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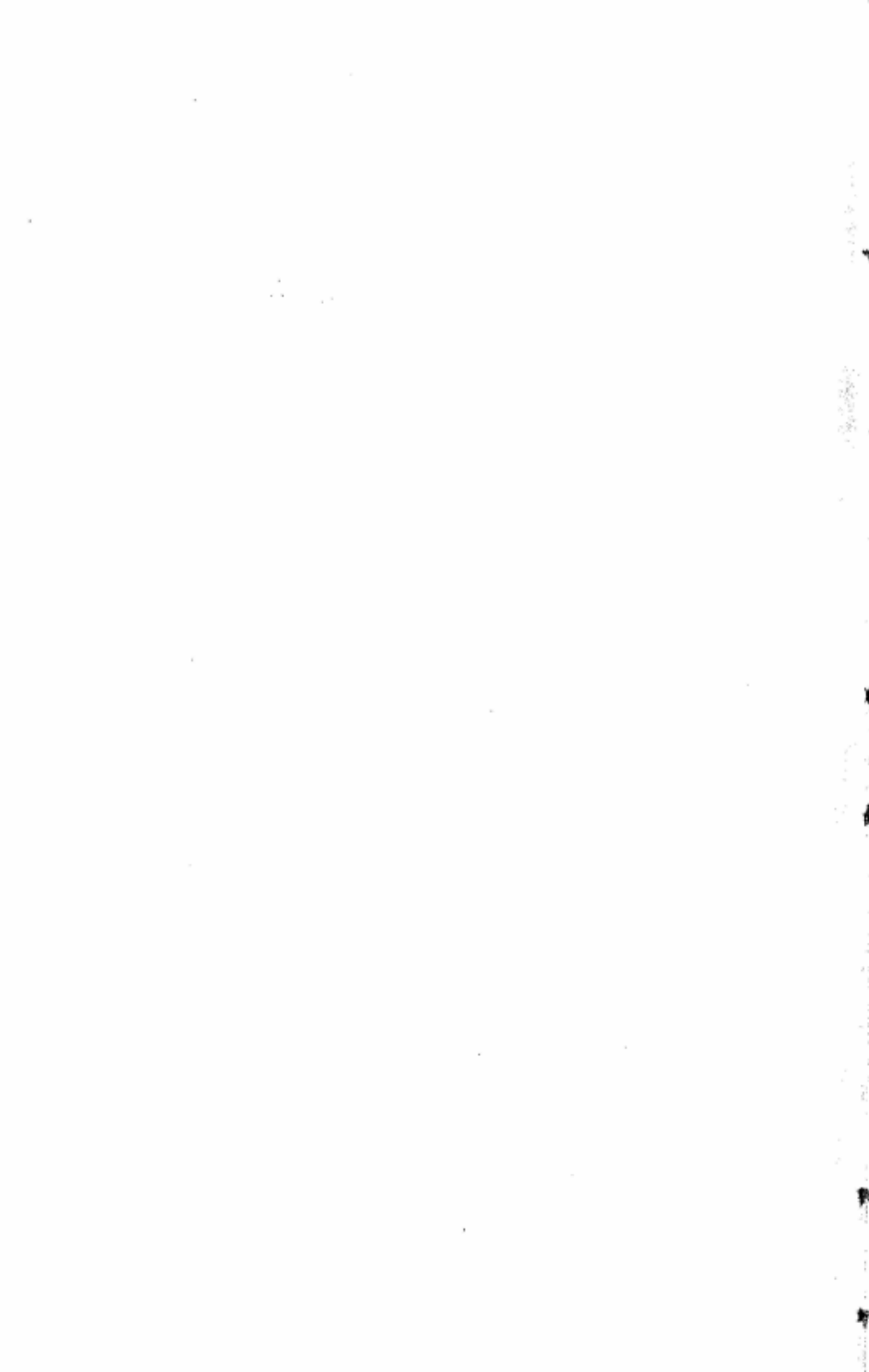
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HISTORY OF THE PORTUGUESE NAVIGATION  
IN INDIA (1497—1600)





# HISTORY OF THE PORTUGUESE NAVIGATION IN INDIA (1497-1600)

By  
K. M. MATHEW

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FOREWORD  
B. SHEIK ALI

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## FOREWORD

Rarely does Clio the Muse smile constantly on the same power or people or country. There is distributive justice, and each receives its favour, plays its part and fades out. The Egyptians, the Chinese, the Persians, the Indians, the Greeks, the Romans, the Arabs, the English, have all had a point of glory which lasted for a time and then disappeared. Same was true of the Portuguese, whose meteoric rise at the dawn of the renaissance period would for ever remain unparalleled. An unimaginably small power dominated the globe, extended its sway over the four continents of the world, and became the path-finders for a new era of expansion and imperialism. The key-factor in their glorious venture and historic role was their mastery over the seas which opened the door to a new world, and excited them to ever new adventures bringing the treasures of the world to their feet. The bold venture of the Portuguese into high-seas, their discovery of the new sea-routes to unknown lands, their long voyages with potentiality for a new era of political, economic and cultural dominance, and their supremacy over the seas to become the super-power of the times, have all enabled the Portuguese to carve a fascinating niche in the annals of mankind.

This study dealing with the Portuguese navigation in India for a century from 1498 to 1600 A.D. is only a small but vital

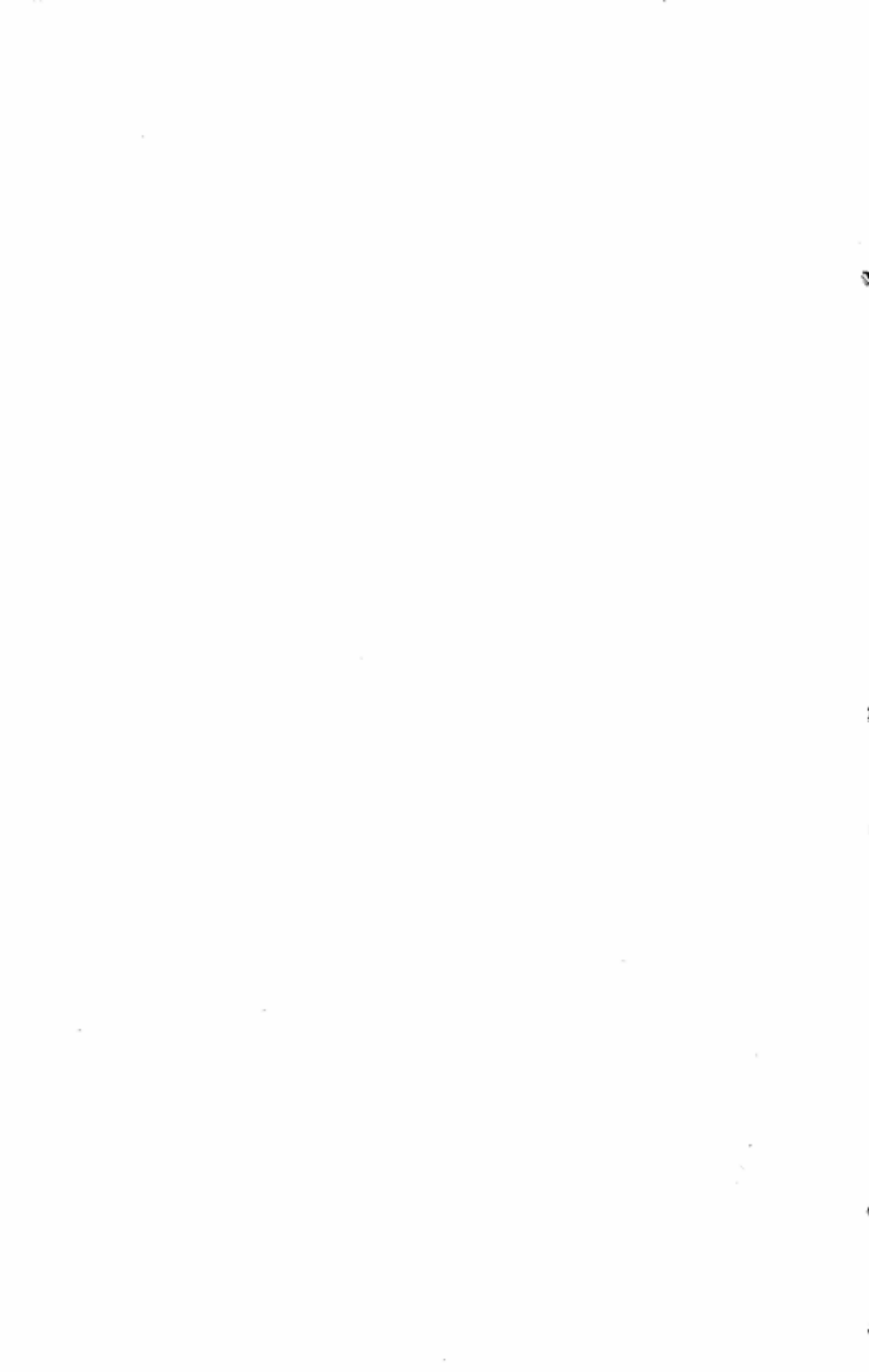
link in their global exploits. It was indeed their discovery of a new sea route to India, the touching of Indian shore by Vasco-da-Gama, and the conquest of Goa by Afonso de Albuquerque that pushed the Portuguese to lime-lights of history. The rise of the Portuguese in India was as much due to their high spirit of adventure as to their knowledge of nautical science, the superiority of their military skill and the competency of their political machinations. This work touches the entire gamut of Portuguese naval ventures in India, from the genesis of the growth of the Portuguese navy to the decline of their naval power. We do hope the painstaking research that has gone into this study would throw a flood of light into many a dark corner of our medieval history.

Since Goa happened to be the focal point of Portuguese attention in Asia, it becomes essential on our part to promote research in this direction, so as to present a comprehensive, correct and scientific picture of the entire role of the Portuguese in this hemisphere. It is with this intention the newly established Goa University has launched a comprehensive history of Goa through the ages, a four-volume study in which would emerge the full role of the Portuguese. It is for the same purpose that a volume, *Goa Wins Freedom*, was recently released dealing with the liberation movement. The University had the honour of bringing out yet another volume on *Goan Society Through The Ages*, which examined an aspect of Portuguese influence on Goan society. The present study is the third in the Series, which has concentrated more on Portuguese navigation, the pulsating aspect that lifted them skyhigh. The fourth-volume on cultural aspects of Goa is in the offing, and we hopefully look forward to its release soon, which would cover positive role of the Portuguese influence on Indian life and culture. Thus, the University believing in the dictum that a society that forgets the past will have no future and that not to know the past is for ever to remain a child, is doing its best to reconstruct the past of this region. The main purpose of history is not merely to know and understand the past but also to complete and consolidate whatever good had emerged from the past. It is in this spirit

we have to appreciate the hard work of the present author, a faculty member of the University, who has exerted his utmost to give us a glimpse of the major premise of the Portuguese power in India.

DR. B. SHEIK ALI  
Vice-Chancellor

University Offices  
Bambolim, Goa.  
16 October, 1987.



## PREFACE

The importance of navy was felt right from ancient times when man tried to acquire the art of crossing waters and has been struggling to dominate it. In course of time, navy emerged as a powerful factor and control of seas dominated the mind of man. The Indian Ocean itself has witnessed the rise and fall of several naval powers with changing fortunes. In fact, the history of the Indian peninsula has been intimately connected with that of the Indian Ocean which washed its shores.

There is hardly any period in world history as romantic in appeal as the age of renaissance discovery, when the Portuguese 'fidalgos' spearheaded the European overseas expansion and thus inaugurated the maritime era of history. If the Portuguese had not evolved the great 'nau' which could withstand the buffeting of the 'mysterious Atlantic' tides and carry materials for the long, unknown and perilous voyages, the maritime discovery of the world would have been a mere dream. The Portuguese achievement is a success story which has few parallels. That they achieved what they set forth—the possession of the sources of spice-trade and its diversion to Europe—is a great feat for a country of Portugal's size, population and resources.

The Portuguese navy which set sail under Vasco da Gama to find a new route to the old world for trade and Christianity,



was fully equipped with all types of scientific instruments, geographical informations of the coastal outposts from Ceuta to the Cape of Good Hope and from the Cape to Calicut. Their sea-worthy ships which could withstand the ordeals of high-seas navigation for over seven to eight months at a stretch were piloted by expert navigators well-versed in nautical science, knowledge of tides, winds, currents, landmarks, location of ships in terms of longitude and latitude of a place and the distance covered etc.

The discovery of the sea-route and the arrival of Vasco da Gama at Kappat near Calicut in May 1498 was one of the greatest events for a small but enterprising nation. It opened what Sardar Panikkar called 'the Vasco da Gama epoch of Asian History'. Gama's feat of navigation with hostile crew and sailing at the mercy of winds and storms, was the climax of a century of navigation and exploration masterminded by Prince Henry the Navigator, one of the greatest sea-farers in history. It fired the imagination of poet Camoens who in his immortal epic 'Lusiadas' wove the tale of the exploits of the Lusitanian seafarers into a narration of historical voyage. Gama opened the gates of the 'mysterious East' and thus solved the riddles of centuries. He became the first discoverer of the means of utilizing sea-power as the foundation of colonial power. The discovery made radical changes and Lisbon became the emporium of world trade with the East. Portugal became the mistress of the Eastern sea-route.

In the Indian Ocean, the Portuguese were the first to have understood the concept of sea-power and to have evolved a naval strategy for the collective control of the sea. The mastery of the Indian sea passed on to them when they won a victory of great significance over the Zamorin of Calicut at the battle of Cochin in 1504. Since then, their naval supremacy enabled them to dominate the high-seas which they considered as their own and denied free navigation to their rivals by their own concept of the sovereignty of the sea. However, it is pertinent to note that their hold on the main-land was confined to small coastal areas within the range of their guns of their ships and fortresses. Viewed from this angle, there is a peculiar interest to the story of the Portuguese navigation in India.

The Portuguese empire in India depended on a strong navy, naval organization, sea-force and diplomacy. One of the secrets of their long rule is to be found in their naval organization in India and this aspect in its entirety is discussed in one chapter. Along with the naval organization, policy formed an important aspect. It included the capturing of strategic outposts on the sea-coast, the establishment of the sovereignty of the sea by a system of cartazes etc. Afonso de Albuquerque's well planned policy extinguished the Arab monopoly on the Indian coast. Important forts along the coast, strategically located, guarded their commercial empire. To man them, they had to depend on the converts. To establish their sovereignty and to acquire trading outposts, they had to fight wars. A study of these wars illustrates the supremacy of their navy in Indian waters and highlights their strategy and war tactics. It was mainly for trade that the Portuguese came to India and in that they gained an absolute monopoly. They derived tremendous profit from it and it sustained their voyages and provided a financial ballast to their navy in India. Their supremacy remained so long as their financial position was sound. Technical aspects like nautical science, cartography and shipbuilding have been critically discussed in the book.

Compared to all these, the navies of the native rulers who were required to face the Portuguese, were extremely poor in every respect. Even though attempts were made by the natives to improve their own navies, it fell short of the requirements to face the Portuguese. When the naval development was ignored, the Portuguese empire naturally declined. The Portuguese navy was at the height of its power during the period covered by this book (1497-1600). With the advent of the Dutch in the Indian waters, the Portuguese navy started declining from 1550 onwards. The underlying causes for this decline are discussed critically in the concluding chapter. The Portuguese empire in India continued till 1961 with changing fortunes. In order to understand the secrets of their long rule, it is necessary to have a full grasp of their naval power and strategy. The navy was a bridge over which activities like trade, colonization and evangelization passed, linking the mother country with the colonies. With the coming

in of the Dutch, this bridge became vulnerable.

The Portuguese were the first to come and the last to go and their empire in India which went through many vicissitudes lasted four and a half centuries. This long association has left a deep mark of influence. The Portuguese navy which did pioneering work in Indian waters, has left a permanent imprint on the Indian navy. Their contribution to the knowledge of geography, nautical science, cartography, naval equipments, naval warfare, shipbuilding, oceanic trade, art and architecture etc., were truly immense. The Portuguese language opened the doors of the West and with it brought about a blending of Indian and Portuguese cultures. The various threads of history of our land intertwined with those of Portugal, have produced this beautiful mosaic which is Goa of today.

This book is a revised version of my Ph.D. thesis accepted by the University of Bombay some years back. The study was conducted under the guidance of Dr. B.K. Apte, Retired Professor of History, Centre of Postgraduate Instruction and Research (University of Bombay), Panaji, Goa. He initiated me to a relatively new field of research in naval history, and supervised my work with great zeal and interest. I fail to find words to express my deepest gratitude to him. I express my profound gratitude to Dr. B. Sheik Ali, Vice-Chancellor of the Goa University and a renowned historian for having written a thoughtful Foreword. I am beholden to him for the constant encouragement he has given to me. I am very much indebted to Professor Lourdino Rodrigues, Retired Professor of Portuguese, Dhempe College, Panaji who helped me throughout my work. Professor K.V. Krishna Iyer of Calicut allowed me to use a sketch from his personal collections and for which I am thankful to him. I am particularly thankful to the authorities of the Central Library, Panaji, the Goa Historical Archives, Dr. P.S.S. Pissurlencar Centre of Historical Research (now at the Goa University), the libraries of the universities of Bombay, and Calicut. I am greatly indebted to Dr. Joseph Barros, General Secretary, Institute Menezes Braganca, Panaji; Dr. A. Cherian, Chairman, Board of Studies in History and Archaeology, University of Bombay; Dr. S.D. Karnik, Director, ICSSR, Western Regional Centre, Bombay; Dr. B.S. Shastry,

Head of the Department of History, Goa University, Professor Adi H. Doctor, Head of the Department of Political Science, Goa University and Dr. P.P. Shirodkar, Director of Archives, Archaeology and museum, Government of Goa for having helped me when the work was in progress. I owe a very special acknowledgement to my wife and children for their unwavering assistance and encouragement, understanding and patience.

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—K.M. MATHEW



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## PART I

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## THE NAUTICAL KNOWLEDGE OF THE PORTUGUESE

### Prince Henry the Navigator and the Sagres Nautical School

Prince Henry the Navigator known to posterity as Infante Henriques, was born on 4th March, 1394. In 1418, at the young age of 24, he renunciated the world and retired to the promontory of Sagres in the bay of Lagos and there he spent the remaining part of his life. However, it was after the humiliating defeat of the Portuguese expedition to Tangier (1437) that Henry "commonly remained there, sacrificed everything and led the life of an austere monk fasting almost half a year,"<sup>1</sup> Sagres, which juts out into the Atlantic on the extreme South-West corner of Portugal, became the base of his maritime operations and it was from here that he organized the voyages of discovery with the final goal to find a sea-route to India. Henry could not have found a more inhospitable corner of the country to pursue his activities. No doubt, to a man so much interested in sea and ships as Henry, the sight from Sagres would have been simply exhilarating with ocean on three sides.

Henry founded at Sagres the first nautical school and observatory which was in fact world's first academy of nautical, astronomical and cosmographical science, marine mathematics and chart-making. This school became the centre of geographical studies and plotted through the history of

the world, Portugal's maritime course and it was here that the Portuguese nautical science was born.<sup>2</sup> Henry invited here all kinds of scholars and gave them patronage. They included astronomers, cartographers, mathematicians and shipwrights etc. from all over Europe. Sagres became a meeting place for the most skilful pilots and scientific experts. Henry selected his collaborators without any consideration of caste or creed and they included Catalans, Jews, Arabs, Genoese and the Venetians.<sup>3</sup> He selected the Jews because they had enjoyed greater freedom to travel in the interior of Islamic Africa. The expert team included Jaime Cresques, the distinguished Jew geographer from Majorca and son of the famous Abraham Cresques who had made the 'mappa mundorum'. Jaime was "an expert in the art of navigation who made charts and instruments and taught his science to the Portuguese pilots." The Majorcan school of cartographers had already developed mathematical tables to help in the measurement of distance at sea and these new methods were applied at Sagres. The Sagres team also included Fr. Egidio, the learned mathematician, Patricio Conti, a traveller who had visited the East upto India, Pilot Morales, Master Pedro and Nicolo Conti, the chart designer and traveller.<sup>4</sup> These experts examined charts and 'roteiros' (itineraries) and handled complicated instruments like astrolabe and mariner's compass in order to improve them and followed the course of stars in the sky.<sup>5</sup> They discussed the possibility of sailing round the African continent in order to reach India and made the strongest and the fastest ships capable of braving the turbulent Atlantic Sea. They trained Pilots and Cartographers and made nautical instruments. Columbus, Pedro Alvares Cabral, Duarte Pacheco, Fernao Magalhães and João de Castro were all members of this nautical school which revolutionized the course of nautical science by the systematic investigation of the oceanic problems. "But for Infante Henriques and his observatory at Sagres, Columbus would not have discovered America and Gama doubled the Cape of Storms and show to the amazing nations the road to India."<sup>6</sup>

Henry remained an experimentalist throughout his life. For about forty-two years (1418-1460), he played an outstanding

role with his firm conviction, never-wavering tenacity of purpose and initiative. A man of high aims, Henry desired to



*Fig. 1. Henry the Navigator.*

know the secrets of sea-currents and winds which had trembled the mariners.<sup>7</sup> With his scientific curiosity, he visualized the

boundless possibilities that lay in maritime exploration. He believed that Africa was circumnavigable and that India could be reached one day. Therefore, he dedicated himself to the work of perfecting the process of navigation and utilized all his talents, labours and the huge wealth in finding a maritime route to India.<sup>8</sup> Year after year, he sent expeditions that scanned the vast, endless ocean and this inspired a generation of pilots and adventurers who in turn made significant contributions. Henry's chronicler Gomes de Azurara said, "how many times the sun found the Prince sitting at the spot where it had left him the day before."<sup>9</sup> Henry developed the art of navigation and shipbuilding, opened up new horizon for Portuguese trade, encouraged colonization and left behind a great legacy which stimulated others to take the sea-career. With his motto '*talent bien faire*' (desire for high feats), he carried out geographical researches and a techno-naval revolution inaugurating the Portuguese Renaissance which culminated in the discovery of the sea-route to India later.<sup>10</sup> Thus Henry laid the foundation stone of the edifice of maritime Portugal and gave an impulse for oceanic research. His death at Sagres on the 13th November, 1460 at the age of 67 was an irreparable loss to the world of nautical science.

### Nautical Astronomy in Portugal

Astronomy was taught in Portugal since long time. *Libros del Saber Astronomia* (1252), an important work on astronomy written by great peninsular astronomers, co-ordinated all the knowledge of astronomical science till then.<sup>11</sup> Besides many astronomical details, it described the nautical instruments, their construction, and dealt with various aspects of navigation by astronomy. This work had exercised considerable influence on the Portuguese nautical science. The University of Coimbra, founded in 1290 by King Diniz, also encouraged the study of astronomy in Portugal.

*Tabulae Astronomicus* was a work of great importance in the history of Portuguese nautical astronomy. It included much geographical and cosmographical data, tables on eclipses, tables of night hours, astronomical tables for calculating lunar, solar and planetary years. Even though it was not a book on

navigation, it constituted a work of permanent value in the history of Portuguese nautical science.<sup>12</sup>

*The Almanach of Coimbra* (1321-1329) was another significant work that contained both astrological and astronomical particulars. Its nautical part had astronomical tables to determine the position of the stars, to find the visibility of the Moon and its place at night on each day of the month, tables to determine the eclipses and tables of longitude for seventy places of the world then known.<sup>13</sup>

*Leal Conselheiro* written by King Duarte himself had explanations to find out the time at midnight and at morning by the observation of the constellation of the 'Little Bear'. It also had a 'regiment' (rule) of the hours by the Pole star and its Guards, Ibn Verga also wrote a treatise in 1457 on 'astronomy'.

Thus there is no doubt that the Portuguese knew how to steer by the Sun. They must have known for long the Arab sea-faring in the Indian Ocean by reading of the fixed stars. D. Pedro, the traveller-Prince must have himself heard about it during his travel to the East. During the time of Prince Henry, the academy of astronomy imparted knowledge of the position and movement of the stars.<sup>14</sup>

### **Astronomical Navigation and the Evolution of Portuguese Nautical Science**

The study of astronomical navigation of the Portuguese is rendered difficult as the original materials of the 15th century nautical development have been all lost. But there are some indications for a general understanding of nautical astronomy in Portugal. Throughout antiquity and upto the 15th century, ships were guided from port to port by the sailor's familiarity with winds, currents, sea-bottom and land marks. The early Portuguese sailors navigated in the North Sea by the Viking's Oceanic Methods without any charts or maps, but by the sounding of the sea, observation of the sea-floor and flight of the birds etc.<sup>15</sup> But as they sailed southwards in the high seas of the Atlantic, they found that their skill and memory were inadequate. In such oceanic navigation, the land may be out of sight for months together when the ship sailed away from

the shore. The fear of the Portuguese sailors to be lost on the high seas led them to trust in the heavenly bodies. They had to determine their course by the stars. This was the beginning of astronomical navigation, though very rudimentary.<sup>16</sup> In fact, a need was felt to invent new methods and determine latitude and longitude. It was here that astronomy came handy. But it is not known when exactly the Portuguese began practising astronomical navigation, though it is evident that it began during the life time of Prince Henry.<sup>17</sup>

The Portuguese navigational art had passed through three stages—'*marinharia*' (mariner's art), '*arte de navegar*' (art of navigation) and nautical science. The term *marinharia* dated from the time of Prince Henry till the mid-16th century when there began the art of navigation which continued upto the 19th century and perfected into nautical science. The term '*arte de Marinharia*' was used in the discoveries as it corresponded for a long period with the Portuguese routes of ship and navigations.<sup>18</sup> The expression *arte de navegar* was used by Pedro Nunes, Lavanha and others and it developed little by little into a standard nautical science which only much later, other Europeans perfected into its present extent.<sup>19</sup>

The very geographical position of Portugal at a strategic point for voyaging ships was quite favourable for the development of navigational techniques. From the University of Coimbra came many of the Portuguese techniques with significant knowledge found in the nautical art of discoveries. But as the Portuguese sailed further south over the curve of the terrestrial globe, the Pole Star was invisible and hence there was a need to find new navigational methods to meet the new situation. They had to invent, discover, create and perfect the system of winds, currents, cartographic representation of earth, navigational instruments, types of ships and their rigging, character of the sea-bed, configuration of land, knowledge of the stars, rules to find out their elevation, method of determining latitudes and longitudes at sea by astronomical methods and the equipment for ships for long voyages in various elements.<sup>20</sup> There was also the need of providing the mariners with some grounding in astronomical knowledge and the need to simplify observation

instruments, work out declination table and lay down rules for observation and calculation. It was in these circumstances that nautical astronomy entered on its second phase in Portugal.<sup>21</sup>

It is now an accepted fact that the priority of creating and practising astronomical navigation belongs to the Portuguese and its merit lies in not making new astronomical discoveries but in making available to mariners the existing knowledge. For the first time, there was collaboration and contact between astronomers and navigators and the result was the birth of astronomical navigation in which the Portuguese made a revolution in the history of Western navigation. The Portuguese were the first to practise systematic navigation sailing far away from the land for a long time. The Portuguese navigational ideals formed the foundation of their astronomical navigation.<sup>22</sup>

The Portuguese developed nautical science both theoretical and practical to such an extent that it enabled them to navigate in the open high-sea of the Atlantic for the first time in history. They discovered not only new lands but also the greatest part of the route of the trans-oceanic navigation by the study of the physical agents of the surface of the ocean. This is one of the features, most interesting, but less known of the Portuguese nautical science. The superiority of their nautical science is now admitted by scholars who appreciated the richness of their methods and originality. The evolution of their nautical science kept pace with discoveries and enabled great discoveries with all its scientific, political and social consequences.<sup>23</sup> The '*doutores astrologos*' of the Sagres nautical school were pre-occupied with finding their way on the high seas by stars. Therefore, it is quite clear that "high-sea navigation was already being practised without any doubt in the life time of Prince Henry."<sup>24</sup> The statement of Ibn Majid, the Arab pilot who guided Vasco de Gama from Melinde to Calicut, that "the Firinghis have contributed on many points for the development of the Arab knowledge of navigation" and his advice to consult the Portuguese "as presently the same art came from the Firinghis," show the high level the Portuguese



nautical science have attained subsequently in the 15th and 16th centuries.<sup>25</sup>

Oceanic navigation based on logs, charts, magnetic compass and celestial observation was genuinely Portuguese. But it will be an exaggeration to say that all the nautical techniques originated in Portugal. In fact, the astronomical knowledge of the Iberian peninsula was of Muslim origin. At the same time, it can't be said that the Portuguese availed themselves of the scientific techniques used by the Arab mariners who were superior to all others in this field.<sup>26</sup> The Portuguese inherited from the Italians and the Catalans the method of navigation, from the Arabs and Jews of the Iberian peninsula the astronomical science, from Italy and Spain the idea of geographical expansion, but the plan of all these was drawn and executed by themselves. "The Portuguese conception of geography began in the experimental class room of the seas where it was helped by.....pilots and cosmographers and mathematicians etc. The Portuguese navigators were.....following pre-determined routes that had been worked out with all the resources of contemporary science....."<sup>27</sup> During 1471-1475, for the crossing of the Equator, the navigational methods were improved and nautical '*regimentos*' (rules) were drawn up.

The main difference between the Portuguese and Spanish navigation was that the former had practical experience based on nautical science, whereas the latter had hypothetical knowledge based on imagination and erroneous deduction about a maritime route of India.<sup>28</sup> Therefore, it is no wonder why John II who himself was very much interested in the problems of nautical astronomy, rejected the scheme of Columbus to reach India by a westward voyage. Vasco da Gama and Cabral would not have embarked on long voyages, if they were not adequately informed of the various aspects of their voyages. There were many in Portugal who devoted themselves to the study of nautical astronomy so much so that by 1538, the Portuguese nautical science reached its greatest brilliance through the works of Pedro Nunes and his disciple D. João de Castro. With them, nautical science may be said to have reached the culmination of its develop-

ment in Portugal when they gave to the world their masterly lesson in the nautical art.<sup>29</sup>

### **Nautical Instruments of the Portuguese Discoveries**

In the Middle Ages, mariners steered their ships by the direction of the wind. The Sun, stars and the oral or written accounts handed down from generation to generation by the navigators, helped them to take their ships in the desired direction. The Portuguese sailors depended mainly on the oral information about coast lines, harbours and regular sighting of the land. The only nautical instrument on board a ship was the plumb, a piece of lead attached to a line.<sup>30</sup> The depth and smell of mud sticking to the bottom of the plumb could tell an experienced pilot how far he was from a particular spot from the coast.

The mariners used the lead lines to gauge the depth of the sea and dead-reckoning to gauge the distance covered. Dead-reckoning was a complex process involving the tossing of a chip of wood off the bow of the ship and timing it to the stern.<sup>31</sup> Later, the chip was attached to a line called 'log line' where knots were tied. The speed with which the knots slipped through the fingers of the sailor holding the log line, gave the speed of the ship. To make effective use of the log line, accurate estimation of time was necessary. The hour-glass was the standard time-piece. It was designed to allow the sand to run from the upper to the lower section in half an hour. This process was repeated. In fact, the minding of the hour-glass was one of the tasks assigned to the young Pages who were taken on expeditions.

The Portuguese mariners used two types of nautical instruments: (i) astrolabe and quadrant which gave them directly the angular height of the star observed, (ii) and balestilha and tables of India which gave it by means of two linear elements.<sup>32</sup> The Sagres nautical school employed proper men to make proper instruments so that "the sailors were instructed before they set out, provided with instruments, astrological and geometrical tables."<sup>33</sup> With these instruments, the Portuguese braved into the open sea without the fear of loosing whether on the outward or on the homeward

journey. But still, during the forty-two years (1418-1460) of Henry's maritime life, hardly  $18^{\circ}$  could be passed on the West African coast and this slow progress was partly due to the rudimentary and imperfect nature of the nautical instruments.

(i) *Astrolabe*

Dead-reckoning, sighting of land and hour-glass which were enough for navigation in the Mediterranean were insufficient for venturing into the turbulent waters of southern Atlantic. The correct determination of latitude was necessary. Astrolabe came for this purpose.

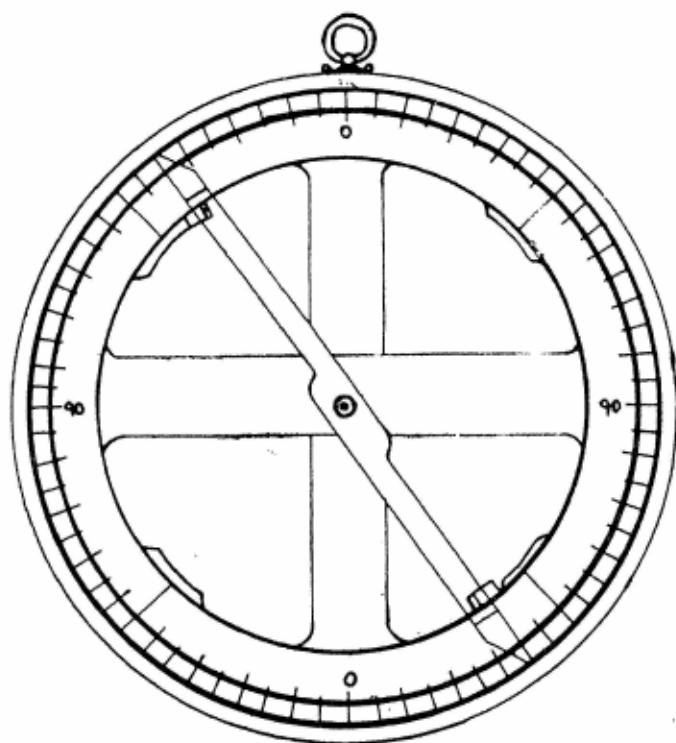


Fig. 2. *Astrolabe.*

Astrolabe was a very old instrument used in the geometrical study of the celestial sphere. It was brought to the Iberian

peninsula by Arabs who knew it first.<sup>34</sup> But this astrolabe was quite useless for navigation and the mariners naturally needed a more simple instrument in order to obtain the height of the star during the voyage. Therefore, the experts of the Sagres nautical school simplified it progressively for use in high-sea navigation.<sup>35</sup> "It was in the kingdom of Portugal that it (astrolabe) was first used for navigation."<sup>36</sup> The Portuguese mariners started using it after the discovery of Madeira islands in the epoch in which the Jew mestre Jacome, an expert in instruments and charts was engaged at Sagres school to make simple astrolabes. Bartholomeo Dias used it during 1487-1488. Astrolabe gave Vasco da Gama facilities during the historic voyage of 1497-1499, not known to Henry earlier. In 1519, Fernão Magalhães carried with him six metal astrolabes, one wooden astrolabe, besides six pairs of mariner's compass, twenty-five mariner's needles, eighteen sand clocks, twenty-five wooden quadrants and three mariner's charts.<sup>37</sup> D. João de Castro during his voyage to India in 1538 used an astrolabe. He reported in his *roteiro* from Lisbon to Goa that astrolabe was "the best of all instruments".<sup>38</sup> During his voyage to India in 1575, Pilot Vincent Rodrigues had few sample instruments with him such as astrolabe, compass, quadrant, chart, cross-staff, *roteiros* and an hour glass.<sup>39</sup>

Astrolabes were made of either wood or metal. Vasco da Gama, during his voyage of 1497-1499, used a wooden astrolabe of three palms diameter and also some of brass, light and small. He used them on landing at the bay of St. Helena.<sup>40</sup> The astronomical observatory of the University of Coimbra has a heavy nautical astrolabe made of brass, half a metre in diameter, one centimetre thick and ten kilograms weight. Pedro Nunes, the Jew nautical expert of Portugal suggested in his *treatise on twilight* (1542) for the first time an ideal graduation of the astrolabe, so that the height and distance of the stars could be measured in minutes and seconds.<sup>41</sup> The astrolabe was graduated from 0° to 90° in the opposite direction so that direct reading of the instrument gave them the height of the Pole.

To measure the altitude, the astrolabe was held hanging

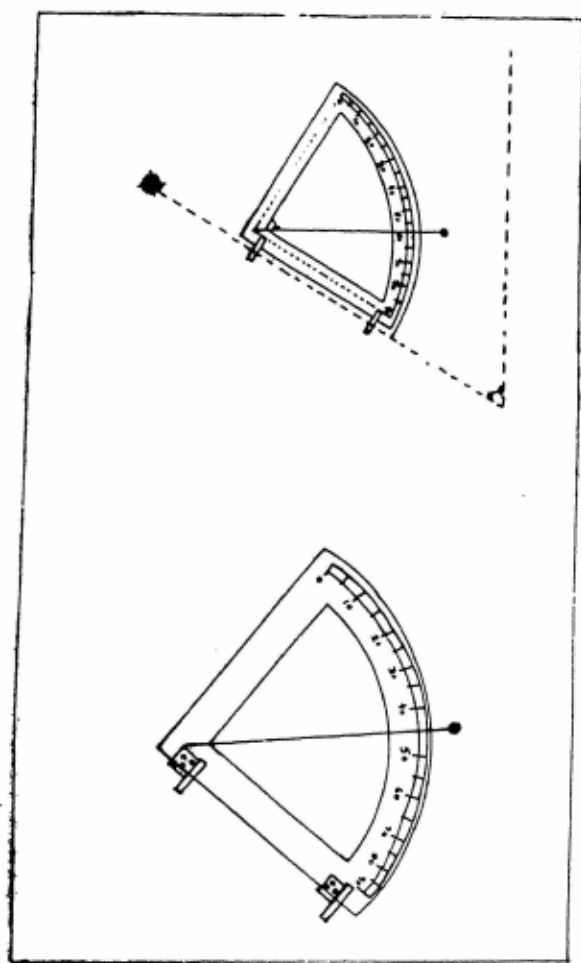
from hand by its ring on a proper place of the ship, preferably near the main mast, till it reached equilibrium. Big brass astrolabe was hung by a rope from three sticks joined on the upper part like a crab. From the findings, tables were calculated. Once they had consulted the tables of the Sun to find out how far the Sun was from the Pole, the latitude measurement could be read on the astrolabe, when added or subtracted from the angle between Sun and the Pole and conversely from the equator.<sup>43</sup> The latter was the latitude. This could be calculated just by any one knowing to read, add and subtract. Even an ordinary sailor could do it. Martim of Bohemia, the German on the board of mathematicians appointed by John II, made some useful modifications in 1480 and made astrolabe really useful for navigation. Later D. João de Castro made suggestions for its use when the Sun was close to the heads.<sup>43</sup>

#### (ii) Quadrant

There were two types of astronomical quadrants: (i) the '*novus*' (new) used specially for solving astronomical problems and (ii) 'the *vetus*' (old) used for finding out the time and to solve the geometrical problem.<sup>44</sup> The Quadrant had the shape of a quarter circle with a graduated limb from 0° to 90°. It was from such astronomical quadrants that they arrived at nautical quadrants by simplification. The Portuguese mariners adopted the nautical quadrant (if not invented) for maritime observation probably after Jew Mestre Jacome was engaged at the Sagres nautical school. The well known astronomical work *Libros del Saber Astronomia* (1277) had a chapter on 'Libros del quadrante', dealing with the construction of wooden quadrante and it must have influenced Henry very much.<sup>45</sup> Diogo Gomes was credited with the earliest nautical use of a quadrant in his voyage in the Cape Verde islands.<sup>46</sup>

The quadrant was usually made of wood and hence light. It satisfied the navigators' requirement to obtain the latitude with the approximation of one degree.<sup>47</sup> The meridian height of the Sun was taken by the quadrant in order to get the geographical latitude of a place situated to the north of the Tropics. But it was unable to do all the functions of an

astrolabe. Therefore, the latter prevailed upon the quadrant in the maritime enterprises of Portugal.



*Fig. 3. Quadrant.*

(iii) *Balestilha*

Some device was necessary to measure the angle of the Sun from the horizon and thus to estimate the number of degrees south to which the mariner had reached. It was for this purpose that *balestilha*, a simplified version of the astrolabe, was

devised in the form of a cross-staff. Balestilha which was used for taking the height of the star derived its name from *balhesta* or *besta* (cross bar). Jew Mestre Ben Gerson described it for the first time and called it as '*baculus Jacobi*' (Jacob's staff).<sup>48</sup> The Portuguese received it from other Europeans in the beginning of the 16th Century and continued to use it till the end of the 18th Century. *Livro de Marinharia* which had referred to it had a '*regimento*' to take the Sun by means of a balestilha.<sup>49</sup>

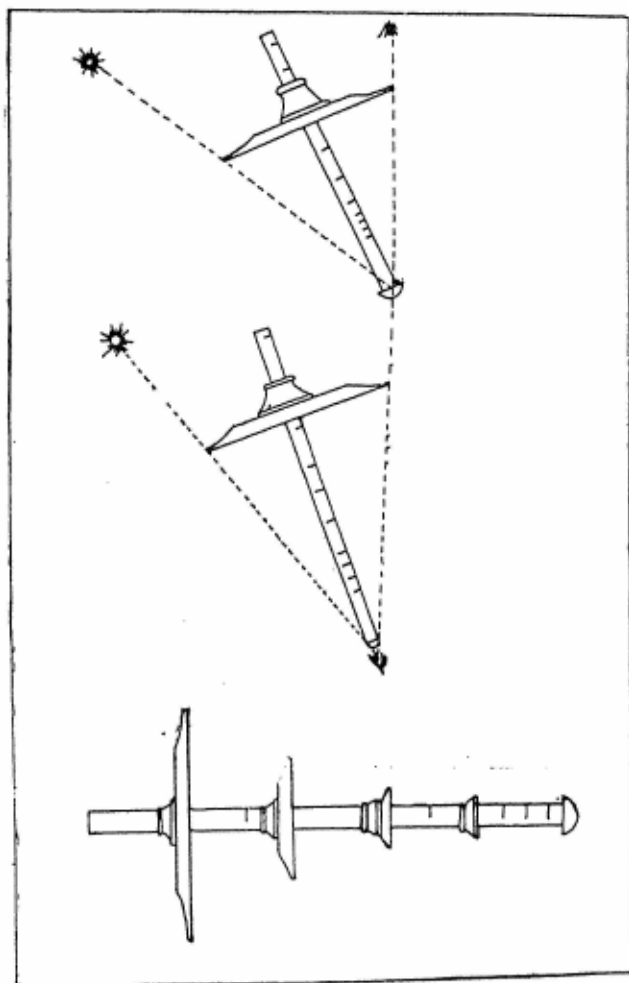


Fig. 4. Balestilha.

Pedro Nunes felt that it was an adequate instrument to measure the distance between two stars.<sup>50</sup> D. João de Castro preferred the use of Balestilha in order to avoid doubts resulting from the use of astrolabe for taking the Sun near the Zenith.<sup>51</sup>

The balestilha consisted of a rod three or four palms long named '*Virote*' (short staff) on which passed perpendicularly another small rod called '*Soalha*'. Both were divided into equal parts. In order to take the height of the star, one placed close to the right eye, one of the ends of the '*Virote*' and on it the '*Soalha*' is moved by its lower extremity till the horizon is sighted and by the upper extremity is seen the star. The angle that is formed, is the height of the star. Prince Henry encouraged his Captains to take this simplified instrument with them and take reading wherever possible from dry land rather than the rolling deck of the ship.

(v) *Tables of India*

The Arab mariners of Cambay performed navigation in the Indian Ocean by the star with an instrument consisting of three tables. The Arab Pilot Ibn Majid himself showed to Vasco da Gama an instrument of three tables of this kind. Dr. Luciano Perreira Da Silva identified this with '*Kamal*'. This *Kamal* was provided with a rope graduated by means of knots to determine the heights in *isbas* (each *isba* being equal to 32°). Gama brought such an instrument from India to Lisbon for graduating into inches.<sup>52</sup> Thus, in course of time, the *Kamal* was introduced. The working of *Kamal* was very simple. The observer held the rectangle in the left hand and placed it vertically in front of the right eye. With the right hand, he stretched the string held in the teeth by one of the knots and looked at the star and horizon. Each string had knots at convenient distance representing the different latitudes usually needed. In 1500, Cabral took to Portugal a '*Kamal*' of this type and it had seven knots corresponding to the different Indian places such as Bassein etc.

The *Tavoletas* were used by João de Lisboa and the 'tables of India' were referred to by Master João in the voyage of Cabral.<sup>53</sup> In fact, the *tavoletas* were *Kamals* with knots graduated in degrees to obtain the height of the stars observed.



Pedro Nunes invented a nautical instrument called the *graduated ring* and cosmographer J.B. Lavanha made another instrument of unknown name. Simão de Olivera was credited with yet another one called *armilla nautica*.

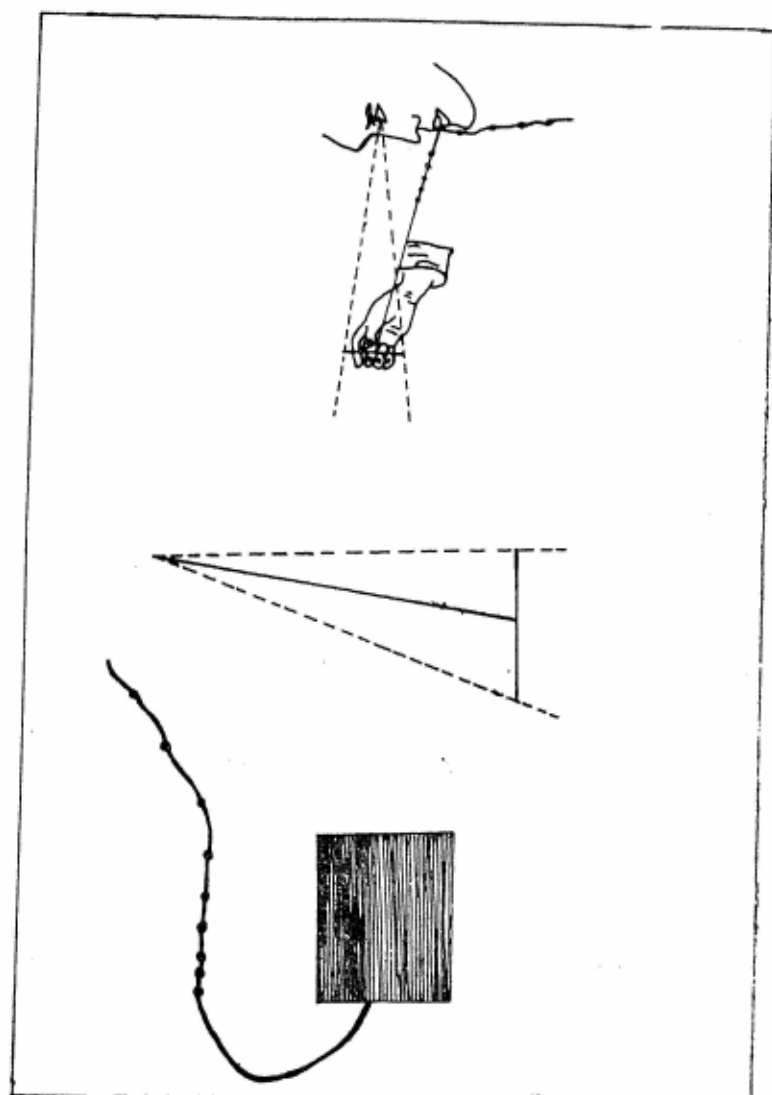


Fig. 5. Tables of India.

(v) *Magnetic Needle*

The exact date of invention of the magnetic needle is yet unknown. There are five independent stages in the discovery of the magnetic needle:<sup>54</sup> (i) the discovery of the powers of the lodestone to attract iron, (ii) the realization that this power could be transferred by rubbing from the lodestone to iron itself, (iii) the iron thus magnetised would point to the North, if floated in same way, (iv) the development of placing the magnetic needle on a pivot, and (v) floating on a pivot and thus reducing friction and oscillation. It is equally difficult to know how and where these stages of discovery were accomplished. The Chinese knew its use as early as the 3rd century B.C. It passed from the Chinese to the Arabs and then the Europeans knew it in the 12th Century. An English monk Alexander Neckham first mentioned about a pivoted compass needle in 1187.<sup>55</sup> A Frenchman wrote a treatise on compass in 1269. Progress was made in the development of the compass at Amalfi in the 14th century.

Thus it is clear that the compass was well known to nautical circles by the time Prince Henry started sending his first expedition. Compass was more an object of curiosity than use, but it was successfully applied to the progress of navigation. During the time of Prince Henry, the compass was brought into general use and it increased the competency of the Portuguese mariners. The Pilots were very careful in watching the compass needle. A contemporary English document said... "Portugalls doe exceed all that I have seen, I mean for their care which is chieftest in navigation. And I wish in this...we should follow their examples. In every ship,...upon the half deck or quarter deck, they have a chair or a seat, and of which whilst they navigate, the Pilot or his adjutants never depart, day or night, from the sight of the compass..."<sup>56</sup> The French traveller, Francisco Pyard Laval saw that the Portuguese Pilot never left his place on the poop as he always had to observe his needle and compass. In this, there was a second Pilot to help him.<sup>57</sup>

D. João de Castro was the first to study and record the so-called '*magnetic deviation*' at the sea during the course of his voyage to India. He noticed very minutely on the 5th August,

1538, the deviation of the magnetic needle about which the Pilots had so often complained. Castro realized that iron whose source attracted the needle, caused deviation.<sup>58</sup> Thus he studied the problem one hundred and twenty-eight years before Guilherme Diniz (1666) who was reported to be the first in history of navigation to sense the magnetic deviation at least vaguely.<sup>59</sup> By his experiments, Castro concluded that variation was not the function of the differences of meridians. He verified the mistake of the wrong method of determining the longitude by variation of the needle. He had also found out that the distance from East African Coast to India was less than that was shown on the charts.<sup>60</sup> By studying the variation of the magnetic needle and magnetic phenomena, Castro inferred conclusions of a very high value for the progress of navigation in his time. He was the first to carry out the study of geomagnetism and its influence on navigation.<sup>61</sup> During his voyage, he studied the variation with all the circumstances explaining the causes and laws of the magnetic phenomena. On his way from Goa to Diu, he recognized and recorded local attraction at the Bassein river for the first time on the 13th December, 1538.<sup>62</sup> His efforts brought great progress in the science of magnetic declination and it was a definite step in the progress of Portuguese nautical science. Pilot G.F. Reimao during his voyage to India in 1595 on ship 'S. Pantaleao' observed this phenomena of the needle and he recorded it. In his return voyage in 1596 also, he recorded the findings of the needle.<sup>63</sup> In 1597, Pilot Reimao recorded the readings of the needle in his diary on board ship 'S. Martino.'

It may be that the Portuguese must have foreboded the variation of the magnetic needle since the 14th century. The terms '*north-easting*' and '*north-westing*' exclusively applied for the variation of the needle to east and west, were also due to the Portuguese mariners. Once the magnetic variations were known, the methods to measure it went on improving. Consequently, the disposition of the needle improved, as dealt with by Pedro Nunes in the invention of his '*Instrument of Shadows*'.<sup>64</sup>

#### *Determination of Tides, Currents, Winds and Storms*

Tides of sea-water is a phenomena observed from the very

early times and so also the relation between the high tide and low tide and the position of the Moon in the sky. A 14th century Catalan chart dealt with the relation of the tides with the movement of the Moon. The atlas of Portuguese cartographers like Lazaro Luis, Fernao Vaz Dourado and others contained drawings of a wheel with illuminations which gave very useful particulars to determine the time of the tides.

During the 16th century, the Portuguese knew how to find out the time of the tides as well as the condition of the tide at a particular point. Duarte Pacheco, the hero of the battle of Cochin (1504) dealt with this interesting problem of tides in a masterly manner in chapters eleven and twelve of his *Esmeraldo*.<sup>65</sup> In the midst of the battle, he found time to study the phenomena of tides and realized that tides were connected with the movement of the Moon. In the prologue of the book, he referred to the tides necessary to enter and leave the bars and mouth of river for the purpose of maritime attacks. Thus he wrote from his experience especially at the fords of Pallanganad and Palluruthi.<sup>66</sup> Later, D. João de Castro also sounded the bar and waters of Diu (1538-1539) and studied the equinoctial tides there.<sup>67</sup> He had often observed that on the Indian Coast the high tide started before the Moon rose on the horizon during the whole year, but while at Bassein on the 3rd February 1539, he noticed that the high tide started when the Moon was already at 44° above the horizon.<sup>68</sup>

Tides were calculated by *rosa horaria* (equatorial) and by Calculus. Joao de Lisboa studied the method of *rosa horaria* and this required the knowledge of the number of days elapsed from the new Moon i.e. the age of the Moon to which corresponded practically equal number of the quarters in the *rosa horaria* which had thirty-two quarters. Calculation of tides by Calculus was a simple method. The time of high tide was found out by this method. Then they found out that the next high tide of the same day took place at six hours from the high tide of the same day.<sup>69</sup> The Portuguese mariners used also the rhumbs of the Moon to show the different phases of the tides. *The Art of Navigation* written by Pedro Nunes

contained a table giving the high tides of the same port for different ages of the Moon.

The Portuguese mariners also discovered the regular maritime currents and other phenomena. For the India voyages, the current to the east of Medagaskar was already recognized and cited by Diogo Afonso in his '*roteiro*' (1536) saying that along the island, water ran to the north-east and then to the south. Castro's accounts of the currents of the Indian ocean and of the Arabian sea are quite interesting. He collected complete knowledge of the monsoon.<sup>70</sup> This shows the practical observation of the Portuguese navigators.

The frequent and long voyages of the Portuguese mariners in the Atlantic and Indian Oceans enabled them to study and develop on the knowledge of winds especially of the Indian ocean received from the Arab mariners.<sup>71</sup> This enabled them to adopt more suitable routes. As the ships sailed down the African coast, the opposing winds severely limited their further voyage. Therefore, they found that if they sailed away from the coast with the wind on their beam, but gaining in latitude, they could come to a zone of variable winds which would enable them afterwards to beat back to Portugal. This was known as '*Volta do lar margo* (round route of the high seas and long ocean track) which was a great navigational feat in respect of wind.<sup>72</sup> Castro studied about the winds in order to enable the ships to sail to India throughout the year. Similarly the Portuguese mariners could also determine storms. The *roteiro* of Gaspar Manuel (1604) recorded the signs of storms such that "the setting Sun inflamed in blood, lightning by the same side and calm wind indicate storms. Heat and swollen sea indicate tempest. The flock of birds in the sea denotes storm...lightning at night and day denotes tempest".<sup>73</sup>

#### Location of Land by Birds and Sea-Weeds

Throughout antiquity and down to the 15th Century, ships were guided from port to port by the sailors' familiarity with the prevailing winds, sea-bottom and suitable landmarks.<sup>74</sup> Portuguese *roterios* like *Livro de Marinharia* by João de Lisboa give detailed descriptions of various landmarks especially on the coast of eastern sea. He graphically described the land-

marks of the Cape of Good Hope. "...When you are making for the Cape of Good Hope...you will see a very large round hill...towards the East, you will see a large mountain with several peaks. Beyond this, there is a narrow strip of land with several hills,...and the Cape ends..."<sup>75</sup>

The Portuguese Pilots noted carefully in their Journals the natural phenomena which enabled them to check up with a standard 'roteiro' from a previous Journal. They attached great importance to the birds sighted during the voyage as they helped them to guess the location of the ship or to calculate the distance to the land. The roteiro of Diogo Afonso (C. 1536) gave the earliest reference to birds. Castro recorded the observation of black, white and grey garajaos during the course of his voyage to India in 1538 and subsequently he warned the mariners against any lack of observation of such signs of the land by birds.<sup>76</sup> In 1575, Pilot Vincent Rodrigues too relied on the various kind of birds sighted during the voyage.<sup>77</sup> His roteiro of 1591 referred to the signs of land by birds. Pilot G.F. Reimao during the course of his voyage to India on board 'S. Martinho' in 1597 collected information of birds and the entry in his diary on 17th January, 1598 is typical of the interpretation of the nature's signs and shows the keen observation of the sea around. "On seeing these signs together with men-of-war birds and winds in the East, you should try to work South-Westwards...and. although likewise gulf weed of this coast, it is not found together with sea gulls and men-of-war birds."<sup>78</sup> Other diaries also record the signs of birds. The fact that certain kinds of birds like Velvet-Sleeves, hawk, skylark, sea-gull, White Seamen, etc. were seen at certain places only enabled them to identify such lands. During his voyage to India in 1538, Castro noticed a kind of typical sparrow called 'Pardelha'.

Signs of the land were given also by the colour of the water near the rivers and at continental terminuses. In his voyage to India in 1575, Pilot Vincent Rodrigues relied on the colour and run of the water and the kind of sea-wood. Other regional signs of animals, algae and fishes, phosphorence of water, nature of depth, currents, conditions of atmospheric intensity and direction of wind and all the signs observed in the sea,

sky and air helped them to verify places. But the main signs were supplied by maritime plants which supplemented the signs provided by birds. G.F. Reimao also referred to algae, sea-weed and other maritime plants and opined that "from 8° to between 9° and 10° latitude...you will find gulf-weed and branches of sea-weed."<sup>79</sup>

### **The Portuguese Regimentos (Rules)**

The Portuguese have considerably improved the navigational methods during the period of discoveries, by incorporating the findings of the best astronomers. They have also drawn up the well known 'regimentos' which were subsequently used by other European nations.<sup>80</sup>

#### *(i) Regiment of the Pole Star*

The navigators used the Pole Star (which was the brightest and nearest to the Arctic pole) to know the height of the pole or latitude in the Eastern seas. It was measured in isbas or fingers and in the 16th century, the Polar distance of the pole star was two isbas or 3°.2'.<sup>81</sup> In this way, the Portuguese navigators established a regiment of the Pole star (North-Star) as it appeared in the Manual of Munich of 1483 or 1484.

#### *(ii) Regiment of the Night Hours by the Pole Star and the Guards*

In Portugal, the 'little Bear' (Ursa Menor) was used to determine the night hours. When the 'advance Guard' moved around the Pole, it looked like an unique needle of a huge clock and hence it was used to find the night hours, at least since the 13th Century. *Leal Conselheiro*, an astronomical work written by king Duarte also dealt with this and invented a system of the point of compass in order to help to determine the night hours.

#### *(iii) Regiment of the Height of the Pole by the Southern Cross*

The Portuguese identified the austral constellation, the Southern Cross and worked out a regiment of the height of the pole by it for navigation in the southern hemisphere. Pilot

Cadamosto named it as 'Cruzciro' in 1455. Pilot Pero Anes who voyaged to India in the fleet of Viceroy Almeida in 1505, referred to it as 'South'. He along with João do Lisboa carried out joint experimentation of this regiment by the end of 1507 and subsequently they were reproduced in all the later works.

The Portuguese formulated a regiment of leagues for giving the distance covered in various directions according to each degree of latitudinal variations.

(v) *Regiment of the Height of the Pole by other Stars*

On landing, the Pilots used to observe other stars which enabled them to fix the exact moment of the day in the maximum or the minimum rising of the horizon. *The Livro de Marinharia*, a precious nautical work refers to three stars—*estrela de barca*, *Canopus* and *alphaca* besides six other stars with their Arabic, Latin and Portuguese names.<sup>83</sup>

(vi) *Regiment of the height of the Pole by the Sun*

The Sagres pilots studied experimentally the possibility of finding out the ship's latitude in good weather by the observation of the Sun and thus they got very important results in navigation, like not over-shooting the ports etc.<sup>84</sup>

(vii) *Regiment of the Astrolabe (1483)*

The Mathematical Board appointed by John II prepared a regiment of the astrolabe and thus showed their knowledge of cosmography, use of astrolabe and table of solar declination. It contained rules for determining the latitude by the height of the Sun and the rule of the Pole star to measure the route converged.<sup>85</sup> It also contained a list of latitudes, a calendar with the table of the position of the Sun in the sign of Zodiac and a calendar of tides.

**Solar Tables**

The calculation of the height of the Pole at mid-day required the knowledge of declination of the Sun. By repeated solar observation, they prepared, after years of study, a regiment of the Sun which was essential for the voyages. The first nautical solar bissextile table was very simple and primitive, as



was the case of navigation then. It showed for each day the place of the Sun in full degrees and minutes.<sup>86</sup> Jose Vizinho, the Jew physician made the second solar bissextile table for one year (March 1483 to February 1484) and this was used subsequently by other navigators including Bartholomeo Dias and continued till the historic voyage of Gama. Vizinho made a quadriennial solar table for 1497-1500 and this table was used by Gama and Pedro Alvares Cabral.<sup>87</sup> During the voyage, Gama landed at St. Helena island to take the height of the Sun. Pedro Gaspar Nicholas made a four yearly solar declination table for 1517-1520 and it became classical and was subsequently used till the mid-16th Century.<sup>88</sup> Pedro Nunes made a solar table for 1537-1540 and João de Castro used it during his India Voyage in 1538. *Reportorio dos tempos* (1518), an astronomical calendar made by Valentine Fernandez played a great part in the development of Portuguese nautical astronomy and it contained practical rules of navigation, solar declination table and other particulars for the successive years.<sup>89</sup>

The libraries of Munich and Evora have preserved two nautical hand-books called *regiment of Munich* (1509) and *regiment of Evora* (1517) respectively. They represent the two different phases in the making of solar tables. The regiment of Munich contained a calendar giving "the places of the Sun on the ecliptic and the declination in degrees and minutes" for all days of the year.<sup>90</sup> However, it did not show all the available astronomical knowledge in Portugal in the year of its printing (1509) because the almanac perpetuum of Abraham Zacuto published earlier in 1496, showed a more perfect calculation. Therefore, this regiment was already outdated when it was printed and that is the reason for its great historical interest. The regiment of Evora showed the places of the Sun in degrees and minutes and provided a table of declination for the quadriennial period 1517-1520.

### Pilotage and Navigation

During the period of discoveries, the voyage of a ship extended from port or coast of a country of departure to the coast of the country of destination. It was often described as

voyage from Lisbon to India or Lisbon to Brazil. The port of destination was rarely mentioned accurately. The terms like *rota*, *carriera*, and *viagem* were used in conferred meanings only. The terms *singradura* or *sangradura*, the distance covered by a ship from noon to noon—appeared in 1493 and later in the famous chart of Pero Vaz de Caminha (1500).<sup>91</sup>

During the voyage of Castro to India on board 'nau Grifo' in 1538, the crew kept watch on board. In order to felicitate the division of the day into quarters of four hours each, Castro gave different names to each quarter of four hours: *prima* meant from 8 P.M. to mid-night; *madorra* meant from mid-night to 4 A.M., and *alva* meant from 4 A.M. to 8 A.M. Castro often referred to this *alva* in his first *roteiro* of 1538. Each quarter was determined by sand clock of half an hour so that one half hour of a quarter was called one clock and so each quarter consisted of eight clocks.

The requirements of a ship which were prepared at the India House, Lisbon were provided at the port of shipment. The pilots were also given information collected from previous voyages as well as copies of requirement of the height of the pole and solar declination table etc. Before commencing the voyage, the Captain also received special royal instructions for the voyage. Some of them are preserved at the Torre de Tombo and Ajuda Library, Portugal. The pilots calculated distance covered in the voyage by imagination or personal knowledge. The '*particular leagues*' helped a bit to calculate the distance. But the simultaneous calculation of latitude and longitude in the sea was the greatest problem for the Pilot. As the latitude which they could avail were less correct, the pilots could use any available means like the forerunning of the signs of the land furnished by birds and other geographical indications shown by the marine plants and by the variation of the needle. All such data helped them to calculate the position in the sea. The use they made of the magnetic variation—north-easting and north-westing—rendered them great service. It can be inferred from a passage of the *roteiro* of *Livro de Marinharia* about navigation in the gulf of Bengal that they knew how to obtain the approximate position of the ship by means of "isobatic" or isogonic" lines.

### The Early Portuguese 'Roteiros' of India Voyages

A *roteiro* (itinerary) was a day to day report of a voyage written by the navigator and it mentioned the route, distance covered, astronomical observations and calculations, sounding of the sea and other navigational particulars, adventures of the expedition, disembarcation, description of the land visited and the customs of the inhabitants, etc.<sup>93</sup> The earliest European *roteiros* originated during the course of navigation in the Mediterranean and were passed orally from one generation to another.<sup>94</sup> The lay mariners, keen and practical observers, used to memorize and remember. But with the beginning of high sea navigation, there arose the need to locate the vast lands being discovered and this naturally demanded that navigators be provided with several particulars. Thus arose the need of *roteiros*. Since the crossing in 1434 of the Cape of Bojador, the limit of European navigation till then on the West African coast, a record was maintained of the particulars collected by the mariners and thus began the early sketches of the *livro rotear de Africa* (book of routes of Africa). In fact the Portuguese were the first to find the 'book of routes' in the new regions and therefore they were the first to write such books as well. For many years navigation in these regions was governed by these books.<sup>95</sup> Subsequently, as navigation progressed, the *roteiros* also contained information for navigation of a particular region, physical features, precautions to be taken and the manner of finding the land, sea, land-marks, etc.

The Portuguese *roteiros* which are the forerunners of the modern hand-books for pilots constitute a special literature in themselves (Portuguese literature of *roteiros*) and form a monumental contribution to nautical science.<sup>96</sup> A standard *roteiro* had two parts: (i) a treatise on navigation containing a calendar, table of the Sun's declination, rules for finding the latitude by observing the Sun on the meridian, explanation of the variation of the magnetic needle, direction for determining the latitude of the pole-star, rules for making the ship's tract on the mariner's chart, traverse table for dead-reckoning of the course, rules for calculating the daily run of the ship based on the measurement of  $17\frac{1}{2}$  leagues for one degree and a brief

summary of the medieval treatise *De Sphaera* and (ii) sailing directions between Lisbon and Goa and from Goa to Cochin and Malacca with an appendix on the regional variation of the magnetic needle.<sup>97</sup> In course of time, these *roteiros* were textually copied and used by all European nations.

The official sailing instructions for India voyages are to be found in various *roteiros*, compiled by experienced pilots of the India route (*Carreira da Índia*) from the time of João de Lisboa (1519) to that of Manuel Serrão Pimental (1699).<sup>98</sup> These *roteiros* were modified by the pilots to a great extent. The early *roteiros* which described the coast of India and the meridional coast of Asia upto China were those of D. João de Castro, Manuel de Alvares, Andre Pires, Diogo Afonso, Vicente Rodrigues and João Baptista Lavanha.<sup>99</sup> Even though the manuscripts of these *roteiros* were in circulation in the 16th Century itself, the first printed *roteiro* of an India voyage by cosmographer Manuel de Figueiredo was published only in 1608.<sup>100</sup>

(i) *Roteiro of Duarte Pacheco Pereira (Esmeraldo de Situ Orbis)*

Duarte Pacheco "one of the greatest representatives of the Portuguese nautical school", as navigator-soldier and cartographer participated in the armada of Pedro Alvares Cabral in the discovery of Brazil.<sup>101</sup> In 1503, he reached India, remained there as Chief Captain and fought numerous battles, especially for the defence of Cochin in 1504. On his return, he wrote during 1505-1509, a *roteiro* on the orders of the King. The title 'Esmeraldo' is a fusion of the names 'Emmanuel' and 'Edward' (Duarte) and 'De situ orbis' means 'about the position of the terrestrial globe'.<sup>102</sup> It is a product of the author's laborious study and exhaustive survey on cosmography and geography and is very valuable. It is one of the earliest samples of a new kind, a sea-rutter or guidebook to sea routes. It has sixteen cartographic maps, landscapes, world maps, nautical astronomy and related studies introducing remarkable innovations.<sup>103</sup> Known for its precision and polished language, it has tables of tides, hydrography, maritime routes, economic information, etc. Duarte often corrected the distance and

added further details to the routes pointing out the dangerous areas for navigation. He had condensed all details like nautical instructions, routes, sea-marks, soundings, tides, etc.<sup>104</sup> While referring to the India voyage, he suggested that the proper time was the months of January, February and March, even though February was the most suitable.<sup>105</sup> Pacheco was the first to find out that the average daily deviation of the Sun and the Moon was of 45 minutes instead of 40 minutes and this afforded a scientific basis to the navigation. The book gave a table of the degree of latitude of 210 places among which some important ones were : Chaul 22°N, Anjediva 15°N, Cannanore 12°N, Calicut 11°N and Quilon 8°N. By devoting himself to the study of nautical science, Pacheco contributed considerably to the Portuguese sea discoveries.

(ii) *Roteiro of João de Lisboa (Livro de Marinharia—1519)*

Pilot João de Lisboa accompanied Vasco da Gama to India on the historic first voyage and subsequently made several voyages to the East and became well known. He composed several works from a series of notes of the pilot's log books and he even improved upon them. His 'livro' has a precious collection of *roteiros* titled 'Book of Routes from Lisbon to India'. It is simple and without any literary style. It is the first simple *roteiro* on Indian voyages and was considered so secret that it was printed and published only in 1930 by J.J. Britto de Rebello under the title of 'Livro de Marinharia'. It contains many rudimentary sights of land and also deals with the routes from Goa to the Red Sea, etc. in unpolished language.<sup>106</sup>

(iii) *Roteiro of André Pires (c. 1530)*

Pilot André Pires wrote a book of routes from Portugal to India and it contains a treatise on the compass, rules about the Southern Cross and other valuable nautical particulars. There is also an unpublished manuscript *roteiro* on the India voyage by an unknown author and it can be dated c. 1530.<sup>107</sup>

(iv) *Roteiro of Diogo Afonso (c. 1536)*

Pilot Diogo Afonso made a monumental *roteiro* of the India voyage and its influence on other pilots of this route was

such that even a pilot like G.F. Reimão used it in his *roteiro* on the India voyage.<sup>108</sup> Diogo was the first to make at least scanty records on north-easting and north-westing of the magnetic needle in various regions as well as the landmarks and signs derived from the sight of birds and marine plants.

(v) *Three Roteiros of D. João de Castro*

Governor D. João de Castro (1500-1548), an eager student of the sky, sea and air, one of the greatest navigators and cosmographers of all times and "the most considerable representative of the scientific investigators of the sea of the latest times" left valuable diaries "which contain undeniably the greatest and most valuable treasure of...observations...(which) are worth being studied eagerly by all those who propose to write the history of physical geography or [nautical science]."<sup>109</sup> His profusely illustrated *roteiros* which contain vast knowledge of nautical experience, observations of latitude, calculations of longitude, variations of the magnetic needle, tides, eclipses, winds and currents, are considered true monuments of maritime investigation and science.<sup>110</sup> The tables and hydrographical pictures are truly unique and they represent a mile-stone dividing the two periods of Portuguese *roteiros* through which Castro gave the world a masterly lesson in navigational science. Castro authored three *roteiros*.

(a) The first was a *Roteiro from Lisbon to Goa*. It was mainly a diary of his voyage on board the ship *Grifo* during the period 6-4-1538 to 11-9-1538 and it reveals his nautical knowledge and its practical application. During the voyage Castro got an opportunity to experiment and make a critical study of various nautical methods and observed the meteorological phenomena. He drew eleven hydrographical drawings of ports and small extensions of the sea-coasts of India seen from the sea, for the useful information of future pilots of the India voyage.<sup>111</sup> He was the first to notice the minute deviation of the magnetic needle and he contended that the difference of longitude was not a function of the variation of the needle and he verified the mistake. By determining the variation of the magnetic needle, Castro found that the distance from the East African coast to India was less than that shown in the existing

Portuguese charts. He calculated the discrepancies of the distances, not thought of by any one till then. He found out the latitude (height of the Pole) at any time of the day and gathered information on currents, noticing several differences and particulars unknown then to pilots. Castro studied the winds so as to enable the ships to sail to India throughout the year and acquired complete knowledge of the monsoon and eclipses of the Moon. He collected all possible details from the sea through birds, fishes and marine plants and consequently established correct latitudes and routes of many places and lands about which there existed so much wrong information. His invention of an instrument to determine the position of the ship, was a great achievement in nautical science.<sup>112</sup>

(b) *Castro's First Roteiro of the Coast of India from Goa to Diu* was also a diary of his navigation from Goa to Diu (21-11-1538 to 29-3-1539) on board a galley along with Viceroy Garcia de Noronha.<sup>113</sup> During this voyage, he experimented sounding the sea, and thus calculated the angle of rising and setting of the Sun every day. This *roteiro* is a hydrographic survey of India's west coast along which he sailed. He sounded the depth of the waters and bars, studied the direction of the tides of the sea, directions of the channels and mouths of rivers, anchorage of ports, differences of the magnetic needle, flow and stagnation of rivers and latitude of cities. He worked out a table for each place and river, giving pictures of the land, sand-bars, restings, routes, and the way to enter them. This *roteiro* presented a cosmographic description of the Deccan and Cambay and thus became the earliest careful and scientific study of the Arabian Coast.<sup>114</sup> He described the marvellous cavernous temples of Elephanta and Sasette island, the rivers and city of Thana, basalt pillars of Bassein and the artificial stockades in the neighbouring sea, long before the Portuguese chroniclers attempted to write about them. He also observed the concurrence of the oscillation of the sea with the phase of the Moon as a result of Lunar attraction. He found that on the west coast of India from Goa to Chaul, the high tide started before the Moon rose on the horizon during the whole

year. But while at Bassein on 3 February, 1539, he noticed that the high tide started when the moon was already  $44^{\circ}$  above the horizon.<sup>115</sup> While at Diu, Castro, drew several maps of the port, bay and the fort. With an instrument of shadows, he found out the latitude of Bassein on 13 December 1538 and thus obtained the correct variation of the magnetic needle and through such variations got the longitude of the lands and the difference of meridians.

(c) *The Roteiro from Goa to the Red Sea* was the diary of his voyage on board a galleon as its Captain from 31-12-1540 to 21-8-1541, when he accompanied Governor Estevão da Gama.<sup>116</sup> This *roteiro* written in Goa on his return was a product of careful observations from end to end and it was the earliest geographical description of the Red Sea by a European with maps of harbours and several tables. It has fifteen maps of which fourteen are coloured and pictorial and show the shores as seen from the sea. It also shows the views of towns, actions of troops on land and very interesting pictorial representations of several ships.<sup>117</sup> The *roteiro* deals with the moon and the floods of the Nile.

Castro also mentioned another *roteiro* of the Indian coast but it must have been either lost or not completed. His "Treatise on the Sphere" composed at Goa in 1541 was his best nautical science contribution dealing with geography, sphericity of the earth, problems of the universe, elements of the Zodiac, etc.<sup>118</sup>

(vi) *Roteiro of Manuel de Alvares (1545)*

Pilot Manuel de Alvares, of the ship *Grifo* under governor Castro in the voyage from Lisbon to Goa in 1538, had compiled a collection of roteiros in 1545.<sup>119</sup>

(vii) *Roteiro of Pero Vaz Fargosa (1560)*

Pero Vaz Fargosa made a *roteiro* of the India voyage in 1560.

(viii) *Roteiros of Vicente Rodrigues (1575 and 1591)*

Vicente Rodrigues who spent a life-time in the *Carreira da India* was the greatest *roteiro* writer of the India route



of the 16th century and his works have become classic. Leaving Lisbon on 7 April, 1568 as pilot of the *Chagas* under Viceroy Luis de Ataíde, Rodrigues was a keen observer during the voyage and he even saw the 'sand-bank' of India. His unpublished *roteiro* of 1568 became a type of sailing directions for the India voyages from 1575 to 1612. Again, in 1590 he was the pilot of the *Bom Jesus* under Viceroy Matias de Albuquerque and during the voyage his vessel ran aground a sand bank. But he still managed to reach India and wrote his second *roteiro* in 1591.

(i) *Other Roteiros*

Vicente de Cintra wrote a *roteiro* of his voyage from Goa to Mozambique towards the end of the 16th century. Manuel Monteiro also wrote one. In 1600, pilot G.F. Reimão and cosmographer J.B. Lavanha wrote *roteiros* of the India voyage in Spanish. The Dutch traveller Linschotten made a remarkable edition of the Portuguese *roteiros* of the 16th century. He copied, translated and published in 1569, the works of several Portuguese pilots of the India voyages.<sup>120</sup>

### **Contributions of the Jews to Portuguese Nautical Science**

The Jews were very influential in the development of Portuguese maritime enterprises because of their knowledge of the Arabic language and science which provided elements of oceanic navigation. Jacome of Majorca, a Jew Mestre and an expert in nautical science worked at the Sagres nautical school on astronomical and cartographical jobs and improved the nautical techniques.<sup>121</sup> Johude Cresques, the Jew cosmographer and designer from Argão also worked at Sagres because of the skill in making the mariners' compass. King John II who understood the capabilities of the eminent Jew astronomers and mathematicians, had very intimate relation with them. The various oceanic conquests of the Portuguese could not have been possible without the help of Jews. The well known board of mathematicians set up by John II included Jew Mestres Rodrigo, Moses and Jose Vizinho etc. They were all experts who studied and solved

the various problems connected with nautical science which was progressing.<sup>122</sup> Rodrigo and Moses who were experts, in cosmography were entrusted with the scrutiny of Columbus plan and preparation of a solar table and chart for Covilham's over-land journey to India. Pero de Covilham and Antonio de Paiva whom the king had sent to India by land, were also crypto-Jews. Moses advised them and prepared a solar declination table and a regiment of the astrolabe. He gave them much information about the land of spices. Joseph of Lemago, a Jew was also sent to the East in search of Covilham later.<sup>123</sup> A Jew called Gama from Plemia was also invited to the royal court for discussions on nautical matters.

*Jew Mestre Jose Vizinho*, the royal physician was entrusted with several astronomical problems and he tried his best to solve them. In his capacity also as royal counsellor, his opinions weighed most in scientific circles connected with the voyages of discovery. The fortunate King (Manuel I) was much given to judicial astronomy and whenever ships were setting out for India or when he was expecting them back he used to call Vizinho to make prediction for him.<sup>124</sup> Vizinho evolved a method to observe the altitude of the Sun at noon with a quadrant or an astrolabe, when the Pole Star was invisible in the southern hemisphere. He calculated a bissextile solar table for 1483-1484 and it was used for voyages since then till the time of Gama. He also translated the original *almanac perpetuum* of Abraham Zacuto also a Jew, from Hebrew to Latin and published it in 1496, at least one year earlier to Gama's historic voyage. Vizinho made another solar table for four years (1497-1500) which Gama and Cabral used in their voyage.<sup>125</sup>

*Abraham Zacuto*, the celebrated Jew court-astronomer served the Portuguese rulers till 1496, when King Manuel expelled all Jews from Portugal.<sup>126</sup> Zacuto was the author of a well known astronomical work in Hebrew, containing valuable scientific data. In 1495 he completed his monumental work called *almanac perpetuum* and when printed in the next year, it exercised great influence on the subsequent maritime enterprises of Portugal.<sup>127</sup> He advised King Manuel on

the feasibility of an expedition for the discovery of India. He assured that "Your Highness will discover it and will conquer a great part of India in a short time...for your planet is under your royal device, the sphere which contains the skies and the land...and you will accomplish everything... And I find that two brothers, your subjects, will discover India..."<sup>128</sup> The king consulted him very often and the Jew exercised great influence on the king and when he appointed Vasco da Gama for the expedition he enquired from Gama whether he had a brother. This shows that the king had not forgotten the Jew's prophetic words which had really come true. Zacuto was consulted to know the way in which Gama should proceed in the expedition. He also made an astrolabe for astronomical observation and trained pilots in all kinds of nautical works. Thus he contributed a lot for the development of pilotage in Portugal. "The Portuguese pilots grew ever experienced and learned in the said science of pilotage which went on improving until it reached the present state of perfection.....All this was started by the said Jew named Zacuto, a great astrologer."<sup>129</sup> He assured that "this navigation to India will then be easy and very small vessels will be able to navigate it....."

Pedro Nunes (1502-1578) a Jew convert rendered great service to Portuguese nautical science. With his original ideas, he carved out a prominent place in the Portuguese scientific history.<sup>130</sup> He occupied several positions before he became the royal cosmographer in 1529. His main job was to supervise everything connected with navigation, engage nautical classes and examine pilots for issuing them certificates. His works include (i) *treatise on certain doubts of navigation* (1534), (ii) *treatise of the sphere* (1536), (iii) *In defence of the chart of Navigation* (1537), (iv) *the theory of Sun and Moon* (1537) and, (v) *on the art of navigation* (1546). Besides, he wrote several works on mathematics and applied astronomy so much so that he was considered as the greatest expert in Geometer ever produced in the Iberian peninsula and undeniably one of the greatest of Europe in 16th century.<sup>131</sup> His work, including *De Crespusculis* (1546) which was certainly of "everlasting

remembrance in astronomical studies" hold the highest place in the annals of Portuguese nautical science. As a distinguished Portuguese nautical astronomer, he was the first to expose the error of plane charts and he solved many nautical problems. He invented *nonius*, a device for graduating the nautical instruments. He is also credited with the improved methods for finding latitude, correct determination of the needle and the theory of navigation by the maximum circle. He invented an *instrument of shadows* by which latitude could be obtained by observing the height of the Sun before and after noon.<sup>13</sup> He found out new methods to determine the variation of the needle which resulted in the law of navigation and of the phenomena of local attraction. In fact, the official teaching of pilotage began in Portugal with Nunes.

*Joao Baptista Lavanha* (1550-1624), a desciple of Nunes and a Jew convert, worked in several capacities such as mathematician, engineer, architect, chronicler and cosmographer. Lavanha's works, both published and unpublished included :

- (i) *Treatise on the art of navigation* (1558)
- (ii) *Shipwreck account of nau 'S. Alberto'* (1593)
- (iii) *Hand book of navigation dealing with the art of navigation and the work of Balestilha*
- (iv) *Tables giving the amplitudes of the Sun when rising and setting* (1600).
- (v) *Roteiro of navigation of India* (1600)
- (vi) *A description of the Universe* (1613)
- (vii) *The fourth decade of Asia of João de Barros*. He added maps of Gujarat and Bengal etc.
- (viii) *Treatise on shipbuilding, naval architecture, sphere of the world, longitude and latitude* which are all lost.<sup>133</sup>

*Duarte Gomes de Solis* was also a Jew whose ancestors had settled in Portugal and among whom there were good mariners whose names were attached to the Portuguese history of navigation. Solis was a pilot who came to India four

times and he was the author of four nautical works all in Spanish language.

### *Influence of the Portuguese Nautical Science*

The Portuguese method of pilotage, landing and methods of navigation were greatly helpful for the progressive evolution of their cartography. Columbus during his stay in Portugal (1470-1484) married the daughter of Prince Henry's technician and through this source, he obtained access to nautical journals, maps and instruments. "It was in Portugal that the Admiral (Columbus) began to surmise that if the Portuguese sailed so far south, one might as well sail westward also and find land in that direction."<sup>131</sup> The Portuguese nautical science attracted other people also. All great maritime exploits have drawn inspiration from the Portuguese art of navigation. The Spaniards, the Dutch, the French and the English were all greatly influenced by many of the Portuguese experiences in the development of navigational techniques.

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130. ACMN, *op. cit.*, (1894), pp. 22-40.

131. SEHU, *op. cit.*, p. 33.

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133. Costa, A.F. da, *Roteiro Portugueses ineditos de Carreira da India de Seculos XVI*, Agencia Geral de Colonias, Lisbon, 1940, pp. 119-120.

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## THE EARLY PORTUGUESE CARTOGRAPHY ON INDIA

Geography describes earth and cartography records such description in charts. Cartography has recorded the progress of human knowledge in mapmaking and this progressive knowledge slowly expelled the misconception of earth from ancient cartography. Cartography which deals with topography and hydrography is concerned with surveying and drawing of maps and charts of any portion of earth's surface and record the land forms and surveyed regions.<sup>1</sup> Map is any cartographic representation like sea-chart, nautical chart, marine chart, navigational chart or navigating chart. In fact, cartography and geography are closely linked with navigation and they advanced rapidly during the age of exploration which began during the last decade of the 15th century. The Portuguese cartography graphically recorded year after year the progress of their geographical discoveries. As exploration of navigators gradually expanded the geographical boundaries, the charts began to record large surface of the earth.

The word 'cartographie', was first expressed in 1839 by a Portuguese historian Viscont of Santarem.<sup>2</sup> Subsequently, he published from Paris a monumental work titled *Atlas Compose de Mappe Mundos de Portulans et de Cartas hydrographiques et*

*histriques de le XV e XVII Siecle . . .* with 22 folios containing 33 fascimiles.<sup>3</sup> This atlas was a compliment to his early work titled *Memória Sobre a Prioridade dos Descobrimentos Portugueses no costa d, Africa Occidental* (1841). Later during 1849-1852, he published in three volumes a grand work on cartography titled *Essai Sur L, historie de la Cosmographie et de la Cartographic Pedant le Moyen-Age et sur les progres de la geographie apres les grandes decouvertes du XV Siecle, pair servir d' explication a I Atlas compose de Mappe . . .*<sup>4</sup> Viterbo Souza published during 1890-1894, a scholarly work *Trabalhos Nauticos Portugueses nos Seculos XVI e XVII* in 2 volumes. They contain much documentation and biographical elements of the Portugueses cartographers.<sup>5</sup> The Geographical Society of Lisbon organised during 1903-1904 an exhibition of Portuguese cartographs. Dr. Ernesto de Vasconsellos published them later in a catalogue. Gabriel Perreira, Vincent de Almeida Desa, Joaquim Bensaude and Duarte Leite had also attempted study of the early Portuguese cartography in their several scholarly works. Dr. Armando Cortesão published his *Cartographia e Cartogrofos Portugeses dos seculos XV e XVI* in 2 volume (1935) quite appropriately considered as 'a contribution to a complete study'.<sup>6</sup> This work was abridged and brought uptodate in 1960 when he published *Cartographia Portugueses Antiga* to coincide with the fifth centenary of the death of Henry the Navigator. On this occasion, several other scholarly works were also published depicting the various facets of Portugueses maritime life. But the most monumental study on Portugueses cartography till todate is *Portuguliae Monumenta Cartographica* in five volumes (1960-1961).<sup>7</sup> The first four volumes contain in all 519 sketches in which are reproduced 1295 specimens including 86 illustrations. The first volume deals with the specimens of cartography from the end of the 15th century to the mid-16th century. The second volume has sepcimens from 1557 to 1584; the third volume contains specimens from 1568 to 1600. The fifth and last volume deals with the scientific and other aspects of the early Portuguese cartography. Others who studied Portuguese cartography include Dr. Antonio de Barbosa, Commandant Abel Fontoura da Costa, Admiral Gago Coutinho

Jaime Cortesao and Dr. Luciano Perrira da Silva etc., besides foreign scholars.

Dr. Jean Denuce, a french scholar on cartography distinguishes two periods of Portuguese cartography with opposite trends (i) the theoretical cartography based almost exclusively on Ptolemy's theory and (ii) the positive cartography based on new data collected by experience. These two conceptions merged in about 1520.<sup>8</sup> But Dr. Armando Cortesão recognises four different periods of Portuguese cartography: (i) the period of Henry the navigator, (ii) the period of Pedro Reinel, (iii) the period of Lopo Homen, and (iv) the period of decline.

(i) *The period of Henry the navigator* is the beginning of nautical cartography in Portugal and it continued upto the voyage of Vasco da Gama. Henry founded the Sagres nautical school and engaged Mestre Jacome, the famous cosmographer, cartographer and the maker of nautical instruments who was also considered as the highest exponent of the nautical techniques. He also called Jahude Cresques, the eminent cosmographer from Argão because of his known skill to solve the problems of astronomical navigation.<sup>9</sup> Eminent nautical masters and chart-designers like Pedro and others were appointed to train pilots, to solve the nautical problems and to prepare maps. In fact, the Sagres school welcomed anyone gifted with cartographic knowledge.<sup>10</sup> The map-makers of this school studied the earlier cartographical works with a view to improve maps and nautical techniques. They plotted and mapped their routes with great technical skill and exactness. Henry patronized and gave personal attention to cartographic arts and ordered to make charts of the newly discovered coasts. Here lies the importance of Henry's work to cartography<sup>11</sup>. Being surrounded by well-known cartographers, Henry was able to execute his grand plan which was to culminate later in the discovery of a sea-route to India. The nautical charts of this period were of cylindrical projection with meridians and parallels<sup>12</sup>. They recorded the new discoveries of the Atlantic islands and the coast of West Africa. They were used abroad as prototypes especially by the Mediterranean cartographers.

(ii) *The period of Pedro Reinel* begins with the return of

Gama from India. The voyage gathered valuable information and naturally cartography looked to new horizons and took a new shape. As a consequence of astronomical navigation, the Portuguese chart-makers introduced a scale of latitudes in the chart and this revolutionized the Portuguese cartography. Thus in the 16th century, the Portuguese cartography reached its climax and all Europeans sought geographic and cartographic knowledge from Lisbon. Instead of a simple scale of latitudes as in the early charts, the charts of Pedro Reinel (c. 1502) shows two scales as a consequence of the difficulties caused by the variation of the needles and the defects of the square-plane charts.<sup>13</sup> The publication of Ptolemy's work in Portugal in 1472 must have influenced the Portuguese cartographers so much that a chart of Indian ocean in the atlas of Pedro Reinel shows an inscription in Talmi textually copied from Ptolemy's work. During this period, the maps were illuminated and decorated in such a way that it seems a miniaturist and cartographer worked together to make the work a perfect job.

(iii) *The Period of Lopo Homen* saw a number of versatile cartographers including the well known Pedro Vaz Dourado. By now, the influence of Ptolemy had completely disappeared. Therefore, the beginning of this period corresponded to the end of the influence of Ptolemy's representation of Far East. Perhaps this period began in the early second quarter of the 16th century. The Portuguese cartography which was the immediate and logical consequence of her sea-discoveries, recorded the new geographical progress. Now the developing or developed nautical science helped the Portuguese cartographers to improve their productions, even though the square-plane charts of the earlier period were continued. But the inscriptions of economical nature now disappeared from the charts, giving way to small historical inscriptions. The big charts now gave way to cartographic atlas or quarteledas. The illumination of the charts also changed. The lovely forms which often gave the charts an impression of reality, was followed by more geometrical decorations. It may be due to the influence of Italian renaissance, as seen in the celebrated works of Lopo Hemen and Pedro Vaz Dourado.

(iv) But the *decline* began in the last quarter of the 16th century under the rule of Philips. Cartography made no progress as we can see in the works of this period. Pedro Nunes was the last exponent of the 16th century Portuguese cartography before its decline. Perhaps none surpassed or equalled him in the Iberian Peninsula. In fact, the history of cartography which began in the reign of Diniz reached its climax in the mid-16th century. The madness of King Sebastian, the impotence of the Cardinal King and the work of the fantastic King John III, all served fully the questionable designs of others.<sup>14</sup> The domination of Philips over Portugal during the sixty years (1580-1640) of Spanish control with all its various consequences, opened up the first cracks in the Portuguese culture. The onslaught of the enemies on the Portuguese possessions and the great cartographic progress of the North European countries who had become masters of the sea, now relegated Portuguese cartography to the secondary place. The curve which started to be drawn under Diniz, attained maximum height in the mid-16th century and then declined. Though the inquisition did not endanger cartography much, its influence was adverse. "The decay of the public spirit . . . retracted in Portugal the development of nautical arts to such an extent that the chief cosmographer no longer finds disciples."<sup>15</sup> The Portuguese cartography never regained its former splendour.

### **Development of Portuguese Cartography**

The early Portuguese navigators sailed by means of sounding of the sea, observing the nature of the sea-floor and mountain masses and by the knowledge of the flight of birds. For the first time, they sailed by means of charts in the time of King Diniz in the 13th century. Thus began the Portuguese cartography.<sup>16</sup> The voyage of Marco Polo (1271-1296) to the East and his maps which incorporated the mystical cosmography of the Hindus, had a decisive influence on the geography of this period.

The earliest Portuguese nautical charts were derived from the Mediterranean portulanos and it is a landmark in the history of Portuguese navigation and cartography.<sup>17</sup> It is certain that

nautical charts were drawn in Portugal as early as 14th century but we have not much documentation for this. These earlier nautical charts and portulanos described the seaports, sailing direction, currents and tides with the help of which the position, size and shape of some islands were indicated more or less correctly.<sup>18</sup> The discoveries of the island of Canaries, Madeira and Azores upto the Cape of Bojador were recorded in the map of Dalorto (1339). Dalorto, the Genoese cartographer might have received the details from the Genoese sailors who were in the service of Portugal.<sup>19</sup> Before the crossing of the Cape of Bojador in 1434, Africa was described upto Bojador only. Therefore, the hydrographical description of the south of Bojador was wholly Portuguese who in the beginning of the 15th century broke open the mysteries that covered the old world.<sup>20</sup>

Many documents give positive references about the Portuguese charts.<sup>21</sup> A letter of concession from King Afonso issued on 22nd October, 1443 refers to a Portuguese navigation chart. Venetian Andre Bianco's chart of 1448 showed the Portuguese discoveries of the African coast upto Cape Verde islands (1444).<sup>22</sup> Chronicler Azurara referred to these Portuguese charts. These charts were still Azimuthal charts without any definite projection. King Afonso asked Fra Maura, the great cosmographer ('cosmographus incomparabilis') to make a map of the world, and it was a fact that Maura was getting a payment from Lisbon during 1457-1460.<sup>23</sup> His map which was "a masterpiece of medieval cartography" was useful for future exploration and it showed the southern extremity of Africa under the name of the 'Cape of Devil'. This was forty years before Bartholomeo had circumnavigated it. This map has a legend on it to indicate that the Portuguese navigators had covered the coast of Africa and hence made it. Maura who made considerable use of Marco Polo and Nicolo Conti had given up the idea of the Indian Ocean as a land-locked sea and this encouraged the Portuguese to pursue their 'plan of the Indies'. A.C. Benin Casa's map of 1465 had marked the Portuguese discoveries upto Sierra Leon (1460).<sup>25</sup>

The earliest sea-charts covered only the regions of actual navigation but as discoveries continued, a world map (mapa

mundi) of real cartographical value had to be made. In fact, Ptolemy's 'cosmographia' first published in 1475, exercised great influence on Portuguese overseas expansion and hence on their cartography of this period as well.<sup>26</sup> Even though most of the Portuguese cartographers had given up Ptolemy's theories, Pedro Reinel and others continued the old practice trying to compromise with the new geographical knowledge which was being provided by the progressing sea-discoveries.<sup>27</sup>

Navigation by compass and charts which satisfied the Portuguese in the earlier short-distance navigation was not sufficient for high-seas navigation in Atlantic for long distance voyages which required ships of sail. As they sailed further south over the curve of terrestrial globe, the Pole Star became invisible and hence there was the need to find out other navigational methods. They felt the need for a scale of latitude so that the pilots would be able to determine on the high-seas the position of the Sun with sufficient precision. Therefore, they tried to adopt methods to determine latitude on land to the needs of navigation on high seas. This was rendered possible by astronomical navigation by simplifying the complicated astrolabe, quadrant, tables and rules, used by the land astronomers for the use of simple seamen.<sup>29</sup>

The progress of geographical discoveries, development of astronomical navigation and determination of latitudes on board the ship led to a revolutionary improvement of charts which were now graduated in latitudes. This constituted the foundation of scientific cartography in Portugal. As a matter of fact the great extent of discoveries and the observation of latitudes on the high seas led to the marking of latitudes and it was a new element in the nautical chart.<sup>30</sup> This brought many improvements in cartography such as the introduction of an oblique scale of latitude to allow for magnetic variation and the detailed hydrographic charts of harbours and small portions of the coast. The introduction of a scale of latitudes necessitated the drawing of chart in accordance with the hydrographical drawing during the reign of King John II (1481-1495) and this feature distinguishes the Portuguese cartography from others. They gradually introduced the graduation of meridians in a the north-south direction along the African



coast. It was in the first voyage of Diogo Cão (1484) that remapping of the coastal areas was first used. John II was responsible for considerable progress in the field of nautical cartography and therefore it is possible that a map (c. 1485) kept at the Escorial Library with a scale of latitudes, was made during his reign. It can be reasonably presumed in view of his great interest in cartography that he also ordered to make a map of Portugal.<sup>31</sup> John II gave a navigational chart, taken from a world map of his cosmographers Diogo d'ortis, Rodrigo and Moses to Pero de Covilham before the latter left for his overland journey to India in 1487.<sup>32</sup>

The exact date when the first graduated Portuguese chart was drawn is not clear. But we know that the Portuguese charts are the oldest with the indication of latitudes on it. The chart of c. 1505 probably of Pedro Reinel is the first known chart of navigation with a scale of latitudes. Therefore, it can be inferred that they introduced the graduation of latitudes in the charts in one of the last decades of the 15th century.<sup>33</sup> Since then, all the Portuguese charts were graduated in latitudes. The first hydrographical survey of the African coast from the Cape of Good Hope to Sofala by Pero de Quresma on 31st August, 1506 shows the nautical and cartographical knowledge of the Portuguese.<sup>34</sup>

### **General Features of Portuguese Charts**

The Store of India house (*Casa de India*) in Lisbon was the official centre of Portuguese cartography. In this *armazem*, there was a standard chart or a planisphere on which the new meridians were recorded and according to which charts were made by the cartographers to be supplied to the ships.<sup>35</sup> There was an overall policy of secrecy in respect of these charts. In those days of maritime rivalry, there was the need to conceal the cartographic activities. Even the *Esmeraldo de Situ Orbis*, a great cartographic work by Duarte Pacheco written in 1508 was not completed nor printed in the life time of the author, but only in 1892 and that too not from the original but from the copies the 18th century, deleting the original maps and with mistakes and lacunae.<sup>36</sup> King Manuel I had issued a royal order on 13th November, 1504, declaring that

"no navigation should be indicated on the the sailing charts..."<sup>37</sup> This warrant was known as "the warrant regarding the information given on sailing charts and the prohibition of maps".



*Fig. 6. Portuguese Cartography.*

The Portuguese cartography is essentially an artistic work which enables us to appreciate the techniques of the cartographer and the skill of the illuminator and to follow the development of Portuguese expansion in the exploration of the seas, in the discovery of lands and in the evolution of their nautical science. The Portuguese nautical charts of 15th century represent a product of the new scientific school of Sagres based on the direct observation of the nature. A study of the numerous charts will show the evolution of the Portuguese cartography which began with the scientific navigation of the Sagres school in the beginning of 15th century, attained highest perfection in the 16th century and declining in the 17th century<sup>38</sup>. Their lively maps are indeed a witness to the various phases of their epic development. Their maps also testify to their knowledge of human types, flora and fauna, drawings of cities and exotic landscapes. These charts not only reveal the discoveries of the sea-route,



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continents, islands and the development of astronomical navigation and their other nautical skills, but also the advance made my men towards the perfect knowledge of the earth. In fact, the work of the navigators and cartographers is really unique in word history and deserves admiration. The Portuguese cartography shows mainly a nautical character as their charts were mainly meant for mariners and were inspired by their navigations. Their cartography was supreme in quality and quantity and their charts became a model for others. The superiority of their cosmographical technique can be seen in their cartography. The style and technique of their chart were highly influential. A large number of their charts which all come from outside Portugal, are a mine of cosmographical and nautical rules, not seen in any other charts of the world.<sup>39</sup> The Portuguese cartographers not only continued the Mediterranean practice of including some cosmographic rules in their charts, but also the rules of navigation as was done in the charts and atlases of a number of cartographers. All the navigation charts of the 16th century were drawn with thirty two points of the compass *rosas de ventos*).<sup>40</sup>

### **The Early Cartography of India**

There is quite positive evidence about the Portuguese cartographers during the 15th century. But all the charts of this period have disappeared. Many charts of this period might have been diverted to foreign countries, but that can't explain the wholesale disappearance of the charts. However, a large number of Italian and Catalan charts were quickly copied from the Portuguese originals.<sup>41</sup> Plenty of specimens of the 16th century have fortunately survived. It is believed that all the charts were at the royal library of *Paço de Ribeiro* in the India House and from there they disappeared during the earth quake of 1772. Other causes like traditional national negligence and inquisition were also responsible.<sup>42</sup>

About thirty one cartographers of the 16th century are known and their charts and atlases still exist. There are references to nineteen cartographers whose works are not yet identified. Numerous charts and atlases before 1600 are

known but neither signed nor dated. Sometimes, we know nothing about these cartographers, but at other times what ever we can gather from documents scattered in various Archives, may help us to get an idea of the eagerness with which a number of Portuguese cartographers were sometimes sought abroad. There exists in many Archives documents referring to some anonymous Portuguese cartographers also.<sup>43</sup> Good cartographers were generally good cosmographers and makers of good navigational instruments. Very often, they were good draftsmen and illuminators too. If the drawing and illumination embellishing some charts was due to some other artist, in others the ornamentation was the work of cartographers themselves.<sup>44</sup> It is also probable that great master cartographers may have taught young men who in turn became experts in the art and helped their masters. This may be the reason for the difference in the handwriting and other details noticed on various charts which although unsigned, must be inevitably assigned to a certain cartographer.

*Pedro Reinel* who was the earliest and one of the most remarkable and accomplished cartographers, made a collection of charts and atlas showing discoveries, for presentation to some high dignitaries and that justified the exceptional and rich illumination of all his charts.<sup>45</sup> He took the help of a miniaturist who was also a good painter to provide the charts with magnificence and artistic beauty. Two of his charts show Indian Ocean. His atlas of 1519 now preserved at Paris, contains contemporary ideas in cosmography, chart of the Indian Ocean with remarkable and gorgeous illumination, exceptional beauty, large dimensions and it is one of the most beautiful atlases in the entire history of cartography any where. His works show Ptolemaic influence.

*Francisco Rodrigues* was a Pilot-cartographer who voyaged to the East and on his return in 1512, made an atlas, which is regarded as the oldest known cartographical representation of the Insulinda.<sup>46</sup> Afonso de Albuquerque sent some maritime charts of the author to King Manuel and praised his ability in this art.

*João Gomes* drew two maps, one navigation chart made on Indian cotton dark blue and white and another a picture

of Aden on a cotton cloth.<sup>47</sup> Albuquerque referred to him in a letter which he wrote from Cannanore to King Manuel on 4th December, 1513.<sup>48</sup> The King also mentioned about him in his letter to the Provisor of the India House (dated 28th January, 1514) asking him to give João a mariner's chart to make a globe.<sup>49</sup> João also came to India with the King's letter to Albuquerque dated 2nd March 1514. Later he proceeded to the Red Sea and collected much cartographical information.

*Lopo Homem* was an official cartographer-cum-cosmographer. Only four of his charts have survived. An atlas of the world (1519) deserves special mention. It is an important atlas from the artistic and cartographic point of view and has good drawing and superb illumination.

*Diogo Botelho Pereira*, son of Captain Antonio of Cochin under Viceroy Almeida was an eminent cartographer who commanded several voyages to India, participated in warfare and later became Captain of Cannanore.<sup>50</sup> It was from a Dominican Friar of Cochin that he learnt cosmography and the art of sphere in 1527 and made "a chart of navigation and a description of the fort of Diu."<sup>51</sup>

*Sebastio Lopes* was an official master of charts and navigational instruments in the Store of India House. He was a contemporary of Lopo Homem, another cartographer and the one succeeded the another as the official examiner of cartographers. It may also be possible that Lopo Homem taught Sebastio who was an artist and may have used Lopo's prototypes. His chart of 1558, now kept at the British Museum, is a beautiful work of great intrinsic value and is a good proof to identify his other works.<sup>52</sup> They are second to none in delicacy, beauty, characteristic writing, typical illumination and unusual wind roses. There is also a large drawing of Christ on this chart, marking the East, and this is not seen in any other works and that too never with this design.<sup>53</sup> Picturesque drawing of five horse men is highly individual. His atlas of the world (c. 1555) is one of the most beautiful and surviving specimens of early cartography.<sup>54</sup> This atlas opens with an impressive design of a crucifix and it is followed by nineteen pages of cosmographic data and charts. This well-known

and beautifully illustrated atlas has ten artistic drawings of ships which are the most beautiful features in the illumination of the whole atlas. The refined style of ship-drawing is exceptionally lovely. It has also interesting drawing of human figures, animals, cities, castles, wind-roses, scale of leagues and even ornamentation of pages bearing cosmographic data. It seems that Sebastio had engaged a pupil to write the nomenclature of the atlas but the latter failed to do it in some charts.<sup>55</sup>

*João Martins* was a well-known cartographer with eighteen atlases and one hundred and forty charts to his credit.<sup>56</sup> One of his charts shows the Indian sea, Calicut and the gulf of Bengal etc., with the legend that "in the Indian Ocean there are two *naus* with the cross of Christ on the sails". The best known atlas of the author, now seen at Madrid Library, has ten charts, the last of which shows India, Persia and Japan etc. All his charts are according to the classical type of seventeen sets of points of compass and with profuse and artistic illumination.

*Diogo Homem*, son of cartographer Lopo Homem was the most prolific of all the early cartographers and one by whom the largest number of works have survived.<sup>57</sup> He lived in Venice as a great chart-maker and the Portuguese Archives have not even a single of his charts. His eleven charts and twenty atlases which have survived are all first rate and considered among the best and most beautiful specimens of early cartography.<sup>58</sup> They maintain uniformity of geographical features with only minor variations. They have one hundred forty five sheets giving coastal outlines and cosmographic data. The heavy ornamentation seen in his earlier works become lighter and then all his charts were drawn soberly with not much ornamentation, but there is much improvement in taste. Cosmographic wheels are seen in all his atlases and this is very characteristic of Diogo. The indication of years is of particular interest. His charts which were masterpieces, sometimes lacked originality. His atlas of the world (1558) is full of cosmographic details with a cosmographic wheel and with careful and luxurious illumination. One of his charts show Indian ocean.<sup>59</sup> His atlases have cosmographic wheel, solar declination table for four years, zodiac table, climatic zone, wind heads and other details. The drawing and lettering are

neat, illumination bright, but lighter than earlier, and this shows a transition of his two styles in cartographic ornamentation. One of his charts has well-balanced drawing and decoration. His charts describe the navigation of many ports, showing all the islands, gulfs, harbours, reefs, shoals and all other things needed for good navigation. Another chart shows careful drawing, lettering and sober illumination. The exceptionally generous application of gold makes it extremely beautiful and delicate and it shows the beginning of a period when he gave up heavy ornamentation of his earlier works.<sup>60</sup> Then he followed a sober style till the very end. His atlas of the world is a historically significant one with much details like a zodiacal circle, table for Sun's declination, solar declination for four years, large cosmographic wheel and a climatic zone with indications in Latin.<sup>61</sup>

*Andre Homem* who was known as "the Prince of cartographers" of his times and belonged to a family of eminent chart-makers, was the official master of charts in Portugal.<sup>62</sup> We know only about his planisphere (1559) which is a magnificent and most remarkable specimen of early cartography. It is so perfectly balanced, beautifully drawn and illuminated that it is difficult to find its equal in the history of chart-making. It is the largest (seven feet) surviving early Portuguese chart. Its beautiful drawing, ornamentation, perfect arrangements, balance and taste etc., make it as the most remarkable of all early cartographical works.<sup>63</sup>

*Bartholomeo Velho* was a well-known cosmographer-cum-cartographer of the 16th century. Perhaps no other cartographer was so notable a cartographer nor was any other cartographer such a good cosmographer.<sup>64</sup> He served the French king Charles IX. He showed a well-balanced idea of the general layout of the lands and seas unlike the early cartographical works which showed many mistakes. His atlas of the world (c. 1560) is of special interest and beauty. It has much cosmographical details and shows very correct and characteristic drawing of the coast, not seen in similar atlases. A group of four of his charts of the world including Asia is significant, as they show the regions, rivers and mountains etc. Unlike the existing practice, Velho adopted a realistic approach and

covered the whole Portuguese hemisphere as described in the Tordesillas treaty.<sup>65</sup> His 'Cosmographia' (1568) of thirty three leaves is another beautiful specimen and it consisted principles of true cosmography and universal geography of all lands which were discovered with all their distances and heights according to navigation." It contained much cosmographical datas and tide tables etc. It gave several useful details for safe navigation. Velho discovered the problem of a stronomical dead-reckoning and coastal navigation, movement of ship, determination of longitudes and construction of maps and globes. He also suggested the variation of the needle and the distance between the Moon and fixed stars and planets.

*Fernando Alvero Seca*, "a distinguished mathematician and a famous geographer of science..." was the author of the first map of Portugal (1565), a work of great completeness and accuracy.<sup>66</sup> In spite of some errors, this map is a remarkable one showing the great progress of map-making in Portugal.

*Lazaro Luis* was a cartographer of great merit and he was the Warden of Cochin in 1527. The only work which has survived shows the detailed and complete knowledge of the author as a navigator of the seas. His atlas of the world (1563) is a landmark in the history of cartography and shows Red Sea, Indian coast, Ormuz, Goa, Diu etc.<sup>67</sup> This atlas gives five pages of detailed cosmographic data. The interesting feature is that the scale of leagues is formed with the trunk of a tree. It shows Bengal and Malacca etc. It is the earliest chart showing Japan with its particular shape which became a model for others.

*Fernao Vaz Dourado*, one of the most outstanding cartographers and illuminators, was certainly the 'Primus inter pares, with no peer in the whole history of cartography'.<sup>68</sup> Dourado was born and studied in Goa and even participated in the second seige of Diu (1546) and "got hurt in his legs".<sup>69</sup> In India, he kept contact with other India-born cartographers like Diogo Botelho and Lazaro Luis. As he was nostalgic about India, he remained here and worked. His outstanding qualities as a cartographer were the homogeneity of his vast out-put, exceptional skill, artistic taste and beautiful illumination, consistently spread throughout the atlases. They were



perfectly drawn and hence were imaginative, fresh and beautiful. They are master-pieces of cartographic decoration and constitute a magnificent work without any parallel in the history of cartography.<sup>70</sup>

Only six of his works have survived his vast out-put and they are all different in drawing, ornamentation, illumination and general arrangement. His atlas of the world (1568) made in Goa is among the most precious not only as the earliest known but also because it is the only one with special charts, varied drawing and lovely illuminations. This atlas which was dedicated to Viceroy Luis Athiade has the earliest special chart of Ceylon and Japan made after the voyages to these areas. This atlas which dealt with all kingdoms, lands, rivers and islands round the earth has much cosmographic details including a table of tides on the coast of India.<sup>71</sup>

Another atlas of the world (1570) meant for presentation to some dignitaries in Portugal, has in all twenty sheets. It is indeed difficult to make a choice of its charts. They are all lovely and perfectly drawn, beautifully illuminated and well preserved. The charts contain useful cosmographic data including a table of tides for the Indian coast. An atlas of the world (1571) made in Goa has perfect illumination, extraordinary fresh and delicate colours. One of its charts shows India and Arabia etc. Cosmographic details include a table of tides for the coast of India. It is worth noting that the tide tables are drawn in Goa "for the coast of India" and the time for high tide was given in hours and quarters.<sup>72</sup>

His atlas of 1575, whose title page indicates it as "a universal and complete hydrography of the whole world", is the first one with rules for finding the golden number and the only atlas to have a wheel and table for determining movable feasts.<sup>73</sup> It has seventeen charts and four pages of cosmographic data in the usual pattern with perfect drawing, delicate illumination, rich decoration, perfect taste and balance. This shows the author as a cartographer and a consummate artist and in this regard no other cartographer surpassed him.<sup>74</sup>

His atlas of 1580 made in Goa which is perfectly drawn and well illuminated does not show the same refinement, good taste and balance seen in his earlier works. But they show

geographical improvement and numerous human figures not seen earlier in his works. In fact his atlases show a consistent evolution of certain features in cartography. The ornamentation seen in his earlier works subsequently disappeared as was the case with the tide tables.<sup>75</sup>

*Bartholomeo Lasso* was a clever cartographer but in his own careless style. His charts were very much appreciated by the pilots of India voyage.<sup>76</sup> Pilot G.F. Reimeo used it in his voyage to India. In ship S. Pantaleao (1595) and later in his return voyage to Lisbon in 1597 on board 'Sta Maria de Castelo'.

*Luis Teixeira* who belonged to the illustrious Teixeira family of cartographers was not only the founder of new school of cartography with his own individual style but also a connecting link between the greatest Portuguese cartographers of 16th and the 17th centuries.<sup>77</sup> He was an official cartographer-cum-cosmographer who acquired profound information through his several navigations. Since 1564, he began chart-making for the royal fleets and they were perfect and correct.<sup>78</sup> He transmitted the great tradition to his son who distinguished himself in the 17th century. Though he worked for over fifty years, we know only very little of his vast output. His chart marked the number of inhabitants in red near each village and it is of great importance as we have these details from his personal survey as a hydrographer.<sup>79</sup> A special feature of his chart (c.1585) is the drawing of a system of curved lines with legends relating to the variations of the compass. Since it is the first attempt to draw isogonic lines, it is quite interesting in the history of terrestrial magnetism. The blue and green colouring of the waves is very characteristic of Luis and it is not seen in the works of other cartographers of the 16th century.

#### **Pedro Nunes and His Rhumb Lines**

Pedro Nunes who was the chief cosmographer since 1529, contributed immensely to the development of Portuguese cartography. His main contributions were (i) to find out and enumerate the square charts, (ii) to study the rhumb lines (*loxodromics*), its main characteristics and its layout on globes, and (iii) to convert the square charts into reduced chart.<sup>80</sup>

In the art of navigation, the word 'rhumb line' means the curve of a ship heading continuously to the same point of the mariner's compass sailing under the direction of the wind.<sup>81</sup> The existing opinion was that the curve described by a ship when sailing on a constant course, coincides with the maximum circle of the sphere and therefore the ships maintaining such a route in theory may voyage round the earth, returning to the point of departure. But Nunes felt that this opinion was erroneous. Since the navigators encountered difficulties while using ordinary sailing crafts, he undertook the study of the nature of the curve described by the ship, keeping a fixed course and crossing successive meridians at the same angle.<sup>82</sup> Nunes studied "the curved and irregular lines described by a ship on a constant course and worked out the charts and terrestrial spheres (*pomas*) and it was named as 'rhumbs lines.'" He proved that the curve described by the ship was a peculiar type of curved line which was neither circular nor straight. It was not an arc of a great circle, but rather a spiral twisted or doubly curved line.<sup>83</sup>

Nunes studied the rhumb lines drawn on a globe and drew them on the spheres constructed by the Portuguese. By studying the fundamental theory of rhumb lines, Nunes paved the way for the improvement of the nautical charts. He was the first to reveal the nature of the rhumb curves and stated that the globe properly marked with rhumb lines is of greater service than any planisphere.<sup>84</sup> Though he did not indicate the practical process for tracing the rhumbs on the globe, he pointed out clearly the need for such tracing to be done with great accuracy. He complained that "because those who make globes do not know how to put in the rhumb lines, they do not realise this and so the maps are useless". As a cartographer, he tried to harmonize the usual norms of navigation with scientific laws. But his idea of rhumb lines and the directions he issued to the pilots upset the traditional charts. His innovations attracted strong criticism of the practical navigators to whom Nunes was speaking about India though he had never been to India and to sea and had never practised navigation. However, his original cartographical concepts provided a remarkable contribution to the Portuguese cartographical and

nautical history.<sup>85</sup> Nunes wrote a *treatise on the rhumbs of the globes for the art of navigation*. He was the first to examine the rhumb lines in his *treatise on certain doubts of navigation and treatise in defence of charts* (1557). He developed the subject more fully in the Latin translation of his treatise *Petri Noni opera* (1566). His statement that "they (the Portuguese navigators) also took chart carefully marked with rhumb lines" is of great importance in the study of Portuguese navigation and cartography.<sup>86</sup>

The Portuguese were making square charts even in the days of Prince Henry. They were called square charts because they were squared according to meridians and parallels. But the use of such plane square charts was not easy for the navigators who used to sail with the chart of distances so far.<sup>87</sup> As a result, the measurement of distances on a square chart required consideration of the latitude on which they were measured. The geometrical mistakes could be corrected by the process of resolving the figures of plane geometry that is called in navigation as *operation of charting (cartear)*.<sup>88</sup> The square charts were all rhumbed, the respective lines starting from the beautiful sets of points of compass (*rosas de ventos*), generally with illumination harmoniously spread all over the chart.

Pedro Nunes who was the first to expose the errors of the square plane charts, realized the defects and inconveniences of the square charts.<sup>89</sup> He studied the main deficiencies of the square charts for navigational purposes. He proposed the division of the planisphere into quarters (*quarteiroes*) which would be partial maps divided in rectangles and not in squares. He felt that the solution of the problem of maritime charts would be the construction of partial charts (*quartelades*) or rectangular projections. But his suggestion of rectangular charts were not adopted by the pilots as they found no advantage in them and the mistakes in distances and directions made by the square charts continued.<sup>90</sup> The Dutch cartographer George Mercator's globe (1541) with rhumb lines radiating from various centres, was based on the theory of Nunes. Nunes invented a spherical and fixable quadrant to enable the layout of rhumb line and invited the attention of cartographers to the need to take into account the convergence of meridians

and he introduced many improvements which all contributed much to the development of Portuguese cartography. Later, his disciple João de Castro also introduced further innovations.<sup>91</sup>

João Baptista Lavanha an eminent cartographer and cosmographer invented the particular trunks of leagues (1600). Its use reduced the defects of the square charts i.e., the discrepancy between the distances covered and the meridians on the charts.

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## **PART II**

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## PORTUGAL TAKES TO SEA

Portugal is geographically an integral part of the Iberian Peninsula. Therefore, the early history of Portugal is merged with that of the Peninsula of which it forms a one fifth part. The geographical position of Portugal as a narrow strip of land facing the mysterious Atlantic Sea had greatly encouraged the people to understand the importance of sea-power which in the course of time played a significant part in the history of Portugal. In fact, Portugal was in exceptional circumstances to venture a maritime life because it had a number of navigable rivers, deep and sheltered harbours.

Muslims had overrun the entire Peninsula as early as 710 A.D., but the struggle to expel them had also started immediately. Thus the history of Portugal had been a long struggle with the Muslims and a series of continuous warfare made the Portuguese hardy and fostered a race of sailors well versed in the art of navigation.

### **Genesis and Growth of the Portuguese Navy**

The individual history of Portugal began in 1095 when the county of 'Portucale' was given by King Afonso VI of Leao as dowry at the marriage of his illegitimate daughter Donna Theresa with a French noble Count Henry of Bergundy.<sup>1</sup>

Afonso's son Afonso Henriques (1114-1185) who succeeded him, developed the idea of Portuguese nationality and Portugal became a nation, when after the memorable victory at the battle of Ourique, he took up the title as 'King of Portugal'. The Portuguese navy appeared with this national independence of Portugal and there was considerable maritime activity from the very beginning of her nationhood.<sup>2</sup> Afonso possessed a naval armada to defend the Portuguese seas against the Muslims. He pushed the Muslims further south and with the help of the maritime forces of the Crusaders (who seemed to have given the impetus to the Portuguese navy), he conquered Lisbon in 1147 which was in the Muslim possession for over four hundred years. Thus Lisbon became the maritime, geographical and historical capital of Portugal. Such was the beginning of the Portuguese navy and the maritime character of the Portuguese nation began to take shape by the 12th century, when Portugal had as much as one hundred and sixty ships.<sup>3</sup> Since then, Portugal had begun her naval movement in a big way.

We begin to get evidence of Portuguese navigation in the North Sea and shipbuilding in the Portuguese yards by the 13th century. The Portuguese merchants and ship-owners set up a trading house at Bruges and this presupposed the evidence of a capable navy and ability to sail ships. King Sancho I (1185-1211) created a fighting navy and even contributed forty vessels to the Crusader's armada to conquer Silves.<sup>4</sup> Under Sancho II (1225-1248), Portugal had possessed a navy worth its name and it had a varieties of vessels like naus and gales etc.<sup>5</sup> Afonso III (1248-1279) promoted naval trade by attracting traders. In 1263, when he conquered Algarve from the Muslims, Portugal became the first European state to expel them fully, two centuries before the Castillians. We also hear of a naval battle of 1275 between the Portuguese and the Castillians in which the Portuguese naus and gales participated.<sup>6</sup>

King Diniz (1279-1325) can be said to be the true founder of the Portuguese navy and he established many naval stations foreseeing the future of Portugal on sea. He founded the Order of Christ whose history is intimately connected with that of

the Portuguese maritime conquests in the subsequent years. He encouraged the study of Mathematics by founding the University of Coimbra and planted pine trees in Leiria for ship-building purposes. In 1316, he appointed Manuel Pessanha, a Genoese, to be the Admiral of the Portuguese navy and Pessanha contributed much for the development of the navy in Portugal.<sup>7</sup> Diniz took several other measures for the progress of the navy by providing a dockyard for making ships and by framing detailed regulations for its working.<sup>8</sup> There was considerable naval activity in Portugal and in fact the 14th century was a century of armadas of naus and gales making a perfect naval unit for the defence of the country and several fleets were organized for specific purposes. Besides a fighting navy, Portugal had also a merchant navy made in the Portuguese yards for the transport of fish and salts to various European ports.

Naval activities continued under Afonso IV (1325-1357) and D. Pedro (1357-1367), and Lisbon became the central port for vessels of all kinds. Even Pope Benedict XII had the highest opinion of the Portuguese navy when he felt that, "they (Portuguese) would in the end destroy the domination of others".<sup>9</sup>

King Fernando (1367-1383), the last Bergundian ruler of Portugal had a merchant navy and no other ruler did so much for sea-faring than himself. His reign marked the golden period of the Portuguese navy which was now well-defined and established according to the technical regulations and norms of a good navy. He issued two charters in 1377 and 1380 in order to encourage ship builders.<sup>10</sup> He supported ship-building by offering timber from the State forest at concessional rates, allowed duty-free import of raw materials, tax exemption on purchase and sale of foreign ships and tax exception on goods carried in the first voyage.<sup>11</sup> Moreover, in case the ships wrecked in the first voyage itself, their owners enjoyed certain privileges for the next three years, provided they built or acquired other ships instead. Several other measures were introduced for the development of the navy. They included the starting of a maritime register and naval statistics and a co-operative and mutual insurance scheme at a premium of

20% of the amount of freight and not of the value of the ships. The Bergundian dynasty of Portugal (1095-1385) which did so much for the maritime glory of Portugal ended in a revolution.

The Crown of Portugal was formally offered to John I of Aviz on the 6th April, 1385, and he was proclaimed the King of Portugal.<sup>12</sup> He defeated the Castillians in the famous battle of Aljubarrota (14th August, 1385) and founded the Aviz dynasty in Portugal. He was destined to be the founder of a royal line which ruled Portugal for about two hundred years of her history. He preserved the political independence of Portugal and with the instinct of sea-faring inherited by his illustrious sons, including the celebrated Prince Henry the navigator, he laid the foundation of a great navy and began maritime conquests. It was this dynasty which started the age of exploration and discovery with the dream of a sea-route to India which Portugal was destined to realize sooner or later. His illustrious successors engaged themselves in a series of adventures over the Ocean. Portugal entered upon a career of maritime splendour. King Afonso V, 'the African' (1438-1481) arranged a series of naval expeditions on the African coast.

With John II, 'the Perfect' (1481-1495), a new era of active exploration began. He was deeply interested in the monumental plan of his great uncle Prince Henry and he did every thing during the twenty-four years of his eventful career and planned secretly for the first assault of the Indian Ocean, after turning down Columbus' scheme (1484) of reaching India by sailing westward.<sup>13</sup> With his life's ambition to find a sea-route to India, he attracted the wisest experts at his court and did much to perfect the knowledge of navigation. He visualized that it was possible to reach India by sea by sailing round the African continent and even began preparing for a fleet which was to realize his cherished dream. He laboured his best to enter the 'promised land', but his death robbed him of this great triumph.

King Manuel I 'the fortunate' (1495-1521), with his hereditary maritime interest, trode the step of Prince Henry and John II and revived the naval policy of 'discovery, conquest

and commerce'. No plan was more attractive to him than the discovery of a sea-route to India. Discoveries continued for nearly every year of his truly fortunate reign of quarter of a century which witnessed the climax of maritime triumph.<sup>14</sup> The armillary sphere on his coat of arms showing the continuity and progress of maritime enterprises, with markings "espera a esphera" (hope of the sphere) really turned prophetic and he hoped and proceeded on the path shown by his predecessors. It was during his reign that the Portuguese ships sailing with the purple cross of Christ on their sails, reached India and thus opened the gates of India and the East to Europe.<sup>15</sup>

The last ruler of the Aviz dynasty, Sebastian was killed in the battle against the Muslims in 1578 and two years later, in 1580, the crown of Portugal and Spain were amalgamated in King Philip II and for the next sixty years, Portugal ceased to exist as an independent country.

### **Early European Efforts to reach India**

In the early years, the world of Europeans was very small. Some travellers, missionaries and merchants had journeyed to the corners of Asia and nothing was known beyond that. The then known world included Europe, North Africa and North-East.<sup>16</sup> Oceanic navigation was not ventured in the oared galleys. In fact, several attempts made to reach India by the Atlantic had failed.<sup>17</sup> According to Greek historian, Herodotus, the Phoenicians had circumnavigated Africa first and even took ivory and peacock etc. from India.<sup>18</sup> Skylax from Persia sailed up the Indus river and explored the area. With Alexander the Great, the western knowledge on India increased. Megasthenese, the Greek envoy to India spoke of India four sided of which two sides were embraced by sea.<sup>19</sup> With the discovery of the south-west monsoon winds by Hippalus, it was possible to sail with the help of these winds to Mazuris (Cranganore on the Malabar coast). The unknown author of the 'Periplus of the Erythrian Sea' (Navigation of the Red Sea) habitually sailed to Indian Ocean with the monsoon winds.<sup>20</sup> Many geographers and astronomers described the trade relations between the East and the West.<sup>21</sup> With Pliny, ended the

'classical age' of geography and there was no geographical expedition for some time.

An Alexandrian monk Cosmos Indikopleustes (Indian Navigator) who reached India in 550 A.D., talked about India with great exactness in his 'topographica christiana'. From the 7th century onwards, the Arabs controlled the Indian Ocean and they sailed by the monsoon winds for centuries. Arab geographer Al Idrisi had named several islands of the Indian Ocean in a seventy pages atlas of the world. During the crusades, several envoys passed between the west and the east. Marco Polo travelled to the east during 1271-1295.<sup>22</sup> Other travellers who tried to reach India were: Venetian Mario Sanuto (1300-1306), Odorico (1316-1330), Moroccan Ibn Batuta (1324-1354) who visited Goa and Honavar, Friar John Marionolli (1338), English man Sir John Mandovillie (1327-1372), Spanish envoy Ruy Gonçaves at Timur's court (1402-1406), Venetian Nicolo Conti (1419-1441) who visited the Malabar coast, Russian Athanasius Nikitin (1468-1474) and Genoese San Stefano (1494-1499).<sup>23</sup>

### **The Portuguese 'Age of Discovery'**

The new born national independence gained by the Aviz dynasty provided a vigorous stimulus and the Portuguese navigators embarked on an Atlantic sea-policy which though adventurous was profitable. They desired to reach all corners of the world and thus to possess an extensive maritime dominion. Therefore, Portugal pioneered exploration and discovery and for a hundred years, Portugal was the focal attention of the world. Without it, she would have simply been no more than a narrow strip of territory in the Iberian Peninsula. The 15th century was really a 'century of discovery' and during this century, Portugal ploughed through the stormy and unknown sea "which was never before navigated" and thus they opened a new page in the history of maritime discoveries.<sup>24</sup> Their maritime facts were revealed in the epic poem of 'Lusiadas', which would not have been composed without the 'century of discoveries'.

"Thus went we far these unknown seas to explore which people yet unexplored had been."<sup>25</sup>

The exceptional courage, skill, confidence and adventurous spirit of the Portuguese navigators enabled them to perform prodigious exploits in that 'century of discoveries'.

### **The 'Plan of the Indies'**

Throughout the Middle ages, there was lot of confusion about the meaning of the term 'India' and it was applied to all what lay east of the Mediterranean, beyond the land of Islam and south of Sahara desert. The term 'India' or Indies' was applied to any unknown and mysterious region in the east.<sup>26</sup> Many maps showed Indian Ocean as a land-locked sea and hence its discovery was an absurd idea in those days. It was believed that the Nile river divided India from Africa.<sup>27</sup> Considering the fact that even chronicler Gomes de Azurara identified Senegal river with Nile, it was not surprising that the whole of Africa to the south of that river was considered as part of India. It only added to the confusion when several geographers called India by various names. The result was that it simply enlarged the area embraced by the term 'India' or 'Indies' to such an extent that it came to describe all the land-mass that lay beyond the land of Muslims. But the Portuguese had a notion that the Indian ocean was not a closed sea and therefore they planned to double the African continent in an effort to push into the Indian sea. This 'plan of the Indies' was first conceived by Prince Henry and taken up by John II who had thought of an alliance with Priest John of Ethiopia to carry out a double attack against Islam by mobilising land forces of King Negus to attack against Egypt and to intercept the maritime way of the Red Sea. The Portuguese plan was to attack the important Muslim positions in the Indian Ocean.<sup>28</sup>

### **The Driving Motives for Discoveries**

The early Portuguese maritime activities were limited to the Atlantic—to discover new lands, to counteract Moroccan trade and to acquire products of the African coast. But later the scope was enlarged and they planned to capture and hold Ceuta lying opposite Gibraltar, to protect the Iberian Peninsula from the Muslim invasion, fight Islam in Morocco, control it



and go ahead with the 'plan of the Indies' in order to crush the Arab power and trade.<sup>29</sup>

Several motives have been attributed to the maritime discoveries. Both solicitory and impulsionary forces impelled them to sail in frail crafts to the distant sea.<sup>30</sup> They had the desire for gold, spices and adventure to discover a direct sea-route to India in order to destroy the Arab trade monopoly there. According to Gomes de Azurara, Prince Henry's chronicler, the navigators were guided by five motives<sup>31</sup>—(i) to explore the African coast beyond the cape of Bojador in order to know what existed there ; (ii) to find out whether there were or not any Christian people in Africa with whom it might be possible to do profitable trade ; (iii) to ascertain correctly the extent of the territories of the Muslims because every sensible man naturally would like to know the power of his enemy ; (iv) to discover if there was any christian kingdom which would help in the war against the Muslims ; (v) and to extend the Christian faith and "bring to Him all souls that wish to be saved". There were scientific, economic, military, political and religious motives. It is probable that they were all in the mind of Prince Henry.<sup>32</sup>

#### *(i) Commercial Motive*

The east was the home of exotic, luxurious and aromatic goods of all kinds—spices like pepper, ginger, clove, cinnamon, nutmeg, mace, drugs, dye-stuffs like indigo and saffron and other items such as pearls, ivory, silk, muslins, alum and carpets etc. Pepper and other spices were used as good preservatives for the winter season. As a condiment, all dishes were seasoned with it. They were also used in religious accessories and dyes. As pharmaceutical products, they were the main ingredients in every medical prescription and were needed in the manufacture of narcotics, balms, poisons, ferments, appetisers, stimulants, diuretics, disintoxicants and purgatives.<sup>33</sup> Therefore, the Europeans clamoured for the spices which were more expensive than even gold in those days. A quintal of pepper costing three ducados in Malabar was sold in Portugal for forty ducados.<sup>34</sup> It was natural that the Europeans had lust and taste for Eastern luxuries. This encouraged the Portuguese to

make an attempt at all costs to procure them from their very source rather than depending on the Venetians and Genoese who reaped rich profits in their distribution to Europe. The Portuguese also visualized that one day Lisbon could replace Venice or Genoa as the commercial capital of Europe. Therefore, the thirst for gold, ivory, plumes, slave trade, the incentive of reward and the desire to pour the rich treasure of the east into their hands etc., acted as influential motives for the maritime discoveries.<sup>35</sup>

In the past, the eastern commodities reached Europe through three trade routes—the Northern Black-Sea route, the Indo-Syrian middle route and the Southern Indo-Egyptian route. Constantinople, Baghdad and Alexandria became the most important trade emporiums on these routes respectively. They supplied the Eastern products to Europe through the Venetian and Genoese intermediaries. But in 1453, the Turks interrupted these trade routes and closed Constantinople, Syria and Egypt for European trade. Subsequently, Asiatic products could not reach Europe and they became scarce and costly. This affected the European economy vitally. The Portuguese who desired to monopolize or at least share in this trade flowing from India to Europe, could never expect to reach India through the land-route of the Middle-East then under the Muslim domination. Therefore, they naturally desired that the Eastern products could be brought to Europe through an alternate and safe route independent of the Turks. Even when they came to India later, “they entered with the sword in one hand and the crucifix in the other, and finding gold, they laid the crucifix to fill other pockets.”<sup>36</sup> Here the profit motive can be seen very clearly.

#### (ii) *Political Motive*

The Portuguese struggled for their national independence for long years extending from the 10th to the 15th centuries and this resulted in three thousand and seven hundred battles. They became bitter enemies of the Muslims and sought every opportunity to strike a fatal blow at them.<sup>37</sup> They were prepared to face any consequence, if it could lead to the demolition of the Muslim trade monopoly in the East. These attempts

were prompted by a strong political motive to axe the powerful Muslim influence in the Indian Ocean. Trade and war went together. War could not be fought without profit from trade because the resources of a small country like Portugal were small. But very often, small States in danger showed greater enthusiasm, not shown by great nation with huge resources and greater security.<sup>38</sup> The Portuguese hoped that by going to the East and conquering it, they could expand their temporal confines.

### *(iii) Religious Motive and Papal Sanction*

The Kingdom of Portugal was itself believed to be founded "on the blood of its martyrs and those who fell in the battle was entitled to the crimson crown". Lisbon was wrested from the Muslim power with the help of the Crusaders and they organized their expeditions as a mere continuation of crusades on a larger scale with the prospects of plunder and religious proselytism. After the conquest of Ceuta in 1415, John II washed his hand thoroughly "with the blood of the infidels and he considered it as the beginning of a second crusade. To spread Christianity, to promote the missionary activity among the people and to plant the cross in distant lands was the ambition which guided the Portuguese mariners undaunted through all perils and it was that ambition which for a time made the diadem of the world empire hover over the nation's brow."<sup>39</sup> The Pope had sanctioned the maritime expeditions as crusades with the usual forgiveness of sins etc. The capture of the oceanic highway of Asia itself was considered as the maritime extension of crusades.<sup>40</sup> Fired with the missionary zeal of the crusaders, the Portuguese mariners wanted to suppress the growing power of Islam and subject them to Christian ethics. The Cross as the symbol of faith was as much dear to them as sword was the symbol of power and in fact they took possession by the sword so that the cross may have a free access. The objective was not only conquest but conversion. The missionaries in their fleets went with cross with the objective of conquering lands for the king of Portugal and winning souls for the king of heaven.<sup>41</sup> It was in keeping with this religious motive uppermost in their minds that they

planted a cross (*Padrão*) wherever they landed in victory. Religious passion was the driving force and the propagation of the gospel was the main aim of their maritime enterprises and it drove them to the fever-ridden seas of the tropical Africa and beyond. Otherwise, Vasco da Gama would not have said at Calicut that he had come to India "in search of Christians and spices".<sup>42</sup>

The Military Order of Christ founded by King Diniz provided its huge resources for the expeditions as crusades. The missionary spirit of this Order, with a sword in one hand and a cross in its banner clearly indicated the religious motive of the Portuguese expeditions. The history of this Order is bound up with the history of Portugal whose mariners felt that they were always guided by the cross.<sup>43</sup> The Portuguese naus, galleys and caravelas have carried the cross on their sails. The administration of this richest religious Order was invested in Prince Henry in whose hands it became a powerful instrument for implementing the plan of expansion.<sup>44</sup> This Order which received a tribute of 1/20th value of all merchandise brought from the Guinea coast, helped navigation and discoveries very much so that without it, the expeditions could not have succeeded.

The conversion of the non-believers was an obligation imposed on the Portuguese by the Papal bulls which gave the tacit consent of the Popes. These bulls which were issued at the request of the Portuguese rulers entrusted them with the duty of expanding faith and gave them exclusive right to occupy certain zones of discoveries. The history of Portugal shows several examples of Papal authority and sanction. The very recognition of Portugal as a separate entity came from a Papal bull of Alexander III in 1179. The Papal bull of Eugene IV—*Dudum Siquidem* (31st July, 1436)—gave Prince Henry and his successors the exclusive right over the territories already conquered and going to be discovered beyond the cape of Bojador.<sup>45</sup> The bull, *Dum Diversas* of 18th June, 1452 authorized the king of Portugal to attack and conquer the unbelievers, to capture their goods and territories, and to enslave them permanently. This bull has sanctioned the impending Portuguese attack on

Morocco, though there was no such limitation. The bull of Pope Nicholas V, *Romanus Pontifex* of 8th January, 1455, which was officially proclaimed in the Cathedral of Lisbon, had clearly mentioned India.<sup>46</sup> The bull eloquently praised the apostological services of Prince Henry and desired that he undertook more voyages as far as 'Indies' (Usaque ad Indios), the mention of which word enables us to infer that the Portuguese had been already seized of the project of rounding the African continent and reaching the region of India as early as 1454.<sup>47</sup> The bull credited Prince Henry with the intention of making contacts with the people of India in order to continue the struggle against the enemies of the Christian religion. It also clearly recognized the Portuguese efforts and conceded to her the perpetual domination of all that they should find by the ocean as far as the regions of India.<sup>48</sup> This bull has excluded all others from entering the area earmarked for Portugal, under the pain of excommunication. The bull of Calixtus, *Inter Caetera* of 13th March, 1456, conceded the spiritual jurisdiction over the lands from cape Nun to India to the Order of Christ. The bull of Alexander VI of 3rd May 1493 drew an imaginary line which divided that part of the world into two zones which was yet to be discovered and reserved all that on the eastern side to Portugal and the other part to Spain.<sup>49</sup> In the bull, *Ineffabilis et Summi* to King Manuel I in 1497, the Pope allowed him to possess the lands conquered from the unbelievers. The Pope asked him to establish Christianity in the land which might be conquered still.<sup>50</sup> After the discovery of the sea-route to India, the Holy See honoured the king in 1502 with the title of 'patron of catholic missions of the East'. One thing that stands out in all these bulls clearly and which was to influence the policy for a hundred years to come was the combination of the spiritual urge to conquer heathen lands for the Christ with the zeal to cut at the root of Turks by attacking them from behind.<sup>51</sup>

(iv) *The Legend of Priest John*

The legend of Priest John, the semi-mythical Christian Patriarch is closely associated with and played an important part in the maritime enterprises and especially the sea-route to

India and hence an influential factor. For many centuries, this enigmatic figure had haunted European imagination. By the 12th century, it was believed that his kingdom existed in the distant areas of Asia.<sup>52</sup> Marco Polo placed him in Asia and Florentine traveller Sigoli spoke of him as dwelling in India. By 1465, a letter purported to have been written by priest John to a European Emperor was widely current in Europe and it created a lively hope. Known as the Pope of the Orient, his empire was believed to have extended to the Indies and included India and that his kingdom had a scepture of gold, monstrous ants dug up gold, fishes emitted purple fountain and pebbles gave light.<sup>53</sup> The rivers had rare gems and magical pebbles restored sight to the blind. Priest John was known to have seventy-two vessels and followed by innumerable knights, several tributaries, three hundred and sixty Dukes, twelve Archbishops and Bishops etc. and attended by thirteen great crosses before him during war. His palace which was known to be made of ebony and crystal had a vast mirror in which he could see all that happened in the kingdom and could detect conspiracies even in the distant provinces. The roof of the palace made of precious stones was supported on columns of purest gold. Europeans heard that he used to entertain thirty thousand people at his table made of emerald.

Priest John was known to be a great champion of Christianity and ever ready to fight against Islam. Since the 14th century, his legend aroused great curiosity in Portugal not only because of the religious affinity but also because it was said that his dominions were "laden with gold charms".<sup>54</sup> The Portuguese had only a vague idea of his country, believed to be some where in the interior, in the 'Indies', a term very elastic and which often embraced Ethiopia, Africa and Asia.<sup>55</sup> Thus uncertainty and elusiveness only increased their curiosity and they hoped to have contact with his 'terrestrial paradise' which would confer the same spiritual benefits as a pilgrimage to Jerusalem.<sup>56</sup> His land was worthy to be sought for not only for its material riches but also for its spiritual riches, as they heard that the people of 'Indies' were also worshippers of Christ. The Portuguese were only eager to meet him and therefore hoped

to navigate as far as 'Indies', a country of opulence, semi-fabulous wealth and splendour. They desired to seek in him not only an ally against the Turks but also a station as a relief base for further operations.

After the closure of the Middle-East land route by the Turks in 1453, "Prince Henry very much desired also of the land of Priest John, if this might be possible."<sup>57</sup> Henry must have used all means, including the news brought by his globe-traveller brother D. Pedro, to solve this problem and he must have desired to meet Priest John for making an offensive and defensive alliance against the Muslims. In the land of Priest John, he hoped to collect more information which might lead to the discovery of a sea-route to India. He was confident of persuading Priest John to attack the Muslims from the rear or either squeeze them out or at least divert their attention from the Iberian Peninsula.<sup>58</sup> To find Priest John was a 'discovery as that of the maritime way. "Priest John was the means, India was the end."<sup>59</sup> However, Prince Henry had not discovered Priest John's kingdom because of his premature death.

In 1483, a Portuguese sea-Captain reported that the king of Benin used to send envoys and gifts (which included crosses!) to an overlord whose capital was twelve months journey further east.<sup>60</sup> Such a journey might as well reach Ethiopia. Under the successors of Prince Henry, though persistent efforts were made to establish contact, the legend of Priest John had faded away and it did not impress them thereafter.

#### (v) *Geographical Motive*

The prevailing legends about the Atlantic sea created by the ancient geographers only increased the curiosity of the Portuguese. The then safe limit of navigation in the Atlantic was cape Non and "one who passed beyond cape Non will return or not".<sup>61</sup> The Atlantic sea was considered as gloomy sea with imaginary perils and hence not navigable as it had mysterious currents, heavy mists, sudden storms, sand banks and reefs. Europeans believed the mythological pillars of Hercules in the strait of Gibraltar as the end of the world. They trembled by the fear that the Atlantic sea

would boil, sky would be always overcast and sea would be always shallow with stormy currents, a league from the shore.<sup>62</sup> Some even felt that Atlantic was a "sea bounded by sea" while others considered it as a lake with no access to the sea, with monsters and draggons guarding its marvellous riches and hence not circumnavigable. Even the Arab geographers advised against any attempt as the Atlantic was a sea of terrors with thick water and air and that none would dare to sail and steer away from the coast.<sup>63</sup> The Atlantic sea was heard as a burning zone. Because of these legends, the Portuguese anxiously desired to ascertain the real truth and in that process, they solved the riddle of the centuries.

(vi) *The Influence of King Duarte and Regent D. Pedro*

King Duarte sent for copies and translations of Greek and Arab works and combed them for any scrap of information which would help his brother Prince Henry's plan of discoveries. Perhaps Duarte may have had access to the writings of Al Masudi and Idrisi and even the travels of Ibn Batuta, all of which described the shores of Indian Ocean in some detail.<sup>64</sup>

Regent Pedro visited Venice in 1428 which was then at the height of its opulence. At Venice, he went to all parts of the Arsenal and every corner of the shipyard. "He took note of their (ship's) masts, their rigging and their sails. He took part in setting masts in every section of the naval-yard and after walked through the decks to the ships anchored at the port."<sup>65</sup> He brought from Venice a copy of the travels of Marco Polo and an up to date map of the world. He visited Florence where scholars like Toscanalli were engaged in geographical studies. He learnt that they now believed that the world was round and that they could even calculate its approximate dimensions.<sup>66</sup> D. Pedro was convinced that the Muslim world must be overflanked and alliance sought with Christian kings and people who lived beyond in the east. A way had to be found to reach these distant lands by sea and the first step was to overcome the obstacles of cape Bojador. He suggested the provision of better



ships and equipments so that the physical difficulties of long sea-voyages could be easily overcome. It seems probable that the design of the caravela was inspired by the visit to Venetian ship yards.

Marco Polo's work was available in Portugal since 1428.<sup>67</sup> It revealed that there must be a passage round the south of Africa. It is only reasonable that this work acted as a great incentive to the Portuguese voyages.<sup>68</sup> It must have profoundly influenced Prince Henry's determination to continue voyages on the African coast until he found a passage to take him to the east. Later Pedro granted a charter to Henry allocating him 1/5th of the share of the profits of the African expedition and in future all Captains were to seek Henry's permission.<sup>69</sup>

### **The Policy of 'Planned Secrecy'**

The Portuguese maritime discoveries were not a mere chance experiment or mere fortune. They were the results of persistent and systematic step by step organisation by adventurous seamen.<sup>70</sup> Throughout the discoveries, there was an unbroken continuity and consistency. They planned their expeditions with meticulous care and in order to conceal the discoveries from their enemies, John II ordered that all the records to be deposited in the archives. Thus the other Europeans were kept away from knowing the Portuguese plan. The Venetians, Genoese and Castellians etc., knew nothing about the Portuguese voyages of discoveries.<sup>71</sup> The Portuguese chroniclers also observed the official policy of secrecy which deprive us today much of the information on maritime discoveries. The Court of Portugal (Cortes) even suggested to the king "not to allow the foreigners to settle in your kingdom or dominion for they reveal your secrets".<sup>72</sup> But in spite of all these, it was not altogether impossible for the rivals to lure the Portuguese Pilots away from their allegiance or to arrange at a price the Portuguese maps to be smuggled out of the country.

### **The Maritime Discoveries**

The conquest of Ceuta, a strong Muslim trade centre on the north coast of Africa across Gibraltar, marked the

beginning of the maritime enterprises. It was through Ceuta that the gold of Guinea Coast trickled into Europe. Therefore, it could be made a base from where the Portuguese ships could prey on the Muslim vessels in the area. But there were numerous objections to the project—the poor size of the army, lack of fleet for transportation, huge expenses involved, danger of leaving the newly established kingdom of Portugal undefended and the risk of upsetting the delicate balance of power in the Iberian Peninsula.<sup>73</sup> The Portuguese 'Cortes' approved the venture as a crusade rather than a campaign.

The destination of the expedition was kept a closely guarded secret. The preparations continued for two years and the shipyards of Tagus and Douro hummed with activity. Many people contributed for the expedition. At this stage, the Queen mother Phillipa fell seriously ill due to plague and she called her three sons to the bed-side and gave them crosses to be worn and also swords and blessed the expedition.<sup>74</sup> Prince Henry felt that it was his mother's dying word that the enterprise of Ceuta should go forward. By July, 1415, a fleet of twenty galleys was ready. The entire fleet numbered two hundred and forty vessels including twenty-seven galleys with three tiers of oars, thirty-two with two tiers, sixty-three troop-transporting ships and over a hundred store ships. The armada was propelled by 30,000 sailors and oarsmen with 20,000 solidiers.<sup>75</sup>

The fleet sailed out of Tagus river on 23 July, 1415, hardly five days after the death of the Queen mother. It was only at the Lagos harbour that the destination was revealed to the participants. A sermon was also read announcing the Papal bull declaring the enterprise as a crusade. Ceuta fell within few days. The capture of Ceuta had political and economical effects.<sup>76</sup> It was a turning point in history, a curtain-raiser to the domination of Europe over Africa. Ceuta not only secured gold and other products but also collected information about the mysterious East. Being the first expedition outside Portugal, it inspired them and showed the proof of their capacity. The whole of Portugal rejoiced when the fleet returned from the enterprise. Those who had distinguished were rewarded. Henry was made the Duke of

Viseu. But the conquest of Ceuta sent an alarm throughout the Muslim world.<sup>77</sup>

Prince Henry began to see the interior of Africa not merely as a field of battle but as a land of mystery and of opportunity. But his plan of a surprise attack on the Muslim garrison at Gibraltar had to be given up at the instance of John I. However, several voyages were undertaken during the 15th century "in order to know the reasons for the powerful currents in the Atlantic and collect details that trembled the previous navigators".<sup>78</sup> Henry equipped several square rigged barcas and sent them to the Atlantic coast of Morocco and thus Porto Santo was discovered. This discovery led to more important development. It encouraged the fitting up of another expedition under João Gonçalves Zarco who explored Madeira in 1420. In a short time, the island of Madeira was sending back to Portugal hard timber for ship building, honey, sugar and a distinctive wine which was shortly to become famous throughout Europe. Henry realized the fact that trade could be a great incentive for exploration as the pursuit of glory and that much that was unknown was not unknowable. Later the fleet of Gonçalo Velho Cabral located a group of islands named Azores (from hawks, a kind of birds found in this area).<sup>79</sup>

During 1425—1434, Henry sent not less than fifteen unsuccessful expeditions down the African coast in order to break a new ground *i.e.* to sail beyond the cape of Bojador which was the limit of European navigation till then. Henry had to confront with so many superstitions—that Bojador protruded into the sea and hence was the limit of navigation; waves crushed over reefs; and currents met in whirl pools. The heat of the desert-coast line made them suspect about the existence of life even! At last in 1434, Captain Gil Enes sailed beyond Bojador and this broke a great barrier of superstitions. The rounding of Bojador, "the dark and sinister sea...filled with mysterious dangers and powerful currents was a great feat which broke fresh grounds in the progress of maritime discoveries."<sup>80</sup> Now the way was clear for progressive exploration down the African coast. With the fears of Bojador allayed, the barinel and oared galley sent under

Antonio Gonçalves Baldia voyaged further and discovered the 'Angra dos Ruivos' (from the Gurmets which they fished there). In 1436, he sailed some 260 miles south, crossed the tropic of cancer and explored the mouth of river named as Rio de Ouro.

### **The Tangier Disaster (1437)**

Further progress was a question of time and several expeditions were sent. But the one which was sent in 1437 to Tangiers to destroy the Muslim domination there and then to reach India, ended in dismal failure and Prince Fernando had to die in captivity.<sup>81</sup> Henry had a long cherished dream to have a new assault on the Muslims of North Africa. But Regent Pedro disapproved the whole project. However, King Duarte was unable to turn it down because Henry had exerted great influence on the Queen to such an extent that when she was in child-birth in September, 1436, she extracted a firm promise from the king that a crusade against Tangiers should be launched.<sup>82</sup>

From the beginning, the preparation for the expedition did not go very well. The destination of the expedition was kept a secret and in the mean while Tangier had strengthened its defence. Finally, a huge force of six thousand left Belem in a fleet on 23rd August, 1437 and reached Tangiers on 13th September, 1437. Fighting continued with great casualties. The expedition ended in a tragedy. The only alternative was to surrender Ceuta and to give Prince Fernando as a war hostage till final settlement. The Portuguese were prepared for any sacrifice except the surrender of Ceuta. Henry had to return to Sagres in great humiliation. Prince Fernando died in captivity.

The tragedy of Tangiers and a dispute about Regency arrangement on the death of King Duarte enforced a respite on the voyages for some time, but in the mean while, the Portuguese were busy remodelling ships suitable for each voyage. In 1441, Henry again began exploration and sent Nuno Tristao who sailed further and discovered Cape Branco. The Papal bull of 1443 allowed the spiritual jurisdiction to the Order of Christ over all the lands to the south and the

voyages were considered as crusades. Tristao sailed still further reaching Arguin island and brought natives.

### **The Beginning of Slave Trade**

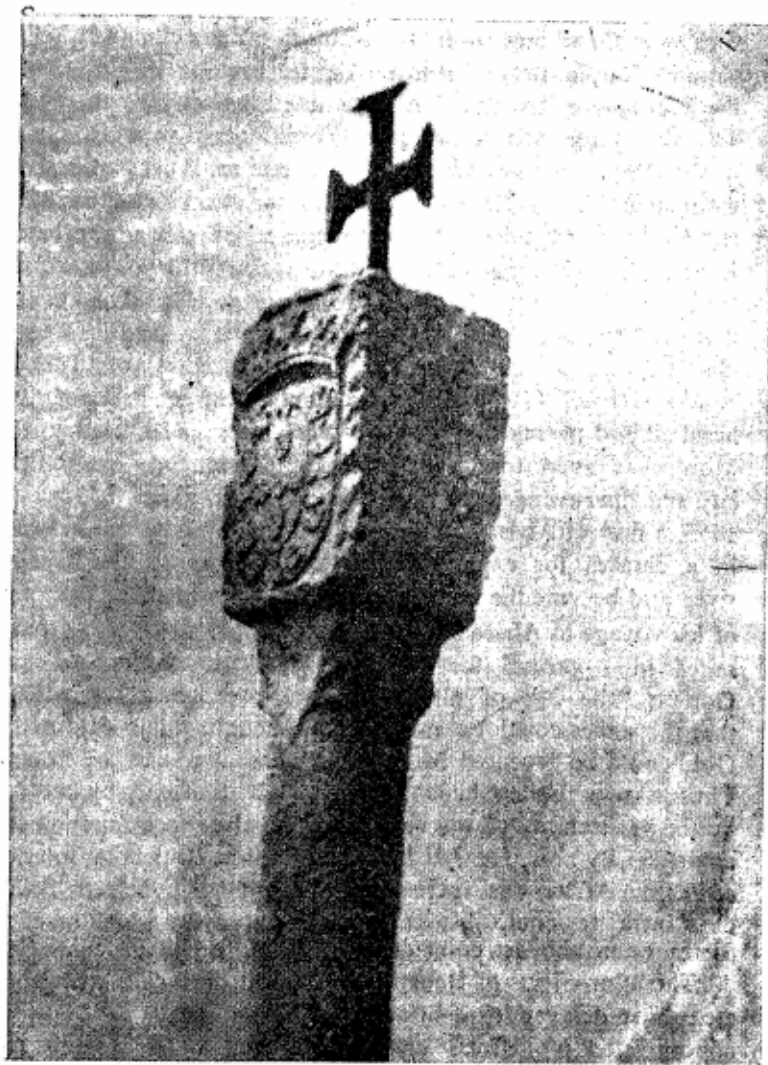
Six caravelas that sailed in 1444 under Gil Enes brought home a number of natives. They were no longer for interrogation but as commercial commodity. Thus began the slave trade. Now that the voyages were increasing and that the profits could be used to finance fresh expedition according to a charter of Regent Pedro, there was great inducement to ensure that profits followed.<sup>83</sup> Soon exploration and slave trading had become naturally complimentary. Lagos became the centre of slave market which encouraged the Portuguese to undertake further voyages. During 1434-1448, 927 slaves were brought from the African coast. The slave trade greatly financed further voyages and gold accelerated the desire for more gold. Navigation, discovery and conquest went together with commerce and colonization. Thus the Portuguese went on with the maritime exploration of the mysterious Atlantic seeking a sea-route to India.

The voyage of Goçalo Cintra (1445) met with attack from the natives. They were the first casualties in which some Portuguese died. The fleet of João Fernandes (1445) brought first hand information. In that year, twenty-six caravelas sailed on an expedition to the vicinity of Arguin islands. The voyage of Nuno Tristao (1446) to the mouth of Gambia river resulted in his own death from the poisoned arrows of the natives. According to chronicler Gomes de Azurara, upto 1446, over fifty caravelas reached the last point at the Guinea coast and brought gold dust, salt and slaves.

### **The Marble Pillars (Padrões)**

So far the Portuguese had been placing wooden commemorative columns (known as Padrão) at every cape they explored. It signified the formal possession of the place by the Portuguese. But these columns disappeared soon. They would also carve on trees the motto of Henry—'talent bien faire'—along with the name given to the newly discovered

land. Under John II, the wooden columns were replaced by carved marble stone pillars with the cross of the Order of



*Fig. 7. Padrões.*

Christ and the royal coat of arms. These heavy pillars which were carried in the caravelas were inscribed with the name of

the king, the discoverer, and the date of discovery in both Latin and Portuguese.

From 1448 to 1453, there were no voyages due to disputes with the Castilians over the Canaries. But, in 1453, when Constantinople fell to the Turks, it became inevitable for the Portuguese to find an alternate sea-route to the East. The new king Afonso V quickly responded to the appeal of the Pope to mobilize a force against Turks and even made a gold coin-Cruzado—carrying the crusader's cross from the African gold, to pay for the expenses of the enterprises.<sup>84</sup> Henry also planned an expedition against Morocco not only for a trial of strength, but to gain access to the textile centre there and to harass the Muslim shipping in the straits. It was planned to attack Alcaser Ceguer, a centre of Turkish concentration. On the approach of a large fleet of two hundred and twenty ships with 25,000 men under Henry, the Moroccans sued for peace. Henry triumphantly entered the city and thus avenged the humiliation of Tangier (1437). In 1455, a fleet of Alviso Cadamosto, a Venetian adventurer, went in a caravel for exploration. He sailed up to the Senegal river and became the first European to give a detailed account of his voyage in Africa south of Sahara. In 1457, Diogo Gomes sailed in a caravel for exploration. With Cadamosto and Gomes, "the age of plundering was over and it was realized that the slaves could be more easily bought than captured". Gold could be procured by knowing where it was to be found. Thus a new policy began. Henry felt that only by keeping up the profitability of the voyage, could their continuation be assured. By now, Henry's knowledge about the whole interior of Islamic Africa was increasing. In 1460, he helped Pedro de Cintra to equip his caravelas for a voyage which reached Sierra Leon, the last point discovered before Henry's death.<sup>85</sup>

The after-effects of Henry's death and financial stringency etc., have delayed expeditions for some years. Afonso V concentrated his efforts against Morocco which earned for him the title of 'the African'. Because of his preoccupation with Tangier and Arzila, he could not supervise voyages to further south. But still, more than 2000 miles of unknown coast line was added, a distance far greater than that had been discovered

during the whole life time of Henry.<sup>86</sup> In 1469, the exploration of Africa and the trade of Guinea coast were entrusted to a Lisbon merchant, Fernão Gomes for five years on condition that he should explore about 100 to 375 leagues of land every year.<sup>87</sup> But the ivory trade was reserved for the Crown. The Equator was crossed from north to south for the first time in human knowledge in 1471. In the same year, the La Mina coast, well known for gold dust was discovered and Fernao Gomes was honoured with the surname of 'Mina'.<sup>88</sup> Exploration went upto as far as the cape of St. Catherine. During 1471-1475, the whole of Guinea coast was explored.

John II took great interest on the exploration of West-African coast. He not only completed the Arguin fort begun long before, but also erected one at St. George de Mina on the well-known Gold coast. Voyages of exploration continued. The fleet of Diogo Cão discovered Zaire river (now Congo) in 1484. Since then, John II took up also the title of "the Lord of Guinea". Cão again returned for exploration and within fifteen months, traversed more than 200 leagues beyond Congo.

### **Columbus' Scheme Rejected**

In the same year (1484), Christopher Columbus, a Genoese who came to have the ear of the king, submitted some proposals and sought patronage for a westward sailing across the Atlantic which would prove the direct and quickest sea-way to India. He proposed that he would acquire for Portugal vast new territories, but wanted the king to help to equip for him three caravelas and to appoint him as the Admiral, grant him the hereditary title of the Viceroy of all lands he might discover and award him a tenth of the profits of the expedition.<sup>89</sup> The king felt sceptical about the distance across the Atlantic and decided to study the whole project submitted by the foreigner. Therefore, he appointed a committee including expert cartographers, geographers, mathematicians, his chaplain Diogo Ortiz, his Doctor Rodrigo the Jew, Joseph Vizinho and Duarte Pacheco Pereira, the future author of the celebrated 'Esmeraldo'. It was possible that Martim Behaim, the well-known German who constructed the oldest globe and navigators like Diogo



Cão and Bartholomeo Dias might have been also consulted. But in the end, the committee rejected Columbus' scheme. The recent return of Cão from the African route must have suggested that success was near and that Portugal could not afford to spend her resources on a dubious scheme submitted by a foreign upstart when there were so many competent navigators in Portugal itself.<sup>90</sup> Columbus was sent away only to be engaged by the rulers of Castile and he discovered the new world under the Spanish flag (1493).<sup>91</sup>

#### **Covilham's Land Journey to India (1487)**

During all these years of maritime exploration, the Portuguese had been doing their best to collect as much information as possible about India. Soon after Diogo Cão's return from the African coast, the advisors of the king considered how every difficulty that Cão had reported might be overcome. The king wanted to know about the monsoon, winds and currents in the Eastern seas in order to strike a new route or at least exploring land routes, so as to correct the prevailing geographical mistakes.<sup>92</sup> He sent two emissaries, Fr. Antonio de Lisboa and a lay man, Pedro de Monteiro, by overland to India to find out the land of Priest John, to know whether his territories reached upto sea and whether pepper and cinnamon grew there,<sup>93</sup> but they had to return from Jerusalem as they lacked the knowledge of Arabic, essential for travel beyond. In the mean while, the king of Benin in South Africa supplied some useful information about the route to India. Under this circumstance, John II decided to send two expeditions, one by land and the other by sea, almost simultaneously and both were to be complementary.<sup>94</sup>

The overland expedition consisted of Pero de Covilham and Antonio de Paiva both of whom knew Arabic and they were "to discover and learn where Priest John dwelt and whether his territories reached upto sea and where pepper and cinnamon grew and other sources of spices which were brought from... the countries of the Muslims".<sup>95</sup> They were also to gather information about the sea-route to the East, to ascertain whether it was possible for ships to sail round the southern extremity and find out the approximate distance susceptible, for navigation

between India and the terminal point of the African point and even to draw a map of the travel. Paiva was asked to verify whether Africa could be countered by the southern hemisphere and also to find out the relation between Priest John and India. The purpose of the mission, which was kept a closely guarded secret, was not the search of Priest John, but the search of the land of spices because the Spaniards who had the same objectives and maritime rivalry could create diplomatic complications.<sup>96</sup> Both Covilham and Paiva were provided with confidential letters of credit on Florentine Bankers and 500 Crowns in ready money. Besides, they were also provided with "a sea-card (chart) taken out of a general map of the world".<sup>97</sup>

The expedition left on 7th May, 1487 in the disguise of Arab merchants and they reached Aden via Alexandria and Cairo. Here they have learnt that Priest John was the king Negus of Abyssinia and hence Paiva went to see him there, agreeing to meet at Cairo on the return trip. Covilham embarked for India in a Muslim vessel and after sailing in the Indian sea, he reached Cannanore and thus became the first Portuguese to set foot on the Indian soil.<sup>98</sup> He visited Calicut and Goa. He travelled further to the East African coast via Ormuz and visited the Arab trading centres there and as far as upto Sofala, a place already marked on the Portuguese map of 1457-1459. He examined the gold mines of Sofala and collected information about the Moon (Madgasker) island. His visit to Sofala supplied the missing link between the sea-discoveries round Africa and their ultimate goal in India. As he was anxious to pass on this information to Portugal, Covilham reached Cairo in 1491 where he learnt of the death of Paiva. In the meanwhile, John II had sent two Jew emissaries, Rabbi Abraham of Beja and Joseph of Lemos, in search of Covilham. At Cairo they met Covilham who gave a letter meant for the king narrating his travels (this letter reached Portugal in 1491 at the time when Bartholomeo Dias had already doubled the cape of Good Hope and brought the news). Covilham's letter showed that the winds were favourable for sending ships during the months of May to October and that November to April were safe and suitable for return from India. "If the ships which traded with Guinea were to continue their

course along the coast of Sofala, they would strike in the Eastern seas and reach the Calicut coast."<sup>99</sup> This letter clarified that "it was possible to attain the end of the continent (of Africa) by sailing the route of south.....and that on entering the Eastern Ocean, the best route was to demand Sofala and the island of Moon (Madgasker)".<sup>100</sup>

Frequent despatches from Covilham reached Portugal and they were all kept secret. In all these letters, Covilham exhorted the king to pursue the mission vigorously as there would be no danger in such a project. His descriptions were accompanied by a map which he had received from the Muslims in India and in which the cities all round the coast of Africa were exactly marked. It is true that Covilham the first explorer of India was the theoretical discoverer of the cape route as he had supplemented the news brought by Bartholomeo Dias. "B. Dias' expedition to Rio de Infante and Pero de Covilham's expedition to the East to Sofala were the two great factors that prepared the way for the discovery of the sea-route to India."<sup>101</sup>

### **Bartholomeo Dias and the Circumnavigation of the Cape of Good Hope**

The next expedition was assigned to Bartholomeo Dias, the greatest caravel master of his time.<sup>102</sup> The fleet consisted of two caravelas and a naveta (store ship), under B. Dias, João Infante and Pedro Dias. Pero de Alemquer was the Pilot of the vessel of Dias. Dias was provided with a table of Sun's declination so that in the southern hemisphere where the pole star disappeared over the horizon, he could easily calculate the latitude.<sup>103</sup> He had with him few natives of Congo, who were earlier brought to Portugal by Cao, and now they were to spread the rumour on the shore that a European Prince was sending ships to make contacts with Priest John. It was hoped that the rumour would reach the native ruler who might send emissaries to the coast to meet the Portuguese.

The fleet left Lisbon on 2 August, 1487 and proceeding along the west-coast of Africa for several days, they beat against the wind, but was heavily reefed. Some times, they had to sail in the high seas because of the adverse coastal tides. At

various places on the coast, the natives were sent to explore the country and to bring back news. Passing the last point reached by Cao, they reached a bay called Angra dos Ilhas. Now sailing southwards, they reached the southern most part of the Orange river and named it as Angra dos Voltas (cape of Turns, from the frequent tacks they had to make due to bad weather). All along the way, he had mapped and named every outlet and head-land on the coast. Dias sailed in the South Atlantic for fifteen days and turning away from the coast, covered 300 leagues southward to 40° of latitude.<sup>104</sup> Now the wind blew briskly and stronger and they could not move on. Therefore, they left the store ship with nine men to look after. It was a moment for decision and they made up their minds. Many more days passed and they could only estimate latitude by dead-reckoning. Dias now stood out boldly to south-west and after some days when he realized that he had made considerable distance to the south, he turned to the East. But since he had not recovered the African coast, he then stood to the north and made a land fall at Mossel bay.<sup>105</sup>

Now in view of the resistance of the weather, he left the coast, where he was sailing close to it and made a great tack out into the sea for thirteen days and with the change of weather, turned to the east, hoping naturally to see the coast running from north to south. The coast now ran east-west which meant that he had rounded the tip of Africa without noticing it and had discovered the southern entry into the vast Indian Ocean. It was an unexpected wind that took the fleet beyond their destination and in that process he doubled the cape unaware. He pushed further to the vicinity of the Rio de Infante (the great Fish river) and ascertained that the coast ran eastward and slightly to the north and this fact greatly satisfied him.<sup>106</sup> Here they encountered a warm current flowing southwards which confirmed the belief that they were now entering the Indian Ocean. Dias found his way from the Atlantic to the Indian Ocean, studied the winds there and determined the best course for ships going to the Indian ocean.

The crew, exhausted and suffering from fatigue and shortage of provisions, were alarmed by the heavy seas and opposed further journey and demanded to return. It is also probable

that one of the vessels might have parted company and that there was difficulty to get information from the natives.<sup>107</sup> As he sailed to the west of Sta-Cruz, Dias saw the cape which was hidden from man for so many centuries. It was the 'Promontorium Prassum' of the ancient and he called it as 'cabo tormentos' (cape of storms) because of the storms he had faced. This cape was later renamed as the 'cape of Good Hope' (Cabo de Boa Esperança) because now they could look forward with hope to reach the goal.<sup>108</sup> In fact, "Dias had seen the land of India, but he had not entered therein, as Moses in the 'promised land'. He gazed on that great noble cape hidden from the sight of man for so many hundreds of years which when seen, showed not merely itself but the whole world".<sup>109</sup>

On their journey, they reached the place where they had kept their supply vessels nine months before with nine men. There were only three survivors and of them, one Fernando Colaço, died of joy on seeing the return of the caravels. Now they burnt the empty store ship and sailed for Portugal reaching there after sixteen months and seventeen days at sea.

The doubling of the cape should have at once opened the gates of India. By his circumnavigation, Dias had destroyed the myth of the Atlantic and clearly demonstrated that the African continent could be rounded and the Orient could be reached by sea.<sup>110</sup> Now the passage to India was within the reach of the Portuguese. However, the news was either concealed or its importance lessened by spreading false news in accordance with the traditional policy of secrecy.<sup>111</sup>

### **The Division of the Atlantic (1493-1494)**

After the return of Dias, there continued further expeditions. But in the meanwhile, the discovery of 'new world' in 1493 had complicated the problem and hence there was the urgency to draw up a line of demarcation in the new world for Spain and Portugal. There was also the possibility that the Castillians might forestall the Portuguese in Indian waters because with the success of Columbus and the overthrowing of the Muslim state of Granada by Spain in 1492, it became clear that Spain was also entering a period of expansion.<sup>112</sup> In fact, both the Spaniards and the Portuguese were trying to deceive each other,

the former with the secret favour of the Spanish Pope Alexander VI and the latter with the secret definite geographical knowledge.<sup>113</sup> It was the usual practice then to obtain the mandate of the Papacy in respect of the newly discovered lands. The Pope endorsed the Spanish claim in a Bull issued on the 4th May, 1493 which divided the world into two parts by a line drawn from north to south 100 leagues west of Azores islands. All lands discovered or to be discovered west of that line was to belong to Spain and all those to its East was to belong to Portugal.<sup>114</sup>

But John II refused to accept this ruling and hence negotiation started with the ruler of Spain. During the negotiation, he offered valuable presents and bribed the Spanish delegates and adopted the policy of secrecy.<sup>115</sup> His idea was to keep the Spaniards in the western zone and guarantee to Portugal the monopoly of the sea-route to India, and even to secure it for her. His secret system was so well organized that while the negotiations were going on at Tordesillas in Spain, he learnt the line of arguments of the Spanish delegation and he could prepare counter-arguments which he put to his men at the negotiating table. He carefully concealed the Portuguese knowledge of a practical sea route to India. There is considerable evidence that the Portuguese had at least sighted land in the southern Atlantic well before the discovery of Brazil by Cabral in 1500.<sup>116</sup>

The negotiation resulted in the treaty of Tordesillas (September, 1494) which was the final settlement of all the conflicting claims and for the time being it avoided an open rift which could have been detrimental for the whole Iberian Peninsula. It ratified that John II was the king of the Algarve both "here and beyond the sea", i.e. of his north African possession and the 'Lord of Guinea'. It prescribed a new line of demarcation at 370 leagues west of Cabo Verde islands, drawn from pole to pole. This line divided the Atlantic into two zones for the purpose of discoveries. The Portuguese were well aware that India would be in the Eastern zone, even though the dividing line was placed far west of Cabo Verde in order to include Brazil deliberately in their zone.<sup>117</sup> It was also agreed that within ten months of the signing of the treaty, they

were to set up towers or marks of identification on the border. The envoys of Spain and Portugal swore on the wood of the cross that they and their monarchs would abide by the treaty and observe the conditions.<sup>118</sup> The treaty safeguarded the cape route and its extensions to the Portuguese hands. It demonstrated the master diplomacy of John II about the future discoveries. Now his ships could sail unhindered in the south Atlantic. As matter of fact, the treaty reserved the East for Portugal. Both the Spanish and Portuguese rulers were happy, the former because of their conviction of being the masters of the route to India, and the latter because they were sure that they would be able to complete very shortly the discovery of the sea-route to the East.<sup>119</sup> The Spaniards realized the deception only on Vasco da Gama's return from India.

#### **Further Voyages**

When John II died on 25th October, 1495 at the age of 40, he had already prepared the way for his successors to grasp. But his death was a great setback for maritime activities. Still voyages were continued and one even entered the Indian Ocean and reached Sofala in 1495. "In the year 900 (1484-1495) near this place (Sofala) sailed the ships of the Firinghis trying to find a route to India."<sup>120</sup> This fleet, probably of Vasco da Gama and Nicalo Coelho wrecked at Sofala due to violent waves on 29th September, 1495.<sup>121</sup> Otherwise Gama who was heard for the first time in the history of Portuguese activities would not have been chosen later by Manuel I for the captainship of the fleet to discover India. Therefore it can be safely inferred that the epic voyage of Gama (1497-1499) must have been preceded by at least a decade of experiments and they had reached...as early as 1495. All these efforts were kept secret and suppressed. Even the court chronicler Rui de Pina made no mention of the doubling of the cape of Good Hope in keeping with the policy of secrecy.

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## THE HISTORIC VOYAGE OF VASCO DA GAMA (1497—1499)

The doubling of the cape of Good Hope by Dias and the encouraging letters of Pero de Covilham about the Indian Ocean had convinced the Portuguese that they could discover a sea-route to the East by voyaging in the southern direction. The existing maps had also shown that India was closer to Portugal by East than by the West.<sup>1</sup>

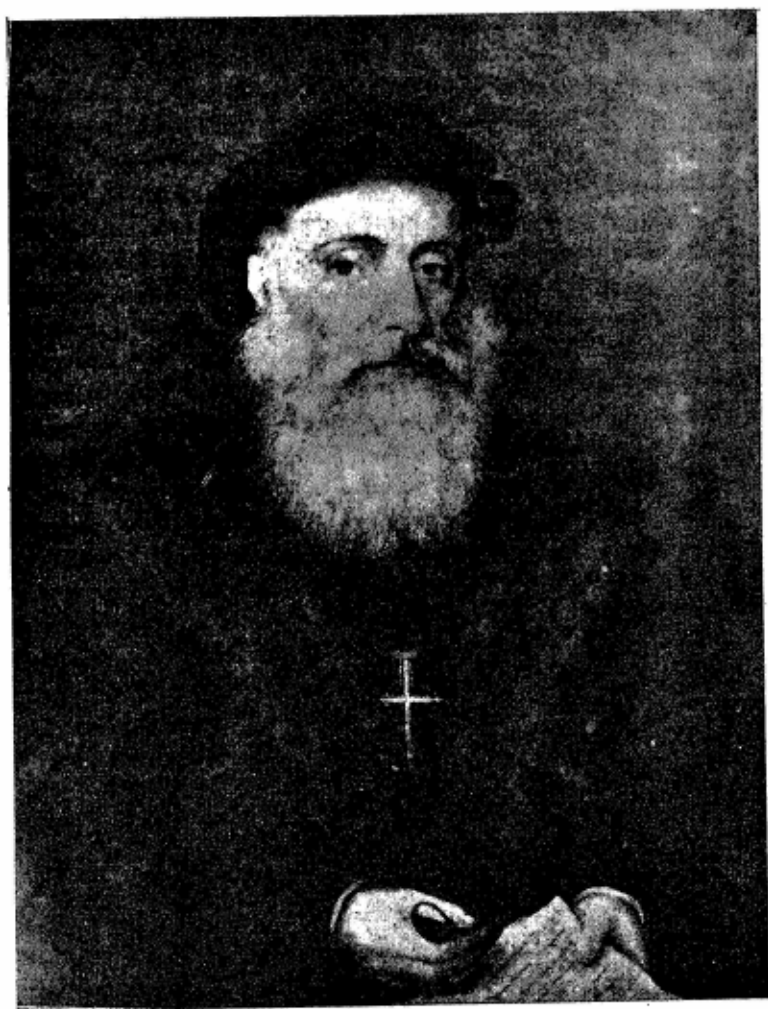
The entire plan was formulated by Prince Henry, pursued by John II and carefully processed after critical scrutiny by the Portuguese experts. Once the plan became viable, it has discussed in the King's Council in December, 1495. The majority was against the project because of the incalculable risk in the distant waters. Some elders even desired to discontinue the project on the ground that it would arouse jealousies in other countries.<sup>2</sup> The Sultan of Egypt would not like the Portuguese arrival in the Eastern waters nor the Venetians in their monopoly of the spice trade. It would be a heavy burden and would mean inviting trouble for Portugal. But the youthful king Manuel I (aged 26 years) refused to accept all these and felt that "I have inherited from my predecessors a sacred mission. Both my great uncle Henry and my father D. Fernando devoted

their lives to the cause of exploration overseas and their labours must not be brought to naught. For my own part, I am prepared to leave these matters in the hands of God in the conviction that He, of his great goodness, will find a way to bring profit to the kingdom".<sup>3</sup>



Fig. 8. King Manuel I.

The command of the fleet was entrusted to Vasco da Gama (who was under 40 years) as Bartholomeo Dias was too tired to be engaged so soon on yet another voyage.<sup>4</sup> Gama was an experienced navigator and he belonged to a noble family and he was selected in 1496 in order to find out a sea-route to India by the newly discovered southern cape of Africa.<sup>5</sup>



*Fig. 9. Vasco da Gama.*



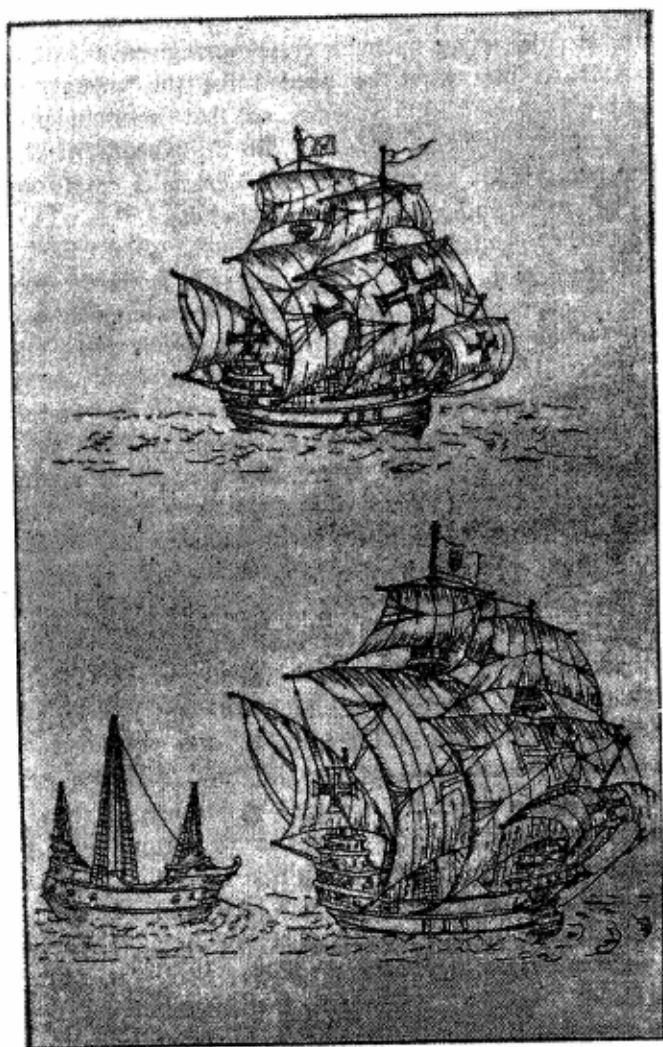
### **The Fleet, Crew, Stores and Equipments**

The preparation for the enterprise was done with great foresight. The task of building the fleet from selected wood was entrusted to B. Dias "as he had the qualities that a ship should have to withstand the fury of the sea about the great cape of Good Hope".<sup>6</sup> The king personally supervised every thing in the fleet and he wanted that they must be sturdy, low-built so that they enter even the smallest bay without the danger of running aground.<sup>7</sup> The fleet was different from the earlier caravelas which served the previous voyages so well and must have taken several months to build. They were purposefully not very big for the sake of easy movement. They were slower and hardy than the caravelas, but larger and heavier and more suitable for long oceanic purposes with more room for stores. The vessels were well fastened with iron. They were square-rigged on fore and were strengthened so that they could carry cannon. The vessels retained the lateen rig for the mizzen.

The flag ship nau 'S. Gabriel' (100 or 120 tons) was commanded by Vasco da Gama with Pilot Pero de Alemquer who had earlier accompanied Dias. 'Nau S. Raphael' (100 tons) was under Gama's elder brother Paulo de Gama with Pilot João de Coimbra. The third vessel, a caravel called 'Beiro' (50 tons) and later renamed as 'S. Miguel', was commanded by Nocolo Coelho with Pilot Pero Escobar, an experienced man of several expeditions earlier. The fourth vessel, a store ship (200 tons) was under Gonçalo Nunes, servant of Gama with Pilot Afonso Gonsalves.<sup>8</sup>

The total crew were not more than 160 persons, including Secretaries such as Alvaro Velho on 'Nau S. Raphael' and his diary is the only first hand account of the voyage to have survived; interpreters like João Martin who knew Arabic and Hebrew; Martim Afonso who had for so many years lived in Congo and knew African language; Priest João and Pero de Covilham to be Chaplains for confession; convicts who had been offered freedom in exchange for a promise that they would undertake any types of work that might be assigned to them.<sup>9</sup> They were meant to be sent to the shore if required. "On this voyage were sent the principal pilots, navigators and

those wisest in the art of seamanship that were to be found in this country, on whom were bestowed high pay and other



*Fig. 10. The Fleet of Vasco da Gama*

rewards greater than any moneys usually paid to other seamen in any other province of this realm; for this voyage, so many

and so heavy expenses were lavished on so few ships that since they seem hard to believe I shall not give them in detail."<sup>10</sup>

The king raised the wages of the crew from 5 to 7 crusados a month. Besides, every bachelor crew was given a bonus of 40 crusados to buy what he needed for the voyage; every married crew received 190 crusados so that he could provide for the family while he was away on the expedition. Vasco and brother Paulo were granted 2000 crusados each towards the cost of stores, equipments and merchandise.

All kinds of needed stores were laid in the ship. Each ship was provided with tripple supply of sails, spars, wraps, and other gear ropes, three to four times the number usually carried. The equipment included the most uptodate instruments and nautical tables. The vessels were provided with bombards, rudimentary bronze cannon (the forerunner of guns) "as fully as the venture required and much more". Ropes and barrels were carried for storing wine and water. Biscuits, salt tack, raisins and dried beans were intended to last for three years. Vinegar and Olive oil were each reinforced with iron hoops for greater security of their contents. Bread, meat, vegetables and medicines were also provided.

As the fleet lay anchored in readiness off Restello, D. Manuel summoned Vasco da Gama to the castle of St. George to give him final instructions. The king reminded him about the seriousness of the mission. "The principal aim which I have in my mind...is to increase the wealth and reknown of this kingdom, so that I may reward more generously all those who have served me. No other enterprise will bring more profit to my realm than the discovery of a new way to India and the countries which lie near to it."<sup>11</sup> Vasco and other Captains kissed the royal hand and knelt before him. There was a bright silk banner of the fleet embroidered with the red cross of the Order of Christ of which the king himself was the Administrator. The king's Secretary held it in his hand as a symbol of faith and Vasco took an oath in a loud voice. "I, Vasco da Gama, obedient to your orders,... go now to discover the land and seas of the Orient. I swear by the sign of the cross that I will keep this banner always aloft before Muslims or Gentiles or whatever people I may meet. And I swear that

through all the perils of water, fire or steel, I will defend that cross unto death. And I swear that throughout that enterprise which you have charged me, I will serve you with loyalty, vigilance courage and faith, respecting your orders and obedient to your commands.<sup>12</sup> The banner was given to Vasco and besides these verbal exhortations for the voyage, letters were also given which were meant for Priest John of the Indies, the Zamorin of Calicut and other rulers through whose waters his way pass.<sup>13</sup> Vasco and other Captains took leave of the king and went to spend that night of Friday, the 7th July, 1497, in the Chapel of Our Lady of Belem which Henry had built for the solace of the mariners on the eve of their departure.<sup>14</sup> The voyage was blessed and sins were absolved of the would be 'martyrs' during the voyage.

The epic poet of Portugal Camoens had beautifully painted the scene on the Lisbon water front when Vasco's fleet left for the East.<sup>15</sup> Vasco and his men entered the ship, each holding a lighted candle in hand and on bare foot. Soon the vessels slowly cast loose their moorings and began to underway from Belem on Saturday, the 8th July, 1497.<sup>16</sup> B. Dias has also accompanied the fleet in a caravela upto Sierra Leon on a different mission. The fleet sailed directly between the Canary islands and the African coast upto cape Verde islands. Vasco didnot sail too close to the coast of Africa unlike the earlier explorers. From Cape Verde, the fleet headed south-east until off Sierra Leon (where he parted the company of Dias) during August-September, 1497. The fleet faced strong winds, rains and fogs and the frightened sailors who did not see the land for thirteen weeks begged to return. But Vasco did not yield and instead locked the leaders of the mutiny in the hold, put the Master and Pilot in chain and controlled the situation. From Sierra Leon, Vasco steered into the high seas on a long curved tack and picked up the westerly winds of the southern hemisphere. This could not have been a mere chance and it presupposes a close study of the winds and currents of the south Atlantic over a period of years. Thus he crossed the Equator very close to the coast of south America where the modern Brazilian province of Pernambuco bulges into the ocean, but unaware of this fact.<sup>17</sup> After a voyage of three months, Vasco

anchored in the bay of St. Helena on 4th November, 1497. Here they landed to take in water and to make astronomical observation with the astrolabe, newly invented by Martim Behaim, because Vasco did not trust the observations taken on board due to the rolling of the vessel. The one which he used was a wooden astrolabe, three hands breadth in diameter and formed of three pieces like a triangle. They erected a marble pillar on the St. Helena island.<sup>18</sup>

The fleet deviated to the east in order to round the cape of Good Hope and made several unsuccessful attempts. At last, they doubled the cape with great difficulty at noon on Wednesday, the 22nd November, 1497 with the aid of westerly winds. On Saturday, 25th November, they entered the bay of San Bras, where the store ship was set on fire as it was not needed now.<sup>19</sup> They left the bay on Friday, the 8th December and sighted 'Ilhas Chaos', on Friday, the 15th December and on Sunday, the 17th December, they passed the Rio de Infante, the limit of B. Dias' voyage. They sighted land on Christmas day and it was named 'Natal'. On Wednesday, the 10th January, 1498 they came to land in a country which was named as 'Terra da Boa Gente' and the river was named as 'Rio de cobre', because here they got copper in exchange of linen shirts. On Monday, 22nd January, they reached a large river and met merchants who furnished valuable information about the sea-route to India. The river was named as 'Rio de boa signas' (river of good signs) where a padrao—S. Raphael—was erected.<sup>20</sup> Here scurvy broke out among the crew.

On Saturday, the 24th January, they sailed off and reached Mocambique in March, 1498. Here two convicts were sent to the shore to collect information and from here Vasco da Gama secured the service of two Muslim Pilots on payment of 420 reis each.<sup>21</sup> But when it was realized that the foreigners were Christians, the people of Mocambique attacked and wounded the Portuguese. Therefore, Vasco left the coast on 29th March and on Sunday, the 1st of April, reached some islands among which one was named as 'whipping island', where the pilots of Mocambique were whipped. On Friday, the 6th April, nau S. Raphael got stranded on some reefs opposite a hill which was named as 'Serras de S. Raphael'.

The fleet reached Mombassa on Saturday, the 7th April, and here they were treated well by its ruler who provided them supplies. However, Vasco and his fleet had just escaped the trap laid by the ruler of Mombassa. They set sail on 12th April, skipped off Sofala because of its known bad winds and anchored at Melinde on Easter day—15th April, 1498. The Portuguese received welcome because of the previous diplomatic relations.<sup>22</sup> Here the fleet had to be anchored for about nine days and they were repaired with local pitch and coir cable. A marble pillar was placed at Melinde whose ruler helped Vasco to hire a veteran pilot Malemo Canca (Ibn Majid) who even though aware of the Muslim enmity to the Portuguese, still offered his services on payment of 50 gold cruzados. The pilot may have agreed for the job at the instance of the ruler. Vasco and Ibn Majid discussed about various navigational instruments and methods and the pilot showed Vasco a fine map of the Indian Ocean with all the contours of the coast and it pleased Vasco very much.<sup>23</sup>

The fleet left Melinde on 24th April with the help of the south-westerly winds and crossed the Indian ocean, passing between the islands of Laccadives and Maldives without sighting them. On Thursday, the 17th May, 1498, they saw the land of India and reached the Indian coast on Sunday, the 20th May, after a non-stop voyage of 23 days from Melinde.<sup>24</sup> The exact place where they landed is not clear.<sup>25</sup> "The Firinghis reached Malabar in the year 904 (Hijira era) in the sixth of Reckadom (Karkadom) of the year 672 (Malabar era) and disembarked at Pandarini Kollam and then went to Rarikotta where they collected all information about Malabar."<sup>26</sup>

For the journey from Lisbon to Calicut—3-7-1497 to 20-5-1498 (207 days), they covered over 4000 leagues and Vasco arrived in India, the land of golden dreams.<sup>27</sup> At Calicut Vasco sent a convict João Martiã to the shore to explore the situation and he was surprised to see a Spanish speaking Tunisian merchant named Moncaide.<sup>28</sup> To the questions of the Tunisian, the convict replied that the Portuguese had come in search of Christians and spices. Moncaide went with him to the ship and the Portuguese were surprised to see a man speaking their

language. He was very useful to Vasco and later went to Portugal in the ship.



*Fig. 11. Gama's Audience with Zamorin.*

At Calicut, Vasco had an audience with its ruler Zamorin on 25th May, 1498 when presents were exchanged. When Zamorin asked the Portuguese to bring their ships nearer to the shore, Vasco refused it on suspicion and for which he was detained from 6th June to 8th June and was released only when the Portuguese offered presents to the Calicut minister.<sup>29</sup> Zamorin demanded 600 Xerafins, probably at the instance of the Muslim merchants who saw the real danger in the arrival of the Portuguese in Malabar. Therefore after being anchored at Calicut for 101 days (from 20th May to 29th August, 1498), Vasco set sail on Wednesday, the 29th August. They had already erected a marble pillar at Calicut, and it was named as 'S. Gabriel'.<sup>30</sup> While leaving Calicut, they had taken on board a Syrian Christian of Malabar who agreed to learn Portuguese and teach Malayalam on the way as it would be indispensable for the future.<sup>31</sup> Vasco had also on board the Tunisian Moncaide and "five or six Indians of Calicut".

The fleet anchored for twelve days at the island of Anjediva for water and repair. Here both the vessels—S. Gabriel and Beirro—were taken ashore for caulking. It was here that they met a Polish Jew speaking Venetian fluently. He was also taken on board for Lisbon where he became a Christian with the name of Gaspar da Gama. He was very useful for the return journey especially at Melinde and was later employed for negotiation with Indian rulers.

The fleet left Indian coast on Friday the 5th October for Africa and crossed the Indian Ocean on 10th October. The passage across to Africa lasted three months minus three days because of opposing winds. During this period, scurvey affected the crew badly and thirty men died so that now there were only seven to eight men to work in each vessel and if the voyage had lasted a fortnight longer, there would not have been a single soul left in it.<sup>32</sup> Fortunately, favourable wind blew and on Monday the 7th January, 1499, they anchored off Melinde whose ruler welcomed them. Here they took rest and relief for five days and the Melinde ruler sent to Portugal an envoy to request friendship. They sailed on 11th January and passed Mombassa on the 12th and anchored on S. Raphel island on the 13th and here they have burnt and abandoned a ship because they too were short of men for all vessels.<sup>33</sup> The vessels continued the voyage on 27th January and on Friday 1st February anchored off the island of St. George in Moçambique and set up a marble pillar which was named as 'St. George'. On Sunday the 3rd of March, they reached the bay of St. Bras and the wind being very fair, the cape of Good Hope was rounded on Wednesday, the 20th March. The survivors were caught up with cold due to their having come from a hot country. For twenty-seven days, that sailed to reach off the island of Santiago, in the cape Verde islands. Here, Alvaro Velho, the diary writer had disembarked from S. Raphel and did not accompany the fleet further and therefore his account of the voyage stops here abruptly.<sup>34</sup> On Thursday, the 25th April, they have reached the shoals of Rio grande and shortly afterwards, the caravel of Niccolo Coelho separated from the fleet and left for Portugal, may be due to a storm or whether aware of the superior sailing qualities of the vessel, he wanted to be



the first to reach Lisbon to convey the great news. He reached Lisbon on 10th July and was profusely welcomed.

Vasco reached Santiago where he gave the command of his vessel to his Secretary João Desa. He then freighted a caravel to shorten the passage to Portugal. Meanwhile, his brother Paulo de Gama who was sick for most part of the voyage, died of scurvy in August 1499. Vasco reached Lisbon on 29th August and solemnly entered it on 8th September, 1499, from where he left two years and two months ago with one hundred and sixty men of which only fifty-five had returned<sup>35</sup>. In the voyage, Vasco lost his elder brother, more than half of the crew and half of his vessels, but brought back the solution of a great problem which was destined to raise Portugal to great heights soon.

During the return voyage, the fleet had covered 3500 leagues.

The total number of days of voyage from Calicut to Lisbon (29-8-1498 to 10-7-1499)	279
Anchoring on the return voyage	43

This makes the following statistics for the whole voyage:<sup>36</sup>

The distance covered for the to and fro voyage (4000+3500)	7500 leagues
Total number of days for the to and fro voyage	479
Total days of anchorage in the whole trip (109+101+43)	253
Therefore, the total number of days taken for the whole expedition (479+253)	732

On the return of Vasco from India, King Manuel took up the title of "Lord of conquest, navigation and commerce of Ethiopia, Arabia, Persia and India."<sup>37</sup> Vasco was rewarded with a well deserved prefix of 'Dom'. He was awarded the coat of royal arms, the admiralship of the Indian seas for himself and descendents, an yearly pension of 3000 reis and permission to invest yearly 200 cruzados on Indian trade.<sup>38</sup> He was also given ten quintals of each spice for distribution among friends and one quintal of each drug brought from India.<sup>39</sup> Vasco became entitled to be the chief captain of any armada going to India in future. Every member of the crew was also

rewarded. Besides salary, they were permitted to keep whatever were brought along with them and ten pounds of each kind of spices per person.

Vasco's feat of navigation across the 'seven seas' was with his hostile crew sailing at the mercy of winds and storms. But throughout the voyage, they displayed great heroism which found the subject matter of the epic poem of *Lusiadas*. The discovery of the sea-route was a great achievement for a small nation. It crowned their efforts of three quarters of a century and Vasco became the first discoverer of the true means of utilizing sea-power as the foundation of colonial power.

From the point of view of the result that followed, it paved the way for the domination of the west in the eastern sea. Vasco's entry into the Indian Ocean announced the claim of the Portuguese for exclusive dominion over Indian Ocean and soon Portugal became the mistress of the Eastern sea-route and they looked upon the sea as their own. Vasco opened the gates of the mysterious East and solved the riddle of centuries. It checked the advancement of Turks, as the Portuguese struck a blow at their power and influence in Asia.<sup>40</sup> The discovery made radical changes in the economic balance of the world and placed Portugal in a unique position. It evoked almost a revolution in geography and trade and gave Portugal a great political importance.<sup>41</sup> It meant the overthrow of the monopoly of the Indian trade of the Venetians, Genoese and Arabs and enabled Lisbon to become the emporium of the world trade with the East.

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## PORTUGUESE NAVAL POLICY IN INDIA

The historic voyage of Gama which was both exploratory and adventurous can be considered as the beginning of the Portuguese naval power in India. Gama had no idea of conquering territories on the Malabar coast but to open up trade relation.<sup>1</sup> Cabral came to India in 1500, not only to establish trade relations but also set up at least one factory at the Calicut shore with a view to purchase local specialities for being taken to Portugal in the annual fleets. He was asked by King Manuel to persuade Zamorin (the ruler of Calicut) to expel the Arab merchants from the lucrative trade, to establish peaceful relations with the coastal rulers of Malabar and convert people to Christianity.<sup>2</sup> In accordance with this policy, Cabral sent Aires Correa to the shore as the first Factor of Calicut. But the factory was attacked and even some Portuguese were killed, probably at the instance of the influential Arab traders who realized their great loss. Now the Portuguese realised that peaceful trade was not possible in India in the existing circumstances.

The Portuguese fleets were regularly arriving on the Malabar coast every year since 1500. They secured the friendship of Cochin, Quilon and Cannanore. The Portuguese victory in

the battle of Cochin (1504) against Zamorin clearly demonstrated that they could not only defend their factories now, but could also defeat powerful local rulers. They could monopolize the Indian trade and could conquer India as well.<sup>3</sup> But slowly they began to realize that the safe maintenance of trade and commerce in India would necessarily involve them in frequent wars with the Muslim merchants of Arab countries who would come to the help of Malabar rulers. Now King Manuel, considering the fact that India was far away from Portugal and that the voyage would take about a year and a half, decided to keep in India itself a powerful fleet instead of the yearly expeditions, and to set up an administrative unit on the Malabar coast under a chief captain to carry on the affairs according to the exigencies of time and take proper control of the Portuguese interests in the East.<sup>4</sup>

Accordingly, Francisco de Almeida was sent to India with the powers of Governor and with far-reaching instructions which marked the beginning of an ambitious policy of rapid naval expansion in the East.<sup>5</sup> He was instructed (i) to erect two forts on the African coast; (ii) to go to India as early as possible and build a fort at Anjediva where the Portuguese vessels often called on their way for fresh water; (iii) to construct a fort at Cannanore and another at Cochin and to have a factory and arsenal for repair and shelter of ships<sup>6</sup> (iv) to erect a fort at the mouth of the Red sea so that "no more spices can pass to Egypt and all those of India may loose the notion of being able to trade with any one but us"; (v) to return to the Indian coast and try to get permission from the ruler of Quilon for a fort and to supervise the loading of pepper cargo for Portugal; (vi) to make a cruel war on Zamorin of Calicut as the real enemy and to make peace only if the ruler of Cochin approved it and only if Zamorin agreed to expel all the Arab traders from his territory; (vii) to distribute the armadas into different fleets and cruise the coasts of Dabul, Chaul, Cambay and Ormuz and to attack all shipping and give them peace only if they agreed to pay tribute and allow the Portuguese vessels to enter their ports and buy supplies; (viii) to send expeditions to Ceylon, Pegu and Malacca and for this purpose to arrange

a fleet of a dozen vessels with 1500 men and (ix) to exercise all the powers in the matter of justice and administration.<sup>7</sup>

Almeida achieved a good deal, but not all the instructions. He erected forts at Kilwa, Mombassa, Anjediva, Cannanore and Cochin and then took up the title of Viceroy at Cannanore on 22nd October 1505.<sup>8</sup> A fleet was sent to Ceylon on an exploratory mission. In 1506, a Portuguese fleet defeated the Calicut fleet at Cannanore and this trembled the Muslim vessels on the coast. In 1507, another fleet carried on an expedition to north at Dabul and Chaul. During the Viceroyalty of Almeida (1505-1509), the Portuguese became the masters of the Indian Ocean. They declared their right of seizing any ship which did not carry a licence granted by them. This was the first device to overthrow the Muslim commerce.<sup>9</sup> Subsequently, trade with Red sea was completely prohibited. Expeditions were sent along the Malabar coast and once it clashed with an Egyptian fleet. Almeida was not merely satisfied with destroying the Muslim trade, but he wanted to secure complete command of the Eastern seas for the Portuguese. He contended that the whole power of the Portuguese must be at the sea *i.e.* the Portuguese must maintain the monopoly of navigation and maritime trade.<sup>10</sup> The successful battle of Cochin (1504) against Zamorin had showed that they could protect their factories when threatened. Now Almeida gave up the policy of defending when attacked, and adopted a vigorous naval policy of active naval interference in the coastal states. He was prepared even for war in case any of the coastal states denied the Portuguese to set up factories in their territories. In his letter to king Manuel, he defended the need of a strong naval policy. "The greater number of factories you hold, the weaker will be your power... Let all our forces be on the sea, because if we should not be powerful at sea, every thing will be at once against us... As long as you are powerful at sea, you will hold India as yours and if you did not possess this power, little will you avail a fortress on the shore."<sup>11</sup> In accordance with this policy, he refused the offer of Diu from Malik Ayaz of Gujarat at the end of the naval battle of Diu (1509).<sup>12</sup> Almeida again wrote to the king that "it is by a naval force that it is necessary to rule India and if you do not



maintain a strong fleet in the sea, you will not be able to defend nor maintain the castle".<sup>13</sup>

Almeida did not believe in building too many forts, and to establish an empire in the east. It was enough if the Portuguese had a few forts to protect their factories and dominated over the sea to protect their ships. He impressed the king that money could be better spent on armadas rather than on too many forts.<sup>14</sup> He argued for an exclusive and vigorous sea policy supported by a few coastal forts at key positions which could be used as naval bases. He desired to exterminate the Arab and Turk merchants and protect the natives so that the Portuguese could be the de-facto rulers in India. He built a fort on the African coast in order to have safe base where that could refit before and after crossing the Indian Ocean. He also organized the first Pilot service to India, as he felt that the Portuguese should not be dependent on the native pilots for crossing into the Indian Ocean.<sup>15</sup>

It was Afonso de Albuquerque who initiated the imperial motive first and his name is foremost in the annals of the Portuguese in India.<sup>16</sup> Since he was instructed to destroy every enemy ship and to ensure for Portugal the complete mastery of the Indian Ocean, he took the step of closing the sea by means of the superiority of the Portuguese ships and building forts at strategic outposts commanding the trade routes. Albuquerque found that the existing policy was misguided and he noticed that some of the fortresses were badly situated in terms of strategy and that the fleets had not been used always wisely. Therefore, he changed the position and desired to build upon the power gained by the success in the battle of Diu (1509). He wanted to exercise direct control over the trading centres. He went a step further and felt that it was not enough to possess only few fortress on the coast but also a permanent acquisition. Albuquerque realized that unless the Portuguese possessed territories in India from which they could draw resources and reinforcement in any emergency, all their efforts for trade supremacy and monopoly would be in vain.<sup>17</sup>

Albuquerque visualized and materialized the plan of an empire supported on commercial power, but based on

imperialistic, commercial and religious ideas. In fact, the idea of an empire was forced on the Portuguese by the opposition they met with in establishing commercial policy.<sup>18</sup> Albuquerque realized that only by occupying and holding strategic posts on the coast, could the Portuguese succeed in maintaining the elements of an empire. He wanted his fort to guard the port from where the Portuguese vessels could sail out and meet their enemies. He was anxious to prevent yet another combination of the Egyptian fleet in the Arabian sea. His policy was to conquer areas and control directly. In case it was not possible, he desired to build a fort there and if that too was not practicable, he desired to induce the native rulers to recognize the Portuguese supremacy and pay tribute. His policy was a great naval fleet, an army or the conquest and fortification of the main towns on the shores. In a letter to the king, he explained his policy of acquiring strategic outposts on the coast. "It seems that ships from Calicut can't make the voyage because through my care, they don't go at all. Had I such a number (5000) in India, I could overthrow the might of India and conquer a great part of her land..."<sup>19</sup> He wrote again that "if you wish to destroy (calicut navy) by stern war, it will require a fleet always in occupation...The fleet of India is not so large that it can be divided into two squadrons...They (calicut navy) have always done navigation and will continue unless you have these posts (Ponnani, Pandarini Kollam and Chaliyam) accompanied with some very good ships and some rowing vessels to be close upon the shore."<sup>20</sup>

Albuquerque conquered Goa in 1510 from the Sultan of Bijapur because he realized that this strategic post would help the Portuguese to dominate the Arabian sea. Goa later became the political capital of the Portuguese eastern empire. Malacca which was the main centre of spice trade in south-east Asia was taken in 1511 and a fort was built there as well as at Cochin, Cannanore, Calicut and Ormuz. Thus Albuquerque deserved the title of the founder of the Portuguese empire in the east. Ormuz became a vassal state of Portugal in September 1507 by a treaty, promising to pay an yearly tribute and an indemnity as war expense besides permission to build a fort and a factory.<sup>21</sup> Though he began to erect a fort there, it was

given up in 1508 because of the strong opposition of the captains. The control over Ormuz enabled domination over



*Fig. 12. Francisco Almeida.*

the Persian gulf areas. Muscat on the Arabian coast was fortified in 1507 itself. Socorta near Red sea was also fortified but was given up later as he found it useless. Though he attacked Aden, it was unsuccessful and thus the Portuguese failed to close the Red sea to the Muslims. However, they had a general control over it and could enter it whenever

required. Negotiations for a fort at Diu failed, but they secured it in 1535.



*Fig. 13. Albuquerque.*

Thus the Portuguese had three angles—Diu, Ceylon, and Malacca, a great triangle whose two southern sides formed the route of the spice trade.<sup>22</sup> They had established their power from Persian gulf to Malaya and their fleets had influence over its trade. It was an admirable palm. The coastal empire which Albuquerque founded consisted the overlordship of the oceanic

shores in a huge semicircle of 15,000 miles from the coast of Natal to Moluccas. "From the Red sea to Malacca, all the orient crawled beneath the banner of Portugal and the white beard of Albuquerque."<sup>23</sup> Albuquerque wrote to king Manuel from Cannanore in a letter dated 30th November 1513 that "the whole coast of India was under the Portuguese control and that peace and friendship prevailed with all the rulers from Ormuz to Coromandal. The king of Cambay had granted a fort at Diu. It is necessary to seize the control of the Red Sea. Chaul is in peace and pays 2000 pardaus. Dabul is in obedience. Goa is Portuguese. Onor (Honovar) pays tribute. Bhaticola (Bhatkal) is under control. Cannanore and Cochin are friendly with Portugal..Calicut willingly intended to grant a fort. Coulon (Quilon) wanted peace. Coromandel is obedient...The Portuguese are safe in the whole of India in land and sea. Their navigation of trade are free and none dares to attack them."<sup>24</sup> The Cochin ruler himself had acknowledged the position in a letter he sent to king Manuel dated 11th December 1513. "Cochin is as Portuguese as Lisbon and that I have no friend in the world so trustworthy as the King of Portugal. Everybody is sure that our friendship is forever."

Governor Albuquerque (1509-1515) had ensured that the Portuguese grew into a territorial power on the Indian continent. He faced all problems-conquests to be made, forts to be built and dominions to be established. He understood as to how to defend the religion by breaking the Arab power and how to consolidate as the mistress of the sea in the east.<sup>25</sup> Albuquerque tried to withdraw himself from the entanglement in Asian politics except when there was a clear advantage. He realized that a general Muslim hostility supported by Gujarat and Egypt would ruin the Portuguese empire in the east. Therefore, he tried to weaken their coalition by isolating its members from one another and cleverly turned the rivalries of the native rulers to his own advantage acting on the principle of 'divide et impera'. He originated the idea of playing off the Hindu rulers against the Muslims and successfully supported one brother against another for the position in Honavar.<sup>26</sup> He not only interfered in the family intrigues of the native rulers

and even adopted their methods. In a succession struggle at Cochin in 1512, he expelled Zamorin's candidate and agreed to poison him and thus re-establish the ruler of Cochin in case the new ruler supported him. The anarchial conditions in India during 1500-1550 helped the Portuguese to carry out their designs.

Albuquerque's marriage policy is worth special mention. He encouraged the Portuguese men to marry native women so that the forts could be manned by honest men in India itself. He also encouraged the Portuguese artisans such as ship builders, rope makers and gunners and other workmen in the arsenal and dock yard to marry from Goa. He created a race of half-caste Portuguese by encouraging the Portuguese men to marry the wives of Muslims who had been killed in the conquest of Goa. His aim was to form a loyal population who would also remain in India for life.<sup>27</sup> "It was entirely his own idea that this privilege should be granted to them and he extended permission to marrying far beyond".<sup>28</sup>

The success of his colonial policy depended on several factors. When this 'lion of the seas' died, he left behind the beginning of a maritime empire with good naval bases, squadrons to command naval routes and a fairly consistent naval policy in India. This policy was sufficient for defence because they never acquired inland territories but patches on the sea-board. But this policy was not followed by his successors. Nevertheless it had such intrinsic merits that the king was certain that as long as Albuquerque's bones remained in Goa, India would be safe for Portugal.<sup>29</sup> Governor Lopo Soares took the step of Portuguese expansion in Ceylon by erecting a fort there. It was the first step for the conquest of Ceylon. The death of king Manuel in 1521 and the accession of the fanatic John III only proved fatal to the Portuguese power in India because he looked upon the connection with the east not only as a lucrative monopoly to increase the wealth of the Crown but also to spread Christianity.<sup>30</sup> The really great Governor after Albuquerque was Nuno da Cunha who devoted himself for the expansion on the Coromandel coast beyond Mylapore and opened up link with Bengal. He was anxious to establish a strong position in the North by possessing the island of Diu

which had been one of the strategic posts designed by Albuquerque for a Portuguese stronghold. The Portuguese establishment at Diu in 1535 was the most important event since the conquest of Goa in 1510.

By all calculations, Governor João de Castro was the greatest of all the rulers after Albuquerque. His successful defence of Diu in 1546 when attacked by the Gujaratis was one of the greatest events won by the Portuguese in the East. From the death of Castro to the loss of Portuguese independence to Spain (1546-1580), the Portuguese power declined in the east. The defence of Goa in 1570 from the attack of the Muslim powers was a great achievement of Viceroy Luis de Athiade, who was the last great ruler of the Portuguese in India. The fabric of their power in India was utterly rotten and it gave way before the Dutch, even though their commercial monopoly lasted some years later.<sup>31</sup>

To sum up, Viceroy Almeida's naval policy of undisputed supremacy over the eastern seas, passed through stages and became an imperial policy under Albuquerque and this meant acquiring territory at strategic outposts. Naturally, the Portuguese had to wage wars in order to maintain them.

### **The Administrative Arrangement**

Right from the beginning, the Portuguese in the East were a branch of the Home Government. The administration was considered as a responsibility of the officials of the Crown (both military and civil) and they were paid by the king. The policy put the control in royal hands. It was quite characteristic of the Portuguese to have their territorial possessions limited to the sea-coast. They were not interested in any interior possessions. They were concerned solely with their control of the high-seas and its coast and here their strength depended on their fleet.<sup>32</sup> For the purpose of capturing and occupying the most strategic posts and to defend them, administrators were not needed but brave soldiers and sailors.<sup>33</sup>

The Portuguese empire in the east included the conquered territories, native kingdoms, either protected or allied and where they had commercial Agents. The empire extended from Ormuz to Far East and their sovereignty was openly

acknowledged by many rulers, chieftains and Potentates. By the end of the 16th century, the Portuguese sphere of influence extended a vast area from the African coast to Moluccas and comprised a number of important commercial posts and territories depending on them. The empire extended from the Cape of Good Hope to China—the whole East African coast, from the mouth of Red sea to the Persian gulf, from Bussora to the gulf of Cambay, from Cambay to Cape Comerine, from cape Comerine to the north of Ganges on the Coromandel coast including Madurai, Carnatic, Golkunda, Orissa and the unfortified factories like St. Thome in Mylapore, Nagapatam, Masulipatam, Hughli in Bengal and then Ceylon, from Calcutta to Singapore embracing Pegu, Tenasserim and Malacca and finally from Singapore to Maccau and Timur in China.<sup>34</sup> Under Viceroy Almeida, the Portuguese jurisdiction extended from Sofala to Guadafim and Captains were appointed for Sofala (1505), Kilwa (1505) and Moçambique (1507). Moçambique had a separate Captain placed in-charge of the coast of Melinde and he managed the factories that side.<sup>35</sup> Albuquerque set up the administration on strong basis. Factories of Ormuz, Moçambique, Muscat and Malacca were under the control of the Government of Goa which became the capital of the Portuguese empire in the east in 1530, on its transfer from Cochin. The vast empire was subject to the Viceroy or Governor of Goa during the early period of 'navigation and conquest'.

To govern such a far-flung empire, there was an elaborate administrative arrangement. The king of Portugal was at the top and he was assisted by his officials who could only lay down general policies.<sup>36</sup> The India House (*Casa da India*) and the '*Conselho de Fazenda*' in Lisbon looked after the trade to the East, including the supply of ships, crew and provisions. During the 16th century, the administration of the colonial empire was controlled by the king himself with his royal council. The office of the Secretary of India was established in 1568 and he was in-charge of the royal official correspondence.<sup>37</sup> The factory, the fort, the friar and the fleet were the main institutions which constituted the Portuguese administration. The administration was controlled by a chain of forts and factories.



Really speaking, the authorities of Goa and their subordinates in other parts of India ruled the whole empire. The central Government at Goa was headed by the Viceroy or Governor. A Viceroy enjoyed higher status than a Governor but their functions and powers were identical. In official correspondence, they were regarded as 'Vice-rei Capitao Geral' or 'Governador Capitao Geral'. They were invariably from nobility which also provided Captains for the forts.<sup>38</sup> The Viceroy or Governor was the representative of the king and came directly from Portugal with orders-letters patent or succeeded to the post on the sudden death or departure of the incumbent. In many cases, they were sent to India with specific instructions, secret or otherwise, as in the case of Governor Nunu da Cunha who was secretly instructed in 1528 to prevent the Castillian navigation at all costs and to see that "in no case they should be allowed to Portugal".<sup>39</sup> The tenure of Governor was normally three years and he had absolute powers in civil, military and judicial matters. Exemptions were there. Governor Castro had suggested to the king to make all future appointments for three years only and he himself handed over the charge of his office at the end of his first term.<sup>40</sup> This device which was meant to reduce corruption was not an effective remedy. Usually, Governors were eager for power and never waited even for a single day to take over the office. However in 1528, Governor Diogo Lopes' patient waiting for the return of Governor Lopo Soares was appreciated by all.<sup>41</sup>

The Central Government of Goa consisted of Viceroy, Chancellor, Secretary, Treasurer and the Chief Justice.<sup>42</sup> This arrangement was transferred from Cochin. In 1524, the new Viceroy Vasco da Gama began a new arrangement for the succession of Viceroy or Governor. So far, there was much inconvenience during the interregnum following the death or departure of a Governor. Gama brought sealed packets containing the order of names of those whom the king nominated to succeed him.<sup>43</sup> The packets were entrusted to the 'Veador', a high civil official. The Captain or Captain-Major of important places like Ormuz, Muscat, Ceylon, Malacca and Meccau were placed under the direct control of the Viceroy of Goa. Besides, there were captains of several forts and lands like Salsette and

Bardez exercising civil and military authority within their jurisdiction according to the order of appointment. They received specific orders from time to time.

There was a loosely organized council to advise and assist the Viceroy and it met at his whims. Noble men (*fidalgos*) were the members of this council, but there was no fixed membership or procedure. Normally, a consensus was reached. The origin of this council can be traced to the Council of Captains which Albuquerque used to consult on important matters. In the 16th century, the council evolved and became institutionalized as the Council of States.<sup>44</sup> Its members were the Governor or the Viceroy as President, the Archbishop of Goa, two or three senior *fidalgos* residing in Goa, the Captain of the city of Goa, the head of the fortress (*Alcaide—Mor*) and the 'Vedor de Fazenda'. The special invitees included the Notary and the Captain of the Sea. The Governor assisted by this council, controlled military matters and external relations. The Government of Goa was a macrocosm of that of the other areas and forts. A council functioned in all forts and trading posts of the Portuguese in the East. Each fort had a Captain, a Factor who supervised the royal trade, Vedor de Fazenda and minor officials like Clerks.

In course of time, great inconvenience was felt in leaving the whole eastern possessions under the control of the Goa Government. The communication gap was so much that for months together, the captains of the distant settlements were practically independent. Therefore, it was resolved in 1570 to introduce a new administrative arrangement. Accordingly, the eastern empire was divided into three Governorships. Antonio de Noronha was to be supreme from the coast of Arabia to Ceylon with full control of the Persian and Indian trade. He was to have the title of Viceroy. Francisco Barreto with his headquarters at Moçambique was to look after the settlement on the south-eastern coast of Africa. The administration of the areas from Pegu to China was entrusted to Antonio Barreto with headquarters at Malacca.<sup>45</sup>

### **The Sovereignty of the Sea and the System of Cartazes**

For many centuries, the Arabs were the *de facto* sovereigns

of the Indian Ocean but they did not dispute the supremacy of the rulers of the coast. This policy enabled them to enjoy trade monopoly between India and the west.<sup>46</sup> In fact, the Indian Ocean 'was a mare liberum' and there was no concept of sovereignty of it except in some coastal areas.

The Portuguese were essentially a sea-power and they founded their extensive dominion in the east by their powerful navy. The Portuguese who considered that the sea belonged to them by virtue of the Papal Bulls, acknowledged the freedom of navigation only to the Christians in Europe who were governed by the principles of Roman law. They felt that Hindus and Muslims were outside such laws and hence they had no claim to right of passage in the Asiatic waters. When king Manuel assumed the title of the "Lord of Navigation, Conquest and Trade of Ethiopia, Arabia, Persia and India", it implied that his captains also exercised the authority that this title carried. None had claimed the sea as hereditary or as a conquered property before the arrival of the Portuguese. Therefore, there being no precedent titles, there was no present or future right as well.<sup>47</sup> The Portuguese justified this concept and they argued that "the sea belonged to the king of Portugal and none ought to come here without his licence. The king of Portugal was the lord of the sea of the whole world and also of the coast of India by virtue of which all rivers and ports... ought to obey him and pay tribute to his men who moved about in his fleets."<sup>48</sup>

According to this policy, they denied sea-navigation to all who could not enforce their rights. They effectively tried to establish their maritime supremacy of the eastern seas in three ways: <sup>49</sup> (i) Certain routes were declared the monopoly of the king; (ii) certain commodities were earmarked for export only by the Portuguese; and (iii) the Indian vessels plying on the coast were forced to pay a toll and take a licence from them. Others could navigate in the Indian Ocean only with their express permission which could be secured by obeying them and paying tributes to them. "By virtue of the treaties and pacts made with the Indian rulers, the Portuguese became the masters of the sea of India, so that the Indians were unable to sail without obtaining from the Portuguese passports

known as *cartazes*".<sup>50</sup> The cartaz system produced a great impact on the Asian trade which they controlled with the support of a strong navy. They issued cartazes on the assumption that they got their right from the domination of the seas and allowed liberty of navigation only to those vessels which purchased them.<sup>51</sup> A contemporary writer described the method of enforcement of this sovereignty, "after the Franks had established themselves at Cochin and Cannanore...the inhabitants...became subjects to these foreigners, engaged in all the arts of navigation...and making voyages of trade under the protection of passes from the Franks; every vessel...was provided with a distinct pass...And upon each of these passes, a certain fee was fixed, on the payment of which the pass was delivered to the master of the vessel, when about to proceed on his voyage. Now the Franks, in imposing this toll caused it to appear that it would prove...a source of advantage to those people, thus to induce them to submit to it...If they fell with any vessel in which their letter or pass was not to be found, they would invariably make a seizure both of the ship, its crew and its cargo"<sup>52</sup>

All trading ships in Asiatic waters were required to possess cartazes. Any one who wished to put a vessel into the sea, had to secure a cartaz from the competent Portuguese authorities. Cartazes were usually issued at Goa or any fort or factory along the coast of India, depending upon the destination of the vessel. Passes were issued at Goa for vessels going across the Arabian sea or bay of Bengal. From 1596 onwards, only the Governor could issue cartazes for voyages beyond the coast of India. Cartazes were required to be purchased by Christians, Hindus and Muslims for coastal trade and even for trade from one port to another port on the western coast.<sup>53</sup> They were compulsory for those vessels sailing to Goa from any part of India in order to purchase cartazes for going abroad.<sup>54</sup> Usually, a cartaz was valid for one year. The fee charged for a cartaz was negligible, a few coins, depending upon the capacity of the vessel.<sup>55</sup> Some times, cartazes were issued either free or on reciprocal concession.

There are indications that cartazes were issued from 1502 onwards.<sup>56</sup> A cartaz was accompanied by several demands. It

included the name of the captain of the ship, the capacity of the vessel, name of its owner, native place, destination, crew and other personals on board. The arms and munitions allowed were strictly limited. The cartaz-holders were not allowed to export or import certain 'prohibited articles' like spices, ginger, copper and wood, as they could be used to build ships in India.<sup>57</sup> The cartaz clearly mentioned the port to which she was allowed to sail. Ships even with cartazes were not allowed to visit Muscat or any other port of the enemies of Portugal. The vessels were prohibited to carry Turks and Abyssinians, both considered to be enemies. A Gujarati vessel was captured in 1555 as it had eight Turks on board. They were not to carry Christian slaves. "If there is any suspicion that any of them is a Christian or son of a Christian, an examination shall be made...even though such sons are not baptized"<sup>58</sup> The cartaz authorized a ship to call at a Portuguese fort while going or coming to pay duties before going on its destination. The main object of the cartaz system was finance which was needed for the empire and its maintenance. A cash security had to be kept at the port where cartazes were issued as a guarantee that the ship would return and pay duties on its return voyage. A certificate had to be produced if duties had been paid at another Portuguese port.

The Portuguese exercised a right to make a forced search of any ship even with cartazes in order to ascertain whether all conditions were fully observed or not. Lawrence de Britto, the Factor of Cannanore issued a pass to a Calicut vessel in 1507, but Captain Gonçalves Vaz believed it to be a forgery and captured the ship.<sup>59</sup> During the time of Governor Diogo Lopes, the Portuguese had even refused to recognize their own passes issued to the native-trading ships. A Gujarati vessel was searched in 1540 as its cartaz mentioned one place as its destination, but judging by its position, when it was checked, it could not have been going there. Two other ships were also seized for trading with places with which the Portuguese were at war, and another vessel for having a captain other than the one mentioned in the cartaz.<sup>60</sup> Ships even with cartazes but violating the conditions, were confiscated as a prize and the crew were liable to be sent as slaves to the galley

or killed instantly. The confiscating Captain always received a fixed share of the value of the seized ship. There were cases where "taking advantage of the ignorance of the people in understanding the Portuguese language, they issued them death warrant asking the inspecting Portuguese captain to kill the bearer, plunder and sink his ship. Mamalli Marakkar of Cannanore was the victim of such a harassment."<sup>61</sup>

But in spite of the strict conditions, there was considerable flexibility in the cartaz system. Even a small bribe could change the position even for a 'forbidden area'.<sup>62</sup> The cartaz system continued even in the 17th century with modifications in their structure. In the 1690's, the Portuguese were seizing ships in the gulf of Cambay, if they did not have proper cartazes. They insisted that cartazes must be taken in spite of their declining naval position in India. By and large, the Portuguese claims were accepted, even though there arose a tendency of evasion of cartazes. Exemptions were shown for those with whom the Portuguese were friendly. Free cartazes were given to local rulers for political purposes. They were meant to pacify the native rulers so that they did not attack the Portuguese settlements. Such ships were not to pay duties also on the goods carried. But they were prohibited from carrying 'prohibited' goods and people. The Sultan of Bijapur got four free cartazes per year and according to an agreement of 1571, they got two more cartazes.<sup>63</sup> The Sultan of Ahmednagar got seven free cartazes a year, five for ships going to Ormuz, one for Red sea and one for Malacca.<sup>64</sup> Akbar was given one free cartaz a year for a ship to go to Red Sea. Free cartazes encouraged evasion. A cartaz-free ship would set off, show its cartaz to the Portuguese officials and then send the documents to the shore. Then another ship would leave carrying the same cartaz and thus avoided payment of duties.<sup>65</sup>

An agreement between Governor Lopo Soares and the King of Quilon on 25th September 1516, enforced the cartaz system on Quilon.<sup>66</sup> The Zamorin had also agreed to purchase cartazes. An agreement between Garcia de Noronha and Zamorin at Calicut on 1st October 1513, prescribed that "any Zambuco (small boat) except from Cochin and Cannanore and their lands asking for passes at Calicut will

be issued by the Portuguese captain. The amount of the cartazes will be distributed equally between the king of Portugal and the Zamorin.<sup>67</sup> But this agreement was disliked by the Cochin ruler (a good ally of the Portuguese) who complained to the king of Portugal that "D. Garcia granted passes to the naus of Calicut to sail to Mecca and presently the traders of Calicut sail with passes issued by D. Garcia who did not inform me about it".<sup>68</sup> Therefore, king Manuel in his letter dated 26th February 1515, made a change such that "zambucos from Cochin and Cannanore need not have to purchase any pass to enter the port of Calicut". The Portuguese made another treaty with Zamorin in 1540 that no vessel was to navigate to and from Calicut without a pass from the captain of Chaliyam fortress.<sup>69</sup> No vessel was to trade in pepper or any drug without the permission of the Viceroy. Yet another agreement in 1582 allowed free navigational permits for sending the ships to Gujarat, Persia and Arabian ports.

An agreement between Governor Castro and the Sultan of Bijapur at Goa on 6th October 1547 authorized free passes to four vessels provided the Turks were not allowed on board the vessels. Another agreement between Governor Garcia Desa and Adil Shah of Bijapur at Goa on 22nd August 1548 prescribed that vessels captured at Bijapur ports without cartazes were to be impounded and half the cost was to go the Portuguese and half to the Sultan.<sup>70</sup> The Governor also agreed to send a Factor and a Clerk to Dabul to issue cartaze for navigation on that coast and to Ormuz. Cartazes were to be issued to the Bijapur vessels to navigate every where except the coast of Arabia and the strait of Mecca. The Sultan secured yet another two free passes as per an agreement of 1571. A treaty between Governor Antonio Barreto and Adil Khan at Goa on 22nd October 1576 confirmed that "naus of Adil Shah sailing with cartazes should not be humbled by any one...and the naus of Adil Shah should freely take load at Ormuz."<sup>71</sup> Afonso de Albuquerque gave cartazes to ships of Aden and those going to Ormuz on 4th August 1513 on condition that they brought horses of Arabia, Persia and other places to Goa only.<sup>72</sup> As per an agreement made between Captain Heitor de Silveira and the ruler of Aden in 1530, "naus of Aden

were free to navigate any where except Mecca.<sup>73</sup> Cartazes were also issued to Maratha merchants on payment of twenty xerafins per khandi of cargo carried by the vessel.<sup>74</sup> However, the Marathas were not prepared to accept the Portuguese claim of sovereignty and effectively ignored the cartaz system".<sup>75</sup>

On the Cambay coast, trade to Red Sea areas was blocked and forced the Gujarati vessels to purchase cartazes. Even though the merchants generally accepted the Portuguese claim, some of the nobility tried to avoid taking cartazes.<sup>76</sup> The taking of Diu was crucial in enforcing the Portuguese claim. Once Bassien was acquired in 1534 and Diu a year later, the Portuguese were able to patrol effectively along the northern coast. With the conquest of Daman in 1559, the grip became still tighter. Evasion was now difficult for a ship leaving the gulf of Cambay. The invincibility of the Portuguese fleets and their ruthlessness terrified the Gujaratis who now accepted the system. There was no alternative to take cartaz and pay the duties at Diu. Ships from the ports west of Diu were to go to Diu to pay duties unless the Portuguese sent a ship or a fleet to collect them. As early as 1537, thirty-nine ships from Arabian coast, Aden and Red sea called at Diu for getting the cartazes.<sup>77</sup> But there are also references when these ships went with out them.<sup>78</sup>

Governor Nuno da Cunba and Sultan Bahadur Shah of Gujarat agreed by a treaty on 23rd December 1534 that Red Sea-bound Gujarati ships had to go to Bassein, first to cartaz. While returning, they were again to come to Bassein to pay the duty of one tanga.<sup>79</sup> However, exemptions were given to the Mecca-bound pilgrim ships of Gujarat. Ships trading to places other than Red sea were also to take cartaz but were not obliged to pay duties to the Portuguese while coastal trade required no cartaz at all.<sup>80</sup> Another treaty with Bahadur Shah in 1535 prescribed that ships trading to the Red Sea should call either at Bassein or Diu to get cartazes. Other ships were still not obliged to pay duties to the Portuguese but must purchase cartazes as before.<sup>81</sup> Ships sailing from other Gujarati ports were also required to obtain a cartaz at Diu but not to pay duties there.<sup>82</sup> By 1545, the Portuguese-Gujarati relation grew worse and the Gujaratis of Surat had



either stopped asking for cartazes for ships bound for Red Sea or the Portuguese had refused it.

The Portuguese maritime supremacy was complete as far as their relation with Mughals were concerned. The Mughals were paying tolls to the Portuguese for the safe passage of their vessels.<sup>83</sup> The Mughals were at the mercy of the Portuguese on the high seas without whose passes they could not go to Mecca on pilgrimage. For this passes, 3000, 4000 and even 8000 mamudis were demanded.<sup>84</sup> In 1573, Akbar agreed not to shelter pirates of Malabar and for this, he was given a free pass a year for Red Sea voyage.<sup>85</sup> Akbar recognized the Portuguese claim over the Gujarat seas, without any infringement to his sovereignty. In 1581, cartazes were issued to Akbar's ships for Red sea voyage. Throughout the 17th century, the Mughals were given one free cartaz a year. Occasionally, they also asked for some changes—either an additional cartaz or permission to leave from a port other than Surat (may be Gogha). Some times, an extraz carta was also given.<sup>86</sup> Even Aurangzeb took cartazes for his ships.<sup>87</sup>

Once the Portuguese established their ascendancy over the Indian sea, they did not allow any other power to challenge their supremacy on the high seas. Their success in India was due to the absence of strong navies in the eastern seas. In Asia, only countries like Egypt and Gujarat challenged them at sea without any fair chance of winning a victory. All local conditions favoured them. Most of the eastern countries had no interest in naval matters and hence did not possess big navies. In these circumstances, the Portuguese utilized the weakness of these coastal powers to their own advantage and their fleets wielded power and established hegemony in the Indian Ocean.

### **The Coastal Patrolling**

Special fleets of war-ships were maintained by the Portuguese in order to keep a check on their cartazes and for general patrolling of the coast. King Manuel had asked Viceroy Almeida in 1505, to maintain two fleets, the Red Sea fleet cruising from the Red Sea to Cambay and another from Cambay to Cape Comerin. Patrol duty in the Red Sea was always assigned to the best naval force "in order to trap the

Muslim ships sailing in the ports.”<sup>88</sup> After the conquest of Goa (1510), regular patrolling was undertaken from Goa to the north and to the south. The northern armada cruised upto the mouth of the Red Sea and the gulf of Cambay and guarded the western coast from Ormuz to Goa.<sup>89</sup> The southern armada cruised the Malabar coast up to Cape Comerin and even up to Maldives island.<sup>90</sup> These armadas guarded ships trading under the Portuguese protection. After the conquest of Ormuz in 1515, Albuquerque divided the sea-borne empire into two zones under Captain-Majors. One of the fleets was stationed at Socorta to guard the sea between Sofala and Diu and at Cochin to watch upto Cape Comerin. But after 1533, the Indian coast was divided into northern, central and southern zones under other Captain-Majors, at Bassein, Goa and Cochin.<sup>91</sup> Though the Portuguese had over 15,000 miles of coast line to hold in Asiatic waters, their fleets guarded them effectively.

By the end of the 16th century, the northern and southern armadas consisted of about sixty vessels including small galeots and large gales rowed by convicts and prisoners of war. Besides them, there were other fleets to cruise upto Malacca, Sunda and Moçambique and in case of any emergency, special fleets were sent from Goa to several places in the east and even to the west.<sup>92</sup> A small fleet cruised off Malacca in order to enforce the ships to call there and pay duties.<sup>93</sup> Patrolling seems to have been sporadic in the Persian gulf. A fleet covered the island of Mannar in south and the Coromandel coast.<sup>94</sup>

As early as 1512, there were about fifty ships in India for several operations and in 1520, the total was eighty. In 1525, there were a number of ships in India for various purposes;<sup>95</sup> naus-six; galeoes-eleven; gales bastrades-two; gales Sotis-three; galeotas-four; lateen ships-nine; barges-two for loading and unloading of ships; bateis-five, to transport people from naus to the land; paraos-twenty seven; and merchantship-eleven. During 1567-1568, the number rose to over 90. Even large number of ships were pressed into service for special purposes. Apart from the special fleets, there were numerous cruises during the 16th century and hence

no native ships cruised on the west coast of India. In the 17th century, the native merchantship sailed in convoys, accompanied by a small armada of warships. Two small fleets proceeded to the west in order to force the ships from west Gujarat ports to call at Diu and to escort small ships bound for Diu from Cambay.<sup>96</sup>

The Captain-Majors in the command of armadas were directly under the orders of the Governor or Viceroy of Goa. The Governor and his council appointed a General and a Captain in each fleet whether ordinary or extraordinary. They also fixed the number of vessels in each fleet as well as the emoluments of the Captains etc.<sup>97</sup>

### **The Policy of Cruelty**

The Portuguese perpetrated severe cruelties, may be because of their peculiar position in India. Their force was so small that they thought it necessary to terrorize and punish their enemies severally. The policy of piracy on the seas began with Vasco de Gama and the prize catch was divided between the crew and the king. The rule of prizes taken at sea followed the war laws of the time. In retaliation for a robbery on the Portuguese at Bhatkal bay, João de Nova ordered in 1501 that the culprits be hanged after cutting of their hands. Cruelty became a regular principle from the second voyage of Gama and it continued. Gama expected that the expenditure to keep the vessels in India could be covered by prize they would take in the sea.<sup>98</sup> A Calicut fleet was captured and Gama ordered to cut off the hands and noses of about 800 men and the crew and sent them to Zamorin to make a curry of it.<sup>99</sup> A Brahmin messenger was tortured and forced to confess a spy. His lips and ears were cut off and the ears of a dog were sown to his head and he was sent to Zamorin! Captain Vincent de Sodre who was cruising on the Malabar coast flogged a well known Arab merchant till he fainted and filled his mouth with dirt and tied over to a piece of bacon! Sodre left for Cambay in 1503, captured loaded vessels of Muslims and looted its huge wealth of 200000 Pardaus.<sup>100</sup> He set fire to all Muslim ships there and acted as a sea-pirate in the Arabian sea.

The instruction given to Almeida in 1505 contained the earliest regulations for taking of prizes in the Indian Ocean. Almeida was blamed for torturing and executing his prisoners after the battle of Diu (1509). The Portuguese barbarously cut off the hands and ears of women to take off the bracelets and ear rings to save time.<sup>101</sup> Albuquerque cut off ears and noses of his prisoners at Kuriyat in 1507 and at Kalhat in 1508 and at Ormuz later and also in the second attack on Goa in 1510. Numerous women and children were slain in Malacca in 1511. Muslims found carrying arms on the second offence were to be flogged and on the third, were to be put to death.

The Portuguese carried on their depredations in Bengal and upto the coast of Orissa in close alliance with the local people of Chittagong known as Maghs. Sandwip at the north of Meghna river was the main stronghold of the Portuguese action in south-east Bengal. This area which had a network of rivers and rivulets offered them great scope for adventure. They could ravage the country and escape with impunity. The well equipped Portuguese vessels with artillery and ammunitions enabled them to establish their control over the bay of Bengal. João de Silveira, on his way from Bengal to Maldives in 1518, saw two merchant-ships going to Gujarat and he promptly captured them. In fact, Silveira was only following the code of behaviour of Cadamosto, Cão, Gomes and Dias.<sup>102</sup> Rui Vaz Perrira visiting Chittagong in 1526, captured a galiot with its cargo belonging to a Persian merchant Khwaja Sabadim. At Goa, there was a naval department to carry on trading and buccannering activities on the west coast. But they had no such regular system on the east coast.<sup>103</sup> The Portuguese ships carried telescopes to make survey of ships from a distance. The Portuguese were called as 'harmads' (from *armada*) on the east coast.

On the west coast of Diu, the fleet of Antonio de Saldhana captured six richly loaded ships returning from Mecca.<sup>104</sup> The booty was so much that the king's share alone amounted to more than 2,00,000 cruzados.<sup>105</sup> Saldhana raided Gogha after an unsuccessful attempt on Diu in 1531 and captured pepper from twenty-five Caicut vessels. Saldhana even set

fire to the pepper vessels and five Muslim ships.<sup>106</sup> There was another attempt on Gogha in which eighteen pepper loaded ships were captured. The town was also set on fire. Saldhana proceeded further and captured seven vessels loaded with pepper and ginger.<sup>107</sup> He deputed Manuel de Vasconcellos in 1532 with a large vessel to deal with the enemy ships. Vasconcellos boarded a vessel and took charge of its cargo and it was sold later. Vasconcellos captured another Mecca-bound Muslim vessel going from Diu and sold its cargo. These seizures which netted about 2000,000 pardaus, were the largest captured made in India.<sup>108</sup> Saldhana sent two cetures in 1532 beyond Diu and they captured a rich ship from Diu which was the richest yet taken. The captured made on that voyage amounted to over 1,80,000 Cruzados in gold, silver, silk, cloth, copper and other merchandise.<sup>109</sup> Saldhana who had strictly adhered to the law and scrupulously arranged for the crew's share and the royal share, was rewarded with the appointment of Arbitrator and Factor to deal with capture. After capturing a small island called Bet near Diu in 1535, all persons were killed till the last man and for this reason, the island came to be known as the 'island of the dead'. Similarly, at the end of the second seige of Diu in 1546, the Portuguese spared no lives there.

### **Presents to the Allies**

The Portuguese kept friendly relation with the coastal powers on terms which suited their conveniences. Presents were given to the allies with whom the Portuguese maintained good relations. In the first voyage to India, Gama bought presents to Zamorin, consisting of twelve pieces of lambel, four scarlet heads, six hats, four strings of coral, a case of six wash basins, a case of sugar, two casks of oil and two casks of honey.<sup>110</sup> Cabral's voyage (1500) also bought presents to Zamorin as well as the ruler of Cannanore. The second voyage of Gama (1502) presented the ruler of Cannanore with six pieces of satin, coloured velvets, a piece of brocade, an arm chair with cushions of brocade and sword of gold and enamel. This was reciprocated by the Cannanore ruler who gave a necklace of two bracelets and ten rings

of great value to the Queen of Portugal besides rich jewels to Gama himself.<sup>111</sup> Gama presented to the Cochin ruler a goblet with a pedestal and covered with a lid which contained 2000 cruzados, a piece of brocade, twenty-four pieces of velvet, satin, coloured damasks, a chair covered with brocade and studded with silver rails. He also gave to the Raja a crown of gold, silver-gilt basin and to the Prince, an enamelled collar ornamented with jewels in the form of a chain and a round tent with double linings of coloured satin. The Cochin ruler gratefully acknowledged it in a letter he wrote to king Manuel from Cochin on 11th December 1513. "...every body was sure that you sent me a gold crown as for a king of whole India and you used to grant me every year five hundrd cruzados in memory of the death of my uncles. Your Governor and I have sworn mutually to help each other against enemies even with the sacrifice of the life".<sup>112</sup>

Gama presented to the Queen of Quilon a beautiful mirror, a bottle of orange flower and to her ministers, thirty scarlet caps and thirty dozens of knives with sheaths. Albuquerque advised king Manuel in a letter from Cannanore dated 24th December 1513 that he should welcome the envoy of Calicut at Lisbon and give him presents of ornaments. He wanted that the king should reciprocate gifts brought by the envoy to Lisbon by presenting similar gifts to Zamorin, his wife and sister who all contributed much in making peace with the Portuguese. He suggested that the seal of the royal letter should not be of lead but of silver or gold, since Zamorin himself was preparing his seal in gold.

### **Recognition of Meritorious Services**

The Portuguese rulers and administrators recognized the service rendered by the officials. The Captain-Majorship of the annual fleets and Captainships of ships to India were the gifts of the Crown. They were given as rewards for the services of the soldiers and sailors.<sup>113</sup> The naval personels were given higher ranks or promotion. Vasco da Gama on his return from India was presented with the well deserved title of 'Dom' (Lord) and he was made the Count of Vidiguera and later sent to India in 1524 as Viceroy.<sup>114</sup> He

was allowed to use the royal arms and appointed to the Admiralty of Indian Ocean, for himself and descendants. He was also entitled to the Chief-Captainship of any India-bound armada and was presented with 20,000 cruzados in gold and on him and his heirs was conferred a perpetual right of 200 cruzados which he might lay out each year in commerce. He could send home in any vessel spices free of freight charges. Liberal rewards were also given to Captain Nocolo Coelho, captain of another ship and the heirs of Paulo de Gama and to the relatives of all who had died in that historic voyage. Governors like Afonso de Albuquerque desired special favours. He requested the king in a letter dated 6th December 1515 to consider his own services and achievements in India and asked for special favours to be shown to his son in Portugal.<sup>115</sup> Nevertheless, king Manuel bestowed on Albuquerque's son many favours.<sup>116</sup> Two war leaders, Domingo Carvalho and Manuel Mattos were rewarded with the knighthood of the Order of Christ and ranking of the fidalgos of the Casa de Real. John III rewarded in 1538, Captain Antonio de Silveira of Diu fort, the survivors of the siege of Diu (1541), including Luis, were awarded with honourable and profitable posts and the heirs of those killed were given compensation.<sup>117</sup> During the second siege of Diu, Governor Castro had promised 1000\$ to the first man to storm the enemy works, 500\$ to the second man and 300\$ to the third man besides the next promotion by way of encouragement.<sup>118</sup> The home-returning Viceroy Luis de Athiade, the last great ruler of Portuguese India and the defender of Goa (1570) was personally welcomed by king Sebastiaen. He was given the greatest reception and the king made him the Count of Atougia.<sup>119</sup>

### **Employment of Natives**

The Portuguese had developed the idea of employing disciplined natives in Indian operations. Their coastal shipping in India was largely operated by native sea-men who were recruited locally. In the Indian ocean, sometimes, the Captain was the only European in the ship and even the pilots were Gujarati Muslims.<sup>120</sup> The Portuguese always kept

a native contractor called 'Mocadam' to engage local recruits (lascary) in the Portuguese fleet and he got a lump sum wages. The oars-men were mostly local recruits. The native soldiers were allowed to take their wives and children with them on the voyages. They were given advance money and provided with arms, clothes and other commodities before embarkation.

It is difficult to know how far the native forces were trained for the operations in the early days. It is known that the natives were used as regular part of the trained Portuguese forces both on shore and in distant sea operations.<sup>121</sup> The recruitment of natives in the Portuguese services began when the Portuguese got their first foot-hold in India. The native force was directed by the Portuguese officers but some times led by their own men as in the battle of Cochin (1504). Antonio Fernands de Chale, a Malabar Christian held important command under the Portuguese and rose to the position of the knight of the Military Order of Christ. In course of time, the native forces became masters of the situation leading to mutiny and revolt. Hence they had to be disbanded after a lot of trouble. Throughout the battle of Cochin, the natives were assigned as a supporting line for the defence of Cochin against the attack of Zamorin. When Zomorin attacked Cochin, which was under Portuguese protection, Duarte Pacheco with a garrison including three thousand Malabareese beat back the attack and finally routed the huge force by and sea. "Thus Pacheco demonstrated that the Portuguese positions could be secured...by strengthening a small body of Europeans with desciplined troops under European command."<sup>122</sup> Again, Duarte Pecheco guarded the fort of Cumbalam with the help of native forces. To help the handful of Portuguese guarding the fort, the Cochin Raja provided five thousand natives under the command of Koviladhikarikal Kandan Kora and Perum Kora and Palluruthi Panikkar and Attulli Panikkar.

When Viceroy Almeida left Cannanore for the battle of Diu (1509), he had with him four hundred Malbareese besides the Portuguese force.<sup>123</sup> Six hundred natives under the king of Poracad, participated in the battle of Calicut (1510).<sup>124</sup>



Native forces were also employed in the conquest of Goa and in several operations inside Goa. Albuquerque understood the value of the native troops. He employed two thousand natives in the first conquest of Goa. He sent a force of four hundred with a Portuguese cavalry force under George Decunha to Kudal in order to deal with an enemy concentration. A large number of natives were employed for the security of various passes of Goa. Albuquerque utilized the services of three hundred Malabarese consisting of mostly Nairs and Malabaree Christians under the Guazil of Cannanore in the second attack on Goa in November 1510.<sup>125</sup> After the final conquest of Goa, Albuquerque marched with a mixed force of two thousand natives besides others. His employment of Hindu clerks in the settlement works is note-worthy. He understood the suitability of natives and employed them for revenue collection and in the management of factories. He understood the need to educate the future clerks in western customs and languages. Hence he set up schools for this purpose and even requested king Manuel in his letter dated 1st April, 1512 to send a competent school master for the education of competent clerks.<sup>126</sup> Captain Rodrigo Rebello reached Velha Goa in March 1511 with a force including two thousand Malabarese and two thousand natives from Goa. When Gen. Rasul Khan of Bijapur from Banastharim demanded the surrender of Goa under the pain of a war, Goa's defence was under one thousand two hundred men of which two-third were all natives.<sup>127</sup>

When Albuquerque left Goa for an attack on Aden in 1513, he kept a force including eighty Malabarese for the defence of Goa. He had carried with him one thousand Malabarese and other natives belonging to Kanara and Malabar.<sup>128</sup> In the expedition to Ormuz, (1515), many native ships carrying Malabarese participated. It also included one thousand natives and other Malabarese and over one thousand slaves.<sup>129</sup> For the Red Sea expedition (1516), Diogo Lopes had with him eight hundred native soldiers and eight hundred native sailors. This clearly shows the high proportion of the natives in the early period and the Portuguese

used the Asiatic natives in increasing numbers. The infantry was mostly of natives, while the cavalry was mostly Portuguese. The Commander of Goa seized a part of the adjacent main-land in 1520 with a force including eight hundred Canarese foot soldiers. In the distant attack of Batam, four hundred Malayan natives were employed along with the Portuguese.

Diogo Lopez arrived at Diu in February 1521 with over one thousand Malabar Nairs and other natives.<sup>130</sup> Governor Lopo Vaz Sampayo left for Cambay coast in 1529 with a large force of natives and Portuguese. An expedition to Aden in 1530 included small crafts fitted out by natives and the force consisted of five thousand native soldiers and eight thousand native sea-men besides the Portuguese. In the massive expedition in 1531, a large number of natives were employed. The Cochin Raja directed six hundred Malabareese to sail to Diu on three month's advance payment. He also provided oars-men to man the Cochin-built vessels. Governor Nuno left for Diu in January 1531 with three thousand Malabareese and two thousand archers."<sup>131</sup> There were in the fleet...some two thousand men-at-arms from Malabar and Goa. Among the men were four thousand native oars-men."<sup>132</sup> "Governor Castro sent a reinforcement from Goa in July 1546 under the command of his son Alvaro Castro and it included five hundred natives besides others."<sup>133</sup> Governor Castro himself reached Diu later in November 1546 with an imposing fleet with three thousand natives besides the Portuguese.<sup>134</sup>

The Malacca garrison consisted of one thousand three hundred natives in 1567. In 1570, Viceroy Athaide managed the defence of Goa against Adil Khan with one thousand five hundred natives. One thousand slaves were called in to join the regular force for the defence of Goa. According to an agreement between Antão de Noronha and Adil Khan (in December 1570), the latter agreed to supply sailors and other natives for employment.<sup>135</sup> In 1594, one thousand five hundred natives and slaves came from Salsette for the defence of Chaul which was besieged.<sup>136</sup> Again for the combined attack on Kunjali Marakkar's Kotta scheduled for 5th March 1599, Belchoir Ferreira had with him five hundred native Nairs besides others.<sup>137</sup> The Cochin ruler sent five ships with two hundred

Nairs for the attack of Kotta. Zamorin himself provided five hundred Nairs, five Manchuas with slaves and others and thirty small boats with sailors.<sup>138</sup>

The Portuguese had earned the reputation of being good gunners and expert sailors and therefore the native rulers were only anxious to employ them in their services. Akbar was much impressed by their sea-manship, probably after the conquest of Gujarat in 1575. Being aware of the need of their good-will on the west coast, he appointed the Portuguese experts and it was followed by others. Shah Shuja had a number of 'Firinghi' sailors in his navy. Raja Prajaditya of Jessore—Khulna in Bengal had as his Admiral Agustin Pedro, a Portuguese under whom other Portuguese naval experts were also employed. A Portuguese captain, Ruda, taken prisoner, was later employed in his services and he trained mariners and other naval officials. One Frederic was the chief of the ship-building department of the Raja. There were many other Portuguese sailors and captains under him. One Pedro was in-charge of the 'Firinghi' fort and a Portuguese Admiral was put in-charge of a harbour. The Arakkan king of Burma who was much impressed by the Portuguese, appointed Portuguese gunners, and they were even allowed a share in the booty. Even land was assigned to them for their maintenance.

Generally, the Portuguese prohibited the employment of their men in the services of the native rulers. According to a treaty between Governor Garcia Desa and Adil Khan at Goa on 22nd August 1548, the latter agreed not to accept the services of any Portuguese and that slaves escaping from the Portuguese lands to those of Adil Khan were either to be returned or sold and money refunded.<sup>139</sup> By means of another treaty with Viceroy Pedro Mascarenhas at Goa on 24th April 1555, Meale Khan had agreed that he will not accept any Portuguese in his land without the permission of the Portuguese Governor and that deserting slaves and others would be returned.<sup>140</sup> However, several Portuguese deserters escaped themselves and found jobs in the service of the native rulers.

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## COASTAL FORTS

The Portuguese built a number of naval forts on the west coast of India from Diu in the north to Quilon in the south. By virtue of their strategic positions, these forts played an important part in the naval history of the Portuguese in India. These forts which were named after the Saints were an attribute of the navy and they had naval bases for the safe anchorage of ships. They were well equipped with water tanks, store houses, missionary houses and magazines etc. and were well armed and garrisoned. During the time of naval battles, they supplied war requirements and they were places of refuge to the navy. The ships, anchored in the bay of the forts were safe from enemy attack in naval engagement. Thus the forts played a significant role in the effective control of the mastery of the sea around them. The gun and artillery mounted on the forts could repulse the enemy ships from entering the sea or the river on which they stood. These coastal forts had factory establishments also where the local goods were purchased and stored for shipment to various destinations. A study of these forts at Diu, Daman, Bassein, Bombay, Asherim, Manora, Chaul, Goa, Anjediva, Honavar, Barcelor, Mangalore, Cannanore, Calicut, Chaliyam, Cranganore, Cochin and Quilon is quite informative for understanding their construction, strategy and the role they played in the hey days of the Portuguese in India.

## FORT ST. THOMAS AT DIU

Ever since their arrival in India and throughout the sixteenth century, the Portuguese made several attempts to capture Diu which in the gulf of Cambay on the Gujarat Coast commanded the approach to India from the Persian Gulf. Diu was easier for access and was outside the influence of the dangerous tides and currents of the gulf of Cambay. The Portuguese had understood the strategical significance of Diu which in the Muslim hands was always a base for Turkish advance. Therefore, they desired to possess Diu and erect a fort there in order to consolidate their naval supremacy and trade in the North. But the conquest of Diu and its retention cost them more blood and wealth than any of their Indian possessions.<sup>1</sup> Governor Afonso de Albuquerque desired to conquer Diu or atleast to erect a fort there as a base for further naval operation and he even wrote to the King of Portugal about it.<sup>2</sup> But his death made the project impossible. An attempt to take Diu in 1518 was frustrated by the Gujaratis. D. Alexio de Menezes made a futile attempt later. The efforts made by Governor Diogo Lopes de Sequeira on 9th December 1521 to take Diu "either by good will or by force" also ended in failure. Lopo Vaz de Sampaio who went to Diu with a huge fleet could not conquer it because of the objections of his Captains who wanted the honour to go to the incoming Governor Nuno da Cunha who reached Diu on 3rd February 1531 with an imposing fleet of three hundred sail and literally covered the sea in front of it. But the entrance of Diu was blocked by huge chains suspended between vessels and the Portuguese attempt to break them failed. The artillery battle both by sea and land made no progress and they withdrew.<sup>3</sup>

The Portuguese had been fighting on the Gujarat coast for so long in an effort to get a footing and they began harrassing and capturing Gujarati vessels. This forced the Sultan of Gujarat to enter into a treaty with the Portuguese in 1534. Accordingly, the Portuguese were allowed to erect a factory at Diu.<sup>4</sup> Again on 10th October 1535, the Sultan, hard-pressed by the Mughal menace, entered into another treaty with the Portuguese

allowing the erection of a fort at Diu and gave a place for it.<sup>5</sup>



*Fig. 14. Diu Fort.*

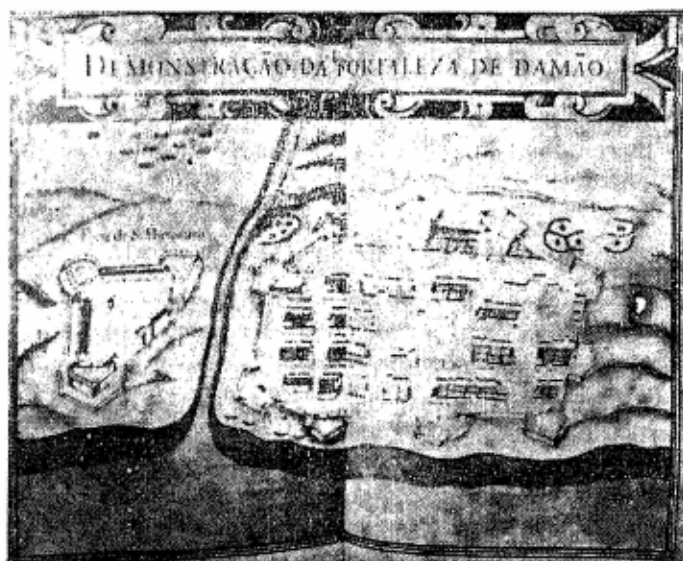
The foundation of the fort was laid on 20th November, 1535 and the construction was completed on 29th February, 1536, after forty-nine days of work. With its completion, the "longing of a generation had now reached fruition" and Manuel Desouza was entrusted to be the first Captain of the fort. The fort had almost a round shape with its walls 20' high, 12' broad, made of stone and lime and there was a ditch of 12×10×15 fathoms. The fort with its wall was 119 fathoms long, besides three bastions of triangular shape. The Diu fort which was a symbol of Portuguese power and prestige had a garrison of three hundred and fifty men and there was a fleet of eleven 'fustas' in the bay for guard duties. It was for this reason that Governor João de Castro wrote to the King of Portugal that even though this fort was good for nothing, he wanted to keep it for ever.<sup>6</sup> In 1546, Governor Castro had frustrated the efforts of the Gujaratis to capture the fort in a

pitched battle recorded as one of the greatest fought by the Portuguese in India.<sup>7</sup> His success in Diu confirmed the Eastern empire on the Portuguese. Castro himself laid the foundation on 25th November, 1546 for a new fort and for the expense of which he secured a loan of twenty thousand pardaus from the Municipal Council of Goa on 27th December, 1546, on the pledge of his beard "as he had neither gold plate nor anything of value". It is said that he even ordered to exhume the bones of his son Fernando Castro from the grave yard of the fort and to send them to Goa as a pawn.<sup>8</sup> However, the Municipal Council of Goa, feeling hurt by the Governor's lack of confidence in them, sent that part of the beard back with an amount of twenty thousand one hundred and forty six Pardaus and one tanga to be repaid "whenever and if possible."<sup>9</sup> When the fort was completed, it was "so strong that no power in the world could attack it". It was erected around the old fort walls, so that it looked a fort inside another fort. The fort was fully equipped with the best artillery, gun powder, iron bullets and stone balls. The store contained guns, armours, hardware, nails, ropes, ladders and iron bars etc.

#### THE FORT OF OUR LADY OF PURIFICATION AT DAMAN

After the conquest of Diu, the Portuguese naturally desired to acquire Daman also from the Sultan of Gujarat. It was ceded to the Portuguese by means of a treaty made on the 27th March, 1537.<sup>10</sup> But since this treaty was not implemented, Governor Francisco Barreto (1555-1558) secured the promise of the grant of the town and fort of Daman to the Portuguese. Later, Viceroy Constantino Bragança himself reached Daman on 22nd February, 1559 with an imposing fleet of hundred sail and defeated the Gujaratis by sea and by land. Daman was taken over without any loss of life and the Portuguese flag was flown at the fort. This square fort was made of teak beams and tiles. The fort wall was of 10 fathoms long and 15 fathoms high with bastions. Later, a new fort was designed by architect Fr. B. Martin and erected at the same place. It was named the fort of Our Lady of Purification and its 'regimento' was

issued from Goa on the 5th April, 1565. The fort had ten bastions which were well equipped with canons. Inside the fort there was residence for the Captain of the fort, a church, jail, a factory and the St. Paul's College for Jesuit fathers.<sup>11</sup>



*Fig. 15. Daman Fort.*

### THE FORT OF BASSEIN

Bassein, on the banks of the Bassein river was a flourishing settlement (Vasai) under the Muslims for over 250 years. It was renamed as Basai. Governor Nuno da Cunha made an attempt to conquer it with a huge fleet of 150 ships and 4000 men, but in vain.<sup>12</sup> Later, the fear of Mughal attack induced the Sultan of Gujarat to make a treaty with the Portuguese on 23rd December, 1534. Bassein was ceded to the Portuguese and it was their first acquisition on the Gujrat coast.<sup>13</sup> Another treaty dated 25th October, 1536 confirmed the cessation. Nuno began to construct the fort in 1536 and when completed it had eleven bastions which were well fortified. He was the founder of Portuguese Bassein and Garcia Desa its first Captain. Bassein remained with the Portuguese for over two hundred years

(1535-1739) and in 1739, the Marathas conquered it. Under the Portuguese, it was the main settlement and chief city of the North and was only next to Goa. It was the headquarters of the 'General of the North'. The present ruin of Bassein is a silent memorial to its vanquished glory.

### THE FORT OF BOMBAY

Eight leagues south of Bassein fort and four leagues North Chaul, there was a bastion with a square platform equipped with artillery. It was on the right bank of a river and about one fourth league from its bar. By the side of the land was the village of Mumbai where the Portuguese built a fort.

### THE FORT OF ASHERIM

The hill of Asherim was about seven leagues from the village of Tarapur and two leagues from the nearby Manora fort. Here there was a fort which was annexed by Governor Francisco Barreto in 1556. At the foot of the hill, there was a fence with a wooden bastion where the Captain of the fort lived with a big garrison. The height of the hill was about half a league and it was higher than the nearby mountain. On the top of the hill, there were twenty wells and twenty tanks which were filled with rain water. This fort was maintained for the safety of Daman and Bassein.

### THE FORT OF MANORA

This fort was also annexed in 1556. The Manora river, a tributary of Dativare river, flowed to the fort of Manora which was situated about five leagues from the river bar. It was a round fort with a two storied tower in the middle of the fort having on the top five cannons.<sup>14</sup> The fort was made up of a fence of wood with a circuit of one-fourth league.

### THE FORT OF CHAUL

Originally known as Revadanda, Chaul on the banks of Kundalika river belonged to the Sultan of Ahmednagar. In

1509 Viceroy Almeida on his way back from Diu stopped here and made a treaty with the ruler of Ahmednagar who accepted the Portuguese as rulers of the sea that side and received an yearly payment of two thousand gold pagodas.<sup>15</sup> In 1516, the Portuguese were allowed to erect a fort here in order to spite Gujarat. At last, a fort was built here in 1521 by Governor Diogo Lopez de Sequeira. During the period of its construction the Portuguese had to face the attack from the rulers of Diu who realized the inconvenience of such a fort for Cambay. After its construction, Henrique de Menezes was appointed as its first Captain. The fort was surrounded by a wall with nine bastions and enough fortifications.

There was another fort on the Chaul hill at the right hand side on entering the bar of Chaul. This fort was meant for guarding the City of Chaul. The hill could be climbed only by its northern slope. At the foot of the hill, there was a fortification (couraca) called 'Holy Cross' with ten pieces of artillery. From this fortification went up a stair of steps upto a round bastion and then climbing up from there were two bastions and nearby there was a sentry house.<sup>16</sup>

### THE FORTS OF GOA

The ideal situation of Goa (a great emporium of Asiatic commerce and trade centre for horses from Arabia and Ormus)<sup>8</sup> in between the Malabar and Gujarat coasts, made it a rich port on the west coast of India. Being an island formed by the navigable rivers of Mandovi and Zuari, it had better facilities for anchorage for largest ships which could sail at least ten miles inside and thus it formed a good line of defence, so that the ships could easily escape in any emergency.<sup>17</sup> Goa dominated the whole shore line of western India from the Gulf of Cambay and Cape Comerin. Therefore, ever since their arrival, the Portuguese naturally desired to possess Goa. Afonso de Albuquerque desired to occupy a foothold at a centrally located place in order to lay the foundation of the future Portuguese Empire in India. He visualized that Goa could be easily fortified and defended so that the Portuguese navy could command the Arabian Sea from there. If the Muslim Goa



could be conquered, it would demoralize the entire neighbouring rulers. Therefore, Goa was conquered in 1510 and since then, the Portuguese erected at least four good naval forts at different parts of Goa.

### THE FORT OF BARDEZ

It was built by Viceroy Afonso de Noronha (1550-1554) on a hill over the bar of Goa on the ruins of a Muslim castle. It was named the 'Holy Fort'. Later, Governor Manuel Desouza Coutinho built its fortifications and during the time of Caetano De melo Castro, additional works were carried out. The fort consisted of a wall twenty feet high with a circuit of forty fathoms. It had a door on the eastern side, On the Northern side, there was a trench two fathoms deep and two fathoms broad.

### THE FORT OF AGUADA

This fort, also in Bardez, Goa stood on a hill at the bar of Goa. It had a wall fifteen feet high and four feet broad with a circuit of forty-eight fathoms, in which there was a tower six fathoms high, on the top of which there was a light house that was lit at night. From the foot of the hill, between the two wings of walls, a stair of hundred steps come down to the level of the sea where there was a fortification with a platform. At the foot of the hill, there was a spring of sweet water which was used by the fleet. The above platform of the fortification had seven pieces of artillery. Near the doors of the Northern side, there was a bastion with a belt. The two other bastions had four pieces of artillery each. The fort stands today intact reminding us the lost Portuguese glory.

### THE FORT OF MURMAGAO

In Salsette, two leagues from the bar of Goa, there was a hill at the foot of which was erected the fort of Murmagao. At a certain distance from the fort, there was a bastion with twelve pieces of artillery. Near the fort, there was a large creek over one league long and deep enough for all types of ships of any size and number.

### THE FORT OF RACHOL

D. João Perrira, Captain of Goa created another good fort in Salsette by the side of the river of Salsette on a rocky hill, five leagues from the island of Goa and one league from the passage of Borim. This fort was constructed in three month's time and it was named as the fort of St. John of Rachol.

### THE FORT OF ANJEDIVA

The island of Anjediva is situated in the middle of the west coast of India. Vasco da Gama himself had realised its importance as a watering port during his voyage to India. It was an ideal place for fresh water and a good shelter for ships in monsoon.<sup>18</sup> In fact, Gaspar da Gama, whom Vasco da Gama had taken from Anjediva at the end of his first voyage, had impressed upon the King of Portugal about the need of a naval fort here because the Portuguese could easily gain control over the neighbouring Goa from a fortified Anjediva.<sup>19</sup> It was in these circumstances that Viceroy Almeida was instructed by the king of Portugal on 5/3/1505 to erect a fort here. Almeida reached Anjediva on 13/9/1505 and began the work of fortification of the island by erecting a fort here and got it completed in just twenty days. There was no objection to the Portuguese fortification of the island either from the Vijayanagar ruler or his vassal Gersoppa Chieftain. In fact, the natives supplied timber, cane, palm leaves and lime for the construction of the fort. It is said that Almeida destroyed a temple there and utilized its stone blocks for the construction of this fortress.<sup>20</sup> But subsequently this fort was found to be of no importance to the Portuguese. The maintenance of this fort was found to be difficult as it was away from Cochin. Its bad climate and vulnerability of an attack from the side of Goa also discouraged its maintenance. Therefore, this fort was demolished in 1506 itself and its garrison was brought to Cochin.

### THE FORT OF HONAVAR

The Portuguese desired to capture Honavar where there was a fort situated on a hill in the land of Balaghat, eighteen

leagues south of Goa. This fort was at distance of one-fourth league away from the bar of the river. Viceroy D. Luis de Athaide captured this fort in 1568-69. It had a circuit of four hundred fathoms and eleven bastions of round shape with four pieces of artillery each. However, this fort was captured by the ruler of Ikkeri, Shivappa Naik in 1654.

#### THE FORT OF ST. LUCIA AT BARCELOR

This fort also in the land of Balaghat was on a hill at a league away to the South along a river. Viceroy D. Luis de Athaide conquered this fort also. But as the fort was unsuitable, it was reconstructed by the Viceroy 1/2 league from the river and it became more convenient for its defence. It was a round fort of three fathoms high and five fathoms broad with four round bastions. It had a circuit of hundred fathoms and there was no trench. In 1652 this fort was captured by the Ikkeri ruler Shivappa Naik.

#### THE FORT OF ST. SEBASTIAN AT MANGALORE

The Portuguese realised the importance of Mangalore as a prosperous port for the trade of rice and pepper. In 1530, Governor Nuno sent Captain Diogo de Silva to deal with the Chettys of Mangalore known to be in league with the Zamorin of Calicut and dealing in spices to the great detriment of Portuguese trade on the Malabar Coast. It was an easy victory for De Silva who again sacked it in 1532 and the natives fled away at the sight of the Portuguese fleet. At last, a treaty was made between Nuno and the King of Gujarat, the overlord of Mangalore and accordingly the port along the city of Mangalore was ceded to the Portuguese.<sup>21</sup> In 1555 D. Alvaro de Silveria was sent to deal with the Queen of Ullal at Mangalore who had refused to pay tribute to the Portuguese. But a settlement was made at the intervention of Zamorin. Again in 1558, Viceroy Constantino de Braganza sent Captain Luis de Melo to Mangalore and he destroyed the city in an encounter. In September 1567, Viceroy Antonio de Noronha sent João Peixota to obstruct any help coming to the Queen of Ullal from her allies. But the whole enterprise ended in a disaster.<sup>22</sup> In 1568,

Viceroy Antão himself proceeded from Goa with a huge fleet to finally subjugate the Queen. The mission was successful and he built a fort at Mangalore on a hill (in 1568) and named it as the fort of St. Sebastian, the foundation stone of which was laid on 20/1/1568. Viceroy D. Luis de Athaide completed the construction in 1569. It was a square fort with four bastions at the corners with the walls four fathoms high and six palms board. The city of Mangalore was surrounded by a wall of two fathoms height and it had many bastions. In 1570, at the time of the Confederacy, the Queen of Ullal tried to free herself from the Portuguese with the help of Zamorin of Calicut, who was promised the fort of Mangalore in case of victory. But the attempt failed because of the shrewed garrison of the fort. In 1599, peace was made between the Portuguese and the Queen of Ullal and consequently the fort of Ullal built by the Queen in opposition to the fort of Mangalore was pulled down. The Mangalore fort was captured by Ikkeri ruler Shivappa Naik in 1653.

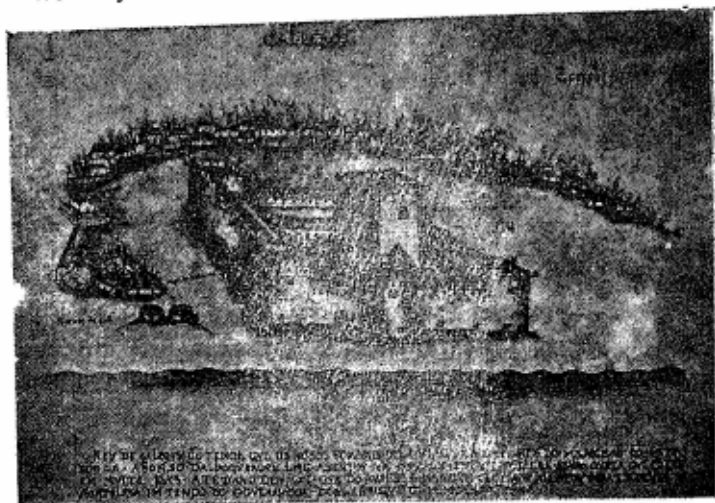
#### THE FORT OF ST. ANGELO AT CANNANORE

This well known fort is situated on a promontary projecting into the sea. The land grant for the settlement and fort was given by Kolathiri Raja as early as 1498 when Vasco da Gama visited here.<sup>23</sup> Again, Viceroy Almeida visited here on 23/10/1505 and secured permission to build a fort. The work of construction began on 24/10/1505 and the foundation stone was laid by Gonçalo Gil Barbosa, the Factor of Cannanore. The construction was quick with the active support of the Kolathiri Raja and within five days the walls and towers reached sufficient heights for being equipped with artillery. This wooden fort, which was named the Fort of St. Angelo, was completed on 30/10/1505 and its first Captain Lourenço Britto had a garrison of 150 Portuguese and two ships in the sea. The fort had a long trench. After the construction of this fort, Viceroy Almeida began using the title of Viceroy, as instructed in the Royal Instructions.<sup>24</sup> Again in 1507, the Viceroy began construction of a stone fort inside its walls. It was of square shape with four round towers on the corners. By the side of

the bay, there was a two storied tower. Between the wall and the fort, there was the Church of Santiago. The door of the fort was by the seaside. This was the first mainland fort built on the Western coast and it had a trench of three fathoms deep and two and a half fathoms broad. Its circuit was 255 fathoms. As this fort had no revenue, its expenses were met from Goa. The 'regimento' of this fort was issued only on 2/11/1564. Linchotten described this fort as "the best fortress that the Portuguese have in Malabar". This fort commanded the coastal sea-routes of the Arabian Sea and it played a prominent role in the Portuguese colonial expansion. The citadels, watch towers and entrance for sea going vessels were all on European style of architecture. But the arches and laterite structure were on local style. When Goa was invaded by the Portuguese in 1510, naval supplies went from this fort. The same was the case in the establishment of the Portuguese hegemony over Malacca. This fort played a significant role and the Portuguese flag flew here for over a century and a half. The Dutch conquered it on 15/2/1663.

### THE FORT OF CALICUT

As early as 1500, Pedro Alvares Cabral was charged with



*Fig. 16. Calicut Fort.*

the duty of erecting a fort at Calicut either by friendly means or by war.<sup>25</sup> Later, the Prince Nambiadiri of Calicut sent a letter to D. Garcia de Noronha who was then cruising in the bar of Calicut, to inform him that permission could be given for a Portuguese fort in the city if peace could be established between Albuquerque and Zamorin. Accordingly, a peace treaty was signed in 1513. Vide a letter dated 30/11/1513, Albuquerque informed the King of Portugal that Zamorin was willing to allow Portuguese to erect a fort. In another letter of 24/12/1513, Albuquerque requested the King to confirm the treaty with Zamorin and informed the King that a fort was being built at a suitable place for the safety and defence. Later, Albuquerque informed the King that Zamorin had already given a place for the fort against the wishes of the Muslims. Albuquerque sent Francisco Gonçalo Nogueira and Gonçalo Medes to Calicut to erect the fort and Thomas Fernandes as the Master of works and he was asked to erect the fort at the same place where there was previously a wooden 'Serame' which had witnessed a furious battle in 1510. At last, the fort of Calicut was completed in 1513.<sup>26</sup> But when D. Duarte de Menezes struck at the Ponnani naval station and dockyard of Zamorin and destroyed it on 26/3/1525. Zamorin seized the Portuguese fort of Calicut. The Captain of the fort, D. João de Lima with three hundred<sup>27</sup> men had defended the fort. Zamorin attacked it on 3/6/1526. The Portuguese reinforcement came from Goa and landed at Calicut on 20/9/1526 and it was planned to embark and attack Zamorin's forces who were besieging the fort. But finding that the fort was not worth to be maintained, it was decided to demolish it as the Portuguese were in permanent war with Calicut. Therefore, after vacating the fort, Capt. Manuel De Macerda was asked to demolish it. But he could not demolish it fully and therefore they abandoned it later.

### THE FORT OF CHALIYAM

Ever since the loss of Calicut fort, the Portuguese were in search of a fort in the neighbourhood. "A fortress on the coast near Calicut would allow the ships to patrol the coast and serve as a shelter from storms."<sup>28</sup> It was decided that such a fortress

shall be built at Chaliyam to the south of Calicut about two leagues away. The entrance of the Chaliyam river was big enough for big vessels. From this river sailed most of the vessels that carried pepper from Malabar and a fortress here was better suited than any where else and also because it lay half way along the coast". Governor Nuno da Cunha desired it in order to compensate for the failure of the Diu mission in 1531 and also to stop the pepper boats which the Muslims took away from the Malabar coast. Accordingly, negotiation began with the ruler of Chaliyam and through the mediation of the King of Tanur, an agreement was reached. The Portuguese were to pay 2000 pardaus for the land on which the fort was to be erected. Nuno himself laid the foundation and the work of this stone and clay fort commenced by end the of October 1531 and was completed by the end of March 1532. According to Zainudeen, a mosque was demolished to erect this fort. The fort had a square shape with towers on its three corners and on the fourth corner there was a three storyed constpuction. The gate of the fort opened on the beach side. Its garrison consisted of 300 men and there were 200 *foists* to patrol the coast. But the Chaliyam fortress was a "dagger directed into the throat of Zamorin." Therefore, it was attacked during 1570-1571 and its Captain Castro surrendered the fort to Zamorin. The fall of Chaliyam was a great blow to the Portuguese.

In 1585, the Portuguese began the erection of a fort at Ponnani, but was never completed.<sup>29</sup>

### THE FORT OF ST. THOMAS AT CRANGANORE

Cranganore was known as a flourishing fort since very ancient times as Mazuris. In 1508, Viceroy Almeida wrote to the King of Portugal on the need of a fort or castle here on the bank of a river in order to obstruct the transport of spices to Calicut. But the castle was built at the time of Governor Nuno only. It was about five leagues from Cochin and was about 1/4 league into the interior. Its first Captain was Diogo Perrira and its 'regimento' was issued later in Goa on 12-10-1564. It was a square fort with four round bastions on the corners. The fort surrounded the city and its whole circuit was of 600 fathoms

with wall,  $1\frac{1}{2}$  fathoms high and two palms broad. All the bastions were fortified with artillery, garrison and alarm bells.

### THE FORT OF D. MANUEL AT COCHIN

It was Francisco de Albuquerque who reached Cochin on 2-9-1503 felt the need of a fort at Cochin for the Portuguese protection and he asked permission which was granted. A place was chosen on the bank of the river and the work began on

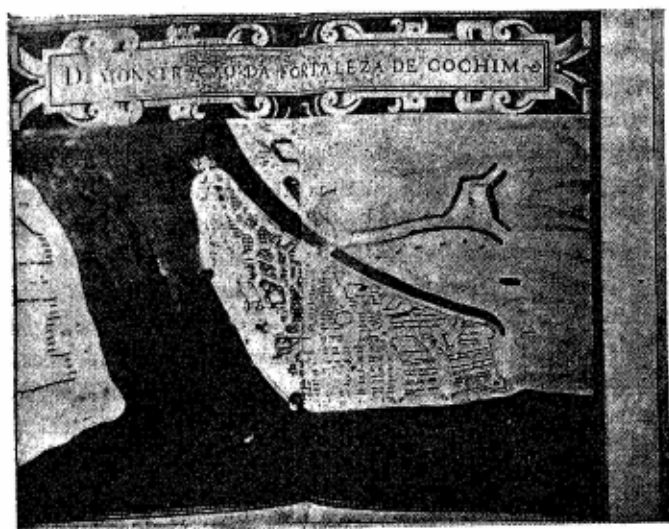


Fig. 17. Cochin Fort.

27-9-1503 in which the natives gave a helping hand.<sup>30</sup> In the absence of stone and lime, coconut wood and other woods were used. When the construction was going on, Afonso de Albuquerque reached there on 30-9-1503 and rendered help for its expeditious construction. The Cochin Raja himself informed the King of Portugal in a letter dated 11-12-1513 that "he had helped the Portuguese in every possible way by supplying timber to the fort and...so on."<sup>31</sup> It was a square shaped fort made of coconut wood and on each angle was raised a bulwark for artillery. The fort was blessed and named as the fort of D. Manuel by the Vicar. The Church of St. Bartholomeo was



erected. The fort of Cochin was the first Portuguese fort and it was one of the theatres of Portuguese action in India.

In 1504, Viceroy Almeida understood the deficiency of a wooden fort and instead desired to erect a stone fort. But the Cochin Raja would not agree. Therefore, the Viceroy deliberately made some wooden frames to catch fire and one night the Church was also burnt! Soon, the Cochin ruler permitted a stone fort. The stone of the new fort was laid by the Viceroy himself, and when made, it was a square fort with two storeyed towers covered with lead sheets. On the two corners by the side of the land, storeyed towers were also raised, which were connected by verandas, below which there were houses for merchandise, and rooms on the upstairs for the Captain of the fort, the Chief Alcaide-Mor and garrison. The door was towards the shore side and loopholes were opened on walls. On the first tower by the sea-side, a copper plate was fixed with the date of construction of the fort. At the entrance of the fort there was a wooden bench fitted for the Viceroy and other nobles to relax. On the banks of the river at a little distance, there was a pepper weight (*pessoa de Pimenta*) where pepper was weighed. On completion of the main tower, the charge of the fort was entrusted to D. Alvaro de Noronha and the Cochin Raja and his key officials were invited for the inauguration. It was explained to the guests that the fort belonged to the Cochin Raja and the Portuguese Captains and others were there only to guard the river bar for the defence. The Cochin Raja was more than satisfied. A fleet was also kept there to cruise the sea. Since 1529, when the headquarters of the Portuguese Government was shifted to Goa, the expenses of this fort were managed from the Goa treasury.

### THE FORT OF ST. THOMAS AT QUILON

Afonso de Albuquerque started a factory at Quilon in order to purchase commodities for the Portuguese ships. Later the Queen of Quilon realized the need of a fort for her safety and for the Portuguese and hence she permitted Governor Diogo Lopez de Sequeira in 1519 to erect a fort. When it was soon erected, it was eighty-five palms long, seventy-five palms

broad and of a man's height. From the door of the fort fifteen steps above, there was a sentry box. From the fort went down a wall to the door at sea-shore, and through this door one entered into the land. The fort had three towers and four bastions which were all fully equipped with artillery. The regiment of the fort was issued later from Goa on 12-10-1564. But soon after, the ruler of Quilon attacked the fort which was defended by Captain Hector Rodrigues. However, peace was made on 17-11-1520 between Governor Diogo Lopez de Sequeira and the ruler of Quilon with the usual trading facilities for the Portuguese. On 25-10-1543, Governor Martim Desouza made another treaty with Quilon, confirming the earlier terms. This fort was captured by the Dutch fleet on 10-12-1661.<sup>32</sup>

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## NAVAL BATTLES

### General Features

When the Portuguese arrived in India, they found the circumstances very congenial. Even though there existed navies in India since the dawn of history, they were not properly organized and from the naval point of view, this was a natural draw-back.<sup>1</sup> The Portuguese who were stronger on the Indian sea, found this greatly advantageous in overcoming the Indian rulers in wars. They were not prepared to allow their maritime supremacy to be disputed by any power in the East. Therefore, right from the time when they set foot on the Indian coast, they had to involve themselves in constant warfare. They entered into a naval struggle at sea for years together with changing fortunes. No all these wars were exclusively sea-battles of the Trafalgar type, but were partly on sea and partly on land.

Almost all wars of the Portuguese were fought with the coastal forts in the background. Forts provided shelter when they had to retreat as a defensive measure. The role of the coastal forts has been discussed in an earlier chapter. All along the coast, a number of creeks with deep waters served as anchorages and the mouth of these creeks, guarded by the forts, formed excellent naval bases.

The subject of warfare is very complex and it has to deal with the problems of defence and offence, man-power and discipline, armaments and weapons, Generalship and of course the actual topographical situation of the war-theatre. Several factors contributed for the success in these wars. The superiority of their ships which were specially built for the purpose of wars, was an important factor. The Portuguese ships were sturdy and well-built and they were more efficient than the fragile native and Arab vessels which were meant for voyages in the calm waters of the Indian Ocean, Red Sea and Persian Gulf.<sup>2</sup> The Portuguese *caravelas* had definite constructional advantages.

The Portuguese war weapons consisted of sword, gun, spear, lance etc. The introduction of artillery was an important stage in the evolution of warfare. In fact, Gama's artillery on his ships changed the whole concept of naval warfare in India. Cannons of the Portuguese type were not in use in Malabar and hence the Calicut forces could easily be defeated. The excellence of artillery and the skill of the Portuguese gunners, mostly Germans and Flemings, were advantageous. The Portuguese Gun foundry at Goa and Cochin had enjoyed high reputation for the bronze guns and iron cannons. These heavy guns which were superior and capable of firing to a long distance, were eagerly sought for by the Eastern rulers.<sup>3</sup> But the Portuguese were reluctant to sell them. Apart from the Papal Bull, the First Ecclesiastical Council of Goa passed a Resolution in 1567 to prohibit the lending of artillery to infidels, even if they were meant for fire salute in the festival days. The possession of match-locks also gave them superiority. They were in a better position with the introduction of cartridges with correct measure of gun-powder and ball. When they acquired boarding nets and powder pots, they became their favourite weapons. In fact, possessing a weapon is one thing and its effective use is entirely another thing. The carefully-planned firings from the Portuguese ships rarely missed their targets. In 1502, when Gama bombarded Calicut, Zamorin's men had no idea of aiming and loading their guns. Similarly, in the battle of Cochin (1504), Zamorin's iron guns could hardly send shots as much as a man could throw them.<sup>4</sup>

Different tactics and strategy were adopted in war according to the exigencies of the time. They changed when new weapons were brought into operation. When their enemies showed themselves above the deck, the Portuguese hid themselves strategically and maintained silence until the final order was given and then they suddenly attacked their enemy. The Portuguese soldiers were better protected and the mail-clad Portuguese could hardly be killed by an offensive weapon. That was one of the reasons why the Portuguese suffered much less than their enemies. The Portuguese allowed no shelter to their enemy in the battles. In the battle of Cochin, Duarte Pacheco cut the trees opposite the ford of Palluruthi in order to prevent them from serving as protection to their enemies. The Portuguese employed natives who were well informed of the local geographical conditions. They protected their ships with cotton sacs on the sides and at the same time, they blocked the stream by erecting pointed and sharpened masts. Some times, they chased the enemy fleet and forced them to fight a decisive battle. Tactics changed according to the need of each battle.

#### THE PORTUGUESE-ZAMORIN NAVAL CONFLICT ON THE MALABAR COAST (1500-1600)

Traditional rivalry between Calicut and Cochin was a familiar feature on the Malabar coast. The Portuguese advantageously availed themselves of this rivalry, and though rebuffed at Calicut, they befriended Cochin. The Portuguese-Cochin friendship was an eye-sore to the Zamorin of Calicut who was so far unchallenged on the Malabar coast and maintained a great naval force under the hereditary Mopla Admirals called Marakkars.<sup>5</sup> The powerful Arab community of Calicut also instigated Zamorin. Consequently, the Portuguese, world's greatest maritime power then, had to enter into a deadly naval struggle with the Calicut navy in a long contest in the sea lasting a century.

In 1500, the fleet of Pedro Alvares Cabral which was charged "to put them (enemy) to fire and carry on fierce war with the Muslims" attacked a loaded Muslim ship at the Calicut

harbour.<sup>6</sup> Soon, the Calicut navy retaliated by attacking the Portuguese factory and killed the Factor Aires Correa and fifty three others including three priests. Cabral's demand for compensation met with no response. Soon the twelve Portuguese ships fired their artillery on the shore, seized the Muslim vessels and killed six hundred Muslims.<sup>7</sup> It was Cabral's bombardment of Calicut for two days that transformed Zamorin into a sworn enemy of the Portuguese.

The fleet of João de Nova (1501) continued the policy of plundering and burning the Calicut ships and then skipping off into the high seas. The Portuguese were unable to get a foot-hold at Calicut and they also failed to get the Muslims expelled from there. Therefore, Vasco da Gama, the Admiral of the Indian seas who was fully equipped to start a war retaliated in 1502 by seizing twenty-four rice-loaded Calicut ships, tortured its eight hundred people and burnt every thing for eight days together.<sup>8</sup> Vincent Sodre, whom Gama had left for cruise on the Malabar coast, sighted a Calicut fleet and he ordered his caravelas to edge close in shore in a line and to fire the guns." "When they (Portuguese ships) reached as far as forward as the Muslim ship... discharged their guns all firing at the flag ship... With their discharge, our men made such good work that they brought down the mast of the flag-ship which fell over and killed many Muslims and... wounded many people".<sup>9</sup> The Portuguese guns sunk thirty-five ships and the remaining fled. Now came another squadron of ships straight to the Portuguese ships and tried to board them. "But a shot from the Portuguese ship took the flag-ship of the Muslims obliquely and threw it in disorder, killing many men, because all the Muslims showed themselves above, but our men remained below..." The Portuguese who hid themselves were not affected by the Muslim guns. In the confusion which ensued, the Portuguese ships fired against the Muslim vessels and "caused much terror... Pedro Rapheal advanced further and reached the ship of Kassim and fired so many shots into his rigging that he brought down his yard, for he broke it and as the sail had no wind, it fell, killed and wounded many people." The Portuguese boats with falconets and swivel guns fired at the vessels. "Our men entered with lance thrusts and drove

them into sea. Then the gunners entered and with their hammers knocked out the planks at the bottom, so that water came in and they went to the bottom. This they did to six to seven vessels".

The Portuguese were required to face a naval coalition of Indian and Arab vessels, in which their fire-power and strategy decided the issue in their favour. "The failure of the Calicut navy showed to the Portuguese the essential weakness of Zamorin's sea-power. It showed the Portuguese the weakness of Indian navies and afforded them an opportunity to build up a naval empire."<sup>10</sup> The heavy Portuguese guns were much superior and capable of firing to a long distance. The caravels had definite advantage in fire-power. The Portuguese also took advantage of the favourable wind.

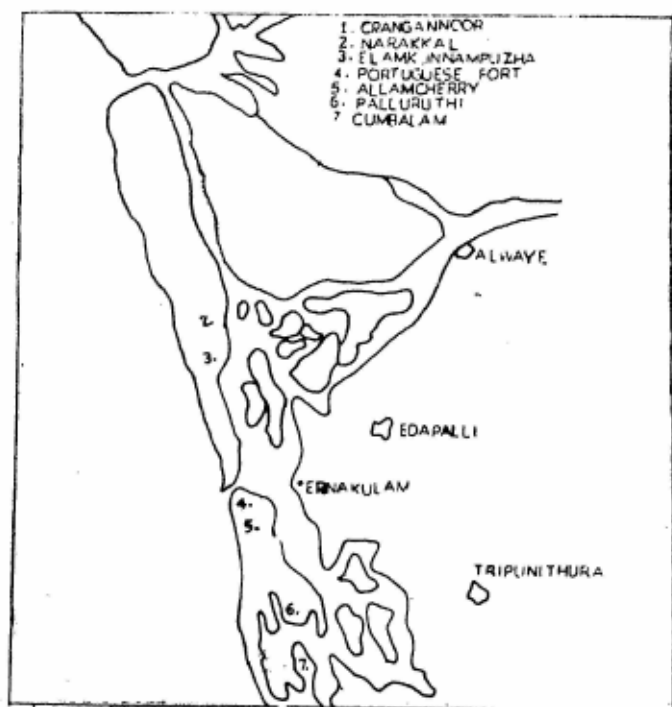
#### (i) The Battle of Cochin (1504)

The enraged Zamorin had decided to expel the Portuguese from Cochin at all cost and as a pretext, asked the Cochin Raja to surrender the few Portuguese there. But the Raja refused to oblige. Soon Zamorin began preparations for an attack on Cochin and to enter her back-waters by forcing the passage of Chetwaye river. However, Zamorin's nephew, the Kozhikode Nambudiri had his own doubts when he enquired that "even if we succeeded in killing the ten Portuguese who were at Cochin, shall we be able to kill the Portuguese at sea?"<sup>11</sup> Zamorin's first attempt to force the passage of Chetwaye river was not successful and therefore as soon as the monsoon advanced, he withdrew leaving his men to besiege the Cochin island. In the mean time, nine ships came from Portugal under Afonso de Albuquerque, Francisco de Albuquerque and Antonio de Saldhana. "First of all, two of Zamorin's ships were captured and... he (Antonio de Saldhana) went along the river and landed his men on the beach, which was taken after much toil and blood had been spent... before our men had reached within the throw of a lance, there were showers of arrows so thick from one side and other that our men could not go forward... Then with our muskets and cross bows, more ground was gained and they were driven at the point of lances..."<sup>12</sup> The Albuquerque sailed to Edappalli island and



set fire there. The Portuguese also sailed to Cheruvaippu and Cumbalam, plundered and captured the pepper-loaded Muslim vessels.

In January 1504, when Albuquerque left for Portugal, he had kept Duarte Pacheco Pereira with forty-five ships and a little over one hundred and fifty men to help the Cochin Raja in exigencies.<sup>13</sup> In fact, the arrival of Duarte gave a new turn in the Portuguese-Zamorin conflict. The Cochin Raja was ill-equipped to meet any attack and the only way open to him was to call in the Portuguese for help. The Portuguese also felt duty-bound to protect Cochin, their only foot-hold in the East. Therefore, Duarte took over the command of defence and decided to defend the passage of Cochin. When Zamorin attacked Cochin, Duarte with his few Portuguese men and three hundred Cochin Nairs beat back all the attack and defeated the huge force by land and sea. "Thus he demons-



*Fig. 18. Sketch map of the Battle of the Cochin (1504)*

trated that the Portuguese position in India could be best secured by supporting one rival Raja against another and by strengthening a small body of Europeans with disciplined native troops under European command."<sup>14</sup>



Fig. 19. *Duarte Pacheco Perrira, the Hero of Cochin-Battle.*

Duarte kept sentries at the passes of Cochin and assumed the offensive. He defended it with all his ships, when the Calicut fleet tried to cross the ford of Cumbalam in order to enter Cochin. He divided all his forces into two groups ; one group to guard the city of Cochin and the Portuguese fort there, and the other to guard the ford of Cumbalam. The

defence of Cochin city and the fort was entrusted to Diogo Perrira with twenty-five men in a large nau which was fully equipped and provided. An armada was arranged to guard the Cumbalam ford.<sup>15</sup> One caravela was placed under Pero Raphael with twenty-six men. The fleet also included two *bateis*, one under Diogo Pires with twenty-three men and another under Duarte himself with twenty-two men. Thus there were hardly seventy three Portuguese for the whole defence. To support this handful of men, the Cochin Raja had provided five hundred Nairs under the command of Koviladhikarikal, Kandan Kora and Perum Kora, Palluruthi Panikkar and Attulli Panikkar to defend the ford.<sup>16</sup>

On the 15th March 1504, when the Calicut forces announced the impending battle, Duarte replied that "tomorrow is the first Sunday of our great feast, Easter."<sup>17</sup> The battle of Cochin began on the 16th March 1504 on the Cumbalam ford and the Portuguese artillery played havoc. The Calicut paraos were well protected with sacs of cotton. Some twenty paraos were tied together by chain and sent ahead in order to attack the Portuguese ships and to seize them by their bows.<sup>18</sup> Duarte devised a plan to deal with this danger. He tied three caravelas together by chain and kept them across the stream to block the passage. He had to guard the ford with four ships and one hundred and eleven Portuguese. In the midst of fighting, a Portuguese shot broke the chains that tied the Calicut vessels and this dispersed them. Eight of them were sunk and thirteen were forced to retire.<sup>19</sup> On the 25th March, the Edappalli Raja, an ally of Zamorin advanced with a fleet and tried to cross the ford. A pitched battle raged for the whole day, resulting in the loss of one thousand and thirty men of Edappalli, "while the Portuguese loss was one and several were wounded, including a *batel* which was damaged."<sup>20</sup> Duarte was determined to give no rest to his enemy and he crossed to the Cumbalam area and destroyed it. Now the Calicut vessels rushed to attack the Cochin city in order to draw away the Portuguese from the Cumbalam ford and thus to divide them. Therefore, Duarte also went to Cochin in a caravela and the Calicut vessels slipped away on his arrival. Duarte returned to Cumbalam only to find the Portuguese position very precarious—the caravelas

were very badly damaged and riddled with holes, demolished rigging and the protecting sacs were all torn off.<sup>21</sup> Taking advantage of this position, the Calicut forces pressed further by land and sea. Therefore, Duarte unexpectedly attacked them in the rear. A furious naval battle ensued and the Calicut fleet met with their second defeat with a loss of seventy nine-paraos and two hundred men.

The Calicut forces again made an attack on the 27th March 1504. Duarte asked his men to hide themselves out of sight and to keep silence till further orders. The Calicut forces mistook that the Portuguese were all wounded or exhausted and hence advanced for an attack in great disorder. Soon, Duarte gave the signal for the attack in which many vessels were sunk and the remaining were scattered. This was the third continuous defeat of the Calicut forces in this battle.

On the 1st May 1504, the Calicut forces made yet another attack to cross to the Cochin island through the passes of Pallingnad and Palluruthi. Duarte rushed to Pallingnad and effectively met the danger. He also sailed to Palluruthi, (two miles away) where the opponents were expected to make an attempt to cross over. He observed that both the fords could not be crossed at the same time because when it was high tide, Pallingnad could not be crossed on foot and water was not deep enough for the smallest ships, while the ford at Palluruthi could only be crossed at high tide. This was a great idea for the Portuguese in the defence of these fords.<sup>22</sup> Duarte kept few men at both the fords and arranged that at a given signal, those on one ford shall hurry to the help of those on the other. He had also cut down the trees opposite the ford of Palluruthi, in order to prevent them from serving as protection to the Calicut forces. When the Calicut forces attacked Palluruthi, the Portuguese started an artillery battle and sunk seven ships. The fleeing Calicut fleet went to Pallingnad, but had to retire with heavy damages.

Now there was a respite for some time during which the Portuguese repaired their vessels and replenished for any eventuality. For the purpose of defence, Duarte cut stakes, sharpened their edges and driven them deep into the mud at low tide with a view to obstruct the passage of the ford by

foot.<sup>23</sup> A vigorous battle began when the Calicut forces advanced to cross the ford. The Portuguese guns were so well pointed in judgement. A Portuguese shot killed two leading men of the Calicut forces and there was utter confusion in which many got wounded by the stakes and fell or retired. They held the Calicut forces in check until the tide began to flow and it became impossible to cross because of the depth of water. The Calicut forces retired with heavier loss than ever before.

The Calicut forces made the last attempt against the Portuguese. They floated down the stream eight wooden towers set on fire with inflammables, in order to destroy the Portuguese vessels. Now Duarte also applied a strategy. He protected the caravels with a number of boats with which he made a large float and anchored them at a distance from the ships, prows so as to prevent the near approach of the 'enemy castles'. Duarte's wooden bombs covered with iron and tin sheets were quite ready to meet the Calicut fire-ships.<sup>24</sup> Careful firing from the Portuguese ships effectively avoided the danger. As the timber float which was set on fire and sent down the river to the Portuguese ships, the masts anchored in the stream kept them away from doing any damage. A Portuguese shot broke down the first wooden tower of the Calicut fleet. Another was also broken. Christopher Juser and Simão Andrade with two vessels and one thousand Nairs engaged the Calicut forces for a full day and frustrated their determined effort to cross the ford once again.<sup>25</sup> The battle was over for the day, when the high tide began.

The battle of Cochin was over within five months and the repeated defeats forced the Calicut fleet to retire on 24th June 1504. The battle ended on 3rd July 1504. In the battle, "our fire did prodigious execution...Several of their (Calicut) paraos being torn into pieces and a great number being killed or wounded without any hurt on our side."<sup>27</sup> Duarte's heroic defence of Cochin established the Portuguese reputation. The grateful Cochin Raja Unni Raja Raman Koil Thirumulpad presented him with a shield of gold with five crowns to represent those five Rajas whom Duarte had killed in the battle of Cochin, together with the names of the seven battles which he

successfully fought. He gave a testimonial as a token of gratitude, to be preserved by Duarte and his heirs.<sup>27</sup> As a result of this battle, the Cochin Raja became a permanent friend of the Portuguese.

## (ii) **The Battle of Cannanore (1506)**

The battle of Cannanore was actually the continuation of the conflict between the Portuguese and Zamorin going on the Malabar coast from 1500 onwards. The Portuguese continued the policy of destruction all along the territory of Zamorin. In 1505, a naval fleet of fifteen batels and twenty five-paraos under Lopo Soares raided Cranganore and set the city on fire.<sup>28</sup> This act clearly demonstrated the Portuguese intention to destroy the Calicut navy and to establish their naval hegemony in the Arabian sea.

Consequently, the Portuguese-Zamorin relation was bound to be further strained. Zamorin made hectic preparations in order to deal with the Portuguese fleet. Viceroy Almeida learnt this through one Ludvico de Varthema, a Bolognese spy. Accordingly, he sent his son Lourenço on 16th February 1506 to deal with the Calicut fleet and to give a crushing defeat.<sup>29</sup> Lourenço sailed from Cochin towards Cannanore and on the way met a Calicut fleet consisting of twenty-seven ships. After a short engagement, he set them on fire.<sup>30</sup>

As he sailed further, he came across a huge Calicut fleet on 4th March 1506. Lourenço reconnoitered the fleet and fired a few shots in order to test the strength of the fire power of Calicut. The excuse of the Calicut fleet that they had no evil designs on the Portuguese, was not acceptable to Lourenço. When he found that the enemy was weak, he at once decided to finish them and convinced his men to be ready for an early action. A priest in the fleet showed a crucifix, forgave their sins and put moral strength among the men to fight. All these had the desired effect. As the battle started Lourenço steered his vessels between those of his enemy and forced them to disperse. "The Admiral (Lourenço) attacked two of the largest ships of the enemy...The entire crew of six hundred were killed."<sup>31</sup> The Portuguese loss was comparatively little. The Portuguese fleet chased the fleeing ships of Zamorin

and engaged them in an artillery fire. The Portuguese boarded the ships laden with merchandise. In a hand to hand fight, the entire crew was put to death because of which "the sea was covered with blood".

The battle of Cannanore was a great victory for the Portuguese and a complete rout for the Calicut fleet which was badly mauled. In fact, the Portuguese had frustrated yet another attempt of Zamorin at sea. The Portuguese victory at Cannanore definitely established their naval supremacy on the Malabar coast.

### (iii) The Battle of Calicut (1510)

The arrival of Marshal Fernando Coutinho in India (1509) with fifteen naus and one thousand six hundred men, opened a new chapter in the Portuguese-Zamorin conflict.<sup>32</sup> He had been authorized by Portugal to destroy Calicut at all cost. Therefore, hectic preparations were made for an expedition against Calicut in the disguise of an attack on Goa.<sup>33</sup> The Marshal himself assumed the command of the operation. It was planned to start attack from the side of Cannanore and Cochin. Governor Afonso de Albuquerque unwillingly accepted the plan. On the 2nd January 1510, a Portuguese fleet with two thousand men and six hundred natives under their leader, the ruler of Poracad reached Calicut.<sup>34</sup> They landed on the shore in two divisions the next morning. Antonio de Noronha, Manuel de Lacerda, Simão de Andrade and Rodrigo Rebello with three hundred men were kept near the Calicut jetty in order to guard the ships and "to resist whenever they should see any order". Noronha was asked to set every ship on fire in the port as a security for the invading Portuguese fleet.

Incidentally, Zamorin was away from the capital, but his Nair force decided to defend Calicut at all cost. The Nairs had the advantage of being in their own land with enough supplies, hiding stations and other things at their command at a short notice. They had planned not to face the Portuguese in the open, but to resort to guerilla warfare. The Calicut country crafts which were lighter and quicker were best suited for a guerilla battle in the shallow waters of Calicut. In fact, this also ultimately enabled the Nair force to win the day.

As the battle began, Marshal Coutinho proceeded from the Calicut harbour and forced the Nairs to retreat. The Portuguese guns from the ships also helped in this initial action. The Marshal marched to the palace of the Zamorin situated about half a league away from the sea-shore. When the attack began, the Nairs defended the palace and inflicted huge loss on the Portuguese.<sup>35</sup> According to a contemporary authority, "on Thursday, twenty second of the month of Ramzan, year Hijra 915, the Firinghis attacked Calicut which was sacked and the mosque of Jumma was burnt."<sup>36</sup> When the fighting was going on, Afonso de Albuquerque reached there from the rear. He realized that it was impossible to deal with the tactful Nair forces in an open war or blockade, in view of the limited resources at his command.<sup>37</sup> Therefore, he suggested the Marshal to withdraw to their ships and not to proceed further to the interior. Accordingly, they started to retreat and in the confusion, the Marshal himself was killed along with many others. Albuquerque was wounded and had to be carried to the shore. A total destruction was just avoided by the timely action of Antonio de Noronha and Rodrigo Rebello from the shore. "The (fleeing) Portuguese on reaching the beach...threw away their arms and got into the water intending to take refuge in the boats..."<sup>38</sup> In this expedition, seventy eight Portuguese were killed and more than three hundred were wounded, a good many of them were drowned while trying to escape. "A few of them managed to return to their ships and thereafter they went on attacking other places of Zamorin, burning fifty ships and murdering seventy faithful." Zamorin suffered a loss of one thousand one hundred and thirty men, five hundred seventy women and children. The city houses were burnt along with twenty naus.<sup>39</sup>

The Calicut expedition was a total disaster and the naval strategy of the Portuguese was entirely miscarried. Marshal's boast to carry the doors of Zamorin's palace to Portugal ended in fiasco. The Calicut vessels were lighter and faster, but inferior in artillery and organization. They avoided pitched battles and resorted to guerilla war on the sea. Eventhough the Portuguese commanded the open sea, they were powerless against the country crafts.<sup>40</sup>



**(iv) Naval Conflict on the Malabar Coast (1513-1597)**

On the 24th December 1513, Albuquerque made a peace treaty with the new Zamorin, and thereby secured permission to construct a fort at Calicut. However, the death of Albuquerque in 1515 delayed the process of normalization. Between 1513-1522, there was an uneasy truce and even though there was no open war, there were frequent encounters on the Malabar coast.<sup>41</sup> There was an undeclared war on the sea and the Portuguese fleet raided Ponnani naval station and Pantalayini Kollam and attacked the pepper-loaded Calicut ships there.<sup>42</sup> Martin Afonso Desouza fought a fierce battle at Kappat against the Calicut fleet. On 26th March 1525, Duarte de Menezes once again attacked Ponnani and destroyed the Calicut ships anchored there. Now Zamorin retaliated by pulling down the Portuguese fort at Calicut. The situation became tense and the Portuguese made a determined effort to destroy the Calicut fleet. In a pitched battle near Baccanur in 1528, Governor Lopo Vaz destroyed a part of the Calicut fleet under Kutty Ali Marakkar.<sup>43</sup> The Portuguese also destroyed Poracad for having supported Calicut. Captain Desa had another victory in 1528 itself against the Calicut fleet under Chinna Kutty Ali Marakkar who was caught, but left off when he took an oath over Holy Koran not to wage war against the Portuguese in future.<sup>44</sup> In September 1528, the Portuguese attacked the port of Chetwaye and blocked the river mouth in order to bottle up the Calicut fleet. But this was a fatal step as they attacked and destroyed the Portuguese ships.

The naval war continued on the Malabar coast during 1528-1531. Diogo de Silveira who was in-charge of cruising the coast caused much havoc and seized twenty seven loaded vessels.<sup>45</sup> In the mean time, the Portuguese had secured permission to erect a fort at Chaliyam. This was a "dagger on Zamorin's throat", but a fine base for the Portuguese operation.<sup>46</sup> Consequently, an open conflict began in which the Calicut fleet captured several Portuguese ships. In retaliation, the Portuguese attacked Ponnani port and caused much destruction.<sup>47</sup> In 1537, the Portuguese fleet had intercepted several enemy vessels and sunk them.<sup>48</sup> Martin Afonso Desouza,

who was in-charge of the Malabar squadron, attacked Edappili and plundered it.

By 1540, the naval struggle on the Malabar coast continued for forty long years. However, there was an uneasy truce for the next ten years, on account of the peace treaty signed on the 1st January 1540 on *galeon* 'S. Mathews' at Ponnani.<sup>49</sup> It was in such a calm atmosphere that Governor Martin Afonso Desouza sent a force to plunder the wealth of one rich merchant of Cannanore, Abu Baker Ali. The result was that the Cannanore Raja who was an ally of the Portuguese since the very beginning joined hands with Zamorin against the Portuguese.<sup>50</sup> Thus the existing truce was broken when Luis demello arrived at Calicut with a big fleet. He changed the Portuguese naval policy of chasing the Calicut fleet but forced it to fight a decisive battle. He blocked the river mouth and in this way he could have destroyed the Calicut fleet, if he had continued this policy.<sup>51</sup> But he was recalled to Goa. The fleet of Francisco Mascarenhas effectively met the Calicut ships on the coast. Throughout 1559-1560, the Portuguese fleet ravaged the coast. A fleet under Gonçalo Marmanaque not only blocked but also caused heavy damage on the Calicut fleet.

In spite of the long naval war going on the Malabar coast, the Portuguese efforts to bring the Calicut fleet to an open attack, was fruitless. Therefore, Diogo de Menezes went to the Malabar coast with forty vessels and pillaged Pandarini Kollam, Tiracod and Ponnani. In 1570, a fleet under Lionel Coutinho engaged the Calicut fleet at Chaul where they had come to support the coalition partners. The fleeing Calicut fleet was engaged to a serious naval battle by Diogo de Menezes.<sup>52</sup> The Calicut flag-ship was sunk and the remaining surrendered.

"Thus the naval struggle, started with Marshal Coutinho, ended in their signal defeat and nothing came out of their several years of struggle from 1510 to 1570."<sup>53</sup> In 1570, the Zamorin seized Chaliyam fort and the fall of this fort was a great blow to the Portuguese prestige. They retaliated by capturing the rice-loaded vessels on the coast and destroying Nileshtar. Soon war broke out again. Andre Furtado de Mendonça, with twenty *fustas* engaged the Calicut fleet on the Coromandel coast near the Cordiva island.<sup>54</sup>

## (v) The Conquest of Kottakkal (1597-1600)

In 1586, the Portuguese secured Zamorin's permission to erect a naval fort at Ponnani harbour, much to the dislike of the last Calicut Admiral Kunjali Marakkar IV, who was the most formidable enemy of the Portuguese on the Malabar coast in the 16th century. Kunjali had his own fort on the bank of the Kotta river and he began plundering the Portuguese ships which were even escorted.<sup>55</sup> He rebelled against Zamorin. Taking advantage of this situation, Viceroy Mathias de Albuquerque sent Alvaro de Abranches to Zamorin proposing a joint action against Kunjali. A willing Zamorin agreed readily. It was planned that Zamorin should attack by land while the Portuguese should send a naval fleet to destroy the Kotta fort.<sup>56</sup> Accordingly, the new Viceroy Francisco de Gama sent a large naval force under his own brother Luis de Gama with five galleys and thirty-six other vessels. The fleet which left Goa on the 13th November 1597 had to return without achieving anything.<sup>57</sup> However, the Viceroy sent him again with three galleys and twenty *fustas* with one thousand five hundred men in order to blockade the Kotta fort. Six Bassein-built ships also were sent. The fleet reached Kotta and a joint plan of action was drawn up with the support of Zamorin.<sup>58</sup> It was decided to start the action on 5th March 1599.

On the advice of his Captains, Luis de Gama decided to attack the Kotta fort by the side of the land from Ariole. The Portuguese vessels surrounded the mouth of the Kotta river, while the supporting army of Zamorin encamped on the land side. The Bassein-boats were a great threat. The result was that Kunjali's vessels could not reach near the fort because of the close watch by the Portuguese at the mouth of the river.

The joint action on the Kotta fort was to start on the signal of a burning lance and Luis desilva with his men was expected to lead the vanguard to cross the creek of Balycupam and attack Kunjali from that side. Belchoir Ferreira with his men and five hundred Calicut Nairs was also expected to attack at that time.<sup>59</sup> When the action signal was given a little before time, there was confusion. Belchoir marched for an assault, while Luis desilva struck to the original plan and did not move. Thus the whole plan was in confusion. In the

morning, Luis desilva crossed the creek with his men in six ships, but in the process, he himself got drowned with others. There was a panic among the Portuguese. In this action, the Portuguese fleet could not obtain any combat value and played the role of transport vessels for men and equipment on the beach. "This proved the greatest disgrace to the Portuguese record in Asia".<sup>60</sup> A frustrated Luis returned to Cochin in September 1599, keeping D. Ferdinand with twelve ships to block the mouth of the Kotta river so as to prevent any relief from reaching the fort by the sea.

The Viceroy did not give up the project of the Kotta fort, and he sent another expedition under Andre Furtado de Mendonça. Andre left Goa on 3rd December 1599 with two galleys, twenty-two naus, five manchuas, eight periches and a few Bassein-made boats.<sup>61</sup> On the way at Mangalore, he dissuaded the king of Ullal from helping Kunjali. By the time Andre reached Kotta on the 16th December, reinforcement also reached from Cochin and elsewhere.<sup>62</sup> Therefore, arrangement was made for a common attack, in consultation with Zamorin who agreed to keep hostages at Cochin for the security of Portuguese men, artillery and other things in the land of Ariole.<sup>63</sup> Zamorin also agreed to provide one thousand workers for the camp and seige, fifteen elephants, necessary timber, Carpenters, Blacksmiths, Sawyers, five thousand Nairs, four manchuas with sailors and others, thirty small boats with sailors, spades and baskets for the seige.<sup>64</sup>

Andre cleared the bar of the river obstructed by the Muslim masts. Trenches were also made for safety purpose. The Portuguese forces disembarked at Ariole on the northern side of the Kotta river and demolished the bastion of the river with heavy artillery. The assault was planned to start on 7th March 1600.<sup>65</sup> Andre inspected the fort and its strategy and then divided his forces into three, with the main wing under himself. As the order was given for a bitter attack, Andre was the first to scale the fort-wall with a sword in his hand. The seige and bombardment of the fort continued for five days.<sup>66</sup> The seige was so heavy that Kunjali was reduced to extreme misery because of the shortage of provisions inside the fort. Soon negotiation began for the surrender and it was agreed that

Kunjali and his associates were to be handed over to the Portuguese.<sup>67</sup> The surrender took place on 16th March. Kunjali prostrated before the Zamorin after laying down his sword. Kunjali and forty others were handcuffed and led to the galley of Andre. The Kotta fort was razed to the ground on the 25th March. The whole property was offered to the Zamorin. The artillery was divided equally between them as agreed earlier. Everything else was set on fire.

Andre Furtado received from Zamorin a gold plate on which was inscribed "the promise of everlasting peace with Portugal". Andre returned to Goa on 1st April 1600. Kunjali and his men were beheaded at Panjim on charges of being traitors to the king of Portugal and the persecutors of Christianity. There was great rejoicing in Portugal on the conquest of Kotta and the king sent a letter thanking Andre for having restored the Portuguese prestige which was lost in 1599.

## THE PORTUGUESE CONQUEST OF GOA

### (i) The First Battle (February 1510)

Ever since his arrival in India, Afonso de Albuquerque cherished the project of conquering Goa from the Sultan of Bijapur. In February 1510, when he was on his way to a Red sea expedition with a large fleet (eighteen *naus*, two *galeo*, two *caravelas* and one *bergantine*), Timmoja (Thimmappa) of Honavar, one of the commanders of Vijainagar met him at Mirjan where the fleet had touched.<sup>68</sup> Thimmoja expressed surprise why the Portuguese desired a Red sea expedition when the neighbouring island city of Goa itself was preparing for an attack against the Portuguese in the south.<sup>69</sup> He pressed Albuquerque for an immediate attack on Goa, on the ground that it was an ideal occasion because Sultan Adil Khan, the ruler of Goa was engaged in a war against a rebel. There was also dissension among the nobles of Goa and above all the Hindu population of Goa were prepared to rise against the Muslim rulers in case of a Portuguese attack.<sup>70</sup> Albuquerque himself had heard about a Muslim combination against the Portuguese ever since Viceroy Almeida had sacked Dabul port in 1509. He had also received a request from one Mal Pai of

Verna, a Sardesai, to conquer Goa.<sup>71</sup> Accordingly, Albuquerque called his Council of Captains on 13th February 1510 and decided to go in for Goa, with the support promised by Timmoja. The Portuguese fleet under Albuquerque also reached the bar of Goa on the 28th February and anchored.

The Portuguese found the city of Goa surrounded by walls and bastions and all its five passes—Panjim, Agaçaim, Banastharim, Gondalim and Danjim—were well-guarded. But Albuquerque planned a two-fold attack on Goa, to conquer the fort of Panjim and then to march to the city of Goa. He sent Antonio de Noronha with others in ships to cross the bar of Goa. The bulwarks of Goa were easily abandoned by the Muslims. The Portuguese successfully attacked the bastion and seized two bastions without any resistance, and the town of Panjim was taken. The Portuguese fleet sailed up the Mandovi river and crossed the bar.<sup>72</sup> The Muslim forces retreated partly because they were already demoralized by the prophecy of a Fakir 'that Goa would be conquered by foreigners.'<sup>73</sup> They submitted at once and offered the city of Goa to Albuquerque. Thus Albuquerque secured Panjim without any resistance and without a naval war.

Albuquerque triumphantly disembarked and entered the city of Goa on the 17th February and at the entrance, the key of the city was offered to him solemnly by the people. The Portuguese seized from the city large quantity of provisions, arms and ammunitions like guns, cannons, gun powder etc. and in the sea, forty big naus and sixteen bergantins.<sup>74</sup> Albuquerque appointed Antonio de Noronha as the Captain of Goa and made other administrative arrangements.

Monsoon began by April and the Portuguese Captains were not well disposed to stay on in Goa. They even instigated a rebellion which was however promptly suppressed.<sup>75</sup> Albuquerque now received a message from the ruler of Kudal informing him of the presence of a Muslim force at Banda to reconquer Goa. Therefore, he sent George de Cunha with a force to Kudal by land. By sea went Diogo Fernandes de Beja in a parao to support Dacunha. At the Divar island, the Portuguese were told by a native on 23rd April 1510 that the Muslim force had already reached Banda on their way to Goa.<sup>76</sup>

Therefore, Albuquerque recalled Dacunha as it was impossible to resist the Muslim force.

Soon, Albuquerque made preparations for the defence of the city of Goa and he ordered the guarding of all the passes to the island. Francisco Desouza Mancias, Francisco Perrira Coutinho and George Fogaça were kept with a hundred native infantry to guard the pass of Gondalim where a trench was made and equipped with artillery etc. and an armed ship. Banastharim was entrusted to Garcia desouza and Aires Desilva in a ship. Jeronimo De Lima and Gonçalo de Almeida were kept with a small force at Seca pass.<sup>77</sup> Agaçaim was under Lopo de Azevedo with infantry and cavalry. Here Fernao Pires de Andrade and Luis de Coutinho were asked to guard with naus and Diogo Fernandes de Beja with a gale because the river was broad enough and vulnerable. In between Banastharim and Agaçaim passes, Simão de Andrade guarded in a gale; Simao Martin in a galeota; Bernardino Ferreira and Pero de Fonseca in two bateis. Panjim was under Timmoja's brother in-law and Emir Ali with some infantry. The defence of the river was entrusted to Antonio de Noronha with caravelas, bergantins and caravelas. Albuquerque remained with other Captains as a reserve in the city.

When the Muslim force advanced under Phulat Khan and encamped behind a hill at Banastharim, Garcia Desouza of that pass attacked them with artillery and forced them to retreat.<sup>78</sup> The Portuguese destroyed the entire enemy encampment in a night attack. On 1st May 1510, the Muslims sent a message to Albuquerque through one João Machado, a Portuguese convict of Adil Shah, suggesting that the Sultan would gladly give any other area on the coast except Goa.<sup>79</sup> But Albuquerque refused to give up Goa. When the Muslim forces closed the mouth of the river of Goa, Fernao Pires in his gale, and Lionel Coutinho, Bernardino Ferrira and George Fogaça in their bateis sailed in the river for an attack on them. Albuquerque himself moved by land with infantry and cavalry. But when he learnt the strength of the Muslim forces, he withdrew to the city in order to arrange for more ships and to concentrate on the defence of the passes.<sup>80</sup>

On Friday, the 17th May 1510, in a dark and rainy night, the Muslim forces marched on the pass of Banastharim and took it from the Portuguese. As the masters of Banastharim, they marched on and encamped on the hill of Carambolim, near the city of Goa. But Albuquerque prepared for a gallant defence and placed eight of his Captains at eight weak points where the city walls were broken.<sup>81</sup> Through out the night the Muslims stormed the city and hoisted their blue and red flag. To deal with this, Albuquerque collected five hundred Portuguese, four hundred natives and of course his navy. Antonio de Noronha successfully repelled the attack of the Muslims at several points on the city.

In the mean time, a convict Machado informed Albuquerque that the Muslims were going to set fire to the Portuguese fleet in the river. Soon Albuquerque consulted his Captains and decided to withdraw to the fleet and to remain anchored there till the end of the monsoon and arrival of further reinforcement. When they were withdrawing, they did not forget to take "the fair and beautiful ladies and girls" captured at Adil Khan's palace. On Thursday, the 30th May 1510, the Portuguese returned to their ships, after possessing Goa for three and a half months. But as they were unable to cross the bar of the river which was closed, they anchored below Ribander.<sup>82</sup> The Muslim forces re-entered the city and began pestering the fleeing Portuguese fleet from the side of Bardez. It was a dangerous situation and the Portuguese suffered terribly. Their provisions got exhausted and they had to eat even rats and leather articles. But in spite of all these privations, they continued the attack on Panjim from their fleet. The monsoon was over by August 1510 and the fleet crossed the river bar on the 15th August and sailed past to Anjediva island on way to Cannanore. Goa came back to the Muslims who never suspected the return of the Portuguese. The first attack on Goa was at least a temporary success for the Muslim forces.

## (ii) The Second Battle (November, 1510)

Without giving up hopes, Albuquerque prepared for



another attack on Goa. On the 10th October, 1510, he called a Council of his Captains and warned them that any delay on their part would enable the Sultan Adil Khan to form an alliance with Gujarat, Calicut and even Egypt.<sup>83</sup> Therefore, on 20th October, he sailed from Cannanore with a fleet of thirty four ships, one thousand five hundred Portuguese and three hundred Malabarese under the Guazil of Cannanore. Timmoja met him at Honavar on the 25th October and informed that Goa was now well fortified.<sup>84</sup> Albuquerque suspected that Timmoja was with the Muslims. Therefore, the fleet moved to Anjediva and lay anchored there for eleven days with out any definite decision.<sup>85</sup>

When the fleet reached Goa, Albuquerque crossed the river-bar along with his Captains and the ships of Honavar under Medi Rao and anchored at Ponganin on the 24th November. Manuel de Cunha was sent with six ships to sail upto Agaçaim. Jeronimo de Lima, João de Lima and Antonio de Maurã went in their bateis along the sea-shore to reconnoitre the city and they found that the city of Goa was well fortified. Soon, Albuquerque called a War Council and took a firm decision for an immediate attack on Goa.<sup>86</sup> Albuquerque occupied a hill which was to be the strategic centre of command. Diogo Mendes with three hundred men occupied the mid-slope of the hill. Manuel de Lacerda and João de Lima with three hundred and eighty men were to attack the trenches and penetrate into the city. Timmoja was entrusted with the work of guarding the Portuguese vessels in the Mandovi river. It was planned to commence the attack on the next day, Sunday the 25th November, the feast day of St. Catherine e.<sup>87</sup>

All the vessels weighed anchor early in the morning and proceeded upto the Mandovi river and took position opposite the fortress. Here they landed one thousand six hundred and eighty men.<sup>88</sup> Albuquerque divided this force into three squadrons, one under Manuel de Lacerda, another under Diogo de Mendes and the third under himself. Albuquerque's squadron marched upto the door of the city ('Door of the Bachelors'), followed by the other squadrons and attacked the trench along the shore. When the Muslim forces saw the Portuguese on the land, they started artillery fire from the trench, but the

Portuguese captured the trench. The Muslims began to rush to the door, only to be followed by the Portuguese. Nuno Vaz de Castelo Branco went with hundred men to deal with the Muslim force rushing to the bank of the Mandovi river. At this time, one Fradique Fernandes climbed the fort with spear in the hand and shouted "long live Portugal" and others repeated it.<sup>89</sup> In the mean time, the Portuguese managed to open the door of the city a little and one João Corces who entered it was killed on the spot but his corpse in between the foldings of the door prevented the Muslims from shutting the door completely. The Portuguese entered the city and chased the Muslims who were running for refuge. Here a pitched battle ensued in which many Muslims were killed. The remaining fled off the gate which was now closed from inside. The fleeing Muslims drowned in the river in the process of swimming.<sup>90</sup> A victorious Albuquerque climbed up the slope of the hill and heard the roaring in the city because of the artillery fire and shoutings.

Thus the Portuguese had won the second battle and it was a complete rout for the Muslims. Albuquerque entered the city on a horse-back and found the city deserted.<sup>91</sup> "In this fight, perished the people of the city and of ships which they (Muslims) had made ready; some were taken, more were burnt and he (Albuquerque) brought the city forthwith under the rule and governance of the king, our Lord..."<sup>92</sup> The Portuguese casualties were forty killed and about three hundred wounded. The large booty from the city included arms, bombards, iron, copper, ammunitions and provisions. About the carnage that followed let Albuquerque himself speak. "The capture of Goa, the destruction of its defence stations and entry into the fort, was a feat greater than expected; in the city over three hundred Turks were killed and the space from the city to the passes of Banastharim and Guadalim was all sown with dead and wounded bodies; many men and horses were drowned in the river; set fire to the city and put every living being to sword for four successive days; the mosques were filled with the bodies of Muslims and set on fire; the Brahmins and farmers were spared. The total number of Muslims killed would be six thousand; no Muslims should be let live in Goa

nor enter here, but only the Hindus were allowed; spared artisans such as caulkers, carpenters, blacksmiths and painters who would be required in future.<sup>93</sup>

(iii) **The Banastharim Naval Battle (1512)**

The recapture of Goa in November 1510 did not give the Portuguese the possession of Ponda, Bardez and Salsette. They were won from the Muslims only after a hard struggle. After their defeat in November 1510, the Muslim forces had returned to Banastharim (about 2 leagues from the city of Goa) and were trying to provoke the Portuguese by creating insecurity.<sup>94</sup> They took advantage of the absence of Albuquerque who was away on an expedition to Malacca. In this circumstance, the Muslim General Phulat Khan crossed the river without meeting any resistance and landed on the island of Goa in an effort to reconquer Goa.<sup>95</sup> The efforts of the Governor of Goa Malhar Rao and Timmoja to resist the Muslims proved helpless and they themselves had to flee for their own safety. However, Captain Rodrigo Rebello dealt with the Muslims at Goa Velha and put them to rout, with a small force of thirty cavalry men, two hundred Malabarese and three hundred natives of Goa. But the accidental death of Rodrigo Rebello in a skirmish demoralized the Portuguese so much that there was none to take the command till such time when Diogo Mendes was elected the Captains of Goa and he brought order in the city.<sup>96</sup> The Portuguese had hardly two hundred men and six hundred natives in the city of Goa and their ships were withdrawn from the passes for safety. It was in such precarious circumstances that Phulat Khan had set up his camp at Banastharim, erected a fort and even fortified with a view to expel the Portuguese from the Goa island.<sup>97</sup> Fighting continued at dull during the month of May 1512 because of heavy monsoon. Diogo Mendes and his men ably resisted the Muslim attack on the city of Goa from the Banastharim camp.

In the mean time, Sultan Adil Khan sent his brother-in-law Rasul Khan to Goa in order to take over the charge from Phulat Khan who had refused to hand over. Therefore, Rasul played a clever plan and even requested the Portuguese to

defeat Phulat Khan who had invaded Goa without the permission of the Sultan. Diogo Mendes who did not suspect the plan joined Rasul Khan's forces with long boats and galleys with two hundred men. "With our men on the sea and theirs on the land, they attacked Phulat Khan and vanquished him".<sup>98</sup>

Now Rasul Khan revealed his true colour, established himself at Banstharim and demanded the Portuguese to surrender Goa failing which war was to begin soon. The Portuguese were in precarious position with hardly one thousand and two hundred men of which only one third were Portuguese. Low morale, shortage of provisions and severe winter and poor defence etc. badly demoralized them. In this crucial circumstance, one João Mendonça, an employee of Rasul Khan crossed over to the Portuguese and this boosted up their morale.<sup>99</sup> Rasul Khan who was continuously attacking the city for a whole day and trying to enter it through a breach caused by rain, was repelled unsuccessfully. "From then on, Rasul Khan waged war, the city lying seige for the whole winter and the men suffering hunger, hazards and misadventures too numerous to state".<sup>100</sup> Fighting continued for the whole monsoon and all the efforts of the Muslims to capture the city either by force or by strategy failed. Rasul Khan was waiting for reinforcement and the Portuguese for the return of Albuquerque from Malacca. By this time, twenty paroas came from Bhatkal with provisions and this saved the precarious situation.<sup>101</sup> There arrived also a fleet of twelve naus under George Demelo Perrira—naus Cisne, Nazare, Conceicao, S. Giao, Sto. Antonio de Chelas, *Sta. Cruz, Madelena, Biscainha, Bota Fogo, Flor de Rosa, and Sto. Antonio and Ferros*.<sup>102</sup> Soon a thousand and five hundred men landed on the shore in bateis. Rasul Khan sensed the Portuguese strength and tried to capture the target even by a trick. He even availed the service of one Fernandes to whom Ponda was promised; but the Portuguese learnt of the plot and punished him.

On learning the plight of Goa, Albuquerque left Cochin on 10th September 1512 with sixteen vessels and proceeded to Goa.<sup>103</sup> He entered the bar of Goa with the determination to expel the Muslims and capture the passage of Banastharim.

Most of his ships were sent along the Mandovi river as far as the city of Goa, while he himself took the remaining ships along the Zuari river, in an effort to cut off the supplies to the Muslim camp at Banastharim. A long artillery duel followed. Aires desilva sailed with his ships in the Mandovi river and pulled off the stakes kept by the Muslims to prevent the Portuguese ships.<sup>104</sup> Albuquerque led the attack from a boat and the fight continued throughout one whole night in the light of straw fire. The Muslim attack on Goa continued in the meanwhile by the sea. "For eight days and nights the Turks never stopped to belay our ships with their artillery... Our men tell that in this eight days, the Turks fired upon them more than four thousand shots from large cannons, not counting the smaller, and from the ramparts, they shot arrows and balls wounding many of our men."<sup>105</sup> As General Rasul Khan advanced with a force, he was effectively resisted by Garcia de Noronha and other Captains with four thousand men including Malabarese and natives. The Muslims retreated and they were chased by the Portuguese. A fierce battle followed in which many Portuguese were killed as against the loss of one thousand Muslims.<sup>106</sup>

Albuquerque entered the city ceremoniously and there was procession, mass and sermon and none believed that there was a war going on. When the hostilities began the next day, a huge Muslim force marched from Banastharim and came near the city, making a great show. The Portuguese horse-men sent for reconnaissance learnt of the Muslim preparation for a battle. Albuquerque reminded his men that "we should keep in mind our main design to capture the fortress of Banastharim and to throw them (Muslims) out of it."<sup>107</sup> Albuquerque arranged his forces into three divisions under Pero de Mascarenhas, Garcia de Noronha and himself in the rear. When the plan of a grand battle was formulated, Albuquerque put the trained Swiss archers in the centre, Garcia de Noronha and Antonio de Saldhana on the right wing and he himself on the left. The squadron of cavalry was kept in the reserve. The Swiss archers advanced, while the right wing remained stationary. Albuquerque's squadron tried a flanking movement to force the enemy to attack. The manoeuvre was

successful and the Muslims were in great confusion. The Muslims began to retire and their rear guard forded the river and took refuge in Ponda. The retreating main body of the Muslims was attacked by the men of Garcia de Noronha's division. Many of the Muslim force were trapped in mud and died, while others tried to cross the river at Guadalim only to meet the Portuguese ships.

Albuquerque returned to the city of Goa for rest and replenishment. He instructed his Captains as to "how the fortress could be attacked and the place where a breach could be made."<sup>108</sup> During these two days rest, the Portuguese prepared artillery, ladders, battering rams, montelets, picks, hoes, empty casks for redouts and all other materials necessary for the siege of Banastharim. Tents were made from the ship's sails. The Portuguese moved out on the third day. When the Captain's council met, Antonio suggested an immediate action in order to make a breach on the fort-wall because it was difficult to climb the walls. He pointed out that "if we could not make the breach, then we should go to the gates and storm the fortress."<sup>109</sup>

The Portuguese pitched their camp a little away from Banastharim and on the 15th November, 1512, Albuquerque marched towards the fortress. The Portuguese forces began to pound the fort-wall on 18th November, with a view to effect a breach.<sup>110</sup> One early morning, the Muslim force tried their best to destroy the Portuguese artillery and redouts but they were effectively repelled by men under Garcia de Noronha. The bombardment of the fort continued throughout the day and the continuous fire made a breach on the fort-wall. The Portuguese ships also attacked the fort with artillery from the river. By now, General Rasul Khan realized that he had no escape, surrounded and blocked, and being attacked both by sea and land.<sup>111</sup> He submitted and surrendered. He agreed to return all the deserters, all the ships seized at the pass of Naroa and surrender the fortress of Banastharim with all the horses, artillery, ammunitions and ships. Even though the fleeing Muslim force rallied and made another attempt, it was too late and the fate of Goa was already sealed. Albuquerque himself said of the Banastharim expedition that "India is now

tamed and subdued under bondage and obedience... May our Lord keep it so."<sup>112</sup> The Portuguese demolished the fortifications of Banastharim and erected a better one instead. The deserters were punished by cutting off their noses, ears, right hands and left thumbs or sent as prisoners to Lisbon.<sup>113</sup>

#### (iv) The Battle to Retain Goa (1570)

During the time of Viceroy Luis de Athiade (1568-1571), Goa had to face yet another attack of a confederacy of the enemies who hoped to make the last effort to expel the Portuguese from India.<sup>114</sup> The coalition partners, Sultan Adil Khan of Bijapur and Nizam ul-Mulk of Ahmednagar had their grievances against the Portuguese. The King of Achen who had been defeated in 1569 near Malacca by the Portuguese, and the Zamorin of Calicut, the greatest enemy of the Portuguese in the 16th century, also joined in the grand venture. The collaborators had even earmarked the division of the war-spoils among themselves. Accordingly, Adil Khan was to get Goa, Honavar and Barcelor; Nizam-ul-Mulk was to take Chaul, Bassein and Daman. Zamorin was to occupy Mangalore, Cannanore, Chaliyam and Cochin.<sup>115</sup>

However, the security of Goa was far from satisfactory. When the Viceroy enquired, it was even suggested that the alliance was only a pretense to destroy each other and that they did not possess enough men to cross the Ghat and reach the sea-shore of Goa. But the Viceroy felt the need of re-organizing the navy because the maritime forces were the basis of the Portuguese power in India. Therefore, he personally visited the Goa shipyard and the arsenal and inspected the ships, their quality and ammunitions etc. He ordered for the defence of all the passages of Goa and to resist attacks on all fronts. He hurriedly reinforced all the naval forts of Goa, for the defence of which he sent a fleet under Francisco Mascarenhas with pick men. Trenches were equipped with artillery under selected men.

There was a general rearrangement of the forces. Balthazar Souza Lobo with fifty men was in Reis Magos at Bardez at the entrance of the sand bank; Rachol was defended by Damiao desouza Falcao with his men; Lourence Carvalho was expected

to guard the mouth of the river with a ship; Miguel de Castro with hundred men at the pass of Seco; at Banastharim, Pedro de Castro remained with hundred and twenty men; Diogo Barradas with sixty men was on a point of a dry pass. Manuel de Oliveira, Francisco Perrira and Pero Desouza were in the marshy land with twenty men; Ferrao Desouza de Castel Branco was posted with hundred and twenty men at the passage of Banastharim where Adil Khan was expected to enter into the island of Goa. Manuel Rolim was at Carambolim with hundred men; Vasco Pires de Faria was at Naroa and Gaspar de Carvalho was further that side. João Desouza with infantry and cavalry was expected to guard the south bar of the river. George Menzes de Barocha was sent with gales manchuas and fustas to guard the river. Several ships with guns were to patrol the river and render help.<sup>116</sup> All the forces were equipped with ammunitions and artillery and were ordered not to move to any other place. As there remained no force for the defence of the city of Goa, the Viceroy formed a corps of native slaves and posted it along the walls to give the appearance of a strong garrison. He also requested the priests to give a helping hand in the guarding of the city besides their prayers.<sup>117</sup> The Viceroy rejected a suggestion to demolish the forts of Chaul and Rachol and to use their garrison for the reinforcement of Goa. He felt that it was essential not to show any sign of weakness or to loose even a plam of land.

By November 1570, the Portuguese had seven hundred men in Goa to meet any emergency, while the Muslims numbered several times more. The advance party of the Muslims under Gen Nori Khan came and camped at Ponda to be followed by others. They set up their tents in front of the fort of Santiago at the Banastharim pass. First of all, the Viceroy along with Chief Captain Francisco and others went to defend the passage of Seco which was not safe at low tide. From Seca, he went to Banastharim because a greater force was needed there on account of its topographical situation. Soon the Muslims started the attack by furiously bombarding from all sides. Banastharim suffered badly. The Viceroy himself just escaped from the shots. But the Portuguese men cruising that side, effectively used their guns. "The fire from the Portuguese



guns appeared to do more harm to the enemy than what they received at their hands."<sup>118</sup> But still the Portuguese lost several important men here.

On the 6th January 1571, the feast day of Reis Magos, Fernando de Vasconcellos entered the main land with his men and in fighting, many Portuguese were killed.<sup>119</sup> One Antonio de Cabral who was cruising in the river of Chapora with his fustas and obstructing provisions from coming to the Muslims, set fire to the loaded ships of the Muslims and killed all those who rushed in to resist. The Portuguese vessels played havoc and attacked boldly. The Portuguese had another successful encounter at Rachol. George de Menezes Barocha surrounded the enemy by sea with five ships and Pedro de Castro by land with two hundred men and forced them to surrender. The Portuguese slaughtered their enemy and returned to the city with their vessels filled with the heads of the defeated Muslims.<sup>120</sup>

In the mean time, two fleets under Diogo de Mendes and Luis demelo entered the waters of Goa triumphantly after their magnificent action on the Malabar coast and in far away Malacca, and demolished the Muslims who slowly began to be expelled. When Adil Khan learnt about the serious loss of his men and on fearing the arrival of further reinforcement, he proposed peace. But the seige continued. The Viceroy who realized the danger to the island of Goa ordered Alvaro Mendonca and others to defend the passages and not to leave anything undefended.<sup>121</sup> The Viceroy even collected strategical details of the enemy-camp through Adil Khan's wife and proceeded to the low land with three hundred men in order to deal with the Muslims effectively. A pitched battle ensued from early morning till the fall of night. The Portuguese earned success after success and the Muslims were in great despair in spite of their numerical superiority.<sup>122</sup>

The battle was over with the definite victory of the Portuguese. The passages of Goa were now safe. Adil Khan lost all hopes, but he still thought of weakening the Portuguese power by continuing the seige for a long time.<sup>123</sup> But the Viceroy had taken all measures for the defence of the passages to Goa and the guard of the city. Adil Khan left Goa in disgust without peace or any other arrangement. But later, a

peace treaty was signed in between the new Viceroy Antonio de Noronha and Adil Khan on the 17th December 1571.

Thus the ten months-old seige of Goa ended in the defeat of the beseigers. Their defeat in pitched battles was second only to the one won by Governor Castro, twenty five years before at Diu in 1546.<sup>124</sup> In fact, Viceroy Athiade's defence of Goa was the last great feat of arms of the Portuguese in India.

## THE BATTLES OF CHAUL

### (i) The First Battle of Chaul (1508)

For few years after their arrival in India, the Portuguese were confined to vessels plying between Malabar and Red sea, and their success was partially due to the visiting annual fleets from Portugal. But from the time of the first Viceroy Almeida, the Portuguese attacks became more common and more effective, because their unchallenged mastery and control of the sea had become an established fact.<sup>125</sup> The heavily armed Portuguese caravelas had been playing havoc on the western coast for quite some time and this disturbed Zamorin very much because it challenged his age-old supremacy.

Zamorin who was very much concerned with his position sent an envoy to Cairo (Egypt) and invoked an Indo Egyptian naval axis against the Portuguese.<sup>126</sup> The Sultan of Egypt, who had himself grievances against the Portuguese because of the loss of his Eastern trade, naturally welcomed this opportunity to drive them out from India. Thus when they decided for common action against the Portuguese, they were fortunate to secure the help of the Governor of Diu, Malik Ayaz and his Master Bahadur Shah of Gujarat, who were all much alarmed by the Portuguese exploits on the west coast ever since the time of Almeida. Thus the Sultan of Egypt, Bahadur Shah the Sultan of Gujarat and the Zamorin of Calicut formed a grand naval coalition—the Egyptian, Gujarati, Calicut naval axis—against the Portuguese.<sup>127</sup>

When Viceroy Almeida learnt of this coalition, he sent his son Lorenzo de Almeida, a hero of several battles, to guard some vessels plying on the Cochin-Chaul route. A fleet of

eight vessels-naus, caravelas and gales—moved to the North under Lourenço and entered the Chaul river for shelter because of strong winds.<sup>128</sup> Lourenço was destined to fight here his last and splendid battle. In the mean time, the Calicut vessels reached there and kept waiting for the arrival of the Egyptian and Gujarati fleets. The Egyptian Red sea fleet also moved into the Arabian sea with a view to use Diu as a base for further operations. As the fleet arrived, its Admiral Mir Hussain also learnt about the presence of the Portuguese vessels at Chaul. Therefore, the coalition partners decided to engage the Portuguese and after defeating them to proceed to Malabar in order to capture the Portuguese forts of Cannanore with the active help of Zamorin.<sup>129</sup>

When the Portuguese were at Chaul, a Bhramin came with presents of grapes and informed Lourenço about the presence of a powerful fleet at Diu. He also told that "Zamorin had called for the Turks in order to exterminate the Portuguese in the East with their help."<sup>130</sup> But the Portuguese did not believe it and they landed on the shore and were enjoying themselves when they received the news of the arrival of a large fleet entering the Chaul river. The Portuguese mistook it as the fleet of Afonso de Albuquerque which they waited earlier. But as the fleet came nearer, they realized the error and hence were caught unawares. However, they decided to face the enemy within seconds. The Egyptian fleet began bombardment to which the Portuguese responded well with artillery fire. "Thus began the first great naval battle in the heroic struggle between the Portuguese and Islam in January in 1508."<sup>131</sup> It continued for three days. The Portuguese opened all their guns on their enemy ships which were coming so close in order to board the Portuguese ships. It was essentially an artillery battle, and Lourenço was fighting at great inconvenience, because a large number of the enemy vessels were waiting outside for an appropriate moment to attack. Bitter fight continued with cannon, followed by hand to hand fight. By evening, the Portuguese were in an advantageous position.

On the second day, when the fight was resumed, Lourenço thought that it was an ideal time when all the artillery could

be brought to bear in the battle. The Portuguese boarded on two of the enemy vessels and killed every one there.<sup>132</sup> At this time, the Gujarati ships came to the aid of the Egyptians. It was an unexpected turn which almost took away the victory from Lourenço. But he promptly made a surprise move and sent two galleys and three caravelas against the incoming Gujarati vessels.<sup>133</sup> The coalition started firing minor artillery without any serious aim because they considered that they had already won the battle. But the Portuguese fought with order and discipline and inflicted a heavy loss on the enemy. The fighting continued for the whole day and in the evening when they separated, both sides had suffered casualties and were exhausted.

The fighting began on the third day of the battle. Suddenly, Lourenço received two arrow wounds. But in spite of this, he called his Council of Captains and decided the further course of action. Considering the condition of the wounded men, lack of ammunitions and the strength of the coalition, the Portuguese decided to leave the Chaul river and go into the open sea in order to secure a better position to fight.<sup>134</sup> Therefore, Lourenço started vacating the bar of the river, which move was mistaken by the Gujarati ships as a war-movement, and started firing artillery. Lourenço replied it with well-aimed shots and sunk several Gujarati vessels coming within the range of his guns. But the Portuguese fleet was helpless against the massive attack of the Gujarati vessels. Incidentally, a bullet hit Lourenço and he could not stand. So he placed himself at the foot of the main mast and directed his men: but unfortunately another bombard struck him and he fell dead.<sup>135</sup> A dying Lourenço asked his men to surrender only to Malik Ayaaz and not to the Egyptians. His companions hid his body to avoid demoralization and later pushed it down to the sea through a hole with arms on, so that the enemies should not get any thing.<sup>136</sup> The Portuguese flag-ship sank and the rest fled to Cochin. "Thus came the end of a young man in the full bloom of his youth who at the age of twenty-two had covered himself with imperishable glory"<sup>137</sup> The total number of Portuguese killed was around one hundred and forty; one hundred and twenty four were wounded and many more were

taken prisoners.<sup>138</sup> Chronicler Feristha estimated that "no fewer than three thousand or four thousand Portuguese infidels were sent to their infernal regions" seems to be exaggerated but his remark that "four hundred Turks became martyrs in the battle" may not be unreasonable.<sup>139</sup>

The Chaul disaster was a serious blow to the Portuguese. Luckily for them, the Muslim fleets did not follow up their victory to the south. To the Portuguese, it meant a temporary loss of the command of the sea.<sup>140</sup> The moral effect of this battle on the Portuguese was very much greater than any other so far. About the general result of the battle, it is said that "the material and local victory had been on the side of the Muslims, but at such a cost that the moral and far-reaching victory was on the other (Portuguese) side. Never again did any Eastern nation endeavour to end by naval power, the presence of Europeans in the East, and in no case, there was any definite bid for general supremacy of the Indian Ocean ever made by an Oriental State after Lourenço Almeida went under its surface, destroyed in body but conquering in purpose. If therefore, the consequences of this encounter are viewed in this proportions, it can scarcely be denied a fair claim to recognition as one of the decisive events of Oriental history, insignificant though the Portuguese were in less numbers."<sup>144</sup>

#### (ii) The First Siege of Chaul (1570)

In 1509, Viceroy Almeida on his return from the battle of Diu halted at Chaul on the bank of Kundalika river. He made a formal treaty with its ruler, the Sultan of Ahmednagar and accordingly the Portuguese were accepted as rulers of the sea on the Chaul coast. Later, a fort was built at Chaul in 1521 by Governor Diogo Lopez. By 1570, this fort was quite old and needed repairing. It had no protective walls or trenches. It was therefore vulnerable to attack both from sea and land. One day Captain Luis de Andrade, the in-charge of this fort learnt of a powerful force of Muslim preparing for an attack on Chaul with a view to expel the Portuguese from India.<sup>142</sup> Even though the Portuguese did not believe in

this plot, Captain Andrade took all possible measures for the defence of Chaul.

According to the well settled plan, Nizam-ul-Mulk marched against the port of Revadanda (Chaul) belonging to the Portuguese, and started besieging it.<sup>143</sup> "The siege was such strong that none is ever known in the world like this.."<sup>144</sup> To start with, the Muslim forces came and invested Chaul. The Portuguese badly lacked provisions to stand a long siege. However, Francisco Mascarenhas came from Goa with four galleys, five small vessels and small barques with men and provisions and conveyed the Viceroy's orders that Chaul should be defended at all costs, though at first the opinion in Goa was to give up Chaul. Soon, Captain Andrade mobilized his men for any emergency as the Muslim forces had already camped by the side of the Chaul fort hardly seven leagues away. Francisco Mascarenhas was deputed to guard the sea there with his fleet and Andrade himself guarded the land. Andrade, assisted by Lionel De souza, moved from one station to another as per the needs of defence. Every trench, bastion and strategic position was properly guarded.

When the Muslim forces were busy preparing for the battle, Agustina Nunes attacked their camp and caused serious damages. Henrique de Betancore and Fernando de Miranda repelled the Muslims, killing three hundred men.<sup>145</sup> By the beginning of 1571, Nizam-ul-Mulk, the Sultan of Ahmednagar himself reached Chaul with a huge force "as never history has recorded." He ordered the bombardment of the Chaul city. As the fight became intense every day, the Portuguese evacuated their women and children from Chaul to the neighbouring forts.

One Ruy Goncalves de Camara, seeing an unusual movement of the Muslims on the feast day of St. Sebastian (19th January, 1571), gave an alarm.<sup>146</sup> Soon, every one rushed to the spot for action. At this time, one João Alvares Soares, a revenue official of Chaul seeing the grave danger fitted out a vessel at his own cost and gave the much needed help. Ruy Goncalves asked his men to pelt fire pots at the Muslims who had gathered near the door of the fort. In the flame of the fire pots, a fight broke out in which the Portuguese

fought bravely killing two hundred and eighty Muslims and wounding many. But still the attack continued for three more days. Henrique de Betancore, having lost his right hand, fought with his left hand and one Domingo, being lame, was brought to fight on a chair ! Agustino Nunes and his men had beaten off their enemy who tried to assault the door of the fort by the sea. Another fighting broke out in a palm grove in which the Muslims suffered a massive defeat with several casualties but the Portuguese loss was much less.

Nizam-ul-Mulk, seeing the success of the Portuguese, ordered a brave attack on the city of Chaul from all sides. "The fight was so intense that the days were dark, covered by the smoke of the guns and nights illuminated by the flame of the burning building. The slaughter was great on both sides."<sup>147</sup> In the mean time, the arrival of reinforcement from Goa Bassein and Diu greatly relieved the Portuguese. However, a contagious disease which spread in the Portuguese camp, took heavy toll. But still the Portuguese put up a good defence against the Muslim force who tried to enter the houses on the sea-side.

By now, monsoon had set in and on 24th June, 1571, when the Portuguese prepared themselves for the defence of the city of Chaul, they learnt the plan of the Muslims for a final attack. Soon the Portuguese fired at the Muslims and their numerous elephants.<sup>148</sup> George de Menezes and his artillerymen effectively repelled the Muslim attack on the trench of the sea. At a critical stage in the fighting, one Fr. Antonio de costa encouraged the Portuguese by showing a crucifix. The fight went on fiercely and in the end, the Muslims had to retreat. "Thus the Mohemmedan kings were compelled to raise the siege of Revadanda (Chaul).....and returned to their respective capitals."<sup>149</sup> Victory came to the Portuguese at the end of nine month's of siege. The Muslims lost twelve thousand men in this operation. Chronicler Feristha felt that the Portuguese was successful because they obtained provisions by sea and owing to the treachery of Nizam Shah's officers who were bribed by presents, particularly wine."<sup>150</sup>

### (iii) The Second Siege of Chaul (1594)

Several years had passed since the siege of 1570. In the mean time, the security of Lower Chaul, which was under the Portuguese, was threatened by Malik the ruler of Upper Chaul who fortified the 'Morro de Chaul' to the great detriment of the Portuguese. It was in this circumstance that Viceroy Mathias de Albuquerque was asked from Lisbon to destroy the 'Morro'.<sup>151</sup> But Malik was also determined to expel the Portuguese from the lower Chaul because the Portuguese had seized his Mecca-bound loaded ship and that the authorities of Goa had rejected all his excuses.<sup>152</sup> The Thanadar of Upper Chaul, who was a former Portuguese captive, also nourished hatred and sent a force against the Portuguese.

The defence of the Portuguese fort of Chaul was in very bad shape and its Captain Diogo Desa Perreira paid no heed to the Muslim attack. But Malik had made hectic preparation to capture the Chaul city. He erected a bastion "in order to prevent the entrance of the Portuguese into the harbour of Revadanda (Chaul)"<sup>153</sup> He also made other bastions, but the one in the middle was the tallest bastion - 'Balurate Cavaleiro', on the top of which was placed a bronze eagle with an inscription in Persian, reading "whoever reaches here will have to fly higher."<sup>154</sup>

The Muslim forces crossed the Chaul river and started storming the city of Chaul, but was heavily repelled. Soon, the Portuguese made an ambush at the 'bastion of Devil', and when the Muslim forces landed there, they were brutally attacked, killing many of them. Another attack of the Muslims also proved futile.<sup>155</sup> In view of this defeat, Malik sent his General Farat Khan with a huge force and he started an artillery attack against the city. But Fernao Rodrigues Desa with three hundred men crossed the river and climbed up the fort of the hillock and killed about four hundred Muslims. Many were captured including an Engineer from whom valuable information was obtained about the enemy plans.<sup>156</sup>

By the end of May 1594, Cosme de Lafeta, the Captain of Northern coast had reached Chaul and seeing the insecurity



in the city, he worked out a plan. He distributed his one thousand men in Chaul over three positions under expert Captains. Soon, all of them crossed the Chaul river in seven fustas and began to carry out their assignments. They attacked the Muslim fort and demolished a major part. Similarly, the Portuguese artillery planted on the shore began firing, killing large number of Muslims. By now, the Chaul city was free from the continuous attacks. But the Portuguese proceeded further into the interior and burnt the town of Upper Chaul. The Portuguese returned to their ships only when the Muslims gave up the fight. With the onset of monsoon, there was a relative calm.

The continuous victories of the Portuguese forced Malik to seek peace and therefore he sent an envoy to Goa. But the Viceroy rejected his proposals and offered counter-proposals such as the demolition of the fort on the hillock and payment of 30,000 pardaus as war indemnity etc.<sup>157</sup> In the mean time, he instructed Chaul to continue the war with determination and not to give even an hour of truce. The Portuguese went on storming the Muslim lands. On 1st September 1594, Alvaro Abranches came from Bassein with forty ships and five hundred men.<sup>158</sup> Reinforcement came from Salsette also. Thus a squadron was formed which consisted of one thousand five hundred Portuguese and an equal number of natives and slaves.<sup>159</sup> "The fleet of sixty vessels, belonging to the Portuguese, full of men and artillery stores, passing close to the Korlai fort under the cover of night, anchored safely in the harbour of Revadanda (Chaul) where they landed four thousand men and on the following morning, (2nd September), proceeded to attack the Korlai fort."<sup>160</sup> Abranches with seven hundred men climbed up the hillock on the top of which was the Muslim camp. Cosme de Lafeta proceeded along the shore to another camp of the Muslims. A pitched battle began near a trench which was soon filled with corpses and it was used by the Portuguese to cross to the other side.<sup>161</sup> The Muslims started retreating when the Portuguese crossed the trench and entered the bastion. In a fight which broke out, many Muslims were killed. General

Farat Khan was himself imprisoned. All the Muslim bastions were captured and defenders were killed.

The Portuguese knew that the capture of the 'bastion of Cavaleiro' would give them the final victory. Therefore, they climbed up the slope and reached the door of the bastion which was shut and heavily guarded. They sent for ladders and climbed up the wall and entered the bastion after strong resistance by the Muslims. The Muslim forces started withdrawing and escaping into the sea and in that process many got killed. The shores were full of bodies. "Many of the Mohammedans, on the approach of the Europeans fled in confusion.....and they were too closely followed by the Portuguese that they rushed in at the gates with them and commenced an indiscriminate slaughter of the king's troops, who though two to one, made little resistance and upward of 12,000 Mohammedans were put to sword. The Portuguese subsequently reduced Korlai fort to ashes."<sup>162</sup> The hillock came to their possession after an attack of six hours from morning till noon in which the Portuguese loss was twenty-seven dead and two hundred wounded.<sup>163</sup> The booty which the Portuguese secured included gold hars, money, seventy five pieces of heavy artillery, several quintals of gun powder iron, lead, guns and other arms and elephants. Cosme de Lafeta carried the brass eagle from the top of the bastion and since many Portuguese flew higher than it, it was sent as a present to the Viceroy at Goa. Malik, on learning the defeat and loss of the hillock, threw his turban into the fire as a sign of great sorrow and later sent an envoy to Goa and signed a peace treaty.

Thus ended the siege of Chaul with the defeat of the besiegers. This was the last battle fought by the Portuguese at Chaul.

### THE PORTUGUESE-MUSLIM STRUGGLE ON GUJARAT COAST

#### (i) The Battle of Diu (1509)

The first naval battle at Diu took place in 1509, though it was not for the conquest of Diu. It was to expel the

Egyptain fleet which after the battle of Chaul (1508), had sneaked into Diu and based itself there with the hope of driving out the Portuguese from the Indian Ocean with the help of their Gujarat allies.<sup>164</sup> But Viceroy Almeida was not only determined to avenge the cruel death of his son Lourenço, but also to regain the mastery of the Indian sea lost at Chaul and to consolidate the Portuguese naval prestige. He was quite decided that "one who has taken the chicken must likewise eat the cock or pay for it."

The Viceroy left for Diu on the 12th November 1508 with seventeen ships, six naus, six smaller navetas, two square rigged caravelas, two galleys and one bergantim—with one thousand Portuguese and four hundred Malabarese. The Viceroy was in the flag-ship '*Flor de la Mar*' commanded by João de Nova. The fleet was armed with one hundred and fifty cannon besides smaller pieces of which there were many. On the way on the 21st January 1509, the Viceroy sent a bold challenge to the Gujaratis through a Negro prisoner.<sup>165</sup>

The Portuguese fleet reached Diu on 2nd February 1509. The Viceroy called a Council of his Captains and settled the plan of the battle which was to start on the 3rd February in a strait between the main land and the island of Diu. When the starting signal was given, the fleet moved in order and there ensued a hotly contested and desperate battle. The Portuguese ships came down heavily on the Egyptian fleet (to which were joined the ships from Calicut) in a long artillery battle. "As the hostile vessels came to grips, each manoeuvred for an opportunity to her adversary and where this tactics failed, grappling irons were flung and boarding parties armed with half pikes and axes leaped down from the bows and charged and when it became evident that Mir Hussyn's (Egyptian Admiral) plan had miscarried, the foists ventured forth from the channel in the desperate hope of effecting a diversion.....but courage availed nothing against artillery and their fragile crafts were sunk in batches."<sup>166</sup> Both fleets fought so stoutly that many were slain and wounded.

Thus Almeida defeated the combined Gujarati-Egyptian-Calicut fleets. Malik Ayaz, the Governor of Diu, "beholding his crushing defeat sent in haste a message to the Viceroy

begging for complete peace." He congratulated the Viceroy, explaining that he had helped the Egyptians only because he had to, offering to release all the Portuguese captives he had taken earlier at Chaul and to provide provisions to the Portuguese ships. The Egyptian fleet fled in disgust because of the treachery of the Gujaratis leaving the naval supremacy in the Arabian sea. The Portuguese won the victory, in spite of the enormous difference in two combatants—in the number of ships, fire-power, tonnage and the number of fighting men. But the Portuguese fleets suffered heavily in the battle. The Muslim fleet was destroyed except four ships which were spared to serve as war trophies. The colours of Egyptian Sultan and Admiral Mir Hussyan were captured and sent to Portugal.<sup>168</sup> Malik Ayas' offer of Diu was refused by the Viceroy who was not well disposed to acquire land bases. Malik Ayas had been able to test the Portuguese naval strength at very little cost to himself. He drew the obvious moral that the Portuguese were invincible at sea.<sup>169</sup> The battle of Diu was the greatest naval action of the Portuguese in Asia in the 16th century. Never again was there a formal naval engagement between the Portuguese and an Indian fleet. There were several sieges of land and guerilla attack at sea but no Portuguese fleet was subsequently challenged by a hostile fleet in the Indian Ocean until the arrival of the Dutch and the English.

The departure of the Egyptian fleet from the Indian sea meant the establishment of the Portuguese naval supremacy there. The Portuguese regained their mastery and command of the sea which they had lost at Chaul. Now oceanic supremacy had passed into their hands. It was their first success in Indian waters, and it turned the Indian Ocean into a Portuguese sphere of influence. "Thus the naval confederacy of the Muslim powers against the advent of Portugal in Indian seas was for long time been effectively broken up".<sup>170</sup>

#### (ii) The First Siege of Diu (1538)

Ever since their arrival in India, the Portuguese had realized the strategic significance of Diu on the Gujarat coast which in the Muslim hands was always a base for

Turkish advance. However, it was only in 1535 that they were able to erect a fort on the Diu island. The fort of Diu was easily accessible from the main land and hence it was vulnerable for attack by the Muslims. This fort withstood two sieges by the Muslims in 1538 and 1546. The Portuguese defence of Diu in both these sieges are among the greatest battles fought by them in the East. Both the sieges took place in rainy season (from June to September) during which navigation to Diu was not possible or at least difficult. But in both these sieges, they were able to hold out even though by the skin of their teeth, until moosoon ended and help came from the south.<sup>171</sup>

It was quite natural that once the Portuguese had made themselves the masters of Cambay gulf, they were not likely to surrender the prize of Diu which they desired for long and for which they had sacrificed many lives. It was for this reason that they had to enter on a naval war of unprecedented length and difficulty against the Muslims of Diu who were determined to expel the Portuguese. The Gujaratis had planned combined naval attack on Diu fort with the support of the Turks who themselves were unhappy over the Portuguese mastery of the Indian Ocean and blockade of trade routes along which the eastern spices flowed to Europe.<sup>172</sup> Therefore, the Turkish Sultan deputed Sulaiman Pasha to Indian waters in order to wage a "holy war.....and to capture and hold those Indian posts and to avenge the evil deeds of the Portuguese infidels" and to remove the Portuguese flag from the sea.<sup>173</sup> The Captain of Surat Khwaja Safar, an Italian renegade, also instigated the Sultan of Gujarat to attack the Diu fort because he realized that the resistance would be weak due to lack of men, materials and even water inside the fort. Safar was named the leader of the Muslim forces to besiege Diu.<sup>174</sup> Captain Antonio de Silveira of the Diu fort made preparation for the defence and ordered his men to guard all the passages. The garrison was quite insufficient and there was shortage of every thing inside the fort. But still, he displayed courage in guarding the bars of the river which could afford entrance to the island of Diu. He strongly resisted an attack of the Muslims on 'the bastion

of the town of the Rumes, on the 26th June 1538. But when he found that the defence was difficult, Silveria gave up Diu island and returned to the city. When the Muslims entered Diu island and began a regular siege, Silveria gave up the city also and returned to the Diu fort.<sup>175</sup> Chronicler Castenheda's account of the first siege of Diu ends here abruptly as his account of the Portuguese disaster at Diu was prohibited from being published by king John III and even by the Queen because of the author's "severe impartiality and rude frankness".

In August 1538, Captain Silveira sent a message to Goa through one Miguel Vaz and in the meanwhile prepared for the defence of the fort by distributing men at different stations. Watch-men were placed all along by rocky coast.<sup>176</sup> Silveira himself was available for any help. On 5th September, the Turkish Admiral Sulaiman Pasha landed his seven hundred men and began an exchange of fire which killed six Portuguese and wounded twenty. There was a respite on 6th September and this greatly helped the Portuguese because in the meanwhile a *catur* reached there from Goa with the news that an armada was due there any time.<sup>177</sup> As the fight was resumed, it went on day and night, and on the 27th September, many leading Portuguese men were killed. In this circumstance, Francisco Pacheco, in charge of a bastion, surrendered to the Turks and even advised Captain Silveira also to do like wise as the Portuguese would never be able to resist. But Silveira scornfully rejected the suggestion and assured that "we will die before we will give up the smallest stone of this fort."<sup>178</sup>

The siege continued vigorously with pitched fights and it became violent day by day. Inside the fort, there was shortage of men, scarcity of food and ammunition and complete lack of gun powder. Scurvey had broken out causing great privation and death. The survivors had to mend the breaches of the fort-walls caused by the enemy artillery in a continuous action of twenty-five days.<sup>179</sup> In this critical situation, the women-folk inside the fort showed great courage. "She (Anna) used to go round the fortress and the walls...telling each one how great was his obligation to be brave both to

defend his life and to win honour. She did not take refuge in her house from firing," but carried the dead and the wounded.

The Muslims started a general assault on the 4th October 1538 in order to break the fort wall all along. From 12th October to 16th October, attacks and counter-attacks continued. On the 17th October, Lopo Souza Coutinho, a Portuguese participant was wounded while on guard duty, and therefore, his account of the siege hereafter was "from what I have heard and knew from the sick bed."<sup>180</sup> In the mean time, the Portuguese repulsed several attacks of the Muslims. One Fernão Panthaleao, being wounded on head went to the Surgeon but finding him busy, returned to fight and received another wound and seeing the Surgeon again busy, went back to fight and with a third wound, he went for treatment altogether.

On 30th October, the Turks suddenly stopped fighting and returned to their ships and moved into the sea giving false impression that they had given up, but it was only a trap in which Captain Silveira would not fall. He reinforced the defence of the fort expecting another attack. When fighting started fiercely, it was so loud that Lopo Souza could hear and see it from his sick bed. In the course of this fighting, which continued for four hours, one Anna Fernandes climbed up the fort wall and encouraged the men by showing a crucifix. But still the Portuguese loss was very heavy. All ammunitions were exhausted and the garrison had only forty men to fight at the end of the combat.<sup>181</sup> Another attempt of the Muslims on 1st November was however frustrated by the Portuguese.

Soon the Turks began to withdraw to their ships as Safar stopped to co-operate with them and he even sent a message that a Portuguese fleet was coming to the relief of the fort.<sup>182</sup> Infact, right from the beginning, the Turks acted in the most overbearing manner while the Gujaratis were concerned as to what exactly would be the prize of the Turks once the Portuguese were defeated. Co-operation was to the minimum. The Portuguese force who were fully exhausted, could have been overcome easily. On the 5th November,

Admiral Pasha "after had many days besieged the castle both by the sea and by the land and tried upper most of his strength, he was repulsed by the Portugalis, that he was glad to forsake the siege and leaving his great ordnance behind him for haste..."<sup>183</sup> The Turkish fleet left in a buff.

Thus ended the first siege of Diu, one of the most significant achievements of the Portuguese in the East. In March 1539, peace was established in between the Portuguese and the Gujaratis. The Portuguese success was due to the heroism of the garrison and the grim tenacity with which they held their bastions till the very end of the siege. Lack of solidarity and co-operation of the Muslims, which were the weak points helped the Portuguese very much. The siege of Diu which was a maritime feat in the annals of western India, saved not only the Portuguese naval supremacy on the Cambay coast, but also the Portuguese dominion for the time being.<sup>184</sup>

### (iii) The Second Siege of Diu (1546)

The Gujaratis were determined to restore the honour lost in 1538 due to the Turkish highhandedness. They thought that it was still possible for them to drive out the Portuguese not only from Diu but also from the whole of India.<sup>185</sup> Therefore, they began hectic preparation for "the last great dual between the Portuguese and Gujaratis in the half century of struggle" and take Diu either by strategy or by force.<sup>186</sup> Khwaja Safar who was named the chief of the Muslim forces, wrote a letter to Captain Mascarenhas of the Diu fort offering his services, but the Portuguese recognized "the wolf under the sheep's skin" and accordingly prepared for the defence of the fort. In the mean while, in response to his request for reinforcement, Governor Castro sent from Goa nine fustas and caturus with men and ammunitions.<sup>187</sup> Mascarenhas distributed the bastions and towers of the fort among his men and prepared to defend it at all costs.

The fighting began on the eve of Easter in 1546. The Portuguese jumped into a Muslim vessel, cut its moorings, tied it to their catur and towed it up the river and set on fire.<sup>188</sup> This was a bold action which demoralized the Muslim force.



Fighting continued throughout April and May 1546. A Portuguese participant Leonardo Nunes gives a day to day and "faithful account" of the siege which he wrote within fifteen days of the incident.<sup>189</sup> On the 18th May, Fernando Castro, the 19 year old son of Governor Castro reached Diu from Goa with seventeen ships and men. Thus, now the garrison numbered four hundred and forty men. In the meanwhile, the Muslim forces intercepted some fustas coming to Diu from Bassein and Chaul. But the Portuguese effectively repelled the large-scale attack on the fort. Throughout May and June, the Muslim artillery caused much damage, but in the end, the Portuguese were able to destroy the temporary bastion erected by the Muslims opposite the Diu fort. Safar himself died in action on 24th June.

The Portuguese frustrated another attempt of the Muslim forces led by the new General Rumi Khan to scale the bastion of the fort. The Muslim strategy of making one Portuguese Captain Simao Feio about abandoning the fort also did not work. On the 19th July, Fernando Castro heroically resisted the attack on the bastion of St. John. In the mean time, Governor Castro sent from Goa twenty fustas and six caturs with men under his son Alvaro Castro.<sup>190</sup> This reinforcement reached Diu just in time when the Portuguese garrison was almost on the point of exhaustion. On 25th July, the Portuguese effectively resisted the Muslims who were scaling the walls of the fort. The women of the fort rose to the occasion and carried the materials of defence, scaled the walls and faced the fire when the women of Chaul collected their jewellery and other ornaments and presented them to Governor Castro at Goa for the expenses of the defence of Diu.<sup>191</sup> Another attack of the Muslims on 25th July was also ably resisted by the Portuguese. The cruel fight continued for the whole day and night. The Portuguese loss was three dead and thirty burnt or wounded, when there was a whole-sale slaughter of the Muslim forces.<sup>192</sup>

By now, the Portuguese loss was over hundred and fifty men. There was shortage of arms, provisions and gun powder and hence kitchen pots were used for filling gun powder made at home. In this precarious condition, Captain Mascarenhas

made a device by joining roof tiles with pitch and filled them with gun powder. But unfortunately a mine laid by the Muslims exploded at the bastion of St. John in which Fernando Castro and fifty important men were killed. All the dead men were buried by the women during the night. The Muslim force who were trying to enter through the breach caused by the mine were repelled by the Portuguese garrison. On a rainy day, a pitched battle broke out at the towers of Santiago and St. Thomas and this lasted for five hours. By now, further reinforcement came under well known Captains like Alvaro Castro and Francisco Menezes and this made the Portuguese happy.

At Goa, Governor Castro learnt about the situation of Diu and the cruel death of his son Fernando. Soon he sent a message to Diu instructing the Captain to carry on the fight till he himself reached Diu soon.<sup>193</sup> Castro reached Diu on the 7th November with an imposing fleet of thirty-five fustas, catur, three galleons, naus and gales and with a huge force of three thousand Portuguese and three hundred natives "in order to raise the siege of Diu and to punish the Gujaratis."<sup>194</sup> The Portuguese forces landed into the fort by the rope ladders.

Both sides prepared for the most serious battle of the siege. The Portuguese oar-ships moved towards their enemy bastion with a grand show and the Muslim force thought that Governor Castro was coming and rushed against it. But Castro had already left by the side of the land. The Portuguese drew out their swords and killed many Muslims who were caught un-awares.<sup>195</sup> In another crude battle, many Portuguese were killed. Guns and spears crossed the air. At a critical moment, Fr. Antonio de Casal Climbed up the bastion and hoisted a crucifix and encouraged the soldiers. But a Muslim soldier pelt a stone at it, breaking its arm and that of the priest holding it. Soon after, the Muslim forces began to lose the field and their blood began to flow as a result of the cruel attack of the Portuguese.<sup>196</sup> There followed large scale slaughter and ravage. "The Portuguese walked into the city ... and put to sword every living being...and cut open the wombs of pregnant women and killed the unborn babies. The city of Diu was ransacked and plundered."<sup>197</sup> The Portuguese fleet voyaged

further, sacked and burnt Gujarat. Destruction continued on the Gujarat coast. Cogha, Surat, Rander, Baroach etc. were all taken looted and burnt.<sup>198</sup>



*Fig. 20. The Hero of Diu Battle (D. João de Castro)*

The second siege of Diu continued from April to November 1546 and the Portuguese lost five hundred and fifty men while over four thousand Gujaratis were killed including Khwaja Safar and so many were captured. The booty included thirty-six pieces of metal artillery and a lot of other amunitions. It

is said that "there is no memory of such an extraordinary siege which may be regarded as the eight wonder of the world."<sup>199</sup>

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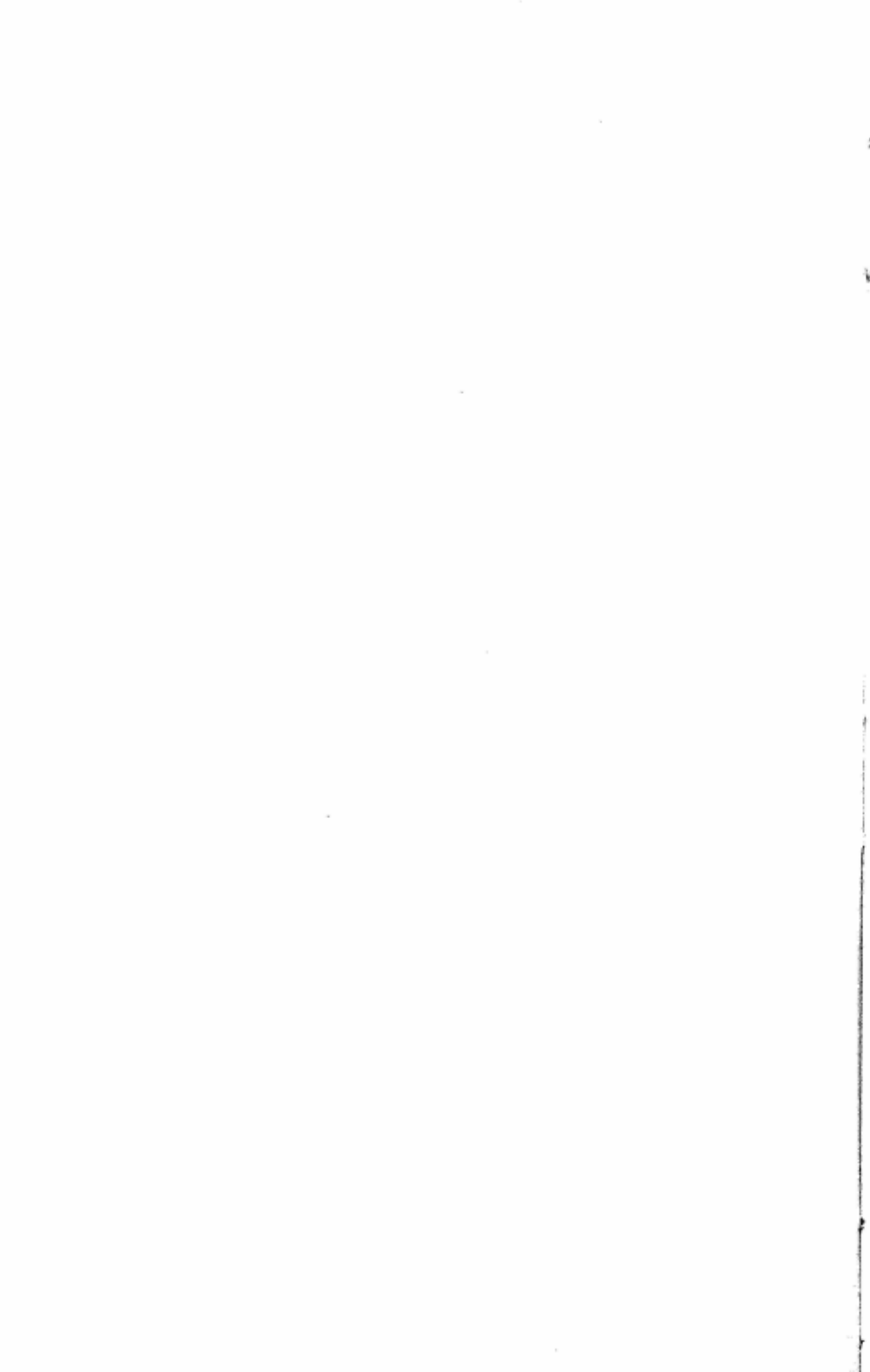
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## Organization of The Navy

Organized navy was the backbone of the Portuguese sea-borne empire in India. Therefore, great care was taken for its organization and maintainence. With all its problems, the Portuguese ship was a 'township in miniature' or a 'floating Babylonia'. The naval organization was concerned with all sorts of problems of about four to five hundred people who remained on the waters for months together. It dealt with scientific, disciplinary and administrative matters. The scientific subjects included rules and regulations for the departure of fleets to India, the actual sea-route to be followed, wintering, halting enroute and other precautions to be taken and return of fleets from India etc. The disciplinary matters were concerned with the overall discipline aboard a ship and general instructions etc. The administrative aspects consisted of the recruitment of sea-men, their pay and allowances, procedure for advance and other payments, duties of various officials, privilege of duty-free baggage, 'liberty chests' and 'deck-space' etc. The India House (*Casa da India*) in Lisbon which was an autonomous establishment, looked after the organization of the annual fleets to India, and the recruitment of the soldiers, sailors and there crew for the India voyages.

### THE ANNUAL FLEETS TO INDIA

The Portuguese armadas—'the armed fleet'—reputed then to

be the best in the world regularly crossed the Indian Ocean and ensured their rule over the sea. It was computed that between 1497 to 1612, eight hundred and six ships of various sizes and types under one hundred and seven Chief-Captains left for



*Fig. 21. Cabral's Fleet*

Indian waters of which four hundred and twenty five returned to Portugal safely. Two hundred and eighty were permanently stationed in the East and the remaining were lost due to various

reasons.<sup>1</sup> Different chroniclers give different names of ships and their Captains because when a Captain died on the way, another Captain was appointed and this was not properly noted. However, one does not know why the name of a ship was changed when its Captain was changed. The Portuguese rulers took great care of the sea-worthiness of the India-bound ships. John III appointed Antonio Saldhana as technical

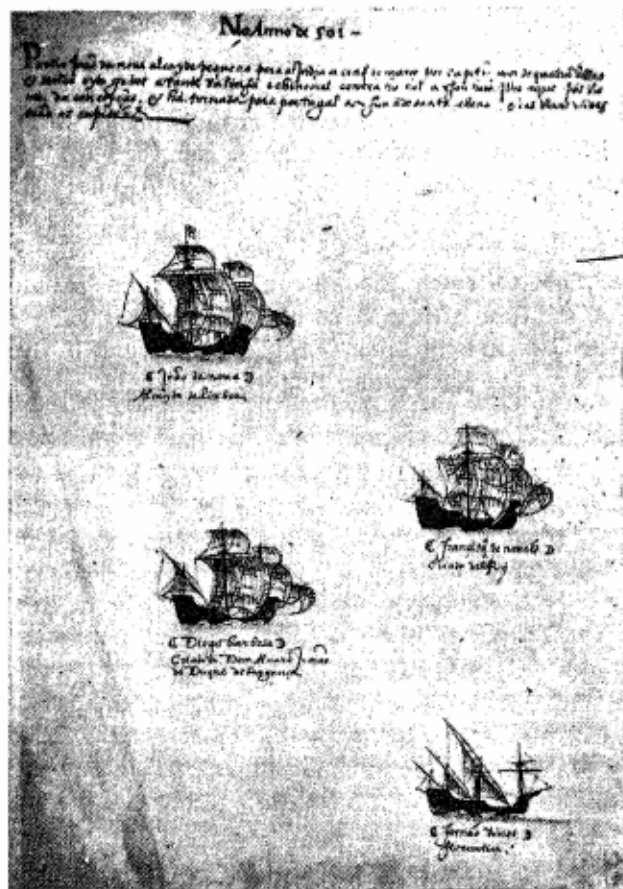


Fig. 22. João de Nova's fleet.

Advisor of the Indian fleets.<sup>2</sup> The expenses of the fitting of each fleet varied from year to year. During the hey-days of

the Portuguese in the East, a fleet consisting of five to ten ships was sent to Goa and other Asiatic Settlements annually, but by the beginning of the 17th century, their power began to decline and their superb and splendid navy also declined. The sudden appearance of greater naval powers like the Dutch and the English in the East, was the main cause.<sup>3</sup> The Portuguese began to meet opposition from all sides and their declining trade could not maintain them.

#### DEPARTURE OF THE FLEET FROM LISBON

"The 'Carreira da India' (round voyage to and from India) was without any doubt the greatest and the most arduous of any that are known in the world".<sup>4</sup> The annual fleet for India left Lisbon usually in March/April and reached Goa in September in a normal voyage.<sup>5</sup> The ships left before Easter with a view to catch the tail-end of the south-west monsoon winds off the East African coast north of Equator and brought them to Goa in September/October. The winds of the tropical zone were the determining factors. Normally, the 'round voyage' took about eighteen months including a stop over at Goa for three or four months. Though the period varied, six to eight months were quite common. The first half of March was quite ideal for departure from Lisbon. But very often the ships actually left in the second half of March or early April. Very late departure, say early May, was not suitable because such ships made 'abortive voyages' (*arribadas*) and returned to Lisbon or else they were forced 'to winter' in Brazil or Moçambique. Delay was caused by administrative or financial reasons. Difficulty in collecting ready money and crew was common. Occasionally, out of season voyages were also made. Viceroy Mathias de Albuquerque's fleet of five vessels left for India on 8th May 1590. Four vessels lost their voyage and returned home.<sup>6</sup> The flag ship 'Bom Jesus' under Chief Pilot Vincent Rodrigues rounded the Cape of Good Hope and reached Moçambique in a distressed condition. Later, it voyaged and reached Goa on 15th May 1591, a year after its departure from Lisbon.<sup>7</sup>

## RETURN OF THE FLEET FROM GOA

There were repeated royal instructions to avoid late departure from Goa. But some times, administrative delays, shortage of ready cash and waiting for full cargo of pepper which was not easy when the Portuguese were at war with the coastal rulers of Malabar, were causes for delayed departure.<sup>8</sup> Ships often left Goa in February or March and some times in April, instead of leaving on the eve of Christmas or at the new year. There used to be colourful scene at the bar of Mandovi river on the departure of a fleet when several small crafts came with fresh fruits and vegetables and people played all kinds of musical instruments to see them off. "It was one of the prettiest sights in the world."<sup>9</sup>

## DIRECTIONS REGARDING SEA-ROUTE

There were two routes—the Moçambique canal route and the route to the east of Medagasker. The ships were to take the 'inner route' through the Moçambique canal if the cape of Good Hope was rounded before the end of July. They were to take the 'outer route' *i.e.* to the east of Medagasker, if the voyage was after July. For the first twenty five-years after Gama's historic voyage, the outward voyage took the 'inner route' via Moçambique canal, in spite of the unhealthy nature of the port of Moçambique. During 1525-1579, Lisbon-bound ships were ordered to avoid the Moçambique canal and to take a route away from Medagasker. However, Goa-bound ships still used the canal route. The 'outer route' was used by ships which rounded the cape after mid-July.<sup>10</sup> During 1570-1598, Viceroy Francisco de Gama reintroduced the Moçambique canal route, because of the heavy loss of Lisbon-bound ships on the outer route. Thereafter, the Lisbon-bound ships used either of the routes depending upon which month they left India. An expert body of Pilots of India-voyages suggested on 18th March 1615 that ships leaving Goa upto the end of December should take the inner route for safer voyage; from the beginning of January onwards, this route became riskier and hence the outer route was used. All ships leaving Cochin was to take the outer route <sup>11</sup>



## HALTS ENROUTE

The Crown made every effort to prevent the ships from halting at the Brazilian ports on either way during the first one century and a half of the India voyages.<sup>12</sup> Sometimes, a halting was made at Moçambique port on the way to India for fresh water and provisions. But non-stop voyages were also made some times.<sup>13</sup> Usually, there was a halting on the return voyage, either at St. Helena island or Azores island. Ships could touch at Angola or at Brazil in an emergency. Lisbon-bound ships touched at Bahia, a Brazilian port, and it became a regular halting station for the exchange of Eastern luxuries for Brazilian goods, but in the pretext of rest and refreshments. By and large, Moçambique was the port of call for India-bound ships. Ships which were forced to winter here, suffered badly. Moçambique could not meet the requirements of crowded ships anchored here for weeks together. Therefore, the early navigators were against Moçambique as a port of call. India-bound ships were either to make direct voyage without halt or touch at Moçambique and face difficulties. Viceroy Francisco de Gama left Goa on the 25th December 1600, made a voyage and reached Tagus river on the 26th May 1601 without any stop during the whole voyage.

## GENERAL DISCIPLINE ON BOARD THE SHIP

There were general instructions almost on every thing—baggage of passengers and crew, allotment of berth and cabin space, loading of cargo, prohibition of new Christians and crypto-Jews going to India without permission etc. The Purser of a ship was to record the day of departure, the day on which the ship entered a port and the day it left the port. He had to make the muster roll of sea-men and men-at-arms who left for India in the ship and returned from India later. He specially noted the sea-men who changed places with others. Those were found to be other than those who were recruited before the voyage were dealt severely. He had also to mark the sailors and soldiers found absent. This enabled the authorities on the return journey to take up the cases of the absentees with those persons who stood sureties and recover compensa-

tions. The goods of those who were found absent in the ship were entered in the inventory book and were later disposed off on the orders of the Captain. The clerk of the ship had to deposit the particulars in the Central Registry at Goa. Senior officers were disallowed to carry more water on board the ship than that were allowed. A special supervision was to be kept on the vessel while anchored at Goa and Cochin. Great care was to be taken to avoid fire. In case of fire due to any reasons, only those who were assigned the work were to deal with it. None was allowed to leave the place in the pretext of putting out the fire. Violators were severely punished.<sup>14</sup>

The Captain-Major of the fleet had the jurisdiction in civil and criminal offences committed on the ship and could punish offenders even with death except in the harbour of Goa. The Captain of a ship was supposed to enforce discipline. All offenders were to be arrested and later handed over for trial at Goa or Lisbon as the case may be. Mutineers could be summarily disposed off. When the frightened sailors of Gama's first voyage revolted and demanded return, Gama locked the leaders of the mutiny, put the Master and Pilot in chain and controlled the situation.<sup>15</sup> When the Captains revolted, Afonso de Albuquerque deprived them of their positions but later restored it when expressed regret. He also suppressed a mutiny on board the ship *Flor de la Mar*.<sup>16</sup> Offences on board a ship included blasphemy, sodomy, reading of prohibited books and false playing cards etc. Quarrels developed often between sailors and soldiers and for this purpose, they cooked their food separately. The young inexperienced recruits were more prone to pick up quarrels. "As these lads got very thirsty and the water ration was insufficient for them, they drank up the wine... and since they were not used to it, it went straight to their heads and made them act like headless youth."<sup>17</sup>

The Portuguese rulers encouraged the policy of sending to India Crown orphans and girls of marriageable age armed with dowry in the form of various colonial posts and any one could marry them here. In 1546, after the arrival of ship 'Santo Espirito', Governor Jaõ de Castro complained that capital punishment should be given to those who bring in women.<sup>18</sup> Therefore, the Crown legislated against the practice of bringing

in children under thirteen as sailors and soldiers and also bringing back slave-girls to Lisbon.<sup>19</sup>

In the ship, there were Chaplains to say Mass on Sundays and holy days and to perform religious duties. Usually, they were Franciscan friars, even though the Jesuits acted for them on the out-ward journey to India. The fleet of Cabral (1500) had eight Franciscan friars.<sup>21</sup> The fleet of Viceroy Almeida (1505) had two Chaplains in each ship to bear confessions.<sup>21</sup> The friars not only performed purely religious works but gave spiritual assistance to those engaged in pumping out water in an attempt to prevent shipwreck. Mass was said daily with a view to avoid shipwreck. Sermons, processions and religious services were organized in the ship during Easter week. The regular morning prayer which was recited loudly by all fostered brotherhood and discipline.<sup>22</sup> The Pilot recited songs in honour of Our Lady and St. James.<sup>23</sup> The royal regiment often stressed emphasis on the fear of God as the beginning of wisdom and essential for a safe voyage. Sometimes, the passengers and crew vowed alms or donated to Saints in case of a safe journey, especially during great storms. Many a times, the Purser of the ship had to remind them to contribute to the hospital of All Saints at Lisbon.<sup>24</sup>

### THE CREW, ITS RECRUITMENT, PAY AND ALLOWANCES

An average ship of India-voyage had eighteen officers, sixty sailors, sixty ship-boys, four cabin-boys and twenty-six gunners.<sup>25</sup> They included Captain, Pilot, Second-Pilot, Master, Under-Master, Boatswain, Sub-boatswain, Guardian, Clerk, Steward, Recorder, Store-Keeper, Barber-Surgeon, Blood-Letters, Nurse, Chaplains, Factor, Purser, Carpenters, Caulkers, Coppers, Rope-Makers, Men-of-Arms, Chief-Constable, Constables, Sailors, Estrangeiros, Ship-boys, Pages, Cooks etc.

The Captain-Major of the fleet and the Captain of a ship were ranked as sailors. Both were the gifts and reward. In fact, noble men (*fidalgos*) were sent to India as Captains of ships. These positions could be even purchased or sold or inherited by women in their capacity as widows or daughters.

One Bartholomeo Dacunha de Vasconcellos purchased the captaincy of an India-bound ship from a widow at the instance of the Crown.<sup>26</sup> Because of these system, sometimes there were more claimants for Captaincies than there were ships going to India. In such cases, the Crown made a selection of those with some maritime experience. But very often, the command of a ship devolved on a noble without any experience. Later, these noble men-Captains were replaced by professional men in the rank of Captain of Sea and War.<sup>27</sup> The Captain was in supreme command of the ship, with power over the crew and passengers. On important disciplinary matters, he called his Council, awarded punishment and imprisoned during the voyage.

In the fleet of Vasco da Gama (1497-1499), Gama received a salary of 2000 Cruzados. Paulo da Gama received an equal amount. Nicoló Coelho got 1000 Cruzados.<sup>28</sup> In the fleet of Cabral (1500), the Captain-Major received a salary of 1000 Cruzados. He was allowed to bring home 500 quintal of pepper and boxes of forras. Out of the 5000 Cruzados which he received as assistance cost, he had to give 1/10th to the Monastery of Belem in Lisbon which was under construction.<sup>29</sup> Captains of each ship of the fleet received 1000 Cruzados as salary and every one could bring home fifty quintals of pepper and six boxes of forras. In the fleet of Viceroy Almeida (1505), the Chief-Captain was given an annual amount of 30,000 Cruzados for his official expenses, 1500 quintals of pepper, 200 quintals of copper and 20,000 Cruzados for domestic expenses. By the middle of the 16th century the Chief-Captain of a fleet earned one conto of Reis in cash for the round voyage. However, he was not eligible for any other allowances, except bringing from India eight boxes of allowed size containing only permitted goods.<sup>30</sup> Captain of ships earned 1/3 of their salary while on land and 2/3 while in the sea. Every Captain earned for the round voyage 1000 Cruzados in cash and no allowances but he could bring six boxes of allowed size containing allowed goods.

The *Pilot* of a ship ranked next to the Captain. Since the Captain happened to be a noble man-soldier, the Pilot had the order to be the sole in-charge of the navigation of the ship.

The efficient functioning of the voyage largely depended on him. The Pilot always remained at the stern, watching the compass needle, assisted by an Under-Pilot (Soto—Pilot). The Pilots in the fleet of Cabral (1500) received 500 Cruzados for the voyage, thirty quintals of pepper and four boxes of forras.

The *Master* of a ship commanded all the sailors, ship-boys and rest of the crew and he was assisted by an Under-Master. He was in-charge of the ship from the stern to the mast and the Under-Master looked after from the prow to the mast of the mizere sail and the loading and unloading of cargo. The Master of Cabral's fleet (1500) earned 500 Cruzados for the round voyage, thirty quintals of pepper and four boxes of forras.<sup>31</sup>

The *Boatswain* and *Sub-boatswain* held several duties in the ship. The chief Boatswain received a salary of fifty *mil reis* for the round voyage and which he received ten *mil reis* as advance pay before the departure of the fleet.<sup>32</sup>

The *Clerk* (*Escrivão*) of a ship was expected to record all the affairs of a ship such as the judicial proceedings, inventory of all belongings in case of death of any person on the voyage.<sup>33</sup> The royal regimento of no. 161 dated 25th October 1530 revoked the order of 1517 in respect of the emoluments of the Clerks of ships and prescribed that Clerks of Government owned India-bound ships would henceforth earn not more than 40,000 Reis as salary. However, this provision related only to the Clerks of Government owned ships and that the salary etc. of the clerks of other private ships were to continue as per the existing regulations.

The *Quarter-Master* (*Guardian*) was in charge of the ship-boys with whom he was always on the deck all the time, day and night, rain, shine and winds. He earned a salary of 1400 Reis a month and a freight allowance of 2600 Reis. He was eligible for an advance salary of seven *mil Reis* before the departure of the ship. There was an assistant Quarter-Master also who received 1200 Reis and freight allowance of 2600 Reis.

The *Men-of-Arms* who were recruited at the India House Lisbon, served for a seven years term. The Portuguese

soldiers who were assigned a higher ranking than the sailors were governed by many regulations and they were supposed to remain in India.<sup>34</sup> In the fleet of Cabral (1500), they received five Cruzados per month, three quintals of pepper and one box of forras.<sup>35</sup> They received an advance salary and a box of clothes etc. for maintenance. In the second voyage of Gama (1502), each soldier was paid three Cruzados per month and when on land, one Cruzado for maintenance and could bring two quintals of pepper to Portugal every one year and a half brought by paying the freight. He had to pay the usual 1/20th to the Monastery of Belem. In the fleet of Viceroy Almeida (1505), the Men-of-Arms from Portugal who were bonafide residents of Portugal (*moradores*) were paid three Cruzados, one Cruzado per month for maintenance on disembarkation and could bring three quintals of pepper every year.<sup>36</sup> A royal regimento no. 98 dated 16th March 1513 directed that all men-of-arms sent to India on the service of the fidalgos and other persons were to be paid regular salary from the day of departure onwards and on their return only 1/3. Other men-of-arms, not on the service of any person, received salary from the date of departure till they returned to Portugal, provided they returned with the permission of the Captain, on completion of a three year term.<sup>37</sup> By the royal order no. 99 dated 16th March 1513, it was directed that among the men-of-arms sent to India, there were more mechanical artisans who could be useful for service at forts. Hence, these vacancies were to be filled with such men-of-arms knowing mechanical trades and hence paid a higher salary according to their work. Though these men-of-arms were to serve as mechanical officials, they were to be given the regular salary of soldiers and half the difference between the salary of soldiers and that of artisan.

*Sailors* were supposed to read and they did all the navigation manoeuvres. They were recruited at the India House and were governed by several rules. But large scale embezzlement was practised in their recruitment. Once it was found out that there were actually 40,00 men in service, when the pay roll mentioned 17,000 men! Sailors were bound to return to Portugal at the end of their seven years term.<sup>38</sup> In

fact, it was always difficult to find good sailors in Portugal. The royal order directed that only experienced sailors should be sent to India voyages. The Portuguese sailors generally preferred a shorter and easier 'Brazil voyage' which was not too far away from their home. As a result, as early as 1505, inexperienced crew had to be recruited for the India voyages and many were convicted criminals from jails and lock-ups and from streets and fields. All kinds of ignorants were sent to India, in spite of strict regulations to that effect. They even bribed the officials of India House for employment.<sup>39</sup> Once a Viceroy complained that "they (sailors) were prone to desert to the Hindu and Muslim enemies...as soon as they had the chance of so doing."<sup>40</sup> The contempt for sailor's profession can be seen even in official correspondence.<sup>41</sup>

During night, the sailors were distributed into three groups, one for the Pilot, another for the Master and the third for the Under-Master. In the fleet of Gama, each sailor received five Cruzados per month.<sup>42</sup> Every married sailor got an allowance of 40 Cruzados extra. In every ship, there were two sailors called '*estrangeiros*' with special duties to look after ropes and sails. Every one got one *mil Rei* a month and 2800 Reis in freight.<sup>43</sup> In the fleet of Cabral (1500), one *Estrangeiro* was paid the salary of two sailors. The sailors were paid ten Cruzados a month, allowance of ten quintals of pepper and one box of forras.<sup>44</sup> Portugal which owed its greatness to maritime enterprises ranked a sailor far below a soldier even though several reformers opposed it in vain.<sup>45</sup> The salary of the sailors was very poor and was not paid regularly and sometimes for this reason, they deserted and took service under local rulers. They were called '*renegados*'. The king was requested to increase the salary of the sailors but nothing was done. The Commander of a ship with the title of Captain of Sea and War was paid less than a Dutch Sergeant. However, they did not suffer because they took to illicit private commerce and even seized the goods of the patients who died in the hospitals.<sup>46</sup>

The *Ship-boys* (*Grumets*) did all kinds of work and slept on the deck. Like the sailors, they also were distributed to the Pilot, Master and Under-master for various jobs.

During the later period, their number in a four-decked ship, was increased to one hundred and forty.<sup>47</sup> Their salary structure was revised by the regimento no. 96 dated 16th March 1513. At the time of enrolment, they were expected to declare that they would serve as ship-boys in India. But if they were promoted as sailors, they were to be paid salaries of ship-boys for three years from the date of departure from Lisbon and for the rest of the period of time, will be paid the salary of a sailor on the basis of a certificate of promotion issued by the Chief-Captain. In case of ship-boys who came to India and chose to remain here, were promoted subsequently as sailors, the period of three years was to be counted from the day of departure. In case they were promoted as sailors before the period of three years, for the period required to complete three years, they were to receive half of the difference between the salary of ship-boy and there after the full salary of a sailor.<sup>48</sup> They also received advance salary.

#### OTHER OFFICIALS AND ARTISANS

There were many officials and artisans in the ship with various specialized jobs. Every ship had two *Store keepers* to distribute rations, one for the sailors and another for the soldiers. The *Steward* looked after meat, drink and other provisions. The *Marinheiro* who was in-charge of all ammunition and powder and was responsible for their proper delivery, imprisoned men on board the ship. He got a monthly salary of one mil Rei and 2340 Reis in freight besides berth space in the ship. The *Usher (Alcaide)* who was in charge of the gun powder and bullets also performed the orders of the Captain regarding justice. There was one *Master-Gunner* and eight other gunners in every ship with different scales of pay. The *Chief Constable* was in charge of artillery and he was assisted by twenty five *Constables (Bombardeiros)*. The Chief Constable got one mil Rei a month and 18,60 Reis in freight. In the fleet of Cabral (1500), a Constable was paid 200 Cruzados and he brought ten quintals of pepper and two boxes of forras. The Constables were paid as ordinary sailors.



<i>Designation of officials</i>	<i>Salary etc.</i>
<i>Captain</i>	
(i) Captain of ship of over 100 tons and Captain of Royal Gales	10,000 Reis per month, no allowances, but could bring from India three boxes of goods as per rules.
(ii) Captain of gales of 20 benches and above	7000 Reis per month, no allowances but could bring three boxes
<i>Pilot</i>	
(i) Pilot of ship (200 to 300 tons)	200 Cruzados, no allowances, but could bring 2 boxes, 2 slaves and 2 casks of wine for the round voyage
(ii) Pilot of ship (300 to 400 tons)	250 Cruzados, no allowances, but could bring 2 boxes, 2 slaves and 2 casks of wine
(iii) Pilot of ship (above 400 tons)	300 Cruzados, no allowances but could bring 2 boxes, 2 slaves and 2 casks of wine
<i>Master</i>	
(i) Master of ship (200 to 300 tons)	200 Cruzados, no allowances, but could bring 2 boxes, 2 slaves and 2 casks of wine for the round voyage
(ii) Master of ship (300 to 400 tons)	250 Cruzados, no allowance, but could bring 2 boxes, 2 slaves and 2 casks of wine
(iii) Master of ship (over 400 tons)	300 Cruzados, no allowances, but could bring 2 boxes, 2 slaves and 2 casks of wine
<i>Sub-boatswain</i>	
(i) Sub-boatswain of ship (200 to 300)	35,000 Reis for round voyage; no allowances, but could bring 1 box and 1 slave
(ii) Sub-boatswain (300 to 400 tons)	35,000 Reis, no allowances, but could bring home 2 boxes, 2 slaves and 2 casks of wine
(iii) Sub-boatswain (over 400 tons)	50,000 Reis, no allowances, but could bring 2 boxes, 2 slaves and 2 caks of wine
<i>Clerk</i>	
(i) Clerk of ship (200 to 300 tons)	40,000 Reis, no allowances, but could 2 boxes of goods
(ii) Clerk of ship (300 to 400 tons)	45,000 Reis, no allowances, but could bring bring 2 boxes of goods.

Boys called *Pages* were employed to shout for various members of the crew for their jobs. The *Factor* and *Purser* of the ship earned no pay but only the berth below the under-hatches and a chamber of twenty pipes for each man. Each man had his cabin to stay and this he normally sold to rich merchants and other passengers and made good profit.<sup>49</sup> The artisans in a ship included two Carpenters, two Caulkers, two Coppers and two Rope-Makers etc. Each Carpenter and Caulker got four Ductas a month and 3900 Ries in freight. In the first fleet of Gama, Caulkers and Carpenters, Rope-Makers, Black Smiths and Coppers were to receive two Cruzado each.<sup>50</sup> In the fleet of Cabral (1500), all the artisans were paid salary of two sailors. According to the Order no. 98 dated 16th March 1513, the Clergy-men, Physician, Barber-Surgeon, Black-Smiths, Carpenters, Caulkers, and other artisans were to be paid their salaries from the date of departure till their return to Lisbon.<sup>51</sup> It was also directed that noble-men, knights, Squires and other Portuguese *moradores* who went to serve in India were to be paid boarding and lodging for the round voyage. Their return voyage was counted from the day when their salary in India ceased till their arrival in Lisbon. The non-Portuguese residents were to be paid salaries as per the respective orders.

The Royal regimento no. 159 issued by the king Manuel on the 17th August 1517 regularized the emoluments of all kinds of officials in the India-bound ships.<sup>52</sup>

### Procedure for Payments

When a ship came from India, the Judge of Deeds made due investigation about the persons of a particular ship and prepared a list of law-breakers and it was intimated to the concerned officials of India House not to pay their salaries. Others were paid straight way. Such a list was to be made for each ship and for each year separately.<sup>53</sup> The royal order no. 50 issued on 21st August 1509 directed that those who have served in the factories in India and were not paid there will bring necessary certificate of non-payment and apply at the treasury office. But all such payments were restricted

to 1500 Reis against such certificates.<sup>54</sup> All payments were to be made in the presence of Clerks. For all other payments, the existing regulations continued. A Royal order dated 16th March 1513 decreed that Captains, Chief Alcaldes, Factors, Clerks and other officials were to earn salary for the time spent in the to and fro voyage, but they were to earn boarding and lodging (*Moradoria*) in the voyage. They earned their salary from the date they took charge of their offices till they gave up their charge to new officials. Those who were not Portuguese residents doing the above job, earned their salaries only for the time serving in India and not for the time of their to and fro voyages. Rules prescribed that no salary was to be paid to those persons who were sent to serve in the ships, remained in India and received payments in India, unless a certificate is produced from the competent official stating that the person had served as a substitute in the ship on the orders of the Chief-Captain and that he was not paid in India. Regulations no. 100 dated 16th March 1513 prescribed that the Treasurer of India House was to pay salaries of persons returning from India for the period of their services only on production of a certificate from the competent authorities and also after checking whether it was in accordance with the salary agreed before their departure.<sup>55</sup>

When a ship came from India to Portugal, the Treasurer of India House paid the salary of the return voyage after recording their names, parent's names, whether married or unmarried, substituted or not and then made the payments. In case a person expired during the voyage, the account was to be settled in accordance with the record of death in the book of the Clerk of the ship and the name of the heir who could receive the money, must be stated clearly. If there was no claim for the salary within a year from the heirs, such salary was to be passed on to the Treasurer of Captives to do the needful. In case a person did not apply for the payment of his salary of the return voyage, while such payments were being made by the Treasurer either because they remained in India or for other reasons, that item remained blank in the register mentioning such non-payment, for the purpose of audit. If there was a change of a Treasurer,

one other than the one who was present at the arrival of the ship, payment was to be made only on recording all relevant particulars.<sup>56</sup> When it came to be known that some persons used to collect illegally money due to the salaries of persons, regulations were introduced. Regimento no. 158 dated 19th November 1519 prevented such malpractices and it was ordered that none could collect such salaries under the pain of loosing properties of which 1/3 was to belong to the person who denounced, 1/3 to the captive and 1/3 to the Hospital of All Saints and besides this penalty, the culprit was to be deported for five years to St. Helena island. The officials of India House were not to pay salaries to any one but only to the concerned persons or to their legitimate heirs on production of certificates issued by a court of law or with the power of Attorney of the parties, to their parents, brothers, cousins, brother-in-law, uncle and nephew swearing on Gospel.<sup>57</sup>

#### **Advance Salary**

Royal regimento no. 96 dated 16th March 1513 prescribed that the Captains, officers, sailors and soldiers who were sent to serve in India were to be paid advance salary of four months only and free boarding and lodging.<sup>58</sup> Regimento no. 94 dated 17th August 1517 directed that the Treasurer of India House should make advance payment to the soldiers and others meant for India voyages as per the list supplied by the Vedores of Fazenda or by the Chief Officer of the Stores. But "it costest them more in gift before they get their place which are given by favour and good will of the Provedor."<sup>59</sup> Another order no. 157 dated 17th August 1517 directed that the Captain-Major of the fleet, Captains, Pilots, Masters, Clerks and Boatswain were to be paid an advance of 1/5th of their salary for the round voyage before departure.<sup>60</sup> The Clerks and other royal servants were to get an advance of 25,000 Reis per voyage and others 20,000 Reis per voyage. The Steward got 1000 Reis and others got 900 Reis. The Men-of Arms were to get 700 Reis. This category of persons received three month's advance pay only. In case the salary were changed afterwards, then the new salary

was to be paid.

### **Privilege of Duty-free Goods from India**

All personnel of a ship coming from India to Portugal were allowed to bring some spices and other specified goods free of duties up to a total value which varied according to the rank and status of the concerned person. The reason was that the Crown was either unable or unwilling to pay adequate wages and hence tried to compensate the servants by allowing them to bring certain quantities of cinnamon and other spices. It was felt that by giving the sailors a direct interest in a portion of the ship's lading, they would fight better if the ship was attacked by enemy and in that case they would be defending their own property as well as that of the Crown.<sup>61</sup> In the second fleet of Gama (1503), each crew was allowed to bring for himself a limited amount of spice for the freight of which he had to pay 1/20th of its value which amount was given for the construction of the monastery of Our Lady of Belem.<sup>62</sup> Regular payment of this "20th" continued from 1503 to 1522 when John III abolished it on completion of that Monastery. Instead, a limited sum was to be paid to it every year, by the India House on the arrival of every fleet from India.

The Royal regimento of 1515 allowed the privilege of duty-free goods on the basis of ranks and status as follows :<sup>63</sup>

<i>Personnel</i>	<i>Duty-free allowance</i>		
Governor, Captain-Major and Bishop of Goa,	400	mil	Reis each
Captains of armada, Captains of forts,	300	mil	Reis each
Controllers of Exchequer, Vicar General of Goa and Captain-Major			
Captains, Chief Judges, Judges	250	"	"
Secretary of State and other noble men of king's services			
"All my other Servants"	200	"	"
Men-at Arms	120	"	"
Sailors	120	"	"
Cabin boys	80	"	"

### The Privilege of 'Liberty Chests' (Caixas de Liberdades)

Spices and other goods were brought from India in special chests known as liberty chest. In the beginning, they were to be of a standard measurement of  $4' \times 3' \times 2.5'$  and they were allotted as follows :

<i>Personnel</i>	<i>Number of chests</i>
Captains of voyages and fortresses	4 chests each
Gentle-men of the Royal house hold	2 to 3 each
Ment-at-Arms who served in India for over 2 years	1 each
Masters, Pilots and Pursers of India ships	1 each
Constables	1 each
Every two sailors	1 chest to be shared between them
Every three cabin boys	1 chest „ „

Such goods brought from India by the crew could be delivered at the India House and were paid for, of course deducting the spoilage etc.<sup>64</sup> According to regimento no. 159 dated 17th August 1517, the Chief-Captain, Captain of ships and merchantships, Pilots, Clerks,<sup>1</sup> and Contra-Masters were not to pay any duties for the boxes of goods brought from India according to rules, but they were not to bring any package or cask other than that were allowed. The erring persons were to loose their goods by way of confiscation by the State.<sup>65</sup> But as time passed on, there were complaints that very large boxes were brought from India in the Liberty Chests and they were an obstruction to navigation. Therefore, an order dated 14th January 1575 decreed that in future no one was to bring in the ships any box of more than 5 palms long  $2\frac{1}{2}$  palms high ( $5 \times 2.5 \times 2.5$ ) and that each person was not to carry not more than one box of the above dimensions in the ship under the pain of loosing the boxes with all its contents to the state.<sup>66</sup> However, such boxes were allowed to be carried in the cabin. In fact, the liberty chest formed the most liberal privilege.

However, in course of time, there grew vested interests and several abuses cropped up. Many people paid more attention

to the safe keeping of their own personal goods rather than that of the Crown. The officers of the ship were more interested to make rooms for their own goods rather than the government stores and hence the naval stores were left to rot on the deck. Repeated royal orders were issued against such practices but with little effect.<sup>67</sup> Royal order no. 159 dated 17th August 1517 prescribed that in future some of the officials were paid their salaries in cash only and no such privileges. None was to enjoy this privilege except when granted by previous orders and on the expiry of such orders, this facilities were also to lapse. But those who already were granted this privilege could have them till the expiry of their official jobs.<sup>68</sup>

By the beginning of the restoration period, this privilege had become so elastic that it seemed as if the Crown was maintaining the India voyages for the benefit of crew than for itself.<sup>69</sup> Hence the Crown made a determined effort to abolish this system and replace by a reasonable wage scale. But this was never popular as the sailors continued to get a nominal salary. Therefore, the Crown had revived the old system with some modifications.

### **Provisions on Board a Ship**

The Captain of a ship or a person authorized by him was called to the Provision store along with the Steward, Recorder and Copper and the provisions were delivered on the orders of the Intendent of the Navy in the presence of the Chief Master, Treasurer and Recorder of the Store house. Provisions like barrels of fish and meat were to be checked by opening some of the barrels and weighing them after wiping off the salt. The wine, vinegar casks and oil barrels were examined by the officials and verified if they were full and packed well. Provisions were also handed over to the Surgeon of the ship and the entry was made in the proper register.

During the early days of navigation, every Portuguese ship on voyage carried a provision of one moio of flour (sixty alqueiros), some quantity of salt, twenty alqueiros, of pulses, eight alqueiros of almonds and a quantity of mustard, sugar

and honey.<sup>70</sup> The Steward of the ship entered the receipt of all provisions in his register not in gross or lump sum number but in definite quantity in casks and boxes etc. The Steward got them properly stamped for use as ration. His store room had three different keys—one with the Druggist, another with the Second-Pilot and the third with the Master of the ship. The ship's Captain had to see that no holes were made in the barrels and casks and if they were found broken, or opened, they were to be protected by planks and iron bands.<sup>71</sup> Opening of the barrel and casks was to be done in the presence of a witness who was not friendly with the Steward, to ensure that there was no embezzlement by the officers of the ship. Every barrel or box to be opened had to be checked to see if it was damaged and recorded its standard measure and contents. The Pilot of the ship ordered the Copper to measure the wine and other liquids in the casks. If any barrel had lost its content because of a hole or other causes, the Captain ordered the transfer of its contents to other vessels and then found out whether the hole was accidental or fraudulent, and in the case of the later, the offender was sued for the loss.<sup>72</sup> Any shortage found, was to be reported to the Revenue Board for necessary action. In case any provision was found rotten and unfit for consumption, the Captain ordered the Steward, Recorder and Master of Rations to inspect it and pack in barrels with due markings so that they could be delivered back to the store room of provisions of the Dockyard later. In case the rice got wet, rotten and not usable, it was weighed and measured and then thrown in to the sea.

### **Ration**

The Recorder of ship made a list of each category of officials and sailors to be supplied with rations. Master of Rations ascertained from the Captain of the ship about the kind of food to be given to the crew on the next day so that it could be weighed and handed over to the Cook. The Steward had to render a daily account to the Captain of the ship about the rations and provisions consumed and this list was to be countersigned by the Captain. Any balance of provision



remaining, like barrel of oil, casks of wine and boxes was to be counted properly and returned later to the store of the naval dock yard.

The Captain of the ship directed the Sergeant of the Sea and War and the Corporal of the sailors that the rations were properly distributed by the Store keeper of the ship to all persons and all received the daily ration equally. Every day, the Steward took out the ration for the sea-men, weighed it in the presence of the Recorder and the Master of Rations for a group of ten persons. All the expenditure of provisions of rations were separately entered such as for oil, vinegar, rice, meat, fish and other commodities. The casks of wine and other barrels were to be opened and measured by the Copper in the presence of the Recorder.<sup>73</sup> When the ship was anchored at any port like Goa, the sea-men while on land, were not to be given any ration. Similarly, when they return, they have no more than but each man a portion of biscuits and water until they came to the cape of Good Hope and from there, they were to make their own provision.<sup>74</sup> The food consisted mostly of salted meat, dried fish, cheese and biscuits. The ration item included husked rice, pork, beef, salted mackrels, fish, olive oil, vinegar, salt, wine and biscuits. Biscuit was the staple diet and each person was allotted 2 lbs of it every day. These biscuits were specially baked at Lisbon and sent from there to Lagos. Honey was used as a sweetner rather than sugar. For the first few weeks of the voyage, fresh fruits and vegetables were available. Olive oil for cooking was carried in large earthen-ware jars and salted sardines were carried in barrels. Garlic and clove were carried to flavour the monotonous rations and for their medicinal value. Wine was always in good supply and was used liberally to wash down the salty food. There was no ration for bread. On the day of fasting, 1/2 lb rice and cod fish or cheese were given in lieu of beef and pork. Usually, the ration was adequate. The fleet of Gama (1502) had instructions to effect an economy in provisions, ration of wine to each sailor to three quartilhos.<sup>75</sup> Some times, there were more than sufficient good food and wine throughout the voyage. In case of shortage of food after rounding the cape of Good Hope, the ship anchored in the bay of St.

Agustine in the southern Medagasker for fresh supplies. Otherwise, they stopped at Zanzibar island for rest and refreshment.<sup>76</sup> None was allowed to sell the ration on board, but if a person did not use all or any portion of his daily wine ration, he got the balance which he was entitled to, at Goa, and he could sell it for support on the shore.<sup>77</sup>

Each galley-slave earned a rice ration of  $1\frac{1}{2}$  medida and  $2\frac{1}{2}$  bazaruco per day. For this purpose, the Master of the galley prepared one coupon each for each slave every day and against which he collected ration and cash from the Treasurer of the dock yard. On every Saturday, the Treasurer presented these coupons to the Intendant of the navy, to be checked by the Accountant of the dock-yard and arsenal, and monthly expenditure was prepared at the end of the month.

Since the ration given to the crew was raw, every person had to cook his meal so that about eighty to hundred pots were seen on fire successively.<sup>78</sup> The sailors and soldiers cooked their food separately in order to avoid quarrels. Cooking facilities were limited to two large sand-filled boxes in the waist on either side of the main mast.

### **Provisions in the Dock-yard and Arsenal of Goa**

The Goa dock-yard and arsenal had a Store house of provisions with a Treasurer and Recorder each of whom possessed a key of the room so that no transaction was possible with only one person. The Intendant of the navy visited this store twice a month and checked the conditions of the provisions by experts and if any item was found in bad quality, he informed the Royal Revenue Board so that such goods could be sold in time.<sup>79</sup> The Treasurer of the Store maintained books for receipt and expenditure of the provisions which were weighed with stamped-scale and measures. For all purchases and receipts, he entered the dates, variety, weight, price, total cost and the order of the Revenue Board and the Intendant etc., in serial number from 1st January to 31st December. The expenses were also to be entered with all particulars and specifications so that any shortage from the store could be

noticed immediately.<sup>80</sup> The Treasurer was not allowed to make any purchase, as it was to be done by the Intendant only. The Store officials were not allowed to bring the fruits from their own properties. Whenever a new Treasurers took over, he made an inventory of all the items in the presence of the Intendant and the containers were marked with 'P' to indicate 'past administration'. The Treasurer reported to the Intendant every Sunday, the stock position and requirement so that the Revenue Board could purchase them. The Treasurer had to see that the casks and barrels were checked by the Copper and any item not according to specification was not to be accepted in the store.<sup>81</sup> The Treasurer went to the store room every morning and checked the casks of wine, vinegar etc., and if there was any leakage, he asked the Copper of the ship-yard to do the needful. He also reported to the Intendant if the wine was becoming vinegar and provisions got rotten, so that the Revenue Board could dispose them off soon. The same procedure was repeated every evening before the store room was closed.

### **Care of the Sick on board the Ship**

The mortality rate on the ships of India voyage was quite high. It was quite common for three hundred men to die out of six to seven hundred people.<sup>82</sup> In the fleet of Nuno da Cunha (1528), about two hundred people died of fever only.<sup>83</sup> An epidemic broke out on board nau 'S. Martinho' and consequently on 20th May 1597, eighty men out of the total four hundred were sick and by June hardly twenty men were fit enough for any work in the ship. Fifty two persons died before reaching Moçambique, including the second Pilot. G.F. Reimao, the Pilot also fell sick and there was none to handle the magnetic needle. The Barber-Surgeon also died and one of the sailors acted in his position. In this circumstance, the ship made a non-stop voyage to Moçambique. On the way, fifty-three crew died already and all others were seriously sick.<sup>84</sup> Other ships of the fleet, nau 'St. John' and 'Maria de Castelo' also met the same fate. Four ships which left Lisbon in March 1564 reached Goa in September 1564 with twenty-five people dead in between Moçambique and Goa.<sup>85</sup>

In the fleet of Antonio de Noronha which left Portugal in 1571, two thousand out of four thousand people died.

There were many reasons for high mortality rate on the India voyage. Elementary sanitary conditions were poor and they did not improve at all in spite of several suggestions.<sup>86</sup> Many of the recruits sent to India were convicts and prisoners who were already suffering from diseases. The chronic overcrowding on the deck only facilitated diseases. The shortage of water made cleaning more difficult. The crew slept in the open and it was not healthy in the hot climate. The extreme heat, bitter cold, tropical rain and seasonal storms etc. must have affected them badly. Sick persons were often left uncared for. There were no proper treatment for tropical fever and intestinal disorders in the crowded ships. Food articles like salty food only caused scurvy (bleeding of the gums) which became common because the Sahara coast offered no fresh supplies of fruits and vegetables. In the first voyage of Gama himself, his brother Paulo and the well known Pilot Pero de Alemquer of the voyage of Bartholomeo Dias (1487-1488) died of scurvy.<sup>87</sup> Late leaving-ships were forced to winter at Moçambique, notorious for malarial fevers and many people died.

The Harvard University has preserved the 'Athiade naval papers' giving a list of medical supplies essential for a voyage.<sup>88</sup> It also shows the detailed rules for Crown and private ships regarding the medicines and treatment of the sick. Before the voyage was to start, the Chief Physician and Chief Surgeon of Goa prepared a list of medicines required for the voyage. This list was submitted to the store of provisions of the Goa shipyard.<sup>89</sup> The first fleet of Gama had "in each ship all the articles of an Apothecary's shop for the sick."<sup>90</sup> Similarly, each vessel of Viceroy Almeida's fleet (1505) "had a well provided pharmacy with one Surgeon (Barber-Sangrador) and a Master Healer."<sup>91</sup>

There were two medical chests (*botica*) in every ship, one for the sailors and other for the soldiers. Each ship had a Physician and a Surgeon with well provided medical chests provided by the Crown. Usually, medicines and instruments were not enough and of good quality. There was many a time

an ignorant Barbar-Surgeon in a ship.<sup>92</sup> Generally, nursing Orderlies were unwilling to work in the ship because of the fear of infection. In the beginning, there was a grading of Surgeons—first, second and third Surgeons. But it led to lack of co-operation between them. Therefore, it was decided to have two Surgeons to look after the medicine chest and the instruments. The Captain of the ship had the order to see that all medical staff—Surgeon, Druggist and Blood-letters performed their duty properly and any lapse was to be reported to the Revenue Board for action.<sup>93</sup>

The common treatment on board the ship was frequent bleeding of the patients which must have killed many more than it actually cured. Some times, a person was bled six to seven pints of blood in few days. The two Surgeons along with the Blood-letters and Nurse attended the patients every day morning and the prescriptions were taken to the Druggist who dispensed them. Those who could walk up to the drug-room were taken examined and medicines were prescribed. Later, all the prescriptions were initialled by the Captain and submitted to the store of provisions of the ship-yard of Goa, for proper accounting. The treatment of the sick was favourably mentioned by many voyagers who visited India.<sup>94</sup>

Sick persons were given diet according to the suggestion of the Surgeons. Before the sailing of a ship, the Steward of the ship received the provisions for the sick from the store of the ship-yard of Goa and they were entered in the register and signed by the Druggist. The Captain even tasted the food before it was given to the patients. All persons who fell sick were expected to make their wills and declarations. An inventory was also made of those who died at sea.

The Master of the galley-slaves of the dock-yard visited them every day and attended to their welfare. The Surgeon resided very close to the ship-yard so that he could promptly treat the slaves. In case of death of a galley-slave, it had to be certified by the Surgeon and Parish priest. The latter will certify that the slave was buried in the church.

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## Shipwrecks

The main problem in the study of shipwreck is that it is often difficult to distinguish between shipwrecks and ships foundering in the open sea or casualty through other causes like attack from the enemy etc. Most of the ships suffered wrecks in the Indian Ocean on their return journey to Portugal off the coast of Natal before they rounded the Cape of Good Hope. Shipwreck on the outward journey to Goa or at Goa when the ships were not laden heavily and after they rounded the Cape on the return voyage, were extremely less.<sup>1</sup>

On the basis of the India House records at Lisbon, it is computed that during 1497-1612 (115 years), out of the 806 ships that sailed for India, only 420 ships returned to Portugal and 20 ships were wrecked.<sup>2</sup> During 1500-1579 (80 years), 31 ships were wrecked and during 1580-1610 (30 years), 35 ships were wrecked *i.e.* during the period 1500-1610, 66 ships (7.7%) were wrecked<sup>3</sup>. In between 1521-1551, 31 ships suffered wrecks. Shipwreck was alarmingly high during the years 1588-1592. The total loss of ships during one century (1550-1650) was 130.<sup>4</sup> During 1585-1597, out of the 66 ships that left for India, only 34 returned safely and 18 were wrecked *i.e.* 27.4 per cent of ships wrecked as against 7.7 per cent of the earlier period<sup>5</sup>. During 1590-1592, out of the 7 ships that left Lisbon for Goa, only 2

ships returned to Portugal safely. By 1650, shipwreck reached a disastrous level.<sup>6</sup>

Various causes—natural and man-made—have been attributed to shipwrecks. The important man-made causes were over-crowding, over-loading, misuse of the facility of cargo space (liberty chests), superficial and inadequate careening and careless caulking, contract system and bad repairing, shortage of skilled and trained persons, untimely departure of ships and administrative negligence etc. Among the natural causes, rocks hidden under the water, sand-bars and unpredicted storms etc., were common.

Over-crowding on ships bound for India was very common. Here is a description of over-crowding on an India-bound ship. "Imagine for yourself and think well what a ship of India is like when put to sea with 600 to 800 and sometimes more than 1,000 persons in it, comprising of men, women, children, slaves, freemen, fidalgos, plebians, merchants, soldiers and sailors..." It is compared to a large villa. The voyage took not less than five months during which one had to undergo and face danger, the doldrums of Guinea coast, the torrents of the Cabo, the rotting of the provisions, lack of accommodation, fever, sea-sickness, spells of darkness and constant danger of death.<sup>7</sup> In this condition shipwreck was not worse for the unprivileged and perhaps a boon for the slaves.

Willful and reckless over-loading was another cause for the loss of so many ships on their return voyage to Portugal. Those ships were packed to full capacity with valuable commodities from India with a view to make most of a trip. Every one from the Captain to the cabin boy was interested in filling to capacity the 'cargo space' allotted to him according to his status. He could fill his chest with his own goods and could sell them on reaching Portugal and thus make good profit. Thus all were prepared to face any risk due to over-loading. They lade the ships without any proper distribution of the cargo. To maintain the balance of the ships, heavy goods had to be put in the lower part of the hold and the lighter goods were to be piled at the top. But this well accepted practice was reversed by the crew because it was easy to take out heavygoods while unloading, if kept at the top. This kind of

irregular over-loading had exceded to such an extent that it was difficult to steer the ship properly and it made the ship-top heavy, disturbing the entire balance. An over-crowded ship was described as "floating Babylon" and it lost balance when caught in an unpredictable storm. The king of Portugal had issued repeated orders against the practice of over-loading, but no serious note was taken about it. There were standing instructions against irregular storage of cargo on ships. The king reminded the authorities in Goa in 1587 and again in 1597 that if the existing regulations were not adequate to deal with, they were to be revised and supplemented.<sup>8</sup> But in Goa, none enforced it seriously. Vested interests ignored them. Therefore, the authorities insisted on their compliance forthwith.<sup>9</sup>

Superficial, defective and inadequate careening and careless caulking of ships were the other reasons for shipwreck. It was much cheaper to careen the ships rather than to lay them ground. The use of immature and unseasoned teak made the wood wary, shrink and split and become loose. With the dampness of water outside and the great heat of pepper and other spices inside, the timber became rotten and unsound during the first voyage itself. Even one plank cut out of season was enough to cause wreck of a large ship. When they were caulked, they did not take the oakum properly being badly dried and during the voyage, when they were tossed by heavy seas and buffeted by strong winds, the caulking came away and water gushed in.

Regular repair of ships increased the life-span of a ship, keeping it fit for long voyages. But this was not done regularly by the higher authorities. By the end of the 16th century, the cost of ship-repair in Goa rose steadily because of the higher cost of timber. "There was no longer in Goa contractors who used to repair and refit carracks. Nowa-days... they all went bankrupt and hence no capital."<sup>10</sup> "By the beginning of the 17th century, the cost of ship-repairing at Goa had almost doubled. Very often old ships were put on the sea for long voyages which they were not in a position to withstand. But this was inevitable because Portugal did not possess enough ships to serve her far-flung sea-borne empire. In fact they did not have more than 300 ships even at the height of her maritime

glory in 1536.<sup>11</sup> Admiral Martim Afonso Desouza in his letter to the king of Portugal dated 15th November 1534, explained the miserable conditions of the ships in India and suggested that if they were laid up and repaired properly, "they will last ten thousand year"<sup>12</sup>. Again Governor Castro informed the king in a letter dated 16th December 1546 that the ruin of the ships in India was such that he had "no words to describe." The ships were all rotten and eaten by a variety of worms. "He felt that unless repair work was started soon, "within three months, the entire fleet will perish".<sup>13</sup> He pleaded with the Home Government on the extreme need of timely repair. But no serious note was taken about it.

The repair work was done by contract system. The contract system of refitting timber, stitching the sails, nailing etc. completed the work as quickly as possible to save time and labour, but at the cost of good work. In this process, they never finished any work properly and everything remained imperfect. The concealed defects and deficiencies in old ships and hid the damages in such a way as to show every thing in good order. Inspecting officers were often bribed and the job was passed off as proper. But the defects were exposed as the ships faced storm when any remedy was too late. The contractors used inferior materials for shipbuilding. The result was that during 1585-1597 i.e., during the first two contract periods, out of the 66 ships that sailed for India, only 34 returned safely<sup>14</sup>. The contractors made floating castles with improper size and this ruined ship construction. Most of these ships could not withstand the voyage and wrecked on the way. "Not one Portuguese ship out of the three return safely from the voyage."<sup>15</sup>

Structural defects, crankiness and excessive tonnage also caused shipwrecks after 1580. The vessels were like "wooden mountains". By the end of the 16th century, a ship of the India voyage could hardly make two trips, while the old ones had done ten to twelve round voyages. To remedy this evil, the king of Portugal issued instructions in 1570 that in future all the ships used in the India voyages should not exceed 450 tonnes or be less than 300 tonnes<sup>16</sup>. But even this order was not seriously implemented. Later, it was ordered that ships should have only three decks instead of four. But the tonnage was

raised upto 500 to 600.<sup>17</sup> However, such regulations were resisted by the over-ambitious ship-builders.

When the Dutch came to the Indian waters, the Portuguese ships were a century behind in shipbuilding, naval equipments and tactics. The ships were rotten and broken and this shook the very confidence of their navigation in India. When the ship was actually caught in a storm, there were no spare at hand on board to meet any emergency. There were several allegations of inefficiency in the fitting of armadas at Goa. Very often, a ship dashed against a hidden rock or ran ground because at times the Pilot had no knowledge of the waters wherein his ship was sailing. Careful sounding of the sea and maintaining the relevent data would have avoided shipwrecks. As early as 1597, the king of Portugal had admitted that the pilots and others were often incompetent and that they had purchased their posts rather than any merit or experience. This was revealed later also in an enquiry held in 1630 at Goa.<sup>18</sup> Inefficient crew and lack of descipline on board a ship hastened its destruction in difficulty. Portugal suffered from the shortage of qualified sailors which she never was able to make good. After 1570, there were complaints that all kinds of ignorant persons such as tailors and cobblers were freely recruited as mariners and the poor boys could not even distinguish between a star-board and lar-board ! Lack of descipline added to the difficulties especially when the ship was in danger. Very often the Captain of the ship behaved arrogantly and some times they were even not even on talking terms with the pilots and sailors. Therefore, there were royal instructions suggesting amicable consultations on board a ship. Punishments were prescribed for violations of these rules.

There were allegations that the ships were not properly equipped for the voyage and hence they were the victims of shipwreck or other disasters. There were not enough provisions of all types for the long voyage and some times there were not even a pair of spare sails.<sup>19</sup> The rigging and tackle of ships were deficient and rotten.

Late departure of ships from Goa and parting company of other ships in a fleet in order to reach Portugal earlier to sell private commodities etc. also caused shipwreck.<sup>20</sup> Late leaving

ships were forced to winter at Moçambique which was an unhealthy port. Therefore, instructions were issued against ships leaving too late from Goa.<sup>21</sup> But they were not seriously enforced.

Nature too was responsible for shipwreck. On a number of occasions, storms appeared suddenly and unpredictably. Meteorology had not sufficiently developed in the days of the Portuguese. The equatorial region was very dangerous. The changing winds and oceanic currents were responsible for many shipwrecks. Historian Oliveira Martin had very rightly commented that "the Portuguese navy was lost...because the ship construction was worse, ships were over-loaded and the ignorants arrogated themselves as Pilots. It was the sea which devoured the Portuguese ships and not the English and the Dutch"<sup>22</sup>.

Even though all possible measures were taken to avoid shipwreck, it did happen some times. People in a ship recited littonies loudly and Mass was said every day so that there was no mishap. On rounding the Cape of Good Hope, it was customary to sing "te duem" and all embraced each other without any distinction of status and cheered "boa viagem" to the Cape five times.<sup>23</sup> Every effort was to be made in a ship in case of any leak so that water did not gush in quickly. The ships were to be ready for action at short notice in case of any bad weather. Heavy guns were to be dismantled and stored below. It was quite usual for people involved in a shipwreck to invoke the help of Saints and some times they vowed to make gifts etc., to the shrines, in case they survived the calamity. During shipwreck, the priests inside the ship gave spiritual encouragement to those who were engaged in pumping out water throughout day and night in an effort to save the ship. It was also common that some of the unfortunate occupants of the life-boats were thrown over-board in order to give a better chance of survival to the rest, as was done in the case of ship Santiago in 1585 and S. Thome in 1589.<sup>24</sup> But there were also cases when the Captain himself was the first to escape in the only available life-boat !. However, there were instances of self-less service as in the case of Nuno Velho Perrira who after the tragedy of ship S. Alberta in 1593,

marched with his survivors through the jungle of Africa and suffered many privations. The typical behaviour of the people during a shipwreck can be seen in the shipwreck account of S. Paulo which took place in 1561 in the Indian Ocean. "There was no body...who did not wish himself to be one of the lowest animals on the shore...but men at sea behave like women on child birth who swear in the severity of their agonizing labour pain that if survived, they will never again lie with a man. Like-wise in these terrible and fearful storms, there is none who does not swear that he will never go to sea again...but once the danger is over, it is gone and forgotten, every one is dancing, strumming and jocking.<sup>25</sup>

Shipwreck accounts were compiled either by survivors or contemporary writers so that they could serve as timely precautions for future voyages in similar circumstances. But precautions were not actually followed. These shipwreck accounts are faithful narrations showing the danger to life on board a crowded and over-loaded ship in tragic situations. They also clearly speak out the various abuses responsible for shipwrecks. These accounts of shipwrecks were one of the styles of literature in Portugal in the 16th century. They opened up new horizon before the eyes and revealed the sea as it was seen, navigated and suffered by the mariners of India voyage.<sup>26</sup> Gomes Barnard de Britto had compiled from various scattered sources, his classical but tragic stories of the sea and it was published in Portugal first during 1735-1736<sup>27</sup>.

Thirteen ships that left Portugal for India in 1500 under Cabral met with a sudden storm during the voyage.<sup>28</sup> There was hardly any time even to shorten the sails. Later, four ships under Bartholomeo Dias, Ayres Gomes Desilva, Vasco de Athiade and Simao de Pina wrecked and foundered with 300 people. Thus Bartholomeo Dias was destined to round the Cape again which he had rounded earlier and now died at the same place. This disaster caught popular imagination and even Luis de Camoens, the epic poet of Portugal sang about the dread and the Cape. In 1502, the ship of Antonio de Campos' expedition wrecked near Sofala. The ships of Vincent de Sodre, whom Vasco da Gama had left in India for guarding the Malabar coast met with a storm and wrecked on 20th April



1503, killing most of the crew including Vincent and brother Braz Sodre.<sup>29</sup>

### SHIPWRECK OF GALEO S. JOÃO (1552)

Galeo S. João left Cochin in February 1552 under Captain Manuel Sepulveda and Pilot Andre Vaz with a heavy load of 1200 tons. On the way, the ship was wrecked near Natal on 24th June, 1552.<sup>30</sup> Over-loading and worn out sails were the main causes. Unable to save the ship, the Captain, his wife and children and others landed on the shore. Later, one Alvares Fernandes narrated the tragedy and it was printed in Portugal in 1555. The accounts dealt with the innumerable hardships of the survivors in the jungles of Africa. Many were devoured by the wild animals. The survivors suffered many indignities from the Negros who even undressed the Captain and his wife who opened a whole in the ground and covered herself in the mud with her long hair. In the end, they perished. Captain Manuel buried the bodies and escaped into the jungle only to be feasted by the beasts.<sup>31</sup>

### SHIPWRECK OF NAU S. BENTO (1554)

Nau Bento left Cochin for Lisbon in fine weather on 1st February 1554 under Captain Fernao de Alvares Cabral. On 23rd March 1554, the ship reached off Moçambique where it faced a terrible storm<sup>32</sup>. The Captain tried to touch the shore in vain. Soon the vessel started sinking. "As the joy of this world are not of long duration, as especially those of sailors, which depended upon sea and wind...every thing went against us". Soon boxes were thrown out and many jumped into the sea in order to save themselves. Now the sea was overwhelming and the rudderless ship broke into two parts, drowning about 150 people including Alvares de Noronha.<sup>34</sup> On 27th April 1554, there were 322 survivors and they reached Natal after walking for several days. Their plight was miserable and the natives even wounded them. In the process of crossing the St. Lucia river, many including Captain Cabral got drowned.

By 7th July 1554, they had marched for 72 days and suffered terrible privations in the journey. Now there were only 62 survivors. They were attacked by wild animals. "They were half-dead from starvation. Those who remained on the way did not know and realize that in a few hours they would die... There were often quarrels between friends and relatives over a locust, beetle or small lizard... Seeing the strangers naked, bare-foot, lost and needy, living on raw herbs, the natives persecuted them with a thousand different insults"<sup>35</sup> They spent five months like this and in the meanwhile saw a Portuguese ship sent by the Captain of Moçambique in search of ivory for Portugal. There were only 23 survivors out of 322 souls saved from the wreck. They entered the vessel and reached Moçambique on 2nd April 1555 after an year of the tragedy. On landing, they went to pray in the church. A survivor Manuel Mesquita Prestello wrote an account of the voyage and the tragic end of his own brother. This graphic narrative dealt with the tempestuous voyage and the agony of the survivors during their wandering in the interior of Africa.<sup>36</sup>

#### SHIPWRECK OF NAU NOSSA SENHORA DE CONCESSÃO (1555)

The nau left Belem for India with Captain Francisco Nobre and Pilot Afonso Pires.<sup>37</sup> They sighted the Cape of Good Hope on the 18th July 1555 and proceeded further off the island of Medagasker in the direction of India when they saw green water indicating the sign of a sand-bank. Soon the vessel dashed against it and got stranded on the bank of the island of Pero dos Banhas.<sup>38</sup> Some people jumped and swam across to the island. 154 persons perished in this tragedy. Captain Nobre, Pilot Pires and some other sailors went in a batel. On the island they made a small ship and the newly selected Captain Alvaro de Athiade went in it to India promising to send help. The survivors remained there for about five months with no help. They made another small ship and left for India on 1st April 1556 without a Captain or Pilot but with 27 survivors and they reached Cochin in January 1557.<sup>37</sup> It included Manuel Rangel who wrote an account of the tragedy.

### SHIPWRECK OF NAU AGUIA AND NOSSA SENHORA DE GRAÇA (1559)

The nau, the largest ship of the India voyage (1000 tons) left Cochin for Lisbon late in January 1559 under Captain João Rodriques de Carvalho.<sup>40</sup> On 20th January 1559 also left from Goa for Portugal a smaller ship Aguiã, carrying ex-Governor Francisco Barreto. When both vessels were about 230 leagues from the cape of Good Hope in March 1559, they faced a storm.<sup>41</sup> As the water began to gush in, Nau Garça forcelanded at Moçambique. Nau Aguiã with Barreto was caught in rough winds near Natal but escaped narrowly and reached Moçambique by April 1559 and met nau Graça there. Both the vessels remained there for over seven and half months for repair and then sailed from the cape of Good Hope on 17th November 1559. Soon the water started gushing in the nau Aguiã and hence all efforts were made to pump out water and continued the voyage. Surprisingly, nau Graça also developed a leak and therefore requested for help from Aguiã. Governor Barreto went in a Manchua to nau Graça and collected all its people on his nau and abandoned Graça.<sup>42</sup>

Aguiã sailed to the Cape with an unusual crowd of 1137 persons and soon again faced a storm. Now it was decided to proceed to Moçambique but the vessel dashed against a rock. Still it managed to move on and force-landed at Moçambique on 17th December 1559 for the second time. Captain Rodriques of nau Graça died of sorrow. In March 1560, Ex-Governor Barreto left back for Goa in a fusta and reached there on 17th May 1560. Aguiã was repaired and left Moçambique for Goa on 1th August 1560 under new Captain Bastiao. Desa. But again it started leaking and had to be force-landed at Mombassa where it was dismantled. An account of this tragedy was written by Manuel Barradas, a Jesuit father.

### SHIPWRECK OF NAU SANTA MARIA DE BARCA (1559)

Even before its voyage to India commenced, the vessel developed a leak and hence it was fully off-loaded and the nail

hole found in the keel was caulked with great difficulty.<sup>44</sup> On its return voyage, the vessel left Cochin on 19th January 1559 for Lisbon under Captain Luis Fernandes de Vasconcellos. While it was near Medagasker, water began to flush in and it was not possible to proceed. Some persons jumped out and swam shore and others were sent in a batel. The Negros helped the survivors in the island of St. Maria and gave them food and cloth.<sup>45</sup> But by the middle of April, they saw two ships coming from Moçambique and they returned to India in them. An account of the mishap by an anonymous person was published in Lisbon in 1566 and it showed the courage, perseverance and fortitude in the midst of unbearable privations of all kinds.

#### SHIPWRECK OF NAU S. PAULO (1561)

Nau S. Paulo left Belem on 25th April 1560 with Captain Rui demello de Camara and Pilot Antonio Dias. On the 14th January 1561, while near Sumatra, it faced strong winds, thunder and rains and it seemed that every thing would perish soon. The masts were broken and sails were torn and the vessel got stranded on a rocky island.<sup>46</sup> The prow was under water. On 22nd January, the vessel was finally broken. The survivors made a small vessel with the locally available wood and left on 20th March. Soon they faced strong winds but managed to reach Sunda on 27th April and here they remained for 26 days. It is said that 12 persons died of over-eating!<sup>47</sup> Later, they left for Malacca where twenty died and from there they proceeded to India.<sup>48</sup> Among the survivors was Francisco Paes, the Chief Accountant of Goa and Henriques Dias who wrote an account of the tragedy. It was published in Portugal in 1565.

#### SHIPWRECK OF NAU SANTIAGO (1585)

Nau Santiago left Lisbon for India on 1st April 1585 under Captain Ferrão de Mendonça and Pilot Gaspar Gonçalves.<sup>49</sup> On the way, it faced a storm. But soon it cleared and the vessel managed to reach Guinea coast. On 12th July 1585, it

reached the cape of Good Hope and Natal. When it reached 'baixes de India' (rock of India), it got stranded killing twelve people. The vessel was broken on the flank and the batel was thrown out.<sup>50</sup> The people of the vessel landed on the rock but many got drowned during a high tide. From the over-crowded batel itself, seventeen persons were thrown out. The survivors were treated badly on the shore by the natives. They left the place on 16th November 1585 and reached Moçambique on 3rd February 1586.<sup>51</sup>

### SHIPWRECK OF NAU ST. THOME (1589)

Nau St. Thome left Cochin in 1589 under Captain Estevão de Viegas and Second Pilot G.F. Reimão. On the way, it sprang leak and water began to gush in. After minor repairs, the voyage continued. But again there occurred bigger leak at the stern below the sleepers due to faulty caulking. Soon the crew tried to stop the leak by large nails and other things, plugging the space with sacks of rice in order to make a sticky substance. This was useful to some extent and the voyage continued and they reached near Natal. But it started leaking again. There was utter confusion on the ship and every thing was thrown out into the sea so as to clear the hatches. The water level began to rise above the ballast in spite of round the clock effort to pump it out. Soon the ship began to tremble. Therefore, it was decided to touch the nearest land. But the water level was still increasing because the pump got blocked with the pepper which went into the hold. The orlop deck was covered with water and the sails were torn with violent storms. "Every thing was against them...and every thing represented death to them, for beneath they saw a ship full of water and above them the heaven conspired against all, for the sky was shrouded with the deepest gloom and darkness."<sup>52</sup> Now it began to rain heavily. Sighs, groans and prayers rent the air. With great difficulty, they launched the boat when the ship was violently rolling in the water. People threw themselves into it like maniacs and it was so packed that there was the danger of it being foundered.<sup>53</sup> While the boat was moving, some six persons were thrown out of it in

order to reduce the weight of the ship and to avoid a wreck. There were 104 persons in the boat. Rowing also was difficult because of the opposite currents. Those who remained in the ship started reciting littonies loudly and soon the ship was under water. Now some slaves were thrown out of it only to be swallowed by the waves. The ship sank in, witnessed by those in the boat. Ninety eight survivors landed and they set fire to the boat in order to collect its nails which were very much liked by the Negros. Second Pilot G.F. Reimão narrated the account of the disaster and Diogo the keeper of the Torre de Tombo wrote it out in 1611.<sup>54</sup> The account of this tragedy which took place at the *terra das fumas* (land of fumes) dealt with the trials and tribulations of the survivors.

#### SHIPWRECK OF NAU SANTO ALBERTO (1593)

Before the vessel left Portugal on 21st January 1593 under Captain Julio de Faria de Cerviera and Pilot Rodrigo, the shipwreck account of nao Thome (1589) was read out to the crew at the harbour by one Nuno Velho Perrira in order to warn them of the possible dangers.<sup>55</sup> On the way, the vessel developed a leak near Natal and water gushed in through the fashion pieces of the stern under the floor timber. It was repaired. Now in order to reduce the weight of the ship, the main hatch was cleared of all the water kegs and every thing from the gun deck and spice holds were thrown out. The pumping process continued for the whole day but even the pumps became unserviceable. In the morning, when they sighted the land, they threw every thing, set up the top sail, main sail and spirit sail in an all out effort to touch the shore quickly. However the ship had grounded on 24th March 1593 and broke into two and the deck broke loose. Those who knew swimming dived into the sea and escaped. Sixty two people out of 275 perished in the tragedy.<sup>56</sup> An account of this shipwreck which took place at the 'Rock of Springs' near Natal was written by Cosmographer Lavanba from the personal notes of the Pilot but verified by Nuno Velho Perriera, a survivor of the tragedy.<sup>57</sup> The narrative was to serve as a guide for the future and it dealt with the experience of the survivor of 100 days of

march. It provided a lesson as to how to behave in such cases, the route to be followed and avoided, the general precautions, ways of disembarking with least danger and causes for the shipwreck etc.

Nau Chagas under Captain Antonio demelo de Castro was destroyed in 1594 on its maiden voyage. Melchoir Estacio de Amaral wrote a faithful account of the tragedy after examining the various survivors. In 1596, nau S. Francisco met with a tragedy on its way to India under Captain Vasco de Fonseca. Fr. Gaspar Afonso S.J., a survivor wrote an account of the disaster.

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## SHIPS OF THE INDIA VOYAGES, THEIR ARMAMENTS, EQUIPMENTS AND ACCESSORIES

The 14th century was a century of armadas of naus and gales both of which made a perfect naval unit. It was a golden age for naval construction in Portugal.<sup>1</sup> In the 15th century, the Portuguese shipbuilders made great progress especially in the construction of caravelas and it culminated in the discovery of a sea-route to India. In fact, the period from 1519 to 1559 was one of great activity in shipbuilding.<sup>2</sup> As the 16th century opened, construction strategy had progressed and several models were adopted in place of caravelas. A new type of round-ship was invented and Vasco da Gama himself had availed of it in his historic voyage to India. Since it was recognized that ships of larger tonnage were not advisable for risky voyage in the unknown seas of India, Gama reshaped the caravelas by maintaining bigger tonnage but reducing the size.

National prestige as well as security demanded that every king possessed at least one large-size ship. Besides fitting a fighting navy, Portugal maintained merchant-ships for over two centuries up to 1650. Naus and gales were built in the docks

for carrying huge quantities of merchandise. Merchantships of over 1000 tons were not unknown and the cargo justified their size. Modification of the existing types and introduction of new types greatly accelerated the activity. Many experts like D. Antonio de Athiade studied the problems of shipbuilding and Padre Fernão de Oliveira, a naval architect wrote a treatise on shipbuilding for the first time.<sup>3</sup> Later, Cosmographer J.B. Lavanha composed a work of this type. The 16th century was a crucial one in the development of fighting vessels. The designs of warships also went on changing to meet the new situations and conditions.<sup>4</sup> The purpose was to improve the speed and manoeuvrability of the vessels. Castles were built solidly in order to face the battles. The new warships relied on their sailing qualities, manoeuvrability and gun power. In fact, the construction of ships and their equipment for the India voyage was a special interest to the Portuguese authorities who were aware of the contemporary advance in naval matters and the importance of guns and gunnery. They did much to improve the fire-arms and send several fleets of the new type to India for several purposes.

The Portuguese navy represented a vast variety of ships especially because of their power of adoption of the practices of other people. The early Portuguese vessels were fishing boats, quite modest and deficient in nautical details, but they went on changing little by little and improved.<sup>5</sup> It is quite difficult to identify the various types of ships used in the remote times. The early chroniclers referred to the common ships of those times bearing peculiar designations with no description, as it was unnecessary then. Some times, native names, designated the ships commonly used by the Portuguese in different places and some times resulted from oral corruption. The earliest glossaries of Portuguese language did not record large number of varieties of ships which were known earlier, so much so that now it is difficult to find them out.<sup>6</sup> Many names were forgotten during the two or three centuries.

A total of 167 varieties of ships can be inferred from the references of chroniclers of Portuguese navigators and other documents. Some of the important types are the following :

- (1) Albetoça (Albitoca)
- (2) Almadia (Almadya)
- (3) Baixel (Baxel)
- (4) Blanco
- (5) Balandra
- (6) Balao (Balio, Balo, Ballio)
- (7) Barca (Barcha, Barqua, Bartscha, Burcia)
- (8) Batel (Batell)
- (9) Barcone
- (10) Batelao
- (11) Bergaintim
- (12) Bote
- (13) Brulote
- (14) Calamute (Calemute)
- (15) Candura
- (16) Canoa
- (17) Caravo (Carabo, Carabia, Carrabi, Carevo, Carrebo)
- (18) Carraca
- (19) Carvela
- (20) Catamarao
- (21) Catur (Cathur, Caturo, Catury, Catur, Cauturra)
- (22) Escuna
- (23) Falua
- (24) Fragata (Frigate)
- (25) Fusta
- (26) Gale (Guale, Gualle, Gallee, Gaolle, Galee)
- (27) Galiota (Galeota, Galleota)
- (28) Galeao (Galleota, Galiao)
- (29) Galeaca
- (30) Nau (Nao, Nao)
- (31) Naveta
- (32) Pangaio (Pangayo, Pangjao, Pangajoa, Pangaciaoa)
- (33) Parangue
- (34) Parão (Paro, Paraao, parabo)
- (35) Patacho (pataxo, pataixo, patax, patage)
- (36) Ptamarim
- (37) Pinaca (Pinasa, Pinaze)
- (38) Taforea
- (39) Urca (Hurca, Huquer)

(40) Varinel (Berinbel)

(41) Zambuco

(42) Zambuquinho

### **Albetoça and Almaida**

Albetoça was a vessel of Indian origin but the Portuguese used it for pleasure trips.<sup>7</sup> Almaida was originally an Indian vessel 80 feet long, six to seven feet broad with pointed ends, sailing with sails and oars at high speed. The Portuguese availed this light model and modified it by adding an '*esporao*' to the prow. Almaidas were sent from Goa for the second siege of Diu in 1546 in spite of the stormy monsoon.<sup>8</sup>

### **Baixel, Balanco, Balandra, Balao, Barca, Batel, Batalão, Bregantim and Bote**

Baixels were small vessels of moderate size, below 25 tons, used for exploration and reconnaissance of river bars. In course of time, the name 'baixel' was generalized to mean different kinds of vessels. In India, they were called baixeis when their hulls were little high above the water-line. Duarte Pacheco was attacked with about 250 baixes in the battle of Cochin in 1504.<sup>9</sup>

Balanco was a vessel of Asian origin used by the Portuguese probably at the service of larger ships of the fleet. These light vessels moved by spade-oars were suitable for easy landing. Its lightness helped the Portuguese to chase their enemies. They were often used in the operations of Malacca strait, especially to conquer Bantao in 1526.<sup>10</sup>

Balandra derived its name from English 'bi-lander' and hence this vessel was used for coastal navigation. It had a deck and the larger balandras were about 80 tons and equipped with a crew of 3 or 4 sailors and used for transport of cargo.

A small and light vessel moved usually by oars, Balão looked like an Almaida and like it moved with sail. It had

a pointed shape at the ends like a half-Moon. Though its exact size is not known, it could carry 12 gun-men besides the crew. Usually the balaos were used for in the service of naus in which they were housed during the voyage. A balao had salvaged 90 men from the shipwreck of nau 'S. Joao de Gama' on its way from Malacca to Goa in 1550.<sup>11</sup>

Barca was a fragile vessel of small tonnage (10 to 30 tons) with one deck and ordinarily with one mast crossed horizontally by one rod on which a large quadrangular sail was fixed.<sup>12</sup> The rear and prow were pointed. The word 'barca' was derived from 'barge', a small vessel meant for coastal navigation for transporting merchandise and for loading and unloading of ships at the ports in the Indian sea. Batalao was a big barca used for the transport of artillery etc.<sup>13</sup>

Batel was used for cargo and fresh water for the ships and occasionally for fighting purposes.<sup>14</sup> It was placed in the middle of the nau and in a caravela, it was laid across from the board to starboard. Thus batel formed an integral part of a nau or a caravela.

The Portuguese Bergantim was a magnificent vessel commonly used for the transport of dignitaries. It was a small, light ship of small tonnage with two lateen masts and one deck and was suitable for fighting purposes. This oar vessel was usually used as an advice-boat (aviso) of a fleet and looked like a gale.<sup>15</sup> Captain João de Nova commanded a bergantim in the first naval battle of Diu in 1509. 'Ladrao' was a famous bergantim of the 16th century and it cruised the Indian waters for a long time under the command of João Vaz Serrao.

Bote was an oar vessel used in rivers and at ports for communication with larger ships, though some times, it was taken for conquests also.<sup>16</sup> Usually, it had a small sail.

#### **Calamute, Candura, Canoa, Caravo, and Carraca**

Calamute was originally a vessel of the Malabar coast and was used at the service of larger ships. The fleet of Estevão de Gama to Suez in 1541 had one Calamute at the

service of a gale.<sup>17</sup> Candura was a small ship adopted by the Portuguese from the sea off the Maldives island.

Canoa was originally a small vessel of single piece carved from the trunk of a tree, but later it had a complex structure. It was moved by oars and was used for communication between the coast and an anchored ship.

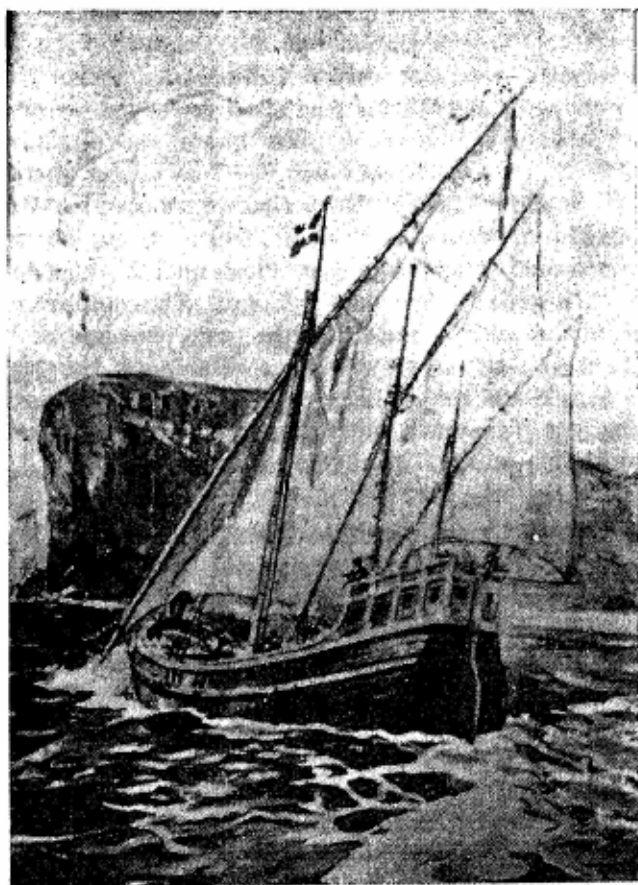
To start with, Caravo was a Muslim vessel used for trade purposes and some of them carried 60 horses besides a crew of 30. It had lateen sails with one or two masts and usually one deck.

Carraca was a merchant ship of considerable size and was the largest round-ship sailing in India. Such a large vessel was unable to float without a depth of less than 60 feet of water. It had seven to eight big decks and could carry up to 2000 people. The stern and prow were higher than the upper deck, thus forming two castles raised on the ends of the ship. Between the two castles, there was a two-storeyed platform or veranda. From the cock-pit to the upper deck, its height was about 10 meters and from the front to the rear about 15.5 meters.<sup>18</sup>

### **Caravela**

As the Portuguese began to sail further south in the Atlantic, they had to face several problems. There was delay for return because the north-westerly wind still persisted. The slow return was an adverse factor because of the limited provisions. There were also the problems of the safe transport of cargo, availing of the monsoon winds for sailing and laying aground the vessel without damaging its hull. The Portuguese had to keep themselves abreast of the times and for this, there arose the need to design a new vessel of 50 to 100 tons to be equipped with new gadgets which could carry heavy guns in an age of artillery warfare, but at the same time to maintain speed and mobility also. The caravela was made exactly for this purpose. Its prototype which was brought from Venice by D. Pedro in 1428 might have taken twelve years to perfect it.<sup>19</sup>

Caravela was the symbolic ship of discoveries and it had



*Fig. 23. Caravela*

an important place in the history of the Portuguese maritime architecture and naval aesthetics. It remained as the most important ship of the explorers in the 16th century. The caravela came from *caravo de vela* or *caravo velu* or *carabela* (pretty face) or from the Latin *carabus*.<sup>20</sup> There are different opinions about this peculiar Portuguese vessel and its features. The caravela was first used in Portugal in 1255 and then it was little bigger than a boat used for fishing



operation and coastal navigation. It was a small vessel of about 50 to 100 tons with a speed of about 7.5 kms. Until 1434, caravelas were not used for discoveries. Prince Henry sent two caravelas in 1440 for the discovery of the mysterious African coast and it was the earliest known use of caravela, sailing away from the continent.<sup>21</sup> They were the best sailing ships afloat during the period of discoveries. But as time passed on, this primitive caravela went on increasing in its dimensions, tonnage and nautical qualities and finally evolved the classical Portuguese caravela. This improvement gave more and more comfort for the crew and now it was possible to beach the vessel for careening or for repairs with minimum difficulty. Later, its structure was altered by providing the fore-mast with round sails, perhaps under the Spanish influence.<sup>22</sup> The number of masts was also reduced to two or three.

The caravela which was a characteristic ship till the beginning of the 16th century was a light, long but solid ship with tonnage below 200 and with exclusively triangular type sails. The triangular structure of the sails came from the Indian Pangaios with which the Muslim merchants carried their goods to Red sea.<sup>23</sup> Caravela made better use of the wind and could sail with beam-wind even when it was coming from off the bow and thus was able to face the natural calamities of the sea for the first time in naval history. It was found suitable for long distance reconnaissance voyages as its closed decks protected the cargo from high sea waves. It could easily manoeuvre in the foggy shores and was stout enough to withstand a stormy voyage. Caravela had the hull shaped on the model of a fishing boat and it differed from other ships.

There were two types of caravelas—latten caravelas and round caravelas. The latten caravela usually had a latten mast and the main mast of the round caravela was round. Round caravela with a tonnage of 150 to 200 were common in the 16th century.<sup>24</sup>

In 1498, Bartholomeo Dias rounded the cape of Good Hope with three caravelas. During 1488-1499, as much as 56 caravelas left Lisbon on voyages and it included the well

known caravela 'Beira' which Vasco da Gama used in his historic voyage to India.<sup>25</sup> During Gama's second voyage in 1502, 'caravela Pomposa' was built in India.<sup>26</sup> Since then, caravelas started to use round sails beginning with a foresail mast for long voyages in order to face the storms. On arrival in India, lateen sails were restored because they were lighter and more suitable for sailing frequently in the Asiatic seas. In 1512, Afonso de Albuquerque ordered the construction of a small caravela of 40 tons and his own armada to Dabul in that year had six caravelas.<sup>27</sup> They were used in the expedition of Malacca also. A large number of caravelas with latten sails were seen in Diu during the action of 1538. The caravelas went on changing so much that it still continued to be a grand ship for two centuries. They lost their basic features and found to be inadequate and therefore were not in use from the mid 17th century.<sup>28</sup>

Being the exclusive ship of discoveries, the caravela was kept as a monopoly by the Portuguese. They expressly prohibited selling of the caravela to foreigners and prevented others from acquiring it. King Manuel issued a decree on the 10th May 1520 which clearly laid down that "we order to prohibit that any person should sell caravelas to foreigners and should go abroad to build them."<sup>29</sup>

### **Fusta**

Fusta was a long and flat ship moved by means of lateen type sails and oars with one or two masts, generally able to carry 300 tons and was meant for cargo and war.<sup>30</sup> They were used in the East for war expeditions. Fusta had ten to twenty oars on the two boards and in the middle was a mast with lateen sail. Fustas were built in the shipyard of Goa and other ports.<sup>31</sup> They had no deck and as such water was stored under the net (*xarreta*) and the provisions in the movable store rooms at the waist (*amurada*). Diogo Botelho Perrira sailed in a fusta in 1535 from Cochin to Lisbon with the news of the foundation of the fort of Diu. Similarly, in 1542, the fustas of Manel de Vasconcellos sailed to spy the Turks and in spite of being chased by the Turkish vessels, they managed to reach

Goa to inform that the Sultan of Turkey was preparing a fleet to attack the Portuguese fort of Diu.

### Gale, Galota, Galieao and Galeaca

Gale was a battle-ship of small tonnage with triangular lateen sails. It had 25 to 30 oars each side with 3 men for each bench. A gale had usually 25 to 30 benches with 5 to 6 rowers on each bench. Normally, a gale was about 25 palms long and 30 palms wide and had two masts and two lateen sails.<sup>32</sup> There were two types of gales – *gales sutil* and *gale grossas*, and they differed from each other in their length and tonnage. Gale sutil had in the middle only one lateen mast and some times at the prow, a small mast with a banner sail. Gale grossas had three lateen sails. Their sails showed insignas of the Order concerned. Royal gales were longer and carried the Chief of the fleet and the bastard gales shared lateen and

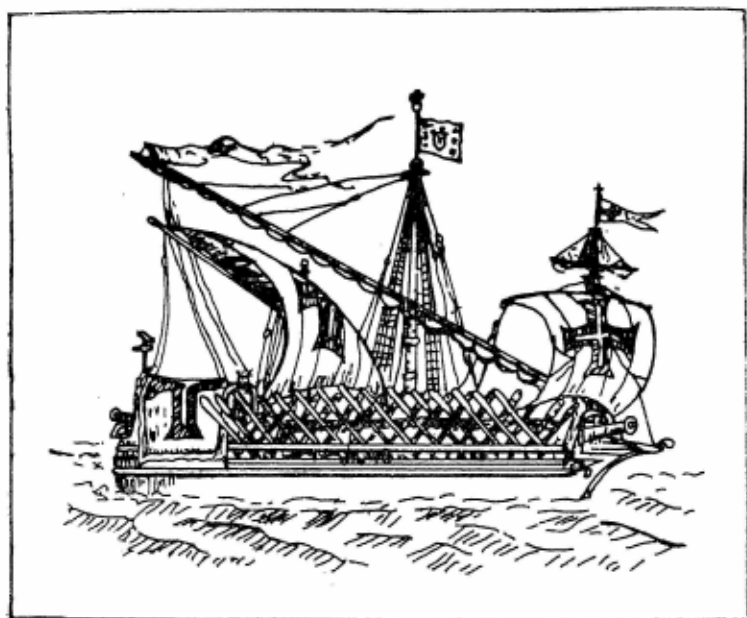
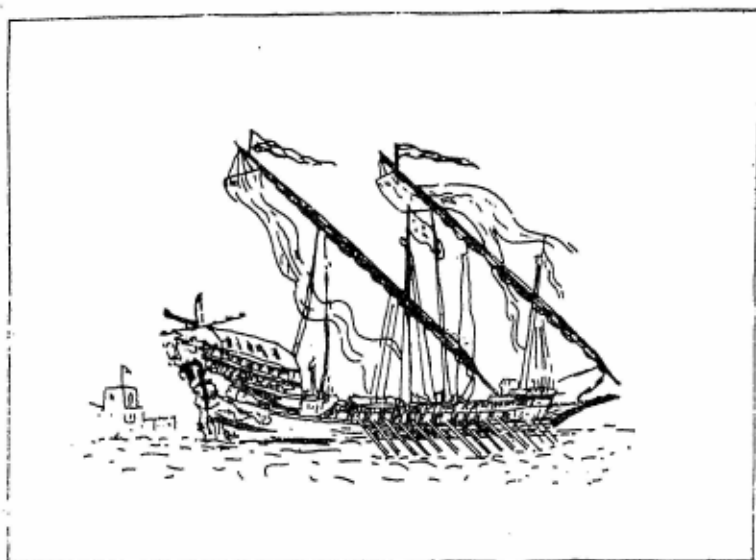


Fig. 24. Gale.

round structure.<sup>33</sup> The tendal of the rear bearing the Captain's sign, showed either a cross of Christ or the armillary sphere of



*Fig. 25. Gale.*

king Manuel. The predominant colours were green, red and yellow. The Portuguese gales of India are found drawn in Castro's roteiro from Goa to Diu and elsewhere. Gales required a large number of rowers and therefore many slaves condemned for "serving in the gale" and slaves were availed of. In large gales, there used to be 200 to 300 men-at-arms.<sup>34</sup>

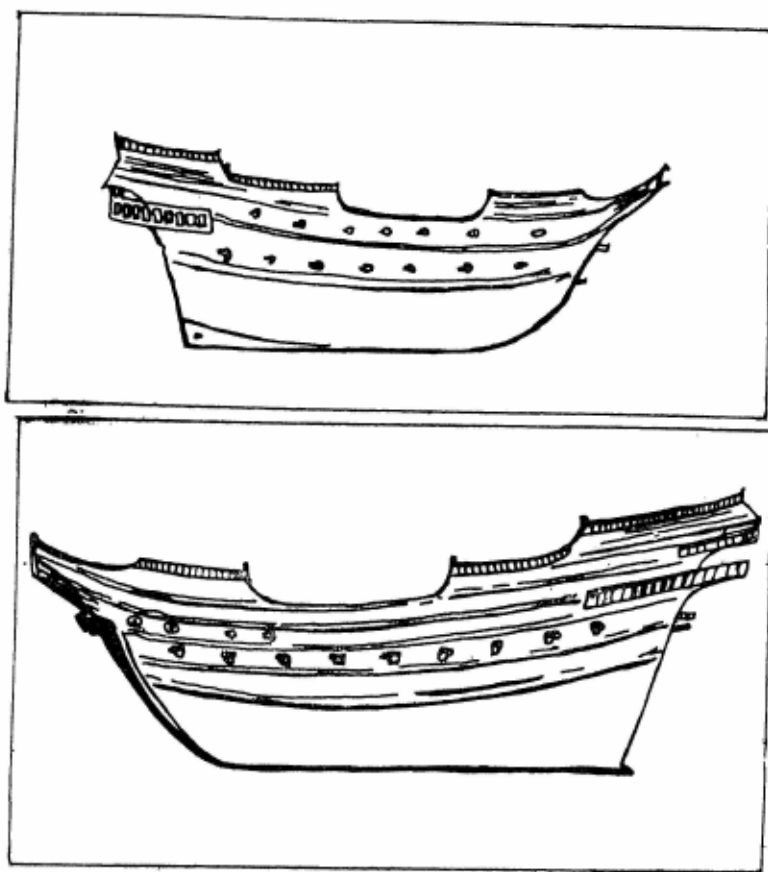
Galiota was a sail boat of complicated structure and it was a war ship. It had lesser dimensions than a gale. Since the vessel was very high, its speed could be increased by using one or two lateen masts. The galiota had 15 to 20 benches on each side with one man at each oar.<sup>35</sup> The Galiota were fully utilized by the Portuguese. It was bulky from the stern to the prow.

Galeao came when larger vessels were needed for transport. It was not originally a Portuguese ship, but they adopted it. It was basically a fighting ship, lighter and handier but more heavily gunned.<sup>35</sup> In the beginning it had a small tonnage, but

later increased the tonnage and acquired sails. The tonnage ranged from 100 to 1000 as in the case of 'galeao Piedade' and 'galeao St. John Baptista'. A galeao had usually two decks with a prow. The number of sail was not definite. The bigger galeao had four masts, two round ones in front, and two lateen in the rear. Galeao was the big vessel of the *Carreira da India* and solid with heavy artillery built for war.<sup>37</sup> It could easily cut waters and sail faster because it was bulky in the front and



Fig. 26. Galeao Trindada.



*Fig. 27. Models of Galeao*

narrow in the rear. Galeao St. Martinho, St. Mathew and Santiago were all well known. In 1531, Governor Nuno da Cunha's main ship for the bombarding of Diu was galeao St. Mathew which had 22 pieces of artillery. On 17th October 1546, twelve galeaos with the main galeao St. Diniz left Goa under João de Castro for the Diu operation.

Galeaca was the biggest of all oar-boats with sails and oars with three lateen masts which could not be lowered. It had 32 benches with 6 to 7 prisoners of war for each oar. Galeaca

was the largest sailing ship in the sea and could carry about 1200 men. Their strength obviously decided the lot of the battles.

### **Nau**

Nau was an elegant vessel and the Portuguese brought it to



*Fig. 28. Nau of the end of the XV Century*

its most spectacular development in the *carreira da India* in the 16th and the 17th centuries. The *roteiros* of Castro, the *Esmeraldo* of Duarte Pacheco etc. give descriptions of a nau.

The early nau had a small tonnage of 100 to 120 tons. They had two decks, the first one extending from the rear to the front containing the cargo-hold, store room for water and provisions, cables, cloth and gun powder etc. The second deck in the upper deck at the prow had at the rear the Captain's quarter deck (*tolda*) covering the castle of bombardeiros.<sup>38</sup> A nau had three masts—the foresail mast on the upper deck, the main mast in the middle and the maizen sail mast. The sails carried inscriptions like Ave Maria, Ave

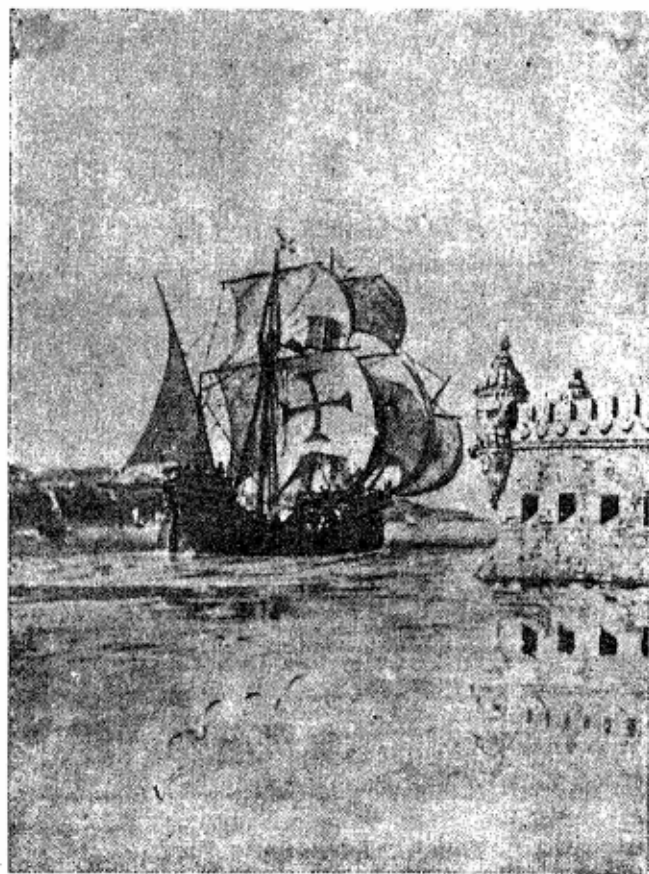
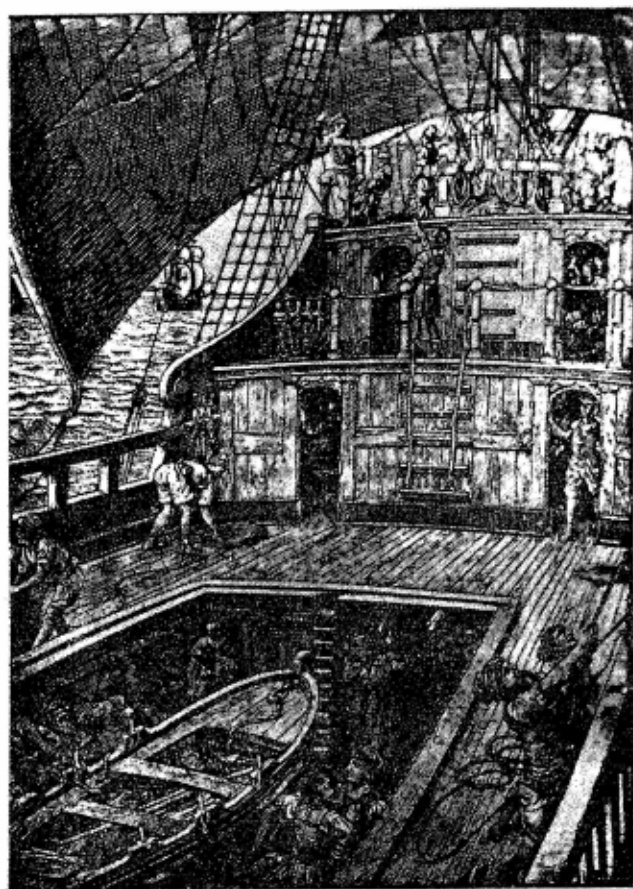


Fig. 29. Nau

Maria Stella, In hoc Signo Vinces, Padre Nossa Gloria Patria.



It was the custom to display the nationality on the sails with the coat of arms and the cross of Christ in red design. A nau did not exceed over 400 tons in the beginning, but it reached 900 tons under John III who encouraged ship building activity during 1521-1557.<sup>39</sup> In course of time, nau became a large merchantship with 3 or 4 flushdeck, a high poop and forecastle,



*Fig. 30. Interior of a Nau*

but highly gunned for its size. By the end of the 16th century, it reached even over 2000 tons and hence were the largest ship afloat. Viceroy Constantinho Bragança built 'nau chagas' at

his personal expense and it rounded the cape of Good Hope twenty times. Other well known naus were Graça, Rainha, Tigre, Castello, Nossa Senhora de Nizare and Madre de Deus.

Nau S. Gabreil in which Gama sailed to India in his historic voyage was a typical ship of grand appearance and irregular shape. The ship was built with great care mainly in respect of solidity and safety. But not much heed was placed on its speed and therefore the voyage to India took over a year.<sup>40</sup> Thick pine wood was used as the timber. The bottom was caulked and coated with pitch. The upper pavements and waist (*amuradas*) were caulked and then oil-painted.<sup>41</sup> The nau was 19.5 meters long on the floating line, 25.6 meters from one end to another and 8.5 meters at the largest breadth (*boca*). The vessel immersed 2.3 meters at the rear and 1.7 meters at the front. The capacity was 100 tons which meant 178 metric tons of capacity when fully equipped. The total floating area was 121 square meters.

On the front, the nau had a castle (*deck*) and on the rear the different pavements and the prow rose over the floatation. The stern was considerably raised above the water line. This structure gave the ship a great floating power and strong build, but very deficient in nautical details. The hold (under the deck) was divided into three parts. In the middle, there were tons of water, over which were placed the coils of flax cables. At the rear, there was a gun-powder store and other items like stone and iron balls. The front compartment was for storing nautical equipments. On the deck, there were two screens (*anteparas*) to make the compartments to house provisions and spices, articles for exchange and gifts. In the middle space, there were balconies which sheltered the crew. On the first pavement over the deck, were the rear and front castles with the batteries and over the rear castle, there was another castle also with artillery, housing the Captain's cabin.

The rigging of the vessel consisted of three masts. It had a white flag with the coat of arms of King Manuel I. There were six sails, main sail, fore sail, mizen sail, sprit sail and two top sails.<sup>42</sup> From the top sail, a red flag hanged as a sign of the ship of the Chief-Captain. In order to increase the area of the sails, some cloth strips were sewn to the lower part of the

main sail and fore-sail and they were called the bonnet sails. The height of the sail was 11.9 meters and the total area of the sails as 371.7 square meters.

#### **Pinaca, Potacho, Taforea, Urca and Varinel**

*Pinaca* was a light and narrow vessel with oar and sails with three masts and a square stern and was used for reconnaissance and disembarkation of people on land. *Potacho* was a light merchantship or warship with two masts, used by the Portuguese to guard the entrance of ports, to explore the seas and for naval reconnaissance.<sup>43</sup> *Taforea* was a transport ship mainly intended to carry horses. It had a wide door at the stern which enabled 20 horse men to come out.<sup>44</sup> *Urca* was a cargo vessel of low speed, with flat ribs (*caverna*), broad on the flanks and rounded in the rear.<sup>45</sup> It had two masts. *Varinel* was originally an Egyptian fishing vessel of small size and the Portuguese had adopted it later. It was an oar-rowed ship of regular dimensions and used for discoveries.<sup>46</sup> *Varinel* was bigger and larger than a *barca* and with greater tonnage. It had two masts on which quadrangular sails were used. These vessels were used for long oceanic voyages and was first used by Gil Enes in his second expedition which rounded the cape of Bojador in 1434.<sup>47</sup>

#### **Armaments on Board an India-bound Portuguese Ship**

In the 14th century, merchantship and war-ships were almost the same. The war weapons were very simple and there was no heavy artillery.<sup>48</sup> The war equipment of a ship in the 15th century was arbitrary depending upon the type of ship and other circumstances but the side arm (*arma branca*) played the main role. The main armament of the Portuguese were artillery, swords and spears. They did not use bows and arrows in the naval encounters.<sup>49</sup> Bundles of lances were always on board for defence purposes. The usual armaments of small ships were falconets, bombards, little cannons (*passa volantes*) and swivel guns (*pedreiros*). Guns loaded at breech (*culatre*)

were much in vogue and were handled by German *bombardeiros*. The commonly used missiles were stones and iron shots (*pelouros*) as was used by Cabral against Calicut in 1500.<sup>50</sup> The protective instruments included laminated leather (*couro*), coats of mails (*saíes de malhe*) and helmets. Only a few privileged Captains wore steel armour for chest. Spears, swords, cross-bows (*besta*) and axes were used either for attack or defence. Gun powder-pots and fire-clay-pots (*alcanzia*) were used against the enemy vessels.

The Portuguese developed the construction of smaller cast-bronze cannon that could be accommodated on board the ship, when they wanted to use against fortification on land.<sup>51</sup> A further advance was made by about 1500 when gun-pots were cut in the hulls. This greatly increased the number of guns that could be mounted but also the damage which could be inflicted on the enemy. Ships were provided with a lot of bombards and war ammunition. There was a gun powder store (*paiol de polvora*) under the castle of *bombardeiros*. Gama's fleet of 1497 had artillery and ammunition in great abundance, swords, daggers, spears and shields.<sup>52</sup> *Nau S. Gabriel* had three batteries, two on the main castle (top of the upper deck) at front and at rear, and one on the upper castle of the stern. The rear battery was more important both in quality and number of fire-arms amounting to each piece, four on each board. The other two batteries had three pieces of small calibre on each board and they were called as bombards. Thus *nau Gabriel* had twenty fire-arms weighing 6480 tons. The war ammunition weighed 6000 tons.<sup>53</sup>

The *naus* and gales of Cabral's fleet of 1500 were all armed with artillery in their back, upper deck and *coberta*. Cannons were kept in the Crow's net (*cesto de gavea*). Culverins, the ancient fire-arms were placed in the platform around and mid-way up to the ship's mast.<sup>54</sup> The *caravelas* were armed with light guns and thus were valuable for reconnaissance and for sounding the approach to harbour. By the end of the 15th century, bronze was already being used for artillery weapons and the *caravelas* were equipped with large calibre guns. A *caravela* of Vincent Sodre who was cruising in the Malabar waters (1503) had four heavy guns below, six *falconets* above,

ten swivel guns on the quarter deck and in the bow. His naus carried six guns below on the deck, two smaller ones on the poop, eight falconets above and several guns, while two smaller pieces which fired forward were kept before the mast. His 'ship of burden' carried a heavier armament.<sup>55</sup> A *caravela* of João Serrao in Indian waters (1504) was equipped with twelve falcons and twenty bombards.<sup>56</sup> The essential artillery pieces for five *caravelas* included eight pieces-one *camelo*, two half *esperas*, four falcons and one *berco*.<sup>57</sup>

Each *gale* had a big cannon called *coxia* and some small cannons. There were five pieces of artillery-two bastards, two of small calibre, and one which fired with a bullet of 33 to 34 lbs.<sup>58</sup> The *gale* of Cabral (1500) had seven pieces of artillery *grossas*, kept only at the bow and in the back (*costado*). Many pieces called *bercos* were placed in the *remeiros*. The small *gale* and *fustas* had two pieces of *grossas* each.

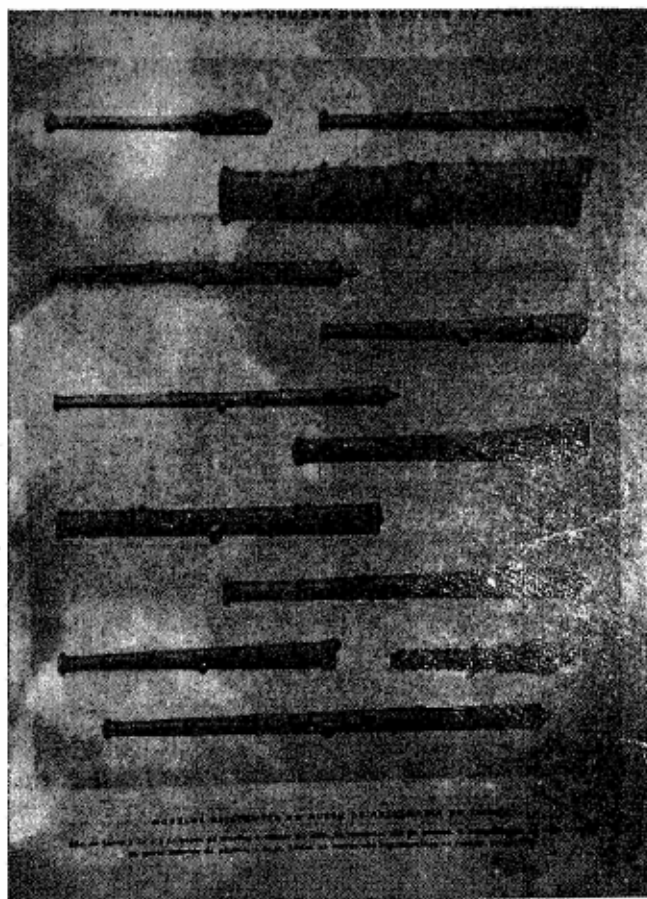
Each *galea* had twenty cannons of different calibre. It had three batteries in its prow, one having two pieces of 35 lbs of bullet, another having two pieces of 10 lbs. *Galeota* had small cannons. Later, the *galeoes* had reinforced arms, half cannons, spheres (*esferas*) and culverin in the batteries of the waist (*amurada*), fore-castle and rear-castle.<sup>59</sup> There were also other pieces like *bercos*, *sakers* and *falcons* etc.

The artillery of a *carraca* consisted of about thirty five bronze cannons. In its moveable platform (*verandah*), cannons of big calibre were kept. Besides these, it had some 18,350 kgs or, 22,950 kgs which were placed on its mast-frame (*gavea*) that could contain different small cannons.

The artillery in the various Portuguese ships in India in 1525 were as follows :<sup>60</sup>

<i>vessels</i>	<i>Number of artillery pieces</i>
Galeao Conceição (250 tons)	43
" St. George (150 tons)	28
" St. Raphael (300 tons)	50
" St. Zamorin (150 tons)	46
" St. Diniz (300 tons)	65
" St. Miguel (300 tons)	51

Galeao St. Luis	(100 tons)	28
„ Santaiago	(150 tons)	26
„ Leão	(150 tons)	26
„ Piedade	(80 tons)	28



*Fig. 31. Portuguese artillery*

Gales Bastardes	130 pieces in each vessel
3 Gales Sortis	93 „ in all
5 caravelas	85 pieces in each
6 other ships of 70 to 80 tons	16 pieces in each
5 Galeotas	75 „ „

5 Bergantims	35	"	"
5 Oar—boats	45	"	"
25 Paraos	5	"	"

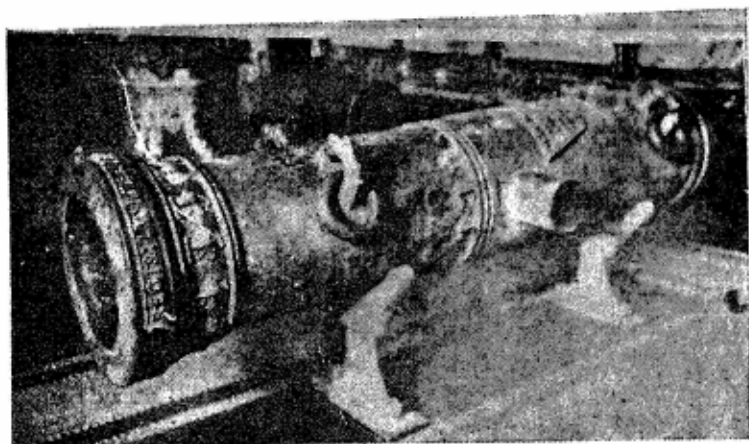


Fig. 32. A Portuguese Bombard

Thus in all, the Portuguese had 1073 pieces of artillery in India of which 667 were of copper and 406 were of iron. It was laid down later in the 1570's that merchant ships of 150 to 200 tons should have eleven artillery pieces and ships of larger tonnage were to have fourteen pieces and that less than four ships were not leave at one time. Royal regimentos were also issued prescribing that ships of India voyage should mount at least twenty eight guns of which twenty were to be *peças grossas*. But these orders were not effectively implemented by the authorities in Goa and a vessel never carried more than twenty two or twenty three guns and also a number of them were only eight-pounders.<sup>61</sup> Rules and regulations were issued for the maintenance of the armaments in a ship. The armourer of the ship was expected to overhaul the weapons on the ship every fifteen days. Recruits were to be drilled in the proper use of fire arms. When the ships reached Goa, the fire arms were to be collected and stored, because of the possibility of the soldiers deserting with arms.<sup>62</sup>

**Equipments and Accessories on a Ship**

Towards the end of the 15th and early 16th century, the ships of India voyage were provided with large quantities of materials such as three sets of clothes (*andainas*), anchors and



Fig. 33. Men-of-Arms

a large amount of cables. The hold of a caravela was filled with barrels of drinking water and was used as a store room of moorings. The masts and provisions were stored in the front store room of the ship, while the rest were stored in the rear. Gun powder was stored under the castle of the bombardeiros. The store rooms were lined with mats when it carried drugs and spices. There was a pump moved by the hand, located in the front of the mast, in order to discharge the hold and the pit of the ship. The upper deck was painted in dark colour known as *roxo-terra* which went on substituted by



yellow, black and red in the later years.<sup>63</sup> Each ship had three fixed oil lamps. The leading ship of a fleet, carrying the Chief-Captain of the fleet, had displayed six trumpets which were not considered in the tonnage of the ship. It carried a white flag of the king hoisted on the main top mast and a red banner hanging from the top sail as a sign of the Chief-Captain.

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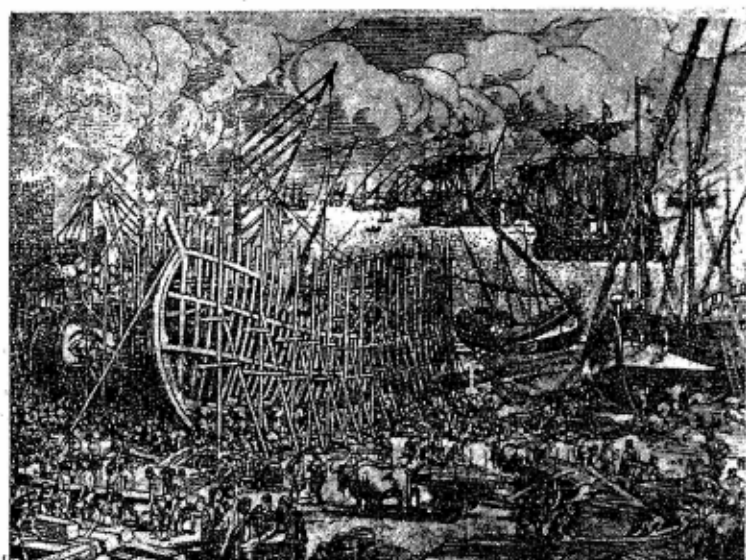
## PORTUGUESE SHIP-BUILDING IN INDIA

Even before the conquest of Goa in 1510, Governor Afonso de Albuquerque had known that there was already a naval establishment there and that the Indian native carpenters and caulkers were excellent workmen. In a letter dated 17 October, 1510 addressed to King Manuel I of Portugal, he expressed his strong desire to capture Goa because the natives were good shipbuilders, while European carpenters and other artisans ceased to be useful after about a year's stay in the hot regions of India.<sup>1</sup> After the conquest of Goa, Albuquerque again wrote to the King on 22 December, 1510 that he had found plenty of nails, iron, and a number of artisans, carpenters and labourers so that any number of ships could be built in Goa. He found in the city of Goa and in the dockyard, forty large ships, nine large fustas or pinnaces, magazines, forty heavy guns, fifty-five pieces of ordnances called falcon, pitch, naphtha, oil, steel, iron, copper, cannon balls and a variety of other articles.<sup>2</sup>

Thus it can be surmised that the Portuguese were very well aware of the desirability of building ships in India. However, there was no clearcut agreement as to whether it was better or cheaper to build ships for India voyages in India or Portugal.<sup>3</sup> In fact, from time to time there took place considerable discussions between the authorities at Lisbon and those at Goa on this subject. It was felt that Indian-made ships were certainly

stronger, but they were not always cheaper. An average Lisbon-built ship seldom made more than three or four round voyages or lasted hardly a decade. Therefore, experts argued in favour of India-made ships and the King of Portugal frequently made legislations for building ships in India itself.

A royal letter dated 22 December, 1585 and addressed to Viceroy D. Duarte de Menezes emphasized the importance of constructing ships in India rather than in Portugal. The King had realized that "it was convenient to build at your end some ships for India voyages, since experience has shown that ships built there last longer than those built in the Kingdom (Portugal) and also because they are less expensive and more



*Fig. 34. Shipyard at work*

solid and moreover shipbuilding timber is becoming short here."<sup>4</sup> Therefore, the King had asked the Viceroy to inform him whether anyone either at Bassein or at Cochin could undertake to build ships of 500 to 600 tons. In fact, this royal letter was textually repeated on 3 March, 1594 when the King wrote to Viceroy Mathias de Albuquerque that "as I am informed that at your end many ships are built which are better and

more suitable for the above voyages than those built in this kingdom, I recommend you (as already I have written to you personally) to acquire some ships built by private persons, which should be new and good, suitable for the said voyages and for others..... The King of Cochin possesses in his kingdom a great quantity of timber and artisans, in case you think the construction of ships by the intervention of the said king will be less expensive than through any other person, you are advised to avail of his services to build the ships....."<sup>5</sup> In 1596 and even later also, the King had ordered the construction of two *naus* every year at Cochin, if possible, because the teak there was superior to that of the North (Bassein). If this was not practicable, then at least one *nau* was to be made yearly at Cochin and the other at Daman or at Bassein. The specific amount sent out every year from Portugal to India to defray the cost of ships was on no account to be diverted to any other purpose until such time when the 'Carreira da India' had enough ships. But this was an optimistic expectation and was not fulfilled.

The main shipbuilding centres of the Portuguese were Goa, Bassein and Cochin and to some extent Daman. But the great royal dockyard and arsenal at Goa was probably the most highly organized naval enterprise during the Portuguese heydays in the East.<sup>6</sup> The shipyard of Goa received successive names of *Ribeira*, *Ribeira das Armadas*, *Ribeira das Naus*, and finally *Arsenal de Marinha* (Naval Arsenal). Between the city of Goa and the river bank, there were three large dockyards.<sup>7</sup> The main dockyard on the western side of the city was the *Ribeira de Grande* or *Ribeira das Naus*. In this dockyard, there were important public institutions like the Mint (Casa da Moeda), Gun Foundry (Artilharia), Ammunition and Gunpowder factory, etc. It minted coins, manufactured artillery and also made all other hardware for ships for the State fleet and for the private traders. Next to this dockyard and nearer to the wharf of St. Catherine, there was the *Ribeira das Gales* (Dockyard of Gales). All the merchandise meant for ships sailing for Portugal were loaded in this dock. All the berths of this dockyard were well-built and the steps were of stone. Then there was the dockyard of the Viceroy's Fort (*Cais de Fortaleza*

*do Vice Rei*). Immediately after the conquest of Goa in 1510, its shipyard was placed under the supervision of a Factor.<sup>8</sup> But with the expansion of the Portuguese empire, it was placed under a Treasury Intendant (*Vedor de Fazenda*). In 1526, Vedor Afonso Mexia framed rules for its proper management. In 1753, this establishment with a great portion of shipping got destroyed in a devastating fire. Therefore, by means of a royal order (*Alvara*) dated 28. 4. 1713, it was rebuilt.<sup>9</sup> Subsequently, it was improved considerably and its designation was changed to the *Arsenal de Rebeira de Naus* and the post of Vedor was abolished. It was put under the charge of Intendant of the Navy (*Intendant de Mrinha e Armazem*).<sup>10</sup>

The Goa shipyard produced ships which aroused the admiration of even the Dutch. The shipyards in India turned out some stout ships. The most famous India-built ship was *Nau Cinco Chagas* constructed at Goa by Viceroy D. Constantino de Bragança in 1559-1560. She served in the India-voyage for twenty-five years and made nine to ten round-trips apart from other voyages and was the flagship of five Viceroys before ending her days in Lisbon.<sup>11</sup> Another celebrated ship built in India was *Galeao Bom Jesus*. Even though she did not make any voyage to Portugal. It was "one of the noblest vessels" seen by the traveller Peter Mundy. It had a complement of six hundred mariners and soldiers and mounted sixty four guns. The Ethiopian Patriarch Afonso Mendes found it "as the finest ship afloat on the sea today with her built and strength for she has sixty-four guns all from 18 to 30 lbs calibre."<sup>12</sup> *Nau Madre de Deus* was a huge ship built in India with three closed-decks, seven storeys, a main orlop, a fore-castle and a spar-deck of two floors and it measured 16½ feet from beak to stern and about 47 feet across the second 'close-deck'.<sup>13</sup> During the 16th and 17th centuries, the Masters in the Goa shipyard were Portuguese and some of them who built *Galeao Bom Jesus* and *Nau S. João Baptista* were as good as any in the world. In the later days, the cost of shipbuilding and repair in India rose sharply and due to this and many other reasons such as the superiority of the European cordage etc., the majority of the India-bound ships continued to be made in the Lisbon yard.

### Wood for Shipbuilding

Before teak was used for shipbuilding purposes, the Portuguese commonly used oak and pine wood. Oak was the most resistant and least corruptible timber for shipbuilding and therefore it was used in all parts of the ship such as floor, internal and external lining, apartments and store rooms etc. Other types of wood used for shipbuilding were the Pine, Elm, Ash, Buch, Guaiac, Acaçia Catchu, Mahogany, Brazil-wood and Chestnut. None of these varieties of wood was corroded by sea-water especially for parts which were constantly under salt water. The ring wood of Pine tree cut in January and kept immersed in water for about a year did ensure over half a century of life for a ship, provided the ship was caulked at the bottom, cleaned after the return voyage and kept loaded till the waterline when laid up in a port or aground in a safer place so that the cables were not spoiled.<sup>14</sup> The Portuguese used oak wood (*carvalho*), for the main frames of the ship and the planks. Upper deck and the rest were made of ordinary Pine wood and the remaining were made of ordinary Pine and Cork wood and everything was iron-fitted. The use of such ordinary materials resulted in the inferiority of the ships, which were not capable of more than two round voyages, while the old ones did ten to twelve round voyages. Hemp was used for making cables which were so perfect that the Portuguese ropes were the best in those days.

Teak was the best timber ever known for shipbuilding. It is highly priced because of its durability and buoyancy. A ship built completely of teak was the lightest and the best.<sup>15</sup> Such ships lasted twice as those made of European wood. The speciality of teakwood is that it does not affect nor corrode iron and therefore it is used for the layers of streealing, planks of the decks, hatchways and external layers of the metallic hull. The Portuguese had fully recognized the superiority of the Indian teak wood over the European Pine wood or Oak.<sup>16</sup> Wood was plenty in the hinter-land of sea-ports in India. There were about 120 valuable varieties of timber in Malabar alone, including the well-known Angeli wood.<sup>17</sup>

The Portuguese secured wood and other materials for ship-



building from the native rulers of the neighbouring lands by means of treaties. The Raja of Cochin supplied wood to the Portuguese for shipbuilding and he himself had reminded King D. Manuel in a letter dated 11 December, 1513 that "hitherto I have helped the Portuguese in every possible way, either by supplying the cargo for the ship or timber for the forts and ships."<sup>18</sup> In a letter from Cannanore dated 24 December, 1513, Afonso de Albuquerque had informed King D. Manuel that "Zamorin is willing to supply timber for the construction of naus, gales and other ships." Vide a treaty between the ruler of Amin islands and the Portuguese, the former agreed among other things a tribute of coconut fibre (coir) needed for shipbuilding.<sup>19</sup> The treaty between Governor Baretto and Adil Shah of Bijapur dated 22 October, 1576, stipulated that the latter would supply timber for shipbuilding.<sup>20</sup> Vide another treaty (Dec. 1571) between Antonio de Noronha and Adil Shah, the traders of Goa were allowed to go to the land of Adil Shah (Bijapur) to acquire planks and sails etc.<sup>21</sup> The Portuguese safety passes (Cartazes) clearly prohibited export of wood, in order to ensure sufficient quantity of wood at seaports.

### **Tonnage of Ships**

The ships meant for India voyages never exceeded 400 tons. In fact before 1570, most of the ships for India voyage were under 600 tons. Experience had shown that ships of under 500 tons were more sea-worthy and economical than the unwieldy 'monsters' of 1000 tons or more. Therefore, vide a *regimento* on tonnage dated 1 March, 1570, the Crown ordered that in future all ships to be constructed for usage in India voyages were not to exceed 450 or be less than 300 tons.<sup>22</sup> However, no serious notice was taken of this decree on shipbuilding at any rate in the India dockyards, even though the order was repeated on later occasions. Vide another letter dated in 1594, the King wrote to Viceroy Mathias de Albuquerque that "the ships you acquire and construct would be of such dimension and specification as stated in the 'description' of the officials of my warehouse and enclosed herein ; the above ships should

not exceed 500 or 550 tons, as this tonnage is more convenient for better and safer sailing. Since this is a very important matter, I except you will deal with it with utmost care so that the work should correspond to the trust I put in you."<sup>23</sup> It was also ordered that the ships meant for India voyages should have only three flush decks instead of four.

### **Officials of the Dockyard and their Functions**

The dockyard and arsenal of Goa and all the connected establishments functioned under the overall control of the Royal Revenue Board with an Intendant-General of the Navy. The other administrative staff of the Dockyard included a Recorder for admission of seamen, Recorder of store of arms, war ammunitions, tools, materials, etc., Recorder of provisions and equipments, Treasurer of the office of the Recorder of provisions and equipment an Accountant, etc.<sup>24</sup> The Recorder of admission of seamen was to discharge the office of commissary of all the sailors, officials and infantry soldiers on board the ship and prepared the pay sheet of all officials of the dockyard and arsenal. He, like other officials was assisted by clerks.

A large number of other technical personnels worked in the dockyard under a Chief Master in every workshop. They included the Chief Master (Patrao-Mor), Under-Chief-Masters, Master of the shipyard, Under-Master, Master Caulker and Under-Master Caulker, Master Rope-Maker and Under-Master Rope-Maker, Master Blacksmith, Master of Locksmith, Master of Sails, Master of Masts, Master of Rudders.<sup>25</sup> Besides them and working under their supervision, there were Axe Carpenters, Caulkers, Rope Makers, Blacksmiths, Oar Makers, Bombardeiros, Foundry workers and a number of other persons like door-keepers, Peons, Attendance in-charge, Guards of the shipyard and Guards of nails, etc. St. Rock was the patron saint of the naval carpenters.<sup>26</sup> Valentine de Mundo and Francisco Ribeiro were two well known Chief Masters of the Goa shipyard. Diniz da Costa, Gaspar Lopez and Gaspar Rodrigues were the well known Masters of the dockyard and

the last named was also a Master of Gales. The expert Master Carpenters included Diogo Luis, Simão Fernandes, Antonio Pinto, Afonso Pires, Vincent Rodrigues and Francisco Sonato.<sup>27</sup> Among the Master Caulkers, the names of Pedro Gonsalves, Jorge Marinho, Andre de Silva, Antonio de Costa, Simoa Dias Antonio Fernandez deserve special mention. The dockyard and Arsenals employed a large number of slaves who were condemned to serve in the yard. In dockyard a proper register was maintained with their particulars, such as names, place of birth, age, identification marks, period of punishment and the name of the court awarding the punishment.<sup>28</sup> During the working hours, the slaves were accompanied by Guards.

The *Intendant of the Navy* was the highest official of the shipyard and as such had jurisdiction over all others working there. He kept himself acquainted with the progress of work in the yard and used to have periodical discussion with the Chief Masters and other concerned Masters for the efficient working of the yard.<sup>29</sup> Not only that he got the technical personnel examined for competency and efficiency but he also recommended names of all personnels to the Royal Revenue Board for appointment in the yard. The navigational aids such as compass and charts were also examined in his presence by experts so that before the embarkation of a vessel, everything was checked for its fitness. On the arrival of a ship, he ordered the dismantling of the artillery for their staking on the land so that they could be easily embarked when needed. He also ensured that unused articles such as ropes, spares, gun powder etc., were returned to the yard at the end of the voyage. He had also to see that ships did not throw ballast of store or sand in the waters of Goa yard. All defaulters were to be punished with 50 xerafins and 100 xerafins for the first and second offences respectively. Half of this amount was to be used for the Mercy House of Goa.

The *Treasurer* of timber, armaments and other materials of the yard was the next important official. He joined service for three years tenure after depositing a security amount. He made inventory of the stock with all particulars.<sup>30</sup> He also entered receipt of articles like sails, timber, fateizas, coir, canvas, mast, armour, etc. with all the details. He was neither to purchase

articles from influential sellers nor to make any expenditure without proper authorization. He maintained a daily petty expense register for a week starting from Monday to Saturday. On every Saturday, this book was produced before the Intendant of the Navy who got it checked by the Accountant and at the end, a sheet of monthly expenses was prepared. The store room of the shipyard was to be guarded with different keys. In these store rooms, materials from ships returning from a voyage had to be deposited. They were properly examined and those ropes and sails needing repairs were attended to by those concerned.

The Recorders (*Escrivaes*) attended the yard and arsenal regularly and checked all receipt and expenditure.<sup>31</sup> They prepared wage sheets honestly and certified the persons who did not collect the wages in time. They maintained records of all types and the sureties of officials, licence of the pilots and other officials etc.

The Auditor of the yard was to be a honest man and he maintained the account in respect of the wage sheet, purchases, expenditure, transport and freight, etc.

The Chief Master remained in the shipyard and visited the ships under construction and satisfied himself that every thing was going on well and that the ships were provided with all equipments and spares. During the 'wintering season' of the ship at Goa, he ordered for mooring of the ships with chains and anchors and covered the ships properly. When a royal ship sailed from the yard, he accompanied it till the bar of Goa and then returned. He also reported the arrival of a ship to the Intendant and arranged to send a boat with anchors and moorings to the bar of Goa. He personally attended at the time of cutting of sails for ships and inspected the canvas, pitch and strings, etc., for the sails. As a ship sailed off, he ordered the removal of the mooring and anchors and did not allow the cutting of the mooring, except in an emergency. He also furnished a list of seaman fit for the voyage, as the ship was prepared for sailing. When a ship reached the yard, he went in along with the concerned officials and locked up the hatchways, store rooms and gunpowder rooms and collected the keys.<sup>32</sup> Then the unloading took place, when each kind of

goods went to the respective Treasurer who recorded them. He used to carry out searches in the river of Goa twice a year for moorings and anchors and he was entitled to one-third of the value of the materials found.

All the *Masters* of the yard resided in the dockyard premises only for their easy availability. They selected the necessary materials such as timber and nails and entrusted to their workmen under them whose performance they always noted so as to effect a cut in the payment of their wages for any irregularity.<sup>83</sup> The Masters had to train two or three apprentices in their respective trades. The Master of Rudders was an expert in steering vessels. The Master of Masts was an experienced person and he chose masts with the help of Chief Master and Master of Construction. The Master of Sails cut the cloth for the sails and estimated the quantity of coir for ropes, supply of other materials etc. When the ships returned from voyage the sails were taken to the yard where the Master checked them and attended to repairs if necessary.

The *Door-keeper* of the shipyard kept the keys of the establishment and when all officials reported in the morning for duty, they did not allow any person to go out without permission. He called the peons for work, accepted petitions from the parties and carried messages to the Intendant of the Navy.<sup>84</sup>

There were three *Peons* in the yard and arsenal and they were always present at their work. In the same way, there were three Guards who remained on duty at different places in the yard during nights. They were not to allow any vessel in the yard, except the one bringing timber. They had to see that the beams and wooden logs were kept tied up. The Guards resided in the premises and were held responsible for any discrepancies of materials held in their charge. The *Guards of nails* had to guard the nails and had to collect every day the remaining sails and oakum and not allow them to be taken away. All the broken, bent and dropped nails were collected. They also kept watch on the ropes, hardware, shrouds, block of pulleys etc. They had to see that no vessel approached the ship under construction and kept a watch on everything so that nothing was taken out of the yard.

### **Purchase of Timber and Other Materials for the Shipyard**

When timber and other materials were to be purchased, the Intendant informed the Revenue Board in time so that good quality timber could be acquired well in advance at reasonable price. Before the purchase of materials, the Intendant enquired about the market price and got them examined for quality by the concerned Masters of the trade who issued certificate of fitness.<sup>35</sup> The materials were to be weighed and measured, in the presence of all concerned and then registered. The ropes after weighing were to be marked with uniform signs, stating the weight, measures, names, and specifications. Such signs were stamped hot with the iron seal of the Intendant. The Intendant was to see that the officials of the dockyard did not collect any emoluments from the parties in the purchases.

### **Purchase and Sale of Ships**

When a ship was to be purchased from a private party for the royal service, the Chief Master along with the Masters of the yard and other Recorders went and examined the ship, checked its condition, measured the tonnage, value and fitness, evaluated the shrouds (ropes), sails, anchors, moorings and submitted a report to the Intendant who in turn reported to the Revenue Board. Any overvaluation or showing false defect meant loss of job, besides usual penalties. In case of sale of a royal ship and if the officials undervalued fraudulently, they were to be penalised. The Masters of the Yard were not to take any contract work by themselves or through any middle men. Any default meant loss of job and repayment of the value of the work.<sup>36</sup>

### **Contract Construction of Ships**

When contract works were given for construction of ships, the price rates were to be agreed to in advance with the concerned black-smiths, pulley-makers, tinsmiths, bombmakers, glassmakers, painters, carpenters, rope-makers, copper foundry

workers and others. No person to whom the work was awarded on contract was to be supplied any material from the stores on discount basis, but such materials were to be sold to its highest bidder.<sup>37</sup> The contract for ships was awarded to those offering the lower prices by the tenderer and the proceedings of auction were to be recorded. The work was not to be paid unless confirmed by the Chief Master.

### **Enrolment and Payment**

The Attendance in-charge of the yard took muster twice a day of all persons on duty including the workers, galley-boys and daily wage workers. Those working in the sea-workshop were not to go to land for lunch and failure meant loss of half a day's wage, besides other punishments. He maintained particulars of all artisans in the yard and noted their increment details which changed every six months. He prepared weekly wage sheet, mentioning the days, salary-rate and total wages etc.<sup>38</sup> When a royal armada was being sent, an enrolment of all seamen was made with all their particulars like names, parents' name, age, residence, identification marks and domicile of the sureties. At the time of the roll call in a ship, this enrolment copy was checked to find any omission. As a ship touched the Goa port, the ship's Recorder produced this enrolment for further action.<sup>39</sup> All salaries were paid against the muster roll of attendance and salary was deducted for absence, except sickness to be attested by Medical Certificate. They were entitled to eight days of leave for every three months, but during the time of armadas they could get only 32 days' annual leave. The artisans of the yard were paid by means of weekly pay-sheets signed by the respective Masters and approved and checked by the Intendant and the Accountant. The payment of the naval staff like Captain of Sea and War was prepared for every quarter of three months with the above procedure. Whenever advance payment was made, securities were taken from the concerned artisans.<sup>40</sup>

### Other Shipbuilding Yards

Cochin, Bassein and to some extent Daman were the other shipbuilding centres on the west coast of India. Cochin possessed great facilities for shipbuilding. It had good and large quantity of timber, especially Angeli wood, which was used for building all types of ships.<sup>41</sup> Iron was available in the interior, as well as good and plenty of coir for rope making. There was facility for launching vessels of any size and the shipwrights and carpenters were numerous and experts.<sup>42</sup> Therefore, every year many ships of very good quality were built here and they lasted longer. As early as 1498, D. Manuel I was informed by Michael Job, a Syrian Christian who accompanied Vasco da Gama, that teak-made ships of Cochin were far superior to ships made of oak.<sup>43</sup> In 1516, at the Portuguese fort of Cochin, there was a dockyard where ships were repaired and new vessels—*naus*, *caravelas* and *gales*—were built with the same perfection as in the Lisbon dockyard.<sup>44</sup> Duarte Barbosa himself found that "in this port and settlement of Cochin, the King our Loard carries out the repair of his ships and other ships are built, both gales and caravelas in as great perfection as the Lisbon strand".<sup>45</sup> In 1530, Captain Antonio Saldanha built there nine caravelas, twenty-six long boats which filled with heavy artillery etc., meant for the Diu expedition of 1531.<sup>46</sup> In order to encourage the quick building of ships needed for the expedition to Diu, Governor Nuno da Cunha publicly promised that any person who built his own vessel for the fleet, whatever be its kind and size, could be given pay of a Captain and receive artillery to arm the vessel which once back from Diu could be taken over at the value officially assessed. Whoever built their own vessels, could buy the materials from the stores out of their pay, while the armaments would be furnished by the Government.<sup>47</sup> In this way, a large fleet was built at Cochin. At Cochin, ships were built by the system of contract with the Cochin Raja. For this purpose, there were detailed royal instructions. However, "here in the later years, shipbuilding traders had altogether deserted and the expert shipwrights and carpenters now live in memories of old residents; steam, steel and iron have taken the bread out of their mouth."<sup>48</sup>



Bassein was the main shipyard of the North. The country around Bassein yielded timber of the best quality for the building of ships and it was for this main reason that governor Nuno da Cunha had captured Bassein. Frenchman Laval referred to the excellent timber which Bassein supplied to all Portuguese establishments for shipbuilding. "This place, Bassein, is to India what Biscay is to Spain for all vessels for the king of Spain (and Portugal) are constructed, because no such country yielded so much timber."<sup>49</sup> *Naus* built in Bassein were usually sent round Goa for completion when the third deck was finished. *Naus Antonio de Thana*, a ship built at the Thana creek near Bassein made one round-voyage in the Carreira de India and then served in the fleet of the Indian Ocean. In spite of it being attacked heavily by the Arab batteries, her sturdy hull resisted all attacks.<sup>50</sup> It was realized that the Bassein-built ships were superior to those built in Portugal while the Portugal-built *naus* made generally one or two or at the most three voyages, the one built in Bassein made six voyages; During the Kotta expedition to Malabar Coast in 1599-1600 the Bassein-boats played havoc. *Nau S. Martinho* was an important Bassein-made ship.

Daman was building ships for Bombay owners in the country trade. The Muslim defeat at Diu in 1509 was followed by a stringent treaty to prevent the construction of ships.<sup>51</sup> Further treaties with Gujarat dated 27.3.1537 and 23.12.1543 also maintained and reinforced this condition. Defaulters were to be punished with flogging and death.<sup>52</sup>

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## DECLINE OF THE PORTUGUESE NAVAL POWER IN INDIA

If the 16th century had made the Portuguese wealthiest, the same century also saw them sink into an insignificant power. In fact, the seeds of decline were sown much earlier. The position of Portugal deteriorated under king John III, when he introduced the Inquisition, and from the mid-16th century onwards, there began a period of quick and profound decline.<sup>1</sup> King Sebastain tried to save the situation by undertaking an expedition to Africa, but his death in the battle-field was a great blow from which the Portuguese power never recovered. Therefore since 1578, only a weak naval activity is recorded.<sup>2</sup> The Portuguese met opposition from all sides, found their trade returns on the decrease and thus they were not able to maintain a naval establishment in the east. By the beginning of the 17th century, the Portuguese power began to show definite signs of decline and their navy, once superb and splendid, became a matter of the past. A number of factors have contributed to the decline of the Portuguese navy in the east. An analysis of these factors reveals the many-sided degeneration of their navigation in Indian waters.

### **Union of Portugal with Spain (1580-1640) and Its Echo in Indian Waters**

The Portuguese amalgamation under the Spanish domination had its echo and serious repercussions in the Indian waters. What happened in 1580 was that the fate of the Portuguese navy was tied up that of the Spanish. When the Spanish ruler prohibited the Protestant merchants of Amsterdam and London from purchasing Asiatic goods at Lisbon, the latter naturally turned to India not only to punish the Spanish king but also to collect the eastern commodities, now under the Spanish protection. "The capture of India seemed to Holland a continuation of her just revolt against Portugal-Spain."<sup>3</sup> The Dutch also wanted to try their hand and introduce a new religion. They collected a good deal of nautical information and charts and even got published the Portuguese roteiros on navigation. In 1595, when three Dutch ships rounded the cape and broke into Indian water, the Portuguese, whose power depended on the absence of a rival navy, were unable to check the newcomers and were destined to collapse. The Spanish ruler was pre-occupied with domestic problems and could not help the Portuguese in India. He did not send enough men to India to defend the Portuguese possessions against the increasing attack of their enemies. The Portuguese were neither strong nor numerous enough and therefore they had to yield. *The Estado da India* suffered from indecision and delay. During the sixty years of Portuguese union with Spain, the Portuguese navy received a hard blow from the enemies of Spain and it left a scar which had never been fully healed.<sup>4</sup> The destruction of the 'Spanish armada' at the hands of the English meant a great setback to the Spanish naval supremacy, under which the Portuguese were now only a part. Many of the Portuguese fleets were also destroyed in the action.

The arrival of the Dutch in Indian waters in 1596 was followed by a long struggle between them and the Portuguese, and altogether the Portuguese lost 1429 men, 155 ships and property worth 75,00,000 xerafines.<sup>5</sup> In 1603, when the Dutch blockaded Goa and even though unsuccessful, it marked the

beginning of a struggle which in the next seventy years shattered the Portuguese power in India<sup>6</sup>. The Portuguese began to loose their possessions one by one to the Dutch. The take over of Cranganore by the Dutch was "the beginning of the end of the Portuguese power in Malabar, if not of their eastern empire itself."<sup>7</sup> In 1611 and 1615, the Portuguese suffered defeat off Cambay and Surat. Ormuz was lost in 1622 and Shah Jahan took Hughli in 1629. Malacca and Jafnapatam (Ceylon) were lost in 1640 and 1658 respectively. In 1656, Cannanore was taken by the Dutch and that was followed by Nagapatam, Kayamkulam and Quilon in 1661. Bombay had to be ceded to the English in 1661 as part of the dowry of Catherine of Bragança. It was in fact a face-saving measure and by it the Portuguese were purchasing safety from the English at a high price. In 1670, the Arabs plundered Diu which had earlier resisted the greatest onslaughts of the Muslims in 1538 and 1546. The Marathas took Bassien in 1739 and stormed even the very wall of Goa. All that remained after these conquests were captured by the rulers of Ikkeri in South Canara who captured the forts of Mangalore, Bhatkal and Honavar and thus effectively cut off the supply line of rice to Goa.<sup>8</sup>

### **Weak Successors and Reversal of Policies**

The successors of King Manuel I were men of mediocre talent and they selected Viceroys and Governors of the same type who being not good diplomats contributed only to the ruin of the Portuguese in the east. "...Truely, the Portuguese have bred heroes in place of diplomats and poets in place of capitalists."<sup>9</sup> The wise policy of Albuquerque visualized a Portuguese empire in the East based on imperial notions. But his successors were inferiors and they set aside his policy as impractical and changed the role of the Portuguese as traders and took up a career of conquest not backed by enough resources. This proved fatal in the long run.<sup>10</sup> João de Castro was the last great Portuguese Governor in India and with his death in 1548, the Portuguese power declined

definitely in the eastern seas. Finding it impossible to hold the Indian Ocean, the Portuguese had turned their attention to Brazil, nearer to their home.<sup>11</sup> It was difficult to find the heroism of the Portuguese of the time of Albuquerque. But still they survived with their remaining pockets, Goa, Daman and Diu. Prof. Plumb has rightly said that "the Portuguese were the first to come and last to go."<sup>12</sup>

### **Part Played by the Natives**

Tired of the Portuguese yoke and anxious to shake off their rule in India, the native rulers of Indian coast sought support and alliance of the enemies of Spain and therefore of the Portuguese. They further weakened the Portuguese by sea and by land.<sup>13</sup> The native troops too participated and added only confusion to the Portuguese. These troops who were trained for the war by the Portuguese became masters of the situation. Mutiny and revolts became common.

### **Poor Resources**

The costly naval wars fought during 1580-1640 against various powers had crippled Portuguese economy completely and the ever-decreasing and meagre revenues of India were fully absorbed in the continental wars of Europe fought by the Spanish rulers. The Portuguese who had become rich due to outside resources had nothing to fall back upon when they lost it and Portugal naturally fell behind in the economic race which was won by her rivals with greater resources than her own.<sup>14</sup> The fall of Vijaynagar in 1567 was a death-blow to the Portuguese commerce, because since then the lucrative horse-trade between Goa and Vijaynagar declined.<sup>15</sup> Some amount of this trade continued with other native states like Bijapur and Ahmednagar. This helped the Portuguese economy to a certain extent.

### **Corruption, Negligence and Piracy**

Corruption, embezzlement and dishonesty prevailed every

where. In one particular year, the officials of India House showed 17,000 names on the roll when actually only 4000 men were sent to India.<sup>16</sup> The officials in India got poor salary, if at all they got it regularly and hence they began to conduct their own expeditions openly. Every one desired to make a fast fortune by all means. The sudden acquisition of wealth dazzled and blinded the Portuguese and prevented them from seeing the real problems, and they became the slaves of her own glory. Vanity was the cause of her ruin. A letter from Goa dated 25th November 1552, and submitted to the king said that "each one considered only himself. In India there is no justice. The object is getting together of money by all means. Help us Senhor, help us Senhor, for we are sinking."<sup>17</sup> The Viceroys, Governors and Captains of forts were traders and not rulers and they came to India to amass wealth. They neglected the armadas in India for which they had no money. But a Viceroy could collect one million Cruzados in his three years term when his salary was hardly 30,000 Cruzados.<sup>18</sup> Piracy was practised openly in the eastern seas. One of the main functions of the Portuguese fleets in India was to chase the pilgrim ships of the Muslims in the Red sea on their way to Mecca. This not only led to a moral decline but was disastrous to the royal trade leading to great political weakness.<sup>19</sup>

### **Insufficiency of Manpower**

Albuquerque adopted the policy of mixed marriages because he foresaw that the constant drain of the male population of a small country like Portugal would ultimately lead to the shortage of manpower. But his policy was ignored by his successors.<sup>20</sup> Year after year, Portugal sent fleets to India consisting of 3,000 to 4,000 men of which few only returned to Lisbon. Many perished in the battles, shipwrecks and in bad weather.<sup>21</sup> Thus Portugal had been drained of men and she had neither enough men nor resources to protect her eastern possessions and naturally the Portuguese eastern empire entered into degeneration and decadence. Their forts and factories deteriorated for want of forces to guard them from attack.



**Lack of Artillery and Ammunitions**

The coastal forts were ill-equipped for want of money and neglect by the Captains. There was not enough artillery and the existing ones were inefficient. The gun-powder and ammunitions were of inferior quality. The Captains of the forts pilfered artillery from the forts and supplied them to private traders. In 1587, the king tried to check the abuses by issuing the necessary regulations which were often repeated, but of no avail.<sup>22</sup> In 1596, when the new Viceroy Francisco de Gama reached India and found that artillery was in extreme short supply. He soon acquired some copper and ordered the manufacture of some artillery. In that year itself, the king had asked him to stop issuing of artillery to private persons as it was reported that a good amount of artillery was stolen and even sold to the Muslims. No wonder that in 1596, when the Dutch came to India with eleven ships, they could easily seize some Portuguese ships. Again in 1604, when they blockaded Goa, the forts of Bardez and Gaspar Dias were unable to face them due to lack of weapons, even though the king had been advising the authorities in Goa to make artillery in sufficient quantity.

**Increasing Cost of Construction and Repair of Ships**

By the end of 16th century, the cost of shipbuilding and repair in Goa rose sharply. One reason for this was that the Captain of forts whose perquisites included felling and selling of local timber, always charged exorbitant prices. The Captains of Bassein and Daman sold the timber to the ship-yard at 40 xerafins a khandi, even though it costed them only 5 xerafins.<sup>23</sup> In a letter from Goa submitted to the Portuguese East India Company in 1629, it was reported that "there was no longer (in Goa) Contractors who used to repair and refit carracks. Now-a-days, it is clear contrary, because they all went bankrupt and have no capital." By the beginning of the 17th century, the cost of repairing, caulking and careening of ships at Goa shipyard had almost doubled.

### Shipwrecks and Lack of Ships

There was lack of ships of large tonnage and there were not enough ships to be sent to the help of a threatened spot. In fact, Portugal did not possess more than 300 ships at the height of her maritime glory (c. 1536) and it was insufficient for supporting a far-flung sea-borne and trading empire with world-wide ramification<sup>24</sup>. As early as 1534 (15th November, 1534) Admiral Martim Afonso de Souza wrote to Portugal a confidential letter in which he described the affairs of the navy in the 16th century. He felt that India was not in a position to maintain warfare "even for three years as no person wished to serve in the armada". He gave a graphic account of the overall decline and suggested remedial measures. He advised that if the ships were laid up and repaired, "they would last ten thousand years".<sup>25</sup> Again Governor Castro wrote to king John III on 16th February, 1546. In this letter, he gave a detailed report about the condition of the fleets in India. It throws light on the miserable state of decline of the navy. The ruin was so much that the Governor had "no words to describe" "The ships were all rotten and eaten by a variety of worms (buzano)". He was sure that unless repair work was commenced soon, "within three months the entire fleet would perish". He felt that "since our fleet constituted the wall of our India", timely repair was needed.<sup>26</sup> By the end of the 16th century, the size of the annual fleets which in the early days was 12 to 14 sails, was now reduced to 5 to 6 and some times even three. A large number of abortive voyages and maritime mishaps had reduced the navy to the minimum. One of the causes for the loss of so many ships was the system of contract construction and repair of ships adopted by kings Sebastain and Philip II. The contractors used inferior materials for shipbuilding and the whole work was not at all done perfectly. The result was that during 1585-1597 *i.e.*, during the first two contract periods, out of the 66 ships that sailed for India, only 34 returned safely.<sup>27</sup> Ambitious naval constructors made floating castles with excessive and improper size. This ruined the construction of ships. Most of these ships could not withstand the voyage and wrecked on the way. "Not one Portuguese

ships of three, returns safe from the voyage".<sup>8</sup> The cup of Portuguese maritime disasters was full.

Shipwreck were due to various causes, such as the use of old ships for long voyages, greed for profiting by building cheap and unsafe vessels, the abuse of over-crowding, ambitious over-loading and untimely departure of ships. At the end of the 16th century, a *nau* of India voyage could hardly make two voyages while the old *naus* had done ten to twelve round trips. To remedy this evil, it was ordered in 1570 that the *naus* of India voyage were not to exceed 450 tons, but the effect of this order was nullified by increasing the number of storeys of ships as the capacity of the hold was not allowed to be increased. When the Dutch and the English came to the India waters to dispute the naval supremacy, the Portuguese vessels were about a century behind in shipbuilding, naval equipment and tactics. The Portuguese ships were rotten and broken and this shook the very confidence of their navigation in India. On 3rd November 1571, orders were issued for convoying of ships, election of the Captain of the fleets ; but all these measures could not arrest the progressive dismantlement of the Potugese navy in the east.

There were various allegations of inefficiency in the fitting of armadas. An enquiry held in Goa in 1630 revealed that the Pilots and gunners were incompetent and they bought their posts rather than secure them on merit and experience. This fact was admitted by the king himself earlier in 1597.<sup>30</sup> Lack of discipline on board a ship led to disagreement between the Captain and the crew. The allegations also included that the ships were not properly equipped for war during the voyage and because of which they were the victims of plunder and attack. There were not enough provision of all types for long voyages at some times, there were not even a spare set of sails.<sup>31</sup> The rigging and tackle of the ships were deficient and rotten.

The following statistics of the movements of ships and shipwrecks reveal the true nature of the deterioration of the Portuguese navy.<sup>32</sup>

Ships that left for India during 1497-1612 i.e. during 1497-1579	620		
During 1580-1612	186		
	<hr/>	806	
Ships that remained in India	285		
Ships that returned from India	425		
	<hr/>	710	
Ships wrecked or lost during 1500-1579	31		
Ships wrecked or lost during 1580-1610	35	66	7.7%
Ships burnt by the enemies during 1497-1612	6		0.7%
Ships seized by the enemies during 1586-1602	4		0.5%
Ships that forcelanded and cut short voyages (1500-1608)	20		2.5%

It can be seen from the above figures that during 1497-1612 (115 years), out of 806 ships that left for India, 620 ships (*i.e.* 7.5 ships per year) were during the period 1497-1579. During the next period (1580-1612), 186 ships (*i.e.*, 5.8 ships per year) came to India. When 31 ships were wrecked during the period 1500-1579, whereas during the next 30 years, 35 ships were wrecked. The loss of so many ships must have been a great strain on the Portuguese economy. During 1521-1551 itself, 31 naus were wrecked which costed about 3352150 Cruzados.<sup>33</sup>

The particulars of the movement of ships and shipwrecks etc., for the period 1585-1597 (12 years under the Spanish domination) are as follows :<sup>34</sup>

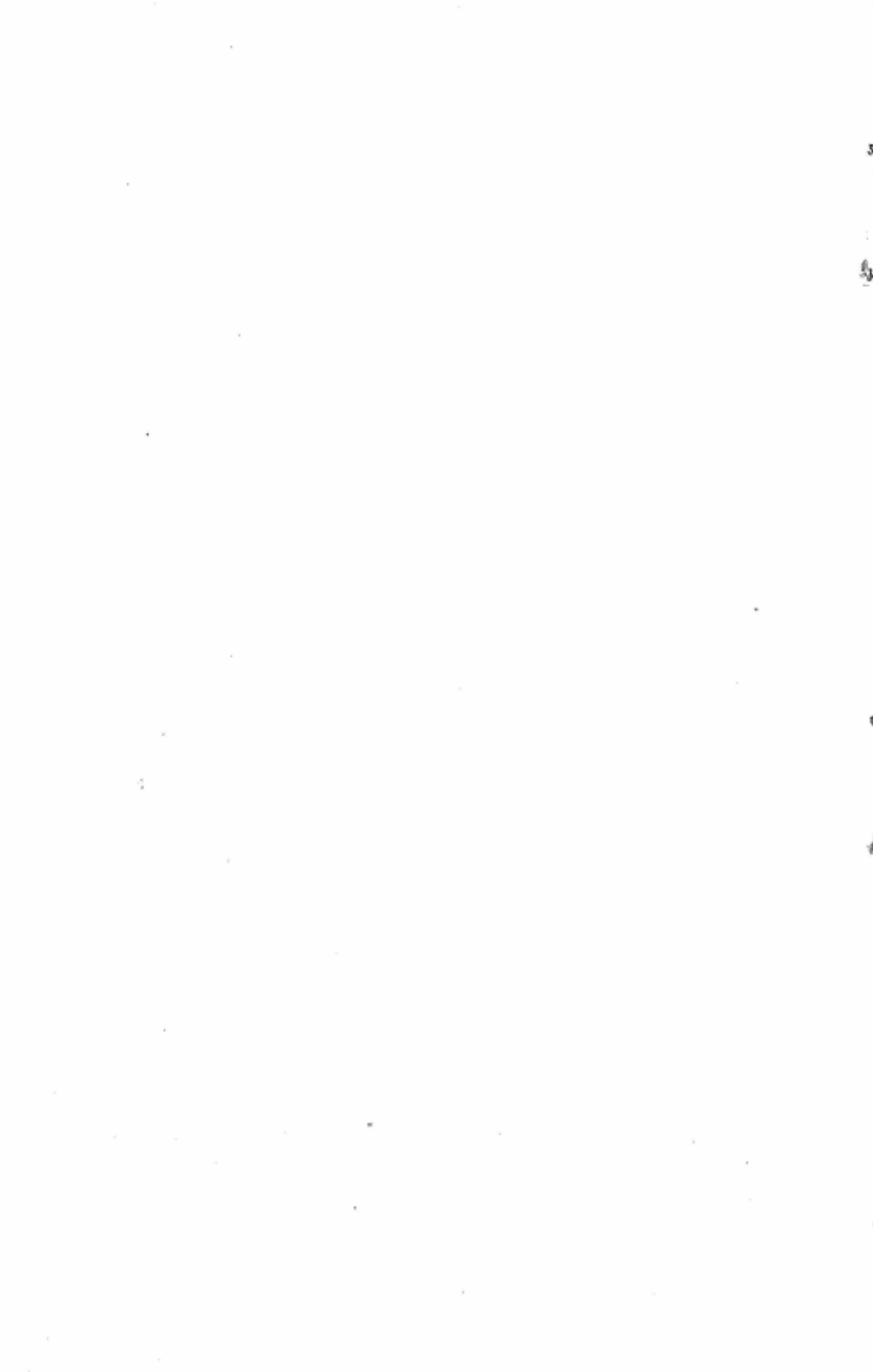
Ships that left for India	66	
Ships that remained in India	1	
Ships that returned safely	34	
	<hr/>	53.5% as against 88.6
	35	of the whole period
Ships wrecked or lost	18	27.4% as against 7.7%
Ships burnt	4	6% as against 0.7%
Ships seized	2	3% as against 0.5%
Abortive voyages	7	10.1% as against 2.5%

This shows that during the short period of 12 years, 22 ships (18 + 4) were wrecked, burnt and only two ships were seized by the enemies, as against 66 ships wrecked, 6 burnt and 4 seized during the whole period. Thus it can be seen that the cause of decline and the ruin of the Portuguese navy was also internal and not completely external. It was the decadence of the art of shipbuilding and the art of navigation that caused the decline of the navy in India. Historian Oliveira Martin had very appropriately commented that "the Portuguese navy was lost even before the loss of national independence (1580), because the ship construction was bad, navigation was worse, and because the ships were over-loaded and the ignorants arrogated themselves as pilots. It was the sea which devoured the Portuguese ships and not the English and the Dutch.

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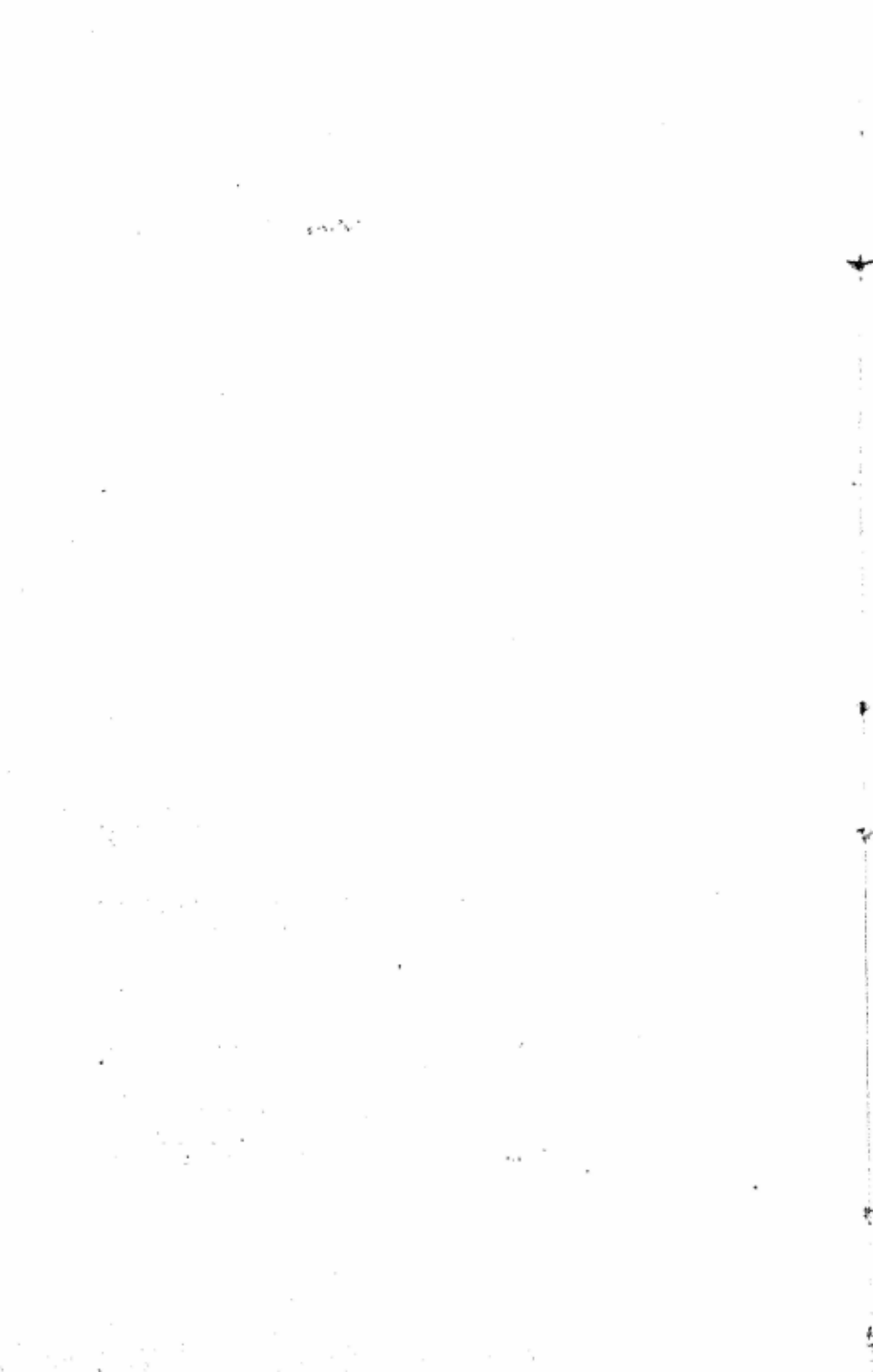
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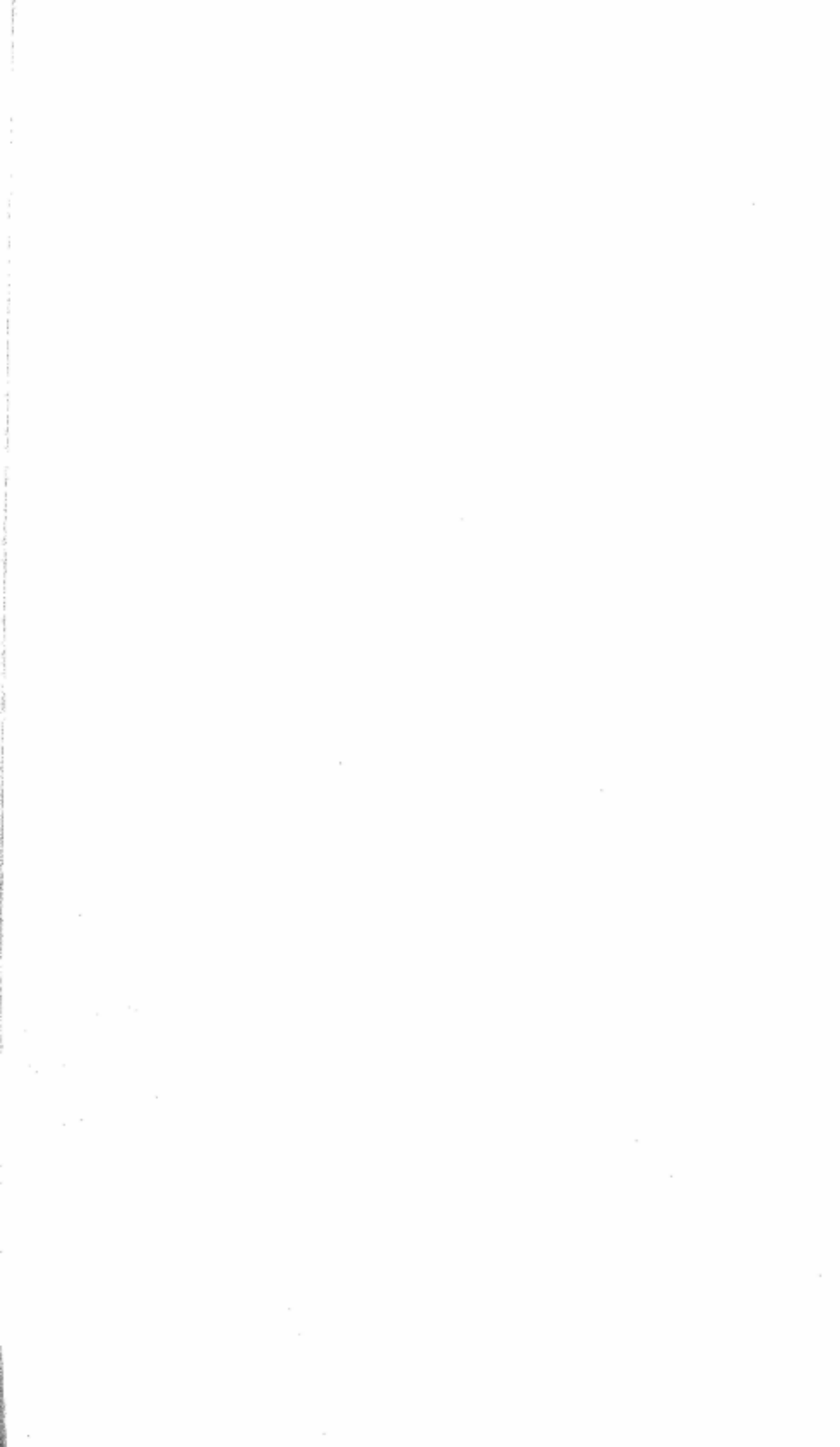
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