

# A STUDY OF THE PRODUCTION OF THE HUANG-YÜ CH'ÜAN-LAN T'U

by Rita Hsiao-fu Peng

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Among all the activities of introducing Western techniques into China undertaken by the Jesuits during the late Ming and the early Ch'ing Dynasties, the most successful one was the production of the *Huang-yü ch'üan-lan t'u* (皇輿全覽圖)。This is a map which was surveyed and drawn mainly by the French Jesuits under the order of the K'ang-hsi Emperor. This project marked the first effort in Chinese history to construct a map of the country based on a survey applying Western techniques.

In order to evaluate the production of this map: its characteristics, its deficiencies and its influences this paper makes an examination of the traditional cartography of China, the beginnings of the introduction of Western geography into China, the reasons for mapping the Empire and the methods the Jesuits used in carrying out this project.

## I. Traditional Cartography in China

Long before any foreign geographical knowledge was introduced into China, the Chinese had already started drawing maps which they regarded with esteem.

Sources referring to old Chinese maps are many. Information concerning the terms and usages of certain kinds of maps as well as the officials and offices that were in charge of map-making in ancient China are revealed to us in the classics, in historical works and the various encyclopedias.<sup>1</sup> Local maps were made in all parts of the Empire especially after the invention of paper (about A. D. 100).<sup>2</sup> Since Chinese authorities took maps as their valued guides for administrative, military and diplomatic purposes, all maps were supposed to be deposited in the imperial archives or held by certain officials.<sup>3</sup> Another source of Chinese maps was the requirement that all vassals submit maps to their feudal lords. These in turn were submitted to the kings as signs of loyalty.<sup>4</sup> This practice was required periodically in order to keep the maps up to date.<sup>5</sup>

Pei Hsiu (裴秀 A. D. 224-273) was "the real father of Chinese cartography".<sup>6</sup> Before him map-making in China did not take a cartographical form, but was composed of simple and rude productions which gradually improved through the dynasties. Learning from the accumulated experience, Pei carried out a comparative study of many local maps and, furthermore, laid down

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1 For classical references see the *Chou li* (周禮 The Book of Rites), the *Kuan-tzu* (管子 The Book of Kuan Chung 管仲) and the *Sun-tzu* (孫子 The Book of Sun Pin 孫臏); for historical books the *Shih Chi* (史記 The Historical Records), the *Han shu* (漢書 The History of the Han Dynasty) and the *Hou-Han shu* (後漢書 The History of the Later Han Dynasty); for encyclopedias, the *T'ung tien* (通典) and the *T'ung chih* (通志)。

2 Erwin Raisz, *General Cartography* (New York: McGraw-Hall Book Company, Inc., 1938), p. 12.

3 Pei Hsiu, "Yü-kung ti-yü t' u hsü". *Chin shu* (晉書 The History of the Chin Dynasty) (Shanghai: Chung-hua shu-chü, 1936), II, ch. 35.

4 Wang Yüing, *Chung-kuo ti-li-hsüeh shih* (中國地理學史 A history of Chinese geography) (Ch'angsha: Commercial Press, 1938), pp. 33-43.

5 *Ibid.*, p. 52.

6 Raisz, p. 12.

six principles of cartography, the so-called "*Chih-t'u liu-t'i*" (製圖六體), which are summarized as follows:

1. *Fen-lü* (分率): Rectilinear divisions, a network by which to start relative locations.
2. *Chun-wang* (準望): Orientation, to show correctly the direction from one place to another.
3. *Tao-li* (道里): Accurate indication of distances.
4. *Kao-hsia* (高下): Indication of higher and lower altitudes.
5. *Fang-hsieh* (方邪): Attention to angles.
6. *Yü-chih* (迂直): Attention to the bends of the roads.<sup>7</sup>

Following these six principles, the map-makers after Pei gradually became more skilled. Among them, the most important one was Chia Tan (賈耽 A.D. 735-805), who made the *Lung-yu shan-nan t'u* (隴右山南圖 A map of the areas of Shensi and Kansu) and the *Hai-nei Hua-I t'u* (海內華夷圖 A map of China and her neighbors).<sup>8</sup> However, after Chia, map work reached a low ebb until the coming of Chu Ssu-pen (朱思本) in the Yüan dynasty. He produced the *Yü-ti t'u* (輿地圖 A map of the Yüan Empire), a result of his personal investigations by travelling in China and of his corrections of old maps. His influence dominated all the successive cartographers lasting even to the Ch'ing dynasty.<sup>9</sup>

Those methods which had been applied to their map-making by Pei and his followers were in a way similar to some of those are used by cartographers today.<sup>10</sup> Pei's six principles, from a westerner's point of view, "attained a certain scientific standard." "In the use of the network Pei Hsiu was ahead of the cartographers of the West," said Erwin Raisz, the author of the *General Cartography*. "His network, however, is not comparable to our drawing of meridians and parallels, for the Chinese conceived

7 *Chin shu*, II, ch. 35; Raisz, p. 13.

8 Liu Hsü, "Chia Tan chuan" (The biography of Chia), *Chiu-T'ang shu* (舊唐書 Old history of the T'ang dynasty) (Shanghai: Chung-hua shu-chü, 1936), VI, ch. 88.

9 Wang, p. 96.

10. *Ibid.*, p. 58.

the Earth as a flat surface with China in the middle."<sup>11</sup> This is true to the Chinese people's conception of the world before the time when Western geography was introduced into China.<sup>12</sup>

While discussing Chinese traditional maps our knowledge would not be complete without mentioning the "Yü-kung"(禹貢), one of the articles contained in the *Shang shu* (尚書 or *Shu ching* 書經, The Book of History), for it has been cited from time to time in the context of the works dealing with geography in China. This article provided explanations of the nine administrative divisions (Chiu chou 九州) of the Chinese Kingdom under Yü the Great (Ta Yü 大禹 or Hsia Yü 夏禹 2205-2197 B. C.), of mountains, and of water sources in the Kingdom. Also it offered maps to show them. At same time, it revealed information concerning the distribution of products, the qualities of soil of the country, the taxes and the revenues from all places, and the relationship between the Kingdom and her neighbors under a formula of certain zones (Fu 服).<sup>13</sup> Although both its time and its authorship still remain in doubt,<sup>14</sup> the "Yü-kung" long ago became the initial source of ideas concerning geography in China. Most geographers were inclined to resort to the "Yü-Kung" as a basic orthodox model. Many maps were found which bore titles including such terms as "Yü" or "Yü-kung" even when they contained was nothing connected with the time or territory of the age of Yü, the Great.<sup>15</sup> Most importantly, the influence of the "Yü-kung" led subsequent geographers to be absorbed in the compilations of maps and topographical records

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11. Raisz, p. 13.

12. John Barrow, F. R. S., *Travels in China* (London, 1806), p. 295.

13. Ying Chi-shih, *Yü-kung chi-chieh* (禹貢集解 A comprehensive annotation of the Yü-kung) (Ch'angsha: Commercial Press, 1944), Summary.

14. Ku Chieh-kang, a contemporary scholars, judges that it was a work produced in the Warring States period, while another scholar, Chung Tau-ming, points out that it was written after the Hsiao-kung reign of the Ch' in dynasty.

15. Evident examples lie in a map of the Chin dynasty by Pei Hsiu bearing the name "Yü-kung ti-yü t'u" (禹貢地輿圖) and a map of the South Sung dynasty entitled "Yü-chi t'u" (禹跡圖); even in modern time there was a geographical journal named "Yü-Kung Biweekly" (禹貢半月刊), first issued on March 1, 1934.

which had, consequently, come to be two exclusive genres in the field of the traditional geography in China.<sup>16</sup> They brought to this field a literary rather than a scientific atmosphere. Even cartography which is supposed to be technical, lacked a sense of science.

## II. The Introduction of Western Geography into China

Catholic missionaries introduced Western geography into China in the sixteenth century. This century witnessed profound changes in Europe--the emergence of national monarchies, the great geographic discoveries, an intellectual awakening and a religious revolution. All of these helped directly or indirectly to encourage the Catholic Church to send its missionaries, Jesuits for the most part, to every part of the world.

Some of these missionaries, sponsored by the new national monarchies, and travelling along recently discovered shipping-routes, proceeded to China, during the late Ming and the early Ch'ing periods. In China, Western science and modern technology gained acceptance more readily than the Western religion. Hoping to make converts, the Jesuits introduced the scientific fruits of the Western intellectual awakening, and provided their technical services to whoever held power. Thus they made themselves welcome at the Ming and the Ch'ing Courts in Peking.<sup>17</sup> It was under these circumstances that maps of Western design and based on new knowledge in the field of geography were presented in China.

The first geographical work in Chinese introduced by a foreigner in China was the *Wan-Kuo yü-t'u* (萬國輿圖 A map of the world), prepared in 1584 by Matteo Ricci in Chao-ch'ing, Canton.<sup>18</sup> Following this Ricci presented three other geographical

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16. Wang, p. 2.

17. Cyrus H. Peake, "Some Aspects of the Introduction of Modern Science into China", *Isis*, 63 (Dec. 1934), p. 174.

18. Kenneth Ch'en, "Matteo Ricci's Contribution to, and Influence on, Geographical Knowledge in China", *Journal of the American Oriental Society*, 59 (1939), 326.

works to the throne. Still other Jesuits who came to China at the same time as Ricci produced works on geography to satisfy the curiosity of the Chinese. The most important ones with their authors and the years in which they completed their works are listed below:

Titles	Compilers	Years
<i>Wan-kuo yü-t'u</i>	Matteo Ricci	1584
<i>Wan-kuo t'u-chih</i> (萬國圖誌)	Matteo Ricci	1601
<i>Ts'e-liang fa-i</i> (測量法義)	Matteo Ricci	1601-1610
<i>Chih-fang wai-chi</i> (職方外紀)	Julius Aleni	1632
<i>Hsi-fang Yao-chi</i> (西方要紀)	Gabriel de Magalhaens	1659-1677
	Ludovicus Buglio	
<i>K'un-yü t'u-shuo</i> (坤輿圖說)	Ferdinandus Verbiest	1672
	Ferdinandus Verbiest	
<i>K'un-yü ch'üan-t'u</i> (坤輿全圖)	Ferdinandus Verbiest	1674

Among these works, the *Wan-kuo yü-t'u* and the *K'un-yü ch'üan-t'u* are world maps, the *Wan-kuo t'u-chih* and the *K'un-yü t'u-shuo* are interpretations of geographical phenomena, the *Chih-fang wai-chi* and the *Hsi fang yao-chi* are descriptions of the West and of some other areas while the *Ts'e-liang fa-i* deals with survey methods.<sup>19</sup> All these works disclosed to the Chinese intelligentsia what the foreign countries really looked like, and added to the sphere of their knowledge new ideas, such as, the spherical nature of the earth; the division of the zones of climate in the world, the reasons of some geographical phenomena--tides, earthquakes and the changing of the weather. These new ideas surprised the Chinese, for most of them remained firmly attached to the belief of the doctrines of their great philosophers and to magical explanations for geographical phenomena.<sup>20</sup> Yet through the process by which the maps were

19. Hsü Tsung-tse, *Ming-mo Ch'ing ch'u kuan-shu Hsi-hsüeh chih wei-jen* (明末清初灌輸西學之偉人 Great persons who introduced Western learning into China during the period of late Ming and early Ch'ing) (Kiangsu: T'u-shan-wan Press, 1926) pp. 9-16. Hereafter cited as Hsü, KHCWJ.

20. Barrow, p. 291. They believed that "the heaven is round, the earth a square fixed in the middle; the other four elements placed at its four sides: water to the north; fire to the south; wood to the east; and metal to the west."

made, three new techniques became available to Chinese cartography: (1) The determination of meridians by carrying out a scientific survey;<sup>21</sup> (2) the use of the astrobabe, an instrument for measuring longitude and latitude;<sup>22</sup> (3) the application of geometrical projections, including the Ortelius Projection and the projection orthographique transversale.<sup>23</sup> All of these were unprecedented in Chinese map-making. The new maps, as mentioned above, were of the whole world. A national map of China produced by Western cartography did not appear until 1717 when the *Huang yü ch'üan-lan t'u* came into existence. The production of this new national map can be attributed to the efforts of the Jesuits and to the enthusiasm of the K'ang-hsi Emperor for geography.

### III. The Map Work of the K'ang-hsi Reign

#### 1. Jesuit influence on the K'ang-hsi court

Since the arrival of Matteo Ricci Catholic missionaries had remained attached to the Chinese imperial court. During the early decades of the long reign of K'ang-hsi (1662-1722), the Jesuit mission at Peking exerted its greatest influence. Ferdinandus Verbiest and his colleagues in the years 1670-1685 enjoyed intimate contact with K'ang-hsi, a devotee of science.<sup>24</sup> They explained Euclidian geometry and some astronomical instruments to him. After this, came the French Jesuits Joachim Bouvet and Jean-Francois Gerbillon in 1687 and Dominique Parrenin in 1698 to replace them. K'ang-hsi deputed Gerbillon and Thomas Pereyra, a Portuguese Jesuit, to act as interpreters and advisers during the negotiation of the Treat of Nerchinsk with the Russians in 1688. Finally when an agreement was reached in the

21. Ch'en, p. 338.

22. Yao Pao-yü, "Chi-tu-chiao chiao-shih shu-ju hsi-yang wen-hua k'ao" (基督教教士輸入西洋文化考 The introduction of Western civilization into China), *Shih-hsüeh chuan-kan* (史學專刊), 1:2 (February, 1936), p. 51.

23. *Ibid.*

24. Ferdinandus Verbiest, *Lettre de la Chine où l'on voit l'état présent du christianisme peut faire pour le salut des âmes*, (Paris, 1682), p. 18; Le Comte, *Nouveaux mémoires sur l'état présent de la Chine*, (Paris, 1696), II, pp. 195-196.

following year, Emperor accepted the treaty with great appreciation.<sup>25</sup>

At the time of the negotiations, Gerbillon presented a map of Asia to K'ang-hsi and at the same time remarked that the Chinese understanding of the geography of Manchuria was lacking. His remarks caught the Emperor's attention.<sup>26</sup> Likewise, Parrenin had suggested to K'ang-hsi that China needed a survey.<sup>27</sup> However, these French Jesuits missionaries were not, in fact, interested in the welfare of China. Rather they hoped to satisfy the desire of their own Emperor, Louis XIV, namely, that they would give themselves geographical observations for the benefit of the newly formed Academy of Science (in France) as well as the work of evangelization.

## 2. The K'ang-hsi Emperor's interest in geography and his intention to map the Empire

Examining the edicts and articles on geography issued by K'ang-hsi, we find that he had deep interest in geography, which became more intensive while the map work was in operation. In his discussions, he used such newly translated terms as "ch'ih-tao" (赤道 equator), "tu-shu" (度數 measurement), "ti-ch'iu" (地球 earth), "pei-chi" (北極 the North Pole) and the names of some foreign countries.<sup>28</sup>

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25. Kenneth Scott Latourette, *A History of Christian Missions in China*, (London: Society for Promoting Christian Knowledge, 1929, 1st. ed., (Taipei: Ch'eng-wen Publishing Company, 1968), pp. 120-121, 158, 199.

26. Yao, p. 51.

27. Hsü Tsung-tse. *Ming Ch'ing chien Yeh-su-hui-shih i-chu ti-yao* (明清間耶穌會士譯著提要 An annotated bibliography of the works written or translated by the Jesuits during the Ming and the Ch'ing dynasties), (Shanghai: The Chung-hua Book Co., 1949), pp. 403-404. Hereafter cited as Hsü, ICTY.

28. Wang Hsien-ch'ien comp., "K'ang-hsi ch'ao tung-hua-lu" (康熙朝東華錄 A record of the K'ang-hsi reign), *Tung-hua ch'üan-lu* (東華全錄 Records of the reigns of the Ch'ing dynasty), (Peking: Chin-wen shu-chü, 1887), ch. 9, hereafter cited as THL; "K'ang-hsi ch'ao Sheng-tsu Jen-huang-ti sheng-hsün" (康熙朝聖祖仁皇帝聖訓 Sacred Instructions of the K'ang-hsi reign), *Ta-Ch'ing shih-ch'ao sheng-hsün* (大清十朝聖訓 Sacred instructions of the ten reigns of the Ch'ing dynasty) ([n. p.], 1879), ch. 5, 146, ch. 30, 5b; hereafter cited as STSH; *K'ang-hsi chi-hsia ke-wu pien* (康熙幾暇格物編 Notes on science studied during intervals of imperial affairs), ([n. p.], 1899), I, No. 1, 5-8; hereafter cited as CHKWP. Most of these terms were translated by Matteo Ricci in the Ming dynasty. Names of foreign countries: used by k'ang-hsi were "oh-lo-ssu" (俄羅斯 Russia), "Ha-sa-ke" (哈薩克) etc.



K'ang-hsi was also fascinated by the use of western instruments to fix orientations and to survey lands. On his frequent Imperial Tours to the North or to the South, K'ang-hsi usually stopped to make calculations or surveys. He always had Gerbillon carry out the surveys. After he became familiar with the operations of the several kinds of instruments, he tried personally to make surveys to measure the length of a road, the height of a mountain, the width of a river, the size of a piece of land or the distance between places.<sup>29</sup>

However K'ang-hsi displayed much more inclination toward textual criticism of geography than toward the study of Western geography. He devoted himself to the study on the sources of the Yangtze River, of the Yellow River and of the Ganges; also to the study on the mountain ranges of K'unlun and of Ch'ang-pai.<sup>30</sup> In these discourses, he usually cited the "Yü-kung" and many other classical and historical works, and emphasized the verification of the names of the mountains and rivers.<sup>31</sup> It was this enthusiasm that stimulated him to send missionaries to investigate the country. In the Edict sent down in the winter of 1720-1721 (K'ang-hsi 59-11) to the Grand Secretaries and the Assistant Secretaries of the Imperial Chancery and the Nine Ministries, the Emperor stated:

From our youth on we have given attention to geography. The names from antiquity until now of all hills and streams, even those in the frontier regions and remote deserts we made a point of ascertaining correctly by the study of maps and records and through wide investigation of local opinion. For this purpose

29. "Ch'ing Sheng-tsu Jen-huang-ti shih-lu" (清聖祖仁皇帝實錄 A veritable record of the K'ang-hsi reign), *Ta-Ch'ing li-ch'ao shih-lu* (大清歷朝實錄 Veritable records of the successive reigns of the Ch'ing dynasty), (Taipie: Wen-hai shu-chü, 1965), ch. 245 (K'ang-hsi 50/2/9), hereafter cited as CSL; "Lettre du Père Fontaney au Père de la China", *Lettres edifiantes et Curieuses*, VII (Paris, 1777), 202-204.

30. Chang Chin comp., *K'ang-hsi cheng-yao* (康熙政要 A classified collection of instructions of the K'ang-hsi Emperor), ([n. p.], 1910), ch. 18, 11a-16b, hereafter cited as KHCT; STSH, ch. 5, 12a; ch 52, 4a-6b.

31. KHCY, ch. 18, 12a-13b, 15a-b; CHCWP, I, No. 1, 1; No. 2, 6-9; No. 3, 2-4; II, No. 1, 3.

we sent commissioners to all the K'unlun and Hsi fan country where they saw with their own eyes the various places where rise the Great River, the Yellow River, the Black Water (Salween), the Chin-sha, and the Lantsang (Mekong), and affter full inquiry they made the necessary entries in maps. <sup>32</sup>

This activity was simultaneously reinforced by his feelings of responsibility as a ruler. Learning from traditional geography, K'ang-hsi was impressed by the past official regard to maps. <sup>33</sup> Examining the existing old maps, K'ang-shi found some serious defects. <sup>34</sup> Dealing with the political situation, he faced confusing frontiers and newly gained territories. <sup>35</sup> Under these circumstances, the Emperor felt it was essential to map out the Empire as accurately and with as much detail as possible. The new map would help to sweep out all the errors and doubts on old maps and would serve as an effective guide to governing the Empire. <sup>36</sup> To achieve this goal, K'ang-hsi assigned the Jesuits to carry out the map project.

### 3. The process of the map project

In view of its nature and its extent, this map project was divided into two stages. The first stage, beginning about 1691, covered a span of nearly two decades. Work at this time was carried out sporadically in small sections of the Empire, and most of the work was improvised during K'ang-hsi's expeditions and tours to both north and south China. <sup>37</sup> The second stage covered the years from 1708-1711. and the project was extended to include the entire country.

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32. STSH, ch. 52, 4a.

33. *Ibid.*, 4a-6b.

34. *T'ing-hsün ke-yen* (庭訓格言 A collection of the K'ang-hsi Emperor's maxims and instructions), (Wuhsing, 1909), Liu Ch'eng-kan rev., 44a-b; hereafter cited as THKY.

35. STSH, ch. 52, 4a.

36. *Ibid.*

37. Latourette, p. 129; Fang Hao, *Chung-Hsi chiao-t'ung shih* (中西交通史 A history of the communication between China and the West), (Taipei: Chinese Culture Publication Committee, 1954), IV, pp. 195-196.

In the first stage longitudes and latitudes were surveyed in the following areas: To-lun-no-erh (多倫諾爾) in 1691; Kal-mucks in 1696; Chang-chia-kou (張家口), Tatung, and Ninghsia in 1697; Chiāng-nan in 1699.<sup>38</sup> Also K'ang-hsi in 1704 sent two officials Shu-lan (舒蘭) and La-hsi (拉錫), to investigate the Yellow River, both its source and its tributaries. And after this, others were sent to survey the area of the Yangtze River.<sup>39</sup> The places surveyed in the second stage, the surveyors and the dates are included in the table on the next page.<sup>40</sup>

During this time the Jesuits measured the longitude by means of long chains or ropes and the latitude with mathematical instruments.<sup>41</sup> They set Peking as the prime meridian for longitude<sup>42</sup> and called the latitude "Pei-chi ch'u-ti kao" (北極出地高).<sup>43</sup> They adopted the measure introduced by the Board of Works (*Kung-pu* 工部) as their standard measure.<sup>44</sup> The operation "required the services of numerous individuals," and was "superintended by many mandarins."<sup>45</sup>

38. Fang, p. 196.

39. W. R. Carles, "The Emperor K'ang-hsi's Edit on Mountains and Rivers in China," *Geographical Journal*, 59 (1922), 259-260.

40. This table was based on the following sources: Ch'en Kuang-yü and Hsü Sheng-mo, *Chung-kuo li-shih ti-t'u chi* (中國歷史地圖集 Chinese historical atlas) (Taipei, 1955), I, pp. 49, 110; II p. 85; Chü Mi, "Ming-mo Ch'ing-ch'u lai-Hua Yeh-su-hui-shih han hsin-ming kao-shih" (明末清初來華耶穌會士漢姓名考釋 A study of the names of the Jesuits who came to China during the period of the late Ming and the early Ch'ing), *Ta-lu tsa-chih* 大陸雜誌, XXXIII (1966), No. 3, 8-12, No. 4, 16-21; No. 5, 25-32; Du Halde, J. B. *Descriptions géographiques, historiques, chronologiques, politiques et physiques de L'Empire de Chine et de la Tartarie chinoise*, (Paris, 1735), I, xxxvj-xlij; Hsü, ICTY, pp. 398, 405, 407-408.

41. Matteo Ripa, *Memoirs of Father Ripa during thirteen Years Residence at the Court of Peking in the Service of the Emperor of China*, 1711-24. Fortunate Prandi, trans., (London, J. Murray, 1844), p. 65.

42. Du Halde, I, xxxvj.

43. Wang, p. 117.

44. Fang, p. 200.

45. Ripa, p. 65.

AREAS	SURVEYORS	DATES
Mongolia Great Wall	Joan-Baptiste Régis (F.)* Joachim Bourver (F.) Petrus Jartoux (F.)	July 4, 1708- Jan. 10, 1709
Liao-tung (West) Manchuria, Fengtien, Northern Korea (between the Yalu River and the T'umen River [40°N-45°N])	Régis, Bouvet, Jartoux Xavier Fridelli (G.) Mu-k'e-teng (Manchu)	May 8, 1709- 1711
North Chihli (North Hopeh)	Régis, Jartoux, Fridelli	Dec. 10, 1709- Jan. 29, 1710
North Manchuria (Tartar)	Régis, Jartoux, Fridelli	July 22, 1710- Dec. 14, 1710
Shantung	Régis, Joannes Franciscus Cardoso (P.)	1711-1712
Khalkas (from the west of Great Wall to Hami)	Jartoux, Fridelli, Bouvet, Bonjour (F.)	1711-1712
Shansi Shensi Kansu	Jartoux, Fridelli, Cardoso, Bonjour, Petrus Vincentius Tartre (F.)	1711
Honan Kiang-nan (including Kiang-su, Kiangsi and Anhwei) Chekiang Fukien	Régis Cardoso, Moyriac de Mailla (F.) Romanus Hinderer (F.)	1712
Western Taiwan	Régis, Malla, Hinderer	1714
Szechwan	Fridelli, Bonjour	1713
Yünnan	Fridelli, Bonjour, Régis	1714 1715
Kweichow	Fridelli, Régis	1715
Hukwang (including Hunan and Hupei)	Régis	1715- Jan. 1, 1717
Tibet and its vicinity (Hsining, Lasa, the source of the Ganges)	two lamas	1717

\*F.-French; G.-German; P.-Portuguese.

#### 4. The application of Western techniques

The methods which the Jesuits applied when they undertook this map work are of significance. They threw new light on Chinese map-making and brought Chinese cartography, in a loose sense, into the realm of modern science. However, little information about these methods exists in Chinese materials. From records in French, largely the statements of Jean-Baptiste Régis, one of the Jesuits who engaged in most of the map work, we learn some important points. The surveyors depended largely on triangulation and partially on astronomical observations. In drawing the maps, they used geometrical projections. In addition to carrying out scientific operations they also paid attention to traditional materials on geography in China, but they considered them merely as references rather than as primary sources.

The survey work during the first stage focused on measuring the longitude and the latitude of certain spots by astronomical observation, in order to set a base for further work.<sup>46</sup> However, owing to some practical difficulties with this method, after 1706 with the beginning of the second stage national triangulation became a major aim of the surveyors who hoped to set standard orientations throughout the Empire.<sup>47</sup> Régis explained as followings:

It is the easiest way to adopt triangulation to map out a vast area in a short time. If we applied solely astronomical observation, there would be a possibility to get an inaccurate longitude which resulted from a wrong calculation of time or from a wrong observation over the appearance of the satellites of Jupiter ... [But] instrumental surveys can result in the measurement of quite exact distances and in that of angles ... Another advantage of this method is that...we can measure latitudes and then compare the

43. Weng Wen-hao, "Ch'ing-ch'u ts'e-hui ti-t'u kao" (清初測繪地圖考 An investigation of surveying and map-making in the early Ch'ing period), *Ti-hsüeh tsa-chih* (地學雜誌 Journal of Geography), No. 3 (1930), 406-407.

47. "Orientation" here means a primary position with relation to the points of the compass.

results with those which have been determined by astronomical observation...<sup>48</sup>

In order to assure the accuracy of their measurements, the Jesuits did their best. Régis recalled: "All the methods of remeasurement ... and any other methods which were efficient enough to improve the accuracy of our measurements and to meet the Emperor's expectation, we had never stopped from doing our best to try them, even when we faced any danger or difficulty..."<sup>49</sup> They remeasured the result by following another route which was different from the original one but led to the primary surveying point. If they could get a measurement equal to what they had gotten from their primary surveying, they accepted it. In case of failing to reach the primary point, they adopted a second method. By taking the primary surveying point as their basis, they looked into and examined the tops of towers or mountains near this point, and kept measuring the distances between them.<sup>50</sup>

At the same time, they used triangulation to check the results which had been gained by former Jesuits from lunar observations and from the observations of the satellites of Jupiter. For example, they surveyed a distance from one city to another. Then they compared it with the measurement which was gained from the observation of a lunar eclipse. "We think that this is the only practical way," said Régis, "and at the same time an unprecedented geographical work."<sup>51</sup> By doing so, they approved, corrected, and disproved some earlier measurements.

Besides surveying, the Jesuits tried to visit in person the important places in all the provinces. They attempted to look up all the topographical records of each district and to consult the officials of the local government.<sup>52</sup> But Régis tells us, "While mapping out China, we did not base our work on the old maps

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48. Du Halde, I, xlv-xlvj.

49. *Ibid.*, xlvii.

50. *Ibid.*, xlvj.

51. *Ibid.*, xlvij.

52. *Ibid.*, xlv.

kept by Chinese authorities, nor did we adopt the current measures. We decided to do all the surveys over. We took the traditional knowledge merely as the reference for finding right routes and for choosing survey points”<sup>53</sup>

In drawing the map, they applied two kinds of geometrical projections:

- (1) Orthogonal Projection. Through this method, the latitude results were in parallel lines with equal distance between them, and the longitude results were in straight lines with their ends on one side meeting at the North Pole and those on the other side at the South pole.
- (2) Oblique Projection. Through this method both the longitude and the latitude results were in parallel lines. <sup>54</sup>

5. The completion of the *Huang-yü ch'üan t'u*  
its characteristics and its deficiencies

Finally, in 1718, Régis, Fridelli, Bouvet and other Jesuits under the leadership of Jartoux completed a national map of China, which was drawn by combining all the maps of the provinces of China inside the Great Wall with those of Manchuria, Tibet and Korea.<sup>55</sup> At the same time, they drew separate maps for each province and for every major city of each province. <sup>56</sup> The national map together with these provincial and city maps were on 32 *fu* (幅 scrolls) and entitled “Huang-yü ch'üan-lan t'u”. They covered a range “south to Mien-kuo (緬國Burma), north to Russia, east to the Sea, west to the Kang-ti-ssu (岡底斯 a branch of the Himalayas in Tibet). <sup>57</sup> All the names of places inside the Great Wall were in Chinese

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53. Du Hadle, I lij.

54. Yao, 55.

55. Hsü, ICTY, p. 405.

56. Du Halde, I, xlv.

57. Nishimoto Shirakawa, *Kōki tai tei* (康熙大帝 K'ang-hsi the Great), (Shanghai: Shunshin sha, 1925), p. 159.

and those of the places outside in Manchu.<sup>58</sup>

K'ang-hsi, in 1719, told Chiang T'ing-hsi (蔣廷錫), a secretary, that "the *Huang-yü ch'üan-lan t'u* has taken us more than thirty years to complete. All the mountain ranges and water sources marked on this map are in accord with that on the 'Yü-kung'." K'ang-hsi then ordered Chiang: "Show this map to the Nine Ministers and ask them to examine it and to point out mistakes, if any, then report to me." Instead of criticizing it, the Nine Ministers answered the Emperor "This is really an unprecedented map."<sup>59</sup> K'ang-hsi asked another Jesuit, Matteo Ripa, to engrave it in copper block.<sup>60</sup> In 1721 another edition appeared in wood block.<sup>61</sup>

The mapping technique of the *Huang-yü ch'üan-lan t'u*, as well as the map itself, demonstrated five epoch-making characteristics as contrasted with Chinese traditional map works.

First, measurement was standardized. Traditional map-makers in China had seldom adopted the same standard of measurement. Their measurements varied from place to place, from dynasty to dynasty, and thus the term "distance" became meaningless.<sup>62</sup> K'ang-hsi, in view of all the non-uniform and confusing measures prevailing at the time before the map project began, decided to standardize the *ch'ih* (尺 Chinese foot). The Board of Works introduced a standard measure for surveying work. According to this measure, 1,800 *ch'ih* became equal to one *li* (里 Chinese mile).<sup>63</sup> Furthermore, K'ang-hsi judged that 200 *li* should equal one degree of longitude.<sup>64</sup> This was later proven true by the Jesuit Thomas' surveying.<sup>65</sup>

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53. Ishida Mikinosuke, "Shina bunka to seiyō bunka to no kōryū," (支那文化と西洋文化との交流 The confluence of Chinese and Western culture), *Iwanami kōza tōyō shichō*, (Tōkyō: Iwanami, 1936), XVIII, 2, 103.

59. CSL, ch. 233.

60. Ripa, p. 66.

61. Fang, p. 201.

62. STSH, ch. 52, 2b.

63. Weng, p. 408.

64. STSH, ch. 52, 2b.

65. According to Thomas' survey, one degree of longitude equals to twenty "lieue" (French mile) and just equal to two hundred Chinese miles.



Resulting from this, "the length of the day and night, the seasonal changes, the time of eclipses, and orientations could be determined."<sup>66</sup>

The second characteristic was the application of triangulation. In addition to lacking a standard measurement, Chinese traditional map-makers did not emphasize orientations and the measurement of angles, nor did they consider the physical features of a place or the angles of slopes. As a result, distances became unreliable when extended.<sup>67</sup> The work of triangulation accomplished during the K'ang-hsi reign, however, used more prudent and thorough methods. The Jesuits surveyed the angles with a hodometer to fix orientations. When measuring the distance of a place, they first set, exact base lines and then calculated and compared them through trigonometry, from near to far. Furthermore, they remeasured the results from other places which had already been surveyed. Therefore, all the relative positions shown on the map were quite accurate. This work really deserves to be considered as a basic and important work in the field of geography in China.<sup>68</sup>

Thirdly, illustration was made more accurate and detailed. Even in remote areas, all the fortresses, palisades of moats, castles, garrisons and frontier passes, postal stations and ferries were marked in detail.<sup>69</sup> This was quite an improvement over older maps. Most important, for the first time longitude and latitude lines appeared on a Chinese map.

Fourthly, the sources of the great rivers with their tributaries and the ranges of the great mountains in China were investigated and most of their names were verified. The work, as a whole, helped to clear up doubts which had been created by previous geographical works in China.<sup>70</sup>

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66. THL, ch. 103.

67. Weng, 417.

68. *Ibid.*

69. THL, ch. 103.

70. THL, ch. 103.

The fifth characteristic was the greatness of the project and its scope. Never in Chinese history had such a huge survey been carried out. It covered nearly every part of the Imperial territory and took more than thirty years to complete. No subsequent survey work in China can be compared with that of the *Huang-yü ch'üan-lan t'u* in terms of their scope or their thoroughness.<sup>71</sup> Even in Europe, where the scientific techniques of cartography originated, no survey on the national scale was completed in France until 1744.<sup>72</sup> This date is approximately three decades after the national survey in China was finished. Remembering that it was completed under circumstances of difficult transportation and insufficient instruments, one can not help praising the accomplishments of the Jesuit map-makers.

Nevertheless, there were several deficiencies in their maps which must be pointed out. The measurements of some longitudes and latitudes were not sufficiently accurate. Neither both Korea nor Tibet were surveyed exactly.

Owing to the lack of reliable astronomical observation and to the limitation of time, some of the measurements of the longitudes and latitudes remained inexact.<sup>73</sup> For instance, the latitude of a certain place might have been found to have two or more measurements with a divergence of several minutes and those of longitude with a divergence of one degree.<sup>74</sup> However, these errors could not be corrected until there was further advancement of the astronomical method. In this aspect, Régis reveals to us that they might have done better than they did:

In order to approach being perfect we intended to go to the East and the West boundaries, and to several appropriate spots in the center of the Empire to watch eclipses directly and to

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71. Weng, 405.

72. Raisz, p. 49.

73. Astronomical observations take much time to complete. And the Emperor expected immediate results.

74. Weng, 426-427.

measure their longitudes. However, the Emperor was already contented with what we had done, so we did not go further. <sup>75</sup>

Although K'ang-hsi sent Jesuits to survey the boundary between Korea and China, they did not succeed. <sup>76</sup> For the Koreans, "being extremely jealous of strangers, would not admit Europeans, and thus part of the business was consequently executed by a mandarin, purposely instructed by the Jesuits. <sup>77</sup> K'ang-hsi sent Mu-k'e-teng (穆克登) pretending to be an ambassador. He gave Mu-k'e-teng a secret order to investigate this boundary carefully while sailing with the Korean officials from Feng-huang City (鳳凰城), along the Yalu River to its source in the mountains of Ch'angpai and then to offer a report. <sup>78</sup> But the Koreans still watched him so closely that he was not able to measure the longitudes with a line. <sup>79</sup> He could only calculate the miles by hour, and succeeded only in taking the sun's latitude. In 1711, Mu-k'e-teng submitted a map of the places he had visited without covering the mountains of Ch'angpai. K'ang-hsi ordered him to survey again the next year, <sup>80</sup> But the result of this errand remains unknown. The map of Korea was finally produced, based on an old map from the Korean palace and revised by Régis, Jartoux and Fredelli. <sup>81</sup> Therefore, the map of this area was far from perfect.

In 1717, Tibet was conquered by the Ch'ing army. K'ang-hsi had a desire to send a mission to map out this newly gained area and to record exactly the variations between the Chinese and tribal names for hills and streams. <sup>82</sup> However,

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75. Du Halde, I, xlvij,

76. In 1709, Régis, Bouvet, Jartoux and Fridelli were sent to survey this area.

77. Ripa, p. 65.

78. STSH, ch. 52.

79. Ripa, p. 65. "He could not take a step without being observed by the guards, who ...wrote down all he said or did...This ambassador, with whom I was intimately acquainted..."

80. STSH, ch. 52.

81. Fang, p. 197.

82. CSL, ch. 290.

Tibet was still governed by the Lamas who belived in Lamaism and allowed no people of other religions to enter their area.<sup>83</sup> For this reason, K'ang-hsi put two Lamas in charge of the survey work in place of the Jesuits. These two Lamas had been trained to some extent in surveying techniques in the Meng-yang-chai (蒙養齋 An institute for training technical workers which belonged to the Imperial Board of Astronomy) under the instruction of the Jesuits, but they failed to do their best.<sup>84</sup> They followed K'ang-hsi's order to survey from Hsining, through Lasa to the source of the Ganges. When they arrived at the Ganges, they rushed immediately because of Tsewang Araptan's (head of the Dzungar tribe) invasion of Tibet. The map which they submitted to the Emperor was largely founded on the legends which they had gained from Tibetan temples.<sup>85</sup> K'ang-hsi asked Régis and Jartoux to examine this map. Fearing to give offence to the Lamas, Régis and Jartoux did not criticize it seriously. They merely corrected the measurement of the longitude of Lasa by a calculation based on the distance between the the three cities of Hsining, Ta-chien-lu (打箭爐) and Li-chiang (麗江).<sup>86</sup>

#### IV. The Effect of the Production of the Huang-yü

##### ch'üan-lan t'u

##### 1. Influence in China

In the Yüing-cheng reign, immediately after K'ang-hsi, no intensive map work was done. But the Jesuits still made some

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83. Lin Ch'un-sheng, "Ch'ing-tai chih-Ts'ang chih-tu" (清代治藏制度 The system of governing Tibet in the Ch'ing dynasty), *Hsi-ts'ang yen-chiu* (西藏研究 A study of Tibet), (Taipei: Chinese Frontier Language Academy, 1930), pp. 121, 125-126. Lamaism which contained a large element of Hinduism and absorbed the popular demon worship of Tibet dominated Tibet politically as well as religiously. It also had exclusive influence in Monogolia. Thus, K'ang-hsi adopted a policy of conciliation in governing Tibet and let the Lamas manage their own affairs. At that time Lamas were in high favour with the Ch'ing Court.

84. Yao, 52.

85. Weng, 433.

86. *Ibid.*

supplements to the *Huang-yü ch'üan-lan t'u*. In 1725, Régis and Bouvet completed a map of Ch'inghai, which had been conquered the year before.<sup>87</sup> Ignatius Kögler and Antoine Gaubil continued taking astronomical observations. Thus, they corrected some old measurements of longitudes and latitudes, and made more accurate the longitude of Peking.<sup>88</sup>

The influence of the *Huang-yü ch'üan-lan t'u* on the map work of the Ch'ien-lung period brought on the appearance of the *Ta-Ch'ing I-t'ung yü-t'u* (大清一統輿圖 A map of the Great Ch'ing Empire) in 1761. It was produced partially by referring to the works on geography by Matteo Ricci and by Ferdinandus Verbiest, but was largely based on the *Huang-yü ch'üan-lan t'u*. A Russia map as well as on the results of new survey work were also used.<sup>89</sup>

Since all the tributaries west to the Kalmucks were conquered in 1754, the Ch'ien-lung Emperor commanded two Manchu officials to lead the Jesuits to survey these areas and to map them out according to the methods which were applied in the K'ang-hsi period.<sup>90</sup> They took surveys in the following areas:<sup>91</sup>

Areas	Leaders	Surveyors	Years
West Chun-pu (準部)	Ho Kuo-tsung (何國宗)	Michel Benoist Joseph d'Esphina	1754
Chun-pu	Ho Kuo-tsung	Michel Benoist Joseph d'Esphina	1755
Hui-pu (回部)	Ming An-t'u (明安圖)	Michel Benoist Joseph d'Esphina	1759

87. Hsü, ICTY, p. 405.

88. Weng, 405, 430-431.

89. Fang, pp. 209-210.

90. Ch'ien-lung Emperor, "Ta-Ch'ing i-t'ung yü-t'u shih' tze-chu," (大清一統輿圖詩自注 The Ch'ien-lung Emperor's annotation of his own poetry on the *Ta-Ch'ing i-t'ung yü-t'u*). *Ta-Ch'ing i-t'ung yü-t'u* (A map of the great Ch'ing Emperor), (Shanghai: Ch'iu-tze-ch'iang chai, 1898), Preface.

91. Chao Erh-hsün and others, comp., "Ho Kuo-tsung chuan" (何國宗傳 A biography of Ho), *Ch'ing shih kao* (清史稿 Draft history of the Ch'ing dynasty) ([n. p.], 1927), ch. 70.

In 1761, under the leadership of the Jesuit Antoine Gaubil, Jesuits completed a map and engraved 104 copper plates covering a range north to the North Sea (北海 Balkhosh) in Russia, south to the Ch'üing-hai (瓊海 the South Sea), west to the Mediterranean, East to the Eastern Sea.<sup>92</sup> In comparing this map with the *Huang-yü ch'üan-lan t'u*, we find that it was on a larger scale, supplemented the part on Hsin-chiang (新疆 including both Chun-pu and Hui-pu) and put emphasis on the Sino-Russian boundary.<sup>93</sup> In addition, its drawing skill was more elaborate.<sup>94</sup>

However, like all the preceding dynasties, the Ch'ing Court considered maps as precious materials and kept them secret in the imperial archives.<sup>95</sup> The *Huang-yü ch'üan-lan t'u* and the *Ta-Ching i-t'ung yü t'u* suffered the same fate. After they came into existence they were deposited in the Yü-t'u fang (輿圖房 map room) which belonged to the Nei-fu (內府 imperial treasury).<sup>96</sup> After the reign of Ch'ien-lung, no one except imperial nobles and courtiers, got a chance to see these maps, let alone to learn from them. As a result, few map-makers applied the methods that the Jesuits had introduced. Most of them even turned back the clock by basing their maps more on material inherited from tradition than on actual instrumental surveys. Maps submitted by local authorities during this period were works made by traditional cartography or by combined methods using Chinese and Western techniques.<sup>97</sup>

During the period between the reigns of Hsien-feng and T'ung-chih, the *Huang-yü ch'üan-lan t'u* and its supplements were introduced to the public by a few officials and had

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92. Yao, 53.

93. Fang, p. 210.

94. Yao, 53.

95. Wang, p. 219.

96. *Kuo-ch'ao kung shih hsü-pien* (國朝宮史續編 A supplement to the *Kuo-ch'ao kung shih-pien*), (Peiping: Palace Museum, [n. d.]), ch. 99; Hu Hsi-yen, "Huang-Ch'ing ti-li t'u pa" (皇清地理圖跋 Colophon to the *Huang-Ch'ing ti-li t'u*), *Huang-Ch'ing ti-li t'u* (皇清地理圖 A map of the Ch'ing Empire), (Canton, 1871).

97. Wang, p. 220.

much greater influence on textual criticism of geography than on mathematical surveying in China. The *Ta-Ch, ing i-t'ung yü-t'u* published in 1862 by imperial order and a private work entitled *Shui-tao t'i-kang* (水道提綱 An outline of water sources) by Ch'i Chao-nan (齊召南) are two examples of textual research works based on the *Huang-yü ch'üan-lan t'u*<sup>98</sup>. Here the map served again as a source for literary research rather than a mold for map-making. However, at the close of the Ch'ing dynasty, the Institute of Army Survey was established. By benefiting from the accomplishment of map works in the early Ch'ing period and from new advancements in science, technical map-making survived in China. This institute was renamed Institute of Mainland Survey and has conducted the map work of the country since then.<sup>99</sup> In fact, as early as in 1899, Dr. Sun Yat-sen compiled a map of China by using the maps which had been made in the K'ang-hsi and the Ch'ien-lung periods along with maps which were made by Western powers.<sup>100</sup>

## 2. Contribution to Europe

The *Huang-yü ch'üan-lan t'u* became popular in eighteenth century Europe. One of the manuscripts of this map was sent to the Jesuit, Du Halde, in France by Fridelli immediately after it was produced.<sup>101</sup> Upon receiving this manuscript, Du Halde first showed it to Louis XIV, and then asked D'Anville, a famous French map-maker, to engrave it in copper blocks.<sup>102</sup> D'Anville and his students corrected the part on Manchuria by referring to Bouvet's memoirs in China; corrected the map of Tibet by using some geographical knowledge from India and Western Asia; and added a map of Japan.<sup>103</sup> Finally, they produced a map of 42 sheets. It

98. Weng, 437.

99. Wang, p. 19

100. Chang Ch'i-yün, "Chung-hua piao-chun ti-t'u hsi" (中華標準地圖序 Preface to the *Chung-hua piao-chun ti-t'u*), *Chung-hua piao-chun ti-t'u* (中華標準地圖 Standard Atlas of the Republic of China), (Yang-ming-shan, 1964).

101. Hsü, KHCWJ, p. 19.

102. Ishida, 111.

103. Weng, 437

was attached to the *Descriptions géographiques, historiques, chronologiques, politiques de L'Empire de China et de la Tartarie chinoise* by Du Halde, published in 1735. Thereafter, this map, together with the book, served as a main source for European understanding of China as well as Asia.<sup>104</sup>

Incidentally, there is another contribution of the map work of the *Huang-yü ch'üan-lan t'u* to the West. During the process of the surveying work, in 1710, when Régis and Jartoux were measuring the latitudes between 47°N-41°N, they discovered that the measurements of longitude varied with the different locations of latitude. This provided evidence for Newton's theory that the shape of the earth was elliptical, while Cassini had, on the other hand, insisted that the earth was like an oval ball. This had long been a disputed question in the early eighteenth century and was finally resolved in China.<sup>105</sup>

## V. Conclusion

To sum up, the map work on the *Huang-yü ch'üan-lan t'u* in the K'ang-hsi reign was unprecedented in Chinese history. In view of the new technical efforts which were made in this work, it marked the dawn of modern cartography in China. These efforts helped to correct many errors existing in Chinese traditional cartography, and provided a more perfect map of China in the eighteenth century. Although in this map there are deficiencies resulting from practical limitation, it served, in its age, as a source for research in China and for the understanding of Asia in Europe. In terms of its scope and its thoroughness, this map project is of significance in the history of both Chinese and European cartography.

However, this map work failed to exert a prevailing influence upon contemporary map-makers in China and to bring radical change in this field as a whole during the Ch'ing period. The map work in the Ch'ien-lung reign imitated that of the K'ang-hsi reign. In fact, it returned to the traditional

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104. Ishida, 112.

105. Du Halde, I, xlj.



Chinese approach to cartography by placing more emphases on textual research than on actual surveys. Subsequently, while textual research on geography grew intensively, technical surveying in cartography nearly disappeared. Although Western geography had been introduced into China in the sixteenth century, and technical map work begun in the seventeenth century, modern survey works undertaken by the Chinese themselves started as late as at the close of the nineteenth century. This tardiness can be explained by the fact that Chinese traditional ideas in geography were still dominant until the end of the Ch'ing dynasty.

Traditional geographical work inclined to the political side rather than to the scientific side, while Western geographers, in general, placed these two aspects on an equal footing. Even so, geography had emerged in China at a rather earlier time than in Europe. Historical geography and administrative maps had flourished, early, whereas natural geography and technical survey had developed only later. Most Chinese had long associated natural geography with geomancy and astrology. Strictly speaking, not every map-maker followed the six principles of map-making which were suggested by Pei Hsiu, father of Chinese cartography. Therefore, when Western geography was introduced into China, the Chinese failed to understand it thoroughly due to their lack of scientific knowledge.

Also traditional treatment of maps was still exercised by the Ch'ing Court. They regarded maps as precious materials and allowed none of them to be circulated publicly. As the sponsor of the map works, the emperors, like all the previous rulers, expected perfect maps for political purpose; but did not think about how to help Chinese map-makers learn from the Jesuits. Even as an enlightened devotee of Western science, the K'ang-hsi Emperor did not have such a desire. Judging from his interests in geography and his intention to map the Empire, we find that for the K'ang-hsi Emperor to adopt European scientific techniques was by no means the same as promoting the application of Western science.

Rather he wished to take advantage of these techniques to cast an ideal map to help his rule and to satisfy his own intellectual curiosity. Although K'ang-shi was fascinated by Western land surveying, he was more impressed by Chinese traditional geography. Therefore, he associated the *Huang-yü ch'üan-lan t'u*, a product of Western cartography, with the "Yü-kung", the source of Chinese geography, by saying that, "All the mountain ranges and water sources marked on this map are in accord with that on the "Yü-kung" when he approved this map in 1719.

On the other hand, the Jesuits who were urged on by religious enthusiasm, purposed to strengthen their position at the Imperial Court in Peking and to satisfy King Louis XIV's interests by offering their technical services to construct a map of China.

In short, although in mapping the Chinese Empire there was a difference between the desires of the Jesuits and those of K'ang-hsi, the two motivations together resulted in the production of the *Huang-yü ch'üan-lan t'u*. Their attitude toward the scientific techniques used to make this map also were similar: These techniques were treated as means to achieve their own goals rather than examples to encourage the introduction of Western science into China. This attitude, as well as Chinese traditional ideas in geography, impeded the map projects of the *Huang-yü ch'üan-lan t'u* and its supplements from producing any profound scientific influence on later geographical works. These facts add to the reasons which help to explain why, after the dissolution of the Society of Jesus in 1773, the scientific interest which the Chinese intelligentsia had shown earlier declined.