

## The Art of the Jesuit Mission in 16th-Century Japan: The Italian Painter Giovanni Cola and the Technological Transfer at the Painting *Seminario* in Arie

Riccardo Montanari<sup>1</sup>

Recibido: 24 de junio de 2021 / Aceptado: 11 de noviembre de 2021 / Publicado: 1 de marzo de 2022

**Abstract.** The Jesuit Mission in Japan was characterized by the establishment of the first painting Seminario in the Far East supervised by the Italian Jesuit Painter Giovanni Cola, who arrived in Nagasaki from Rome in 1583. The activity of the painting school focused on the production of sacred images needed for the Missionaries' evangelization effort, and it soon became a hub of Renaissance technology. European pigments were made available to Japanese and Chinese painters who trained at the Jesuit facility. New archaeometric studies allow, for the first time, a renewed interpretation of historical records, also revealing, along with documentary evidence, that Arie, a place located in Kyushu, where the Seminario stayed between 1595 and 1597, played a major role as it hosted the first European glass workshop in the Far East. The systematic use of pigments introduced at Arie influenced the production of sacred images both in Japan and China. However, the overall technological transfer proved an asymmetrical process due to the fierce persecution of Christians starting in 1614, and as a consequence, local production of imported pigments did not start until the lifting of the ban on Christianity in 1873 with the return of Europeans to Japan.

**Keywords:** Japan; Arie; Painting Seminario; Jesuit; Pigment; Enamel; Glass Workshop.

### [es] El arte de la misión jesuita en el Japón del siglo XVI: el pintor italiano Giovanni Cola y la transferencia tecnológica en el Seminario de Pintura de Arie

**Resumen.** La Misión Jesuita en Japón se caracterizó por el establecimiento del primer Seminario de pintura en el Lejano Oriente supervisado por el pintor jesuita italiano Giovanni Cola, quien llegó a Nagasaki desde Roma en 1583. La actividad de la escuela de pintura se centró en la producción de imágenes sagradas necesario para el esfuerzo de evangelización de los Misioneros, y pronto se convirtió en un centro de tecnología del Renacimiento. Los pigmentos europeos se pusieron a disposición de los pintores japoneses y chinos que se formaron en las instalaciones de los jesuitas. Nuevos estudios arqueométricos han permitido presentar en esta obra, por primera vez, una renovada interpretación de los registros históricos, revelando, además, junto con pruebas documentales, que Arie, un lugar ubicado en Kyushu, donde estuvo el Seminario entre 1595 y 1597, jugó un papel importante ya que acogió el primer taller europeo de vidrio en el Lejano Oriente. El uso sistemático de pigmentos introducido en Arie influyó en la producción de imágenes de miedo tanto en Japón como en China. Sin embargo, la transferencia tecnológica general demostró ser un proceso asimétrico debido a la feroz persecución de los cristianos a partir de 1614 y, como consecuencia, la producción local de pigmentos importados no comenzará hasta el levantamiento de la prohibición del cristianismo en 1873 con el regreso de los europeos a Japón.

**Palabras clave:** Japón; Arie; Seminario de pintura; Jesuita; pigmento; esmalte; taller de vidrio.

**Summary.** 1. Introduction and historical context. 2. Foremost painters from Jesuit records: Emanuel Pereira and Jacob Niwa, materials and techniques. 2.1.1. Emanuel Pereira. 2.1.2. Jacob Niwa. 3. The introduction of the “Western Method” at the painting Seminario in Arie. 3.1. The asymmetrical dynamic. 3.2. Blue pigment smalt in Arie. 4. European influence in the Far-East: from Japan to China. 4.1.1. Step 1: the indirect transfer in the late 16<sup>th</sup> century. 4.1.2. Step 2: the arrival of Giovanni Cola and the direct transfer in the early 17<sup>th</sup> century. 5. Conclusions. 6. Written sources and bibliographical references.

**How to cite:** Montanari, R. “The Art of the Jesuit Mission in 16th-Century Japan: The Italian Painter Giovanni Cola and the Technological Transfer at the Painting Seminario in Arie”. In Pre-Modern “Pop Cultures”? Images and Objects Around the Mediterranean (350-1918 CE), edited by Ivan Foletti, Adrien Palladino and Zuzana Frantová. Monographic Issue, *Eikón Imago* 11 (2022), 119-127.

<sup>1</sup> Independent Researcher, Expert Witness, Rome, Italy  
E-mail: [ckrm97@yahoo.com](mailto:ckrm97@yahoo.com)  
ORCID: <https://orcid.org/0000-0002-0228-6052>

## 1. Introduction and historical context

The Jesuit Mission in Japan started with the arrival of St. Francis Xavier (1506-1552) at Kagoshima in 1549<sup>2</sup>. The journey of the founder of the Jesuit Order was triggered by the fortuitous encounter between Europeans and Japanese in 1543 on the island of Tanegashima<sup>3</sup>. The need for sacred images became an urgent priority<sup>4</sup> as the evangelization effort was immediately confronted with the insidious issue of the language barrier. The risk of the new religion being perceived as just another sect of Buddhism, partially resolved by the linguistic reform by Father Balthasar Gago in 1555<sup>5</sup>, kept manifesting itself as contacts with the Japanese progressed throughout the country. The task of establishing a center for the production of images that would serve as visual aids to the evangelic effort in Japan and China was assigned by Alessandro Valignano (1539-1606), the supervisor of the Mission in Asia, to the Italian Jesuit painter Giovanni Cola (Nola, 1560– Macau, 1626)<sup>6, 7</sup>.

Giovanni Cola, born in Nola, near Naples, entered the Society of Jesus in 1577 and may have spent his novitiate in Rome as presumed by his only extant autograph letter<sup>8</sup>. He left Rome in 1579 heading to Japan through Macau where he met Alessandro Valignano in 1582<sup>9, 10</sup>. His arrival in Nagasaki in 1583 was followed by the establishment of a painting *Seminario* (school) in Kyushu, the southernmost island of the Japanese archipelago<sup>11</sup>. That fundamental facility served as the training center for Japanese and Chinese painters, who were taught European style painting and the use of pigments and materials imported from the Old Continent. The availability of sacred images proved crucial to the success of the Jesuit Mission: at the turn of the 17<sup>th</sup> century, there were over 250 churches countrywide and some 300.000 Japanese Christian converts<sup>12</sup>.

New scientific evidence, along with existing records, has enabled the identification of a hub of Renaissance technology and materials in a particular place in Kyushu, *Arie*, where the *Seminario* stayed from 1595 to 1597<sup>13</sup>. It is relevant to mention here that due to the ev-

er-increasing persecutions by the Japanese authorities in the late 16<sup>th</sup> and early 17<sup>th</sup> century, Jesuit Missionaries were forced to move the *Seminario* to regions where protection was granted by feudal Lords (*Daimyo*), who, as a result, benefited from the trade with Europe through the Portuguese ships that docked at their ports<sup>14</sup>.

That presence of Westerners or *Namban Jin* (Southern Barbarians in Japanese) triggered a deep cultural influence over the Japanese society as a whole in the second half of the 16<sup>th</sup> century. Members of the elite and commoners alike craved the fashionable items bearing European-inspired motifs and decorations, thus giving birth to the *Namban* frenzy that marked the production of folding screens, ceramics, lacquerware, incense burners, writing implements, clothing, dyed fabrics, and other every-day items<sup>15</sup>. In particular, folding screens featuring European allegoric representations and secular images such as battles, cities, maps, Western Kings, musicians and landscapes became a predominant factor that defined the taste of the Momoyama period (1568-1603) as testified by Alessandro Valignano's request to Pope Gregory XIII (1502-1585) to have screens painted in Rome in the Japanese manner to be given as return gift to the ruler Oda Nobunaga<sup>16</sup>.

## 2. Foremost painters from Jesuit records: Emanuel Pereira and Jacob Niwa, materials and techniques

Jesuit records listing Japanese and Chinese painters who trained at the *Seminario* in Japan mention two names of particular importance: Emanuel Pereira and Jacob Niwa. Brief accounts of their lives and activities follow.

### 2.1.1. Emanuel Pereira

Emanuel Pereira (Chinese name: *Yu Wen-Hui*, 1575-1633) was born in Macao<sup>17, 18</sup>. Showing artistic talent, he went to Japan to train under the supervision of Giovanni Cola himself at the *Arie Seminario*, located in the *Shimabara* peninsula in Kyushu, from 1595 to 1597<sup>19, 20, 21</sup>. He then returned to China in 1598 where he served Matteo Ricci in Nanking<sup>22</sup>. After the death of Father Ricci in 1610 he was assigned the task of painting the only extant oil-on-canvas portrait of the Jesuit Father<sup>23, 24</sup> (Figure 1).

*rica Japoniae I – Textus Catalogorum Japoniae 1553-1654* (Romae Apud “Monumenta Historica Soc. Iesu”: 1975), 517 n. 5.

<sup>14</sup> NHK, *Via Orientalis*, 230.

<sup>15</sup> NHK, *Via Orientalis*, 238-239.

<sup>16</sup> Naoko Frances Hioki, “Visual bilingualism and mission art: a reconsideration of ‘Early Western-Style Painting’ in Japan”, *Japan Review* 23 (2011): 30.

<sup>17</sup> John E. McCall, “Early Jesuit Art in the Far East IV: In China and Macao before 1635”, *Artibus Asiae* 11, no. 1-2 (1948): 50.

<sup>18</sup> D’Elia, *Fonti Ricciane. Documenti Originali Concernenti Matteo Ricci e la Storia delle Prime Relazioni tra l’Europa e la Cina (1579–1615)*, 2: 911, 918, 981.

<sup>19</sup> C. Guillen-Nuñez, “The Portrait of Matteo Ricci – A Mirror of Western Religious and Chinese Literati Portrait Painting”, *Journal of Jesuit Studies* 1 (2014): 450.

<sup>20</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 277.

<sup>21</sup> McCall, “Early Jesuit Art in the Far East IV”, 50.

<sup>22</sup> McCall, “Early Jesuit Art in the Far East IV”, 50.

<sup>23</sup> McCall, “Early Jesuit Art in the Far East IV”, 50.

<sup>24</sup> Guillen-Nuñez, “The Portrait of Matteo Ricci”, 448.

<sup>2</sup> NHK Promotion, *Via Orientalis – Exhibition catalogue* (Tokyo: NHK Publishing Inc, 1993), 234.

<sup>3</sup> NHK, *Via Orientalis*, 233.

<sup>4</sup> NHK, *Via Orientalis*, 236.

<sup>5</sup> Hubert Cieslik S.J., “Early Jesuit Missionaries in Japan 2 – Balthasar Gago and Japanese Christian Terminology (1954)”, *Jesuits of Japan* (2004): 4-7.

<sup>6</sup> NHK, *Via Orientalis*, 236.

<sup>7</sup> Pasquale D’Elia, *Fonti Ricciane. Documenti Originali Concernenti Matteo Ricci e la Storia delle Prime Relazioni tra l’Europa e la Cina (1579–1615)*, 3 vols. (Roma: La libreria di Stato, 1942-1949), 2: 231.

<sup>8</sup> Grace Vlam, *Western-Style Secular Painting in Momoyama Japan, Volume One, PhD Dissertation* (University of Michigan: 1976), 252.

<sup>9</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 255.

<sup>10</sup> Luis Frois, *Lettera del Giappone delgi anni 1591 et 1592* (Rome, Zanetti: 1595).

<sup>11</sup> NHK, *Via Orientalis*, 236.

<sup>12</sup> Alexandra Curvelo, “Nuvens douradas e paisagens habitadas. A arte namban e a sua circulação entre a Ásia e a América: Japão, China e Nova-Espanha (c.1550-c.1700)” (PhD Thesis, Lisbon, Universidade Nova de Lisboa, 2007), 119.

<sup>13</sup> J. F. Schutte S. J., *Monumenta Historica Societatis Iesu a Partibus Eiusdem Societatis Edita – Volumen III, Monumenta Missionum Societatis Iesu – Vol. XXXIV, Missiones Orientales Monumenta Histo-*

A recent scientific investigation on the portrait by Pereira has identified the European pigments and techniques employed to paint it<sup>25</sup>. In particular, the black pigment proved to consist of a European mixture (unknown in Japan at the time) of amorphous carbon (organic coloring agent) and verdigris (copper based compound), the latter used to give depth to the plain black robe of the figure and enhance the dark shadows, a technique used in Italian painting practices of the 16<sup>th</sup> and 17<sup>th</sup> centuries<sup>26</sup>.



Figure 1. Emanuel Pereira, painting school of Giovanni Cola SJ, “Portrait of Father Matteo Ricci SJ”, China, ca 1610, oil on canvas, cm. 120 × 95. Source: Chiesa del Santissimo Nome di Gesù all’Argentina, Rome. Photo © Zeno Colantoni. Courtesy of Chiesa del Santissimo Nome di Gesù all’Argentina, Rome.

The identification of this black pigment is crucial as its use has also been detected on one of the two extant martyrdom representations, the *Martyrdom of Leonardo Kimura* (beatified by Pope Pius IX in 1869) (Figure 2), painted in Japan in ca 1619 by an unknown Japanese painter<sup>27</sup>, thus demonstrating how the same materials and techniques had been employed in different geographical areas and periods (1610 in China and 1619 in Japan), through sharing the same source of European technology. It is extremely relevant to mention here that the scientific study on the *Martyrdom of Leonardo Kimura* (Figure 2) has also revealed the presence of a green pigment of European origin made of Lead-tin yellow and a copper-based

compound<sup>28</sup>. Lead-tin yellow is a European pigment used since the 14<sup>th</sup> century and was unknown in Japan at the time<sup>29</sup>. The implication is clear: Japanese and Chinese painters who had trained at the Jesuit *Seminario* in Japan, particularly in *Arie* as testified by Pereira’s timeline, were able to incorporate European materials and techniques into their works through the teachings of Father Cola, thus revealing how the use of Western materials had undisputedly become systematic. In terms of the technological transfer to China, the process is characterized by two main steps that will be discussed later.



Figure 2. Anonymous Japanese painters, painting school of Giovanni Cola SJ, “Martyrdom of Leonardo Kimura and four other Christians at Nagasaki in 1619”, Japan, ca 1619, color on paper, cm. 135 x 153. Source: Chiesa del Santissimo Nome di Gesù all’Argentina, Rome. Photo © Chiesa del Santissimo Nome di Gesù all’Argentina, Rome. Courtesy of Chiesa del Santissimo Nome di Gesù all’Argentina, Rome.

### 2.1.2. Jacob Niwa

Jacob Niwa (Chinese name: *Ni-Yicheng*, 1579-1638) was born in Japan to a Japanese mother and Chinese father<sup>30, 31, 32</sup>. He trained under the supervision of Giovanni Cola and must have spent part of his training at the *Arie Seminario*, as Pereira did, before going to China in 1601 at the request of Matteo Ricci to produce the sacred images needed for evangelic activity<sup>33</sup>. Jesuit records report that Niwa was considered by Giovanni Cola his most talented pupil<sup>34</sup> and that Matteo Ricci even offered a Madonna of St. Luke painted by Niwa to the Chinese Emperor

<sup>28</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 75-77.

<sup>29</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 75.

<sup>30</sup> McCall, “Early Jesuit Art in the Far East IV”, 51.

<sup>31</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 278.

<sup>32</sup> D’Elia, *Fonti Ricciane. Documenti Originali Concernenti Matteo Ricci e la Storia delle Prime Relazioni tra l’Europa e la Cina (1579–1615)*, 2: 258.

<sup>33</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 278.

<sup>34</sup> McCall, “Early Jesuit Art in the Far East IV”, 51.

<sup>25</sup> R. Montanari, M. F. Alberghina, S. Schiavone, C. Pelosi, “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, *X-Ray Spectrometry* 51, no. 1 (2022): 64-85. <https://doi.org/10.1002/xrs.3256>.

<sup>26</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 75-76.

<sup>27</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 75-76.



in 1603<sup>35</sup>. Jacob Niwa went on to assist Giovanni Cola in Macau right after the arrival of the Italian Master in 1614 as a consequence of the anti-Christian edicts enforced in Japan by the Tokugawa shogunate. One of the surviving Martyrdom representations, the *Jesuit Martyrs in Japan* (Figure 3), painted in Macao in ca 1635 and attributed to Niwa<sup>36, 37</sup>, has recently undergone scientific investigation<sup>38</sup>: the European techniques and materials used to paint it have been identified. In particular, a green pigment consisting of a mixture of orpiment (arsenic sulfide) and green earth was detected<sup>39</sup>. This mixture, unknown in Japan at the time, is of European origin and perfectly matches the pigment used by Gian Lorenzo Bernini in Rome<sup>40</sup>, thus revealing, as in the case of the aforementioned black pigment, that Giovanni Cola relied on Italy for the supply of materials to be used at the *Seminario*. It appears very clear that the practice of importing European pigments to produce sacred images continued after the death of Giovanni Cola (1626) and Emanuel Pereira (1633) in China. Thus, the talented Jacob Niwa, who had consequently become the chief painter at the *Collegio* in Macau<sup>41</sup>, must have had the authority to continue importing these expensive pigments as had his Italian Master.



Figure 3. Jacob Niwa (att.), painting school of Giovanni Cola SJ, “*Jesuit Martyrs in Japan*”, China, ca 1635, color on paper, cm. 110 x 220. Source: Chiesa del Santissimo Nome di Gesù all’Argentina, Rome. Photo © Chiesa del Santissimo Nome di Gesù all’Argentina, Rome. Courtesy of Chiesa del Santissimo Nome di Gesù all’Argentina, Rome.

### 3. The introduction of the “Western Method” at the painting *Seminario* in Arie

“Inde ab anno 1592 scholae pictorum vestigia in fontibus apparent”<sup>42</sup>: this record provides the first mention of

a painting school recognized as such in Japan, precisely at Shiki. The record appears after the return of Alessandro Valignano from Rome in 1590.

The *Seminario* then moved to Hachirao (1593-1594, destroyed by a fire) where Gomez, in his letter (1593-1594)<sup>43</sup>, mentions 8 students painting in “guazzo” (watercolor) and others in oil, thus revealing how a full-fledged organizational model for the *Seminario* was being developed there. Good results are mentioned to some extent, yet no specific sacred subjects (crucial to the Mission) are reported to have been painted by the students.

The production of relevant works, therefore, still appears to be the result of Cola’s own effort as the sole painter:

*A third version of the Salvator Mundi, a very large and very beautiful painting according to P. Matteo Ricci, was his principal work in 1587. It was sent to China by the Vice-Provincial P. Gaspard Coelho, his superior...About the same year he painted a St. Lawrence or a St. Stephen Protomartyr in oils on a small copper panel similar to the foot-treading pictures described by Prunier. This picture was also sent by P. Coelho to P. Ricci in China who presented it to the Imperial Prince of Chiengan on August 25, 1595*<sup>44</sup>.

The records confirm that up until 1595, date of the shipment of Cola’s copper painting to China, the production in Japan was not yet suitable to meet Ricci’s needs, and that Cola’s own works basically served as the main source of paintings for the Chinese Mission. This situation will change after the return of Pereira to China in 1598 and the presence of Niwa starting in 1601.

The timeframe 1595-1597 is the *Arie* period: 1595 is a sort of “*Anno Zero*” in the timeline defined by Pereira’s life, scientific evidence, information about school activities and by other meaningful events, all discussed below.

Pereira trained at the *Seminario* in Arie from 1595 to 1597 and went back to China in 1598. It appears certain that no school of painting had been established by Cola in Macau upon his arrival in 1582 (he stayed in Macau for roughly less than 12 months)<sup>45</sup> where Western techniques and materials could have been made available on the basis of the knowledge transferred there by Cola himself, otherwise there would have been no need for Pereira to study in Japan. Pereira could have just trained at Macau and asked for painting pigments to be supplied there, but neither option was available as no such facility (or any kind of training activity) had yet been established in China. That will happen, as previously mentioned, after the return of Cola to Macau in 1614 due to the persecutions.

After his training in *Arie*, Pereira had acquired the necessary knowledge to use European pigments and petition Rome to have Western materials (the black pigment previously discussed among them) sent to Macau as part of the overall shipment destined for Japan to support Cola’s teaching activity.

<sup>35</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 279.

<sup>36</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 81-83.

<sup>37</sup> Curvelo, *Nuvens douradas e paisagens habitadas. A arte namban e a sua circulação entre a Ásia*, 384-385.

<sup>38</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 67-68.

<sup>39</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 81-82.

<sup>40</sup> Montanari et al., “The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art”, 81.

<sup>41</sup> Ministero dell’Interno, *Fiamminghi e altri Maestri – Gli Artisti Stranieri nel Patrimonio del Fondo Edifici di Culto del Ministero dell’Interno* (Roma: L’Erma di Bretschneider, 2008), 69.

<sup>42</sup> Schutte S. J., *Monumenta Historica Societatis Iesu a Partibus Eiusdem Societatis Edita – Volumen 111*, 517 n. 5.

<sup>43</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 265.

<sup>44</sup> John McCall, “Early Jesuit Art in the Far East I, The Pioneers”, *Artibus Asiae* 10, no. 2 (1947): 127.

<sup>45</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 255.

Pereira went back to China in 1598, right after his training under Giovanni Cola. We know there would have been no opportunity for him to learn the new techniques there from 1598 to 1610 (year of the portrait, Figure 1): the only possible chronology of events is that the introduction of the black pigment had occurred no later than 1597 in *Arie*. Overall, considering the time span 1592-1595 (the first Jesuit record for a full-fledged school appears in 1592), only three years had passed between the *Seminario*'s first establishment and the *Arie* period, three years that saw the *Seminario* relocate to three different places (*Katsusa*, *Shiki*, and *Hachirao*)<sup>46</sup>. It appears very clear that some sort of stability had been achieved during the *Arie* period (1595-1597) for the first time.

Proof of the unprecedented favorable circumstances that led the *Seminario* in *Arie* to become a hub of European materials is the establishment of the glass workshop in 1595 under the supervision of Cola himself and the patronage of Naito Tokuen Johan, friend of Takayama Ukon<sup>47</sup>.

It is highly likely that the workshop served as the production center for glass implements of an architectural and/or decorative and/or liturgical nature destined for the many Churches and Jesuit Residences that were being built in Japan, along with presentation gifts for the Japanese elite and colored vitreous materials for other artistic uses (paintings, enamels, etc.).

Strong and consistent evidence of *Arie* being the hub of European technology and materials comes from a hand-colored Buddhist print dated from the late-16<sup>th</sup> century: *smalt* was identified as the vitreous blue pigment used to color the print, thus the introduction of the European blue material as a new palette color must have occurred by this time<sup>48</sup>. One of the direct consequences of such unprecedented technical activity proves to have been the actual transfer of new materials to Japanese artistic circles, to an extent that even Buddhist art ended up being influenced by the influx of European materials and techniques. That could only have happened if a somewhat steady supply was available, and we know this would have been the case at *Arie* through the glass workshop and other imported materials from Europe. This instance is perfectly consistent with the introduction, and first use, of Pereira's black pigment at *Arie*.

Documentary evidence also points to *Arie* as the place where a more developed and full-fledged organizational model was actually implemented in order to make the teaching activities more efficient.

Gomez, in his letter (*Arie*, 1595)<sup>49, 50</sup>, mentions a Crucifixion painted in oils by a 20-year-old Japanese student to be sent to the Jesuit General in Rome in

order to show the great achievements the Missionaries had been praising. He also reports that the main activity was focused on copying European models. A systematic teaching approach that yielded tangible and remarkable results (oil painting of the Crucifixion) had taken off in *Arie*.

Frois, in his letter (*Arie*, 1596)<sup>51, 52</sup>, confirms the implementation of a fully-developed organizational model in *Arie* and lists the categories of activities that had been divided into specific classes of students, and European painting (in oil and fresco) was one of such classes.

Moreover, the report of the Bishop's visit to the *Seminario* in *Arie*, accompanied by Gomez in 1596<sup>53</sup>, offers a significant new piece of information: starting from only "8 students and some others" in 1593-1594<sup>54, 55</sup>, we now have in *Arie* "a large number of students of various ages"<sup>56, 57</sup>.

In the same account of the visit, another specific and tangible work, a completed oil painting of the Madonna of St. Luke, painted by a Japanese 19-year-old student, is mentioned to have highly satisfied the Bishop (crucial to the Mission)<sup>58, 59</sup>. Together with the Crucifixion in 1595, such important results had all been achieved at *Arie*.

Also, a truly crucial detail emerges from the same report: the first mention of a "Western method" appears as "...not only were the boys painting in the Western style, they were also taught a Western method, for they stood with palette in hand in front of the canvas and painted in oils"<sup>60, 61</sup>.

Clear is the implication that innovative European techniques and materials had systematically been incorporated into the teaching activity there. Such a distinction between a "Western style" and a "Western method", the latter linked to the use of oils, is truly remarkable as it is part of an account that was not focused on specific painting techniques or materials, and descriptions of paintings were hardly ever detailed in the Jesuit reports "...absence of detail is customary in the Jesuit records"<sup>62</sup>.

The innovation, therefore, almost certainly of a multidisciplinary nature, had to be extremely relevant compared to previous practices.

This important record could also explain the coexistence of European oils and Japanese traditional pigments identified in the works by the Japanese painter Nobukata<sup>63</sup>.

<sup>46</sup> Schutte S. J., *Monumenta Historica Societatis Iesu a Partibus Eiusdem Societatis Edita – Volumen III*, 517 n. 5.

<sup>47</sup> NHK Publishing Inc, *NHK 歴史ドキュメント6* (Tokyo: NHK Publishing Inc, 1987), 36.

<sup>48</sup> BW. Magurn, "Daitoku Myō-Ō a Japanese Buddhist Deity, Cambridge: Bulletin of the Fogg Art Museum", *Bulletin of Harvard Art Museums* 10, no. 1 (1942): 4-23.

<sup>49</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 266.

<sup>50</sup> (Archivum Romanum Societatis Iesu) ARSI, Jap-Sin 12, II, 270.

<sup>51</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 267.

<sup>52</sup> Luis Frois, *Lettera Annuale del Giappone dell'anno MDXCVI* (Roma: Zannetti, 1599).

<sup>53</sup> ARSI, Jap-Sin 46, 283v.

<sup>54</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 265.

<sup>55</sup> Pedro Gomez, *Lettera Annuale del Giappone dal Marzo del 1593 fino al Marzo del 1594* (Roma: Zannetti, 1597).

<sup>56</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 268.

<sup>57</sup> ARSI, Jap-Sin 46, 283v.

<sup>58</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 268.

<sup>59</sup> ARSI, Jap-Sin 46, 283v.

<sup>60</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 268.

<sup>61</sup> ARSI, Jap-Sin 46, 283v.

<sup>62</sup> McCall, "Early Jesuit Art in the Far East I, The Pioneers", 124.

<sup>63</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 174.

In another account of the Bishop's visit by Frias (*Arie*, 1596)<sup>64</sup>, the renewed efficiency of the newly-developed teaching model caused admiration by the visiting authorities (crucial to the Mission) in "seeing so many projects done by Japanese boys" all painting in oils.

Returning to the scientific evidence, the same black pigment as the one detected on Pereira's portrait (Figure 1, painted in China in ca 1610) has been identified on the *Martyrdom of Leonardo Kimura* (Figure 2, painted in Japan in ca 1619). The implication is clear: the unknown Japanese painter must have learnt the same technique as Pereira did, in all probability at *Arie*. Even if we hypothesize that the unknown painter might have actually learnt the technique at a different location and at a later period, that could not have been the case for Pereira who had already left Japan for China in 1598.

Only one possibility remains: the innovative black pigment must have been introduced and systematically used no later than 1597 on the basis of the new "Western method" that originated in *Arie* and recorded in Jesuit records, otherwise Pereira could have not used it in 1610, twelve years after his return to Macau with no training facility or teaching activity there. The timeline is firm as to the presence of the European black pigment at the *Seminario* in *Arie* (1595-1597).

Further, if we consider the detection of both the Cu-lead-tin-yellow mixture and Pereira's black pigment on the *Martyrdom of Leonardo Kimura* (ca 1619) (Figure 2), we can now better comprehend how lead-tin yellow came to be used on the *Fifteen Mysteries of the Rosary* (believed to have been painted in the 1620s) as reported in a Japanese archaeometric study (see note 66). Besides the possibility that the same painter had actually painted it (we are just a few years apart), we are clearly identifying a line of continuity that characterizes the pigments available after the "Western method" had made its first appearance in *Arie*: the black pigment must have been introduced within 1597 and its detection in different geographical areas (China in 1610 and Japan in 1619) firmly implies a systematic use that must have started at the *Arie Seminario*.

When the place a painter was trained, such as *Arie* for Pereira, can also be associated with a specific pigment used by the same painter, as the case of the black pigment, then labeling the European material after the place of its first documented use provides a unique opportunity to finally set a consistent timeline for events and painters that would otherwise end up being lost to history. For these reasons, and consistent with documentary and scientific evidence, the *Arie Black* label<sup>65</sup> clearly identifies the European black pigment used by Pereira.

### 3.1. The asymmetrical dynamic

Scientific and documentary evidence has revealed that the use of European materials unknown in Japan, particularly yellow chromophores, strictly depended on direct Jesuit guidance. The enforcement of the isolation policy by the Tokugawa shogunate in 1639 caused their use to decrease significantly. Proof and testimony of their limited, yet continued, use comes from the archaeometric studies on the *Martyrdom of Leonardo Kimura* (Lead-tin yellow mixed with copper detected)<sup>66</sup> (Figure 2), on the *Fifteen Mysteries of the Rosary* (Lead-tin yellow detected)<sup>67</sup>, on the renowned *mukozuke* porcelain dish (1624-1644) (Lead-antimony yellow detected)<sup>68</sup>, and from the record by Kaempfer (Dutch)<sup>69</sup> listing antimony as one of the materials imported into Japan for porcelain decoration in 1690.

Scientific evidence has also revealed that by the late 16<sup>th</sup> century the traditional European white pigment, lead white, had replaced the Japanese traditional calcium-based white pigment obtained from oyster shells<sup>70,71</sup>, and that the switch between the two materials had occurred right after the arrival of Giovanni Cola and the establishment of the Jesuit *Seminario* in Japan<sup>72</sup>. The implication is clear: lead white must belong to the earliest group of European materials introduced by Giovanni Cola to the *Seminario* students, possibly as early as 1592 (year of the first-recorded mention of the Jesuit painting school in Japan), in a time span characterized by the religious freedom granted by Oda Nobunaga and Toyotomi Hideyoshi's limited persecutions in the late 16<sup>th</sup> century.

Additional pigments would come to enrich the palette of colors available to Japanese and Chinese painters at the *Seminario* after the introduction of the "Western method" in *Arie* as testified by the consistent detection of European materials on the surviving paintings produced before and during the persecutions.

To conclude, although different pigments introduced by the Missionaries (the initiators) had been immediately incorporated into Japanese painting practice (adoption/assimilation), local painters (on-site third parties) had to rely on European techni-

<sup>64</sup> Vlam, *Western-Style Secular Painting in Momoyama Japan*, 268-269.

<sup>65</sup> Montanari et al., "The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art". 76-78.

<sup>66</sup> Montanari et al., "The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art", 75-77.

<sup>67</sup> 神庭信幸, 小島道裕, 横島文夫, 坂本 満, 「マリア十五玄義図」の調査, 京都大学所蔵, 1998 (Research on the "Painting of the Madonna with the Infant Jesus and Her Fifteen Mysteries", in Japanese).

<sup>68</sup> Montanari et al., "A polychrome Mukozuke (1624-1644) porcelain offers a new hypothesis on the introduction of European enameling technology in Japan", *Journal of Cultural Heritage* 32 (2018): 232-237, <https://doi.org/10.1016/j.culher.2017.12.010>.

<sup>69</sup> T. Volker, *The Japanese porcelain trade of the Dutch East India Company after 1683* (Leiden: E.J. Brill, 1959), 26.

<sup>70</sup> Montanari et al., "The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art", 73-75.

<sup>71</sup> K. Yamasaki, Y. Emoto, "Pigments Used on Japanese Paintings from the Protohistoric Period through the 17<sup>th</sup> Century", *Ars Orientalis* 11 (1979): 1-14.

<sup>72</sup> Montanari et al., "The Jesuit painting *Seminario* in Japan: European Renaissance technology and its influence on Far Eastern Art", 73-75.



cal guidance for their use and on imports from the Old Continent for their supply. This dynamic proves to have been asymmetrical due to the persecutions and expulsion of the Missionaries from the country in 1639: a full-fledge local production of artificial yellows and cobalt-based pigments was only able to start in Japan after the lifting of the ban on Christianity in 1873 and the consequent return of Europeans, thus triggering a technological transfer finally characterized, this time, by a full symmetry<sup>73</sup>.

### 3.2. Blue pigment *smalt* in *Arie*

As previously mentioned (see paragraph 3) a glass workshop was established in *Arie* in 1595, and *smalt*, a potassium-rich glass colored with cobalt, appeared as a new palette color on a Japanese hand-colored Buddhist print from the late 16<sup>th</sup> century<sup>74</sup>. Such an instance is in perfect agreement with the timeline identified in this work: the palette includes both *smalt* and *Arie Black* and made its appearance in the late 16<sup>th</sup> century as a result of the experimentation at the *Arie Seminario* with European materials.

Contrary to the case of European yellow pigments (paragraph 3.1), the use of *smalt* was characterized by a different course of events. Even though its supply, as was the case for the aforementioned yellows, depended entirely on imports from Europe, its use did not fade after the expulsion of the Missionaries<sup>75, 76</sup> in 1639: the development of overglaze enameling in Japan was a direct result of the use of the European blue material, yet its local production, as for all the other imported pigments, did not start until the late-19<sup>th</sup> and early-20<sup>th</sup> century.

Recent studies<sup>77, 78</sup> have identified the crucial role of the European blue pigment (*smalt*) in the development of Japanese overglaze enameling on porcelain (Figure 4) under Jesuit guidance in the late 1630s. Such an early and efficient use of the European blue material deeply differentiated the Japanese art tradition from its Chinese counterpart. Thus the identification of *Arie* as the place where the pigment was first introduced in 1595 finally contributes to answering a fundamental question that has marked research in the 20<sup>th</sup> century<sup>79</sup>. The glass workshop established at the

Jesuit *Seminario* in *Arie* has proved to have been the facility where the introduction of European materials by the Jesuits had taken place. The very same dynamic will mark Chinese art production in the 1700s after another glass workshop was established by the Jesuits at the imperial palace under the patronage of the emperor Kangxi in 1695<sup>80</sup>: European materials such as *smalt* and yellow pigments started spreading right after this facility had become fully operational, a century after the Japanese had already experienced such a technological transfer in the late 16<sup>th</sup> century<sup>81</sup>. Contrary to the case of Japan, the glass workshop in China led to a fully symmetrical transfer of technology immediately after its establishment.

A very important conclusion can be drawn: the Jesuit glass workshop, wherever established, served as the crucial facility where the Missionaries introduced European technology and materials in new territories, so the label *Arie Blue* fully identifies *smalt* as the material introduced at the glass workshop in Japan in 1595, thereby becoming incorporated into the Japanese painting tradition, the production of Arita porcelains and, most likely, in the decoration of *Kyo Yaki* (Kyoto wares) from the 17<sup>th</sup> century.



Figure 4. Porcelain shard decorated with a *smalt*-based overglaze blue enamel, 1640-1650, excavated at Yanbeta kiln site, Arita, Japan. Source: Museum of History and Folklore, Arita, Japan. Photo © Museum of History and Folklore, Arita, Japan. Courtesy of the Museum of History and Folklore, Arita, Japan.

## 4. European influence in the Far-East: from Japan to China

The transfer of European materials and technology from Japan to China followed two main steps. Their descriptions follow.

<sup>73</sup> Montanari et al., "European ceramic technology in the Far East: enamels and pigments in Japanese art from the 16<sup>th</sup> to the 20<sup>th</sup> century and their reverse influence on China", *Heritage Science* 8, no. 48 (2020), <https://doi.org/10.1186/s40494-020-00391-2>.

<sup>74</sup> Magurn, "Daitoku Myō-Ō a Japanese Buddhist Deity", 4-23.

<sup>75</sup> Montanari et al., "The Origin of overglaze-blue enameling in Japan: new discoveries and a reassessment", *Journal of Cultural Heritage* 37 (2019): 94-102, <https://doi.org/10.1016/j.culher.2018.11.008>.

<sup>76</sup> Montanari et al., "European ceramic technology in the Far East: enamels and pigments in Japanese art from the 16<sup>th</sup> to the 20<sup>th</sup> century and their reverse influence on China".

<sup>77</sup> Montanari et al., "The Origin of overglaze-blue enameling in Japan: new discoveries and a reassessment".

<sup>78</sup> Montanari et al., "European ceramic technology in the Far East: enamels and pigments in Japanese art from the 16<sup>th</sup> to the 20<sup>th</sup> century and their reverse influence on China".

<sup>79</sup> A. Roy, ed., *Artists' Pigments – a handbook of their history and characteristics*, National Gallery of Art, Washington (London: Archetype Publications, 1993), 2: 114.

<sup>80</sup> E. B. Curtis, "European Contributions to the Chinese Glass of the early Qing Period", *Journal of Glass Studies* 35 (1993): 91-101.

<sup>81</sup> Curtis, "European Contributions...", 91-101.

#### 4.1.1. Step 1: the indirect transfer in the late 16<sup>th</sup> century

The indirect introduction of European materials and techniques into China was the result of the training activity of Chinese painters at the Jesuit *Seminario* in Japan under Giovanni Cola. The incorporation of imported materials into the works by Pereira and Niwa was owed to their exceptional painting skills as no training facilities or training activities had yet been established in China by that time. This first remarkable step is testified to by the portrait of Matteo Ricci (Figure 1), which bears the *Arie Black* pigment: Pereira painted it in 1610 while Giovanni Cola was still in Japan, so the influx of European practices into the Chinese painting tradition is to be ascribed to the activity of Pereira and Niwa from the late 16<sup>th</sup> century after their training under Giovanni Cola in Japan.

#### 4.1.2. Step 2: the arrival of Giovanni Cola and the direct transfer in the early 17<sup>th</sup> century

Step 2 is triggered by the harsh persecutions that marked Japan in the early 17<sup>th</sup> century. Edicts banning Christianity started being issued in 1587 by Toyotomi Hideyoshi<sup>82</sup>, but it was not until 1614, when the order for all Missionaries to leave Japan was issued, that the persecutions became fierce and brutally systematic. Jesuits were confronted with a dramatic decision: fleeing to Macau and Manila or remaining in Japan facing martyrdom. After the *Shimabara* Rebellion, a watershed event that took place in 1637-1638 and included the involvement of Christian converts (it is believed that 57.000 converts were exterminated), Japanese authorities, in 1639, ordered the expulsion of any individual having any relation to the Christian religion<sup>83</sup>. Trade with Europe consequently became an exclusive prerogative of the Dutch (who had bombarded *Hara* castle, the center of Christian resistance during the *Shimabara* Rebellion) and the Chinese.

Japanese converts who had not renounced to their faith were forced to go into hiding (*Kakure Kirishitan* or Hidden Christians) in order not to be tortured on the basis of the new and cruel apostasy-centered policy enforced by the Japanese authorities; in particular, the terrifying *anatsurushi* (torture of the suspension in the pit) had become popular after proving highly efficient in the case of Ferreira's apostasy on 18 October 1633<sup>84</sup>.

As for the artistic activity of the *Seminario*, the presence of Giovanni Cola is recorded in Macau in 1614 as a result of the edict enforced by the Tokugawa Shogunate the same year<sup>85</sup>. This event identifies the beginning of the direct transfer of technology

and the systematic incorporation of European materials and techniques into Chinese painting practice: the continuous supply of up-to-date European pigments to painters at the *Collegio* in Macau<sup>86</sup> is the direct result of the fruitful exchange that had characterized the activity of the Jesuit *Seminario* in Japan from the late 16<sup>th</sup> century. Thus, the movement of Jesuit Missionaries from Nagasaki to Macau was followed by the continuation of the activity of the Jesuit *Seminario* that had marked Japanese art production and that will influence artistic practices in the Far-East for the centuries to come.

## 5. Conclusions

Scientific and documentary evidence fully reveal the asymmetrical dynamic that characterized the early transfer of European techniques and materials by Jesuit Missionaries to Japanese painters and potters in the late-16<sup>th</sup> and early-17<sup>th</sup> century at the Jesuit *Seminario* established by Father Giovanni Cola in Kyushu in the early 1590s. In particular, the *Arie* period (1595-1597) played a major role for the early production and spread of European pigments. The harsh persecutions, however, caused the transfer not to be a straightforward process. Moreover, although different pigments introduced by the Missionaries had been immediately incorporated into Japanese painting practice, local painters had to rely on Western guidance for their use and on imports from Europe for their supply. This asymmetrical process will not become fully symmetrical until the Meiji period (late 19<sup>th</sup> century), when significant European presence in Japan will once again be allowed after the lifting of the ban on Christianity in 1873.

This work has enabled a renewed interpretation of historical records by combining documentary evidence with the scientific results obtained from the study of the few sacred images surviving the harsh persecutions that marked Japan from the early 17<sup>th</sup> century until the late 19<sup>th</sup> century.

Considering that almost the entirety of Christian production in Japan was destroyed during the over-250 years of persecutions, and that written records reporting any contact with the Missionaries shared the same fate as they would have led to torture and martyrdom if found by the authorities, results from archaeometric investigations of historical paintings and porcelains, combined with the scarce documentary evidence, have finally enabled researchers to overcome the daunting issue of the lack of any Japanese documents from the period.

<sup>82</sup> G. Elison, *Deus Destroyed: The Image of Christianity in Early Modern Japan* (Harvard University Council on East Asian: 1988), 115-116.

<sup>83</sup> Elison, *Deus Destroyed*, 193.

<sup>84</sup> Elison, *Deus Destroyed*, 191.

<sup>85</sup> Schutte S. J., *Monumenta Historica Societatis Iesu a Partibus Eiusdem Societatis Edita – Volumen 111*, 1254.

<sup>86</sup> *Fiamminghi e altri Maestri – Gli Artisti Stranieri nel Patrimonio del Fondo Edifici di Culto*, 69.



## 6. Written sources and bibliographical references

- Cieslik S.J., Hubert. *Early Jesuit Missionaries in Japan 2 – Balthasar Gago and Japanese Christian Terminology (1954)*. Jesuits of Japan: 2004.
- Curtis, Emily Byrne. *European Contributions to the Chinese Glass of the early Qing Period*. Journal of Glass Studies: Vol. 35, 1993.
- Curvelo, Alexandra. “Nuvens douradas e paisagens habitadas. A arte namban e a sua circulação entre a Ásia e a América: Japão, China e Nova-Espanha (c.1550-c.1700).” (PhD Thesis, Lisbon, Universidade Nova de Lisboa, 2007).
- D’Elia, Pasquale. *Fonti Ricciane. Documenti Originali Concernenti Matteo Ricci e la Storia delle Prime Relazioni tra l’Europa e la Cina (1579–1615)*. 3 vols. Roma: La libreria di Stato, 1942-1949.
- Elison, George. *Deus Destroyed: The Image of Christianity in Early Modern Japan*. Harvard University Council on East Asian: 1988.
- Guillen-Nuñez, Cesar. *The Portrait of Matteo Ricci – A Mirror of Western Religious and Chinese Literati Portrait Painting*. Journal of Jesuit Studies: 2014.
- Hioki, Naoko Frances. *Visual bilingualism and mission art: a reconsideration of ‘Early Western-Style Painting’ in Japan*. Japan Review: 2011.
- Kamba, Nobuyuki, et al. “Research on the Painting of the Madonna with the Infant Jesus and Her Fifteen Mysteries”. Bulletin of the National Museum of Japanese History: vol. 76, 1998.
- McCall, John. *Early Jesuit Art in the Far East I, The Pioneers*. Artibus Asiae: 1947.
- McCall, John. *Early Jesuit Art in the Far East IV: In China and Macao before 1635*. Artibus Asiae: 1948.
- Magurn, Blanche. *Daitoku Myō-Ō a Japanese Buddhist Deity*. Cambridge: Bulletin of the Fogg Art Museum – Harvard Art Museums, 1942.
- Ministero dell’Interno. *Fiamminghi e altri Maestri – Gli Artisti Stranieri nel Patrimonio del Fondo Edifici di Culto del Ministero dell’Interno*. Rome, L’Erma di Bretschneider, 2008.
- Montanari, Riccardo, Maria Francesca Alberghina, Salvatore Schiavone, Claudia Pelosi. “The Jesuit painting Seminario in Japan: European Renaissance technology and its influence on Far Eastern Art”. *X-Ray Spectrometry* 51, no. 1 (2022): 64-85. <https://doi.org/10.1002/xrs.3256>.
- Montanari, Riccardo, Nobuyuki Murakami, Philippe Colomban, Maria Francesca Alberghina, Claudia Pelosi, Salvatore Schiavone. “European ceramic technology in the Far East: enamels and pigments in Japanese art from the 16<sup>th</sup> to the 20<sup>th</sup> century and their reverse influence on China”. *Heritage Science* 8, no. 48 (2020). <https://doi.org/10.1186/s40494-020-00391-2>
- Montanari, Riccardo, Nobuyuki Murakami, Maria Francesca Alberghina, Claudia Pelosi, Salvatore Schiavone. “The Origin of overglaze-blue enameling in Japan: new discoveries and a reassessment”. *Journal of Cultural Heritage* 37 (2019): 94-102. <https://doi.org/10.1016/j.culher.2018.11.008>
- Montanari, Riccardo, Maria Francesca Alberghina, Annalaura Casanova Municchia, Emanuela Massa, Anna Pelagotti, Claudia Pelosi, Salvatore Schiavone, Armida Sodo. “A polychrome Mukozuke (1624–1644) porcelain offers a new hypothesis on the introduction of European enameling technology in Japan”. *Journal of Cultural Heritage* 32 (2018): 232-237. <https://doi.org/10.1016/j.culher.2017.12.010>.
- NHK Publishing Inc. *NHK 歴史ドキュメント6*. Tokyo, NHK Publishing Inc, 1987.
- NHK Promotion. *Via Orientalis – Exhibition catalogue*. Tokyo, NHK Publishing Inc, 1993.
- Roy, Ashok, ed. *Artists’ Pigments – a handbook of their history and characteristics, Vol. 2, National Gallery of Art, Washington*. London: Archetype Publications, 1993.
- Schutte S. J., Josef Franz. *Monumenta Historica Societatis Iesu a Partibus Eiusdem Societatis Edita – Volumen III, Monumenta Missionum Societatis Iesu – Vol. XXXIV, Missiones Orientales Monumenta Historica Japoniae I– Textus Catalogorum Japoniae 1553-1654*. Romae: Apud “Monumenta Historica Soc. Iesu”, 1975.
- Vlam, Grace. *Western-Style Secular Painting in Momoyama Japan, Volume One, PhD Dissertation*. University of Michigan: 1976.
- Volker, T. *The Japanese porcelain trade of the Dutch East India Company after 1683*. Leiden: E.J. Brill, 1959.
- Yamasaki, Kazuo, Emoto Yoshimichi. “Pigments Used on Japanese Paintings from the Protohistoric Period through the 17<sup>th</sup> Century”. *Ars Orientalis* 11 (1979): 1-14.