

MATH AND ART IN VIEW POINT OF PERSPECTIVE DRAWING OF THE WEST AND EAST

Young Hee KYE

Kosin University, #149-1 Dongsam-dong Yeongdo-gu, Busan, Korea
yhkye@kosin.ac.kr

ABSTRACT

In this study, we consider perspective drawing of the West and East. In particular, we are pay attention to the Western perspective (one point perspective), and the Eastern perspective(multi point and parallelism) Moreover, we research the reason: why the Western perspective drawing had not developed after its drawing was introduced in the East?

Keywords: Key words: math, art, one point perspective, perspective drawing, Western perspective, multi point perspective, parallelism perspective, projective geometry,

0 Introduction

We know that Ancient Greek math with logical geometry of deductive system had developed proofs, on the other hand the East Chinese math with calculate skill was developed by administrative management. Because Euclidean geometry's proofs systems was developed to persuade every mathematicians, and the East Chinese math proofs systems was not serviced in math. It was studied only measurement for national land and king's reign. In this study, we are going to pay attention to perspective drawing of the West and East. Also we consider issue: Why the Western perspective had not developed in the East?

1 Difference way of thinking in the West and East

Why one point perspective drawing was developed in the West? The Western people want to free away from the monotonic Medieval times paintings, and to acquire more realistic and 3-dimensional paintings. We can find the change from multi vanishing points to one vanishing point in the pictures of painter such as Duccio, Dieric Bouts and Leonardo da Vinci. The perspective is exact mathematical ratios in only one 3-dim space. Finally, Renaissance perspective artists had developed projective geometry. What is the influences of perspective in the West? Western people have had some self-concentrated thinking, so point of view is just my eyes. In Chinese culture, people have a philosophy such as theory of Bulgazi: It means that mankind couldn't understand the reason and principle of the world. Their point of view is long distance far away from me. In the East, Chinese artists had used parallelism and multi vanishing points in their drawings. Figure 1. is a wall painting of tunnel in Don-huang where the Chinese west cities. There are many vanishing points that located in the central line. Figure 2. is a parallelism drawing of Chinese in 17th century. So I think that one point perspective is

a influence of European individual personality: Subjective self-consciousness is strong. On the other hand, many vanishing points and parallelism drawing is a unique Eastern way of thinking: Human could not understand the nature and universal principle, and human is only a part of nature.

2 Western perspective was introduced to China

In 1601, a missionary Matteo Ricci of Society of Jesus, arrived at China with 3 holy drawings and several books. Then the Western perspective was introduced Chinese court painters. An Italian painter and missionary, Castiglione had taught to Chinese court painters about perspective and shading in painting. Hence they added perspective to Chinese traditional painting style. Actually, in 11th century, there was a unique Chinese perspective: artist Kuo Hsi invented Samwon-Bub i.e. High Perspective, Deep Perspective, Wide Perspective. This Chinese perspective drawing was introduced to Korean artists(Figure 3, 4, 5). In 1698, a priest Giovanni Gheradini had painted some wall pictures and ceiling painting of Beijing Sanctuary. Moreover, in 1735 Chinese artist Yeon(年希堯) translated a book 『Method of Perspective』 which had written by Baroque artist Andrea Pozzo. The book was published in the name of 『Sihak』 : It means theory of seeing.

3 Why the Western perspective was perished from China?

Figure 6 is a Chinese famous painting of some spring evening party in the garden of peach flower. The Western perspective was a little bit accepted. But not perfect! Even though some missionaries of society Jesus had introduced and taught the one point perspective into Chinese people. But the Western perspective had not set up and then perished. Firstly, those missionaries were banished by Portugal. Secondly, I think because of absence of geometric proofs. On the other hand, in the West, the perspective had become a great paradigm of art history until 19th century.

4 The Western perspective landed into Korea

In 1636, Korean prince Soheon received the Western drawing of God from Adam Schall at Beijing. In 1720, a noble man Lee Keeji wrote an essay for Beijing: 『Essay of Western Painting』. In 1765, mathematician and scholar Hong Dae-yong visited Beijing and then discussed with German Hallerstein and Gogeisl. At that time, He described the characteristics of the Western perspective such as sense of distance, realistic and stereoscopic painting. In Choson dynasty, Korean scholar and noble man Hong Dae-yong wrote math book: there were ratio rule, reduction of fraction, measure of area and cubic volume. But the book had not proofs such as Euclidean geometry. A Choson noble man Lee Ik had come back to home country with 『Element of Geometry』 of Matteo Ricci.

In Choson painting, the one point perspective was accepted aggressively. Figure 7 was painted artist Kang Hee-on. However, the one point perspective was disappeared in Korean drawing.

5 Conclusion

In the 17th century, influenced by a Catholic missionary, Korean and Chinese painters accepted western perspective. But, its drawing had stayed in a short period of time in the Eastern. In the West

culture, sprit of proofs brought about perspective notion and then it changed paradigm of art. Finally it had dominated painting style during several hundreds, moreover it had influenced into Projective Geometry. On the other hand, in the East(China, Korea), even though the Western perspective was accepted and applied in their drawing, it was disappeared because of lack of sprit of geometry.

REFERENCES

- Morris Kline, 1972, *Mathematical Thought from Ancient to modern Times*, Oxford University Press: New York.
- Sung M. Lee, 2000, *Western Drawing of the Choseon Dynasty Period Paintings*, Daewonsa: Seoul
- Y. W. Kim & Y. K. Kim, 1996, *The History of Chinese Mathematics*, Mineumsa: Seoul.
- Y. B. Song, 2009, "On the meaning of European scholarship introduced by Matteo Ricci", *Korea Realism Study* 17, 7-41.
- W. M. Irvins, Jr., 1964, *Art and Geometry: A Study in Space Intuitions*, Dover Pub.: New York.
- S. W. Lee, S. K. Kim & H. K. Ahan, 2009, *The History of Eastern Art*, Doorri Media: Seoul.
- 横地 清, 1995, 數學文化の 遍歴, 林北出版株式會社: 東京.

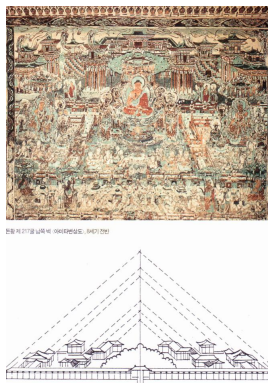


Figure 1

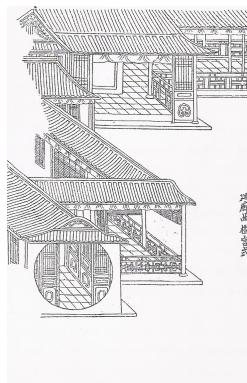


Figure 2

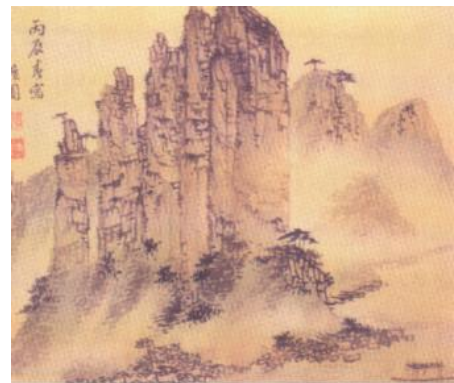


Figure 3



Figure 4



Figure 5

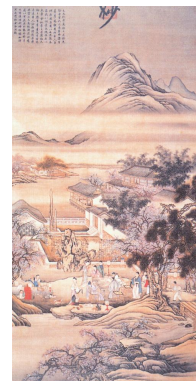


Figure 6



Figure 7

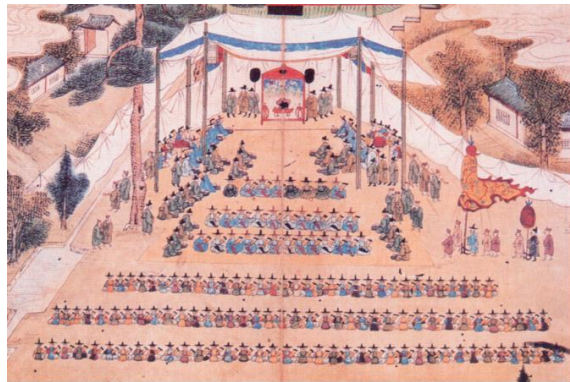


Figure 8