EVOLUTION OF THE FAR EAST ON PORTUGUESE PORTOLAN CHARTS: 1500-1650

BY

LESLIE CHING-YEE LI

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FOREWORD

The cartographic work of Portugal is especially interesting in regard to the Far East, because the mapping closely followed the progress of discovery and exploration by sea. Cartographic representations grew in extent and accuracy as man's knowledge of the world expanded. So, with the turn of the sixteenth century, the cartographic horizon greatly widened, and there were numerous maps recording the discoveries.

The portolan chart was the practical navigator's chart of the Renaissance. Before 1500, this kind of chart ordinarily dealt only with the western world, especially the areas around the Mediterranean Sea and the Black Sea. Portolan charts made after the fifteenth century covered more and more regions of the world, and especially extending eastward to Asia.

The main objectives of this paper are to study the correlation between the progress of discoveries in the Far East and their cartographic recording on portolan charts during the period 1500-1650, and to trace the evolution of the shapes of the mapped coastlines of the Far Eastern countries of Japan, China, Indonesia, Malaysia and the Philippines. The major source of information and illustration for this study is Armando Cortesão's "Portugaliae Monumenta Cartographica."

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CHAPTER I

Introduction

Man has always had an urge to understand the part of the world where he lives or where he goes, whether for economic and political purposes; or merely out of intellectual curiosity. The drawing of maps and charts seems to be instinctive with man everywhere. As man's knowledge of the world expanded, so its cartographic representation grew in extent and accuracy.

European Geographic Concepts of the World Before the Fourteenth Century

Five centuries ago, the European impression of the world was to a large extent formed by the facts and theories derived from classical geographers-Eratosthenes (275-194 B.C.), Strabo (64 B.C.-20 A.D.), and especially Ptolemy (A.D. 87-150).[1] Ptolemy's famous book, known as the "Geography", contained a rich fund of geographical knowledge and exercised an immense influence. However, the accuracy of Ptolemy's map of the world was limited to the coasts of the Mediterranean, the Black Sea and the Red Sea; the northern coasts of Europe were practically uncharted and even the British Isles were distorted almost beyond recognition. His attempt to draw East Asia showed that his knowledge of this region was extremely poor (Fig. 1). He also postulated that a huge unknown continent at the southern end of Africa extended to the south and east until it met the eastern coast of Asia, thus enclosing the Indian Ocean. Navigators after Ptolemy assumed

that this land connecting Asia and Africa made circumnavigation of Africa impossible. Also, as distinct from Eratosthenes, he made the degrees of the globe too short, thus reducing the circumference of the earth to about 21,000 miles, making the earth's size one-sixth too small. (The actual circumference of the earth is 25,000 statute miles). His eastward extension of Asia shortened the distance between Western Europe and Eastern Asia by 50° or 2,500 miles.[2] The adoption of this estimate by Ptolemy fixed the small size of the earth in men's minds for the next 1,400 years, or until the great Renaissance following Columbus.[3] The error of connecting Africa and eastern Asia by an unknown southern land, which converted the Indian Ocean into an inland sea, made a seaway to the East apparently impossible, and this was an almost paralyzing discouragement to seamen. Though his theories were incorrect, some of Ptolemy's work was widely admired, and scholars had no hesitation in adopting his view of the world.

It was through the Arabs who occupied the coast of North Africa and traded throughout the waters of the Red Sea and the Indian Ocean that new geographic knowledge about this area reached the Christian world.[4] Though too inclined to accept entirely the theories of classical scholars such as Ptolemy, the more progressive Arabic geographers of the later years are said to have doubted his geographic concept of Africa.[5] In spite of practical knowledge gained through extensive trade and travel in Africa and Asian lands and seas, and in spite of the fact that their geographers and map-makers were superior to those of the Europeans of the day, the Arabs did not correct to any great extent the erroneous ideas and theories of the ancient geographers.[6] It might be that one of the reasons was that they wanted to minimize trade

competition and protect their markets from European traders by keeping them uninformed about the shoreline of the Indian Ocean.

Marco Polo's Contribution to Geographic Knowledge

Until the thirteenth century, the European's knowledge of the earth was markedly increased only by missionaries and merchants who were the two main forces behind the European expansion of this period. The Polo family of Venice was one of the great merchant-traveller groups to explore the Asia continent, first in 1255, and again in 1271. Their exploits are well known because of the account written by Marco Polo, who accompanied his uncle Matteo and father Nicolo on the second trip.[7] Marco Polo was away from Venice for more than twenty years. He finally returned by sea to Persia in 1292, escorting a Chinese princess to her marriage there. Departing from Peking, they proceeded southward and embarked from the port of Zaiton (Tsuen-chow-fu in Amoy Harbor) in the Fukien province. They sailed along the coasts of the Malay Peninsula, Sumatra and India, and finally reached the port of Hormuz in Persia. Hence, Marco Polo disproved the existing idea that the Indian Ocean was landlocked, at least from the east and that China could not be reached sailing eastward. Thus his homeward route indicated an open passage from the Indian Ocean into the China Sea. Polo's book furnished such an extensive account of Central Asia and the Far East that nothing more of importance was added to European knowledge on that subject until the fifteenth century. His work may be regarded the greatest contribution made by any one man to the geographic knowledge of the Middle Ages, and had tremendous influence on the development of geography and geographical discovery in the later years.[9]

In the early fourteenth century, many merchants and missionaries followed Marco Polo's footsteps; however, the door which he had opened in the Far East was soon to be closed. In the second half of the fourteenth century, three events occurred which isolated Europe from Asia once again. First, in 1368 Mongol rule in China was replaced by the native Ming Dynasty, which did not initially want to establish contact with foreigners. Secondly, a new Moslem people, the Ottoman Turks, took over western Asia, dominated the Middle East, and blockaded the road to China,forcing Europeans to turn their attention to the sea. Lastly, the population of Europe declined markedly owing to the outbreaks of plague. A succession of wars on the European continent further contributed to the lack of interest in expansion abroad.

Motives for the Expeditions of Prince Henry the Navigator of Portugal

The interest in the outer world (i.e. Africa and Asia) and the desire for commercial and political domination in the Orient remained in men's minds throughout the Middle Ages, but only the coming of the Renaissance made the dream seem possible. Portugal, being the farthest from the land route to the East, and interested in the possiblity of reaching the East by circumnavigating Africa, turned to her western seaboard rather than the Mediterranean as has previously been the custom. Helped by England, she had attained independence from Spain in 1385.[10] Growth of the spirit of nationalism pushed Portugal towards monumental achievement in exploration. Portugal's favorable geographic location at the extreme southern frontier of Europe, with an Atlantic sea coast, good harbors at Lisbon and Lagos, and a strong seafaring tradition, made her a good base for

exploration by sea.

It was largely due to one man, Prince Henry of Portugal, that modern geographic discoveries were first systematically begun.[11] Prince Henry inspired, organized and directed the voyages that laid the foundations upon which the accomplishments of later great navigators rested. His motives in exploration were many and varied, but basically there were four: (1) to expand geographical knowledge, as he wanted to know about the unexplored land which lay beyond the Canaries and Cape Bojador;[12] (2) to increase colonization and economic development- the luxury of Africa and the description of the riches of the East by Marco Polo stimulated him to try to establish merchantile relations with the countries of the Orient and Africa; (3) to satisfy his anxiety over the search for Prester John, a legendary Christian monarch, believed to be in East Africa or Asia (Henry wished to enlist the aid of Prester John in Portugal's wars against the non-Christian infidels);[13] and (4) to send out Christian missionaries spreading Christianity.

After Henry's death in 1460, spices emerged as a major motivating goal. Spices were in demand to preserve meat and make it taste better. Apart from salt and a few minor spices such as saffron, Europe produced none of these preservative and flavoring substances. The best seasoning and preservative spices which grew in the Far East were pepper in Java, ginger in Sumatra, nutmeg, mace and cloves, the most valuable of all, in the Moluccas (Ternate, Tidore) and the Banda Islands. Since the Arabs monopolized the trade in spices west of India, the riches of Southeast Asia stimulated competition among traders of all nationalities. Breaking this monopoly was the primary motivation of the Portuguese.

The capture of Ceuta by the Portuguese in 1415

aroused Prince Henry's interest in discovery. Under his order the three island groups, Madeiras, Canaries and Azores were colonized by João Goncalves Zario and Tristao Vaz Teizeira in 1420, Fernando de Castro in 1425 and Goncalo Velho in 1432 respectively.[14] Maritime enterprise became a national interest in Portugal, and opened up new areas undreamed of by men like Dias, Da Gama, Cabral and others.[15] The success of these voyages extended the Portuguese exploration farther eastward to the East which was then a mysterious land to the Europeans.

Navigational Instruments and Ship Building in the Renaissance

In addition, the scientific and practical industries made exploration of the unknown world possible. During the fifteenth century, ship-building in Portugal was gradually improved. Towards the end of the century, the ship designers combined the advantages of the European square-rig with those of the oriental lateen in one vessel.[16] The European square-rigged ship was clumsy and primitive; it could only carry large numbers of men or a bulky cargo for comparatively short distances with a fair wind. It was unsuitable for following the windings of strange coasts, exploring estuaries, meeting the dangers of the shoals, lee shores and head winds.[17] The square-rigged ship was designed for Mediterranean conditions of small tides, and since its large crew consumed food at a great rate, it was not a ship for long ocean voyages. Made with a more durable material and with a long yard and simple adjustments of the sail, the oriental lateen vessel was capable of running faster and was suitable for sailing under almost any wind conditions.[18] Thus this combination of square-rigged and oriental lateen, employed in most Portuguese voyages of

discovery in the late fifteenth and early sixteenth centuries, made possible the great discoveries of the East.

The principal nautical instruments used by the Portuguese in the fifteenth and sixteenth centuries were the mariner's compass,[19] the astrolabe, the quadrant and the portolan chart. European ships had carried compasses at least since the thirteenth century, and by Prince Henry's day the compass had developed from a magnetized needle floating on a piece of wood in a bowl of water, to a pivoted needle swinging above a compass card marked with the four cardinal 'winds' and the thirty-two points.[20] The compass assisted the navigator to determine his course to steer. Speed was largely a matter of guess-work by watching pieces of wood floating by. The astrolabe was used to measure the elevation of heavenly bodies for celestial navigation. The Portuguese navigators used very simple astrolabes, the simplest form being a disc marked in degrees with a swivelled pointer mounted at the center.[21] The Portuguese seamen also used a slightly handier instrument called a quadrant of rudimentary nature for taking sightings at sea.[22] For choosing the course to be sailed (loxodromes or rhumbs), he used a chart, called the portolan chart (also called the compass chart by some scholars).

Characteristics of the Portolan Charts

Portolan charts, which had been used by sailors since at least the thirteenth century, were intended for use at sea and were based on sailing experience. Their maturity of form and relative accuracy suggest that they must have had predecessors; however, there is no generally accepted explanation of their origin, and we are still uncertain concerning the stages and processes of their development. Crone believed that "the portolan charts were from the beginning closely related to the compass

and that it was the introduction of this instrument which made their construction possible,"[23] so he assumed that they originated in 1250-75.[24] Skelton stated that the portolan charts developed from the periplus,[25] and as the use of the compass developed, the old periplus gradually changed into a form of chart called the portolan chart.[26] Brown also pointed out that the portolan chart was a supplement that evolved from the need for more graphic descriptions of navigational hazards and from the inadequacy of the periplus to describe the various situations a pilot might encounter in the course of coastwise sailing.[27] According to Kimble, the portolan charts were the "graphical counterpart of the ancient peripli."[28] Stevenson thought that although a relationship existed between the use of the compass and the construction of the portolan chart, since the charts multiplied rapidly following the application of the compass to navigation, it is not certain that they owe their origin to the use of the compass.[29] Nordenskiöld in his "Résumé of an Essay on the Early History of Charts and Sailing Direction" pointed out that the system of wind-roses (compass roses) had given rise to the supposition that

> "these maps were constructed with the aid of a compass. This is not the case. If we examine the portolani [sic] closely, we shall find that all the bearings are laid down in the true direction, i.e. by the aid of the stars, not by the aid of a deviating compass, with the exception that the axis of the Mediterranean Sea has, probably by accumulation of small errors in the bearings from cape to cape, got a direction differing about 8° from the real direction."[30]

He also stated that the portolan charts were too accurate to have originated in the Middle Ages; they must have come from ancient times and have had a long history of develop-

ment. He further said that the outlines of the Mediterranean and the Black Sea on all the portolan charts were almost unaltered copies of the same original and the scales of distance on the charts were based on the units used by the Carthaginians. Therefore he remarked that it was possible the portolan chart had its ultimate origin "in the time when the Phoenicians or Carthaginians ruled over the navigation of western Mediterranean, or at least from the time of Marinus of Tyre"[31] (second century A.D.). That means the portolan charts probably existed in classical time, alongside the inferior maps of Eratosthenes, Pomponius Mela and Ptolemy. He even hinted that they might be of Phoenician origin.

In general, the portolan charts were drawn on parchment such as sheep skin, goat skin or calf skin with the neck at the west, and were kept like map-rolls. By the time paper came to be used, the production was greatly increased by means of the printing press. The charts were in two forms, either in single sheets, or divided into several smaller leaves glued on to thin boards of wood or card, and fastened together along one edge, in a form of "portolan-atlas."

Color employment is one of the most attractive features of the portolan charts. Usually they included black, red, green, blue, yellow, gold and silver. The colors were used according to certain rules, which had been kept unchanged or exactly copied by the cartographers. Thus the Red Sea, for instance, was almost always reddish-brown. Names of cities, islands and ports along the coasts were mostly in black, except for those of important harbors, which were in red. Color was seldom employed for the larger bodies of water except in the case of the Red Sea, while on certain world charts, large seas and oceans were covered with blue or green waving lines.

Important cities were often made more conspicuous by means of drawings. Territorial boundaries did not appear, but many of the separate states were identified, and often distinguished by ornamental coats of arms. The wind-heads, ornamentally drawn and placed on the border of the charts, indicated the different wind directions. Banners often appeared in great numbers and in brilliant tones. Frequently there were very elaborate cartouches on charts of the later years. Lettering was limited to coastal names and was always on the inside of the land and at right angles to it, so that the chart must be rotated to read the succession of names around the sea.

The coastline was in black, often faded and faint, but was occasionally drawn in green or blue, edged with a line of gold. In general, it was sketched with care and was usually continous, broken only where there was a river mouth. Rocks and shoals were indicated by dots or crossed in black or red along the coastlines. Estuaries were indicated by double lines. Even shallows were marked. A legend for all these symbols was absent. All islands seemed to be represented carefully, but small islands and coast-cliffs, unimportant geographically, but significant to coastal voyages, were drawn disproportionally large.[32]

As the portolan charts were intended primarily for the use of seamen, no attention was generally paid to the geographic features of the interior regions, so they were blank except for the loxodromes crossing over. However, with the passing years, more geographic details were represented on inland regions.

The typical portolans were projectionless maps, i.e. they do not appear to be drawn according to mathematical principles or rules, though they were probably based upon measurements and careful calculation of distances between places.[33] The draughtsman had tried to the best of his

ability to draw the coast of the countries to be mapped, giving the correct distances and the exact mutual relations.

Portolan charts contained no indication of latitudes or longitudes. It was not until the sixteenth century, when the Portuguese were exploring the Far East that it became usual to show the graticule on a chart.[34] However, the portolan charts were covered with a network of loxodromes or rhumb-lines, i.e. straight lines radiating from a number of crossing points supposedly having constant bearing, systematically distributed over the charts. The rhumb-lines were the most characteristic features of the portolan. They were used by the navigator in measuring the course to be steered, for he had no parallel rule of the kind we have today. He would place a ruler between his position on the chart and the harbor which he was heading, and by using the dividers, he found the rhumb-line most nearly parallel to it and steered that course. It cannot be determined whether these directions were written down for the medieval seaman or taught to him during his apprenticeship. However, according to Taylor they are found in the preface to a book of maritime charts for the English king Henry VIII (1537-1553).[35] The crossing points were called a wind-rose and were placed in a position arbitrarily chosen, with eight winds appearing in many early portolans.[36] Wind-roses were beautifully drawn, usually black for the principal winds, green for the half-wind and red for the quarter-wind. It was similar to those 'roses' on the compass card. In the later charts, the rhumb-lines of wind-roses increased in number from 4 to 8, then to 16 and finally to 32. There were no wind-roses (not to be confused with crossing-points of loxodromic lines) at all on the oldest portolans,[37] later a wind-rose appeared on each map in order to indicate the position of the chart with regard to the cardinal points which were shown towards the margins of the charts,

and until the sixteenth century, there were a number of wind-roses on the same chart. Loxodromes and compass-roses showed the sidereal or true north, and had nothing to do with the magnetic compass.[38] Stevenson points out that the loxodromes may have been originally intended as construction lines, being laid down by the draughtsman to guide him in sketching his coasts and in locating his places of special geographical interest. However, since few examples support this theory, he and Nordenskiöld doubted whether the loxodrome, generally regarded as a characteristic, belonged to the original portolan, as most features of these charts were copied from map to map and had been kept unaltered for centuries, whereas one seldom comes across two portolans with a similarly drawn loxodrome-network.[39] Bagrow argued that the term 'loxodrome' is wrongly applied to the sea charts of this period, since a loxodrome gives an accurate course only when the chart is drawn on a suitable projection, and no projection was used in the early portolan charts.[40]

Almost all portolans were supplied with a graphic scale for distances, generally very careless drawn, and placed at the edge of the map or as a ribbon in the interior of the map. Nordenskiöld suggests that the ribbon-like scale indicated that the navigator used a tape measure (not a compass) for reckoning distances on the map.[41]

The scale (in miles) was usually divided into fifths.[42] It was often drawn in as many as four or five different places on the charts, and on [illegible] charts of the later years it was put in a very elaborate cartouche. Since the scale itself was carelessly drawn, there is a notable difference between the lengths of its different parts. It is also interesting to note that the scale employed for the Atantic coast was not the same

as the one for the Mediterranean. Though this fact was not always strikingly prominent, yet it is clearly indicated on a large number of charts. As regards technique of drawing, there is in most cases a contrast between the scale of distance and the loxodrome network. The latter was always drawn carefully and clearly with the aid of a rule, while the scale was often a bad free-hand drawing.

Almost all the portolans before the sixteenth century covered only areas of the Mediterranean and the Black Sea with a portion of the Atlantic coast of Europe. The degree of accuracy was often surprisingly high around the Mediterranean. Ptolemy's figure for the length of the Mediterranean Sea was 20° too large (62° instead of 42°). Nordenskiöld and Tooley pointed out that the error, in regard to the length of the Mediterranean, was early discovered by mariners, as was shown by the more accurate dimension given to the Mediterranean and Black Seas on some portolan charts of the fourteenth century. Outside the Mediterranean however, the errors increased with the distortion of coastlines, which was due to the mariners' unfamilarity with the unexplored shores of the open oceans and the use of different scales for the Mediterranean and Atlantic coasts on many charts.

The oldest surviving portolan is the Carte Pisane,[43] which is anonymous and undated.[44] Many scholars suggest that it was drawn in the second half of the thirteenth century, although it is usually considered to have been made about 1300. It is probably of Genoese authorship. The chart represents the coasts of the Mediterranean, the Black Sea, Western Europe and the north-west of Africa. This is what Nordenskiöld called the 'normal portolan,'[45] from which all the others derived, so the Carte Pisane served as a protype for the other sea charts of that period.

The earlier portolan charts may be divided into two groups according to their place or origin: the Italian portolans chiefly from Genoa and Venice, and the Catalan portolans from Majorca and Barcelona. Although the basic source material was the same for both groups, the Italian and the Catalan charts differed both in appearance and in scope. The Italian portolans covered only the Mediterranean basin and western Europe, whereas some Catalan portolans extended to Scandinavia in the north and sometimes as far as China in the east and may therefore be classified as world maps. Such world maps were circular in shape like the medieval mappa mundi. Although restricted by the size of the parchment, they were often contained with a circle.

Made for the everyday use of seamen, the portolan charts were the best records for charting the process of discovery. The greatest makers of the portolans in the sixteenth century were the Portuguese. (Spain was also involved in chart making during this period, but Portugal was more advanced in mapping the Far East.) Rough maps of the sea routes, the coastal areas and the new discoveries were faithfully recorded after each voyage to the East by the chart-makers who accompanied the fleets. On their return, the charts were stored in Lisbon to be used as guides by commanders of subsequent voyages. Every chart usually showed some improvement on the one that had preceded it. Although these charts were kept as state secrets to prevent others from taking advantage of Portuguese navigational experience, copies of the portolans were smuggled out of Portugal and were used by the cartographers of Italy, Germany and the Low Countries as reliable source material for their maps.

Finally, the information brought back by the Portuguese navigators about the mysterious East, and the pro-

duction of a large numbers of Portuguese portolan charts which included the Far East, broadened the intellectual and widened the cartographic horizons of the Renaissance.

CHAPTER II

Elementary Stage
(1500-1549)

The Division of the World Into Two Spheres of Influence

When Columbus discovered America in 1492, Portugal and Spain were rival nations. Not only wishing to possess the newly discovered lands, they even quarrelled over the possession of undiscovered lands. To put an end to the dispute, Pope Alexander VI divided the world between Spain and Portugal by drawing an imaginary line from the north pole to the south pole through the Atlantic Ocean.[1] This Line of Demarcation, drawn 100 leagues west of the Azores, was established in 1493. All lands discovered east of this line were to belong to Portugal; all lands discovered west of it were to belong to Spain. However, King John II of Portugal was dissatisfied with this line and his complaints forced Ferdinand and Isabella of Spain to modify their demands. Fernández states that according to the Treaty of Tordesillas of 1494, the line was moved another 270 leagues to the west, approximating the 46°W and the 270°E meridians. East of the line Portugal gained full rights to the discovery and conquest of new lands, while Spain received the same privileges to the west.

Under this settlement, Portugal sought control of the system of maritime trade which linked the countries of Asia from China to the Red Sea. To achieve their objective, the Portuguese first sought a route into the Indian Ocean which necessited the circumnavigation of the African

continent. Once established on the Malabar Coast (West India), their influence spread throughout the East with remarkable radipity. Thus Portuguese discovery of a sea route to the East established her domination of European trade with that area.

Charts From 1500-1510

Portuguese cartographers are known to have been active during the fifteenth century, although only two charts have survived, all their other charts having mysteriously disappeared.[2] Before the Portuguese exploration of the Far East, this area was drawn on the planispheres or the portolan charts conjecturally on the basis of either Ptolemy's hypothetical "Aurea Chersonesus" or the report of Marco Polo (Fig. 1).[3] The eearliest surviving Portuguese map is the Cantino world chart (Fig. 2).[4] Although it is anonymous and undated, Cortesâo thought that it was drawn by a Portuguese and finished in 1502.[5] It is preserved in the Biblioteca Estense at Modena. In terms of its depiction of Asia, the Cantino chart almost completely abandons Ptolemy's conception of the southern coasts of Asia and greatly reduces the longitudinal extent of the continent.[6] The Malay Peninsula, though still too broad and long and placed too far south, was portrayed as a single arm reaching out from eastern Asia. The Ptolemic convention of the Sinus Magnus (Great Bay) had completely disappeared. According to some scholars (Crone and Nakamura) the large island named "Taprobana" (the ancient name for Ceylon) situated off the west coast of the Malay Peninsula, supposedly represents Sumatra on the Cantino map, although it is mistakenly oriented north-east south-west instead of north-west south-east.[7]

Although the Cantino chart lacks detail, it reveals amazing progress in geographical knowledge when compared

to earlier maps. On this chart, the eastern coast of Asia is shown more accurately as running north-eastward. The chart also shows a number of names, mostly unidentified, and indicates shoals off the shore of the continent.[8] Recognizable names are "Bar Singaur" (Singapore)and "Chinacochin" (Cochinchina). Near the extremity of the Peninsula occurs the name "Malaqua" (Malacca). A few inscriptions are found along the coasts of the Malay Peninsula, Sumatra and China, but they are not readable. There is a legend on the eastern coast of China, indicating that from this region come silk, musk, drugs and precious stones.[9] The name "Ocean Orientalis" (China Sea) was also given.

Finally, despite the fact that the Cantino map lacks a scale of latitudes, one has little difficulty in determining the parallels by means of the equator and the tropics.

Another later map is the chart of the Indian Ocean, c. 1510 (Fig. 3). Although anonymous, it was undoubtedly made by one of the Reinels, probably Jorge Reinel who was a leading cartographer during the fifteenth and sixteenth centuries.[10] Jorge and his father Pedro were given titles "examiner in the science and art of navigation" and "master of charts and of navigation compass" respectively.[11] Based on Cortesao' comment, none of their surviving works was dated and only one was signed by Pedro Reinel. All other charts more or less positively identified as their work were left unsigned. On the Indian Ocean chart, the compass roses, the scales of leagues, and particularly the typical Portuguese flags with the five dots are strongly reminiscent of other Reinel charts. The drawing of cities vary greatly from those in other charts, but are similar to the Reinel maps, leaving little doubt that this was their work.[12]

The eastern part of this chart is less complete than the Cantino map; only a portion of the southern extremity

of the Malay Peninsula is shown. The "Aurea Chersonesus" extends too far south below the equator. The "very rich and important island of Sumatra" is clearly identified for the first time.[13] It also includes several inscriptions of great interest of the history of geography, indicating Lisbon's knowledge of those regions. For example, over the Malay Peninsula, the cartographer wrote, "the very popular and rich city of Malacca which is still neither known nor discovered." There is another legend concerning "the great archipelago which causes great fear because it is not known how these islands could be reached." These inscriptions reflect the vague reports of the still unexplored Malay Archipelago. Near a large island in the south-eastern part of the chart, an inscription states: "in this island grows all the cloves." There is no doubt that this is a cartographic representation of the Moluccas. Although the island is situated south of the Malay Peninsula right on the Tropic of Capricorn, its displacement is not as great as the same island in the Cantino Planisphere of 1502. The cartographer made a serious mistake of writing "CIRCILO DE CANCRI" over the equator, but underneath it was written "this line is called equinoctial" in a handwriting different from that of the toponomy.[14] Obviously, this is a later correction by a different person.

The Cantino planisphere and this chart, followed by those of Francisco Rodrigues c. 1513 and the successive Reinel charts of c. 1517 to c. 1522 help us appreciate the evolution of geographical knowledge about the Far East gained in Lisbon. It also clearly illustrates the correlation between the progress of the discoveries and their cartographic recording.

The Exploration of the Far East and Sketch Maps of Francisco Rodrigues

Portuguese exploration of the Far East began in full force with the expeditions of de Gama, Albuquerque and Abreu. When Vasco da Gama arrived in India in 1498, he was asked what he wanted there. He is said to have replied, "Christians and Spices." This would certainly serve as a summary of subsequent Portuguese aims in the East. After annexing Goa, Alfonso de Albuquerque, King Manuel's commander of the East, realized the strategic importance of Malacca, a town commanding the strait of Malacca and thus in a position to control the passage of East Indian spices and other goods. In 1511, Albuquerque captured Malacca arriving via Sumatra with a fleet of 19 ships and a crew of 1400 men.[15] The capture of Malacca not only allowed the Portuguese to penetrate farther eastward to the Eastern Archipelago, but also gave them some security for further exploration and trade.

There were no accurate charts of the East Indies Archipelago until after the Portuguese voyages to the East Indies. Francisco Rodrigues, a cartographer, was appointed as one of the pilots of Abreu's expedition (1511), as he was "a young man with very good knowledge and able to make maps."[16] He drew the first European charts of the seas and lands beyond Malacca and thus his charts are the earliest maps known to reveal the extent of Portuguese knowledge of the East Indies Archipelago resulting from de Abreu's expedition. Antonio de Abreu was appointed by Albuquerque as the chief commander to explore the East Indies right after Albuquerque's conquest of Malacca. According to the historian Antonio Galvao, Abreu's fleet sailed along the eastern shore of Sumatra, passed by Bangka, surveyed the north coast of Java. Next, they proceeded eastward to pass the islands of Bali, Lombok, Sumbawa, Flores, Alor, Wetar, Buru, Amboina, Ceram and Banda (Fig. 4).[17]

The earliest reference to Rodrigues cartographic efforts is in the letter of Alfonso de Albuquerque to King Manuel written from Cochin on April 1, 1512 in which Albuquerque wrote of a "piece of a chart" he was sending to the King.[18] It was taken from "a large chart of a Javanese pilot, containing Portugal, the Cape of Good Hope, the Red Sea and the Clove Island (Moluccas Islands)." Albuquerque commented that "this (chart) was the best thing I have ever seen." Unfortunately, the chart was lost when Albuquerque's ship, the Frol de la Mar, was wrecked.[19] Therefore the existing chart, which was with this letter to the King, was a copy of Rodrigues' original Javanese map.

In 1514, Rodrigues wrote a book about his maritime routes in the East which was illustrated with 26 charts. Part of the charts and all the sketches were drawn during or as a result of his voyage to Banda. It is interesting to note that all the charts drawn by Rodrigues have the word "norte" (north) in small letters near the end of the rhumb line extended northwards from the central wind-rose. The most important part of his book includes the charts representing the East Indies Archipelago (Fig. 5). These charts are the earliest surviving charts of Southeast Asia drawn by a European as the result of direct observation. The delineation and placing of the Sunda Islands and the location of the Moluccas Islands were drawn with a moderate degree of accuracy, although many place-names are missing.[20] The important name of Malacca does not appear although Singapore ("samgepurra") is given. The northern part of Sumatra is marked with an inscription stating that "this island is Sumatra where there is much pepper." Along the south-west coast of Sumatra is the inscription "agoadu de Joham lopez dalluim," meaning "watering places of João Lopez Alvin"; on the northern

coast another legend states "elle descobriu daqui ate Japara," meaning "he discovered from here as far as Japara" (Japara is on the northern coast of Java, the present Semarang). The inscription is situated at a location corresponding to the Chi Manuk River flowing northward into the Java Sea.[21]

Despite its valuable new information, Rodrigues' charts embodied numerous distortions. Borneo is shown as a broad parallelogram; its broad north side could be the distorted north-west side. Amboina and Ceram are represented as a single large island. Between this island and certain small islands to the east is written "Ceram has gold." To the north of Ceram is a large island; its locatiom suggests Gilolo, which has an inscription which states "Island of Papua and its people are Cafres." After Rodrigues visited "gulle gulle" (Gulli Gulli) with Abreu, he recorded it on his chart, and almost every Portuguese map up to the seventeenth century gave that name to the south-east extremity of Ceram.[22] Timor was also marked with the words "Allha de timor hamde nace o ssamdolle," meaning the island of Timor where sandlewood grows. Near Banda is a group of seven or eight small islands of various sizes with a legend identifying the "island of Banda where the maces grow." The legend written above the compass rose states "these four islands (depicted in) blue are those of Moluccas, where the clove grows." The delineation of the Moluccas Islands is inaccurate and vague. Celebes was depicted as a long chain of mountainous islands situated close to the Moluccas, while the name "Maquater" (Makasar) which belongs on south-western Celebes was given to Borneo.[23] Thus, there are many shortcomings and errors on the charts.

In his book Rodrigues also included charts of China (Fig. 6a,b,c,d). Cortesão thought that these charts were

probably based on information gathered from the charts of Chinese pilots at Malacca, as Rodrigues did not visit China until 1519. The chart of the Gulf of Tongking (Fig. 6a) was marked "Cochin da china" (Chinacochin) at the head of the Gulf, and at its opening the island of Hainan was drawn. Figure 6b shows the southern coast of China with a legend stating "coast that goes towards China." The southern part of the map shows a mass of shoals called "Ilhas allagadas" (Supply Islands), which may correspond to the vast archipelago of reefs and islets west of Palawan. The long island "Lequeoller" and the unnamed smaller islands at the south seem to correspond to the Philippines.

Figure 6c is a chart of the northern part of the Chinese coast, which was inscribed with the following: "up to here the Chinese have discovered." The island located next to it may represent Korea. Towards the south there is an island shaped like a"V" with an inscription "Perioco island (?). You will find in it many things from China." The long island running north-south in Figure 6d is Lequeos (possibly Formosa) which was labelled as follows: "this is the principal island of the Lequeos. They say that there are wheat and copper articles in it." The two small islands and two islets off its south-west coast perhaps correspond to the Pescadores Islands.[24]

In conclusion, the cartographic knowledge of the East Indies Archipelago shown on the 1514 charts is not only far ahead of that of Rodrigues' contemporaries, but is also far superior to what might be expected as the result of personal observation in those days. Still, many details concerning the Moluccas and China were left unfinished because Rodrigues did not visit this area, only travelling as far as the Sunda Islands in his 1511 expedition.

The Reinels' Charts

As a result of successful Far Eastern expeditions like that of Rodrigues, new voyages were undertaken at regular intervals and new geographical and cartographic information was arriving constantly in Lisbon. This information was kept in absolute secrecy and official map-makers like Pedro and Jorge Reinels obtained that information at first hand. The charts of 1517 and 1518, attributed by Cortesão to Jorge and Pedro respectively, also show the result of the first Portuguese expedition to the Far East. Although the Reinels used Rodrigues' chart as reference, they are more advanced in cartographic representation. On the 1517 chart (Fig. 7), the coast of China runs almost in a straight line, with a large piece of land on the east end of the map across the sea from the peninsula. This can be recognized as the trace of the "Gigantic Peninsula" in older map.[25] The southern extension of the Malay Peninsula is more accurately drawn than that section on Rodrigues' chart, as it terminates at the north of the equator. Sumatra was drawn in its correct orientation. Borneo, clearly drawn on Rodrigues' map is missing on Reinel's. The Moluccas, located east of the Sunda Islands, are represented in an arch-shaped chain of islands. Compare this 1517 chart with the 1510 chart (Fig. 3), it is found that the marking of place-names along the coasts of the Malay Peninsula and Sumatra in the former shows considerable progress in nomenclature, as for example, in the identification of the cities of Malacca, Achin, Tamiang and Pedir.

According to Cortesão, Pedro Reinel's map of 1518 is almost identical to his son's of the previous year.[26] The only differences included depiction of the Chinese coastline, which runs north-eastward instead of due north, and the south-western coast of Sumatra, which is incomplete

in the 1518 chart. The more southerly of the two Portuguese flags in the peninsula marks Malacca, others in Sumatra and farther east show Portuguese penetration in the Archipelago.

Further Expeditions to the Far East and the Representration of These Voyages on Charts (1519-1550)

After Antonio de Abreu's expedition in 1511, Portuguese spice ships were dispatched frequently from Malacca to the Spice Islands (the Moluccas Islands, the Banda Islands and Amboina Island). Lach asserts that the records of famous historians such as João de Barros, Fernão Lopes de Castanheda and Antonio de Galvao, indicated that Portuguese trading ships usually followed the same route. After passing through the strait of Malacca, they followed the western coast of Borneo southward, crossed the Java Sea, and then sailed along Java's northern coast to the southern end of Celebes and from there to the various Spice Islands.

Having established a base at Malacca, the Portuguese visited nearly every corner of the East Indies during the reign of King Manuel I (1495-1521). From 1512 to 1521, numerous visits were made to Pacem, Pedore, the Sumatran Kingdoms of Campar, Sicac, Daya, Acheh, Barus and Aru (Daru).[27] These were ports and ancient kingdoms situated along the eastern and north-western coasts of Sumatra well known for their pepper, ginger and cinnamon. The fifth volums of Tomé Pires' "Suma Oriental," (1512-1515) shows that the Portuguese had also touched the western coast of Sumatra.[28]

Portuguese explorers also visited a number of cities in Java as well as all the Moluccas Islands. The Kingdom of Sunda, located in the north-western part of Java, was visited by Numo Vaz and Jorge Coresma in 1518 and 1521 respectively, in their search for great quantities of

pepper, rice, slaves, and gold.[29] The famous port of Cresik located at the northern coast of Java was also frequented.[30] The Moluccas Islands (Ternate, Tidore, Motir, Makian, Bachan, Morota and Gilolo or Halmahera), Amboina and the Banda Islans, where mace, nutmeg, cloves and ginger roots are grown, were also visited by many expeditions.[31]

As a result of constant trading contact with the Chinese in Malacca, the Portuguese became interested in establishing a relationship with the Kingdom of China.[32] By the end of 1513, Jorge Alvare had taken two junks to the Hsün River (near Canton)-a gate to China.[33] This was the first step in the Portuguese penetration of China. Four years later the first official Portuguese embassy to China, led by Fernão Peres de Andrade and Tome Pires, was dispatched from Malacca to Canton. Having received privileges of residence and trade, Andrade sent Tomé Pires overland to Peking for an audience with the Emperor (1520), despite Pires' long journey, the audience was never granted. Indeed, on his return to Canton, Pires and his entourage were imprisoned. Some were executed; others, including Pires himself, died as a result of the hardships. Two of the survivors succeeded in smuggling letters which urged the Portuguese king to undertake a military expedition against China. These letters were detailed eye-witness accounts of life in China.[34] These letters, and others to Portuguese compatriots, provided fairly accurate geographic information.

The information gained during these expeditions was carefully recorded, interpreted, studied and used as a source for improved maps. The portolan chart of c. 1519 by Jorge Reinel represents the then known world (Fig. 8). In regard to the geographical representation, the chart does not show much progress in comparison with 1517 map. Nevertheless, one of its remarkable features is the presence of an equator graduated in divisions, shown for the

first time in Portuguese maps. At the same time, Sumatra first got its name "Camatara." The river flowing from inland China into the South China Sea might represent the Hsün River although it is inaccurately depicted. Detailed delineation of the Pacific islands was not possible at that time as the ocean had not been fully explored. The depiction of Portuguese ships sailing in the Indian Ocean and the South China Sea suggests the expeditions made to the Spice Islands and China. On the whole, toponomy and inscriptions on the chart are scanty.

Even more geographic information is provided by Diogo Ribeiro's planisphere of 1527 and two planispheres of 1529 (one preserved in the Vatican, another one in Weimar, Germany). According to Cortesão these three world charts are practically identical, with title legends, drawings of a circular table of declination, quadrants, astrolabes, wind roses and wind-heads. The planisphere of 1527 represents the whole world as it was then known to the cartographer (Fig. 9). Along the entire width of the upper and lower borders of the chart runs the legend "Universal Chart in which is contained all that until now has been discovered in the world."[35] A piece of the upper right-hand corner has been torn off, removing the last-five letters of the word "descubierto."[36] The Portuguese and Spanish flags, drawn on each side of the Tordesillas demarcation line in the East, are situated in the lower right-hand corner of the chart. The demarcation line is erroneously drawn falling on the Moluccas, thus placing these islands and the Philippines in the Spanish instead of the Portuguese half of the world.[37]

In addition, only the southern part of China was known at the time of the 1527 planisphere. Although the Portuguese first arrived in China in 1517 and even though Tomé Pires travelled to Peking in 1519, it is presumed

that a map of a newly discovered area would not be drawn up in detail until some time after preliminary exploration. Therefore, only the estuary of the Hsün River visited by Jorge Alvim in 1513 and a small part of South China were depicted on this chart. Cortesão said that it is the first map to record the name of "Cantam" (Canton), which was drawn with considerable detail and accuracy.[38]

The depiction of outline of Sumatra is also incomplete. The large framed legend near the upper right-hand corner is particularly interesting, because it indicates the limits of Portuguese exploration of the island. The second half states,

> "... Malacca is continental and almost a peninsula, and the doubtful coast which is sketched but without color is because it is not known how it runs, for the discoverers did not go from place to place, and you must understand the same about the Island of Sumatra and Taprobane (this shows the confusion of the cartographer; he thought Sumatra and Taprobane are two separate islands), because we know that it is an island, but it has not been navigated around the east...."[39]

Therefore, it is not surprising to find on the chart that the coastlines of the east and west Malay Peninsula are interrupted, and the Sumatra Island is only shown with its north-eastern coastline.

The depiction of Borneo, the Philippines, Java and Timor is also incomplete. For example, only the southern portion of the Philippines and the north coast of Borneo are outlined since no Iberian had yet visited Luzon. The source of cartographic information for the configuration of the Philippines was the voyage of Magellan in 1522. Since Borneo was mostly covered with rain forest, it had only been touched in 1518 by Lorenzo de Gomes, a Portuguese, who arrived at its northern part.[40] Therefore, only a small piece of the north-west coast of Borneo was depicted

on the chart. Ribeiro also recorded the craggy Borneo mountain of Kinabalu (13,544 ft.) as S. Pedro. This mountain is clearly is clearly visible from the seas around Borneo' north tip. Broek states that the name S. Pedro remained the standard reference to this landmark until the end of the eighteenth century.[41] Besides the sketchy outline of Borneo, the southern coast of Java is also missing. Furthermore, the displacement of Timor westward took up the space actually occupied by the Sunda Islands and made it impossible to place these islands accurately between Java and Timor. Toponomy is rich on this chart, identifing many coastal names along north- eastern Sumatra and north Java.

Ribeiro's chart of 1529 (Vatican copy), which resembles the above mentioned chart, is of interest primarily because of the inscriptions found below the drawings of the ships. For example, one inscription states,"I return to the Moluccas" under a ship in the North Pacific coming from Central America; another states,"I come from the Moluccas" under a ship south of the previous one going to Central America; under a third ship located in the Central Atlantic the following inscription appears: "I go to the Moluccas."[42] All these suggest numerous Portuguese voyages to the Moluccas.

In the generation following the Ribeiro's planisphere of 1529, very few extant Portuguese portolan charts or maps show much progress in the depiction of the Far East. The two anonymous charts of c. 1535 and 1540 are the exceptions to this generalization.[43] The most remarkable feature on the 1535 chart is the outline of the Philippines and Borneo (Fig. 10). The Philippines are accurately located, although represented with some fantasy: an inscription at the corner of a large island identifies "Cebu where they killed Magellan," and a legend on Mindanao states "archipelago de an/lazaro, os lequios," meaning "Liu Kiu and other

island north of the Philippines."[42] According to Cortesão Luzon is delineated on this chart for the first time as a circular cluster of islands. However, the complete coastline of Borneo appears for the first time in fairly accurate form. The Moluccas were represented by several islands; three of which bear names-Motir, Tidor and Ternate. Only the northern part of Gilolo was depicted. The name "Jadoa Maia" (Java Major) was given to Lombok and Sumbawa. The outlines of Sumatra and the Malay Peninsula are complete but inaccurate in the assumption of their total area. Finally, more detail was added to the representation of the Chinese coast.

The anonymous chart of 1540 (Fig. 11) shows an advance in cartographic representation by including, for example, on the side margins, two graduations of latitudes from 68°N to 51°S, the two tropics and the equator. The Far East is also shown in greater detail. The coast of China ends at the latitude of "Chincheo" (Changchow or Chuanchow) in the Fukien Province, because the Portuguese had not gone farther north than this trading post. A group of islands drawn in near Changchow and located just above the Tropic of Cancer, apparently represent Quemoy and its neighboring islands. However, only the west coast of Borneo is shown, although this section of coastline was fairly drawn with Brunei Bay quite well presented. The representation of the island of Borneo is related to the knowledge gained in the 1526 voyage of Dom Jorge Menzes from Malacca to the Moluccas when he attempted a more northerly course instead of the frequent route.[45] Significant too is the representation of the north-western coast of Celebes, which is obviously derived from the voyage of Gomes de Sequeira in 1525.[46] The chart not only shows advances in geographic data concerning the south-eastern coast of China, Celebes and Mindanao, but also in

the delineation and location of the northern part of Gilolo, Ceram, Timor and Flores. Each Portuguese chart usually shows some improvement on its predecessor.

In summary, the Cantino chart of 1502 gives a primitive picture of the Far East showing only the Malay Peninsula and the island of Sumatra. The charts by Rodrigues, the Reinels and Ribeiro and by other anonymous cartographers of this period represented more and more of South East Asia as they recorded the Portuguese discoveries in the east. In the middle of this stage, southern China and part of the Sunda Islands and the Moluccas began to appear. Towards the end of this period, a general image of the Far East is given on the charts, showing not only the configuration of the Malay Peninsula and Sumatra, but also most of the Sunda Islands, the Moluccas and the southern Philippines. In general terms, during the first half of the sixteenth century, Portuguese cartography gradually replaced the conventional Ptolemaic pictures of the Far East with maps based on empirical data.

CHAPTER III

Intermediate Stage
(1550-1580)

Once all the great discoveries had been made, with the exception of Japan, the news which came to Portugal was no longer startling. Only when the Jesuits began to operate in the Asiatic mission field were newer materials used for cartographic documentation. Around the mid-sixteenth century Jesuit letters were increasingly employed as data for the portolan charts. Not long after this, information from Japanese maps was incorporated by Portuguese cartographers.

In the latter half of the sixteenth century, the attention of the Portuguese gradually became focused on Eastern Asia (China and Japan) rather than the East Indian Archipelago. According to Lach, this shift of interest was brought about by the hope that the continent of Asia might be forced to open its doors for trading. Portuguese ships had been trading in South China since 1513 and by the beginning of 1540 they began to call at ports farther north. At that time a trading post was established on an island near Ningpo (Chekiang Province). However, Ningpo was closed in 1543 and Portuguese traders moved back to South China.[1] By 1557 the Portuguese possessed three trading centers near Canton: Shang Chuan, Langpokak and Macao.[2] The first two were ultimately abandoned and Macao remained as the primary center of all activity in the area.

Before the mid- sixteenth century, Japan was known only through Marco Polo's brief account which was written on the basis of hearsay two centuries earlier. Polo

described Zipangu as a country full of gold and jewelry. According to Portuguese historians, Japan was accidentally discovered in 1542 by three Portuguese seamen, Antonio de Moto, Diogo Francisco Zeimoto and Antonio Peizotto.[3] However, the record of the arrival of these first Europeans in Japan is drawn wholly from Japanese annals. Mento Pinto, a Portuguese adventurer, was the first official explorer of Japan but the date of his trip is indefinite (1543?).[4] Once the route to Japan was discovered, the visits of the Portuguese navigators became more frequent year after year and their ships were seen increasingly in the ports of Kyushu. Within a few years, the Portuguese traders established a flourishing trading station at Hirado (an island lying off the north-west coast of Kyushu). Lach states that by personal observations, travellers and traders accumulated geographic knowledge of the islands, coastlines and roadsteads around Kyushu and the Inland Sea and often saw native maps of Japan which they incorporated into their charts.

Before the mid-sixteenth century, the Portuguese considered the Philippines of little importance and made no serious effort to occupy them. Nevertheless, they began to take action by dispatching ships to the Archipelago to drive the Spaniards out of their settlement established at Cebu in 1564.[5] More contact with the Philippines increased Portuguese geographic knowledge and added more cartographic information to their portolan charts.

At the same time, Portuguese Macao became the door through which the Jesuit missionaries sought to enter China (1557).[6] The Jesuit enterprise progressed rapidly not only in China, but also in the Malay Peninsula, the East Indies, and especially in Japan.[7] Indeed, Portuguese knowledge of Japan in the sixteenth century was obtained mostly through the letters and reports of Jesuits like P.

Luis Frois, who spent two years there and brought back many topographic details and some general geographic information.[8]

Besides the information supplied by the Jesuits, Portuguese historians like João de Barros (1496-1570) and Fernão Lopes de Dastanheda (d. 1559) added a great deal of geographic information about China. Barros' "Decada" (1552) and Castanhedas' "Historia do descobrimento e conquista da India pelos Portuguese" (1511) were based on the description and maps brought back by Portuguese sailors and merchants coming from China.[9] Lach points out that their accounts had high geographic value, providing information on the length of the Chinese coast, the location of Peking, the Great Wall, and other details. As a result of so much new geographic knowledge, the portolan charts of the latter half of the sixteenth century were extremely numerous; in Lisbon alone six offices employed eighteen people to make charts.[10] Portuguese cartography flourished in this period showing the nation's Far Eastern empire at its zenith.

The anonymous Portuguese planisphere dated c. 1550 contains both the first cartographic acknowledgment of the discovery of Japan and greater detail on China, Borneo and Celebes (Fig. 12). On this map, Japan appears as a double string of small islands which begins at Formosa, runs eastward at the north of the Tropic of Cancer and then turns north. At the point where the double string of islands begins to arch northwards, the name "lequeo" appears and a little farther north, the name "japon" also appears. This is the earliest surviving chart in which the name Japan is recorded.[11] The map also shows more of the south-eastern coastal area of China with a more accurate shape than that of the 1540 map (Fig. 11). The Portuguese flags indicate the location of the Portu-

guese trading posts in China. Although the coastline of Borneo is interrupted, its southern coastal area begins to appear, showing gradual acquaintance with the shape of the island. Celebes also has dense nomenclature.

A more accurate and detailed depiction of coastal China begins to appear on the manuscript map of Diogo Homem dated 1558 (Fig. 13).[12] Homem depicted the outline of China in considerable detail as far north as the Gulf of Pohai, and recorded the names of a number of coastal-trading posts. The cartographer vastly exaggerated the mouth of the Yangtze, which was known to the Portuguese as the Gulf of Nanking, an area in which they were active from their base at Ningpo.[13] The Liaotung Peninsula, located at the northmost point of the coast, was depicted as an island. The Shangtung Peninsula, instead of protruding north-eastwards from the mainland, pointed towards the south-east. This shows that the cartographer was still unfamiliar with northern China. The entire west and north of China was surrounded by high and apparently impassable and uninhabited mountains.

After the Portuguese became active off the China coast, they undoubtedly heard much more about the island of Formosa. On the portolan charts, this Ilha Formosa (Portuguese for "Beautiful Island") was usually exagerated and given the name by which it is still known.[14] Lach says that this 1558 chart, prepared on the basis of cartographic materials made available by people who had actually worked and traded in the East, shows Formosa quite clearly. Its shape, however, is utterly fanciful, since the navigators know only the northern half of the island.[15] Hainan Island (off the south coast of China) was depicted too small. Cortesão points out that this island was important to navigators as it provided good shelter, a water supply, firewood and fish, and was almost

an obligatory port of call for the Portuguese ships sailing to and from Canton or any port farther north.[16]

On this 1558 map, Japan is representated for the first time as an archipelago extending from the Korean peninsula. The name "Japan" appears in small letters on the west side of the islands. Although they are inaccurately drawn, at least parts of these islands are shown in their true relation to the continent of Asia. The coast of the southernmost island, Kyushu, was given in detail. The shape of Japan appears to have been copied from a Gyogi map, a type of traditional schematic chart which was popular among the Japanese at that time.[17]

The outline of the coasts of the Philippines, Borneo, Celebes and the Moluccas had been improved, although the development of accurate cartographic delineation was slow. Mindanao is shown in its full extent and is obviously known from the voyage of Francisco de Castro, a Portuguese captain who circumnavigated that island in 1538.[18] The map is the first to present a cluster of names on the south-western corner of Borneo. The south coast of Borneo is broad with estuaries south of the equator. The knowledge of the south coast of the island is a by-product of the Portuguese voyages from Malacca to the Moluccas through the Java Sea. Across the equator is written "Laue donde foi do Manuel de Lima," indicating the voyage of D. Manuel de Lima to Laue (the present town of Tajan on the Kapuas River) in 1537.[19] On the chart, Gilolo is close to its true shape and Ceram is accurately drawn. The east coasts of Borneo and Celebes and the south coast of Java were still unknown. This chart, elaborately decorated and rich in place-name, shows the coasts frequented by the Portuguese ships. As a whole, it gives sharp detail to physical features of the coastal area.

The first realistic representation of Japan exists in the manuscript drawn in 1561 by Bartolomew Velho (Fig. 14). Lach asserts that Velho was the first to record the geographic location of the island of Yezo (Hokkaido).[20] Velho's configuration is close to Hokkaido's true size and outline and places it correctly in relation to the rest of the archipelago.[21] Velho also showed a wall behind the mountain between China and Tartar which is undoubtedly the Great Wall of China. He also indicated a large, round body of water between Peking and the coast which is explained by the following Latin legend, "City of Shansi (Sancij) which was submerged with seven cities and 153 villages in the year 1557." This may be a reference to "Xanton," a Portuguese transliteration of Shangtung, because the flooding of the Yellow River usually occurs in this province. Cortesão thought that Velho appeared to be well informed about the geographic detail of many regions and to have up-to-date information for the preparation of his chart . The legend with his signature at the bottom of the map indicated that he must have held and official position which would have given him the opportunity to obtain overseas news in Lisbon.

Another chart by Lazaro Luis (1563) provides a great deal of information and geographical detail related to the new discoveries in the Far East (Fig. 15). It is interesting that the nomenclature is up-side-down on the map, as the legend, cartouche, building, trees and lettering are all south-oriented. The legend at the "top" of the chart shows the cartographic knowledge of the then known world; it says, "This table has Bengal, Pegu, the Kingdom of Tenasserim, Malacca, the Island of Sumatra, Java, all Sunda, the Islands of Timor, Banda, Moluccas with all its islands, the islands where they killed him [Magellan], the coasts of Loas and Licoa, the Kingdom of

Canton, the Kingdom of Siam, the Ladrones Islands, all Japan."[22] Obviously, Luis mistook Canton as a kingdom rather than a province of China.

The Luis chart is the earliest one in which Japan was represented peculiarly by the disposition given to the islands of Kyushu and Honshu. Honshu, the largest island, is shaped like a cresent with the points turned south round the Shikoku Island (actually this part should be turned in the opposite direction.) Kyushu is in elongated form protruding southward at the western end of Honshu. Shikoku, on the other hand, lies in rectangular form south of Honshu. The northern part of Honshu and the large island of Hokkaido (Yezo) are omitted, and it would therefore be more correct to consider this representation as showing only the southern portion of Japan. Nevertheless, it became a prototype for the later Portuguese portolan charts, and was still adopted by several foreigh cartographers also as late as the seventeenth century.[23] This chart is also the first one showing Japan as "Japao."

On this 1563 chart, the drawing of the Philippines is different from the typical configuration shown in Lopo Homem's planisphere and all Diogo Homem's atlases. It is the first to represent Luzon and Palawan with a straight coast running north-eastward, and includes a legend with a title "Costa de lucoes" (Coast of Luzon). The inscription reads, "Costa de lucoes e laos por omde pasem p^{o} fidalgo vindo de borneo num llamao" (Coast of Luzon and through which passed Pedro Fidalgo coming from Borneo in a Chinese vessel and sailed with wind for a long time until he reached land).[24] The same representation of Luzon is also found on all the charts by Vaz Dourado (1568-1580).

The depiction of the East Indies Archipelago on the

Luis Chart is similar to that of Bartolomew Velho. Here, the island of Gilolo (Halmahera) begins to appear in its true configuration despite the exaggerated size of Bali and Flores. Although the southern coastlines of Bali and Flores are completed, it appears that the cartographer lacked knowledge of these sections of the islands, as he had drawn straight lines arbitrarily to connect the eastern and western ends.

The cartographer Fernão Vaz Dourado mentioned above was once called "the most famous and remarkable sixteenth century Portuguese cartographer."[25] His work is said to be outstanding because of the artistic beauty of the illumination consistently spread throughout all his atlases. His works are thought to be masterpieces; no other cartographer-artist surpassed or even equalled him.[26] In a period of twelve years (1568-1580), he drew eight atlases which were elaborately illuminated. These atlases, which are still extant, form a homogenous group of portolan charts. Vaz Dourado's 1575 chart has been selected for illustration (Fig. 16), because

> "it is not only complete and well preserved, but one of his most beautiful works. The perfection of the drawing, the delicacy of the illumination, the richness of the decoration, and above all, the perfect taste with which everything is balanced,[27]

show Vaz Dourado's great talent. This manuscript map, like other portolan charts, is mainly devoted to the depiction of coastal feature, as interior emptiness is covered with flags, coats of arms and cartouche.

On the chart, the delineation of Japan is similar to that on Lazaro Luis' atlas of 1563, but whether Vaz Dourado adopted Lazaro Luis' chart as prototype or used some other prototype drawn by the former and now lost is still a dispute.[28] However, Skelton says that the cartographer could have consulted nautical charts and the

reports of the Jesuit missionary, which provided lists of town and provinces and the distances between them.[29] The northern part of Honshu is depicted in a sort of "turtle-backed" outline. However, Vaz Dourado's configuration of Japan was adopted by other map-makers up to the end of the century.[30] In the 1568 edition of Vaz Dourado's atlas, centers of Christianity in Japan are indicated by the word "dechristaos", symbols of flags with crosses, or cross drawn on towers.

The interior of China is decorated with pagodas. The estuaries of Canton and Ningpo are proportionally much too large. Macao, founded about a decade earlier and Ningpo were marked in red to set them apart from the numerous towns along the eastern coast of China.[31] In the collection of 1568, China is divided into two large provinces: "Camtam" (Canton) and "Liampo" (Ningpo), each graced with three exotic pagodas.[32] The pagodas increased in number on his later charts, which might indicate an imagined spread of Portuguese influence in China. It is also interesting to note that Formosa is depicted as a group of three islands.

The delineation of the Philippines is similar to that of Lazaro Luis's map of 1563. The peculiar feature of the northwest coasts of Luzon and Palawan is Vaz Dourado's cartographic interpretation of Pedro Fidalago's report of his voyage in 1545.[33] The already known southern coast of Palawan was filled with nonmenclature.

The Portuguese policy of strictly controlling the news about discovery and trade in the Far East was so effective that other European countries had to rely entirely upon the ancient writers, for their information about Asia. However, this rigid control broke down around the mid-sixteenth century, when it became apparent that

Portugal would be unable to continue monopolizing the spice trade. Furthermore, copies of the portolan charts were smuggled out of Portugal and used in Italy, Germany and the Low Countries as guides for their trading expeditions and as sources for the engraved and woodcut maps prepared for their atlases.[34] Therefore, the Portuguese portolan charts were adopted as models for other European maps produced a generation later in the latter half of the century, including the famous French maps of Dieppe.

In any event, the most important achievement in the intermediate stage is the appearance of Japan, particularly southern Japan, on the Portuguese portolan charts. The mapping of the northern coast of China is another important contribution to the cartographic development. The general outline of the Chinese coast from the delta of Canton to the Yellow Sea can be seen on most of the charts in this era.

CHAPTER IV

Mature Stage
(1581-1650)

Portuguese supremacy in the Far East, especially in the East Indies, remained unchallenged only from the time Albuquerque came to Malacca until about 1580 when Portugal was temporarily annexed by Spain. The decline of the Portuguese Empire was not sudden or striking; its weakness was barely noticeable before 1550.[1] Portugal's limited resources and population size led to its eventual decline in the Far East. Its home population dropped significantly in the sixteenth century, as Lisbon was repeatedly devastated by plagues and the drain of young men leaving for the Far East as soldiers, sailors and officials. Few of these ever lived to return to their native land and their loss was difficult to replace.[2] Therefore, by the end of the sixteenth century, Portugal was having great difficulty in producing able men. Furthermore, the constant unrest of the native peoples in the Far East strained the Portuguese administration and resources. She finally collapsed as result of this internal weakness and external pressure.

In 1580, the Portuguese Eastern possessions came under the control of the Spanish Crown, although actual occupation was never successfully undertaken. In 1640 Portugal regained its independence, but was unable to recover more than three or four Far Eastern possessions, which passed to the control of the English and the Dutch.[3] Although Portugal was declining in power and wealth, the Portuguese school of cartography contained to flourish.

The great achievement of this period was the production of charts which correctly located the islands of Japan between 30 and 40 degrees north latitude. The greatest cartographers in this period were Bartolomeu Lasso, Antonio Saches, Pedro Berrelot and João Texeira Albernaz I.

Bartolomeu Lasso, a great cartographer of the last quarter of the sixteenth century and the beginning of the seventeenth century, was the creator of the earliest known chart (1590) to show a complete drawing of the Philippines (Fig. 17).[4] Its delineation corresponds more or less to reality, as Mindanao, Luzon and the Visayas are all given good representation. Toponomy is quite rich on the island of Luzon. Cortesão states that this is the first European map with the name "Filipinas" on it; in fact, its delineation of the Archipelago shows considerable advancement over Vaz Dourado's chart of 1575. This advancement in the delineation of the Archipelago suggests the cartographer got detailed cartographic information from the Spaniards who had occupied Manila since 1571. Presumably, the Portuguese and Spaniards shared their knowledge after the merger of the two countries.

On this 1590 chart, the eastern outlines of Borneo and Celebes and the southern coastline of Java are complete, although their completeness is "arbitrary," since presumably, it was not based on direct observation. The delineation of the Malay Peninsula and Sumatra is still quite far from reality, but the south coast of China is rich with place-names. As a whole, the chart gives a clear picture of the Far East as it was then known.

According to Kish, missionary charts played an important role as sources of information in the beginning of the seventeenth century.[5] The chart of Antonio Sanches of 1623 (Fig. 18) is an example. On Sanches' map, a cross in the north of Japan and a picture of St. Anthony holding

Christ and a cross show the penetration of the Jesuits in that country. The outline of Japan is improved and Honshu, particularly its northern half, has been better oriented. Instead of bending southward like a hook, it has been given a slight turn to the north-east, although Shikoku is still lying horizontally under it.

The configuration of China, especially its northern part, is also improved. The Liaotung and the Shangtung Peninsulas are both shown, even though they are not conspicuous. The Gulf of Yangtze is no longer exaggerated. A fanciful mass of land stretches across the northern half of the map, showing that the cartographer maintained Ptolemy's ancient idea of a large piece of Arctic land. Physical features like mountains and trees are depicted on the Asian continent. A Chinese official and the Great Wall are also present.

The chart does not reveal much improvement in the depiction of the shapes of the Malay Peninsula, Sumatra and the East Indies. The southern part of Mindanao is missing and the size of Java is exaggerated. Incidentally, the drawing of Korea is noteworthy as it is shown incorrectly as an island with pointed ends, aligned north and south and extending too far south. As a whole, the chart is colorful, but not especially noteworthy in terms of its geographic representation.

The portolan chart by Pedro Berthelot in 1635 is an outstanding one which shows great improvement in the drawing of Sumatra and the East Indies (Fig. 19). The Malay Peninsula begins to approach its true configuration though it extends a bit too far south. The sizes and shapes of Sumatra, Bangka, Mindanao, Samar, Palawan and the Moluccas are accurately presented. Most of the sixteenth century cartographical representations of Borneo and particularly of its east coast, are somewhat fanciful and vague, but

this map is the first extant one to show Borneo's complete coastline in a relatively correct form. This 1635 map also provides an impressive list of names for Borneo, but many of them cannot be matched with modern geographic names except by approxomate location.[6] Pedro Berthelot himself had observed and circumnavigated the entire island of Borneo in 1627, and for this reason, his map is more advanced than those of João Teixeira Albernaz I (1640) and Antonio Sanches (1641).[7] Berthelot changed the configuration of Celebes by abandoning its "sea-horse" shape. Its outline had been improved with two southern peninsulas. Although the outline of the northern part of the island, which looks like a "tail," is missing, the southern part gains an almost modern likeness. This outline of the southern part shows great improvement.

As Heawood said that the Portuguese navigators in the sixteenth century avoided sailing along the southern coast of Java because of the violent currents there, the cartographers lacked the knowledge of the coast.[8] Not until the beginning of the seventeenth century did Portuguese sailors begin to take a new sea-route along the southern Java coast. Heawood's statement leads to the supposition that the southern coast of Java began to appear in maps of the first quarter of the seventeenth century. This 1635 chart is the first map to show the southern coastline of Java in complete and correct form. Finally, this map is clear, detailed and rich in place-names.

The chart of João Teixeira Albernaz I in 1649 represents the then known world (Fig. 20). Albernaz or João Teixeira, as he signed most of his works, was the most notable Portuguese cartographer of the first half of the seventeenth century and perhaps of the whole century.[9] As the Portuguese visited Japan more frequent-

ly or settled there, the geographical and cartographical information become more complete and accurate. Therefore, Albernaz's map of Japan gained a more correct shape, particularly Honshu, which has been given a slight turn to the north-east. The most noteworthy feature is the representation, for the first time, of the large northern island of Yezo (Hokkaido). The whole group of islands is almost correct in latitude. The standard of Portuguese cartographic representation of Japan did not improve much after Albernaz until the nineteenth century.[10] The lack of new cartographic information about the interior was due to the explusion of the Portuguese in 1639 by the Japanese Government. After that, Japan was practically closed to the West, except for the Dutch post there, until 1854.

Moreover, the 1649 chart is remarkable in its depiction of China. The Great Wall drawn along the northern Chinese frontier has an inscription, "Muro que por entre serras, se continua por mais de 360 legoas. fizerao os Chinas esta tao pretensonsa obra, pera se defendere dos tartatosi coquem traze continua querra" (Wall which continued for more than 360 leagues through the mountains. The Chinese constructed this very impressive work to defend themselves from the Tartars with whom they waged continuous war.)[11] The Portuguese finally visited the northern part of the Chinese coast, as several placenames are found for the ports and towns situated there. This geographic information was almost exclusively brought back by the Portuguese Jesuits, for the Jesuits were the only Europeans allowed in northern China. This map, although lacking the color, decoration and technique of the finest sixteenth century Portuguese cartography, is still fairly accurate.

The last portolan chart to be considered is an anonymous chart of 1650 (Fig. 21). There are various

advances on the map, notably in the Philippines and Borneo. The configuration of the Philippines is a fairly accurate representation. Borneo, though its shape is not perfect, is better depicted than it is in the previous map. The chart lacks coastal names, except those on the Luzon, but a name for each island is given.

The greatest achievement in the development of Portuguese portolan charts in this decade is the depiction of the complete and fairly accurate outline of each region in the Far East. The closeness of this configuration to reality is shown in Pedro Berthelot's chart of 1635 and the anonymous chart of 1650. In conclusion, comparing the anonymous chart of 1650 to the first surviving Portuguese chart, the Cantino map of 1502, we can visualize the changing image of the Far East in the eyes of the Portuguese over a period of 150 years. The charts used for illustration in this essay show the evolution of events and the progress of geographical knowledge in the Portuguese world from the sixteenth century to the mid-seventeenth century. The charts drawn in the mid-sixteenth century like the two anonymous charts of 1535 and 1540 are still elementary in the delineation of the outline of the Far East. The configuration of this area was gradually improved in the intermediate stage, especially in terms of the shape of China, while the appearance of Japan is the most remarkable feature in this stage. Although the charts made in the mature stage lack the illumination and decoration of those in the intermediate stage, they are more advanced from a cartographic point of view. For instance, the charts of 1635 and 1650 began to have a modern likeness, as in the delineation of the Philippine Archipelago, the Malay Peninsula and the island of Sumatra. After the mid-seventeenth century, few real cartographic advances were made and the Netherlands usurped both Portugal's Malaysian spice trading

network and its place as the leading nation in the development of the art of map-making.

CHAPTER V

Summary

Before 1500 very little was known in Europe about the Far East. At that time the cartographic representation of this area on the map was still based on the ancient concept of Ptolemy. With the passage of another century, the appearance of the world maps was rapidly changed by the portolan charts of the Far East drawn in the days of the great discoveries. The contributions of the Reinels, the Homems, Vaz Dourado, Lasso and Albernaz, as well as many anonymous cartographers gradually eliminated the conventional Ptolemaic picture of Asia and replaced it with charts increasingly based on empirical data. By 1600 the major outline of the Far East assumed the general configuration in Portuguese cartography that it would retain with minor modifications until the eighteenth century. Such additions introduced in the seventeenth century generally filled in the interiors of the great Asian countries, such as China and Japan, about which the cartographers of the sixteenth century had little specific information, as most of their knowledge was related to familiar ports and coastal towns. This led to the exaggerated depiction of the size of the coastal areas which they were familiar with. The unfamiliar coastal areas, such as the southern coasts of Sumatra and Java and the eastern coast of Borneo were drawn arbitrarily without a basis in observation. Nevertheless, Portuguese Far Eastern expedition made a varity of important geographic discoveries resulting in cartographic

development. In the regard, European maps of the Far East were greatly influence by Portuguese map-making.

In summary, illustrations for several sections of the Far East at more or less comparable scales are given in this essay to provide a better view of the evolution of the shape of the Far East from 1500-1650. All the illustrations are drawn at a scale of 1:39,600,000 (approximately 1 inch to 600 miles.) The regions included in this study are: Japan, China, the Malay Peninsula and Sumatra, the Philippines, Borneo, Celebes, the Moluccas and the Sunda Islands. Of these regions, Japan is the most interesting, because its shape on the portolan charts changed drastically in a period of 150 years.

Japan (Fig. 22)

Most charts which showed Japan during the second half of the sixteenth century were rather elementary in outline. However, progress in its depiction was quite rapid as compare to the configuration of other regions. Japan is first represented as a double string of small islands on an anonymous chart of 1550. Slightly later, on Diogo Homem's chart of 1558, it was represented as an insular group like a prolongation of the Korean Peninsula. The 1561 chart of Bartolomeu Velho gave a better representation of the whole archipelago with Yezo in the north. Although Velho disposed Japan vertically, he represented it in a more advanced stage. A quite distinct depiction of Japan, which is characterized by the peculiar crescent shape of the archipelago, appeared on the charts of Larazo Luis (1563) and Fernão Vaz Dourado (1575). In fact, this configuration only corresponds to the southern half of the archipelago, showing Kyushu, Shikoku and half of Honshu. Through successive improvement, the cartographic representation of Japan reached its climax in the

1649 chart of João Teixeira Albernaz I. In this chart Japan and particularly the upper half of Honshu, gained a more correct shape. This configuration of the main group of islands was maintained until the nineteenth century.

China (Fig. 23)

Progress in mapping of the China coast, like its penetration, was slow. China's eastern coastline was first depicted as straight line, as seen on Jorge Reinel's chart of 1517. The early Portuguese portolan charts show only Chinese trading ports and neighboring areas. This suggests that the interest in China at that time was primarily commercial. The 1527 chart of Diogo Ribeiro shows Canton (Kwangtung Province) and its delta as too large and too far inland. After the trading posts of Changchow (Fukien Province) and Ningpo (Chekiang Province) were opened to the Portuguese, more coastal area was depicted. On the 1535 anonymous chart, the Chinese coastline extends northward from the Kwangtung Province to the Fukien Province, and even farther north to the mouth of the Yangtze River on another anonymous chart of 1550. A more detailed depiction of coastal China begins to appear on the 1558 portolan chart of Diogo Homem. Although the Shangtung Peninsula is incorrectly oriented, the Liaotung Peninsula is misshapen and the Kiangsu and Chekiang Provinces bulge outward, the essential outline of China is shown together with the islands of Hainan and Formosa. Nevertheless, the cartographic image of China in the sixteenth century is blurred, distorted and misshapen; a clearer and more precise form began to emerge only by 1600. The general configuration of the eastern outline of China on Antonio Sanches' chart of 1623 is fairly close to its actual form, and a more accurate depiction of coastal China began to appear on the 1649 chart of João Teixeira Albernaz I.

The Malay Peninsula and Sumatra (Fig. 24)

Before the Portuguese arrived at Malacca, the delineation of the Malay Peninsula was drawn on the basis of hearsay only. The southern part of the peninsula on the Cantino map of 1502 stretched southward far beyond the equator forming an oversized land mass. The position of Sumatra is also inaccurately oriented. This fanciful configuration of the Malay Peninsula began to disappear with the advance of geographic knowledge. The extension of the Peninsula was greatly reduced on Jorge Reinel's chart of 1517. On Reinel's map the Peninsula not only terminates north of the equator, but also begins to show its true shape. Sumatra is also correctly oriented though its size is too small. At about the same time, Diogo Ribeiro gave a more realistic representation of the Malay Peninsula in his 1527 chart. On his map, although the northwestern outline of Sumatra is incomplete, its size is shown in true relation to the Malay Peninsula. Diogo Homem's chart of 1558 provides nearly modern outlines of the Malay Peninsula and Sumatra, but their coastlines are exaggerated in a tortuous form. The configuration of the Malay Peninsula and Sumatra did not change much until the seventeenth century. Pedro Berthelot's chart of 1635 shows a great improvement, as he gave excellent shapes to the Malay Peninsula and Sumatra with outlines and features very much like their actual configuration.

The Philippines (Fig. 25)

The Philippines first appear on Diogo Ribeiro's 1527 chart. The map covers such islands as southern Samar, Bolhol and Cebu, the south-eastern coast of Palawan, Mindanao and neighboring small island. The anonymous chart of about 1535 gives the depiction of the whole archipelago in a peculiar shape based on hypothesis rather than actual

survey, as Mindanao is shown in a 'flat' shape and Luzon is delineated as a circular cluster of small islands. The configuration of the Philippines is gradually improved on subsequent representations. An anonymous chart of 1540 shows Mindanao as hook-shaped and depicts four islands of Negros, Cebu, Bohol and Leyte to the north of Mindanao. To the west of these islands lies Palawan. On Larazo Luis' chart of 1563, a new and peculiar depiction of the Philippines is found. It is featured as a long and thin island, lying southwest to northwest, and lacking the outline of its northeastern shore. The southern end of this strange island corresponds apparently to Palawan, and its northern part, according to legend, represents Luzon. The same configuration of the Philippines can also be found in Fernão Vaz Dourado's chart of 1575. The complete delination of the Luzon Island first appeared in the 1590 map of Bartolomeu Lasso, which gives a realistic representation of the Archipelago. The anonymous chart of 1650 provides an even better shape which is closer to the actual configuration of the Philippines.

Borneo (Fig. 26)

After Antonio de Abreu's expedition, Borneo began to appear on Portuguese portolan charts. Francisco Rodrigues' sketch of 1514 shows it as a parallelogram; its broad north side could be the distorted north-west side. The anonymous chart of 1540 shows an incomplete Borneo with its north-western shoreline and an exaggerated Brunei Bay. However, it gives a more realistic representation of the island. More coastline area of Borneo appears on another anonymous chart of 1550; its southern outline is sketchy, showing a large estuary, while the eastern half of the island looks as if it were shorn off. A better outline of the southern coastal area of Borneo is found on Diogo Homem's

chart of 1558, as the estuary is no longer exaggerated. On Bartolomeu Lasso's chart of 1590, a complete outline of the island is first shown, but its eastern coastline is arbitrarily drawn as a straight line joining the two ends. After the production of Pedro Berthelot's map of 1635, Portugal had a fairly accurate and complete cartographic representation of Borneo. Berthelot drew the shape of the island with impressive accuracy, showing the north-eastern section in its proper position. By 1650, though the delineation of Borneo had been improved, its shape was still quite far from its actual configuration.

Celebes (Fig. 27)

The first Portuguese image of Celebes is provided by Francisco Rodrigues' chart of 1514. It is shown as a long and thin island lying in a north-east by south-west direction. As its location is close to the Moluccas, this island might be the representation of the northermost peninsula of Celebes. Since 1514, Celebes had been missing on all charts until 1540. On an anonymous chart of 1540, the appearance of Celebes is completely different from that on Rodrigues' chart. Here, only the western outline of the island is shown. On later charts like that of Diogo Homem drawn in 1558, the shape of Celebes had not been changed much, only more of its north-eastern coastline was depicted. After that, no improvement had been made in the delineation of this island until the end of the sixteenth century. On the 1590 chart of Bartolomeu Lasso, the outline of Celebes is completed, but it looks like a 'sea horse'. Apparently its 'tail' corresponds to the western peninsula of the island. However, the 'sea horse' shape of Celebes disappears on Pedro Berthelot' chart of 1635. On this map, Celebes is shown as two southern peninsulas and a northern peninsula. Although the northernmost peninsula, which looks like a

'tail' is missing, the cartographic image of the southern part of the island gives a modern likeness compared to the fanciful shape of the previous charts.

The Moluccas (Fig. 28)

Over a period of 150 years, only very small variations were made in the presentation of the shape of the Moluccas on Portuguese portolan charts. The Moluccas were first depicted on Francis Rodrigues' chart of 1514; however, their delineation is inaccurate and vague. The 1527 chart of Diogo Ribeiro shows only the islands of Ceram, Amboina, Buru and some islands located north of them. Here the shape of Ceram is inaccurately depicted; it runs vertically instead of horizontally. On an anonymous chart of 1535, Gilolo (Halmahera) begins to appear clearly. However its shape is inaccurately drawn; it looks more or less like a 'cross' with a long vertical side. The 1540 anonymous chart gives a better delineation of the Moluccas Islands in regard to the depiction of Ceram and Buru. An even more realistic configuration of the Moluccas is found on Bartolomeu Lasso's 1590 chart. On Lasso's chart, Gilolo is shown in its essential outline and Ceram has a fairly accurate shape. On Pedro Berthelot's chart of 1635, not only the main islands of Gilolo, Ceram and Buru are depicted, but Morotai(at the north of Gilolo) and Batjan (at the southwest of Gilolo) are also shown. Although by the middle of the seventeenth century, the shape of the Moluccas is still not like the one found on modern maps, it has a better delineation when compared to the vague depiction of previous charts.

The Sunda Islands (Fig. 29)

There were not many variations in the presentation of the shape of the Sunda Islands in a period of one and a half centuries. On Jorge Reinel's chart of 1517, Java,

Bali, Sumba and Flores are shaped like squares and rectangles. They are both inaccurately shaped and incorrectly located. On Diogo Ribeiro's chart of 1527, only the northern outline of Java is shown. The shape of Sumbawa is more or less close to reality, but its size is exaggerated. Besides, the orientation of Sumba is incorrect; it runs north-east south-west instead of north-west south-east. More area of the Sunda Islands appears on an anonymous chart of 1540. In addition to the incomplete Java, Bali, Flores, Sumba, Timor, Lomolen and Alor are also depicted on the chart. Among the above mentioned islands, only Flores is accurate in its horizontal shape. Others are incorrect in their configurations and sizes: Sumba is still incorrectly oriented, Timor is small in size, Lomolen and Alor are too large. On Bartolomeu Lasso's chart of 1590, a complete outline of the Sunda Islands is found, although the sizes of the islands are unrealistic and their southern coastlines are depicted arbitrarily. Java, the biggest island, is drawn too wide in its north-south direction. As a whole, the chart gives a 'flat' shape to all the islands. An impressive outline of the Sunda Islands is found on Pedro Berthelot's chart of 1635. Here, Java is given a correct shape. Its accurate configuration and the presence of the Madura Island show a great improvement in the delineation of the shape of the entire island chain.

In conclusion, the geographic knowledge gained during various Portuguese expeditions enabled her cartographers to enrich the content of the portolan charts and to lay down positions and outlines of the Far East with greater precision. In turn, the Portuguese portolan charts show the course of the Portuguese Far Eastern expeditions which astonished the world for a brief historical era.

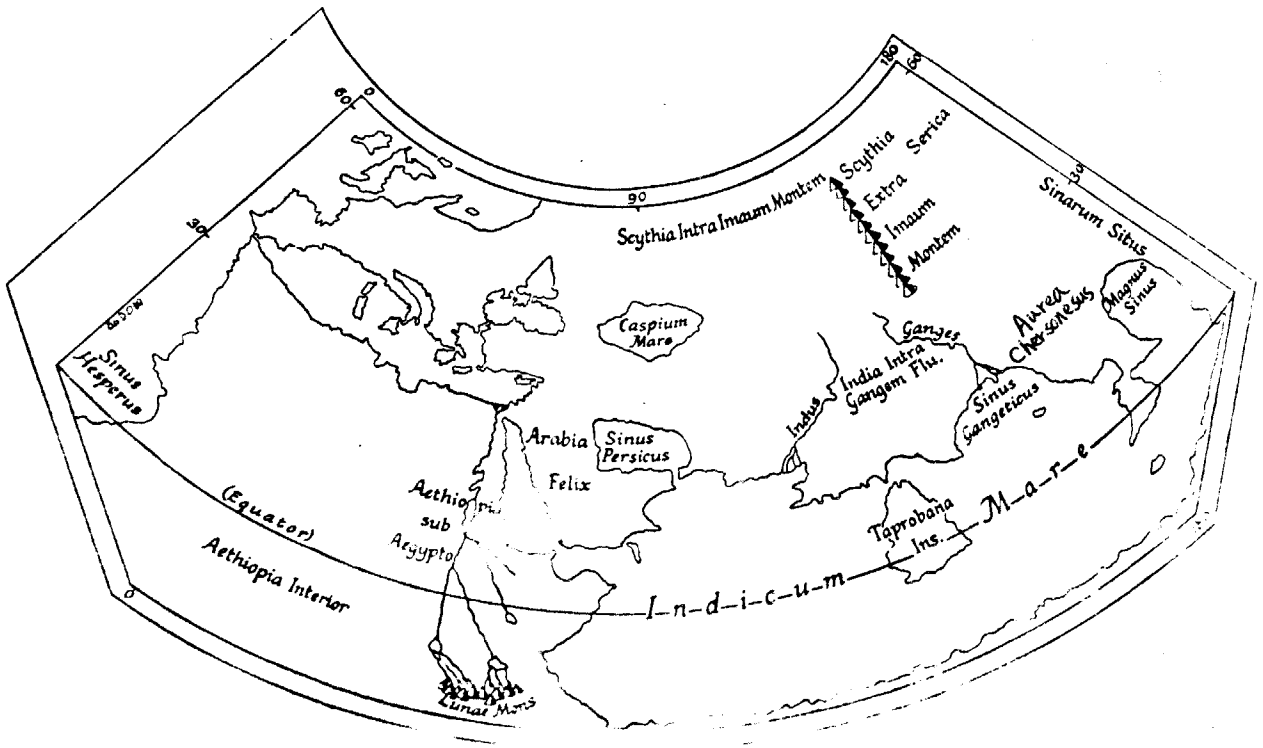


Fig.1 The World According to Ptolemy

(From Sharaf's "A Short History of Geographical Discovery")

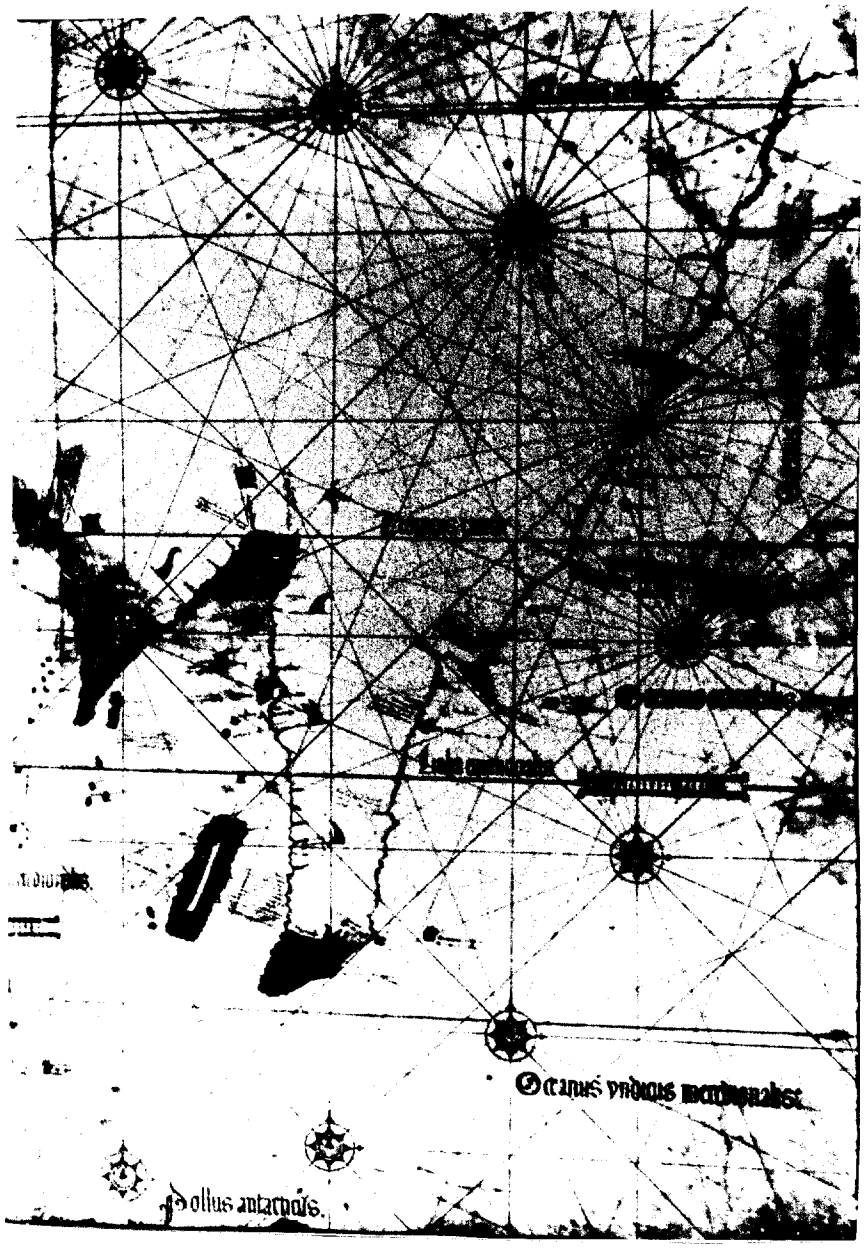
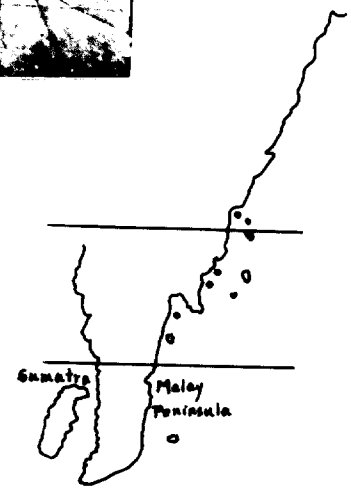
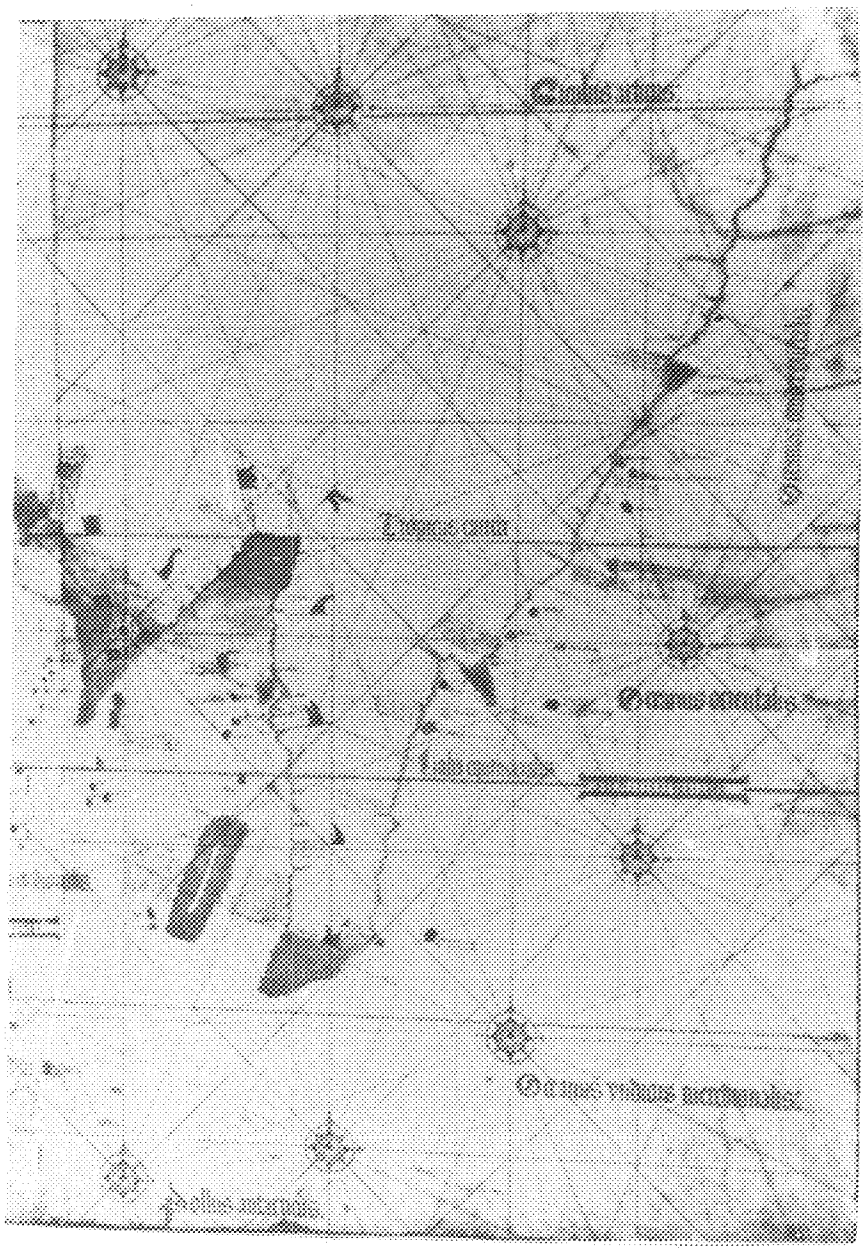


Fig.2 Part of Cantino World Chart of 1502 (From Cortesão's "Portugaliae Monumenta Cartographica")





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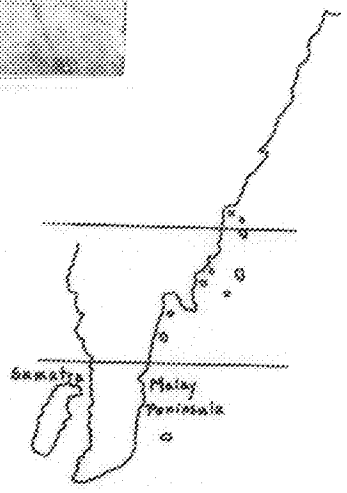


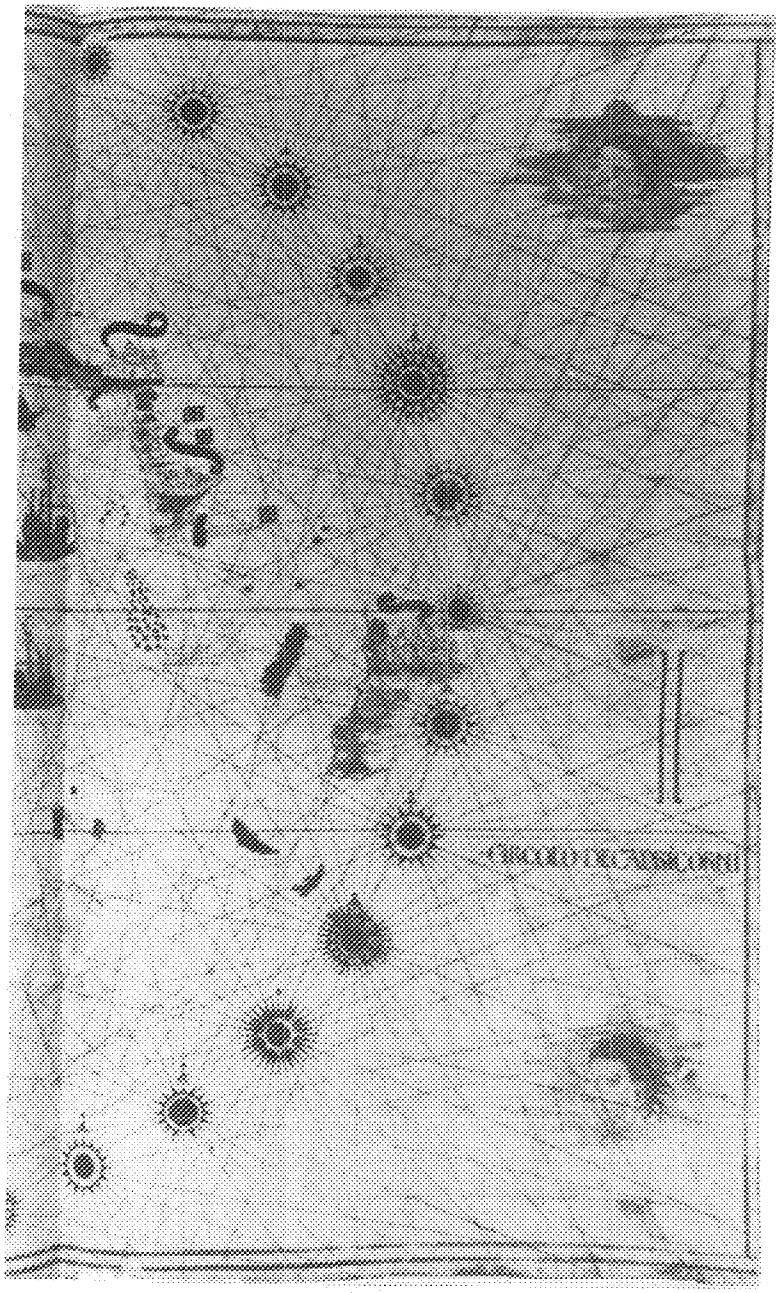


Fig.3 Part of Jorge Reinel's Chart of 1510 (From Cortesão's "Portugaliae Monumenta Cartographica")

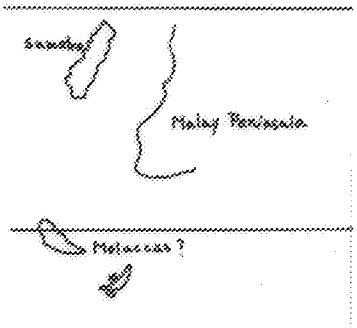
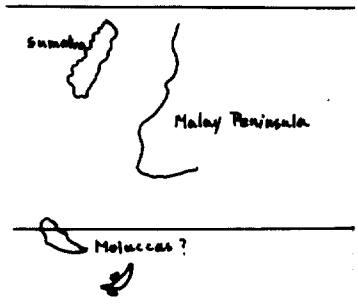


Fig.3 Part of Jorge Reinel's Chart of 1510 (From Cortesão's "Portugaliae Monumenta Cartographica")



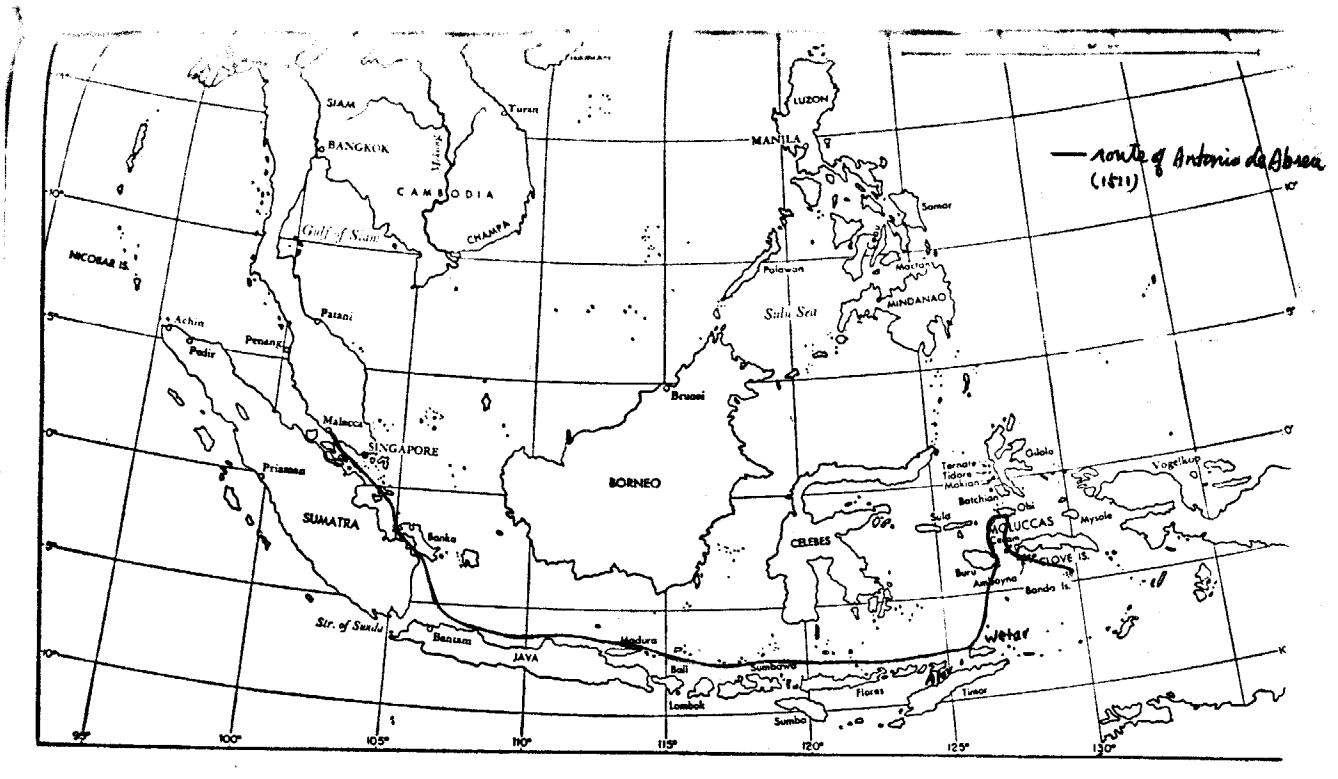
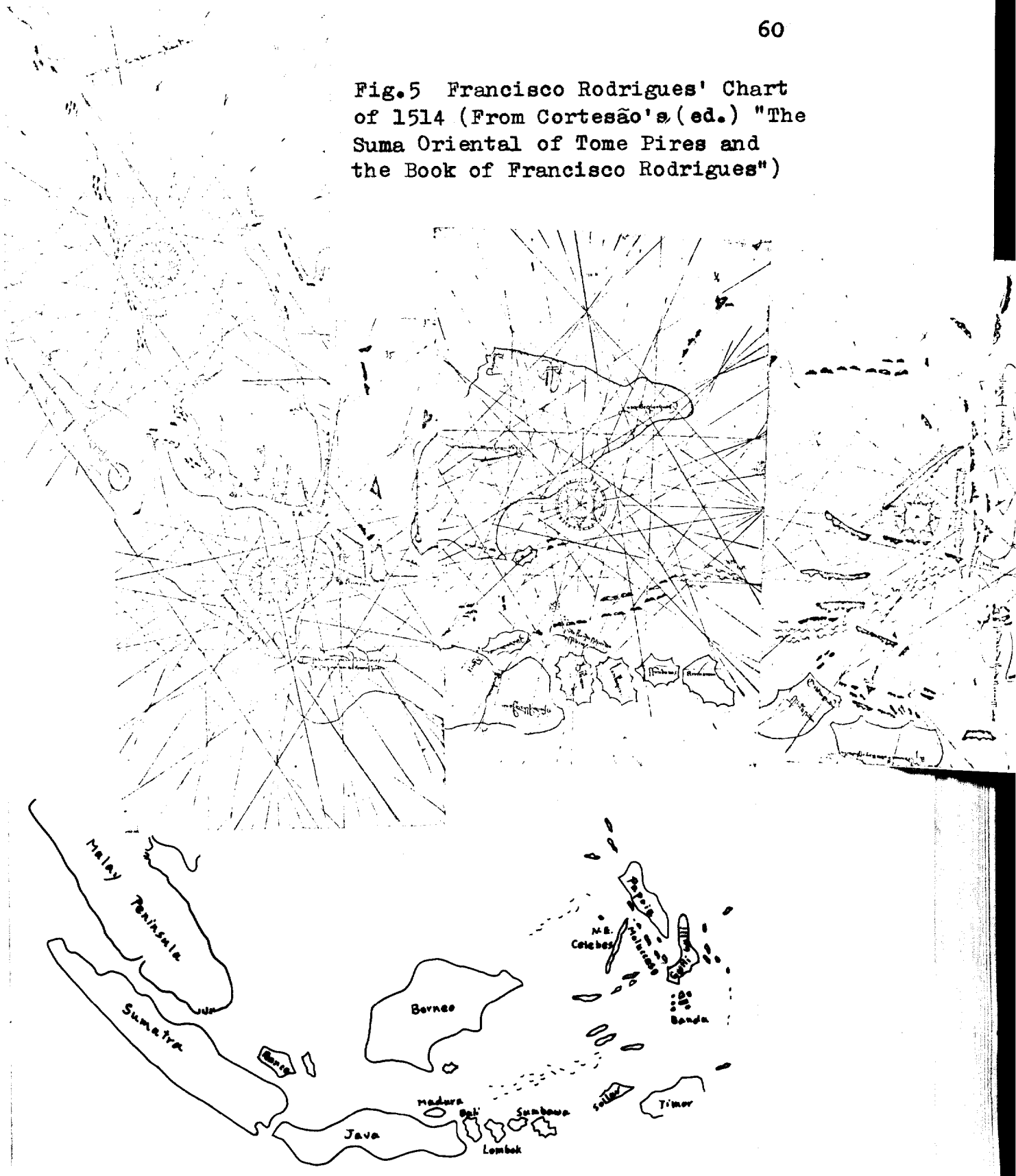


Fig.4 Route of Antonio de Abreu-1511
(From Penrose's "Travel and Discovery in the Renaissance")

Fig.5 Francisco Rodrigues' Chart of 1514 (From Cortesão's (ed.) "The Suma Oriental of Tome Pires and the Book of Francisco Rodrigues")



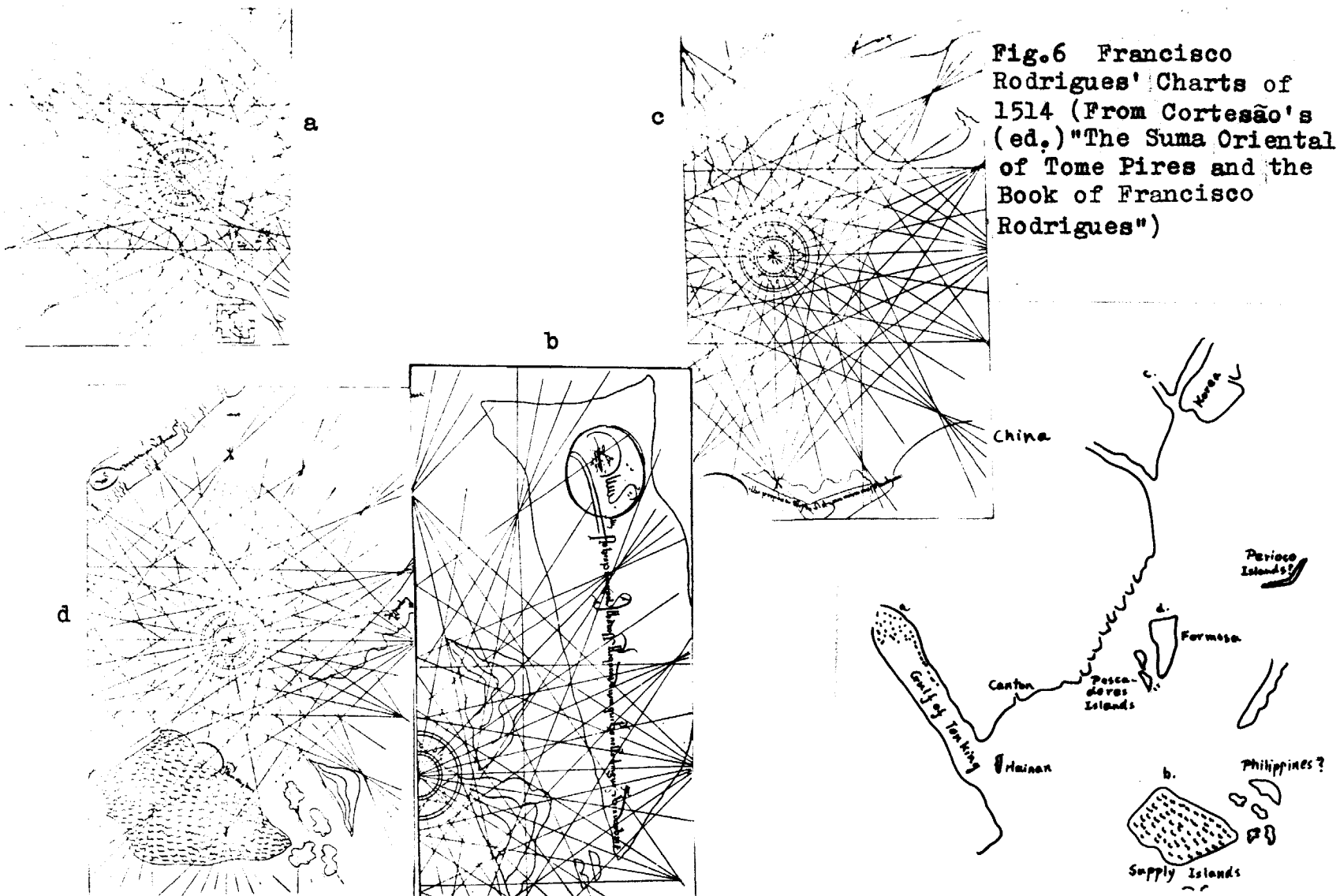


Fig.6 Francisco Rodrigues' Charts of 1514 (From Cortesão's (ed.)"The Suma Oriental of Tome Pires and the Book of Francisco Rodrigues")

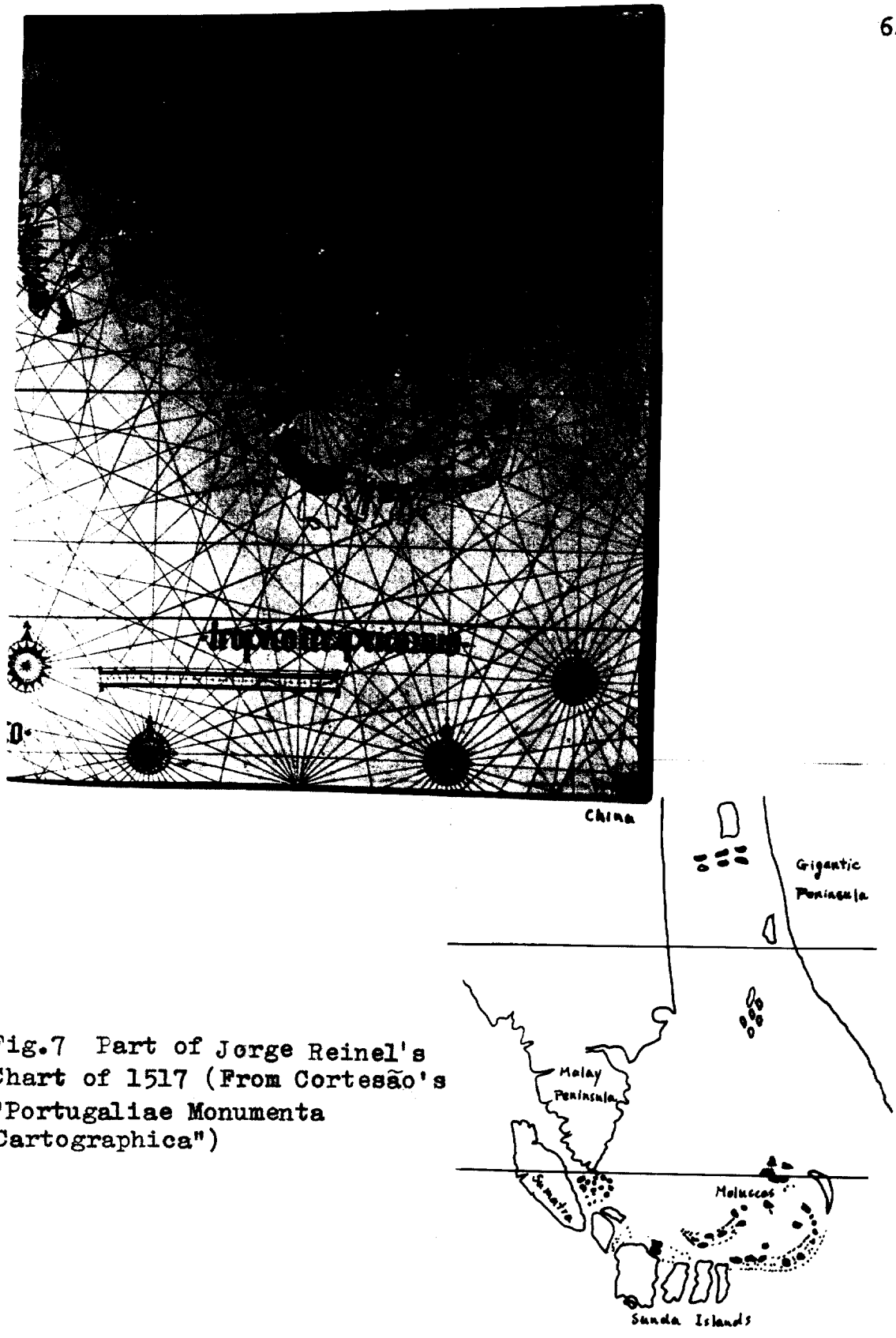


Fig.7 Part of Jorge Reinel's Chart of 1517 (From Cortesão's "Portugaliae Monumenta Cartographica")

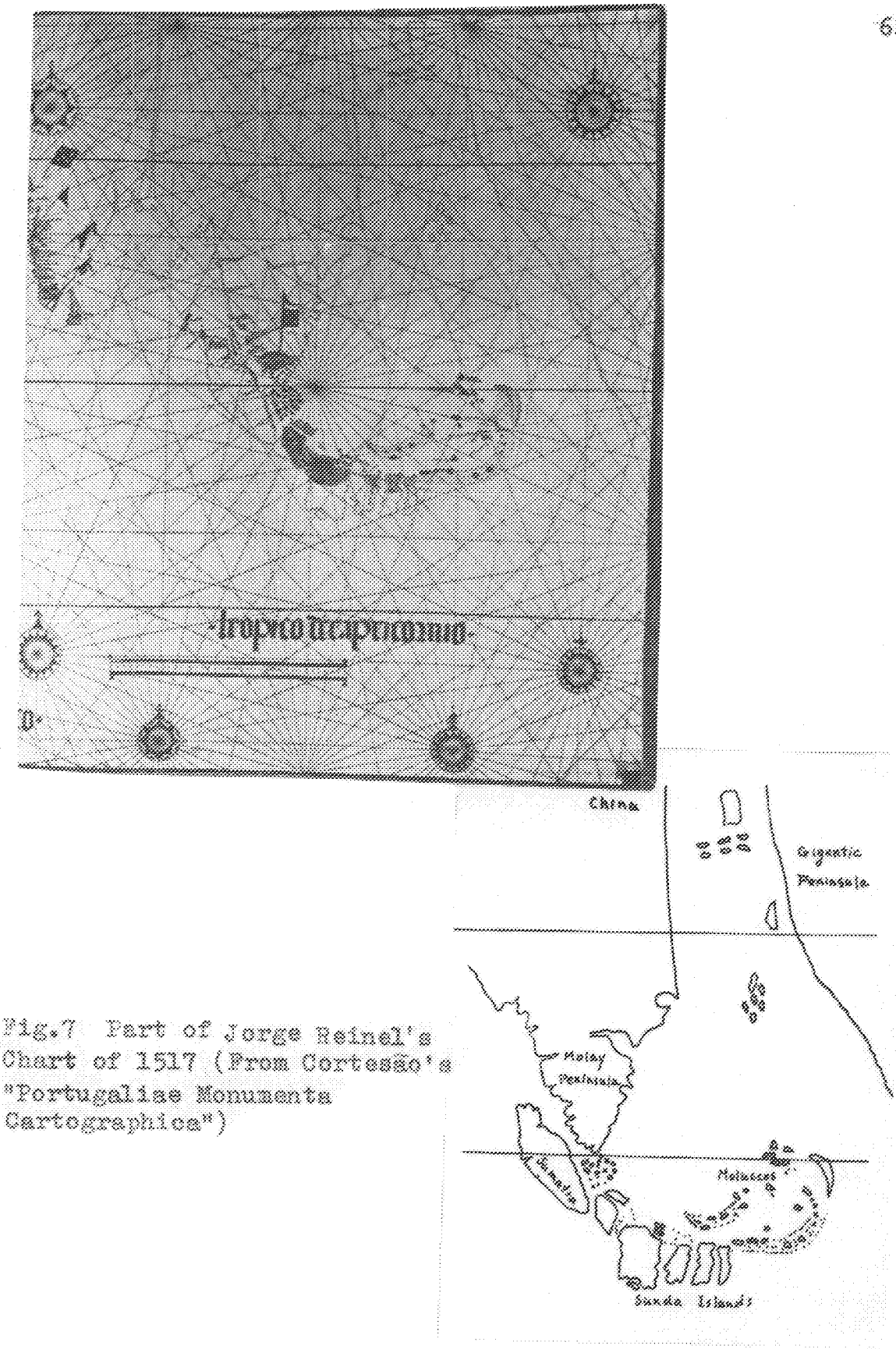


Fig.7 Part of Jorge Reinel's Chart of 1517 (From Cortesão's "Portugaliae Monumenta Cartographica")

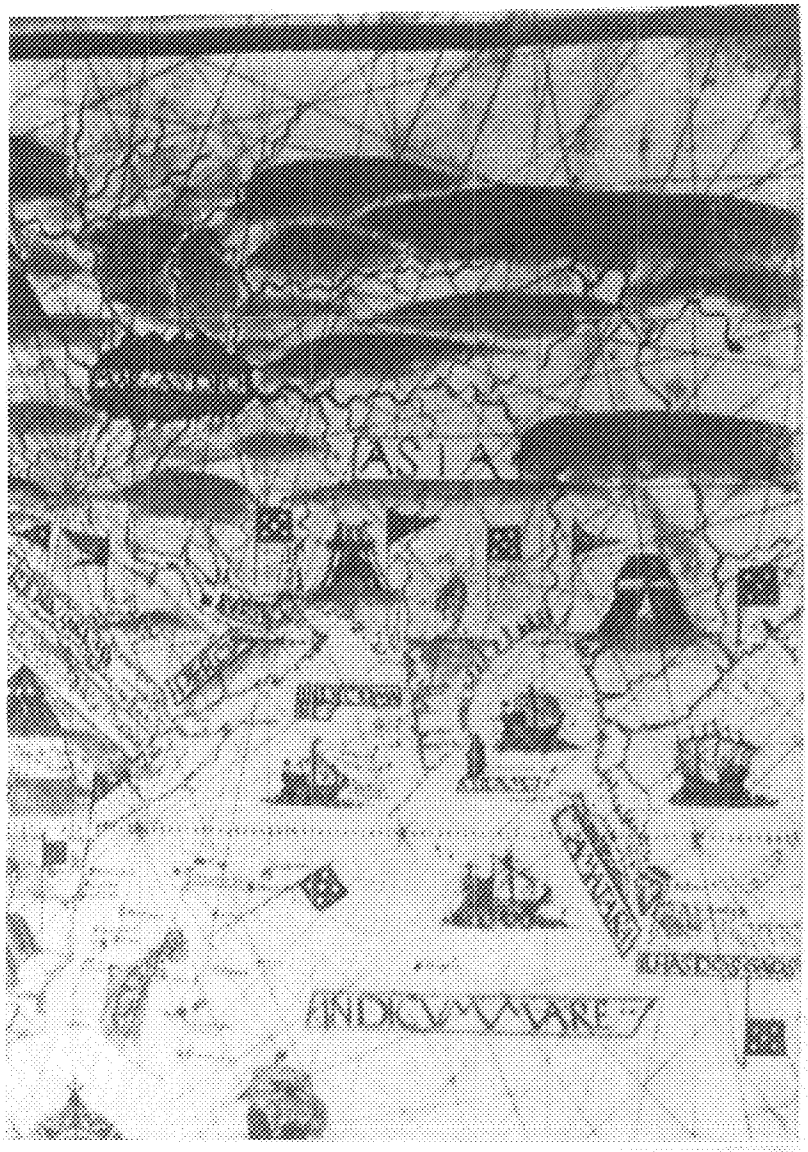


Fig.8 Part of Jorge Reinel's Chart of 1519 (From Cortesão's "Portugaliae Monumenta Cartographica")

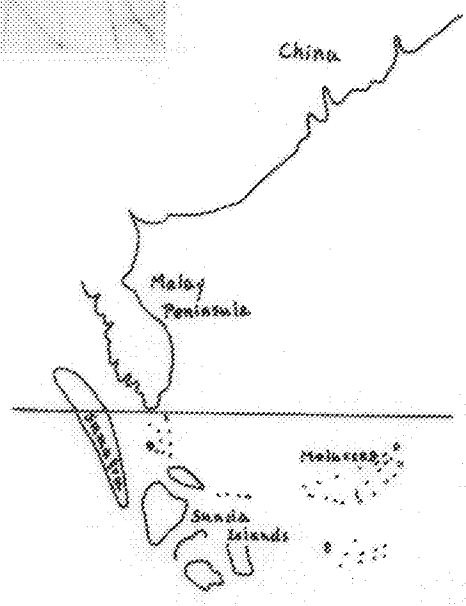
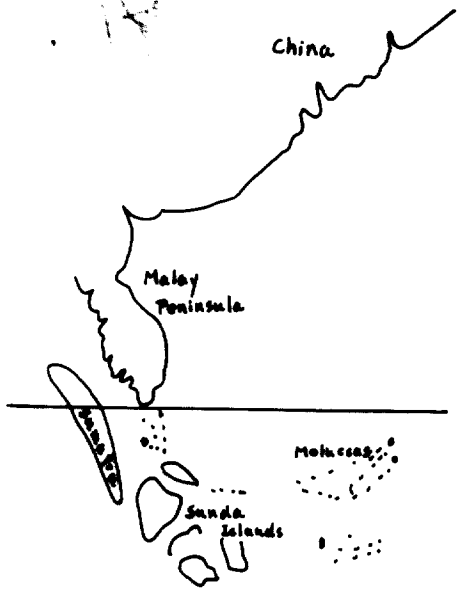
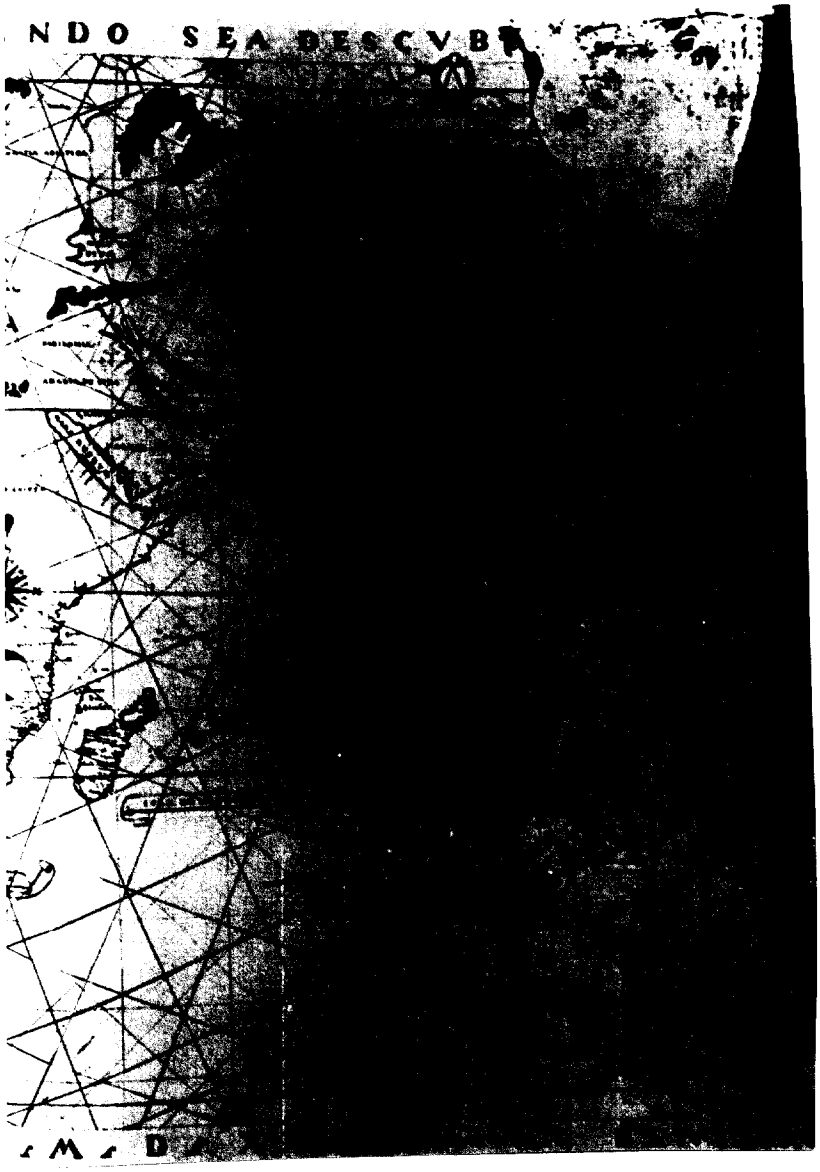


Fig.8 Part of Jorge Reinel's Chart of 1519 (From Cortesão's "Portugaliae Monumenta Cartographica")





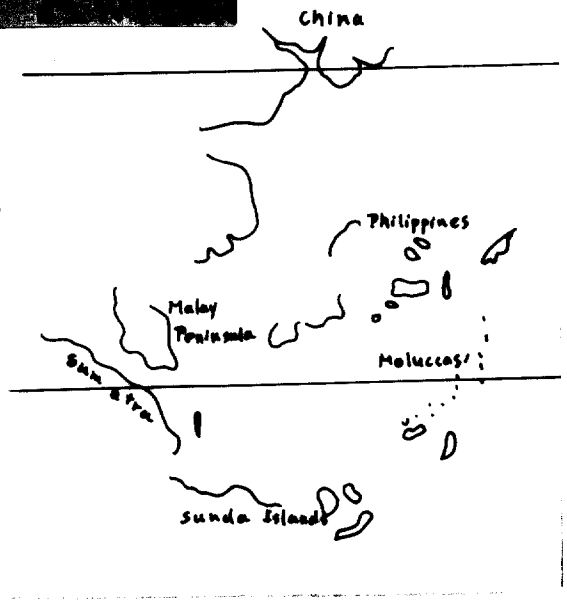
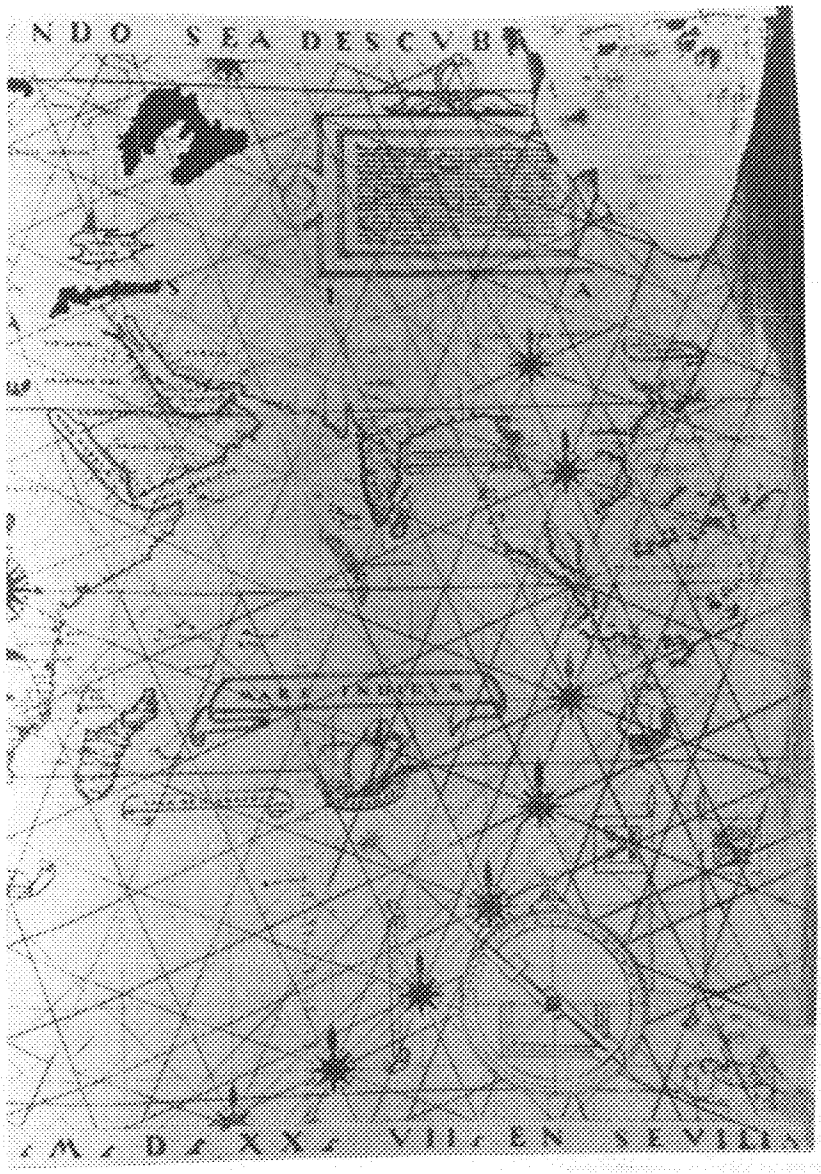


Fig.9 Part of Diogo Ribeiro's Chart of 1527 (From Cortesão's "Portugaliae Monumenta Cartographica")



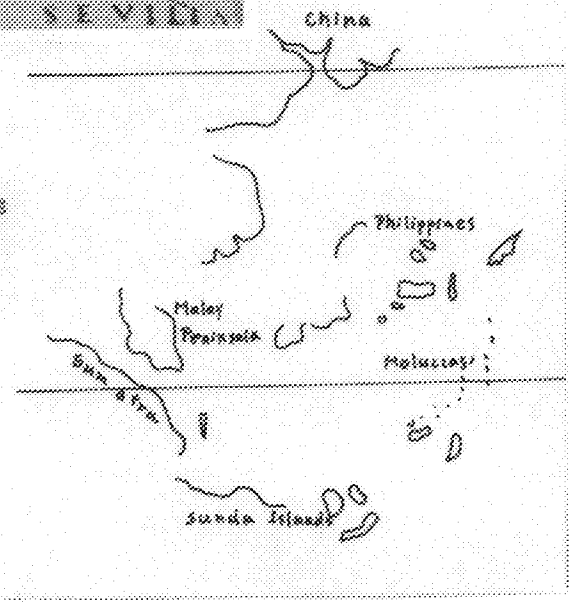
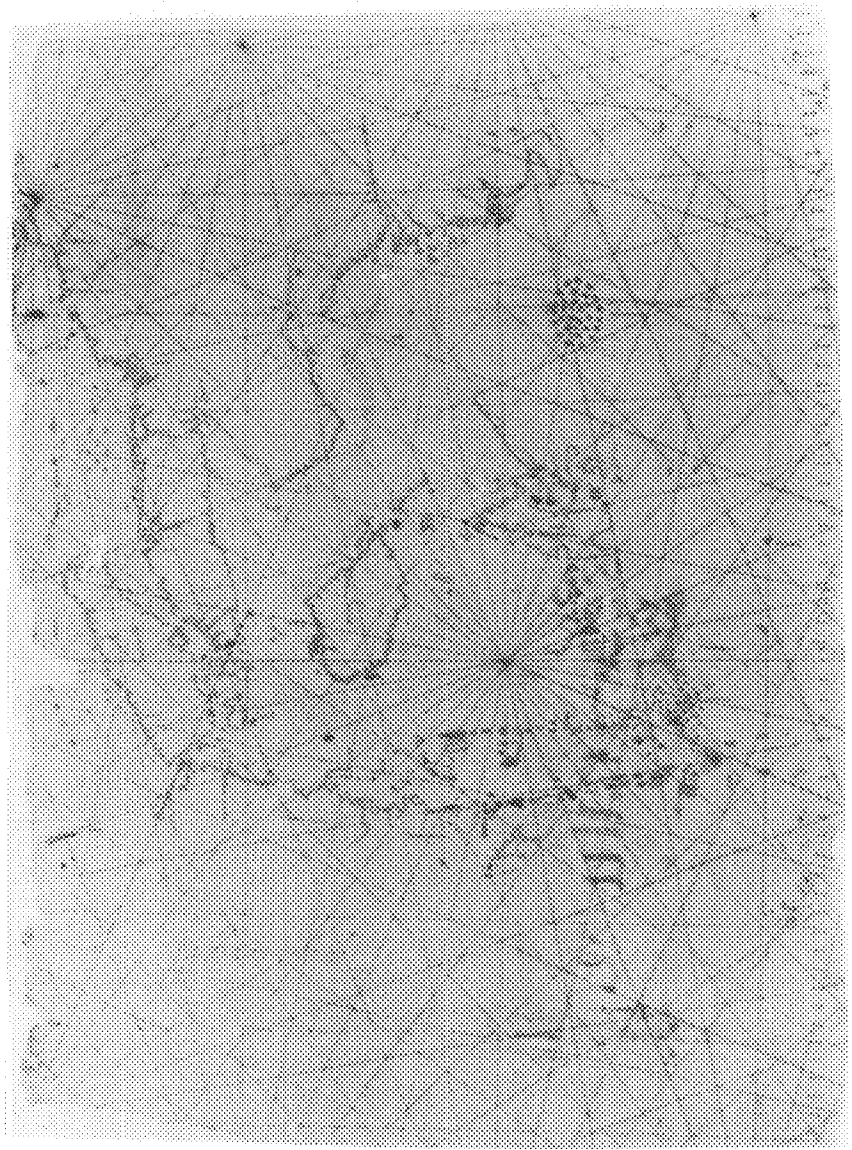


Fig.9 Part of Diogo Ribeiro's Chart of 1527 (From Cortesão's "Portugaliae Monumenta Cartographica")



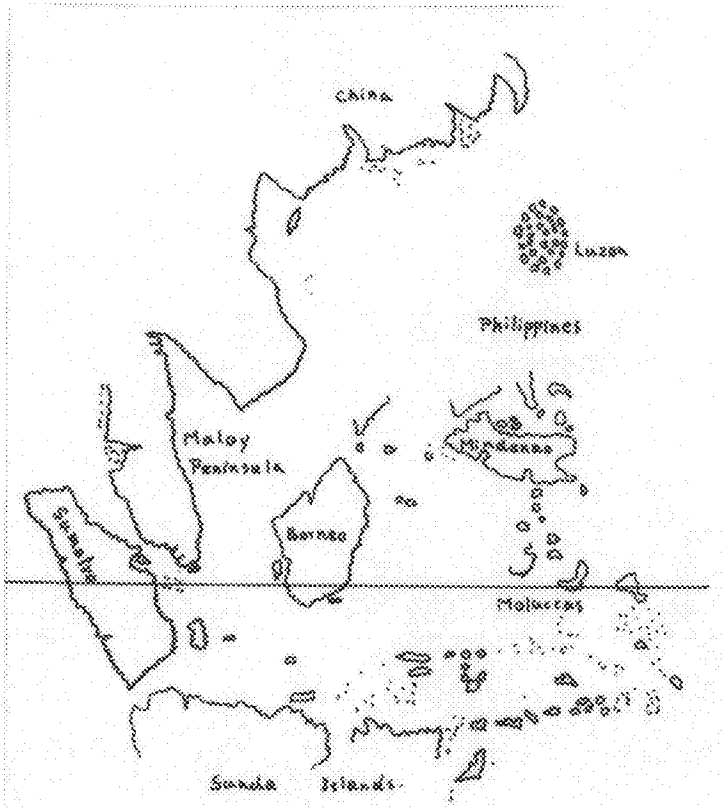
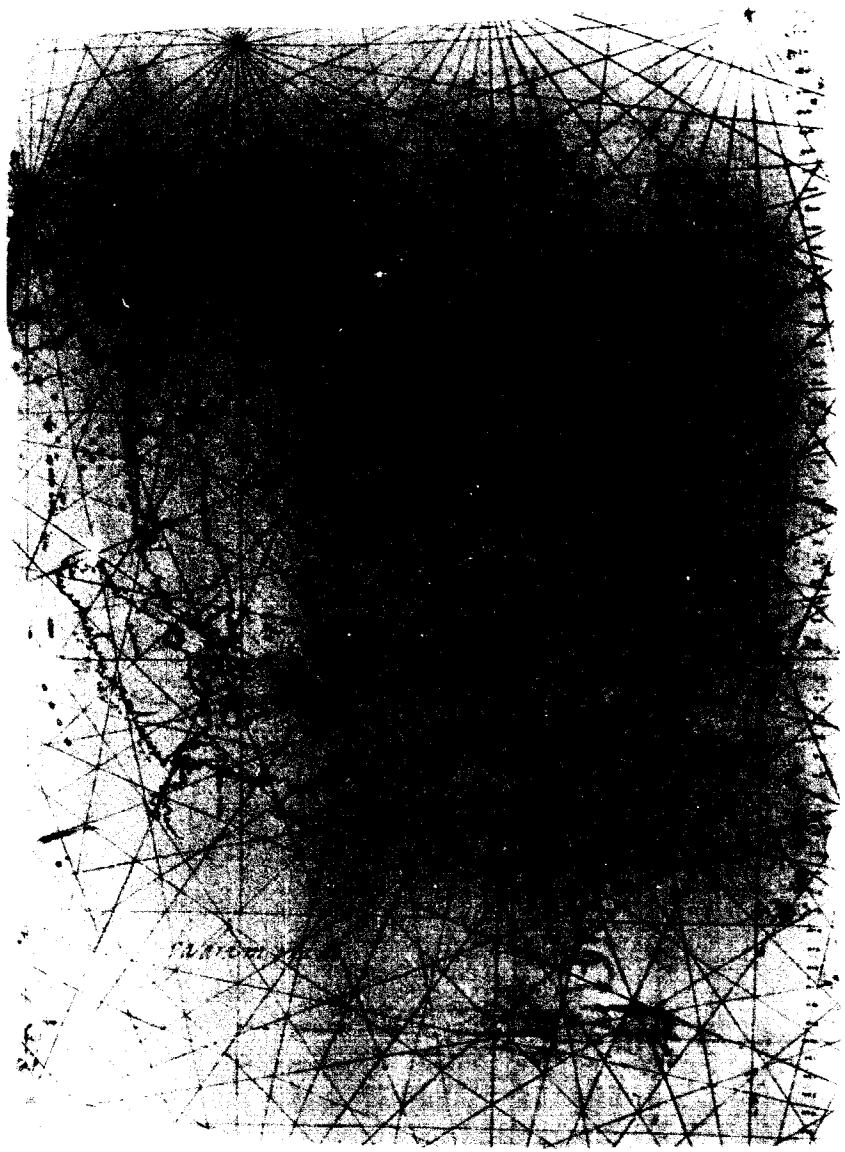


Fig.10 Part of An Anonymous Chart of 1535 (From Cortesão's "Portugaliae Monumenta Cartographica")



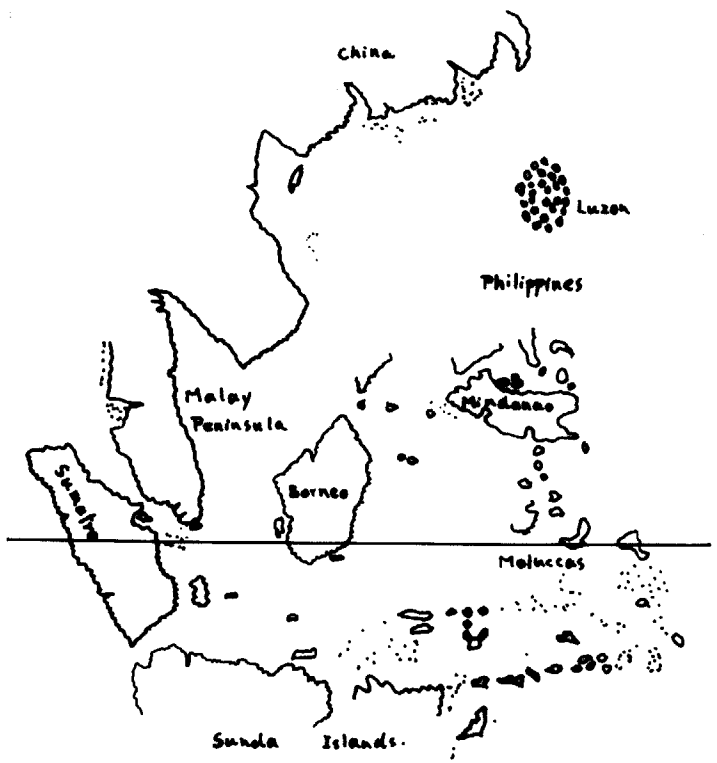


Fig.10 Part of An Anonymous Chart of 1535 (From Cortesão's "Portugaliae Monumenta Cartographica")

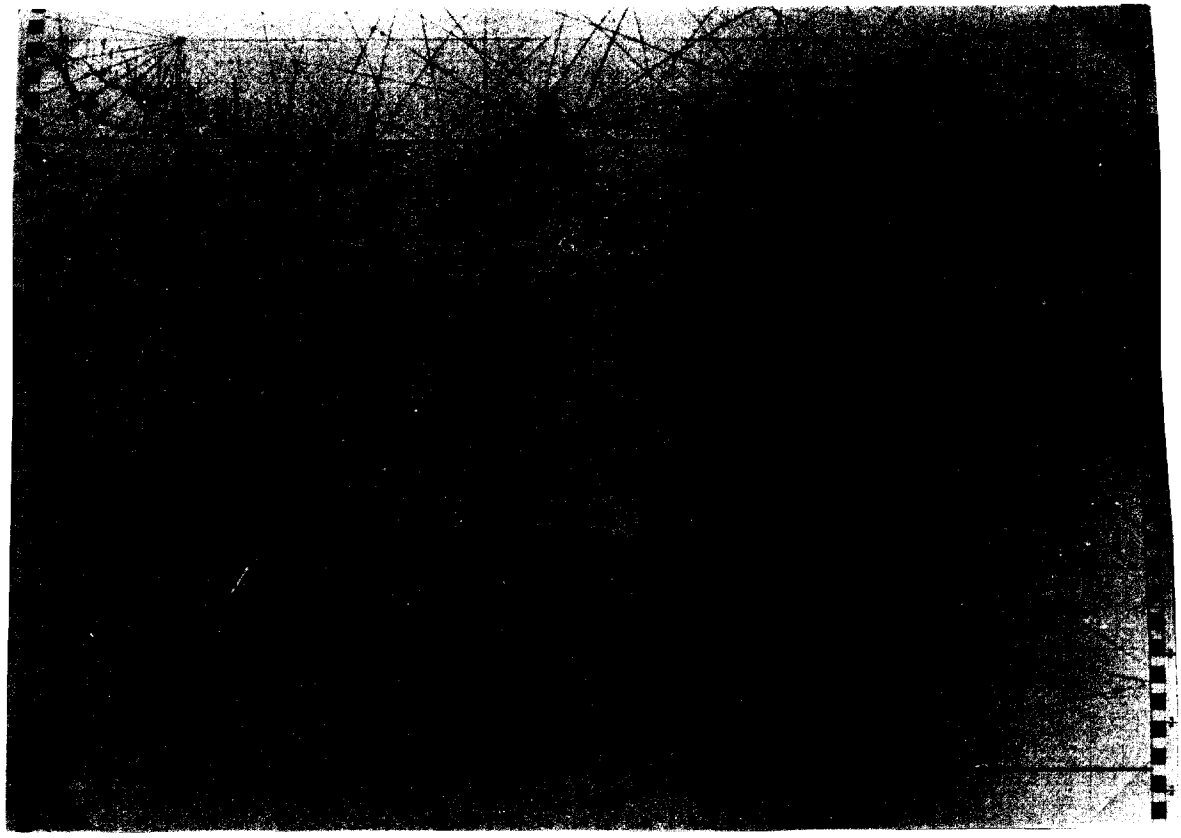


Fig.11 Part of An Anonymous Chart of 1540
(From Cortesão's "Portugaliae Monumenta Cartographica")

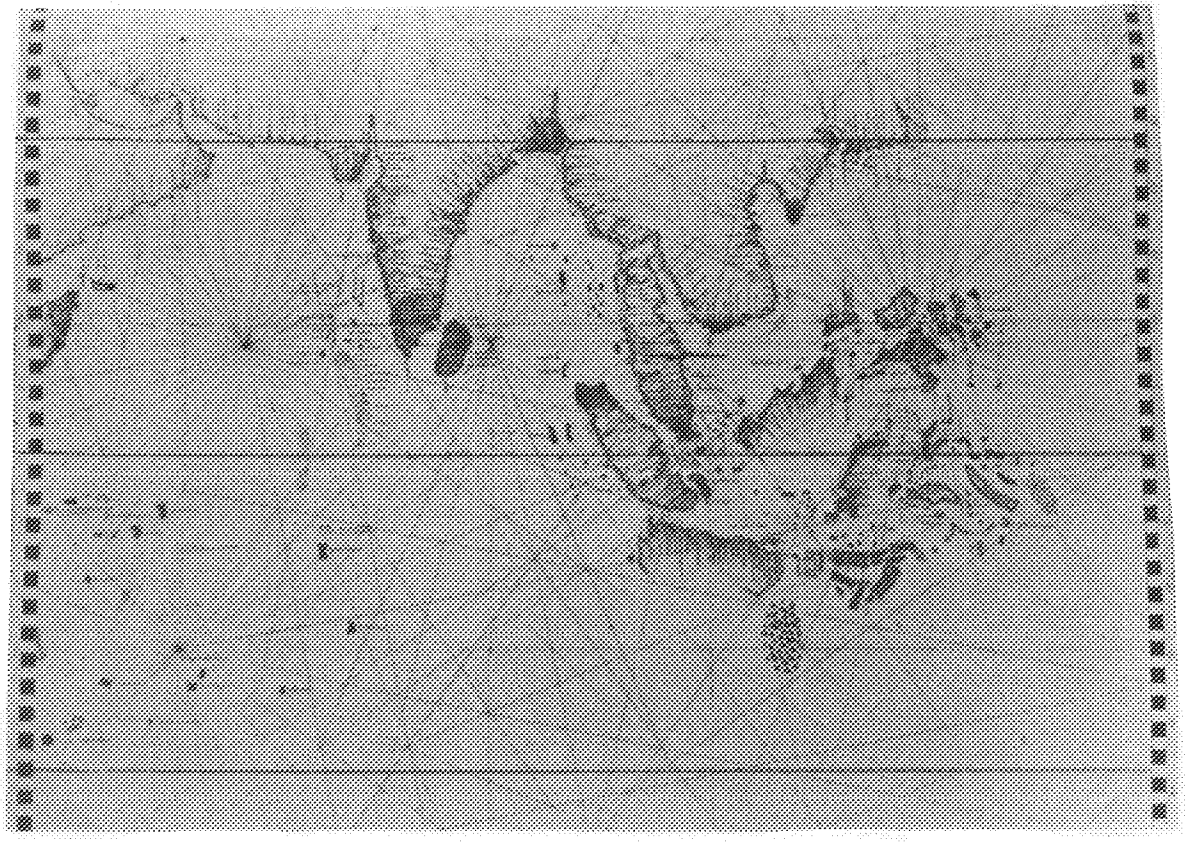
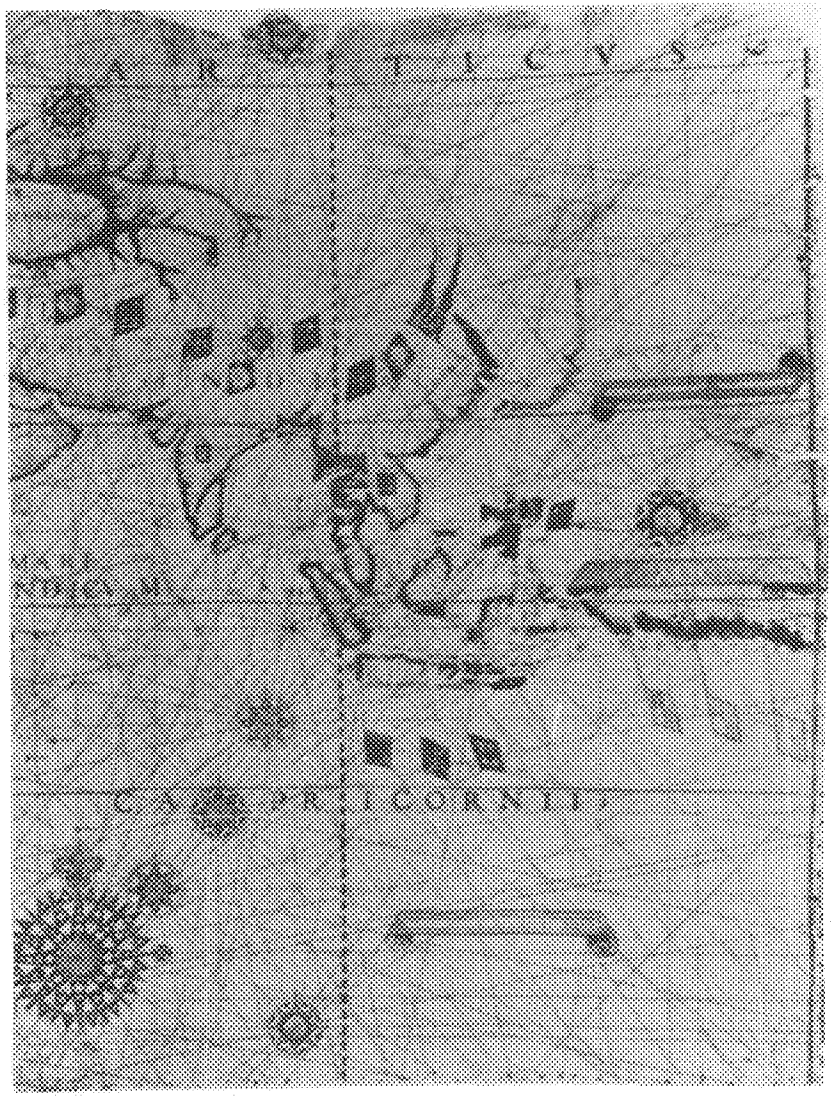


Fig.11 Part of An Anonymous Chart of 1540
(From Cortesão's "Portugaliae Monumenta Cartographica")



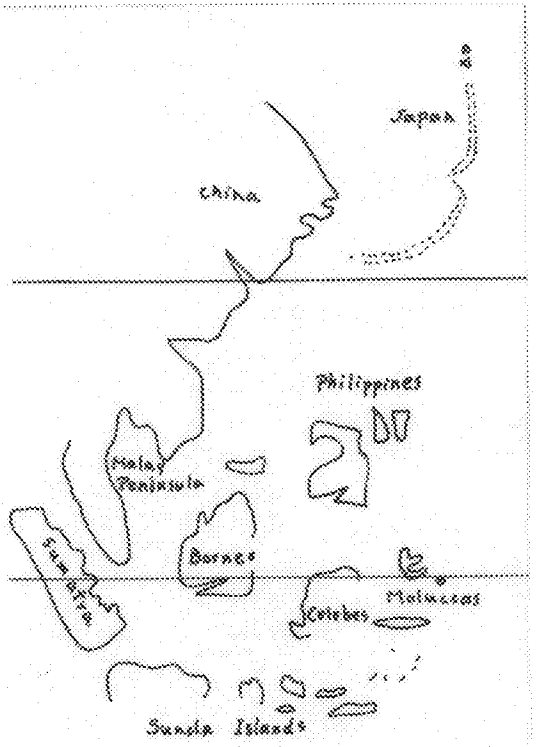


Fig.12 Part of An Anonymous Chart of 1550 (From Cortesão's "Portugaliae Monumenta Cartographica")

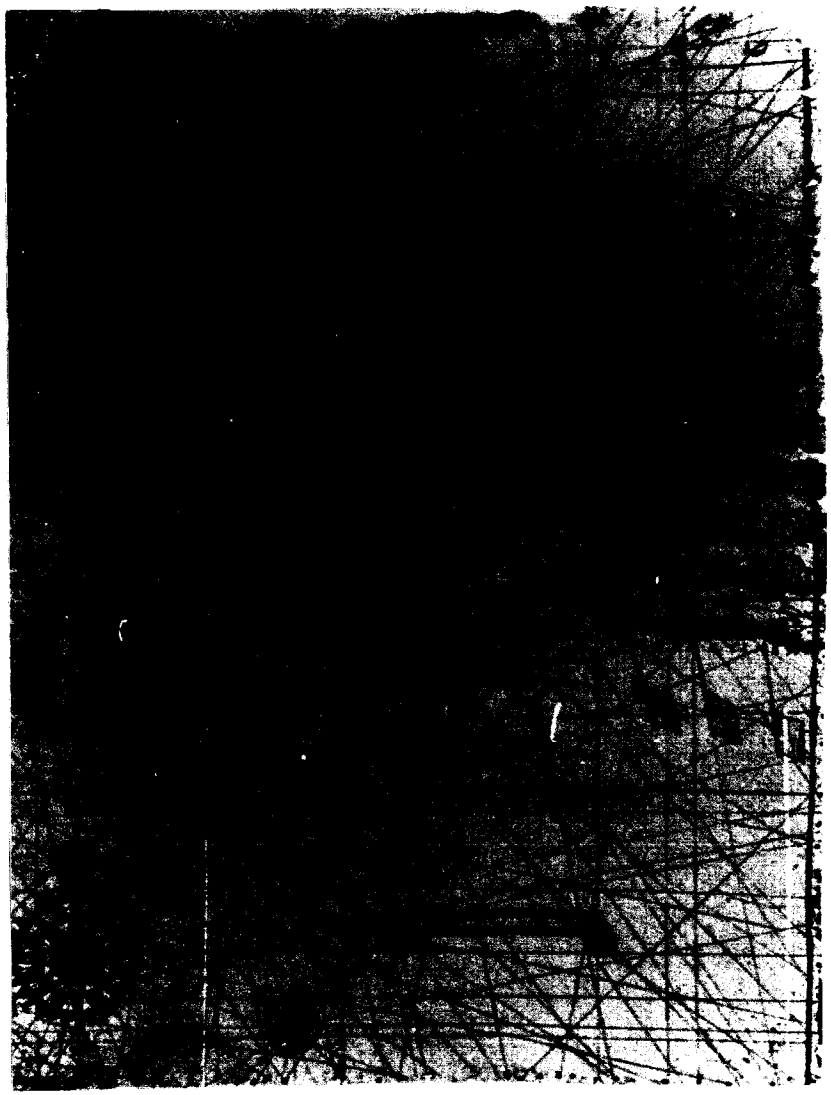
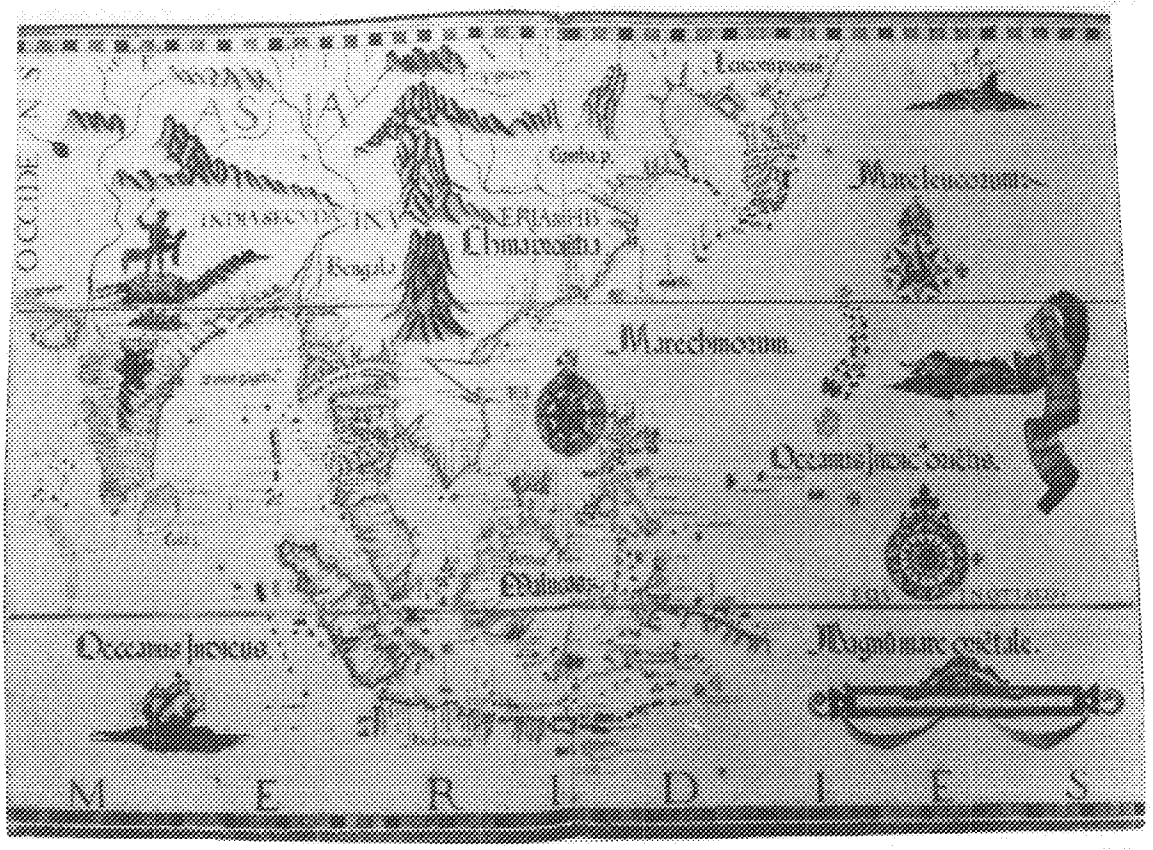


Fig.12 Part of An Anonymous Chart of 1550 (From Cortesão's "Portugaliae Monumenta Cartographica")

Fig.13 Diogo Homen's Chart of 1558 (From Cortesão's "Portugaliae Monumenta Cartographica")



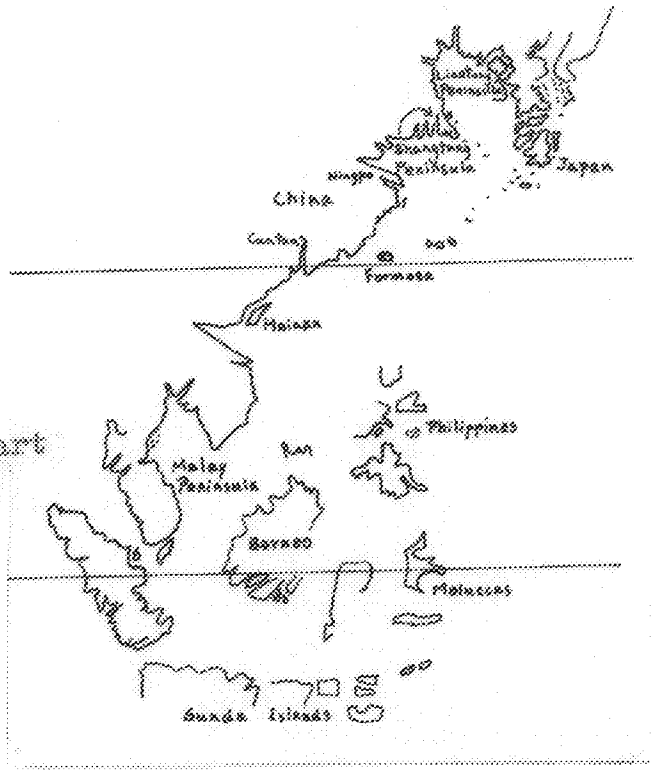
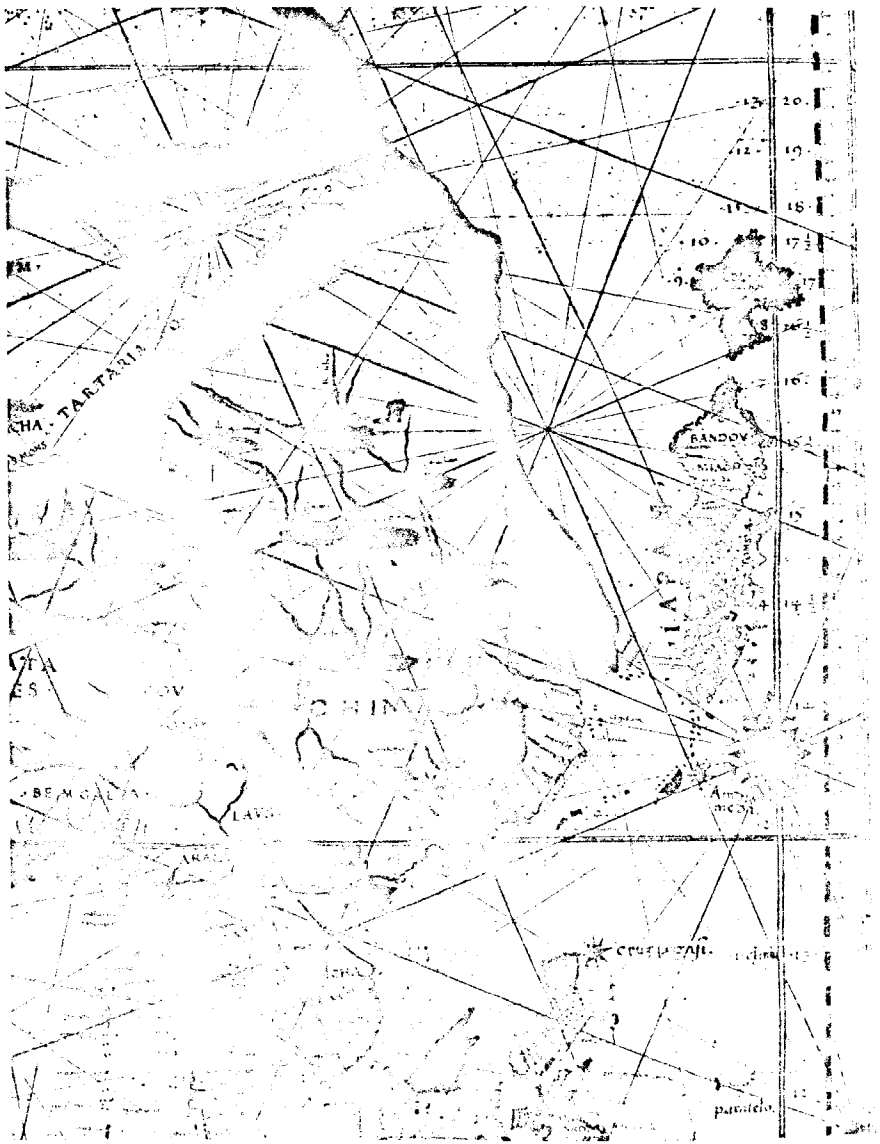


Fig.13 Diogo Homem's Chart of 1558 (From Cortesão's "Portugaliae Monumenta Cartographica")



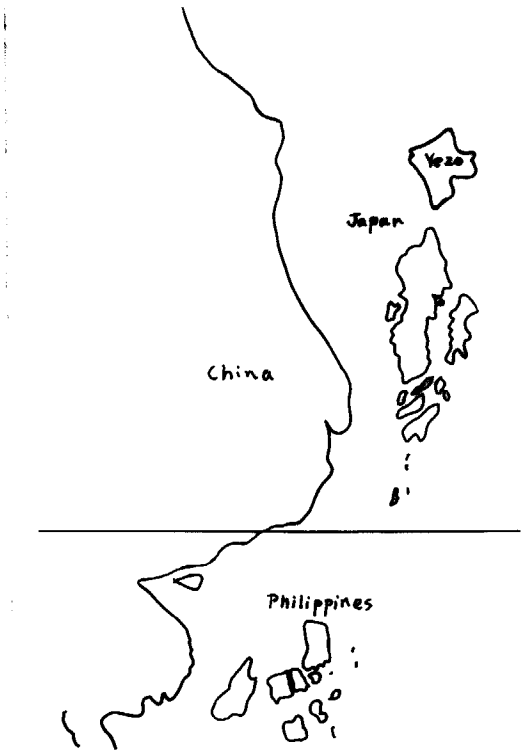
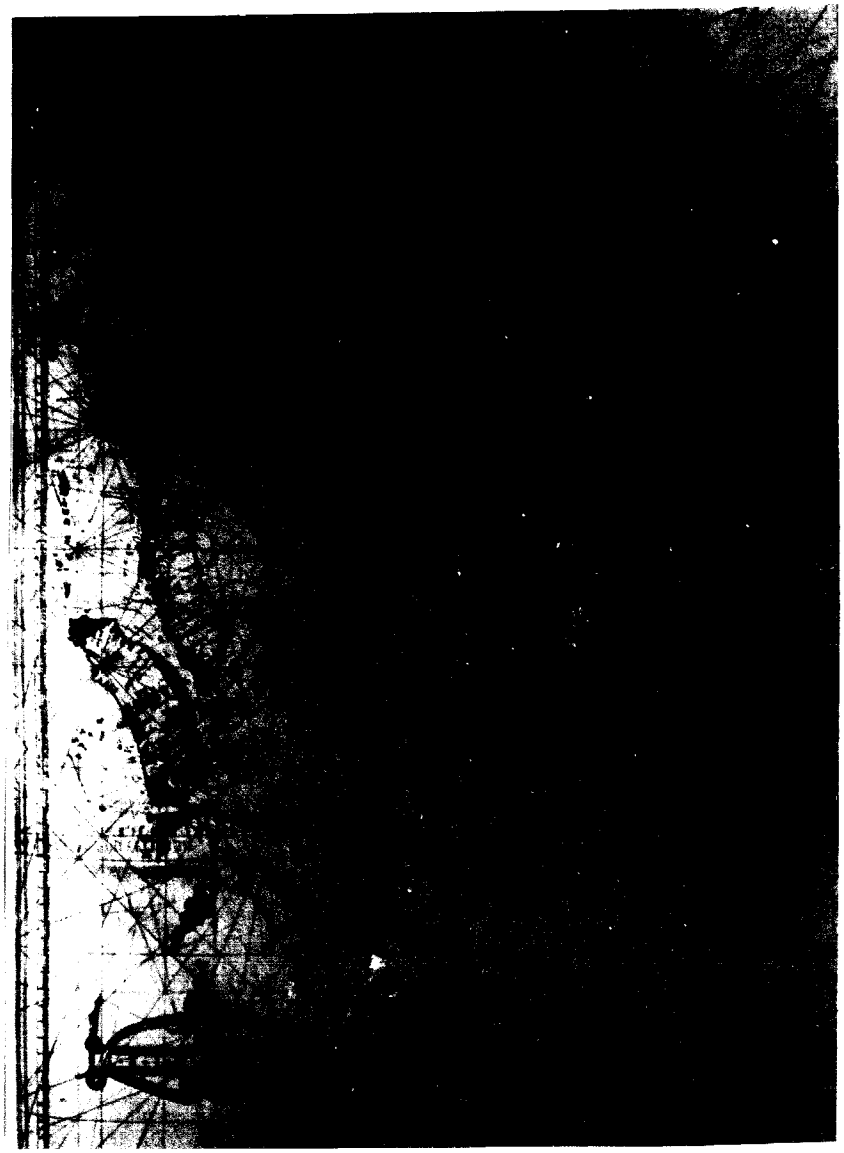


Fig.14 Part of Bartolomeu Velho's Chart of 1561 (From Cortesão's "Cartografia e Cartografos Portugueses dos Seculos XV e XVI")



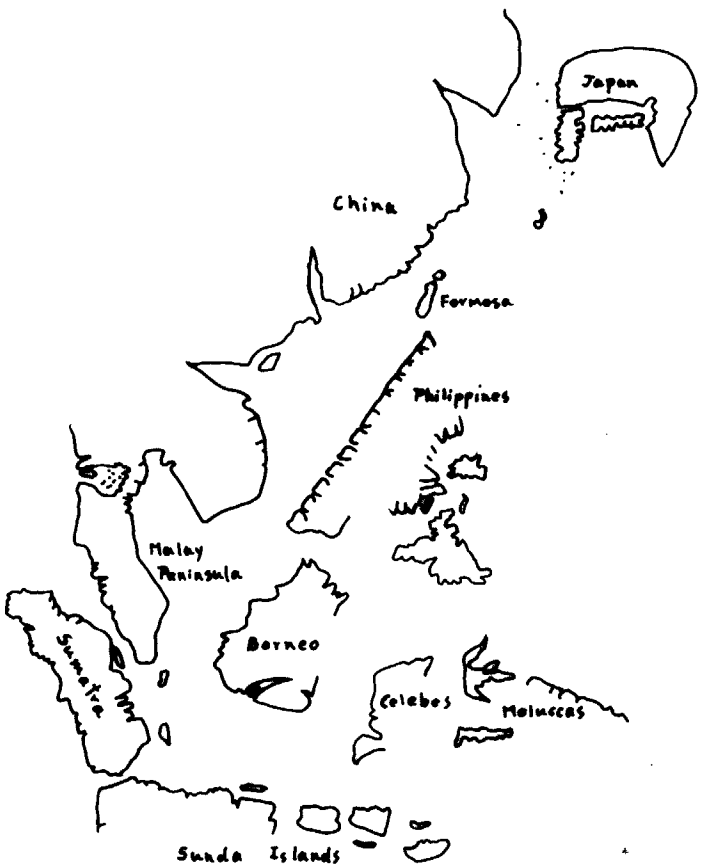
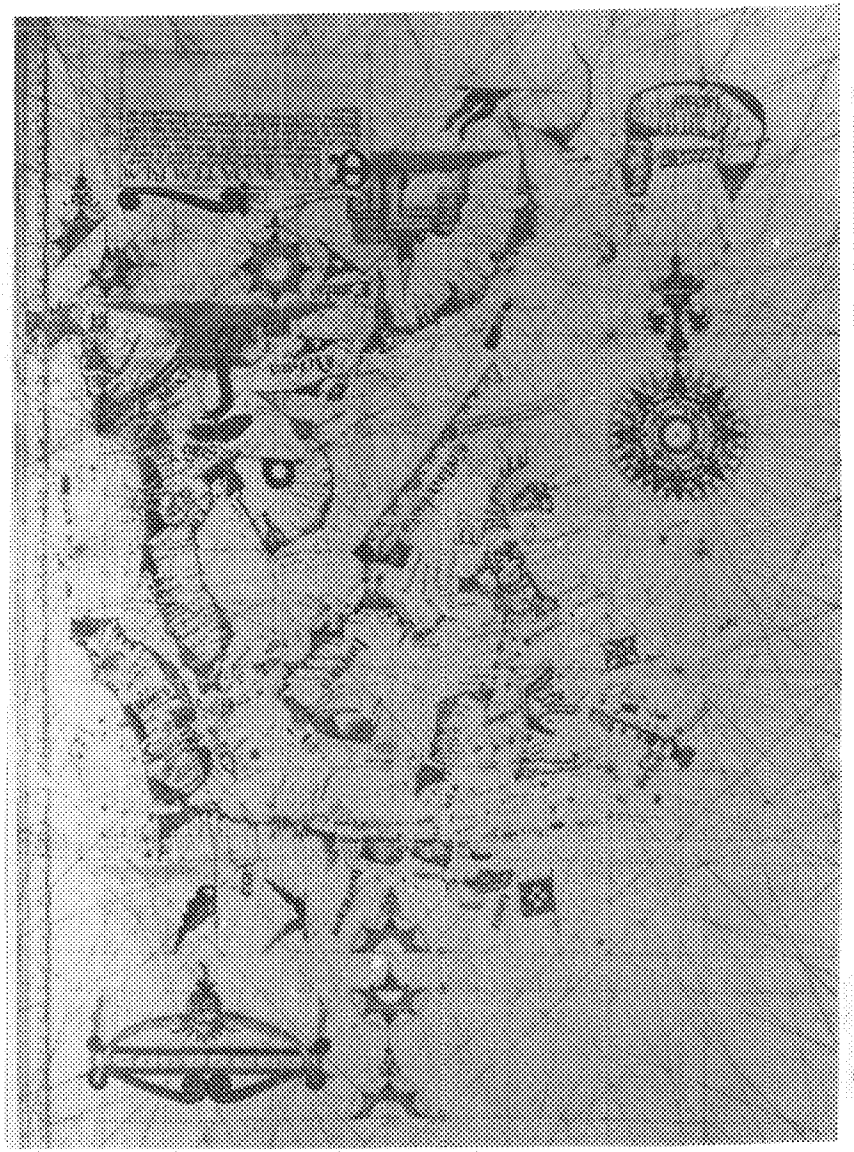


Fig.15 Lazaro Luis' Chart of 1563 (From Cortesão's "Portugaliae Monumenta Cartographica")



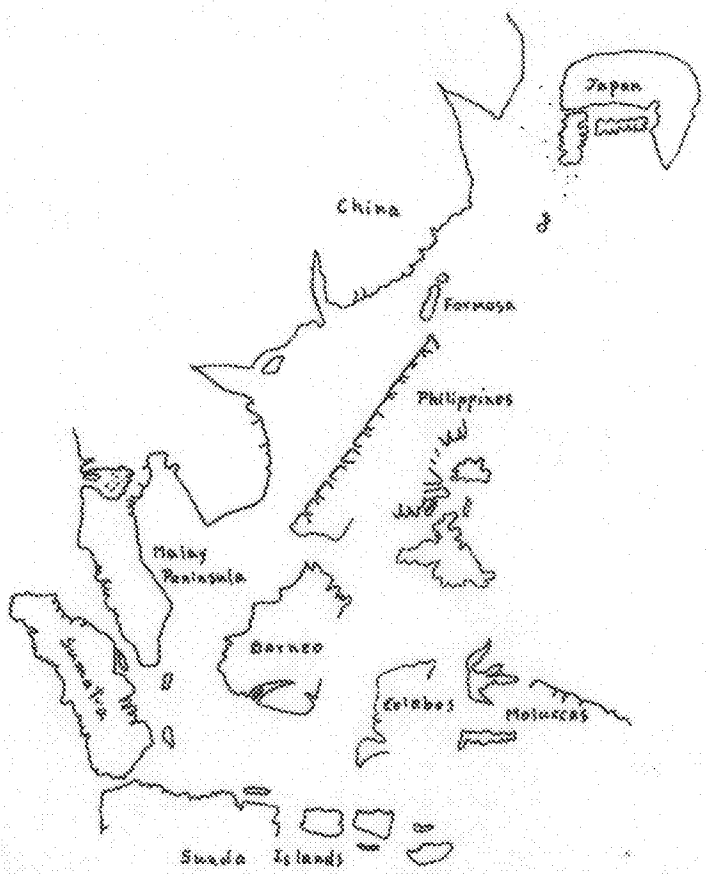
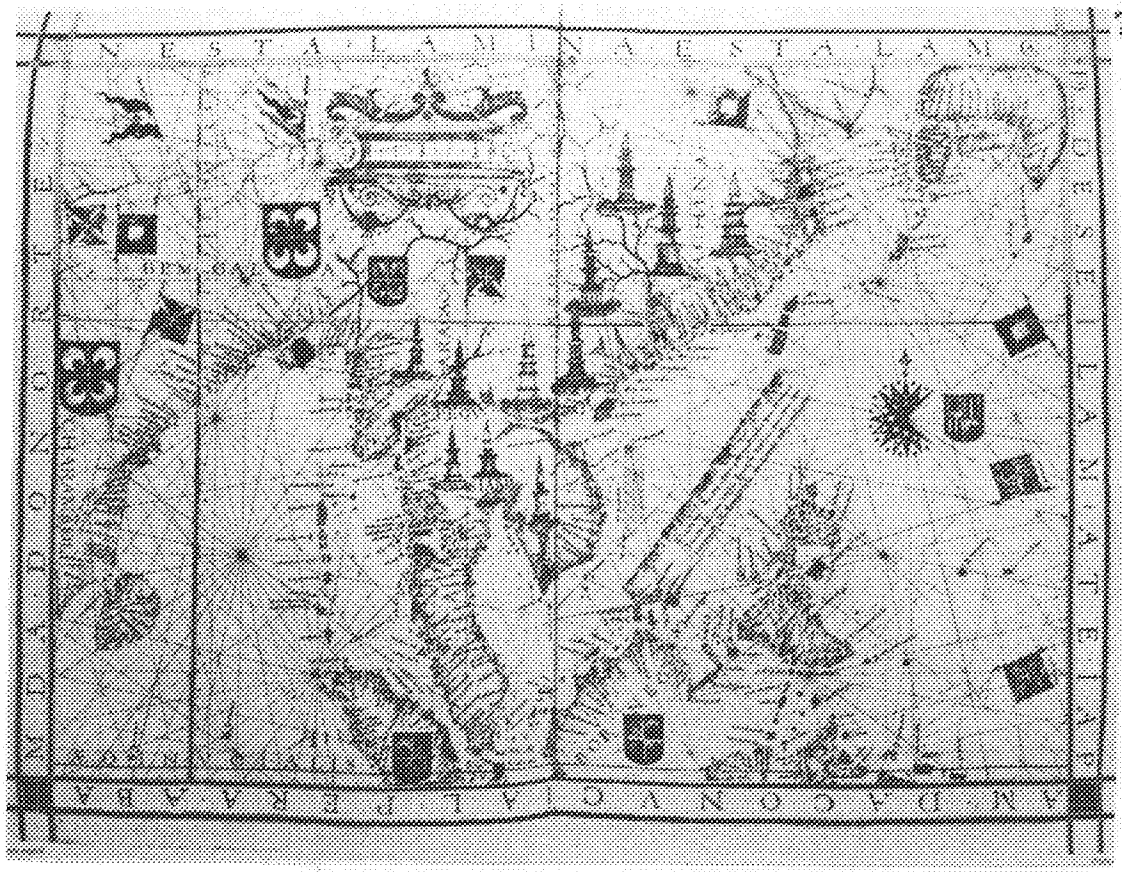


Fig.15 Lazaro Luis' Chart of 1563 (From Cortesão's "Portugaliae Monumenta Cartographica")



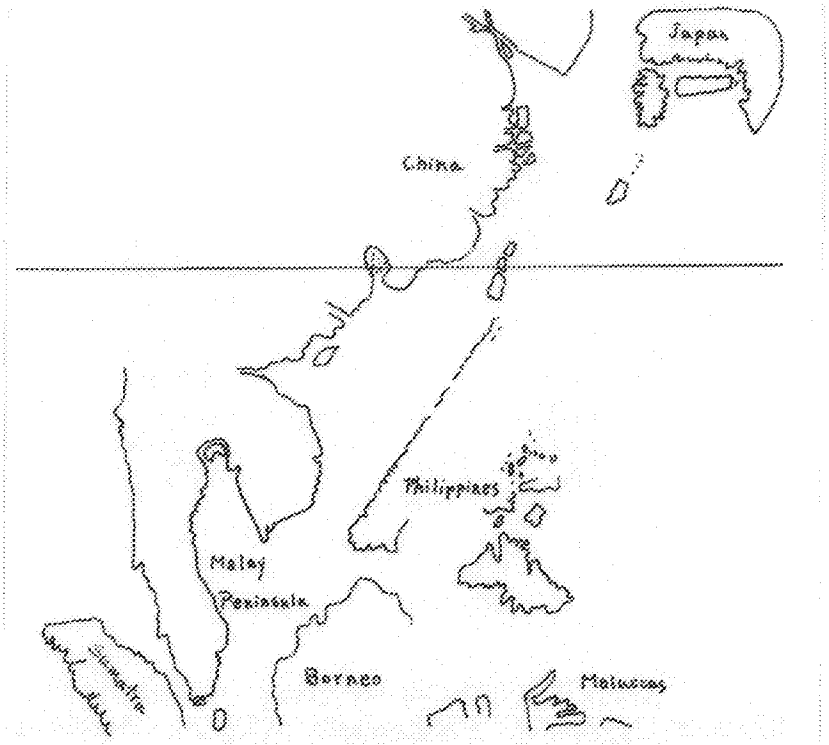
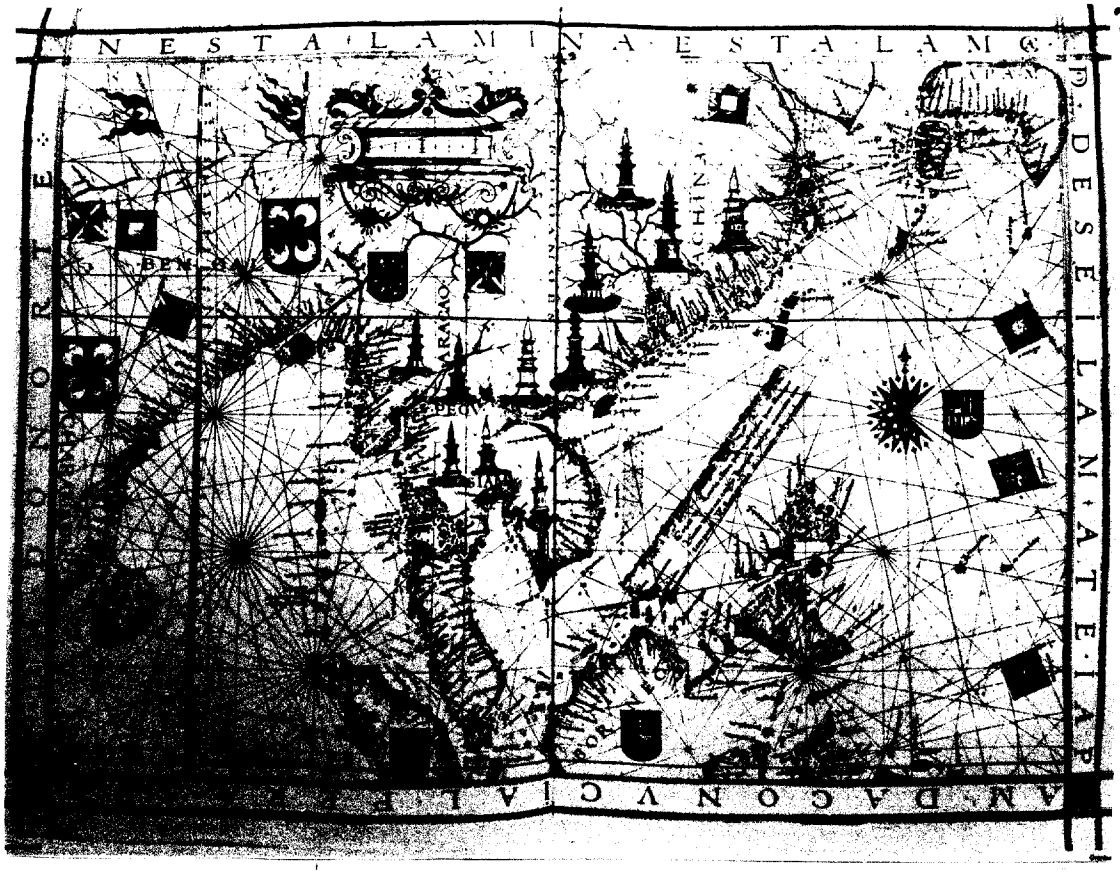


Fig.16 Fernão Vaz Dourada's Chart of 1575 (From Cortesão's "Portugaliae Monumenta Cartographica")



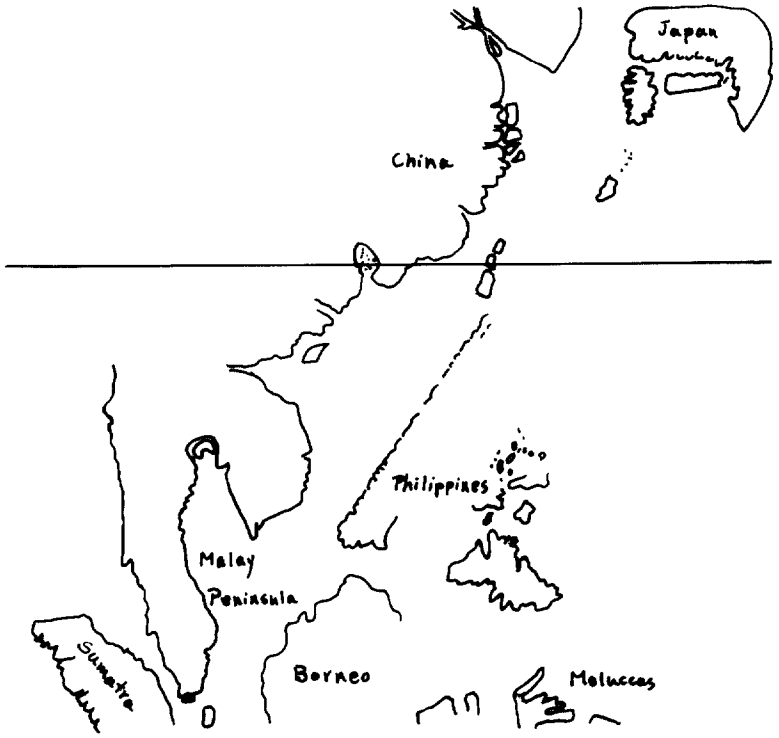
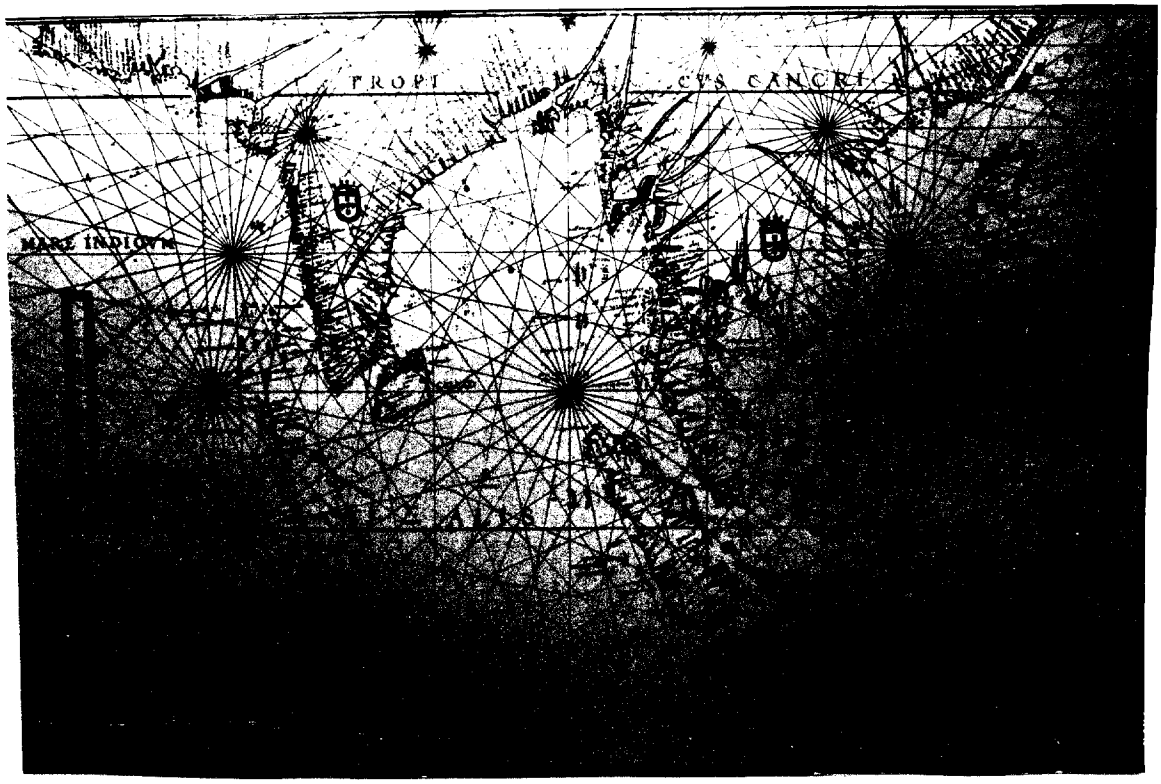


Fig.16 Fernão Vaz Dourada's Chart of 1575 (From Cortesão's "Portugaliae Monumenta Cartographica")



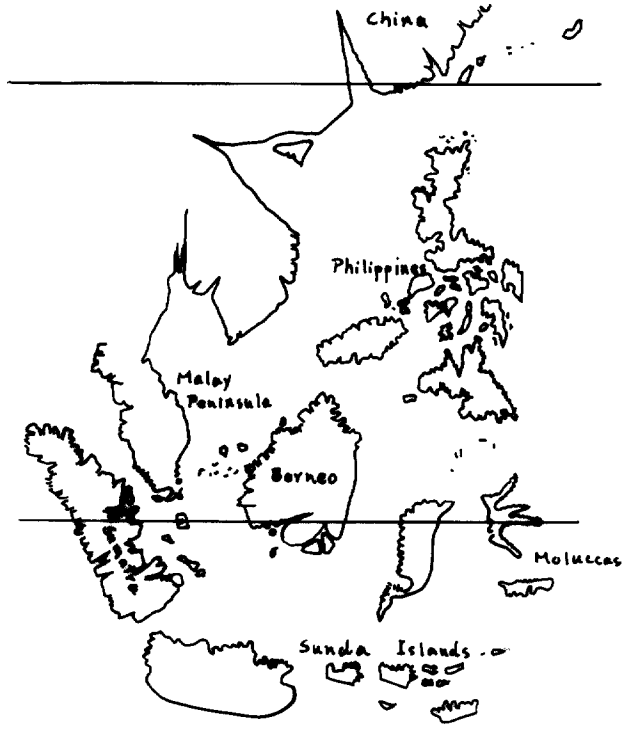
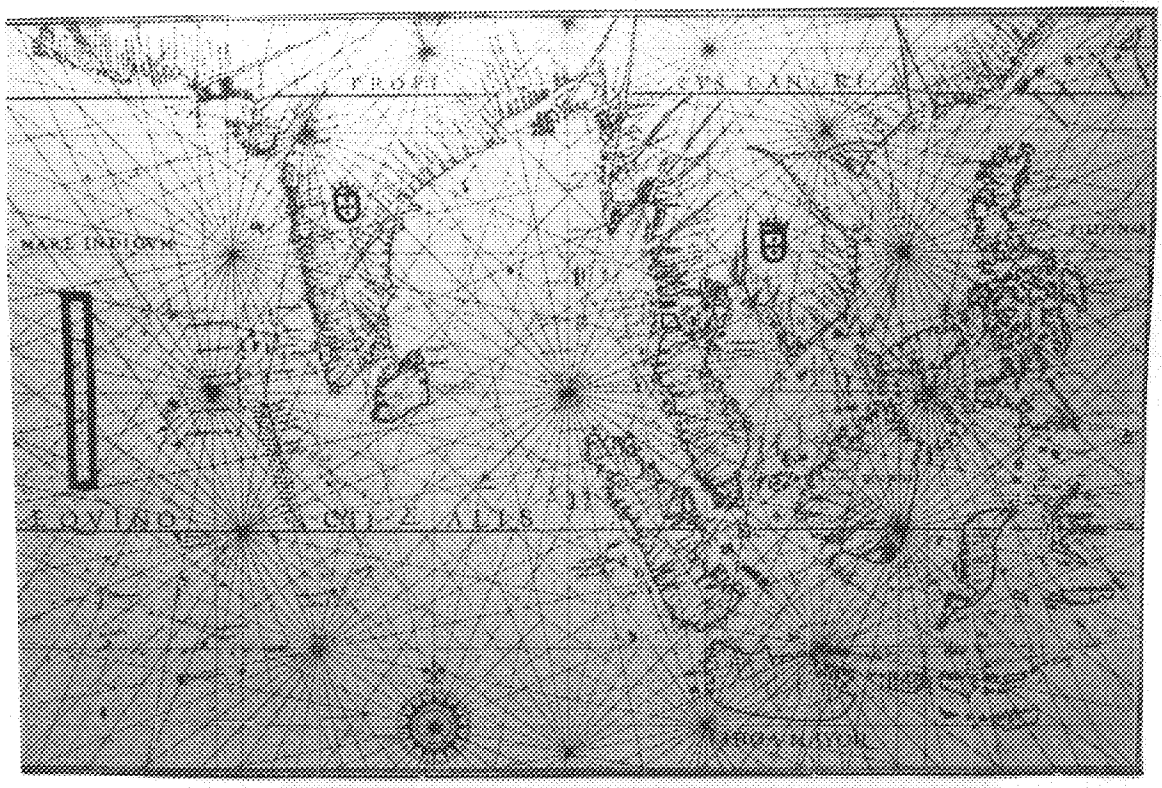


Fig.17 Bartolomeu Lasso's Chart of 1590
(From Cortesão's "Portugaliae Monumenta Cartographica")



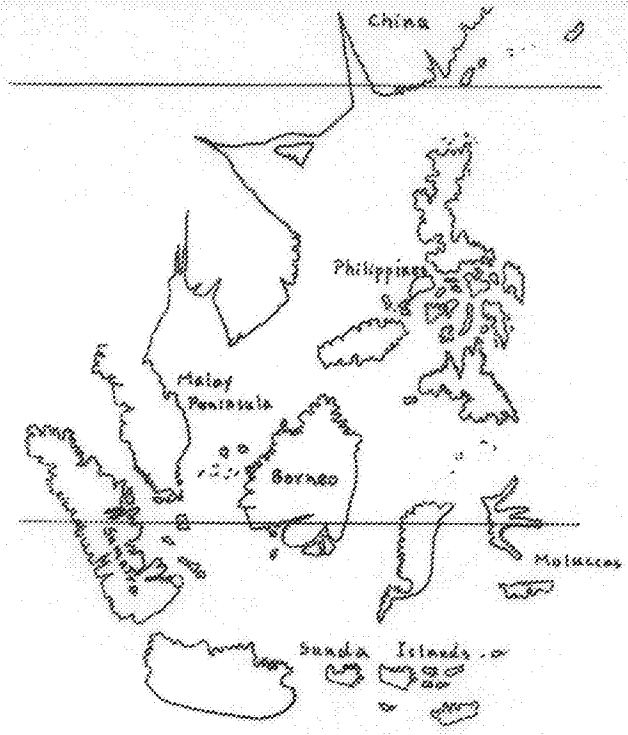
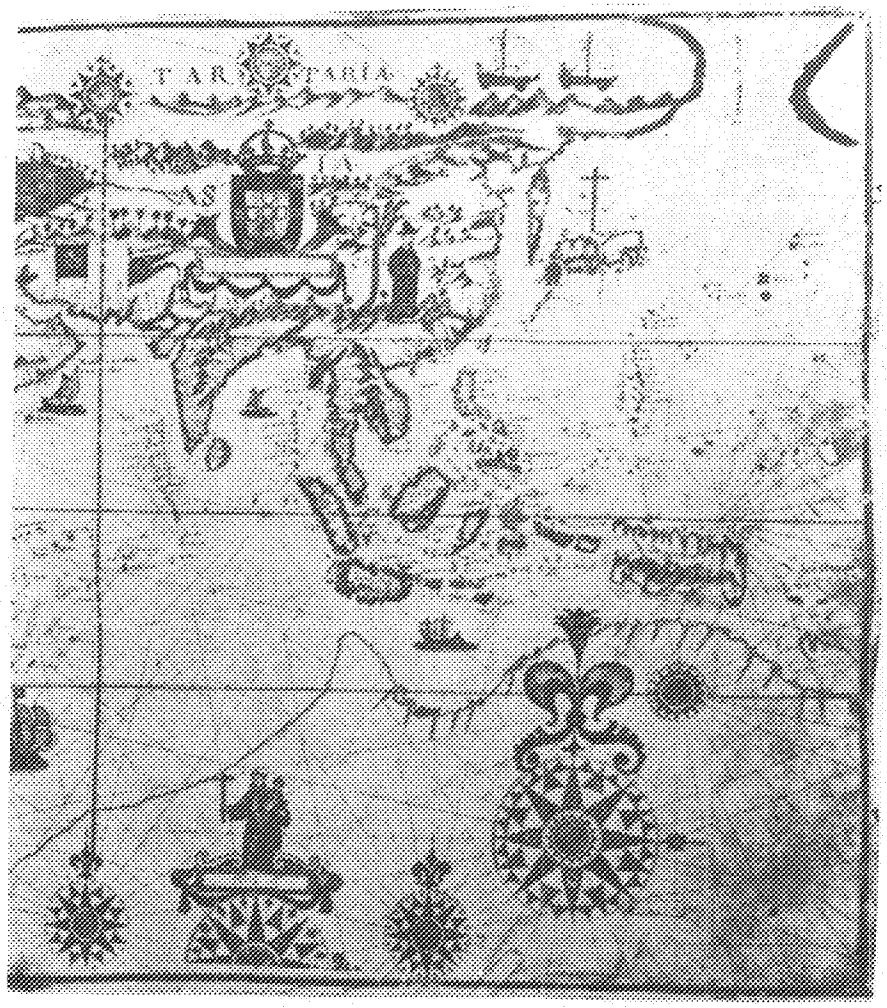


Fig.17 Bartolomeu Lasso's Chart of 1590
(From Corteseão's "Portugaliae Monumenta Cartographica")



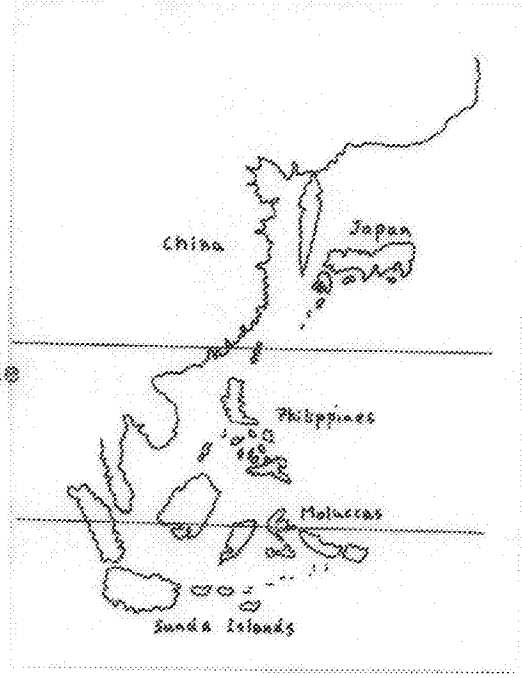


Fig.18 Part of Antonio Sanches' Chart of 1623 (From Cortesão's "Portugaliae Monumenta Cartographica")

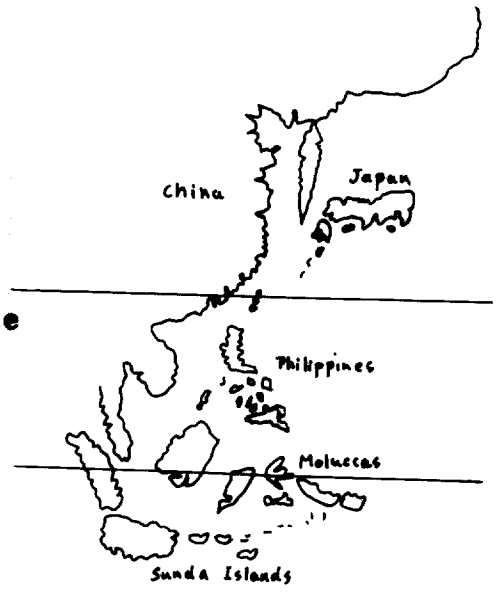
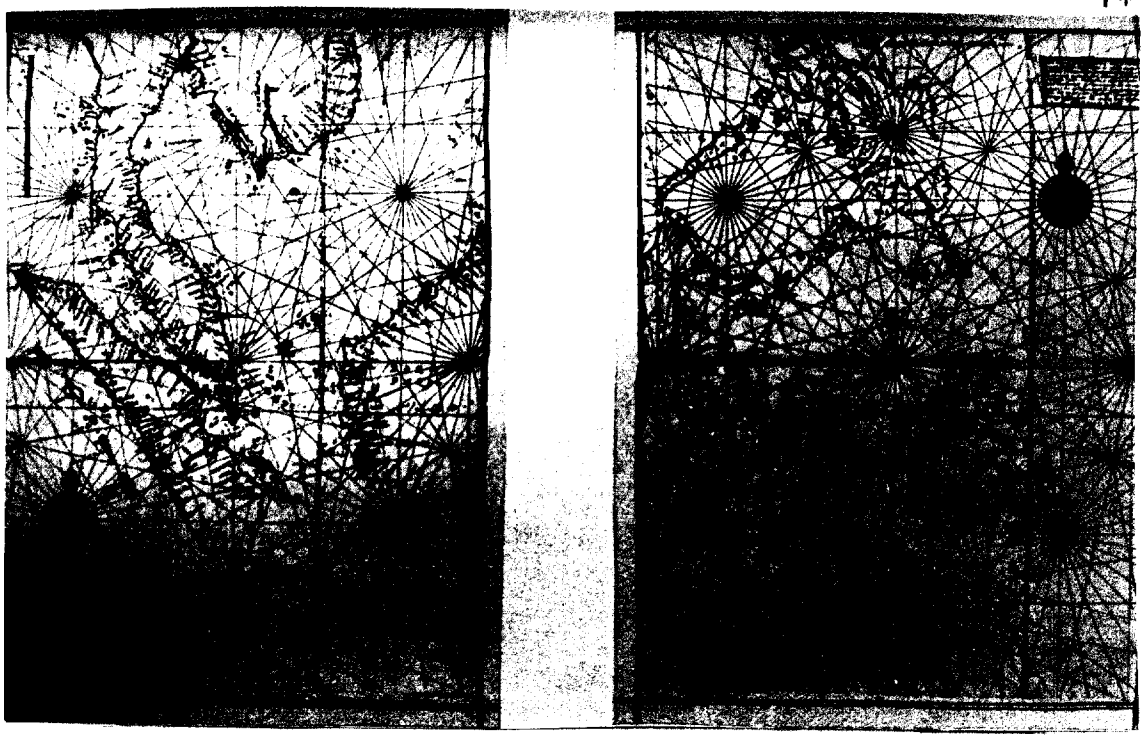


Fig.18 Part of Antonio Sanches' Chart of 1623 (From Cortesão's "Portugaliae Monumenta Cartographica")



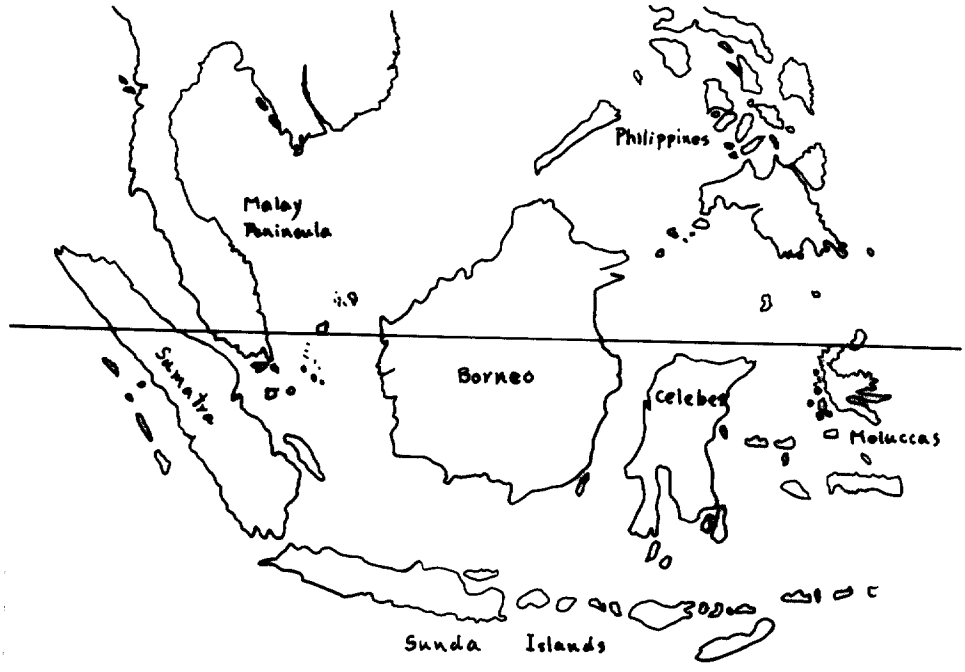
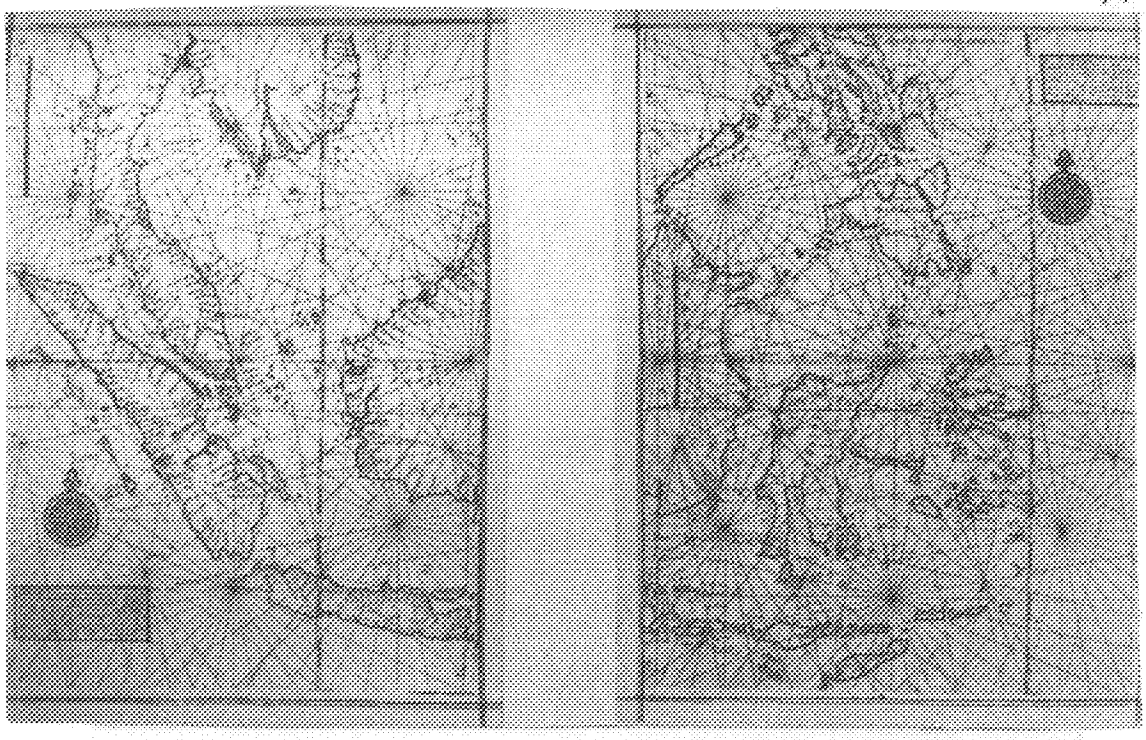


Fig.19 Pedro Berthelot's Chart of 1635
(From Cortesão's "Portugaliae Monumenta Cartographica")



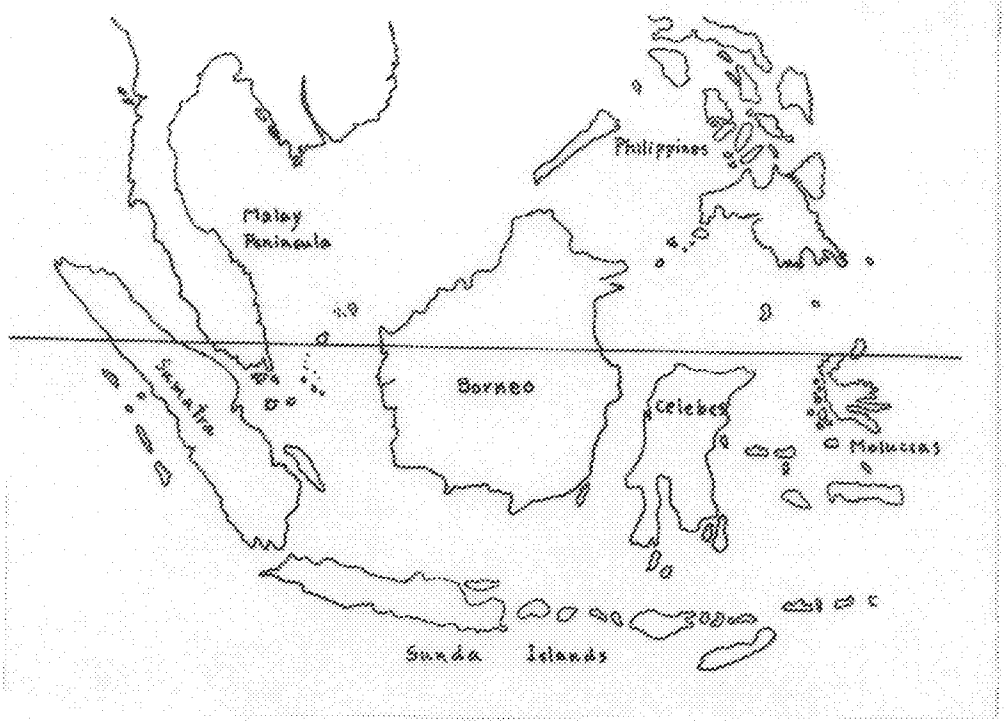
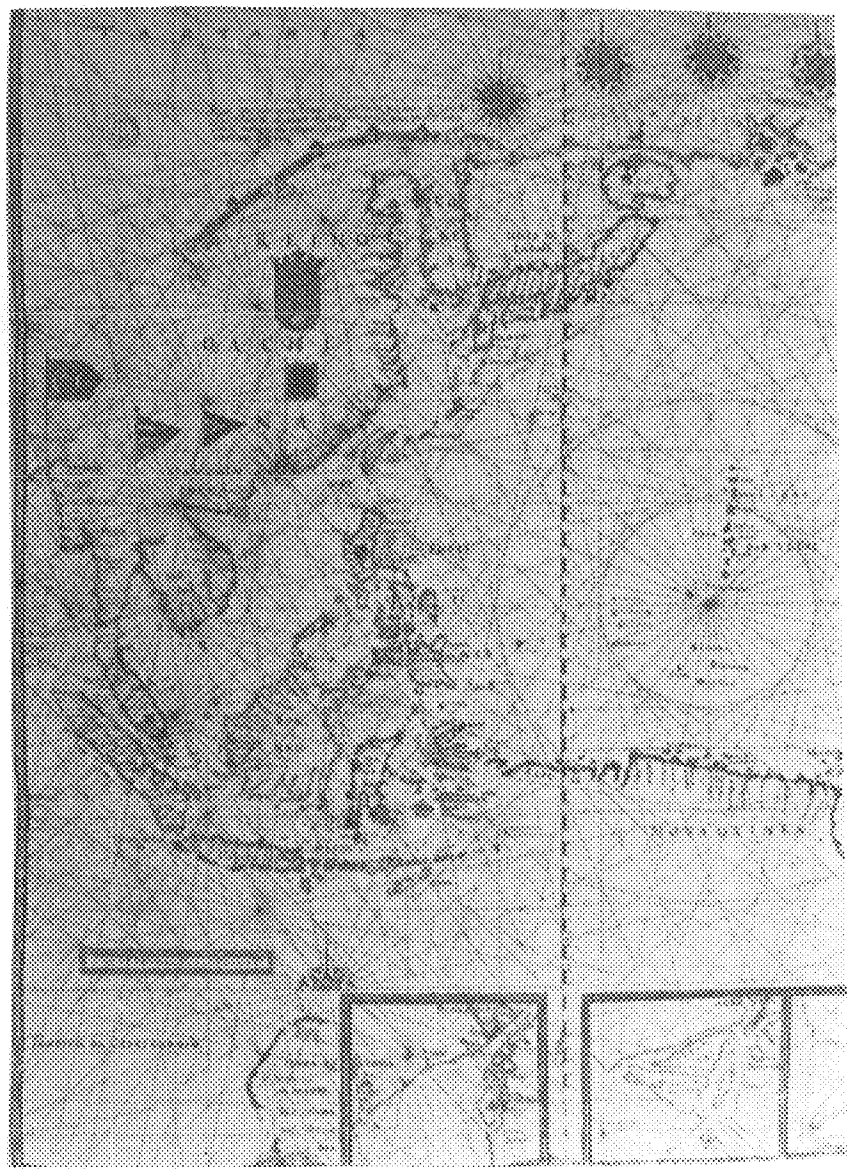


Fig.19 Pedro Berthelot's Chart of 1635
(From Cortesão's "Portugaliae Monumenta Cartographica")



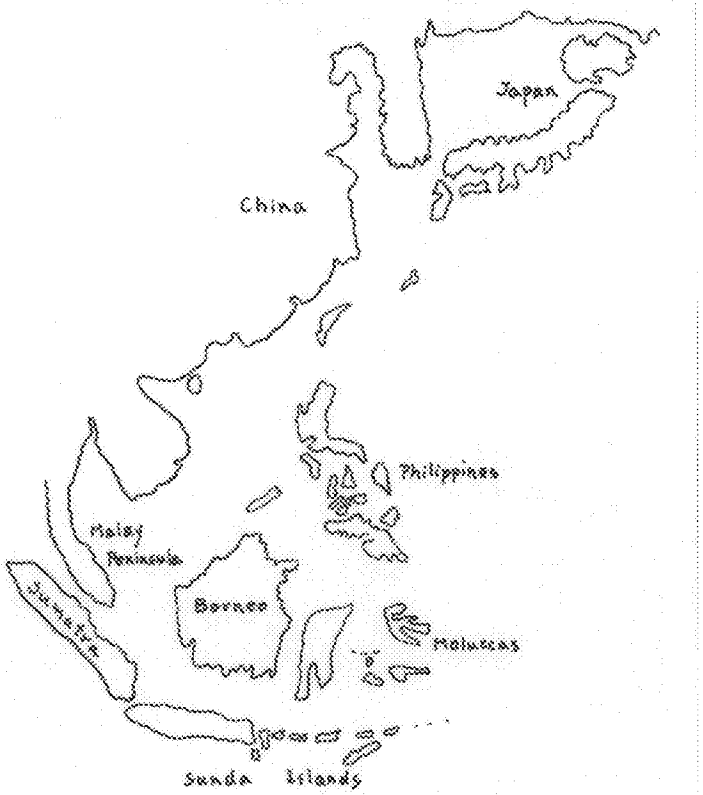


Fig.20 João Teixeira Albernaz I's Chart of 1649 (From Cortesão's "Portugaliae Monumenta Cartographica")

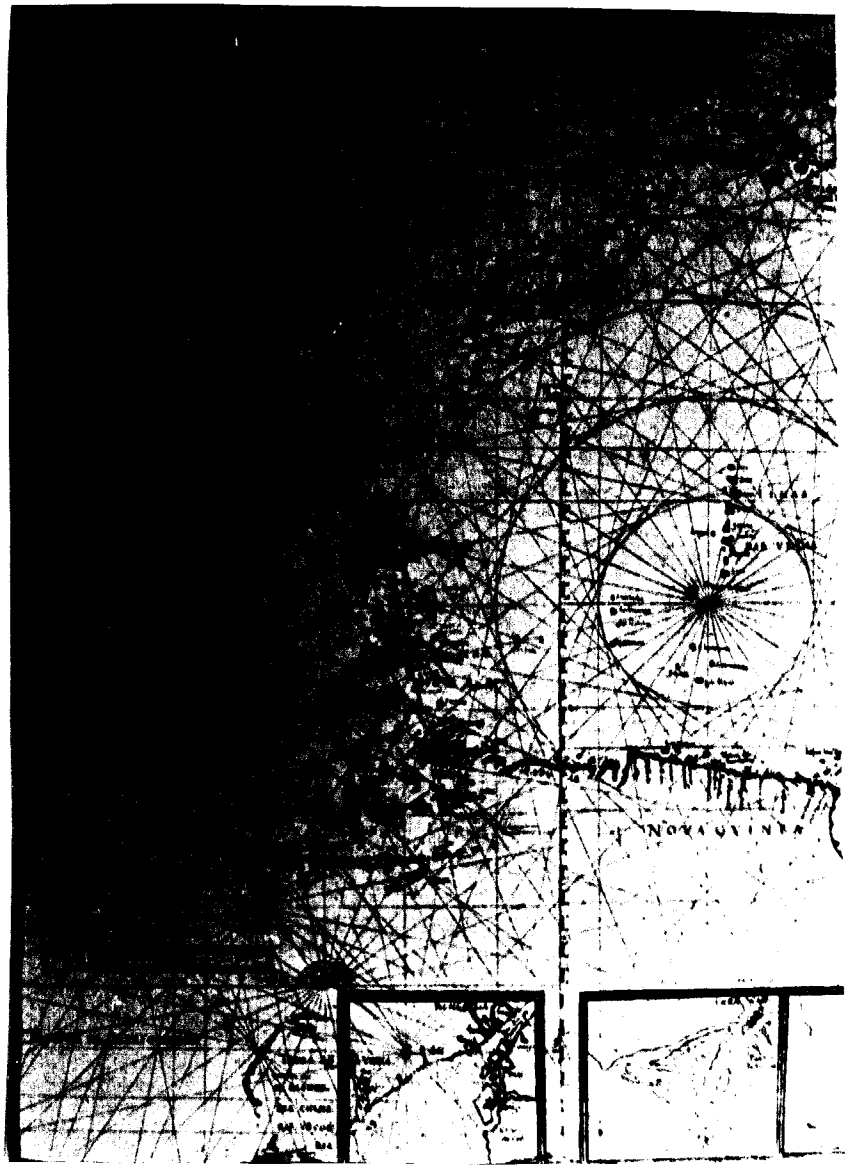
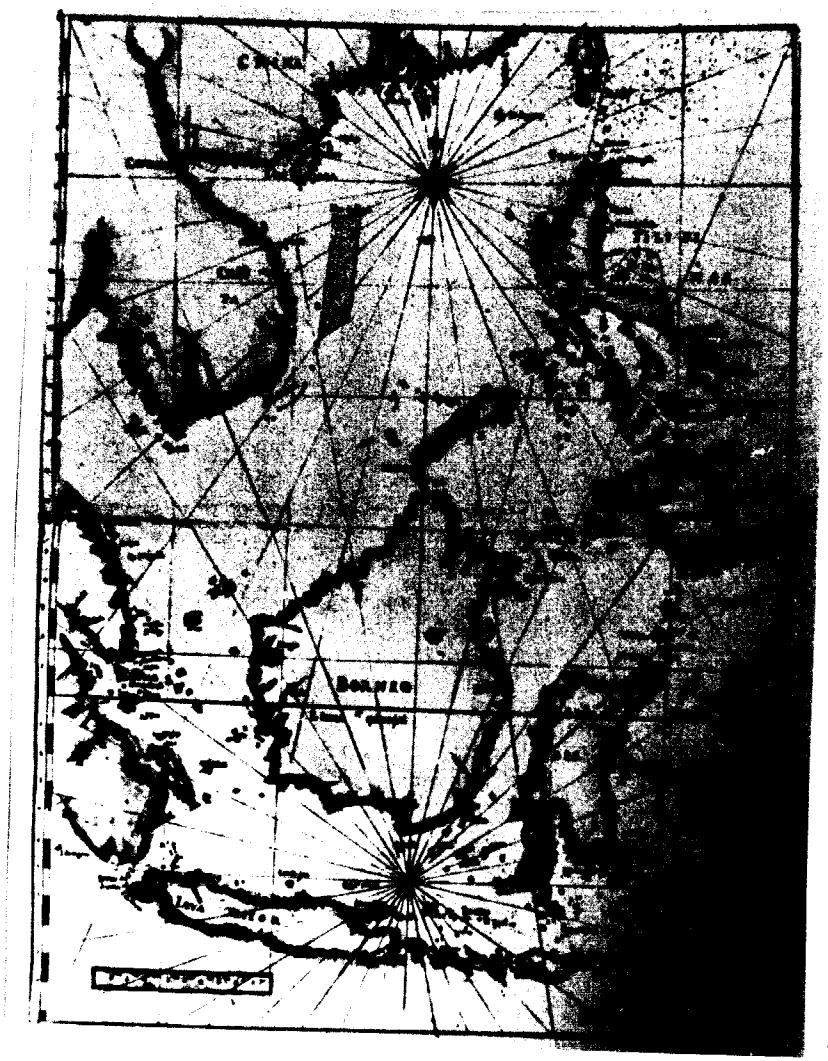


Fig.20 João Teixeira Albernaz I's Chart of 1649 (From Cortesão's "Portugaliae Monumenta Cartographica")



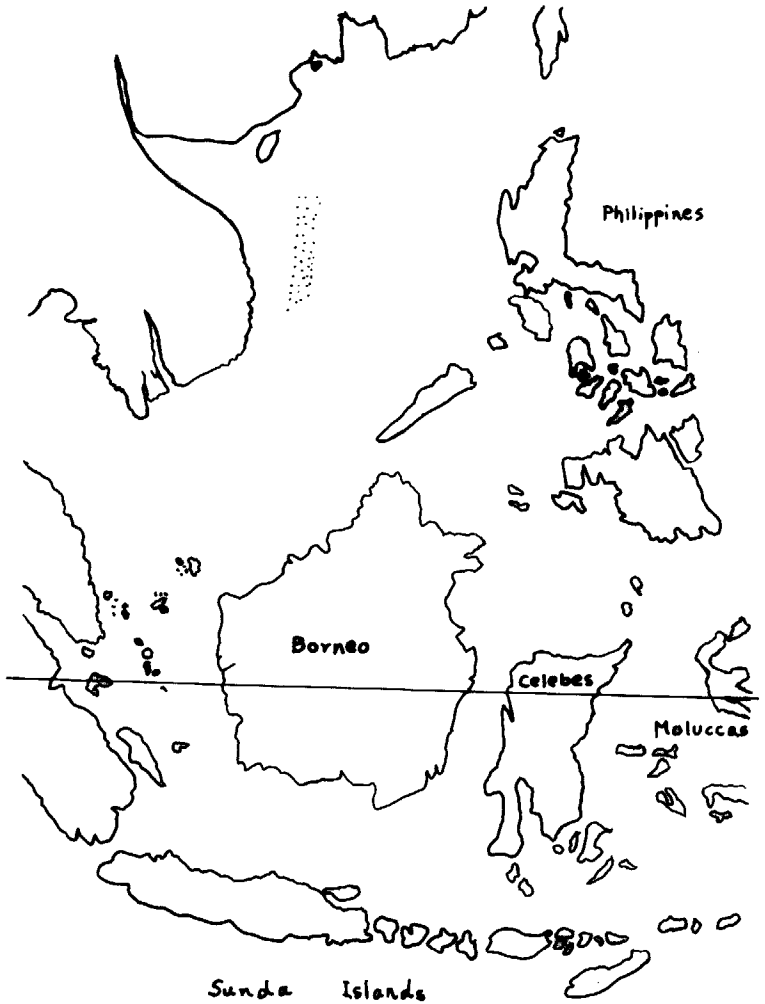
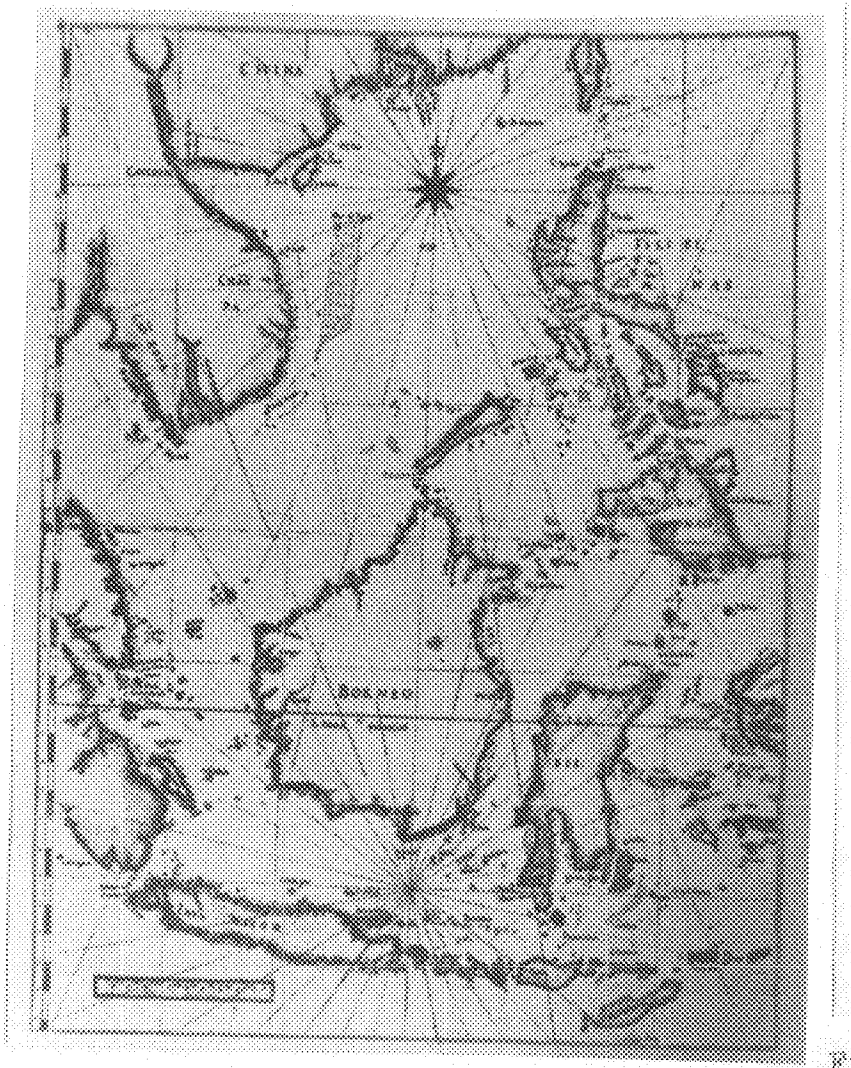


Fig.21 An Anonymous Chart of 1650 (From Cortesão's "Portugaliae Monumenta Cartographica")



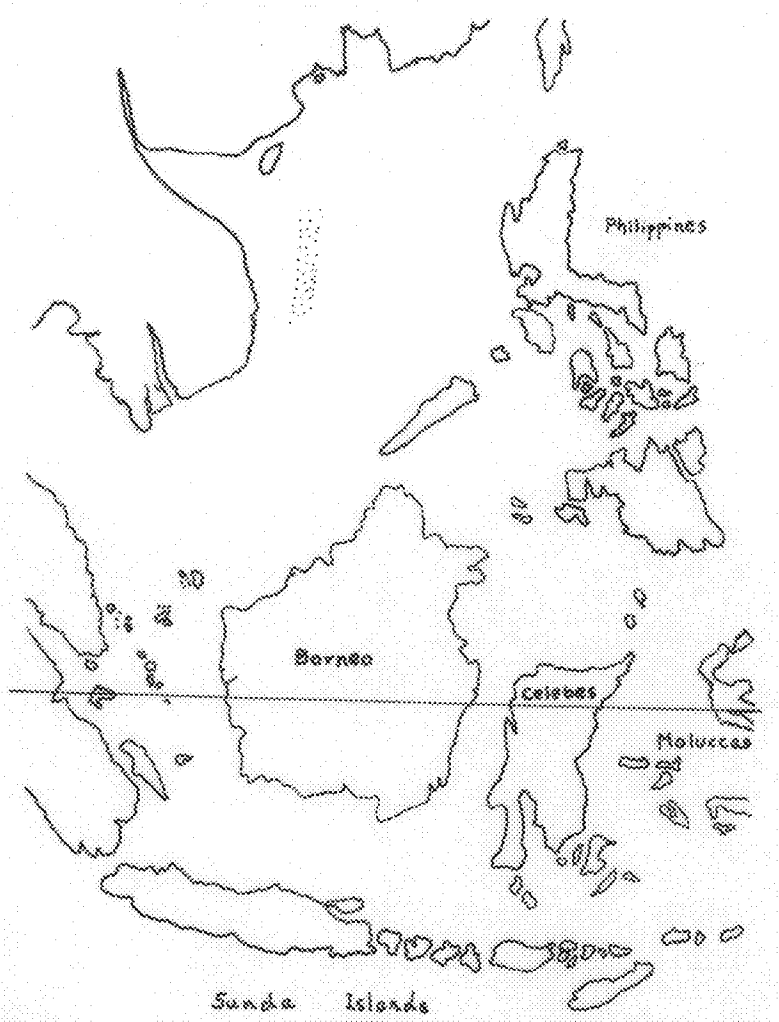


Fig.21 An Anonymous Chart of 1650 (From Cortesão's "Portugaliae Monumenta Cartographica")

Modern Chart

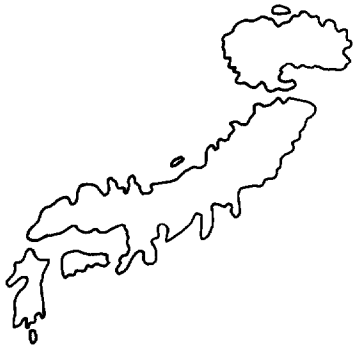
Anonymous 1550

Diogo Homem 1558

Bartolomeu Velho 1561

Fernão Vaz Dourado 1575

Antonio Sanches 1623



João Teixeira Albernaz I 1649

Fig. 22 Japan

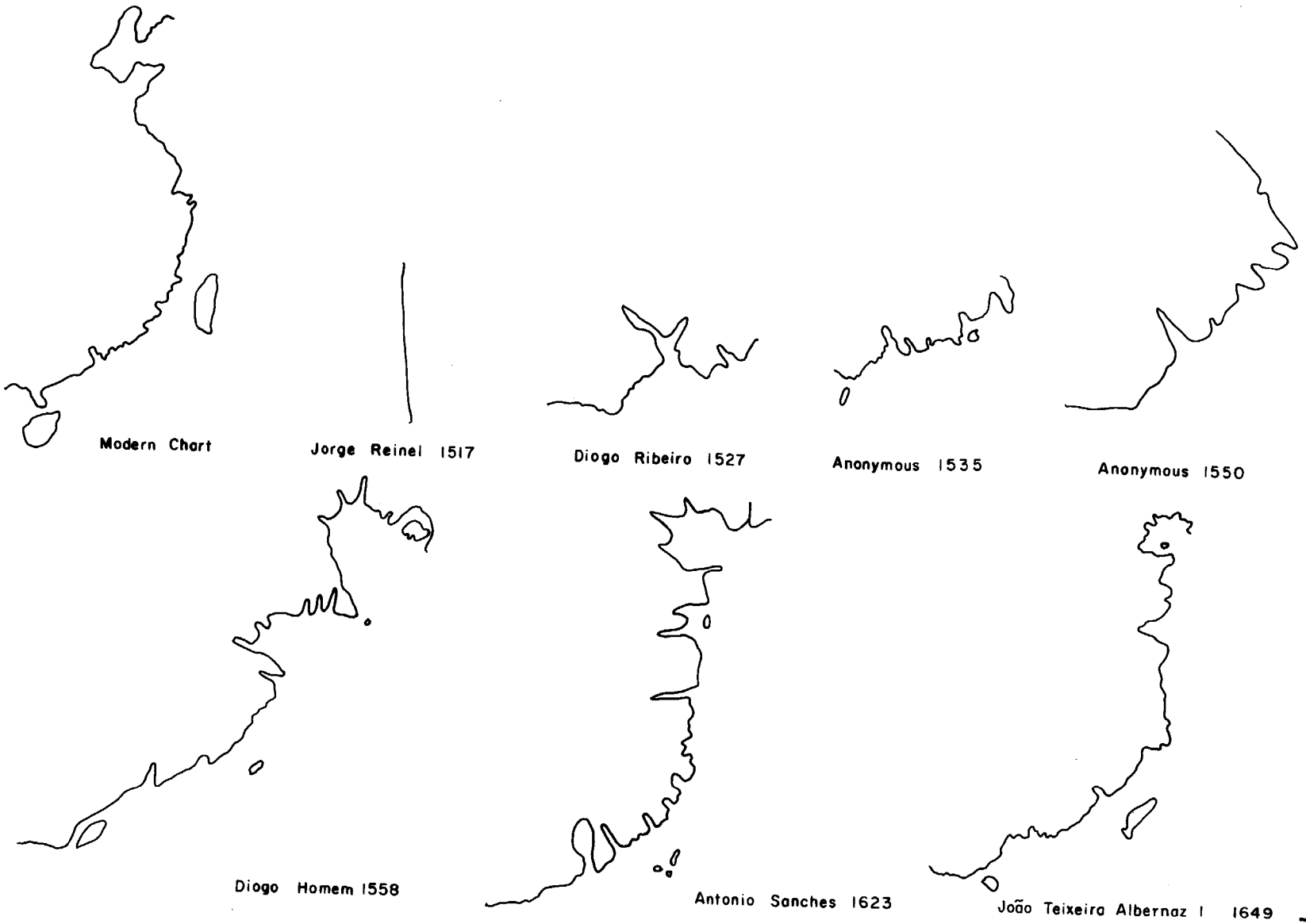
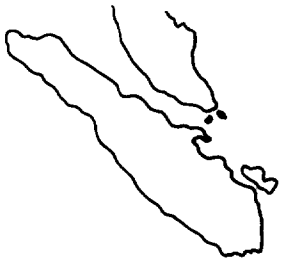
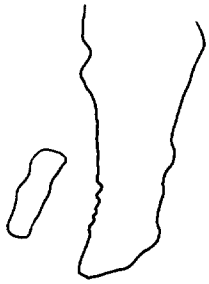

Modern Chart
Jorge Reinel 1517
Diogo Ribeiro 1527
Anonymous 1535
Anonymous 1550
Diogo Homem 1558
Antonio Sanches 1623
João Teixeira Albernaz I 1649

Fig. 23 China

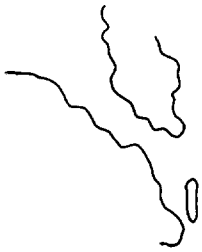


Modern Chart

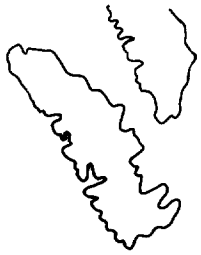


Cantino 1502

Jorge Reinel 1517

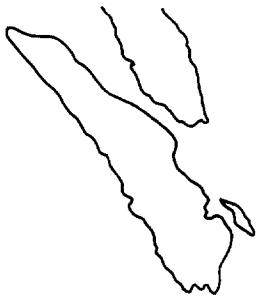


Diogo Ribeiro 1527



Diogo Homem 1558

Lazaro Luis 1563

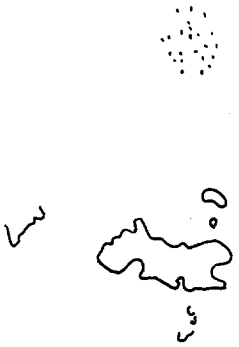


Pedro Berthelot 1635

Fig. 24 The Malaya Peninsula and Sumatra

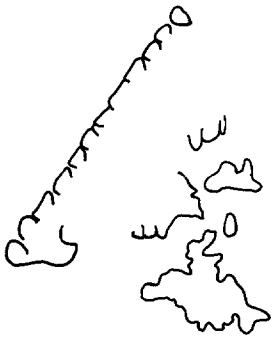
Modern Chart

Diogo Ribeiro 1527

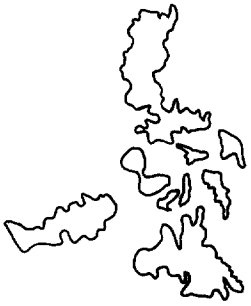


Anonymous 1535

Anonymous 1540



Lazaro Luis 1563



Bartolomeu Lasso 1590

Anonymous 1650

Fig. 25 The Philippines

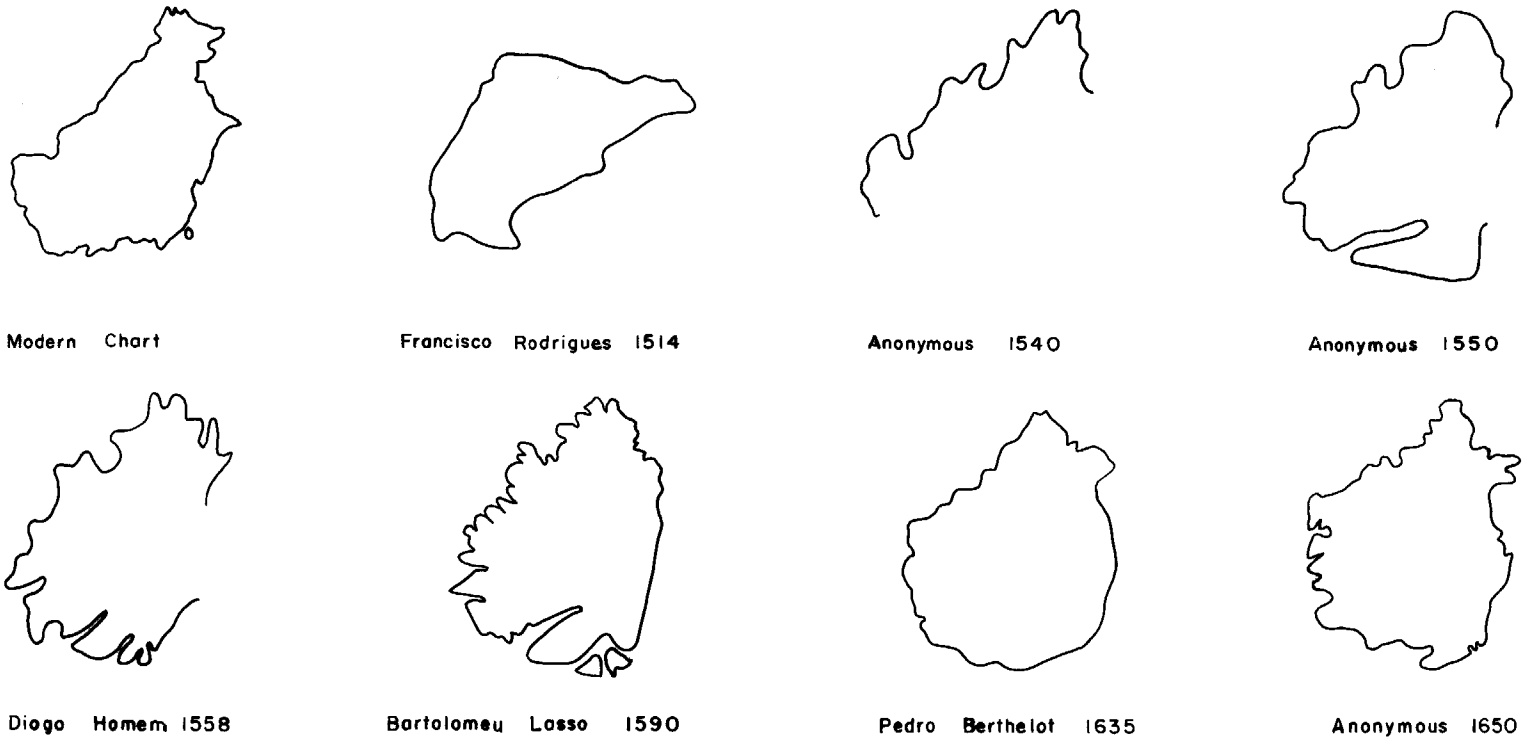


Fig.26 Borneo

Fig 27 Celebes

Modern Chart | Francisco Rodrigues 1514 | Diogo Ribeiro 1527 | Anonymous 1535 | Anonymous 1540 | Bartolomeu Lasso 1590 | Pedro Berthelot 1635

Fig. 28 The Moluccas

Modern Chart | Jorge Reinel 1517 | Diogo Ribeiro 1527

Anonymous 1540 | Bartolomeu Lasso 1590 | Pedro Berthelot 1635

Fig. 29 The Sunda Islands

NOTES

Chapter I

[1]Claudius Ptolemy, an Alexandrian, living in Roman times, was the last of the famous ancient geographers and is best remembered for his books "Geography" and "Almagest". The heirs of the Greeks in geography, as in many other sciences, were the Arabs. The arabs made great use of Ptolemy's "Almagest" or "Astronomy," and translated the "Geography" into Arabic in the eighth century. The "Geography" was introduced into Western Europe early in the fifteen century.

[2]Brown, L.A., The Story of Maps, p.77.

[3]The unknown part of the world between the eastern-most point of Asia and the western point of Europe as portrayed by Ptolemy convinced Columbus, among others, that Asia could be reached by a relatively short voyage westward.

[4]In the tenth century the vast Arab world expanded from the Iberian Peninsula over the whole of North Africa and the Middle East as far as the Indus River. The religious and political organization of the Moslem world certainly helped Arab voyages to the East. After the sixth and until the first of the thirteenth centuries, practically all information in the western world about the Far East came via the Arabs.

[5]Gillespie, J.E., A History of Geographical Discovery 1400-1800, p.4.

[6]Ibid.

[7]Cf. Yule, H. and Cordier, H, (eds) The Book of Ser Marco Polo.

Marco Polo (c. 1254-1324) accompanied his father, Nicolo Polo, a Venetian merchant in a journey to Mongolia in 1271 when he was only 17 year old. They arrived in China in 1275. Marco stayed in China for 17 years, during which time he rose to become a court officer of the great

Mongol Emperor, even becoming goveror of the huge Chinese city of Yanchow. His book gave detailed descriptions of the people of Central Asia, India, Tibet, China, Japan, Burma, Indo-China, Sumatra, Madagascar and the Indian Ocean. The eastern goods which he described in his book were nearly all luxury articles such as beautiful silk from China, spices like cinnaman, ginger, pepper, cloves ect. from the East Indies, and Ceylon. There are certainly some omissions from his book, which contains no reference to the Great Wall, to the Chinese language, or to tea, but the book had an increasing influence on posterity. There are about 90 old manuscripts of the book now existing, and about 100 new and old versions. It is often said that Polo's description of the wealth and prosperity of China and Japan in his book had influenced Prince Henry of Portugal to send expeditions to the Far East, and had stimulated Columbus to set sail on his World Expedition tour.

[8]Richardson, P., The Expansion of Europe 1400-1600, p.5.

[9]Nakamura, H., East Asia On Old Maps, p.9.

[10]Sharaf, T., A Short History of Geographical Discovery, p.163.

[11]Prince Henry of Portugal (1394-1460), the youngest of three sons of John I of Portugal and Philippa of Lancaster, an English princess, was commonly referred to as 'Henry the Navigator'. He was a patriotic Portuguese, and his main object was to promote trade to bring wealth and establish colonization for his country. He built an observatory and a school of cartography at Sagres and trained the Portuguese to be the most skilled seamen of the period. It is strange that the Prince hardly ever navigated, and never travelled further than Morocco. Nevertheless, his is a great name in the history of geography.

[12]Cape Bojador is located on the coast of Morocco opposite the Canary Islands. It was the outer limit of navigation of the Europeans, because it was said by the Moors that beyond it there were boiling seas, sea serpents, and a sun so hot it would turn men black. This frightened the Portuguese sailors so much that one ship after another sent by Prince Henry mutinied until one bold captain, finally passed it in 1434.

[13]The legendary belief in a powerful Christian King called 'Prester John' spread among the Christians from the middle of the twelfth century. It was also believed that the Monogolian king was this Prester John himself.

The legend survived through the fifteenth and sixteenth centuries. Some maps of the time showed his as an African King and others as an Indian King.

[14]Penrose, B., Travel and Discovery in the Renaissance 1420-1620, pp.46-47.

[15]Bartolomeu Dias rounded the Cape of Good Hope in 1488, Vasco Da Gama reached India in 1498 and Pedro Alvarez Cabral reached Brazil in 1500.

[16]The lateen rig vessel was introduced to Europe by the Arabs. It had a huge yard and employed a triangular sail.

[17]Albion, R.G., Exploration and Discovery, pp.27-32.

[18]Ibid.

[19]The compass was undoubtedly employed in China for geometry a long time before it was used to assist navigation. It has been suggested that it was through the Arab and Mediterranean sailors that it was introduced to Europe.

[20]The European mariner's compass is simply the division of the horizon into thirty-two points as contrasted with the astronomer's, which was divided into 360 degrees.

[21]Albion, op. cit., p.27.

[22]A quadrant was lighter and simpler than an astrolabe.

[23]Crone, G.R., Maps and Their Makers, p.34.

[24]Ibid., p.35.

[25]The periplus was a written itinerary complied by sailors in classical times from observations made along the coasts they had visited. The periplus of Scylax is the oldest and most complete coast pilot which has survived and was written in the fifth century B.C.. Its language is simple and its direction is brief. No bearings are given and distances were reckoned according to the number of days of sailing. "Periplus" is Greek in origin ("Portolano"in Italian) and was originally applied only to written instructions, corresponding to the rutters of the late fifteenth and sixteenth centuries, Nordenskiöld in his "Facsimile-Atlas to the Early History of Cartography"

pointed out that its application by modern scholars to any early nautical chart is wrong, but its use has become so general that the name "portolan chart" or "portolan" is used to designate the early navigational charts especially those from the fourteenth to sixteenth centuries with particular characteristics.

[26]Skelton. R.A., History of Cartography, p.26.

[27]Brown, op. cit., p.111.

[28]Kimble, G.H.T., Geography in the Middle Ages, p.191.

[29]Stevenson, E.L., Portolan Charts-Their Origin and Characteristics with a Descriptive List of Those Belonging to the Hispanic Society of America, p.15.

[30]Nordenskiöld, A.E., "Résumé of an Essay on the Early History of Charts and Sailing Direction," Report of the Sixth International Geographical Congress, 1895, p.692.

[31]Nordenskiöld, Periplus, p.17.

[32]The coastline of the large islands were usually treated as the continental coasts but small islands were entirely covered with red, silver, or gold.

[33]Stevenson, op. cit., p.8.

[34]Although latitude was early determined, longitude was a matter of much greater difficulty. However, as the mariner had no means of knowing his longitude other than by estimating how far he had sailed in an east west direction, for a long time this was considered of less importance than might be supposed.

[35]Taylor, E.G.R., The Haven-Finding Art, p.112.

[36]The wind-rose or compass-rose was star-shaped device and was often very decorative. The principal four winds were Tramontane (N), Ostro (S), Levante (E) and Ponente (W). The names were derived from the Italian language. The four cardinal winds were subdivided into half-wind, quarter-wind and eighth-wind.

[37]Nordenskiöld examined portolan charts of different

periods and found out that the Catalan Atlas of 1375, the Guglielmo Soleri (Florence) of 1385 and the Andrea Biano of 1488 are the only portolans with one wind-rose in the fourteenth and fifteenth centuries; others do not have any wind-rose. Thus he concluded that the system of wind-rose did not become common until the sixteenth century.

[38]Nordenskiöld, op. cit., p.17.

[39]Ibid.

[40]Skelton, op. cit., p.45.

[41]Nordenskiöld, op. cit., p.19.

[42]Nordenskiöld called this length-measure the "portolan-mile" which corresponds to 3.15 stadia or 5,830 meters.

[43]Skelton stated that it is called the Pisane after the place where it was found, while Beazley's opinion is that it originally belonged to a Pisane family. The chart is now preserved in the Bibliotheque Nationale, Paris.

[44]It is not unusual to find undated and anonymous portolan charts. Whenever authors' names and dates were given, they are usually inserted on the left of the sheet.

[45]Nordenskiöld, Periplus, pp.45-47.

Chapter II

[1]Fernández, L.H., A Brief History of the Philippines, pp.19-20.

[2]According to Cortesão, the missing charts might have been destroyed by the great Lisbon fire in 1775. The first surviving chart, in the Biblioteca Estense at Modena, represents the west coast of Europe and Africa from France to the Gulf of Guinea, with the archipelago for the Azores, Madeira, the Canaries and Cape Verde. The second surviving chart, in the Nationale da Terra do Tombo at Lisbon, represents the north-western Adriatic and the Mediterranean, the west coast of France and the coasts of Southern England.

[3]Quirino, C., Philippine Cartography, p.1.
Ptolemy called the Malay Peninsula the "Aurea Chersonesus" (Golden Peninsula) based on earlier accounts reporting the presence of gold in the mountains and alluvial ore on the coast.

[4]The Cantino chart owes its name to the fact that it was procurred for Hercules d'Este, Duke of Ferrare, by Alberto Cantino.

[5]Cortesão, A. and Teixeira da Mota, A., Portugaliae Monumenta Cartographica, 1, p.8.

[6]Lach, D.F., Asia in the Making of Europe, p.219.
Lach suggests that the Cantino depiction of Asia was proboaly derived from the Arab maps.

[7]Crone, G.R., Maps and Their Makers, p.87.
Nakamura, H., East Asia In Old Maps, p.20.

[8]Crone, op. cit..

[9]Cortesão, A., Cartografia e Cartografos Portuguese Portuguese dos Seculos XV e XVI, I, p.151.

[10]Pedro Reinel was an official cartographer at Lisbon who served during the reigns of King John II, Manual I and John III. His son Jorge led a more adventurous life but was still a distinguished cartographer.

[11]Crone, op. cit., pp.89-90.

[12]Cortesão, op. cit., p.19.

[13]Ibid., p.30.

[14]Figure 3 shows only the eastern half of the chart. "CIRCOLO DE CANCRI" is written on the half of the chart which is not included in the illustration.

[15]Nordenskiöld, A.E., Periplus, p.144.

[16]Cortesão, A. (ed.), The Suma Oriental of Tomé Pires and The Book of Francisco Rodrigues, I lxxix.

[17]Galvao, A., Tratado dos Descobtimentos, pp.168-172.

[18]Ibid., lxxvii.

[19]Cortesão (ed.), The Suma Oriental..., I, p.146, comments that after the conquest of Malacca, Albuquerque sailed back to India, with a small fleet of four ships, on December 1, 1517 on board the Frol de la Mar (Flower of the Sea). When the ships were sailing along the north-east coast of Sumatra, they were caught in a fierce storm and the Frol de la Mar, an old ship, was wrecked on some shoals with a great loss of life and of all the treasures brought from Malacca. Albuquerque himself escaped with the utmost difficulty.

[20]Rodrigues did not go to the Moluccas, however, information about the Moluccas on his charts was given by Francisco Serrao, the second-in-command, who was ship-wrecked on the Lucipara islets near Banda and was taken by native craft to Ternate in the Moluccas.

[21]F. Lopes de Castanhedo in his "Historia do Descobrimento e Conquista da Indian pelos Portuguese" records that Albuquerque dispatched Nehoda Ismael, a Moorish native of Malacca to the Moluccas two or three days before Antonio de Abreu to start his expedition.

Ismael shipped a quantity of cloves to Java and João Lopes de Alvin went to Java to fetch them. This might explain why Rodrigues' chart states that João Lopes de Alvin discovered Java from the Chi Manuk River to Japara.

[22]Cortesão (ed.), op. cit., p.210.

[23]Ibid., p.226.
Makasar or Mangkasar is the name of the group of people inhabiting the extreme end of the south-western peninsula of Celebes. The name served at first to indicate the whole island or the south-western peninsula, but is now limited to the chief port and capital.

[24]Cortesão (ed.), The Suma Oriental..., II, p.525.

[25]The "Gigantic Peninsula" is part of the configuration of East Asia in Behaim's terrestial globe (1507), which is characterized by four peninsulas projecting from the Asian continent into the southern oceans. The "Gigantic Peninsula" is the eastermost and largest one, extending to 30°S latitude, and is shaped like a horse's leg. West of it is the Malay Peninsula, called "Aurea Chersonesus" by Ptolemy.

[26]Cortesão and Teixeira da Mota, Portugaliae..., I. p.35.

[27]Pacem was visited by Jorge Brito, Pero Paces, Jorge de Albuquerque, Gaspar Machado, Manuel Falcam, Peres de Andrade and Gaspar Rodrigues in 1512, 1513, 1514, 1514-1516, 1516-1517 and 1518, respectively. Campar was visited by Fernam Peres de Andrade in 1512 and Jorge Botelho in 1514. Siaca (or Ciaca) was an ancient Kingdom of Sumatra visited by Jorge Botelho in 1515. Diogo Pacheo directed a fleet to look for the Isles of Gold in 1519 and 1521 and encountered the Kingdoms of Daya and Barus in his journeys. He also went to Achen in 1520. The Kingdom of Aru was reached by João Pereira in 1521. The above mentioned summary is based on R. B. Smith's "The First Age," pp. 76-92.

[28]Pires, T., The Suma Oriental, I, p.162.

[29]Smith, R.B., op. cit., pp.62-64.

[30]R.B. Smith states that it was visited by João

Lopes de Alvin in 1513, Antonio de Miranda de Azevedo in 1514, and again in 1515, and by Alvao do Cocho, Alvaro Diogo Doelho, Francisco Pereira and Jorge de Lancoes in 1516.

[31]According to R.B. Smith, Banda was visited by Antonio de Miranda de Azevedo and Alvaro do Cocho (1515), Manuel Falcam (1517), Siman Vaz (1518), Diogo Brandam (1520), Antonio de Pina and Goncalo Correa (1512). The Moluccas were visited frequently by Alvaro de Cocho (1516-1517), Francisco Pereora and Jorge de Lancoes (1516) and Dom Tristam de Menezes, Antonio de Pina and Goncalo Correa (1518-1521).

[32]At this time, China had shut herself off to foreigners, but the Chinese merchants were allowed to go abroad, and they usually went to Malacca to sell their commodities. In Malacca, the Chinese merchants sold the Portuguese the finest ginger, rhubarb for medical purpose, the famous silk, the unique porcelain and jade and the costly musk used for perfumes.

[33]Crone, G.R., The Discovery of the East, p.65.

[34]Lach, op. cit., p.734.

[35]Cortesão and Teixeira da Mota, Portugaliae..., I, p.99.

[36]Ibid.

[37]This error might be based on political motives. The displacement of the demarcation line aroused conflicts between Spain and Portugal, which were finally settled by another treaty of Saragosa in 1529. According to the terms of this treaty, Charles V sold the doubtful Spanish claims over the Moluccas and the Philippines to his Portuguese rival for 350,000 gold ducats.

[38]Cortesão (ed.), op. cit., p.120.

[39]Cortesão and Teixeira da Mota, Portugaliae..., I, p.105.

[40]Smith, R.B., op. cit., p.93.

[41]Broek, J.O.M., "Place Names in 16th and 17th Century Borneo," Imago Mundi, XVI, (1962) p.134.

[42]Cortesão and Teixeira da Mota, Portugaliae..., I, p.104.

[43]Cortesão points out that the anonymous chart of 1535 has become to be known as the "Penrose Map" since 1928 from its owner, Boise Penrose of Philadelphia.

[44]Magellan gave the name Lazaro to the Philippines in honor of St. Lazarus, on whose feast day the expedition sighted the mountainous archipelago.

[45]Logan, J.R., "Notices of European Intercourse with Borneo Proper Prior to the Establishment of Singapore 1819," The Journal of the Indian Archipelago and East Asia, II (1848), pp.500-501.

Dom Jorge left Malacca in 1526. There were two routes to the Moluccas, one via Java and Banda, the most common though longest, and a shorter one via the island of Borneo, which had not yet been discovered. Dom Jorge took the latter because he was given orders to go by the new route to prevent the usual delay at Banda caused by the monsoons. He arrived at Brunei, a port located along the north-western coast of Borneo. After exchanging presents with the king, he proceeded and passed the island of Mindanao.

[46]G.R. Crone's "The Discovery of the East" mentions that Gomes de Sequeir, accompanied by Diogo de Rocha, was sent to seek gold in northern Celebes in 1525. On his return he was driven some three hundred leagues in an easterly direction.

Chapter III

[1]Matsuda, K., The Relationship Between Portugal and Japan, p.9.

[2]Pattee, R., Portugal and the Portuguese World, p.104.

[3]Antonio de Moto, Diogo Francisco Zeimoto and Antonio Peizotto were mutineers on a trading ship in Siamese waters. To escaped punishment they hurriedly embarked upon a small Chinese junk. The junk was caught in a storm somewhere near Formosa, and in 1542 the broken craft was cast upon the island of Tanegashima off the southern tip of the island of Kyushu. However none of the three Portuguese was sufficiently well-educated to write down his experiences. The source of the above account is primarily based on H. E. Wildes' "Aliens in the East".

[4]The controversy over whether the three sailors or Pinto were the discoverers has not been cleared up.

[5]Fernández, L.H., A Brief History of the Philippines, p.102.

[6]Lach, D.F., Asia in the Making of Europe, p.295.

[7]The first Christian missionary to the Malay Peninsula and the East Indies was St. Francis Xavier, who founded the Society of Jesuits in 1542. St. Francis went to the Archipelago in 1547 and was called "the Apostle of the Indies." He also opened an era of Christian missionary activity in Japan.

[8]Lach, op. cit., pp.682-685.

[9]Ibid., p.738.

[10]Cortesão, A. and Teixeira de Mota, A., Portugaliae

Monumenta Cartographica, II, pp.127-28.

[11]Cortesão and Teixeira da Mota, Portugaliae..., V, p.173.

[12]Diogo Homem was the son of the official cartographer, Lopo Homem. King Manuel (1495-1521) called Diogo "master of our sea charts." Diogo seemed to have been the most prolific of all the early Portuguese cartographers, or at least the cartographer of the greatest extant number of Portuguese charts. His most attractive work is the magnificent atlas made for Mary of England in 1558, now one of the outstanding cartographic treasure of the British Museum.

[13]Lach, op. cit., p.223.

[14]Ibid., p.722.

[15]Ibid.

[16]Cortesão, A. (ed.), The Suma Oriental of Tomé Pires and the Book of Francisco Rodrigues, I, p.120.

[17]Nakamura, H., East Asia In Old Maps, p.53. The Gyogi type of maps was introduced by a Korean Buddist priest, Gyogi-Bosatsu, who went to Japan in the late seventh century.

[18]De la Costa, H., The Jesuits in the Philippines 1581-1768, p.165.

[19]Broek, J.O.M., "Names in 16th and 17th Century Borneo," Imago Mundi, XVI, (1962), p.135.

[20]Lach, op. cit., p.723.

[21]Ibid.

[22]The locations of Licos and Ladrones are unidentified.

[23]Skelton, R.A., Explorers' Maps, p.147.

[24]This legend records the voyage of a Portuguese named Pedro Fidalgo, who in 1545 left Borneo in a junk to Lamao (?), and by strong wind he was driven towards the

north, where he found an island called "dos Lucos," because its inhabitants were thus named.

[25]Cortesão and Teixeira de Mota, op. cit., III, p.3.

[26]Ibid.

[27]Cortesão and Teixeira da Mota, Portugaliae..., III, p.23.

[28]Ibid.

[29]Skelton, op. cit., p.178.

[30]Ibid.

[31]Lach, op. cit., p.818.

[32]Op. cit., p.817.

[33]Quirino, C., Philippine Cartography, p.12.

[34]Lach, op. cit., p.219.

Chapter IV

[1]Penrose, B., Travel and Discovery in the Renaissance, pp.93-95.

[2]Ibid.

[3]The defeat of the Spanish Armada in 1588 opened the East Indies to the British and the Dutch. The latter moved rapidly, sending two expeditions under de Houtman to the islands in 1595 and 1598. By 1600 they had established flourishing commercial bases in the Moluccas, and the British immediately took steps to get their share of the rich spice trade. The English East India Company was formed in 1600, and two years later, the Dutch countered this action by setting up the Netherlands East India Company. The main goal of the British and Dutch in the early seventeenth century was the defeat of the Spanish-Portuguese monopoly on the Moluccas.

[4]Nakamura, H., East Asia In Old Maps, p.72.

[5]Kish, G., "Some Aspects of the Missionary Cartography of Japan During the Sixteenth Century," Imago Mundi, 6, (1950), p.39.

[6]Broek, J.O.M.,"Place Names in 16th and 17th Century Borneo," Imago Mundi, 16, (1962), p.144.

[7]Cortesão A. (ed.), The Suma Oriental of Tomé Pires and the Book of Francisco Rodrigues, p.132.

[8]Heawood, E., Geographical Discovery, p.47.

[9]João Teixeira Albernaz I learned the art of mapmaking from his father, the well-known cartographer Luis Teixeira. Albernaz was authorized by the King of Portugal to make sea-charts, astrolabes, compasses and cross-staffs, and his works reveal the influence of his father in their design, coloring and writing.

[10]Cortesão, A. and Teixeira da Mota, A, Portugaliae Monumenta Cartographica, V, p.175.

[11]Ibid., p.147.
The Great Wall runs from the present province of Kansu to the Gulf of Pohai, a distance of 1,684 miles.

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APPROVED BY: Arthur H. Robinson

TITLE: Professor of Geography

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