johannes van Keulen. Between 1681 and 1684 this firm published a pilot guide, comprehending the whole world, Asia excepted: *De Nieuwe Groote Lichtende Zeefakkell*, written by Claes Vooght. Concentration into one firm did not mean that competition had ended. On the contrary, it had moved into an international stage. In 1693, a *Neptune Francois*, printed in Paris and in Amsterdam surpassed most of the Dutch and English chart-books in accuracy and format.

In London, after 1671 charts and rutters for the European and for the West and East India navigation, were printed for John Seller,¹²⁾ which were more up-to-date than the *Burning Fen* of 1675 by Goos.

For the German Bight, a printed map, surveyed by Mathurin Guitet,¹³⁾ 1708-1710, overclassed Van Keulen's charts for that dangerous sea-area. Also in the Baltic, Swedish pilots had published rutters and charts of greater reliability than those printed at Amsterdam. Well-known is the story of Peter Gedda's chart for the Baltic and its pirated edition at Amsterdam, in 1694.¹⁴⁾

Gradually, the chart trade at Amsterdam lost its international clientèle. On the other side of the North Sea, however, the business of making, printing and selling charts and rutters flourished.

During a long period knowledge of British chart trade has been scanty. Robinson¹⁵⁾ wrote a chapter on "The private chart publishers", but documentation remained scarce. Recently our knowledge was considerably augmented by research carried out by Tony Campbell and others. It appears that a rather unique sort of chart production and chart trade was practised in London, where the chartmakers were organised in the Draper's Company. Records of the Draper's Company give a continuous list of apprentice-ships from ca. 1590 till 1719.¹⁶⁾ This is a clear demonstration of the fact that manuscript charts were still in demand apart from the printed rutters and engraved charts, published by John Seller, the Thornton's, Thomas Page a.o. Comparison between the Drapers' School and the "Noordhollandse School" fails, because, as far as we know, the Dutch School did not have an apprenticeship system. One of the old-fashioned practices in chartmaking by the Drapers' School was the mounting of vellum charts on wooden boards with hinges. From origin a mediaeval practice, it was still practised by British chartmakers in the second part of the 17th century. About 1600, this physical characteristic of the portolan chart was a regular practice at the Mediterranean ports (Messina, Marseille). About 1615, also M. Tatton used hinged boards. It is most remarkable that vellum on boards was almost totally absent with the chartmakers in Holland. We only know of one copy of an engraved chart of the Mediterranean, by Willem Janszoon Blaeu of 1621, mounted on boards.¹⁷⁾ After 1640 it pops up in London, applied by Nicholas Comberford,¹⁸⁾ John Thornton, Andrew Welch and other chartmakers.

It is no more than natural that pilots preferred to sail by charts and rutters made by experienced pilots from personal observations. That is the reason why a private hydrographic bureau Van Keulen had to stop selling chartbooks to the whole world of navigation. Van Keulen's life story ends with a period wherein mainly charts for sailing in home waters were sold. But before that calm period Van Keulen became a chartmaker of the Dutch East India Company, a position take over¹⁹⁾ from Abraham de Graaf, who was the successor or Mr. Joan Blaeu.

This position was not effected by competition because the Company's ships only used charts drawn by the Company's hydrographer. A similar relation existed in England. Manuscript charts for the navigation to and in the East Indies and on the coasts of China and Japan were forbidden to be shown or sold to non-company people.

Fortunately, that patent-area of the Est-India Company did not cover the whole world. Vast sea-area's were left to private trading. Those area's also represented a market for the chart trade. The House Van Keulen, predominantly Gerard van Keulen, actively tried to fill this gap in the market by about 500 different manuscript charts. Copies in manuscript were drawn on order. About 350 originals from which copies were drawn have been preserved in the so called Van Keulen archives in the University Library at Leiden.²⁰⁾ In one case, the text of a private order for a chart by a not-seagoing customer has been preserved.

Five guilders was the price in 1725 for a ms. chart, measuring 50 x 100 cm, copied from the master-copies, preserved in the archives of Gerard van Keulen. In an exceptional case, Mr. Bruijn, a book-lover had to pay twenty five guilders for a drawing, representing the siege of Barcelona. Van Keulen's master-copies, about 500 in all, all in manuscript, cover the coasts of Europe, America and Africa. Duplicates preserved in various map collections prove that customers were interested in buying these drawings. Not only, as we call them, the non-seagoing marine society, but pilots as well.

In the case described above, the chart was ordered because of its beauty. We should not forget it happened in the 18th century. Amsterdam was still the Mecca of the booklover and printcollector. Battles at sea are never won by using attractively decorated charts. Who supplied the navies of Europe with charts? The answer is the following: In the 17th century the battleships in Europe were supported by their Admiralty, who supplied the ship with armour and crew but not with navigational equipment. A hydrographic bureau to the Navy did not exist in the 17th century. Officers obtained their charts from shipchandlers, the same shipchandlers the merchant fleet got her charts and rutters from. France was the first nation which established a hydrographic service to her navy. In 1720 the "Depot general des cartes et plan....", later shortened to "Depot de La Marine" was founded. A British Hydrographic Department was established in 1795. Prior to that time, most of the English hydrographic charts were published by private entrepreneurs.

In wartime charts were often captured from the enemies ships. These captured charts were also handed over to private chartmakers who had them engraved and printed.

For example, Robert Sayer gives an account of his procedure in the introduction to Thomas Jefferys Westindian Atlas of 1775:

"Several of the principal officers in the British Navy, during the course of the last war with Spain, having found on board their respective prizes many curious draughts and surveys of the Spanish settle-

ments in the West Indies, with a most disinterested public spirit, have communicated them to the Editor for the Service of British navigators".

In the Netherlands, a similar procedure was applied to hydrographic surveys, obtained from the navy's ships in the East Indies. But these surveys were not engraved in copper. As late as the years 1820-1830, manuscript charts of East Indian water were still used on board of the merchant fleet and navy.²¹⁾

The power of tradition is demonstrated by the continuation of the House Van Keulen after the French occupation. In 1815, after the restoration, Van Keulen was appointed chartseller to the navy. This position has continued till the expiration of the House Van Keulen in 1885.²²⁾ After that date, Messrs. Van Cleeff at the Hague became the agent and distributor of the Navy's charts. The scene of an appointed chartseller to the navy was seen almost everywhere in Europe. It even continued in the 20th century, for navy traditions are long lasting.²³⁾ This leads to the question: were marketing methods in former centuries efficient or not? In comparison with topographical maps, the marketing methods were most efficient. Printed and manuscript charts of all the worlds coasts were obtainable on the spot where you expected to find them: at the harbours. Maximum favourable opportunities for selling, as we would say nowadays.

The London map trade is well-documented in a most informative book, by Sara Tyack, published last year.²⁴⁾ Its contents proves that map trade is different from chart-trade. The author lists 409 advertisements for maps placed in the London Gazette, 1668-1719. Only about 30 advertisements make mention of printed charts. These printed charts nearly all relate to the waters around England. Obviously charts were not advertised. They had to be obtained from the one and only ressort where trustworthy navigational aids were supplied: the shipchandler's.

NB. Compare to the dentist, who does not need to advertise.

The characteristic difference between the procurement of resp. charts and topographical maps of foreign territory is the following: the sea was open to any nation but land was seldom accessible to foreign surveyors. Consequently, information on marine topography, inclusive coasts, was freely spread in the 19th century. A chart was seldom forbidden to the public. The history of the British Admiralty Chart in the 19th century shows a continuous survey in foreign waters.²⁵⁾ Fortunately, the majority of these charts based on the Admiralty's surveys have been published. Topographical surveying in the 19th century however shows a closeness, for citizens, which is in strong contrast to marine surveys. Topomaps were often forbidden to civilians.

As a fitting finale to this lecture I had to revert to the antagonism: "topo-maps - marinemaps" in order to praise the chart for its easy accessibility. However, for some or other reason, the public is inclined to believe that the chart-sale is more obscure than the map-sale. In fact this has never been so for those customers who knew about shipchandlers and Admiralty agents. Neither in the 17th century, nor in the 20th century shipchandlers in world harbours have failed to keep a stock of maritime charts of all the navigable open waters of the world. Also because of this aspect the chart has rendered great services to mankind.

Paramaribo - de Bilt,
January-May 1979.

Notes

- 1) G.G. Schilder, The North Holland School of chartmakers. Paper to be presented at Greenwich, september 1979.
- 2) A. Lang, Seekarten der südlichen Nord- und Ostsee. Deutsches Hydrographisches Institut, Hamburg, 1968. A facsimile of the Caerte van Oostland was privately published by Lang.
- 3) C. Koeman, The history of Lucas Janszoon Waghenauer and his "Spieghel der Zeevaerdt", Lausanne, 1964, p.29.
- 4) D. Howse, The earliest printed sea charts, 1485-1569. National Maritime Museum, Greenwich, Monographs and Reports 36 - 1978.
This monograph lists altogether seven printed charts, one of 1508, engraved and printed on vellum. Howse ends his monograph as follows:
"Perhaps the survival rate of the charts that were printed was particularly low. Perhaps there just was not the market for printed charts, so few charts being needed altogether at that time that it was more economical to reproduce them in manuscript. Printing on vellum was difficult and expensive, perhaps paper charts simply did not have sufficient durability, for use at sea. Perhaps it was just that mariners were conservative.
- 5) D. Howse and M. Sanderson, The Sea Chart. Newton Abbot, 1973. Erroneously on p. 22 a small engraved nautical planisphere by Roselli is given as printed on vellum. However, it is on paper.
- 6) The comprehensive "Catalogue des cartes nautiques sur vélin conservées au département des Cartes et Plans", Paris, 1963. compiled by M. Foncin, M. Destombes and M. de la Roncière is a model of accurate carto-bibliography. It comprises over two-hundred descriptions of charts on vellum, preserved in the Bibliothèque Nationale, Paris, a list of literature, indexes and annexes. In annexe IV: Liste des cartes nautiques gravées sur vélin, over thirty charts printed on vellum are listed. The oldest one is dated 1605: Willem Janz. Blaeu "Generale Pascaerte vande gheheele Oostersche Westersche Zeevaert, 1605". Seven are of French make. All the others are Dutch. Another useful catalogue, beautifully illustrated as well: Nautical Charts on Vellum in the Library of Congress, Washington, 1977, compiled by W.W. Ristow and R.A. Skelton, lists 32 ms. charts and one engraved chart by P. Goos, Amsterdam (1660).
- 7) C. Koeman a.o., Links with the past. History of the Cartography of Suriname. Here in chapter I by G. Schilder, p.6. Amsterdam, 1973.
- 8) J. Keuning, Petrus Plancius, theoloog en geograaf. Amsterdam, 1946.
Catalogue of the Plancius-exhibition in the Maritime Museum "Prins Hendrik", Rotterdam. (23 December 1972 - 30 April 1973).
- 9) R.A. Skelton, Bibliographical Note in the facsimile edition of Lucas Janszoon Waghenauer's Thresoor der Zeevaert. Theatrum Orbis Terrarum, Amsterdam, 1965.
- 10) R.A. Skelton, Bibliographical Note in the facsimile edition of Willem Janszoon Blaeu's Light of Navigation, Theatrum Orbis Terrarum, Amsterdam, 1964.
- 11) C. Koeman, Atlantes Neerlandici, Volume IV, p.199.
- 12) C. Verner, Bibliographical Notes in facsimile editions of the English Pilot, The Fourth Book, id. The Fifth Book, by John Seller, Seller and Price, London, 1689 and 1701. Theatrum Orbis Terrarum, Amsterdam, 1967 and 1973.

- 13) A. Lang, Pie "Seekarten der Watt- und Aussenfahrt", des Mathurin Guitet, 1708-10. Juist, 1961.
- 14) Ulla Ehrensvärd, Peter Gedda's Maritime Atlas of the Baltic, 1695. Imago Mundi 29, 1977, p.75-78.
- 15) H.W. Robinson, Marine Cartography in Britain, Leicester University Press, 1962.
- 16) T. Campbell, 'The Drapers' Company and its school of seventeenth century chart-makers. In: My head is a map. Essays and Memoires in honour of R.V. Tooley. London, 1973, p.81-106.
- 17) This chart is the general chart from " 't Derde deel van 't Licht der Zeevaerdt", printed on vellum. Stadtbibliothek Hamburg.
See W. Kayser, Blaeviana. Ein Beitrag zur Blaeu-Bibliographie. Het Boek, 26, (1940-42), blz.127-134.
- 18) Professor Thomas Smith of Lawrence, Kansas, has made a detailed study of Comberfords' charts. See i.a. T.R. Smith, Nicholas Comberford, seventeenth century chartmaker at the "signe of the platt" in Ratcliff. Abstract in Imago Mundi, 24, 1970, p.95. id. An early chart of the Mediterranean by Nicholas Comberford, 1626. Imago Mundi 29, 1977, p. 72-74.
- 19) G. Schilder: Organization and evaluation of the Dutch East India Company's Hydrographic office in the seventeenth Century. Imago Mundi, 28, 1976, p.61.
- 20) C. Koeman, The Sea on paper. The story of the Van Keulens and their Sea-torch, Amsterdam, 1972.

id. The Lead of the Dutch in World Charting in the seventeenth and first half of the Eighteenth Century. Proceedings of the Royal Society of Edinburgh. Section B. Vol.73, 1972, p.45-53.

id. and G. Schilder, Ein neuer Beitrag zur Kenntnis der Niederländischen Seekartographie im 18. Jahrhundert. In: Festschrift für Erik Arnberger, Wien, 1977, p.267-290.
- 21) Catalogue of the exhibition "With lead and line". Centenary of the Hydrographic Department of the Ministry of Defence (Navy) 1974. Maritime Museum "Prins Hendrik", Rotterdam, 18th July - 30 September 1974, p. 42-43.
- 22) G.D. Bom, Bijdragen tot eene geschiedenis van het geslacht Van Keulen Amsterdam, 1885. Reprint, Amsterdam, Meridian Publ. Comp., 1972.
- 23) The Catalogue of charts printed at the Admiralty Office in 1825 (first issue) lists seven agents. See: A. Day, The Admiralty Hydrographic Service, 1795-1919. London 1967.
- 24) Sarah Tyacke, London Map-sellers, 1660-1720. Map Collectors publications Ltd., Tring, 1978.
- 25) G.S. Ritchie, The Admiralty Chart. British Naval Hydrography in the nineteenth century, London, 1967.

Records from the 19th century BCE attest to the existence of an Assyrian merchant colony at Kanesh in Cappadocia.[2]. The domestication of Dromedary camels around 2,000 BCE allowed Arabian nomads to control long distance trade in spices and silk from the Far East.[3]. The Egyptians traded in the Red Sea, importing spices from the "Land of Punt" and from Arabia.[4]. The goods from the East African trade were landed at one of the three main Roman ports, Arsing, Berenice, and Moos Hormones, which rose to prominence during the 1st century BCE.[8][9]. In Europe, six countries form the European Coal and Steel Community (SPECS) in 1951, the first international organisation to be based on the principles of supranationalism. A world map of WTO participation: Members. By the middle of the 13th century the family of Genghis Khan controls Asia from the coast of China to the Black Sea. Not since the days of the Han and Roman empires, when the Silk Road is first opened, has there been such an opportunity for trade. In the intervening centuries the eastern end of the Silk Road has been unsafe because of the Chinese inability to control the fierce nomads of the steppes (nomads such as the Mongols), and the western end has been unsettled by the clash between Islam and Christianity. The 14th century is not the best in which to live. But in the 15th century - the time of the Renaissance in Europe, and the age of exploration - economic conditions improve again. The Portuguese slave trade: 15th - 17th century. "Men living during the early Middle Ages (the ninth to 11th centuries) were several centimeters taller than men who lived hundreds of years later, on the eve of the Industrial Revolution," said Richard Steckel, a professor of economics at Ohio State University and the author of a new study that looks at changes in average heights during the last millennium. "Height is an indicator of overall health and economic well-being, and learning that people were so well-off 1,000 to 1,200 years ago was surprising," he said. Steckel analyzed height data from thousands of skeletons excavated from burial s