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THE QUARTI PARTITU EN COSMOGRAPHIA BY ALONSO DE CHAVES. AN INTERPRETATION

BY

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The subject of this paper is the manuscript entitled: «*Quatri Partitu en Cosmographia*» by Alonso de Chaves (1), which is on deposit in the Library of the Royal Academy of History in Madrid. It consists of 150 folios but the text is not complete in all sections, i.e. the table of content refers to parts for which only a title or even a blank page appear in the manuscript. Some selected passages of this book and a brief description were published by Cesareo Fernandez Duro in 1895 (2). There exists an unpublished translation into English of part four in the Yale Historical manuscript collection made by Edward Luther Stevenson in 1929, and reference to it appears in several modern works (3).

My acquaintance with the book came about because of a concern with the pilot-examinations run by the *Casa de Contratación* in Seville and with the literature which might reflect the content of the curriculum offered to student pilots. An attempt will be made to show that this document was the depository of the material taught in Seville, especially to the pilots of the *Carrera de Indias* and that it stands poised on the dividing line between

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(1) Full title of the manuscript, Quatri Partitu en Cosmographia pratica i por otro nõbre llamado Espeio de Navegantes: Obra muy utilissima i cõpendiosa en toda la Arte de Marear i mui neccesaria i de gran provecho en todo el curso de la navegaciõ, principalmente de Espana. Agora nuevamente ordenada y compuesta por Alonso de Chaves cosmographo Dela Magestad Cesarea del emperador y Rei delas espanas Carlo quinto Semper Augusto:

Dell collegio dela compa de Jesus de Monsorio, Real Academia Biblioteca de la Historia, MS 9-14-1 2791.

(2) Cesareo Fernandez Duro, «De algunas obras desconocidas de Cosmografía y Navegación y singularmente de la que escribió Alfonso de Chaves a principios de siglo XVI». Reprint, *Revista de Navegación y Comercio*, Madrid, 1895, 46 pp..

(3) Literary estate of Edward Luther Stevenson in the Yale Historical Manuscript Colletion.

improvisation and organization of both scientific teaching and practices. In addition, the manuscript contains the earliest preserved example of part of a *Padrón Real*, which was the central product of the Casa's most important scientific enterprise.

Certainly the author of the *Quatri Partitu* was representative of the cosmographic establishment. Alonso de Chaves was born before the beginning of the sixteenth century and died in his nineties in 1599. He spent his entire productive life time as a cosmographer in the service of the Casa de Contratación at Seville. His work was well enough regarded by the crown to have him put in charge of the examination of pilots and of charts in 1528, and to bring him the title of Royal Cosmographer. He was a member of the Junta appointed to serve with Hernando Colón charged with the compilation of a *Padrón Real* in 1529. During the absence of the Pilot Major Sebastian Cabot, on his expedition to the La Plata, the scientific work of the Casa fell upon the cosmographers Diogo Ribeiro and Alonso de Chaves. Upon the death of Ribeiro in 1533 Alonso de Chaves alone was for a while in charge of teaching and the examination of charts and instruments. In 1552 he was made Pilot Major, and he took over the *cátedra* of Cosmography eventually succeeding his own son. Alonso de Chaves took part in all aspects of the training and examination of pilots which he had by and large developed, writing a précis about the practices he established in 1556. The crown allowed him to retire only when he was over ninety, despite his earlier requests to be pensioned, and he was granted a degree of grudging recognition which was exceptional in an epoch of notorious royal ingratitude. So much suffices to establish the pivotal role of the author of our manuscript in the cosmographic enterprise of the Casa de Contratación. It is the contention of this paper that the *Quatri Partitu* deserve a comparable place.

The four parts of the manuscript contain a summary of practical knowledge for the professional pilot, that is; the text is ample and precise in the numeration of observed and recorded fact, it is limited in explanation to what is useful for an understanding of the phenomena with which pilots have to deal, and it is careful in instructions for the making and use of instruments and the conduct of ships.

The book set a pattern for later *Artes* by bringing first the *calendarios* which became routine in all similar texts. Part two of the book concerns nautical instruments and brings instructions for their use. The instruments given are: compass, chart, maritime astrolabe, quadrant, ballestilla, lead and line and sand clock. There are also tables of scales and measures in use among cosmographers. Part two presents the sixteenth century concepts of the universe in terms of Ptolomeic astronomy and Aristotelian physics as commonly presented in cosmographies of the epoch. It also contains a record of eclipses from 1539-1560, with tables adjusted for the meridian of Seville. There is another table for the «miles contained by each degree of longitude with reference to each parallel of latitude starting from the equinox». In this chapter the controversy over the sixteen and seventeen-mile degree

of longitude is mentioned. Book five of this part is the unusual one which was printed by Fernandez Duro in 1895 along with other selected excerpts from the work which are the only ones ever to have been published. This section discusses all extant information available to sailors for predicting the weather. The material is collected from ancient authors as well as from pilot observations. As many data are applicable to weather inland as are useful at sea. The most significant contribution of this passage is therefore the importance it attaches to the observation and repeated record of phenomena and not to their nature. Fernandez Duro used the text for a discussion of mariners rhymes about wheather from the point of view of literary, historical, and ethnological interest, which, however, does not make the point above.

The Third Part discusses the basic problem in navigation of how to know where the ship is and how to steer from there to the desired port. This section presents the problem of compass declination (so called by Chaves and not variation), which was then at the center of scientific debate. Book two of Part Three contains a discussion of currents and tides. Chaves' interpretation of the origin and nature of ocean currents persuaded him that there would have to be an open northern passage from Atlantic to Pacific and that a solid and permanent separation of the oceans could not be assumed nor was there knowledge enough to deny this theory, he said. His treatment of tides is thorough and does not appear in such detail in any of the later Spanish *Artes*. It contains an analysis of tidal flow as observed on various coasts and an explanation based upon the phases of the moon. In addition there is the precise description of an instrument designed to tell the state of the tide at any latitude at any time. This description is not illustrated and I have not found the instrument mentioned among those carried by Spanish pilots of the carrera. Tides were no major problem of the Caribbean and for practical pilots the experience with the amplitudes of tides in various latitudes and of the peculiarities with tidal currents in estuaries, bays and straits, was more than a match for an instrument which merely counted time. The difference between the theoretical satisfaction and the use of instruments for the carrera pilots which was a major battle ground between cosmographers and pilots at this time in Seville (4), stands nowhere better revealed than in the design and subsequent obscurity into which this «instrumento general de mareas» was allowed to fall.

The Third Book of Part Three brings discussion about what to do in a shipwreck. Here from the first, Alonso de Chaves is more practical than for instance Pedro de Medina. The latter advises the droning sailor to remember the year, month, day, and hour of the accident in order to establish his location, while Chaves advises the man to shout, and to find a plank or

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(4) URSULA LAMB, «Science by Litigation: Compass and Chart before the Law, 1545-46» paper read before the Society for the History of Discoveries, Bloomington ILL. October 1965, to be published in *Terrae Incognitae*, No 1.

barrel to hold onto. If this sounds trivial, it is characteristic of the attitude of first things first, which is so refreshing a characteristic of the manuscript.

Under six additional headings Chaves brings the vocabulary used to describe ships and their parts and the men who serve in them, officers crew and their duties. This passage was published by Fernandez Duro and has led to characterize the manuscript as a vocabulary or nautical dictionary (5). There is furthermore included a chapter on the conduct of warfare at sea. This early modern discussion superceded the statment concerning naval war in the «Siete Partidas» of Alfonso the Wise (Partidas II, Títulos 24 and 25, ley XXLV; and Título XXV, leyes 1-14). Chaves' chapter is the first to discuss the use of firearms at sea and treats the tactics of naval warfare by squadrons on the open sea. (Coastal defense had been discused by Mosén Diego de Valera on comission by the Catholic Kings in 1497). Chaves initiated the teaching of the *cátedra* of naval war and artillery which was to be founded in the Seville School in 1576 and whose first incumbent was Andrés de Espinosa.

The Fourth Part, properly called «espeio de navegantes» is a *derrotero* describing the way to and from the Indies, that is as in a mirror looking from two sides. The derrotero consists of an alphabetic list of place names which are given their «alturas y leguas» i.e., position, and distance and direction to the nearest ports of reference. It is the contention of this paper that the *derrotero* of Chaves is in fact as close an approximation to the earliest *Padrón Real* as has yet been encountered. This interpretation rests upon the sequence in which the padrones were manufactured and upon what Chaves says about Part four in his manuscript. In résumé the *derrotero* seems to be the Indies section of the book which Chaves used for the examination of pilots and charts before the «visita» to the Casa de Contratación by the licenciado Suarez de Carvajal in 1540. From internal data, the manuscript can be said to be closset to the year 1539. Fernandez Duro places it between 1520 and 1539 because those are the years of the *aureo número*. But church festivals are given only for the year 1540 and eclipses from the year 1539. Stevenson placed the Ms in 1537 because he added a year to the order by the crown to make a *Padrón Real* at the end of 1536 when papers were to be newly gathered together for the purpose (6). His reference is Oviedo y Valdés. There certainly was in use for examinations a *Real Padrón* in January 24th, 1540, when Pedro de Medina was given access to it by cedula. In October of that year an order was given that all charts had to be based upon the *Padrón*,

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(5) H. C. Woodbridge, «A tentative bibliography of Spanish and Catalan Nautical Dictionaries, Glossaries and Word Lists», *The Mariner's Mirror*, 1951, vol. 37, p. 64.

(6) This is also the year when the cosmographer Santa Cruz was to be furnished with all the data concerning the Padrón Real for his *Islario*. See the edition of Santa Cruz by F. Mata Carriazo.

Gonzalo Fernandez de Oviedo y Valdes, *La Historia general de las Indias*, Madrid, 1851-1855, 4 vols.; vol. 2, p. 114 alludes to the map «painted» by Alonso de Chaves, 1536.

and the appointment of the Junta by Carvajal for a revision of the *Padrón* dates from the same year. It is probable that the manuscript by Chaves was not published because its information, particularly in part four, was superceded and not because it was censored.

As for the manufacture of the *espeio* Chaves says: «that it is due to the author» qual asismismo hordeno y compuso con sola su industria y trabajo el dho Alonso de Chaves Cosm. de S.M. Cesarea. La cual obra es aprovada por los otros cosmographos de su magestad y conforme a voto y parecer de los sabios y experimentados pilotos que navegan». The text by Chaves is practically a copy of the emperor's instructions to Suarez de Carvajal that he should bring together the most outstanding cosmographers and the most experienced pilots in order that they might pool their knowledge and compile and sign the corrected Padrón. It is safe to assume then that the *espeio* dates no earlier than 1536 when the data were gathered for Chaves, and 1540 when revision was about to begin.

The manuscript of the *Quatri Partitu* contains therefore a part of a document which has been very elusive despite much search. When used in conjunction with the depositions by Faleiro, Sebastian Cabot and other pilots in the famous legal quarrel between Pedro de Medina and Diego Gutierrez, (1545-46) one might get an exact idea of the state of geographic knowledge and the controversies concerning specific points in the mid sixteenth century. If the *espeio de navegantes* of the *Quatri Partitu* can indeed be regarded as the earliest survival of a *Padrón Real*, it overshadows the rest of the manuscript in importance.

But exclusive discussion of this Part Four or of any other separate part of the manuscript does not do justice to the whole. The manuscript is unlike other Spanish texts a comprehensive record of both the *Arte* and *Oficio de la Mar*. Its instruction is reflected in a manuscript which comes as close to an actual transcript of a pilots examination as I have found excerpted in the *Apuntes para una Biblioteca Cientifica Española del siglo XVI* by Felipe Picatoste, (p. 348). Other works just cite categories of subject matter but that manuscript brings sample answers, including misleading ones (as to what is longitude and latitude and whether under the Arctic pole they could be found by the compass).

In addition to the extensive coverage of disciplines, the manuscript also refers to a wide geographic area. Mention is found of places on the North Sea coast as well as of Mediterranean ports. Tides are discussed with reference to northern latitudes and local practice of correcting the compass, *(aguja de corujo)* is mentioned. The manuscript thus calls to mind that while shipping to the Indies was eventually concentrated in two fleets each year, the port of Seville was choked with European coastal traffic all year round. This is a good corrective for historians of the *Carrera de Indias* or of *the Portuguese imperial roteiros*, or of the exclusive study of European shipping in isolation from each other. Chaves took for his province all the sea lanes which crossed the oceans — even if the *espeio* proper is limited

to the Atlantic routes. This versatility has many implications. Foremost among them is that he accepted facts from whatever quarter they came. Through this manuscript breathes a freedom of inquiry in naval matters which was to survive the freedom to publish for some time.

The work on this aspect and others raised, however, is all to be done, and so is the analysis of the entire manuscript in the light of time place and circumstance of its writing and of the audience which it was meant to reach, as well as of its place in contemporary literature. I thought it justifiable to present research under way rather than conclusions to this distinguished audience as long as acquaintance with the *Quatri Partitu* is not general among scholars.

DISCUSSÃO

R. A. SKELTON. — For the exploration and mapping of North America in the second quarter of the XVI century, the *derrotero* of Chaves is a significant document, which was cited by Harrisse only at second-hand through Oviedo, and abstracted by Phelps Stokes and Ganong from an (unpublished) transcript of F. C. Wieder. It is to be hoped that, even if we must wait for a critical edition of the whole manuscript, the *derrotero* may be published in full, perhaps separately, as soon as possible.

A. TEIXEIRA DA MOTA.—Devemos estar gratos à autora pelo exame que fez do invulgar escrito de Alonso de Chaves e por nos ter mostrado a grande importância e significado de que se reveste. Fazemos votos porque possa em breve ser totalmente publicado, para melhor conhecimento das artes e ciências do homem do mar em meados do século XVI. Neste momento vem-nos ao espírito, pela sua afinidade com a de Alonso de Chaves, a obra de um tratadista náutico português coevo, o P.e Fernando Oliveira, cujos trabalhos constituem uma verdadeira enciclopédia marítima, já que neles se ocupa de arte de navegar, cartografia náutica, construção naval, organização da vida a bordo e arte da guerra no mar. O cotejo entre os dois tratadistas deve permitir úteis conclusões sobre as semelhanças e diferenças nas técnicas marítimas de portugueses e castelhanos, e aproveitamos este momento para anunciar que a Secção de Lisboa do Agrupamento de Estudos de Cartografia Antiga trabalha na edição da «Árte Náutica» do P.e Fernando Oliveira, estando já concluida a sua tradução para português.

A autora salienta muito justamente o interesse da obra de Alonso de Chaves, para o melhor conhecimento da organização e actividade da Casa de Contratación de Sevilha, no campo da náutica e cosmografia, nomeadamente no respeitante às funções do piloto-mór e cosmógrafos e às questões de ensino e respectivos exames. Também neste campo se afigura que poderá ser muito significativa a comparação entre o que se passava nestes domínios na Casa de Contratación, de Sevilha, e nos Armazéns da Guiné, de Lisboa, já que também era nestes que se centralizava a admissão e exame de pilotos, o seu ensino e a elaboração da «carta padrão d'el-Rei», percursora lusitana do «padrón real». Assim, apontamos que em 1559 e 1592 foram promulgados em Portugal «regimentos do cosmógrafo-mor», cujo estudo temos em curso, os quais lançam muita luz sobre a importante questão do ensino e exame de pilotos, estando ligados aqueles dois regimentos os nomes prestigiosos de Pedro Nunes e João Baptista Lavanha.

Em conclusão, o estudo de Ursula Lamb é da maior oportunidade e abre-nos importantes perspectivas para o melhor conhecimento de questões que têm andado um tanto esquecidas.

W. WASHBURN. — The Society for the History of Discoveries of the United States intends to publish a new editon of Pedro de Medina à *Cosmographia* edited by Ursula Lamb who discusses the training and examination of pilots and the legal questions relating to the licencing of pilots in her introduction to the book.

F. MADDISON. — Can you give a discription of the instrumento general de mareas? How did it work?

U. LAMB. — The discription of the *instrumento general de mareas* comes in two parts. One: a description of the manufacture of a circular tide-table which consists of four concentrically mounted wheels which move inside one another. Across the face of the wheels moves a «cuadrante» of 90°. Two: gives several examples of the use of the instrument at various times and latitudes. I did not at first realize the importance of the appearance of the instrument, and my notes are limited to part one and are sketchy. Part two would explain some ambiguity in what appears etched on the wheels, since in my notes two wheels have the zodiac marked on them. I cannot get a microfilm and one will have to wait for publication in Spain before the instrument will take its proper place in the literature.

R. A. SKELTON. — Are there any places mentioned on the North American continent in Part four?

U. LAMB. — The derrotero does have points on the North American continent indicated from Baccalaos to Florida — which is the entire coast. Yale University has a transcript and translation into English of the derrotero in manuscript which was made by E. L. Stevenson in 1929. This work was based upon a fotocopy made on plates at that time from a copy of the Derrotero in the Palacio Real at Madrid. Stevenson thought the other three parts of the *Quatri Partitu* were lost. The foto copy is in the manuscript section of the New York Public Library.