HISTORICAL SURVEY OF OUR KNOWLEDGE OF THE LONGITUDE AND LATITUDE OF MANILA

The fundamental astronomical problem for a given locality is the determination of its longitude and latitude. Upon the accuracy of these two coördinates depends the accuracy of the position with which the locality is placed on the maps. The greatest efforts of the astronomers have been directed towards the discovery or improvement of methods, whereby the longitude and latitude could be easily and accurately ascertained.

The character of the present paper is historico-scientific, partaking of the nature of an historical review of a scientific investigation. An attempt has been made to trace out the historical development of our knowledge of the latitude and longitude of Manila. The main sources from which the information has been derived are two: Books and Maps.

Books.—As to character, the books consulted can be reduced to four groups: historical, geographical, ethnological, and scientific.

Historical.—Of all the books written on the Philippines, the historical books claim the greatest percentage. It was the common aspiration of the Government officials, the ecclesiastical authorities and the religious corporations to keep the home offices well informed, as to the extent and resources of the country and the customs and needs of the people: hence the rather luxuriant store of official reports sent out by the provincial and general governors, judges and naval authorities to the supreme powers of the metropolis; the pile of letters, memoranda, and chronicles submitted to the General Councils of the religious corporations by their local representatives in the islands, either reporting progress in the christianization of the different towns or suggesting modification of the general ecclesiastical laws, to meet local conditions.[1]

Geographical.—Few books were written with the specific purpose of describing the geography of the islands. The object of their authors was the study of a definite problem, either economic or religious, for the proper solution of which an accurate knowl-

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[1] The kings of Spain are to be credited with having enjoined the governors of the Philippine Islands, to submit a report containing the most detailed information about the archipelago. The questionaire submitted to the Governors and to be returned, properly accomplished, to the metropolis, contained 64 questions. The sixth question called for the elevation or *altitude of the pole* of every town, if it had been taken and it is known, or if there was any one who would know how to take it, or on which days of the year the sun would not cast any shadow at noon. (Joaquin Martinez de Zúñiga, Estadismo de las Islas Filipinas, vol. II, p. 254, Appendix.)

The questionaire, called *Instrucción y Memoria* was issued on October 27, 1575 and was circulated through the possessions of the spanish crown on May 25, 1577, together with practical instructions to observe the eclipses of the Sun and of the Moon, in order to ascertain the *longitude* and *latitude* of the towns. The *Instrucción* had been prepared by the cosmographer Juan Lopez de Velasco. Venezuela, Nueva España, Nuevo Reino de Granada y Tierra Firme, Quito and Perú are known to have sent their replies to the *Consejo de Indias*. I have not found any positive and explicit statement about the Philippines. (Acisclo Fernández Vallín, Discursos leídos ante la Real Academia de Ciencias, Madrid, 1893, pp. 216 and 235.)

In 1598 Philip of Spain offered a reward to anyone who would devise a method of finding readily the longitude at sea. One hundred and fifteen years later, or in 1713, the British Government offered a reward of £20,000. The prize was won by the skillful maker of timekeepers, John Harrison, a Yorkshire carpenter.