COLOR IN ANCIENT AND MEDIEVAL EAST ASIA

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Detail of plate 2, "Color at the Court of Japan in the Heian Period," page 166

Director's Foreword

The process of investigating the role and power of color in Ancient and Medieval East Asia built a new and somewhat unexpected community of scholars around a revelatory topic rich with interdisciplinary research potential. These scholars created new paths of exploration that crisscross the territories of art, history, science, technologies, and society. In this endeavor, dedicated experts reached beyond knowledge bequeathed by scholars in their home disciplines and information mined in previous research, demonstrating the prismatic ways that a subject such as color—when placed in a broad historical context with multiple perspectives—can illuminate approaches and methodologies and reveal new forms of knowledge discovery. Color as a source of power and inspiration, as metaphor, color representative of cosmology and religion, as indicator of political life, marker of status and position, representation of natural resources, transformative agent, and as mediator of forces—these are only a few of the larger themes within this publication. Each section draws upon multiple philosophies, contested interpretations, specific examples, and distinct materialities. Captivating in its many appearances, the interplay between ideas, creativity, and the material world demonstrates the relationship of the poetic imagination—so crucial in art—to rigorous individual scholarship of every kind. Such a relationship is essential to appreciate what cannot be seen at our contemporary remove.

When this project began four years ago, we at the Spencer Museum of Art hoped that it would serve as a research exemplar, provoking new questions through energetic dialogue with multiple disciplines. In its realization the colloquia, writings, and conversations additionally became a way to consider how the processes of artmaking (including the selection of materials and techniques) suggest and in many cases demand broad investigations. By exploring the concept of color across multiple domains, we began to expand our own view of collection research and artistic research and to propose the art museum as a powerful engine of cross-disciplinary inquiry. One of the significant roles of the art museum is to recognize and express wonder and meaning in the broad spectrum of the world over time. The Spencer Museum takes this role very seriously, allowing us to serve as an ideal host for this investigation of a complex phenomenon across broad geographic territories and cultural epochs.

The University of Kansas proved to be a generous host for the color project, as the ideas and participants connected and convened and as the Spencer Museum began to take on a more central role in interdisciplinary research on campus. The Commons (a partnership between the Spencer Museum, the Biodiversity Institute, and the Hall Center for the Humanities), which hosted the two colloquia, and the KU Research Investment Council, which funded the Spencer Museum's Arts Research Collaboration initiative, are both dynamic examples of the University's commitment to research teams and projects that cross traditional boundaries in order to explore new ground. Under the strong leadership of Chancellor Bernadette Gray-Little and Provost Jeffrey Vitter, KU has provided facilities, financial support, and a stimulating context for this and other interdisciplinary exploration. Further essential support for scholars and invited participants was given selflessly by the entire staff of the Spencer Museum of Art. I am also grateful to the many other individuals and organizations who contributed materially and intellectually to make this project possible. Finally, it is my great honor to thank Dr. Mary M Dusenbury for her foresight and total commitment to realizing this ambitious project. Her intelligence, vision, and her own sense of artistic possibility grant *Color in Ancient and Medieval East Asia* its individual and collective splendor.

SARALYN REECE HARDY

FIGURE 5
"Wall Paintings at the Mogao Grotto Site, Dunhuang, China," page 54

History of the Project

Many years ago I went to talk to Wai-kam Ho, then curator of Chinese art at the Nelson-Atkins Museum of Art in Kansas City. Wai-kam told me that if I wanted to understand color in ancient China, the first thing I should comprehend was that color is a source of power. We talked further, but he brushed aside lesser questions to emphasize the importance of understanding that color has power. It was a potent force in ancient Chinese society.

This book is the outcome of years of research and the collaboration of chemists, conservators, archaeologists, dyers, historians of art and literature, and scholars of Buddhism and Daoism. Separately and together we have worked to explore the roles that color—and specific dyes and mineral pigments—played in the social and political life, thought, art, and ritual practices of ancient and medieval East Asia. The source material is rich and includes dynastic histories, court documents, travelers' journals, merchants' ledgers, literature, Daoist liturgical and meditative manuals, paintings in tombs and Buddhist grottoes, religious icons, paintings on silk and on paper, pottery, lacquer, and textiles.

The seeds for this book were sown at a College Art Association conference. In 2003 I organized a panel, *Languages of Color in East Asian Visual Culture*, for that conference and invited several scholars represented in this volume to discuss the role of color in East Asian cultures.

Guolong Lai, Amy McNair, and I were joined later by chemist Richard Laursen at a small, exploratory colloquium, *The Power of Color in Ancient and Medieval East Asia*, at the University of Kansas in September 2010. The meeting was sponsored by the Spencer Museum of Art and supported by a seed grant from The Commons Research Initiative in Nature and Culture, a grant designed to nurture and develop interdisciplinary, collaborative research at the University of Kansas. After two days of sharing research and learning each other's vocabulary, questions, and scholarly approaches, the group met for a final session to evaluate the colloquium. We agreed that the topic offered fertile ground for further exploration and that we would like to expand the project, identify other scholars who might collaborate, and plan a larger symposium with a publication to follow.

One of the most valuable outcomes of the 2010 colloquium was the establishment of a network of scholars who were committed to an interdisciplinary approach to the study of color. When the group met in 2010, the scientific and art historical work presented had no points of intersection, although each participant had questions that other disciplines could help solve. Since then, in preparation for the larger symposium, several members of the original group worked together to develop topics that had relevance beyond a single academic field and that could be addressed from multiple viewpoints and disciplines. In December 2011, for example, Zhao Feng, director of the China National Silk Museum in Hangzhou, and I met to discuss topics that he and his colleagues might develop for the project. From this grew the idea that Liu Jian, a new scientific researcher at the China National Silk Museum, might work with Richard Laursen in Boston for further training and to conduct the dye analysis for his project. Laursen and his team had recently completed groundbreaking work in dye-analysis technology. The following summer Liu Jian arrived in Boston with more than one hundred samples of Chinese archaeological textiles for analysis. He and Chika Mouri completed most of the research for their essays in this volume at Laursen's lab in Boston University.

Through these and other interactions during and following the 2010 colloquium, the intellectual and interpersonal groundwork was laid for the intensive and productive dialogues that took place at a final working symposium held at the University of Kansas in the

spring of 2013. Like the 2010 colloquium, *Color in Ancient and Medieval East Asia* was held at The Commons and sponsored by the Spencer Museum, with generous support from The Henry Luce Foundation and the Chiang Ching-kuo Foundation for International Scholarly Exchange. The essays in this publication benefited significantly from interactions that took place during and following that gathering.

This publication has been generously supported by the E. Rhodes and Leona B. Carpenter Foundation. Seed money was provided by the Henry Luce Foundation with additional support from the University of Kansas Research Investment Council and the Marilyn Stokstad Publication Fund. Both the symposium and publication have been produced within the framework of the Spencer Museum's Arts Research Collaboration initiative (ARC), an interdisciplinary research initiative that promotes and facilitates collaborations between the arts, sciences, technology, and society. We are grateful to all these institutions.

MARY M DUSENBURY
Project Director, *Color in Ancient and Medieval East Asia*

Introduction

Color was a critical element in ancient and medieval East Asian life. In contrast to Western thought—in which color has been associated with light at least since the time of Aristotle—in ancient and medieval East Asia color was earth-bound, linked to specific plant or mineral substances rather than to points on a spectrum of light. Many mineral and plant materials that produced color were also potent toxins or medicines. The idea that a color shared the transformative powers associated with the substance from which it came—that it possessed a life-force or energy of its own—permeated early religious, political, and social thought and practices.[1] It also undergirded and enhanced the multiple roles that color played in the society, politics, thought, art, literature, and ritual practices of ancient and medieval East Asia. Interwoven with this and other fundamental ideas about color were several distinct streams of thought, each with its own understanding of the role of color within a particular philosophical structure. These ideas about color sometimes intermingled in complex ways. Nevertheless, one can extrapolate certain basic premises about color that were shared across ancient East Asia. These may be summarized as follows:

1. The colors produced by certain materials were believed to hold and wield substantial power.
2. Many of the materials that produced these colors had toxic or medicinal properties. The power inherent in their ability to kill or to heal was believed to transfer to the color they produced.
3. In ancient China there was a dichotomy between the principal or 'correct' colors (C. *zhengse*) and the intermediary or secondary colors (C. *jianse*). Only the correct colors were believed to be efficacious and therefore appropriate for official and ceremonial use.[2] The idea of correct colors spread from China to kingdoms on the Korean peninsula and to Japan in conjunction with systems of designating official rank by the color of costume and its accoutrements and the concepts of *yin-yang* and *wuxing* (see below).
4. Color was used to indicate political authority, rank, and prestige in systems understood throughout East Asia.
5. The courts, aristocracies, and bureaucrats of kingdoms throughout East Asia were color-literate. They knew the dye plants that produced the correct colors and those that produced non-official popular colors. They understood the particularities of each plant, the properties of the colors it yielded, and the principles of dye technology. Poets could, and did, use

1. There was a similar belief that a word contains the power of what it stands for. See H.E. Plutschow, *Chaos and Cosmos: Ritual in Early and Medieval Japanese Literature* (Brill's Japanese Studies Library, vol. 1, Leiden: E.J. Brill, 1990), 11.

2. Passages in the *Lunyu* (Confucian Analects) and the *Liji* (Book of Rites) warn against substituting secondary colors for the correct colors for official and ritual use. Despite admonitions to the contrary, there seems to have been a considerable gap between the ideal of correct practices based on an ancient norm and the contemporary situation in the lively urban capital. The following passage records royal regulations for the supervision of the public markets and a warning against the sale of cloth dyed an illegitimate color: "All who had charge of the prohibitions for the regulation of the multitudes did not forgive transgressions of them. Those who had rank-tokens . . . were not allowed to sell them in the market-places; nor . . . silk . . . not according to the prescribed quality . . . or of the illegitimate colours [*jianse*], confusing those that were correct." James Legge, trans., *Li-Chi: Book of Rites*, edited and with an introduction by Ch'u Chai and Winberg Chai (New Hyde Park, NY: University Books, 1967), vol. 1, 263. The *Liji* was compiled at the beginning of the Han dynasty from earlier materials. I am grateful to Guolong Lai for his help in understanding the meaning and implications of *zheng* and *jian* colors in classical texts.

these properties as metaphor, sometimes hinging the meaning of a poem on this knowledge.

6. The dyadic principle of *yinyang* and the dynamic concept of *wuxing* (five phases) cosmology were basic precepts throughout East Asia. Color was one of the fundamental ways in which the concepts were expressed in material culture. Both *yinyang* and *wuxing* are referred to throughout this volume. It is useful to discuss the concepts briefly here.

Yinyang and *Wuxing*

The two oldest colors found in Chinese funerary contexts were red and black. The red was derived from hematite (red ochre) or cinnabar, with cinnabar preferred when it was available. The black was derived from lacquer. Both cinnabar and lacquer are formidable toxins and preservatives. In China, the pairing of red and black lacquer objects frequently found in ancient funerary contexts correlated with an early dyadic understanding of the universe, a concept that influenced the cultures of ancient China and its eastern neighbors and later coexisted and intermingled with more complex theories and belief systems. At least by the late Warring States period (ca. 475–221 BCE) this dyadic principle became known as *yinyang*.

Also by the third century BCE, the term *wuxing* was given to a cyclical paradigm of the workings of the universe.[3] *Wuxing* shared with *yinyang* the fundamental notion that change is the most constant feature of the universe but elaborated it into a complex cyclical system comprising correlated sets of five. Among the most basic sets were five elements, five colors, five directions, five seasons, and five musical tones. Over time many other sets of five were added. Philosophically, the whole system is sometimes referred to as a correlative cosmology. *Wuxing* (J. *gogyō*; K. *ohaeng*) has been variously translated into English as 'five phases,' 'five elements,' and 'five agents.'

Correlative cosmology is based on the idea that there are five sets of correlates, comprising both natural and human phenomena, that interact in dynamic relationship to each other and that can be used not only to comprehend but also to affect the cosmos, the natural world, and the world of human affairs. Each of five so-called 'correct' colors was believed to be an agent able to activate other phenomena within its respective assemblage in order to help regulate the five major categories of forces that were believed to control the universe.[4]

Wuxing coalesced into a recognizable system in the third century BCE, during a period of conscious consolidation of earlier beliefs and ritual practices. By this time, the *di* or 'power' of the colors associated with *wuxing* had been honored individually for some time. Michael Loewe reported that in the Spring and Autumn period (770–ca. 475 BCE) the rulers of north China erected shrines to the *di* of blue/green and yellow, and that by the third century BCE the *di* of four colors—blue/green, yellow, red, and white—were worshipped. One of the first acts of Emperor Gaozu, founder of the Han dynasty (206 BCE–220 CE), was to hold ceremonies celebrating black in order to

3. See Guolong Lai, "Colors and Color Symbolism in Early Chinese Ritual Art," in this volume for a discussion of the development from the binary *yinyang* system to the quinary, cyclical *wuxing* paradigm.

4. Wang Aihe describes the concept of *wuxing* as follows: "*Wuxing* is a cosmology about interaction and change. The five cosmic energies exist in constant interaction, conquering and generating one another in circular sequence. As the core of correlative cosmology, *Wuxing* correlated events and actions with the ceaseless cosmic movements of the five interactive phases, serving to explain events in the human world and to dictate human actions." Wang Aihe, *Cosmology and Political Culture in Early China* (Cambridge: Cambridge University Press, 2000), 3. Benjamin Schwartz noted that *wuxing* was not a fatalistic philosophy but included scope for human interaction in the process: "Paradoxically, what correlative cosmology offers is both a sense of the human's dependence on all levels of his being on cosmic forces and yet the exhilarating promise of the capacity on the part of some minds to comprehend these forces which seem to be eminently 'knowable' and the power to use this knowledge to achieve an 'alignment' between the human and natural worlds." Benjamin I. Schwartz, *The World of Thought in Ancient China* (Cambridge: Harvard University Press, 1985), 368.

Core components of the Five Agents						
Direction	Season	Element	Color	Planet	Directional Animal	Musical tones
South	Summer	Fire	Red	Mars	Vermilion Bird	*jue* (mi)
East	Spring	Wood	Blue/green	Jupiter	Azure Dragon	*zhi* (sol)
North	Winter	Water	Black	Mercury	Black Tortoise/ Snake	*gong* (do)
West	Autumn	Metal	White	Venus	White Tiger	*shang* (re)
Center	*	Earth	Yellow	Saturn	Yellow Dragon	*yu* (la)

* an intercalary period sometimes described as mid-summer and sometimes as a period between summer and autumn.

appropriately honor all five of the colors that had become associated with the five agents paradigm.[5] Gaozu's action suggests not only the consolidation and codification of beliefs and ritual practices that were taking place in the early Han, but also points to the vigor of the belief that these colors, like other puissant spirits, were capable of doing good or causing harm. Michael Loewe has noted that black, as an integral component in the north-winter-water-black assemblage of *wuxing* theory, had the ability to activate other phenomena. Services to the *di* of black, therefore, could be used to help regulate and balance the five major categories of forces that controlled the universe.[6]

Wuxing cosmology influenced ideas about color, ritual practices, and material culture throughout ancient and medieval East Asia. The five colors were often the primary material expression of that paradigm.

'Correct' colors and 'illegitimate'[7] colors

The classical texts, which reached their final written form in the Han, admonished officials not to substitute other colors for the correct colors but did not specify or define what the correct colors were. Perhaps it was common knowledge. A Tang-dynasty (618–907) text is more specific. The *Tang liudian* [Compendium of administrative law of the six divisions of the Tang bureaucracy] states that court dyers recognized five official colors: red from madder, blue/green from indigo, yellow from gardenia, 'black' from acorns, and purple from gromwell.[8] With the exception of acorn's gray-brown-black range, these were the colors used to dye official robes the appropriate rank colors and, with the exception of purple, they were the five colors associated with *wuxing*.

Purple was a contentious color. In the Spring and Autumn and the Warring States periods it was considered to be a *jianse* color,

5. Michael Loewe, "The Religious and Intellectual Background," in Denis C. Twitchett and Michael Loewe, "The Ch'in and Han Dynasties," *The Cambridge History of China*, vol. I (Cambridge: Cambridge University Press, 1986), 662–63. Loewe translates *di* as 'power'; it is sometimes also translated as 'god.'

6. Ibid.

7. James Legge, in his translations of the Chinese classics, rendered the term *jian*, literally 'in-between,' as 'illegitimate,' a translation that Guolong Lai has noted carries a very strong political connotation and, as do many of Legge's translations, reflects traditional Confucian orthodox interpretations. Guolong Lai, email communication, May 20, 2014. Legge (1815–1897) wrote some of the first translations of the Chinese classics into English, several of which remain the only full translations available today.

8. Edward H. Schafer, *The Golden Peaches of Samarkand: A Study of T'ang Exotics* (Berkeley: University of California Press, 1963), 208. Schafer referenced the *Tang liudian* [Compendium of administrative law of the six divisions of the Tang bureaucracy] (Kyoto, 1935), 22, 21a. For an English translation of the *Tang liudian,* see: Wallace Johnson, *The T'ang Code*, 2 vols. (Princeton: Princeton University Press, 1979 and 1997).

not appropriate for official use, but perception and practice changed until, in the Han dynasty, it became incorporated into the official system, although not without protest from conservative Confucian scholars.

Made from the roots of a gromwell plant, purple had been one of the two most popular and problematic colors in the Spring and Autumn, Warring States, and Former Han (206 BCE–9 CE) periods. The other was scarlet, extracted from the florets of safflower blooms. Both gromwell purple and safflower scarlet were costly and the dye process required considerable skill. Both colors were derided by Confucian scholars as examples of the luxury and frivolity that they deplored.[9] Nevertheless, beginning at least in the Han dynasty, purple from the gromwell plant was added to the palette of colors used to indicate rank. A marker of this change occurred in 113 BCE, when Emperor Wu (156–87 BCE; r. 141–87 BCE) elevated purple to a status above the five correct colors as emblematic of a great unity behind *wuxing* and the duality of *yinyang*.[10] Emperor Wu's action can be seen as part of a larger effort by scholars during the Former Han dynasty to create a unified philosophical understanding of the universe from an inherited variety of disparate strands of thought, but it also served to provide a legitimate—and prominent—place for purple in official and ritual life. Although purple remained controversial for some time, this action appears to have marked the beginning of the use of purple throughout East Asia to indicate very high rank.[11] Safflower seems to have maintained its stigma and was never used within the rank system in China or Korea.

This book is divided into five sections. The single essay in Section I, *Colors and Color Symbolism in Ancient China*, lays the material and philosophical foundation for the other essays in the book. The two essays in Section II, *Tomb and Grotto Paintings*, present an analysis and discussion of colors and pigments in an extraordinary group of painted tombs dating from the Goguryeo period (37 BCE–668 CE), located along the border between the modern state of North Korea and China, and in Buddhist cave temples at the Mogao Grottoes in Dunhuang dating from the fifth to the ninth century. The five authors of the essays in Section III, *Dyes on Ancient Chinese and Japanese Textiles*, utilize analysis of dyes on archaeological and preserved textiles from the third century BCE through the eighth century CE, coupled with received texts, to study the materials used to make the dyes during that period and the historical implications of that knowledge. Section IV, *Color at the Court of Japan*, considers color in Japanese imperial and elite culture from the sixth through the twelfth century. Section V, *Color in Religious Art in Medieval East Asia*, examines the multiple roles of color in Korean and Japanese Buddhist culture and in Chinese Daoist texts and practices, focusing on the ninth through the fourteenth century.

9. The Confucian attitude toward purple and scarlet is forcefully stated in the *Analects*, a book of sayings attributed to Confucius (ca. 551–469 BCE) and compiled by his followers: "The superior man did not use a deep [purple] in the ornaments of his dress. Even in informal costume, he did not wear anything [scarlet] or [purple]." James Legge, trans. *The Confucian Analects, The Great Learning, The Doctrine of the Mean* (originally published 1893, reprint; New York: Cosimo Classics, 2009, 230). Includes Chinese text and English translation. Words in brackets are my translation of the original Chinese color terms.

10. In that year, Han Wudi built a three-story altar to Taiyi, a deity who embodied the abstract concept of an absolute cosmic unity. The altar was surrounded by five subordinate altars, one for each of the Five Emperors of China's semi-mythological past. Priests responsible for the sacrifices to each of the Five Emperors wore vestments of that emperor's color: red, yellow, blue/green, white, and black, the correct colors of the *wuxing* paradigm. Positioned high above these figures was the priest serving Taiyi who wore flowing purple vestments. See Schwartz, *The World of Thought*, 375, and Michèle Pirazzoli-t'Serstevens, *The Han Civilization of China*, trans. Janet Seligman (Oxford: Phaidon Press, 1982), 99.

11. The elevation of purple was not uncontroversial. Han Wudi's own chancellor, Kuang Heng, tried to abolish the purple altar in 32 BCE. He said: "The purple altar cannot find their models in antiquity . . . everything relating to the artificial adornment of the purple altar . . . is not appropriate to maintain." Michael Nylan and Michael Loewe, eds., *China's Early Empires: A Re-appraisal*, University of Cambridge Oriental Publications (Cambridge: Cambridge University Press, 2010), 481–82. I am grateful to Lisa Shekede for information about Kuang Heng's opposition and Nylan and Loewe's publication.

To date, particularly in the West, research on color in East Asia has been conducted primarily within specific disciplines, especially dye and pigment analysis (mostly for purposes of conservation) and as an element within *wuxing* cosmology. It is our hope that this interdisciplinary study of color in East Asia, and the plants and minerals used to produce the colors, will draw attention to the significance of color in ancient and medieval East Asian life and thought and contribute to a new and more profound understanding of East Asian art and history. Finally, we hope that this volume will stimulate further research, open new avenues of exploration, and encourage significant interdisciplinary collaborations.

MARY M DUSENBURY

Acknowledgments

My first thanks are to Professor Nagasaki Seiki, whose year-long course and seminar at Kyoto University of Arts (Kyoto Geijutsu Daigaku) on the history of color and dyes in Japan opened my eyes to the importance of this research and its relevance to broader studies of the history, art, archaeology, and science of ancient and medieval East Asia. Since that time, other scholars, dyers, and colleagues in Japan have deepened my understanding, and several of them have contributed to this volume. Indigo dyer/artist Shindo Hiroyuki generously shared his knowledge and contributed two works to the exhibition that accompanied our 2013 symposium. Hiroi Nobuko joined me on research trips and provided several key introductions, including an interview with scholar/dyer Fujii Kenzo. Professor Fujii drew my attention to the unrecorded history of dyeing for the imperial court and possible alternative techniques practiced by its dyers. In Korea, professors Kim Jeeun and Cha Byungi guided me through southern Korea, where we visited dye workshops and the National University of Cultural Heritage in Buyo where we discussed with Sim Yeon-ok her contribution to this volume.

I am particularly indebted to Monica Bethe, scholar, dyer, and weaver, for her knowledge and generosity. Over the years we have shared research, contacts, and information. In addition to contributing two essays to this volume, she has been instrumental in compiling information and images for the appendix, and she graciously facilitated much of our correspondence with the Shōsōin.

Special thanks are due to the Office of the Shōsōin, Imperial Household Agency, for their support of this publication. They excused Tanaka Yoko from her duties so that she could attend the 2013 symposium, and with great generosity supplied images of a number of objects from their collection. Several essays in this volume are based largely or in part on the collections of the Shōsōin and ongoing research at the Office of the Shōsōin. In addition to Tanaka Yoko, I would like to thank Ogata Atsuhiko, Nakamura Rikiya, Naruse Masakazu, and Kitada Hiroshi. Their support has been crucial and is deeply appreciated.

The seeds of this project were sown at a College Art Association conference in 2003. Guolong Lai was a participant in the panel *Languages of Color in East Asian Visual Culture* as a newly minted PhD. He has been involved in every stage of the project since that time. I am grateful for his suggestions, introductions to others in the field, and the stellar scholarship that provides the theoretical foundation for this volume. Amy McNair, mentor and colleague, was discussant at the CAA panel, a participant in the 2010 colloquium, and a discussant for the 2013 symposium. Her ideas helped develop the larger project and shape the contours of this book. My great thanks, Amy.

The parameters of the project were developed at a small colloquium held at The Commons, University of Kansas, in 2010. McNair, Lai, and I were joined by Richard Laursen, a chemist who had recently turned his attention to the analysis of dyes on ancient and historic East Asian textiles. Since that colloquium, Laursen has been a key participant in the development of the project. He provided research space in his lab at Boston University and mentored two other authors in this volume, Chika Mouri and Liu Jian. Laursen and I have corresponded, sometimes intensely, at the intersection of science and the humanities as we undertook research for essays in this volume. His knowledge, curiosity, and generosity have contributed greatly to this book.

It was Zhao Feng, director of the National Silk Museum in Hangzhou, who sent Liu Jian to Boston to work in Laursen's lab. Zhao and I met in New York to develop ideas for the essays that he and Liu would write, and he made available samples from archaeological textiles for the analysis that supports these

essays. I am greatly indebted to him as a friend and colleague.

Colleagues across the University of Kansas have supported the project as participants in the two colloquia and as consultants. In addition to Amy McNair, I would like to thank Maggie Childs, Elaine Gerbert, Eric Rath, Sherry Fowler, William R. Lindsey, Leonard Krishtalka, and Mary Anne Jordan. I am also grateful to Colin MacKenzie of the Nelson-Atkins Museum of Art, Andrew Hare of the Freer Gallery of Art and Arthur M. Sackler Gallery, and Elena Phipps of The Metropolitan Museum of Art for their insightful discussions during the 2013 symposium.

Without the support of Saralyn Reece Hardy, director of the Spencer Museum, this project would not have been possible. I am deeply grateful for her support and for her astute comments along the way. She has a keen eye for what matters. Several colleagues at the Spencer Museum have been instrumental in making the book happen—from late-night discussions (Celka Straughn), to planning the project and budget (Margaret Perkins-McGuinness and Jennifer Talbott), to grant writing (Rebecca Blocksome and Alexis Fekete), to working with images (Ryan Waggoner and Jeffrey McKee). Rebecca Blocksome has assisted at every stage of the process, from conception to grant writing to color proofing. Headed by Kris Ercums, the department of Asian art has supported the project in numerous ways. Intern Yegee Kwon provided invaluable assistance in Korean correspondence and translation issues. She also checked the manuscript for errors in Hangul/English transcription.

I have been extremely fortunate to have Ellen O'Neil Rife as my editorial assistant. Dr. Rife worked tirelessly on the manuscript with an unusual combination of creativity and meticulous attention to detail. Thank you, Ellen.

This publication was produced by Marquand Books. We have appreciated their consistently high standards and unfailing good spirits as we negotiated the inevitable bumps of production. Gina Broze, outside rights and reproductions coordinator, worked persistently to procure permissions and high-quality images, often under difficult circumstances. Copyeditor and proofreader John Stevenson contributed much more than these essential functions. The book is better for his suggestions.

Two outside readers provided invaluable comments on the manuscript. Dominique Cardon is senior researcher and directrice de recherche at the National Centre of Scientific Research in Lyons, France. Her primary research focuses on the history and archaeology of textile production and dyeing. Cardon clarified the botanical information and discussions of the chemistry and processes of dyeing. Lothar von Falkenhausen, professor in the Department of Art History at the University of California, Los Angeles, focuses on Chinese Bronze Age art and archaeology and the history of science and technology in East Asia. His feedback and cogent suggestions prompted us to rewrite several sections of the book. We are deeply grateful to von Falkenhausen and Cardon for their careful reading of the manuscript and their corrections and discerning comments. Any remaining errors are our own, the authors in this volume and myself.

My deepest gratitude goes to my fellow authors, whose commitment to their research combined with a willingness to stretch its boundaries and explore the wider, interdisciplinary implications of their work has led to this volume.

The book and the two working meetings that led to it would not have been possible without considerable financial support. A seed grant from The Commons Interdisciplinary Research Initiative in Nature and Culture served as primary funding for the 2010

colloquium. Major funding for the 2013 symposium was provided by the Henry Luce Foundation and the Chiang Ching-kuo Foundation for International Scholarly Exchange. Funding for this publication came primarily from the E. Rhodes and Leona B. Carpenter Foundation, alongside seed money from the Henry Luce Foundation. Additional support was provided by the University of Kansas Research Investment Council and the Marilyn Stokstad Publication Fund.

We are deeply grateful for this support.

MARY M DUSENBURY

Notes to the Reader

This volume follows contemporary standards for romanizing Chinese, Japanese, and Korean words: pinyin for Chinese, Hepburn for Japanese, and the official Revised Romanization developed by the National Academy of the Korean Language and adopted by the South Korean government in 2000.

Bibliographical citations and words from Chinese, Japanese, and Korean that appear in quotations are spelled as they were originally published. Diacritical marks are omitted for words that are well known in the English-speaking world (such as sutra) and familiar place names (Tokyo, not Tōkyō). We have retained the common English spelling for familiar place names (Pyongyang, not Pyeongyang).

Chinese, Japanese, and Korean names are rendered in traditional style, with surname preceding given name(s). In the bibliography, the comma is omitted between the surname and given name for Asian names (Zhao Feng, Tanaka Yoko). Exceptions are Asian scholars working in the United States and publishing in English, including four authors in this publication: Shih-shan Susan Huang, Ikumi Kaminishi, Guolong Lai, and Chika Mouri.

The chronology is based on the Heilbrunn Timeline of Art History developed by The Metropolitan Museum of Art.

Chronology

CHINA

NEOLITHIC PERIOD	ca. 10000–ca. 2000 BCE
Yangshao culture	ca. 5000–ca. 1500 BCE
Longshan culture	ca. 2500–ca. 1700 BCE
Xia dynasty	ca. 2100–ca. 1600 BCE
SHANG DYNASTY	ca. 1600–ca. 1050 BCE
WESTERN ZHOU DYNASTY	ca. 1046–771 BCE
EASTERN ZHOU DYNASTY	771–256 BCE
SPRING AND AUTUMN PERIOD	770–ca. 475 BCE
WARRING STATES PERIOD	ca. 475–221 BCE
QIN DYNASTY	221–206 BCE
HAN DYNASTY	206 BCE–220 CE
Western Han dynasty	206 BCE–9 CE
Eastern Han dynasty	25–220
THREE KINGDOMS PERIOD	220–265
WESTERN JIN DYNASTY	265–317
EASTERN JIN DYNASTY	317–420
SIXTEEN KINGDOMS PERIOD	304–439
Northern Liang	420–439
NORTHERN AND SOUTHERN DYNASTIES	386–589
Wei dynasties	386–557
SUI DYNASTY	581–618
TANG DYNASTY	618–907
FIVE DYNASTIES	907–960
LIAO DYNASTY	907–1125
SONG DYNASTY	960–1279
Northern Song dynasty	960–1127
Southern Song dynasty	1127–1279
WESTERN XIA DYNASTY	1038–1227
JIN DYNASTY	1115–1234
YUAN DYNASTY	1271–1368
MING DYNASTY	1368–1644
QING DYNASTY	1644–1911

JAPAN

NEOLITHIC CULTURES	ca. 10500–ca. 200 BCE
JOMON CULTURE	ca. 2500–ca. 1000 BCE
YAYOI CULTURE	ca. fourth century BCE–ca. third century CE
KOFUN PERIOD	ca. third century–538
ASUKA PERIOD	538–710
NARA PERIOD	710–794
HEIAN PERIOD	794–1185
KAMAKURA PERIOD	1185–1333
NANBOKUCHO PERIOD	1336–1392
MUROMACHI PERIOD	1392–1573
MOMOYAMA PERIOD	1573–1603
EDO PERIOD	1603–1868
MEIJI PERIOD	1868–1912

KOREA

NEOLITHIC CULTURES	ca. 7000–ca. 1000 BCE
BRONZE AGE	ca. 1000–300 BCE
IRON AGE	from ca. 300 BCE
THREE KINGDOMS PERIOD	57 BCE–676 CE
Silla	57 BCE–676 CE
Goguryeo	37 BCE–668 CE
Baekje	18 BCE–660 CE
GAYA FEDERATION	42–562
UNIFIED SILLA	676–935
LATER BAEKJE	892–936
LATER GOGURYEO	901–918
GORYEO DYNASTY	918–1392
JOSEON DYNASTY	1392–1910

SECTION I

Colors and Color Symbolism in Ancient China

This section lays the material and philosophical groundwork for the book. Lai's essay focuses on China from the late Neolithic period through the Western Han dynasty, when various streams of philosophical ideas were consolidated into coherent systems. Although material culture in other parts of East Asia suggests that some of the ideas found in ancient China were shared more widely, only in China are there received texts that discuss and debate the ideas inherent in the objects found in funerary contexts.

A belief in the numinous power of red is shared by many prehistoric cultures. Red—associated variously with blood, fire, and the sun—was intimately connected with life, death, and human society. In East Asia the color red is found in archaeological records that spread from China across northeast Asia to Japan, where, as in China, prehistoric gravesites have yielded red-painted human bones, earth saturated with red pigment, and red-painted burial objects. In ancient China, and also Japan, red and black are often found paired together. Materiality mattered. Lai points out that the pairing of red and black had cosmological, mystical, and magical significance in early Chinese funerary art because of the toxic, preservative, and protective qualities of the colorants cinnabar and lacquer.

Ancient Chinese were literate and documented their thoughts as they sought to understand the cosmos and the world around them. One of the earliest concepts to be recorded was that of a basic duality found throughout the universe (night/day; dark/light; male/female), a concept that found material expression in the red and black pottery of the Neolithic period and textual expression as the concept of *yinyang*. As Chinese culture became more complex, scholars sought more sophisticated models of the universe, ones that took account of the rotations of the heavens and the cycle of the seasons, dependable annual occurrences that were of paramount importance to the agriculture that formed the base of Chinese society. In the early Western Han, these various ideas were consolidated into what became known as *wuxing*, the five phases, five elements, or five agents. Color was an active and integral part of this correlative cosmology.

From the late Western Zhou, color was used to indicate rank and hierarchy. In general, the primary or 'superior' colors came from a single source, while the production of intermediate or secondary colors often required two dye sources. The system changed over time but the idea of a hierarchy of colors continued, along with a distinction between principal ('correct') colors and secondary or intermediate colors.

Cosmological ideas that included colors as active agents, and the use of color to indicate rank, spread from China to Korea and Japan, a story that is taken up later in this volume.

PLATE 6 (detail)

Colors and Color Symbolism in Early Chinese Ritual Art

Red and Black and the Formation of the Five Colors System

GUOLONG LAI

In recent decades, archaeological excavations in southern China have yielded several spectacular ancient burials containing well-preserved exquisite textiles, lacquer ware, wooden sculptures, and silk paintings. These colored objects give us, for the first time, a direct glimpse into the world of colors in ancient China. In this essay, I will utilize both archaeological materials and received texts to explore the context and meaning of color in the construction of ritual settings during the Warring States (ca. 475–221 BCE) and early Han (206 BCE–9 CE) periods. I will trace the evolution from a binary red and black construct to the quinary five-color system that formed part of the Five Elements paradigm.

In the semiotics of colors, materiality matters. For the early Chinese, cinnabar, a bright red toxic mineral consisting of mercury sulfide, embodied this materiality. When mixed with lacquer, another toxic but equally useful substance, cinnabar imparted a bright red color to both early Chinese ritual objects and their settings. Color in ancient China was considered the property of the object itself; by contrast, in the modern sciences derived from traditional Western thinking, color is understood in terms of its relationship with the reflection or emission of light.[1] That is to say, conceptually at least, that even in the dark of night, cinnabar red, for example, was still considered red and possessed the same luminous power as if it was being viewed in bright daylight. Colors were perceived not as abstract concepts but as concrete substances, endowed with rich meanings; color symbolism was directly related to the material from which the color was derived. According to their perception in Chinese culture, colors were an integral part of the qualities of the material.[2]

This emphasis on the materiality of colors is certainly not unique to ancient China.[3] Many other ancient and modern cultures have similar views on colors. However, previous studies of color in past decades have largely focused not on the materiality of colors, but on the abstract linguistic classification of colors in different cultures. Among a large and impressive body of literature on the evolution of color terminology in anthropology, cognitive

1. The *Oxford English Dictionary* definition of 'color' is, "The quality or attribute by virtue of which something appears to have a colour, so that it may present different appearances to the observer regardless of shape, size, and texture; the sensation corresponding to this, now recognized as dependent on the wavelengths of the light reaching the eye. The colour of an object depends on the way it selectively absorbs light incident on it, and also on the nature of the incident light. Because sight is mediated by nerve impulses from the eye to the brain, a sensation of colour can also be produced by other means, such as pressure on the eyeball or stimulation of the neural pathways between the eye and the brain." The meaning of the word dates back to the fourteenth century, but many classical scholars had already discussed colors in terms of its relation to light. *OED Online*, s.v. "colour," accessed March 31, 2014, http://www.oed.com/view/Entry/36596?rskey=lvgRJR&result=1&isAdvanced=false.

2. In recent years, philosophers and neuroscientists have also argued for "color realism," that is, the consideration of colors as physical properties of objects, specifically, types of reflectance. See the target article by Alex Byrne and David R. Hilbert, "Color Realism and Color Science" and open peer commentaries in *Behavioral and Brain Sciences* 26 (2003): 3–64. My emphasis on the materiality of colors in this essay is different from that of Byrne and Hilbert's. It is a cultural association of the color property with other properties of the same material. It is cultural rather than physical or scientific.

3. See, for example, Stephen Houston et al., *Veiled Brightness: A History of Ancient Maya Color* (Austin: University of Texas Press, 2009).

linguistics, and psychology, the most influential theory is the universal evolution of "basic color terms" proposed by Brent Berlin and Paul Kay in 1969.[4] They identified eleven basic color terms and proposed a seven-stage universal evolution of these terms. The terms comprise stage one: black (dark hues) and white (light hues); stage two: red; stage three: either green or yellow; stage four: either green or yellow, whichever did not arise in stage three; stage five: blue; stage six: brown; and stage seven: purple, pink, orange, and gray.[5]

While Berlin and Kay opened up new paths of investigation into color research, recent studies have challenged their hypothesis.[6] The main difficulty is how to define "basic color terms" in any given historical context.[7] The most commonly described colors in historical texts were not necessarily Berlin and Kay's basic color terms, and often one term had a variety of meanings in particular historical contexts. In fact, color terms are often extremely vague unless their unstable semantic fields are anchored by specific objects or materials with a stable color.[8]

A few anthropologists took an alternative approach that considered color classification in specific cultural contexts. Rooted in a structuralist tradition, this approach sees color as a signifier of an underlying system of classification and aims at identifying paradigmatic structures in cultural symbolism. Early in the 1950s, Conklin discovered that the four-color categories recognized by the Hanunóo of the Philippines corresponded to an underlying four-way classification of other visual stimuli.[9] In 1966, Victor Turner explained the symbolism of black, white, and red colors in African Ndembu ritual in terms of the biological fact that they were the colors of issues of the human body.[10] Turner's pioneering approach inspired several anthropological studies of symbolic classification by color.[11] I take a similar approach in this essay. Utilizing visual, epigraphic, and textual evidence, I explore the contexts and the meanings of colors in the ritual arts of early China. Somewhat different from Turner's biological explanation of color symbolism, however, my interpretation of the red and black pair and the formation of the five-color system in early China is essentially a materialist explanation. I argue that it was the materiality of the colorants that contributed to the formation of the ideological symbolism related to these colors.

Color Technology and Color Usage in Early China

Almost forty years ago, Yuan Dexing (a.k.a. Chuge), a researcher at the National Palace Museum in Taipei and a renowned painter, wrote a provocative essay entitled "Conception of Painting in the Shang and Chou Dynasties."[12]

4. Brent Berlin and Paul Kay, *Basic Color Terms: Their Universality and Evolution* (Berkeley: University of California Press, 1969).

5. Ibid., 22–23.

6. William H. Baxter and Wang Tao considered color research in relation to Chinese materials. See William H. Baxter, "A Look at the History of Chinese Color Terminology," *Journal of the Chinese Language Teachers Association* 18, no. 2 (1983): 1–25; Wang Tao, "Colour Terms in Shang Oracle Bone Inscriptions," *Bulletin of the School of Oriental and African Studies* 59, no. 1 (1996): 63–101; Wang Tao, *Yanse yu jisi: Zhongguo gudai wenhua zhong yanse yanyi tanyou* [Color and sacrifice: Investigation on the meanings of colors in ancient Chinese culture] (Shanghai: Shanghai guji chubanshe, 2013). For a critique of Berlin and Kay, refer to Andrew Jones and Gavin MacGregor, eds., *Colouring the Past: The Significance of Colour in Archaeological Research* (Oxford and New York: Berg, 2002).

7. Even the theorized linkage between color salience and color naming, which is the foundation of Berlin and Kay's theory, has been questioned recently. See Kimberly A. Jameson and Nancy Alvarado, "Differences in Color Naming and Color Salience in Vietnamese and English," *Color Research and Application* 28, no. 2 (2003): 113–38.

8. This is why many newly introduced color terms are often object or material specific. Once a color term becomes abstract, its meanings become vague. For critiques of the approaches of Berlin and Kay and their associates, see Jones and MacGregor, *Colouring the Past*; Houston et al., *Veiled Brightness*, 11–12.

9. Harold C. Conklin, "Hanunóo Color Categories," *Southwestern Journal of Anthropology* 11, no. 4 (1955): 339–44.

10. Victor W. Turner, "Colour Classification in Ndembu Ritual," in *Anthropological Approaches to the Study of Religion*, ed. M. Banton (London: Tavistock Publications, 1966), 47–84.

11. Such as Uri Almagor, "Colours that Match and Clash: An Explication of Meaning in a Pastoral Society," *Res: Anthropology and Aesthetics* 5 (1983): 49–73. For a nuanced analysis of Turner's processual symbolic method and that of French structuralism, see Mathieu Deflem, "Ritual, Anti-structure, and Religion: A Discussion of Victor Turner's Processual Symbolic Analysis," *Journal for the Scientific Study of Religion* 30, no. 1 (1991): 1–25.

12. Yuan Dexing, "Conception of Painting in the Shang and Chou Dynasties," *The National Palace Museum Bulletin* (bimonthly, English) 9, no. 2 (1974): 1–14; 9, no. 3 (1974): 1–13. I thank Jerome Silbergeld for drawing my attention to Yuan Dexing's work.

In it he claimed that ancient Chinese bronzes, like ancient Greek sculptures, were originally painted with dazzling colors, but the natural process of oxidation over the centuries and collectors' and archaeologists' efforts to clean them have destroyed the remaining pigments. Although no research has confirmed this, recent archaeological discoveries vindicate Yuan's attention to the use of colors in early Chinese art.[13] One obvious example is the "rediscovery" of the polychrome terracotta army of the First Emperor of Qin in Lintong, Shaanxi Province (plate 1). The grayish terracotta figures were originally painted in rich red, pink, blue, green, yellow, and purple. With the assistance of German conservators, Chinese archaeologists excavated additional terracotta soldiers and successfully preserved their colors.[14]

In this section, I will focus on other archaeological materials, especially those discovered in southern China, where, because of better conditions for archaeological preservation, spectacular ancient burials have been discovered and excavated over the last four decades. Since the majority of the materials discussed in this essay come from mortuary contexts, I will focus on color symbolism in early Chinese funerary arts. In particular, I consider the early history of color usage and color technology, especially red and black, two colors that frequently appear on painted coffins and funerary ritual objects in early China. A contemporary observer of a traditional Chinese funeral would notice that the dominant color is white. This is mainly because traditional mourning attire is made of hemp, the natural color of which is a pale off-white.[15] Yet both archaeological and ethnographic evidence show that many other colors have been used in funerary contexts.

One of the earliest instances of color usage in China, as in other parts of the world, was the red ochre used in Paleolithic and Neolithic burials, such as those discovered at the Paleolithic Upper Cave Man site (Shandingdong ren) at Zhoukoudian near Beijing.[16] This use of red may derive from its relation to the color of blood, associated with both life and death. Early Neolithic archaeological sites also contained red stones, colorful body ornaments, and various colored jades. It was with the development of painting pigments and dyeing, a process of tinting fabric or other materials with colorants, that humans began to control and create colors on objects. Pigments used in painting and dyes were of limited availability, but through individual and collective efforts supply shortages and technical difficulties could be overcome and desired colors achieved.

In the earliest documented stage of color usage on Neolithic painted pottery, the dominant colors are red and black, although white is also fairly common.[17] The principal method of coloration was direct physical attachment. In other words, the union between the colorants

13. Traces of red and black colors have been detected on a bronze vase excavated from the cemetery of the State of Zeng dating to the early Western Zhou period at Yejiashan, Suizhou, Hubei, in the summer of 2013. See Hubei sheng bowuguan, Hubei sheng wenwu kaogu yanjiusuo, and Suizhou shi bowuguan (comp.), *Suizhou Yejiashan Xi Zhou zaoqi Zeng guo mudi* [The cemetery of the State of Zeng of the early Western Zhou Period discovered at Yejiashan in Suizhou] (Beijing: Wenwu chubanshe, 2013), 88–91.

14. Catharina Blansdorf, Erwin Emmerling, and Michael Petzet, eds., *Die Terrakottaarmee des Ersten Chinesischen Kaisers; Qin Shihuang: The Terracotta Army of the First Chinese Emperor, Qin Shihuang: Qin Shihuang ling bing ma yong* (Munich: Bayerisches Landesamt für Denkmalpflege, 2001).

15. This is also because off-white bast fibers, such as linen and hemp, are extremely difficult to dye permanently, since their original function in the plant stem requires them to slough off liquids. See E.J.W. Barber, *Prehistoric Textiles* (Princeton: Princeton University Press, 1991), 10–20. Linguistically, one of the Chinese words for white, *su* (OCM *sâh: "white, colorless"), is related to *suo* (OCM *sâk: "rope"), and they often shared the same graphic component in paleographic materials. OCM stands for "Minimal Old Chinese," a reconstruction of an early stage of Chinese (ca. 1000–200 BCE). All the Old Chinese reconstructions (OCM) cited in this essay are from Axel Schuessler, *Minimal Old Chinese and Late Han Chinese: A Companion to* Grammata Serica Recensa (Honolulu: University of Hawai'i Press, 2009).

16. Tagawa Yoshiaki, "Chūgoku shinsekki jidai no bosō ni okeru toshu jinkotsu ni tsuite" [On red-pigmented bones in Chinese Neolithic burials], in *Ikeda Suetoshi hakushi koki kinen tōyōgaku ronshū* [Oriental studies commemorating the seventieth birthday of Dr. Ikeda Suetoshi], ed. Ikeda Suetoshi Hakushi Koki Kinen Jigyōkai (Hiroshima: Ikeda Suetoshi Hakushi Koki Kinen Jigyōkai, 1980). For the practice and possible meanings of using red ochre in prehistoric sites, see Ernst E. Wreschner, "Red Ochre and Human Evolution: A Case for Discussion," *Current Anthropology* 21, no. 5 (1980): 631–44.

17. Ma Qinglin, Hu Zhide, and Li Zuixiong, "Zhongguo gudai yanliao" [Ancient Chinese colorants], *Gugong wenwu yuekan* 192 (1999): 45–47.

PLATE 1
Polychrome terracotta soldier near the mausoleum of the first Qin emperor, discovered in Lintong, Shaanxi. Approximately life-size. Clay and lacquer. Qin dynasty, 221–206 BCE. Qinshihuang Mausoleum Museum, Xi'an, Shaanxi, China.

and the object was achieved mainly through mechanical fastening, and only in very few cases through intermediate adhesive or chemical reaction.[18] Scientific studies show that the pigments for red and black on Neolithic painted pottery from Gansu in northwest China consist of ferric oxide (Fe_2O_3) for red, magnetite (Fe_3O_4) and manganese (MnO) for black, and white chalk ($CaCo_3$) for white.[19] The melting points of these minerals are above 1300°C, but the ceramics were fired between 900°C–1050°C.[20] Therefore, the technique used to paint pottery involved applying the powdered pigments to the unfired vessel before it dried, then pressing and rubbing the powders into the texture of the surface of the clay with a small, smooth stone. Using this method it was possible to fix the colors on the vessel permanently once it was fired.[21]

Pigments and implements of coloration have been discovered at Neolithic archaeological sites.[22] For example, cake-shaped red pigments were found in small ceramic jars at the Yangshao culture site of Beishouling in Baoji, Shaanxi.[23] Black and red bars of mineral substances were excavated at the Yangshao culture site at Xiawanggang in Xichuan, Henan.[24] At the Yangshao site of Jiangzhai in Lintong, Shaanxi, archaeologists found a set of implements, including a stone mortar, pestle, stone cover, red pigment (Fe_2O_3), and a water container.[25] Some mortars have two separate sections for different colors. For example, stone grinding-slabs and ceramic palettes with multiple depressions for pigments were found in a potter's workshop site at Baidaogouping in Lanzhou, Gansu.[26] Several bronze and stone "palettes" of the Shang and Zhou dynasties in the shape of an animal carrying four tubes on its back were discovered, such as one in the collection of the Saint Louis Art Museum (plate 2).[27] Interestingly, chemical analyses of the residues from the four tubes in a piece in the Ashmolean Museum reveal that they contained four different colors.[28] Scientific analysis of the pigment samples of Siba culture (ca. 1940–ca. 1630 BCE) found at Huoshaogou in Yumen, Gansu, revealed the employment of sulfur (light yellow), red ochre (red pigment cake), cinnabar (HgS), realgar (As_4S_4), and gypsum ($CaSO_4 \cdot 2H_2O$).[29] Other colors, such as white (white chalk, $CaCO_3$, or quartz, SiO_2), brown, and yellow (yellow ochre, $Fe_2O_3 \cdot H_2O$) were also present at Huoshaogou.

Among these colorants, the most ubiquitous and significant is cinnabar. Early specimens

18. Ma Qinglin and Li Xian, "Gansu gudai ge wenhua shiqi zhitao gongyi yanjiu" [Study of ceramic craftsmanship in the Neolithic cultures in Gansu Province], *Kaogu* 3 (1991): 266–67.

19. Ibid., 263–72; Feng Xianming et al., *Zhongguo Taoci shi* [A history of Chinese ceramics] (Beijing: Wenwu chubanshe, 1982), 40.

20. Feng et al., *Zhongguo Taoci shi*, 42.

21. Ma Qinglin, "Taozhi wenwu baohu fangfa zongshu" [General account of the methods of protecting ceramic cultural relics], *Kaogu* 1 (1993): 81–84. See also Ma Qinglin, *Gansu Xinshiqi shidai yu Qingtong shidai zhitao gongyi taoqi yanliao ji taoqi chengfen fenlei yanjiu* [Manufacturing techniques, pigments, and chemical composition classification methods of pottery during the Neolithic and Bronze Ages in Gansu Province, China] (PhD diss., Lanzhou University, 2000), 28–29.

22. For a brief history of color technology in China, see Yu Feian, *Chinese Painting Colors: Studies on Their Preparation and Application in Traditional and Modern Times*, trans. Jerome Silbergeld and Amy McNair (Seattle: University of Washington Press, 1988).

23. Zhongguo shehui kexueyuan Kaogu yanjiusuo (comp.), *Baoji beishouling* (Beijing: Wenwu chubanshe, 1983), 75, plate 60.1; see also the scientific report on the pigments, 154–56. It is worth noting that pigments were buried in tombs at this site and that other evidence of artistic activity, such as sculptures of human figures, were also found.

24. Henansheng wenwu yanjiusuo, Changjiang liuyu guihua bangongshi Kaogudui Henan fendui (comp.), *Xichuan Xiawanggang* [Archaeological report on the Xiawanggang site in Xichuan] (Beijing: Wenwu chubanshe, 1989), 51, plates 7.13–14.

25. Banpo bowuguan, Shaanxisheng kaogu yanjiusuo, Lintong xian bowuguan (comp.), *Jiangzhai* [Archaeological report on the Jiangzhai site] (Beijing: Wenwu chubanshe, 1988), 199–200, 251, 288–89, fig. 212; color plate 16; plates 120.1–5.

26. Gansusheng wenwu guanlihui, "Lanzhou xinshiqi shidai de wenhua yicun" [Cultural remains from Neolithic sites in Lanzhou], *Kaogu xuebao* 1 (1957): 6.

27. Cheng Te-k'un, "The T'u-lu colour-container of the Shang-Chou period," *Bulletin of the Museum of Far Eastern Antiquities* 37 (1965): 239–50.

28. Similar objects (h. 17 cm and h. 16 cm, respectively) are in the Saint Louis Art Museum (plate 2) and the Fogg Art Museum in Harvard University. One piece (h. 15 cm) was discovered at Hejiacun Xihao, Qishan, Shaanxi, a marble specimen was discovered in a Western Zhou tomb in Luoyang, Henan, and more may exist. See Liang Yanmin, "Yinzhou shiqi qingtong tiaoseqi xiaoyi" [Bronze palettes of the Shang and Zhou periods], *Wenbo* 2 (2008): 37–39; Shen Tianying, "Xizhou niuxing yu tiaoseqi xiaokao" [The jade palette of the Western Zhou period], *Sichuan wenwu* 3 (2002): 72–73; Wang Tao, "Shangdai kaogu zhong de yanse" [Colors in Shang archaeology], in *Shang wenhua lunji (shang)* [Discussions on Shang Culture (first volume)], ed. Li Boqian (Beijing: Wenwu chubanshe, 2003), 442–51.

29. Ma Qinglin, Hu Zhide, and Li Zuixiong, "Zhongguo gudai yanliao" [Ancient Chinese colorants], *Gugong wenwu yuekan* 192 (1999): 47–48.

of cinnabar have been discovered at the Chengbeixi site (ca. 4400–ca. 3300 BCE) in Zhicheng, Hubei, and at the Dadiwan and Liuwan sites in Gansu. Like red ochre during Paleolithic times, and probably also due to its affinity with the color of blood, thick layers of cinnabar were often used to cover corpses from Neolithic times to the Han dynasty, especially in tombs of people of high social status.[30] The walls of the principal chamber in many of the princely tombs of the Han dynasty were painted in red cinnabar; examples include the tomb of the Prince of Chu of the Han dynasty at Beidongshan in Jiangsu and the tomb of Prince Xiao (r. 168–144 BCE) of Liang at Yongcheng in Henan.[31]

Although more colorants were available during the Shang dynasty (ca. 1600–ca. 1046 BCE), the two colors most frequently used were red and black. The pairing of red and black had cosmological, mystical, and magical significance in early Chinese funerary art because of the toxic, preservative, and protective qualities of the colorants cinnabar and lacquer. The oldest extant Chinese wall painting (a fragment about 22 cm × 13 cm) discovered at a residential site at Xiaotun, Anyang, in Henan, employed only black and red.[32] Traces of brush-written characters in cinnabar and black ink have been discovered on oracle bones. In addition to brush writing, the carved oracle-bone inscriptions were sometimes filled in with red (cinnabar) and black (carbon or organic matter).[33] The colors red and black were also two of the preferred colors in the Shang ritual system, although there is also evidence that the Shang elite favored the color white.[34] Shang-dynasty diviners sought to discern the animal best suited for sacrifice to specific ancestors and to discover which color associated with that animal was most appropriate for the sacrifice (for example, a white pig or a black pig). The colors they considered included not only red and black, but sometimes white and other colors.[35]

The most important development in color usage occurred in connection with lacquer. The contrasting motifs created by its basic colors, red and black, have been found in many mortuary contexts of the time.[36] Lacquer paintings on carved wooden objects were unearthed at the royal Shang cemetery at Houjiazhuang, Anyang, Henan, in the 1930s and at Taixi, Gaocheng, Hebei, in 1973.[37] At Taixi, lacquer fragments were decorated with black drawings on a red background.

The use of lacquer in China goes back to Neolithic times. A wooden bowl with red cinnabar lacquer (plate 3) was found at the Neolithic Hemudu culture site in Yuyao, Zhejiang (ca. 6000–ca. 5000 BCE).[38] Lacquer is a natural product that comes from the sap of

PLATE 2
Pigment Container (tiao se qi) *with Elongated Neck and Water Buffalo Head*. Height 17.1 cm, width across side handles 14.6 cm, depth along axis of elongated buffalo head 19.7 cm, width of flat top 8.9 cm. Bronze. Shang to early Western Zhou period, eleventh century BCE. Saint Louis Art Museum, St. Louis, Missouri. Gift of J. Lionberger Davis, 33: 1951.

30. See also Li Ling, *Zhongguo fangshu kao* [Studies on early Chinese occult arts] (Beijing: Dongfang chubanshe, 1999), 309–11. For the use of cinnabar in Japan, see Ichige Isao, *Shu no kōkogaku* [The archaeology of cinnabar] (Tokyo: Yūzankaku, 1975).

31. Xuzhou shi bowuguan, Nanjing da xue Lishixi (comp.), *Xuzhou Beidongshan Xi Han Chu wang mu* [The tomb of the Prince of Chu of the Western Han dynasty at Beidongshan in Xuzhou] (Beijing: Wenwu chubanshe, 2003); Yan Genqi, ed., *Mangdangshan Xi Han Liang wang mudi* [Archaeological report on the Western Han tomb of Prince Liang at Mangdangshan] (Beijing: Wenwu chubanshe, 2001).

32. Zhongguo kexueyuan Kaogu yanjiusuo Anyang fajuedui, "1975 nian Anyang Yinxu de xinfaxian" [New discoveries at Yinxu in Anyang in 1975], *Kaogu* 4 (1976): 267. Other colors such as white and yellow were also discovered in funerary settings, see Guo Baojun and Lin Shoujin, "1952 nian qiuji Luoyang fajue baogao" [Archaeological report of the 1952 fall season in Luoyang], *Kaogu xuebao* 9 (1955): 94.

33. Roswell S. Britton, "Oracle-Bone Color Pigments," *Harvard Journal of Asiatic Studies* 2, no. 1 (1937): 1–3. Oracle bones were also painted in purple, yellow, and reddish-brown colors, but these pigments have not yet been analyzed. See Wang Yuxin and Yang Shengnan, eds., *Jiaguxue yibainian* [A hundred years of studies on oracle bones] (Beijing: Shehui kexue wenxian chubanshe, 1999), 2000–2001.

34. Wang Tao, *Yanse yu jisi*, 81–84.

35. Wang Tao, "Colour Terms," 63–101.

36. Lin Chunmei, "Lacquer and Its Uses on Clay in Early China," in *Die Terrakottaarmee des Ersten Chinesischen Kaisers; Qin Shihuang: The Terracotta Army of the First Chinese Emperor, Qin Shihuang: Qin Shihuang ling bing ma yong*, 412–23.

37. Gao Quxun, *Houjiazhuang* [Archaeological report on the Houjiazhuang site] (Taipei: Institute of History and Philology, Academia Sinica, 1962–1976), 2: Tomb 1001, 56–69, plates 39–65, color plates 1–7; 5: Tomb 1004, 29–33, plates 21, 24; Tang Yunming, "Taixi yizhi qiqi de yuanyuan ji yizhi wenhua xingzhi de tantao" [On the sources of the lacquer excavated from the Taixi site and the cultural nature of the site], *Huaxia kaogu* 2 (1988), collected in *Tang Yunming kaogu lunwenji* [Studies on Chinese archaeology by Tang Yunming] (Shijiazhuang Shi: Hebei jiaoyu, 1990), 233–38. Similar lacquer fragments were discovered at Panlongcheng, Huanggang in Hubei.

38. Hemudu yizhi kaogudui, "Zhejiang Hemudu yizhi di'erqi fajue de zhuyao shouhuo" [Important results of the second season of the excavation at Hemudu in Zhejiang], *Wenwu* 5 (1980): 5, plate 3.3.

PLATE 3
Wooden bowl lacquered with red cinnabar, discovered at a Neolithic site at Hemudu in Yuyao, Zhejiang. Length 10.6 cm, width 9.2 cm, height 5.7 cm. Wood and lacquer. 6000–5000 BCE. Zhejiang Provincial Museum, Hangzhou, Zhejiang, China.

the Chinese lacquer tree (*Toxicodendron vernicifluum* [Stokes] F.A. Barkley).[39] The sap is white or grayish in color and about the consistency of molasses. On exposure to the air it turns yellow-brown and then black. Even without mixing with other colorants, the lacquer itself can be used not only as a colorant because of its natural black color but also as an adhesive. Thus, when cinnabar is mixed with lacquer, the resulting red paint can be directly applied to objects. This is the case with the *gu*-shaped lacquer vessels (ca. 1600–ca. 1400 BCE) discovered at Dadianzi, Inner Mongolia. Ceramic vessels from this site were lavishly painted with red, black, and white decorations.[40] Lacquer paint was also applied to textiles. In 1953, archaeologists excavated a textile painted a brownish-black with lacquer from a Western Zhou elite tomb at Puducun, Chang'an in Shaanxi.[41] Colored lacquer served a decorative function for carriages,[42] harnesses, bows, and arrows.

Colors and Social Hierarchy in Late Western Zhou

Color usage and aesthetic attitudes toward colors changed noticeably in the late Western Zhou period (ca. 1046–771 BCE). Based on textual records, William H. Baxter has proposed that a shift in basic color terms probably occurred at the end (or during the latter part) of the Western Zhou.[43] Baxter divided the Chinese development of "basic color terms" into two periods. The Shang and Western Zhou had four basic color terms, white, yellow, red,

39. Rüdiger Prasse, "*Toxicodendron vernicifluum* (Stokes) Barkley," in *Die Terrakotta-armee des Ersten Chinesischen Kaisers, Qin Shihuang: The Terracotta Army of the First Chinese Emperor, Qin Shihuang: Qin Shihuang ling bing ma yong*, 378–93.

40. Zhongguo shehui kexueyuan Kaogu yanjiusuo (comp.), *Dadianzi* (Beijing: Wenwu chubanshe, 1998), 191–94, color plate 20.1; see also Wang Shixiang, *Xiushilu jieshuo* [Annotated explanation of the treatise on lacquer decoration] (Beijing: Wenwu chubanshe, 1983). Liu Guanmin has explored the connection between the decorative scheme of the painted pottery and Shang bronze vessel decoration; see Liu Guanmin, "Zhongguo qingtongshidai zaoqi caihui wenshi shixi" [Preliminary analysis of the painted decoration of the Early Bronze Age in China], *Kaogu* 8 (1996): 61–70, 80.

41. Similar examples have been discovered in Louyang and at many other sites. Guo Baojun and Lin Shoujin, "1952 nian qiuji Luoyang fajue baogao," 91–116.

42. Zhongguo kexueyuan Kaogu yanjiusuo (comp.), *Shangcunling Guoguo mudi* [Archaeological report on the cemetery of the polity of Guo at Shangcunling] (Beijing: Kexue chubanshe, 1959), 42–44, chariot pit no. 1727; 33, Tomb 1704 four lacquer stem-cup (*dou*) vessels, plate 41.

43. Baxter, "Color Terminology," 1–25. For the meaning of *qing*, see Peter A. Boodberg,

black, and the Eastern Zhou through the Han dynasty had five basic color terms, adding the new term *qing*, 'grue' or green/blue. This development may well be reflected in fundamental changes in bronze decoration that occurred at the same time, changes that have long captured the attention of archaeologists and art historians.

Chinese archaeologists have noted stylistic changes in bronze decoration in the late Western Zhou period, and have argued that the shift from zoomorphic masks and motifs of the Shang and early Western Zhou periods to the more pure geometric, abstract ornamentation of the late Western Zhou period embodied new religious and political symbolism. For example, Jessica Rawson interpreted these changes as the reflection of a wider development now often referred to as the late Western Zhou Ritual Reform (or Revolution).[44] Defining taste as "the aesthetic attitudes and preferences shared by artists and patrons that found their visual expression in human-made products of a given period," Lothar von Falkenhausen describes late Western Zhou taste as expressing itself by reducing formerly zoomorphic images to abstract ornaments through patternization, creating unity within a set of ritual vessels by repeating the same decoration, standardizing ritual paraphernalia in ancestral sacrifices, and emphasizing fine distinctions of political status.[45] Patterning can itself create meaning. Colors may well have been employed in all these deliberate, self-conscious endeavors, playing an important role in patternization and geometric design. However, the basis of the new meanings is not concrete iconographic representation, but abstract, emotional, psychological, intellectual, and social conventions, including rhythms, numbers, schemata, cosmology, social hierarchy, etc.

During the late Western Zhou period, different colors acquired significant symbolic meanings, as evidenced by their use in royal gift giving. Western Zhou rulers used political rites to create a cosmologically coherent ritual community, to legitimate their power, and to define political relationships.[46] Certainly royal gifts of lands or territories could be used to secure the loyalty of local states, but royal gifts could also take more symbolic forms such as ritual vessels, ritual attire, and chariot fittings.[47] Inscriptions on gifted bronze vessels help to define the aesthetic attitudes and preferences for colors in royal gifts, enabling us to start a discussion of late Western Zhou taste in colors.[48] Royal gifts were listed in many of these late Western Zhou inscriptions that record royal decrees or official appointments. These records are among the most prominent features of late Western Zhou bronze inscriptions. The objects, conferred on an appointee at the time of his official investiture ceremony, often consisted of a jar of fragrant sacrificial wine, court garments (robes, kneepads, slippers, caps, girdles), weapons, banners, horses,

"On Chinese *ts'ing* 'blue-green,'" in *Selected Works of Peter A. Boodberg*, ed. Alvin P. Cohen (Berkeley: University of California Press, 1979), 178–79; Edward H. Schafer, "Blue-green Clouds," *Journal of the American Oriental Society* 102, no. 1 (1982): 91–92.

44. Jessica Rawson, "Statesmen or Barbarians? The Western Zhou as Seen through Bronzes," *Proceedings of the British Academy* 75 (1989): 89–93; Jessica Rawson, "Western Zhou Archaeology," in *The Cambridge History of Ancient China: From the Origins of Civilization to 221 B.C.*, eds. Michael Loewe and Edward L. Shaughnessy (Cambridge: Cambridge University Press, 1999), 433–40.

45. Lothar von Falkenhausen, "Late Western Zhou Taste," *Études Chinoises* 29, nos. 1–2 (1999): 143–78.

46. Catherine Bell, *Ritual: Perspectives and Dimensions* (New York: Oxford University Press, 1997), 128–35.

47. Li Feng, *Landscape and Power in Early China: The Crisis and Fall of the Western Zhou (1045–771 B.C.)* (Cambridge: Cambridge University Press, 2006). In recent years, some scholars have linked the gradual decline of the Western Zhou dynasty with excessive royal gift giving, a practice that eventually bankrupted the royal Zhou government. Constance A. Cook made a similar point that through gift giving the Zhou court maintained their political ideology and mandate to rule, see her "Wealth and the Western Zhou," *Bulletin of School of Oriental and African Studies* 60, no. 2 (1997): 253–94; Wang Tao, "Yanse yu shehui guanxi" [Colors and social relations], in *Guwenzi yu gudaishi* [Paleography and ancient history], ed. Li Zongkun (Taipei: The Institute of History and Philology, Academia Sinica, 2009), 221–41.

48. There are traces of red ochre in the *leiwen* background ornaments of many Shang and Zhou bronze vessels excavated from burial sites, but the pigment may simply be part of a general sprinkling of ochre over the deceased person's body. We have evidence that some early Western Zhou and Han dynasty bronzes as well as ceramic vessels were lavishly painted. See footnote 13.

chariots and harness, bows and arrows.[49] Distinct ranks of officials were awarded with different insignia and accoutrements. Some of the records on these gifts include descriptions of their colors. For example, robes (*yi*) were often dark black (*xuan*), reddish brown (*chi*), or yellow (*jiong*); kneepads (*fu*) were vermilion (*zhu*), red (*chi*), dark black (*you*), black (*zi*), or white (*su*); girdles (*huang*=*heng*)[50] for jade pendants were vermilion, green (*cong*), yellow (*jiong*), dark black, or golden (*jin*); and slippers (*xi*) were red.[51]

These colors were used on different articles to distinguish political hierarchy. For example, vermilion kneepads denote the highest rank. In all the appointment inscriptions known so far, we have only two cases of vermilion kneepads, which were awarded to the officials Maogong Yin and Pan Sheng.[52] According to the inscriptions, both were assigned at the time to very high positions in the Western Zhou government. According to later textual sources, vermilion kneepads were reserved for the highest political position (Son of Heaven or Lord) only. The next tier in the color hierarchy of kneepads is red and the third black.[53]

> As to kneepads, the Lord wears vermilion; the magnate (*dafu*), white; and the gentlemen (*shi*), red-black ones made of leather.[54]
>
> The Son of Heaven wears vermilion kneepads; the local lords (*zhuhou*) wear red kneepads; and the officials (*qingdafu*) wear green belts.[55]

These later systematized texts, of course, are not records of practices in the late Western Zhou period, but structurally, at least, the late Western Zhou practice of color usage as attested in the bronze inscriptions may provide the basis for later systematization.[56]

The pattern of color usage is evident not only in the hierarchy of individual colors, but also in the combination of colors. Certain favored pairs of colors appeared in court garments. For example, dark black robes, the most common robes mentioned in the inscriptions, were often matched with red kneepads; the kneepads were red in thirty-four of thirty-eight examples in which both dark black robes and kneepads were present.[57] In thirty-six cases where red kneepads and robes were both present, the robes were dark black in thirty-four. The system also pairs red kneepads with vermilion belts.[58] Although scholars still disagree on the exact correspondence between colors and ranks in the late Western Zhou, and the color hierarchy as presented in the bronze inscriptions may not be as systematic as in later texts, the existence of a hierarchy of colors is evident.[59]

49. Virginia C. Kane, "Aspects of Western Chou Appointment Inscriptions: The Charge, the Gifts, and the Response," *Early China* 8 (1982/83): 14–23.

50. Here I use Tang Lan's interpretation of *huang*, see Tang Lan, "Maogong ding 'zhufu, congheng, yuhuan, yuyu' xinjie" [New interpretations on the phrases 'zhufu, congheng, yuhuan, yuyu' in Maogong ding], in *Tang Lan xiansheng jinwen lunji* [Studies on bronze inscriptions by Tang Lan] (Beijing: Zijincheng chubanshe, 1995), 86–93.

51. Yang Kuan, *Xizhou shi* [The history of the Western Zhou dynasty] (Shanghai: Shanghai renmin chubanshe, 1999), 473–79; Huang Weiran, *Yin Zhou qingtongqi shangci mingwen* [Bronze inscriptions on awards of the Shang and Zhou dynasties] (Hong Kong: Longmen shudian, 1978); Chen Hanping, *Xizhou ceming zhidu yanjiu* [A study on the Western Zhou appointment system] (Beijing: Xuelin chubanshe, 1986), 286–93.

52. Zhongguo shehui kexueyuan Kaogu yanjiusuo (comp.), *Yin Zhou jinwen jicheng shiwen* [The corpus of bronze inscriptions of the Shang and Zhou dynasties] (Hong Kong: Xianggang Zhongwen daxue Zhongguo wenhua yanjiusuo, 2001), 2:426–33 (Maogong); 3:461 (Pan Sheng). Maogong's appointment inscription appears on a *ding* or tripod, and Pan Sheng's inscription appears on a *gui* or tureen.

53. Yang, *Xizhou shi*, 479.

54. Ruan Yuan, ed., *Shisanjing zhushu* [The thirteen classics] (repr., Taipei: Yiwen yinshuguan, 1993), 5:560.

55. Xu Shen (ca. 58–147 CE), *Shuowei jiezi* [Explaining the graphs and analyzing the characters] (repr., Beijing: Zhonghua shuju, 1963), 160.

56. The *Liji* texts are generally dated to the Western Han. See Michael Loewe, ed., *Early Chinese Texts: A Bibliographical Guide* (Berkeley: The Society for the Study of Early China and the Institute of East Asian Studies, University of California, Berkeley, 1993), 293–97. Manuscripts excavated recently from Warring States tombs, however, indicate that this type of textual systematization could have happened in the middle of the Warring States period.

57. Zhang Yachu, *Yin Zhou jinwen jicheng yinde* [Index to the corpus of bronze inscriptions of the Shang and Zhou dynasties] (Beijing: Zhonghua shuju, 2001), 805–07.

58. Ibid., 843–45. For the combinations of colors in received texts, see, for example, "Yuzao" in *Liji*, in Ruan, *Shisanjing zhushu*, 5:551.

59. See the summary of the debates in Wang Tao, "Yanse yu shehui guanxi," 270–72. More research is needed to explore the exact relationship between colors and ranks in the Western Zhou bronze inscriptions.

This hierarchy of colors in ritual attire is related to technological developments in dyeing during late Western Zhou and the Spring and Autumn period (770–ca. 475 BCE). These periods marked significant improvements in techniques of dyeing, especially with madder (*maosou*, or *qian*) and indigo (*lan*), techniques that allowed dyers to produce colors that were more highly saturated and also colorfast.[60] The palette was further expanded by using minerals such as cinnabar, red ochre, and azurite to color textiles. The various technological developments during these three centuries enriched and expanded the colors available to dyers. They are also significant for explaining the cosmological conception of colors in early China.

The Pairing of Red and Black Colors

The early pairing of red and black can probably be attributed to the availability of the pigments and coloration technology. In the Spring and Autumn period, however, red and black remained the dominant colors, despite the fact that more pigments and dye materials were available. The pairing of red and black had become a conscious aesthetic choice. Early examples of this are the red palls and black and red coffin decorations discovered at the cemetery of the Guo polity of the early Spring and Autumn period in Sanmenxia, Shaanxi.[61]

Archaeologists have discovered many more lacquered wooden materials, lacquer utensils, and textiles unearthed from Warring States and early Han tombs in south China.[62] All these southern tombs belong to the same burial tradition: the burials usually consist of a deep vertical earth pit with wooden chambers and coffins, sealed with an envelope of a type of oily clay at the bottom. The coffins were usually painted red and black. For example, in the tomb of Marquis Yi of Zeng (ca. 433 BCE), the outer coffin (*guo*) is a wooden encasement with a bronze frame, the outer surface of the encasement is decorated with red and brownish geometric patterns against a black background, and the inside is painted red. The inner coffin (*guan*) is decorated with black geometric and snake-bird motifs against a red background (plate 4).[63]

A second example is the painted coffin excavated from Baoshan Tomb no. 2 (ca. 316 BCE). This burial consists of two outer coffins and three nested inner coffins. The first inner coffin is plain. The second inner coffin is painted with black lacquer both inside and outside. The innermost coffin is painted red inside and black outside with a nine-unit decorative pattern, each composed of four dragons and four birds executed with red and yellow lacquer paint mixed with gold and silver filings.[64]

A third example is a set of four nested inner coffins in Mawangdui Tomb no. 1 (second

60. Wu Shusheng and Tian Zibing, *Zhongguo ranzhi shi* [A history of dyeing and weaving in China] (Shanghai: Shanghai renmin chubanshe, 1986), 45–46; Gao Hanyu, ed., *Zhongguo lidai zhi ran xiu tulu* [A catalogue of Chinese historical textiles] (Hong Kong: The Commercial Press, Ltd., 1986), 22–23; Puyangshi wenwu guanli weiyuanhui, Puyangshi bowuguan, Puyangshi wenwu gongzuodui, "Henan Puyang Xishuipo yizhi fajue jianbao" [A brief report on the excavation at Xishuipo site at Puyang in Henan], *Wenwu* 3 (1988): 1–6.

61. Henan sheng wenwu kaogu yanjiusuo, Sanmenxia shi wenwu gongzuodui, *Sanmenxia Guoguomu* [The cemetery of the polity of Guo at Sanmenxia] (Beijing: Wenwu chubanshe, 1999), 16–19, Tomb 2001; color plates nos. 43–44, Tombs 2118 and 2119.

62. Jessica Rawson and Colin Mackenzie have discussed the influence of textile designs on bronze, lacquer, and ceramic decorative styles in Warring States and Han art. As Mackenzie has pointed out, the influence of textile designs on bronze decoration can be traced back much earlier, probably to the late Shang and Western Zhou periods. Aesthetic sensibility toward colors and color combinations is probably the driving force behind all these transmissions of designs and patternization. See Jessica Rawson, "Chu Influences on the Development of Han Ritual Vessels," in *Arts Asiatiques* 44 (1989): 84–99; and Colin Mackenzie, "The Influence of Textile Designs on Bronze, Lacquer and Ceramic Decorative Styles during the Warring States Period," originally published in *Orientations* 30, no. 7 (September 1999): 82–91; later published in *Chinese Bronzes: Selected Articles from Orientations 1983–2000* (Hong Kong: Orientations Magazine Ltd., 2001), 337–46.

63. Hubei sheng bowuguan, *Zeng Hou Yi mu* [The tomb of the Marquis Yi of Zeng] (Beijing: Wenwu chubanshe, 1989), 12–55, color plates 1–2.

64. As in the case of the red color produced by cinnabar mixed with lacquer, golden and silvery gray colors were the result of gold and silver filings suspended in the lacquer. This practice can be traced back to the lacquer decoration in the tomb of the Marquis of the State of Zeng, Yangtianhu Tombs 14 and 26. See Wang Shixiang, *Xiushilu jieshuo*, 86. Hubei sheng jingsha tielu kaogudui, *Baoshan Chu mu* [The Chu tombs from Baoshan] (Beijing: wenwu chubanshe, 1991), 57–64, color plate 4; the inner coffins in Tombs 1 and 4 from the same cemetery are also painted red and black, 18–20, 284–87.

century BCE) (plate 5).[65] The first or outermost coffin is painted black outside and red inside. The exterior surface of the second features colorful patterns of clouds, monsters, and animals painted against a black background, with the inside painted red. The third coffin includes depictions of colorful images of dragons, tigers, birds, deer, and an immortal set against a red background. The head (northern) plaque is decorated with two deer framing a mountain, while the foot (southern) plaque depicts two dragons crossing a jade disc.[66] The fourth and innermost coffin is painted red inside and black outside and was wrapped with a feathered brocade adorned with geometric patterns. Here the colors black and red on different coffins were an elaboration and expansion of the black-red pair that was common in early Chinese lacquerware.[67]

The pairing of red and black is not limited to funerary items such as coffin decorations, but is also seen in other ritual and non-ritual objects. For example, archaeologists found it in the decorations on bronze mirrors, such as a square mirror from Yutaishan Tomb 10, and lacquer vessels, such as lacquered ear-cups from Baoshan Tomb 2. In fact, most everyday lacquer utensils were red on the inside with a black exterior.[68] We also have textual evidence attesting to the existence of ritual vessels that were painted black and red. The inventory list (Strip 253) excavated from Baoshan Tomb 2 describes some of the objects as having "the interior red and the exterior black" (*dan zhong qi wai*).[69] The *Han Feizi* (Master Han Fei) (third century BCE) observes in the "Shiguo" (Ten wrongs):

> When Yao governed the world, people ate with clay vessels and drank with clay mugs; Yu made ritual vessels, painting the interior in black and the exterior in red.[70]

Similar passages also appear in the "Fan Zhi" (Return to the pristine) of the *Shuoyuan* (Collections of stories). In the *Zhou Li* (Rites of the Zhou), we hear that the exorcist (*fangxiangshi*), when carrying out his duties, "wears a black upper garment and a vermilion lower garment (*xuanyi zhushang*) and carries a dagger-ax and holds a shield."[71] These rich materials raise the question: what was the significance of the pairing of red and black in early China?

The Significance of the Contrast Between Red and Black

My interest in the red and black pair and its symbolism stems from my research on the silk diagram of the mourning-dress system (plate 6) discovered in Mawangdui Tomb 3.[72] It is drawn on a small piece of silk, 48.4 centimeters in length and 26.2 centimeters wide. When excavated, it was in a lacquered box along with other items, such as silk and bamboo manuscripts. The top portion of the diagram is a red umbrella-shaped canopy; under the canopy are six columns of squares, twelve in greenish black on the right and seven in red on the left. According to the text inscribed on the two sides under the canopy, each of these squares was once inscribed with kinship terms, and their arrangement reflected the graded mourning obligations for various kinds of relatives. Such a diagram enabled a user to quickly figure out his or her mourning obligations to a deceased family member. The diagram contains two levels of symbolism. On one level,

PLATE 4
Lacquered inner coffin and bronze framed outer coffin, excavated from Tomb 1 at Leigudun, Suizhou City, Hubei. The two archaeologists standing nearby are Shu Zhimei (1934–2007, right) and Chen Zhongxing (1939–), former directors of the Hubei Provincial Museum. Outer coffin: height 2.19 m, length 3.20 m, width 2.10 m, weight 7,000 kg. Inner coffin: height 1.32 m, length 2.50 m, width 1.27 m. Wood and lacquer. Warring States period. Hubei Provincial Museum, Wuhan, Hubei, China.

PLATE 5
The three nested inner coffins in Mawangdui Tomb 1 (second century BCE). The first (outermost) coffin is painted black outside and red inside. Discovered at the Mawangdui site, Changsha, Hunan. First: length 256 cm, width 118 cm, height 114 cm; second: length 230 cm, width 92 cm, height 89 cm; third: length 202 cm, width 69 cm, height 63 cm. Hunan Provincial Museum, Changsha, Hunan, China.

65. Hunan sheng bowuguan and Zhongguo kexueyuan kaogu yanjiusuo (comp.), *Changsha Mawangdui yihao Han mu* [Han tomb no. 1 at Mawangdui in Changsha] (Beijing: Wenwu chubanshe, 1973), 13–27.

66. There is a jade disc above the head of the deceased on the surface of the innermost coffin.

67. The multicolored feathered brocade of the innermost coffin is, as Yu Xingwu explains, a luxury decoration, especially for female clothing and carriages. See Yu Xingwu, "Guanyu Changsha Mawangdui yihao Han mu neiguan guanshi de jieshuo" [Explaining the decoration on the innermost coffin in Mawangdui tomb no. 1], *Kaogu* 2 (1973): 126–27.

68. Hong Shi, *Zhanguo Qin Han qiqi yanjiu* [A study of lacquer wares of the Warring States, Qin, and Han periods] (Beijing: Wenwu chubanshe, 2006), 122.

69. Hubei sheng jingsha tielu kaogudui, *Baoshan Chu mu*, 369.

70. The passage from *Han Fei zi*, "Shiguo," as quoted and translated by K.C. Chang, *The Archaeology of Ancient China*, 4th ed. (New Haven: Yale University Press, 1986), 4.

71. Ruan, *Shisanjing zhushu*, 3:475; the same reference also appears in Fan Ye, *Hou Han shu* [History of the later Han dynasty] (Beijing: Zhonghua shuju, 1965), 3127.

72. Guolong Lai, "The Diagram of the Mourning System from Mawangdui," *Early China* 28 (2003): 43–99.

the red canopy symbolizes Heaven and the squares below symbolize Earth. On another level, the black squares indicate the kinship of males and the red squares, that of females. The color symbolism in this diagram can also be explained based on the *yinyang* theory.[73] Here I would like to elaborate the cosmological significance of the red and black pair.

Received ritual texts indicate that a similar symbolism applies to coffin decoration. The "Sangdaji" (Extended notes on funerals) chapter of the *Liji* (The Book of Rites), for instance, describes the sumptuary principles governing the use of coffins:

> The coffin of a ruler is lined with red [silk], fixed in its place with nails of various metals; that of a Great officer is lined with black [silk], fixed with nails of ox-bone; that of a common officer is lined but has no nails.[74]

Here the *Liji* describes how to use red and black colors to represent the political hierarchy of a ruler and the various officials. The examples mentioned previously were coffins decorated with lacquer paint, but the *Liji* cites the use of silk to line a coffin. The decorations in the compartments and the coffins of Mawangdui Tombs 1 and 3 with silk linings may reflect the exact practices described in the text.[75] For the excavated coffins, the red and black colors were painted on the inside and outside surfaces, respectively. As in the case of Mawangdui Tomb 1, red and black colors were alternatively painted on the outside surfaces of the two nested inner coffins. The execution may differ in all these cases, but the idea of pairing red and black in coffin decoration remains essentially the same.

The pairing of red and black colors in their ritual context is also mentioned in the *Yili* (Protocols of ceremonies). The text states that

PLATE 6
Diagram of the mourning system from Mawangdui Tomb 3. 48.4 × 26.2 cm. Silk, ink, and pigments. Ca. 168 BCE. Hunan Provincial Museum, Changsha, Hunan, China.

the clothing used to dress the corpse includes the lower garment (*shang*), decorated with pink (*quan*), and the upper garment (*yi*) with black (*zi*) ornaments. The Tang-dynasty commentator Jia Gongyan points out that "the colors black used for the upper garment and pink for the lower garment represent (*xiang*) Heaven and Earth."[76] As mentioned above, since the late Western Zhou period, technological developments in dyeing had introduced many new colors. According to the *Zhou Li* and the *Erya* the colors pink and black are at the two ends of the continuous spectrum of colors that

73. A.C. Graham, "Yin-Yang and the Nature of Correlative Thinking" (occasional paper, Institute of East Asian Philosophy, University of Singapore, 1986); Lai, "Diagram," 74–75.

74. Ruan, *Shisanjing zhushu*, 5:786; translation follows James Legge, in *Li-Chi: Book of Rites*, eds. Winberg Chai and Ch'u Chai (New Hyde Park, NY: University Books, 1967), 2:196, with minor modification. See footnote 56 and Loewe, *Early Chinese Texts*, 293–97, for dating the *Liji* texts.

75. In Mawangdui Tombs 1 and 2, silk was used to decorate the compartments of the burial chambers. See Hunan sheng bowuguan and Zhongguo kexueyuan kaogu yanjiusuo (comp.), *Changsha Mawangdui yihao Han mu*, 2, plates 9–13; Hunan sheng bowuguan and Hunan sheng wenwu kaogu yanjiusuo (comp.), *Changsha Mawangdui er, san hao Han mu* [The nos. 2 and 3 Han tombs at Mawangdui in Changsha] (Beijing: Wenwu chubanshe, 2004), 40–41, 109–16, color plates 23–27.

76. Ruan, *Shisanjing zhushu*, 4:475–76.

could be produced by the dyeing process then in use. The first dipping of the fabric into the red colorant produced pink (*quan*); the second dipping, light red (*cheng*); the third dipping, red (*xun*); the fourth dipping, vermilion (*zhu*); the fifth dipping, black red (*zou*); the sixth dipping, reddish dark black (*xuan*); and the seventh dipping produced black (*zi*).[77]

The spectrum of colors, from pink to black, embodied the essence of the entire universe.[78] It may seem odd at first that two colors flanking the spectrum should carry cosmological significance, yet this makes sense when we consider the craft-based philosophy and cosmology prevalent among Warring States philosophers.[79] As Lawrence Sullivan has pointed out, craftsmanship in traditional societies, such as canoe building, pottery making, basket weaving, house construction, and musical performance, created meanings and became part of the cosmological process by making the universe sustainable.[80] From this perspective, the pairing of red and black can be viewed as a cosmological arrangement of colors that represents a certain conception of the universe.[81]

The materiality of the red and black colors carries religious significance. As mentioned earlier, the chemical qualities of cinnabar and lacquer made them magical. The use of cinnabar in ancient Chinese tombs has long been noted.[82] In fact, the excellent state of preservation of the corpses excavated from the Western Han tombs of Mawangdui (Tomb 1) in Changsha, Hunan, and Fenghuangshan (Tomb 168) in Jiangling, Hubei, is partly attributed to cinnabar.[83] An autopsy of the Mawangdui corpse indicates that the deceased woman, Lady Dai, had absorbed a large amount of cinnabar into her body over a long period of time. It is possible that she had been taking cinnabar as a drug or Daoist "elixir of immortality" before death. In this regard, early Chinese texts rather consistently maintain that cinnabar can help achieve immortality, stating in one example that by "drinking it [liquid with cinnabar in it], you will never die."[84]

The significance of lacquer black, as for cinnabar, is partly a result of its toxicity. Lacquer, like cinnabar, is toxic. In ancient China, its significance was based both on its toxic and protective qualities. In the Mawangdui medical manuscripts, one category of ailments is named after lacquer (*qi*), probably referring to the rash caused by working with lacquer, as pointed out by Donald Harper.[85] Lacquer may have also been used as an antiseptic.[86]

77. Ibid., 3 (*Zhou Li*): 623-24; 8 (*Erya*): 80.

78. Analogies to the Chinese use of the range from pale pink to black to indicate the whole spectrum of colors can be made with the Sanskrit practice of pronouncing Om (a-u-m) at the beginning and end of a prayer. Om includes the whole range of sounds in the Sanskrit language. A comparison can also be drawn to the common English phrase "from A to Z," meaning the inclusion of everything. These examples from three distinct cultures utilize three different means—colors, sounds, and letters—to similarly express the concept of totality.

79. David Keightley, "Craft and Culture: Metaphors of Governance in Early China," in *Proceedings of the 2nd International Conference on Sinology. Section on History and Archaeology* (Taipei: Academia Sinica, 1989), 31–70.

80. Lawrence E. Sullivan, "'Seeking an End to the Primary Text' or 'Putting an End to the Text as Primary,'" in *Beyond the Classics?: Essays in Religious Studies and Liberal Education*, eds. Frank E. Reynolds and Sheryl L. Burkhalter (Atlanta: Scholars Press, 1990), 47–50.

81. Wu Hung reads the black and the red colors in Mawangdui coffins as symbols of the transformation from death to immortality; see Wu Hung, "Art in Ritual Context: Rethinking Mawangdui," *Early China* 7 (1992), 127–34.

82. Early specimens of cinnabar as colorant were discovered at the Chengbeixi site (ca. 4400–ca. 3300 BCE) in Zhicheng, Hubei, and the Dadiwan site in Gansu. See also Li, *Zhongguo fangshu kao*, 309–11. For the use of cinnabar in Japan, see Ichige, *Shu no kōkogaku*.

83. Hunan yixueyuan, ed., *Changsha Mawangdui yihao Hanmu gushi yanjiu* [Studies on the ancient corpse excavated from tomb no. 1 at Mawangdui in Changsha] (Beijing: Wenwu chubanshe, 1980), 15, 215–25; Hubeisheng Xihan gushi yanjiu xiaozu (comp.), *Jiangling Fenghuangshan yiliubahao mu Xihan gushi yanjiu* [Studies on the ancient corpse excavated from tomb no. 168 at Fenghuangshan in Jiangling] (Beijing: Wenwu chubanshe, 1982). Yang Bojun, "Luelun woguo shijishang guanyu shiti fangfu de jizai he Mawangdui yihao Hanmu muzhu wenti" [On the issues of the historical records on body preservation and the occupant of tomb no. 1 at Mawangdui], *Wenwu* 9 (1972): 36; Su Yinghui, "Cong guji jizai shilun Changsha Hanmu nüshi bufu zhi yuanyin" [The reasons concerning the preservation of the female corpse in Mawangdui Han tomb from the perspective of historical records], *Gugong jikan* 10, no. 2 (1975): 1–19. Xu Yongqing and He Huiqin, *Zhongguo gushi* [The preserved ancient corpses from China] (Shanghai: Shanghai Keji jiaoyu chubanshe, 1996), 206. Joseph Needham and Gwei-Djen Lu, *Science and Civilization in China*, vol. 5, part 2 (Cambridge: Cambridge University Press, 1974), 298.

84. Quoted in John S. Major, *Heaven and Earth in Early Han Thought* (Albany: State University of New York Press, 1993), 47.

85. Donald Harper, *Early Chinese Medical Literature: The Mawangdui Medical Manuscripts* (London: Kegan Paul International, 1998), 293–95.

86. See Li Shizhen, *Bencao gangmu*, and *Sanguozhi*, "Hua Tuo zhuan," as quoted in Wang Shixiang, *Xiushilu jishuo*, 22.

However, lacquer's primary function in ancient China was to protect wood and other organic materials.[87] This protective quality contributed to its symbolic significance.

From the Contrasting Red-Black Pair to the Five Color System

The origins of the Five Elements or Five Phases concept, in which the Five Colors constitute an essential component, have long been a subject of debate.[88] A.C. Graham has worked extensively on this issue from the perspective of structural linguistics and argued that the Five Elements concept was the outcome of a process of correlative cosmology building based on binary *yinyang* thinking.[89] The formation of the Five Colors supports Graham's thesis that the system of the Five Elements derived from a construct of contrasting pairs (*yinyang*). Within the system of the Five Colors, the primary binary pair was red and black, although other pairs—white and green-blue, dark-black and yellow—existed, as well as intermediate steps of two or three pairs. The "Kaogong ji" (Records of examination of craftsmen) in the *Zhou Li* states,

> In the affairs of painting and drawing, mix the five colors. East is called blue-green (*qing*); south, red (*chi*); west, white (*bai*); north, black (*hei*); Heaven, dark-black (*xuan*); and Earth, yellow (*huang*). Blue-green and white are painted side by side; the same with the red and black as well as the dark-black and yellow.[90]

Among the three contrasting pairs, the red and black binary pair had a long history of cosmological significance dating from before the first enumeration of the Five Colors as a set, and the earlier cosmological significance of the red and black binary construct was carried into the Five Colors system. Among the six color terms, the semantic field of dark-black (*xuan*) and black (*hei*) is closely related, and in instances where the six terms need to correlate with the Five Elements system, they were merged together as one. Li Ling has explained how the contrasting pairs of two or three evolved into the Five Elements system. He posited that numerologically the number five had special significance in early Chinese culture, and that the formation of the five could either extend spatially from the four directions or quarters (*sifang*) plus the center, or by combining two sets of three, overlapping the center.[91]

This combination of the four or six colors into a Five Elements system also appears in another example, the Chu Silk Manuscript, which is one of the earliest manifestations of the Five Colors system in archaeological materials.[92] Unearthed from a late Warring States tomb at Zidanku, Changsha, Hunan, the Chu Silk Manuscript is a diagram with two cosmographic texts arranged according to different orientations in the central part, surrounded by twelve strange icons each associated with short texts. Four trees, green-blue, red, white, and black, are depicted at the corners of the diagram. As Li Ling correctly points out, the four colored trees represent the four pillars set in the four corners of the diagram to support Heaven.[93] One of the two cosmographic texts at the center of the diagram mentions five colored trees: green-blue (*qingmu*), red (*chimu*), yellow

87. Wang Shixiang, *Xiushilu jieshuo*, 22.

88. It is also translated as "Five Phases," "Five Processes," or "Five Agents." See John Lee, "From Five Elements to Five Agents: Wuhsing in Chinese History," in *Sage and Filial Sons*, eds. Julia Ching and R.W.L. Guisso (Hong Kong: Hong Kong University Press, 1991), 163–78; John B. Henderson, *The Development and Decline of Chinese Cosmology* (New York: Columbia University Press, 1984); Ai Lan and Wang Tao, eds., *Zhongguo gudai siwei moshi yu yin-yang wuxing shou tanyuan* [On the origins of the yinyang and five phase theories and the cognitive modes in ancient China] (Nanjing: Jiangsu guji chubanshe, 1998).

89. A.C. Graham, *Disputers of the Tao: Philosophical Argument in Ancient China* (Chicago: Open Court, 1989), 319–56; Graham, "Yin-Yang."

90. Ruan, *Shisanjing zhushu*, 3:622–23. For the date of the *Zhou Li*, see Loewe, *Early Chinese Texts*, 24–32.

91. Li Ling, "Cong zhanbu fangfa de shuzihua kan yinyang wuxing shuo de qiyuan" [The origins of the yinyang and the Five Element theory from the perspective of the numerization of the divination], in his *Zhongguo fangshu xukao* [A sequel to studies on early Chinese occult arts] (Beijing: Zhonghua shuju, 2006), 69.

92. Li Ling, *Zhongguo fangshu zhengkao* [Studies on early Chinese occult arts] (Beijing: Zhonghua shuju, 2007), 142–56.

93. Ibid., 142–43, 151–53.

(*huangmu*), white (*baimu*), and black (*momu*), which can be interpreted as pillars supporting Heaven. But the yellow tree at the center is not represented on the diagram. Similar cosmological texts in the *Huainanzi* (Master of Huainan) reinforce the significance of the Five Colors system by recounting the story of the cosmic deity Nü Wa who patched the damaged sky with a five-colored stone.[94] The cosmological significance of the five colors and the five pillars in this context is obvious, and the different ways that were used to integrate the four or six into the Five Elements system. The correlative cosmological system of the Warring States and Qin and Han periods correlates the five elements (wood, fire, earth, metal, and water) with ten heavenly stems (every two stems as a union), the five stars, five sacred animals, five gods, five colors, five musical tones, five numbers (from 5 to 9), five types of trees, five tastes, five smells, five domestic deities, five grains, five domestic animals, and so forth.[95]

But why were the binary sets of two, four, or three pairs of colors integrated to form the Five Colors system? Why was a system of contrasting pairs shifted to the Five Elements system? The anthropologist Wang Aihe explains this shift in terms of the political transformation of a cosmology of Four Quarters (*sifang*) to that of the Five Phases (*wuxing*) in the Warring States period.[96] As an intrinsic force of social change and political process, the *wuxing* cosmology transformed the old *sifang*-centered cosmology. *Wuxing* "denied the concept of centrality and hierarchy in the *sifang* cosmology, it did not discard the *sifang* cosmology itself, but rather incorporated and totally transformed it by introducing cycles of cosmic movement into the previous spatial and temporal structure. In this recreated cosmology, *sifang* as the four cardinal directions was grouped with the center, becoming five spatial units correlated to five *xing*."[97] In this process of transformation and systematization, the Five Colors set, as one set in the *wuxing* Five Elements symbolic system, was created from a system of contrasting binary pairs.

The association of animals in the cosmological scheme of the Five Elements provides a useful analogy to illustrate how a binary system of contrasting pairs developed into the quinary Five Elements system. The animal symbolism of the four cardinal directions is an integrative part of the Five Elements: the east is represented by the Green-Blue Dragon (*qinglong*), the south by the Vermilion Bird (*zhuque*), the west by the White Tiger (*baihu*), and the north by the Dark Warrior (*xuanwu*).[98] As John Major has shown, this system, where four colors, four animals, and the four cardinal directions are correlated, became widespread from the Han dynasty onward.[99] But these animals appeared in pairs on earlier artifacts. For example, the dragon and tiger are both depicted in a celestial diagram of the Northern Dipper and the Twenty-eight Lunar Mansions that decorates the surface of a lacquered clothing-chest excavated from the tomb of Marquis Yi of Zeng.[100] Some scholars have even suggested that the dragon-and-tiger pairing from the Neolithic Yangshao burial site at Xishuipo, Puyang, in Henan, is also part of this binary animal system.[101] The dragon-and-tiger pair later became the symbols of the east-west directions in the Han configuration.

Another example of two animals represented as a symbolic pair can be seen on a Middle Warring States bronze lamp excavated

94. Liu Wendian, *Huainan honglie jijie* [The Master of Huainan] (Beijing: Zhonghua shuju, 1989), 207.

95. Li Ling, *Zhongguo fangshu zhengkao*, 125.

96. Wang Aihe, *Cosmology and Political Culture in Early China* (Cambridge: Cambridge University Press, 2000).

97. Wang Aihe, *Cosmology*, 93.

98. John S. Major, "New Light on the Dark Warrior," *Journal of Chinese Religions* 13–14 (1985–1986): 68.

99. Ibid. In the archaeological report of Mawangdui Tomb 1, archaeologists have noted that the tiger, dragon, and bird were present on the coffin decoration; the Dark Warrior is missing.

100. Hubei sheng bowuguan, *Zeng Hou Yi mu*, 353–39, color plate 13; plates 121–22.

101. Puyangshi wenwu guanli weiyuanhui, Puyangshi bowuguan, Puyangshi wenwu gongzuodui, "Henan Puyang Xishuipo yizhi fajue jianbao" [A brief report on the excavation at Xishuipo site at Puyang in Henan], *Wenwu* 3 (1988): 1–6; Li Ling, *Zhongguo fangshu zhengkao*, 85–86, color plate 3.

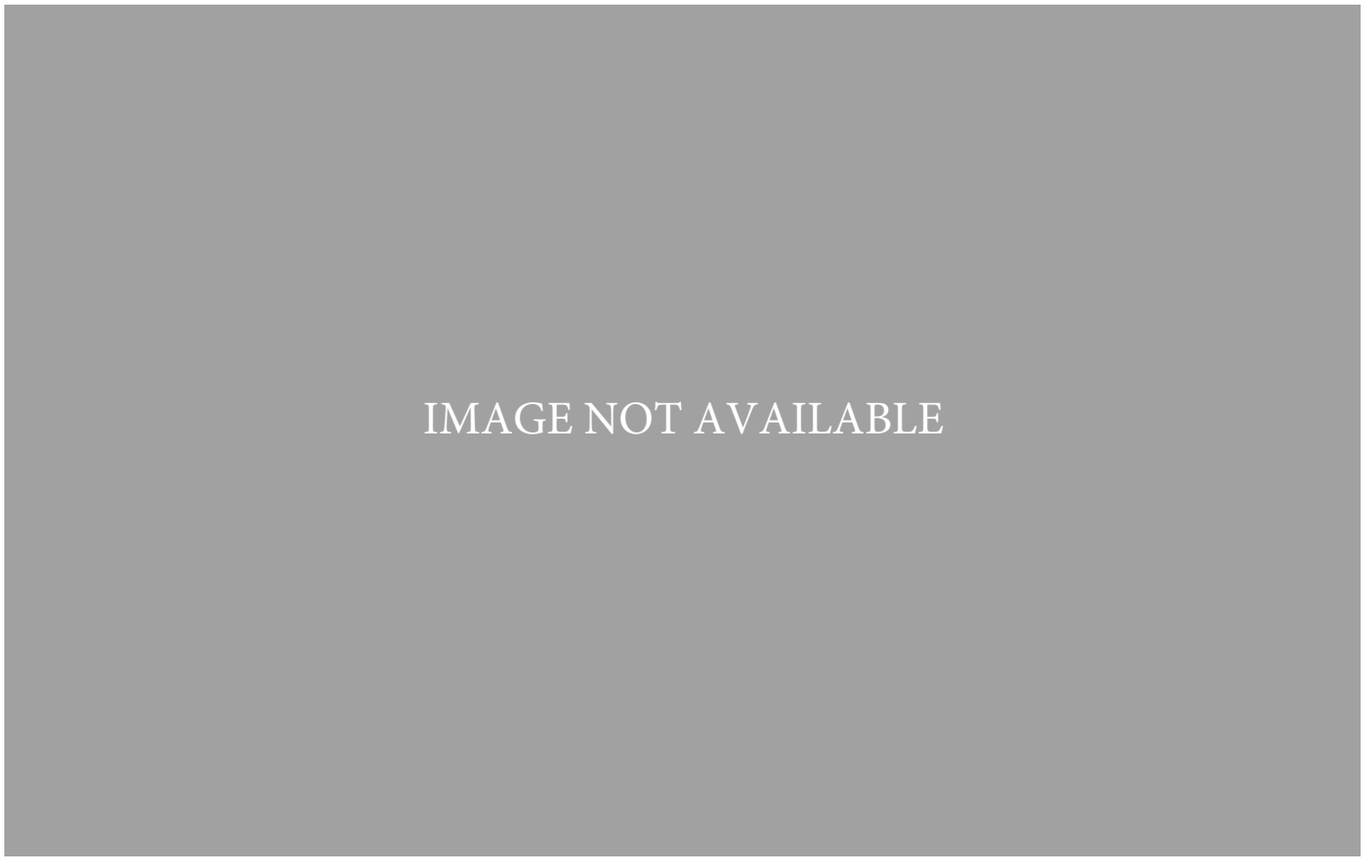

PLATE 7
Five-color medical stones, discovered in the tomb of the King of Nanyue of the Western Han dynasty, in Guangzhou, Guangdong. They are purple crystal, sulfur, realgar, red ochre, and turquoise. Museum of the Mausoleum of the Nanyue King, Guangzhou, Guangdong, China.

from Tomb 6 in the royal tomb complex of the Zhongshan kingdom at Pingshan in Hebei.[102] Attached to the center of the saucer is a pole, on top of which perches a bird. A close look at this object reveals that the pole stands on the back of a turtle and that two snakeheads are grasped by the bird's claws. Here we have an example of the incipient conception of the two animal symbols of the cardinal orientations, i.e., the turtle-snake (*xuanwu*) as the symbol of the north, and the bird representing the south.[103] Although further study on how these two pairs were absorbed into the Five Elements system is still needed, it appears that animal symbols and the Five Colors were integrated through a similar mindset.

The parallel development of color and animal symbolism also sheds light on the process of the formation of the Five Elements system. The medical and magical significance of red (cinnabar) and black (lacquer) carries over into the way colors are conceptualized in the Five Colors system. A number of sets of five objects were believed to possess the power to affect the human body and mind. One of the early references to five-color stones is seen in the "Tianguan" (Heavenly Offices) section of the *Zhou Li* according to which, "to cure sores, use five poisons to conquer them; use five grains to nourish the body; use five medicines to cure them; use five flavors to control them."[104] In his commentaries on this passage, the Han-dynasty Confucian scholar Zheng Xuan explains the "five poisons" as cinnabar (*dansha*), realgar (*xionghuang*), arsenolite (*yushi*), malachite (*shidan*), and magnetite (*cishi*), all of

102. Guolong Lai, "Lighting the Way in the Afterlife: Bronze Lamps in Warring States Tombs," *Orientations* 34, no. 4 (2002): 20–28, figs. 6 and 7.

103. For a later Han example of a lamp with similar iconography, see Jessica Rawson, ed., *Mysteries of Ancient China: New Discoveries from the Early Dynasties* (New York: George Braziller, 1996), 190–91, no. 97.

104. Ruan, *Shisanjing zhushu*, 3:75.

which were commonly used in Han-period pharmacological practice.[105] In medieval Chinese medical literature, there are mineral and herbal recipes using "five mineral powders" (*wushisan*, also known as *hanshisan*, "cold-food powders"), which were elixirs comprising various mineral and herbal materials that were claimed to possess both therapeutic and tranquilizing properties and were included in many recipes.[106] In some instances, the materials are categorized based not on their chemical properties, but on their colors.[107] For example, five medical stones were discovered in the tomb of the King of Nanyue of the Western Han dynasty in Guangzhou, Guangdong. They are purple crystal, sulfur, realgar, red ochre, and turquoise (plate 7). In this recipe, the only toxic materials are realgar and sulfur. The other materials were used simply to complete the set of five colors. It seems that in early Chinese medical practice, the color of the material had the same potency as the chemical properties of the material itself.[108]

Conclusion

This brief survey of the usage and technology of colors in early Chinese ritual art suggests that, first, the symbolic meanings of color in early China were associated with the materiality of colors. The symbolism of the red and black pair and the five colors are both based on their materiality, by virtue of the toxicity and/or pharmaceutical potency of the plants and minerals used as colorants, especially those used as primary ingredients in Daoist elixirs of immortality. Their use over the centuries as colorants laid the foundation for their symbolic association with those colors.

Second, it was during the late Western Zhou period that colors and color combinations were first used to signify social ranks, although the system linking color and rank was not yet fully mature. Third, there was a significant change from the binary red-black symbolism to a quinary color system during the Warring States period. This shift represents a basic cognitive structural change in Chinese religious and cosmological thinking. By comparing the archaeological patterns of occurrence with references in received ritual texts, this essay demonstrates the changes and continuities of color symbolism during a formative stage of Chinese civilization. I offer an interpretation as to why and how the pairing of red and black was selected and used in a particular funerary context, and discuss its relationship with the five colors; that is, the influence of magico-religious practices on the formation of the Five Colors system in early China.

105. Ibid.

106. In ancient China, as in other periods and cultures, drugs, pigments, and artistic creation were closely related. For example, the "sage of calligraphy" Wang Xizhi (303–361) and his son Wang Xianzhi (344–388) were famous for their enjoyment of *hanshisan*. Many of their famous calligraphic masterpieces are letters discussing their symptoms after taking drugs. For further discussions, see Lu Xun, "Wei Jin fengdu ji wenzhang yu yao ji jiu zhi guanxi" [On the inspiring personality of the Wei-Jin scholars, their writings, and their relationship with drugs and alcohol], in *Lu Xun quanji* (Beijing: Renmin wenxue chubanshe, 1981), 501–29; Yu Jiaxi, "Hanshisan kao" [An investigation of the cold-food powders], in his *Yu Jiaxi wenshu lunji* [Studies on Chinese literature and history by Yu Jiaxi] (Changsha: Yuelu shishe, 1997), 166–209. See also Rudolf G. Wagner, "Lebensstil und Drogen im chinesichen Mittelalter" [Lifestyle and drugs in the Chinese Middle Ages], *T'oung Pao* 59 (1973): 79–178.

107. Li Ling, "Wushi kao," in *Zhongguo fanghu xukao*, 260–66.

108. Five-color stones (cinnabar, realgar, arsenolite, stratified malachite, and magnetite) were also buried in medieval tombs; see Carole Morgan, "Inscribed Stones: A Note on a Tang and Song Dynasty Burial," *T'oung Pao* 82 (1996): 317–48.

SECTION II

The essays in this section consider two remarkable groups of wall paintings. The first are murals found in several Buddhist cave temples dating from the fifth and sixth century, part of the extensive Mogao Grottoes at the edge of the Taklamakan desert in present-day northwest China. The second are wall paintings decorating elite tombs on both sides of the border of present-day North Korea and China. They date from the Goguryeo kingdom (37 BCE–668 BCE). The discussion focuses primarily on fifth- and sixth-century tombs.

Lisa Shekede and Su Bomin examine murals at the Mogao Grottoes, a vast complex of Buddhist cave temples cut into soft rock cliffs near Dunhuang, China, between the fourth and fourteenth century. Dunhuang was a thriving oasis city, the gateway to China for those arriving from Central or South Asia, and the last outpost of the known world for travelers journeying west. Trading routes divided at Dunhuang to skirt the fearsome Taklamakan desert, before navigating the high passes through the mountain ranges that surrounded it.

Shekede and Su point to the significant role of color in Chinese cosmological systems (explored in more detail by Lai in Section I). They argue that it is important to analyze the original colors of the wall paintings at the Mogao Grottoes not only to understand their initial appearance but to determine the meaning of the color schemes. Their analysis of the pigments used in several fifth- and sixth-century cave temples revealed that many of them have changed beyond

Tomb and Grotto Paintings

recognition, completely altering the appearance of the paintings. Their findings invalidate earlier interpretations of the apparent stark energy of the coloration, and invite the assistance of art historians and religious scholars to reinterpret the meaning of the color schemes in these caves.

Color analysis can raise political questions. Ultramarine, derived from the precious pigment lapis lazuli, was closely associated with Buddhist painting. It appears throughout the Mogao Grottoes, with the notable exception of almost all Tang-dynasty (618–907) cave temples, where the blues have the greenish tint produced by azurite. As Shekede and Su point out, it is inconceivable that ultramarine would not have been used in the Tang caves at Mogao if it had been available. Lapis lazuli was imported from mines in Badakhstan Province in present-day Afghanistan. Since trade routes were far-reaching and relatively peaceful during the Tang dynasty, there is no apparent reason that lapis lazuli was unavailable to Tang-dynasty painters at Mogao. This intriguing situation invites the attention of historians.

The second group of wall paintings decorate several tomb complexes dating from the Goguryeo kingdom, clustered around the Amnok (Yalu) river on both sides of the border of present-day China and North Korea. The 120 painted tombs so far discovered reveal aspects of the daily life and rich material culture of the Goguryeo rulers and elite. At its height, Goguryeo was a major power in Northeast Asia, controlling most of the Korean peninsula and present-day northeastern China. Located at the eastern confluence of a vast network of trading routes, it had cultural contacts with China, Central and South Asia, and the nomadic Steppe culture of the extensive grass and scrublands to the north and west. In this essay, Park uses an analysis of pigments and painting techniques to suggest the relationships between Chinese and Goguryeo tomb and grotto murals and notes the close connection between Goguryeo iconography, painting style, and techniques and those of the last Japanese tomb murals, especially those in the late-seventh- or early-eighth-century Takamatsu tomb (Takamatsuzuka) in Nara, Japan.

FIGURE 1 (detail)

Wall Paintings at the Mogao Grotto Site, Dunhuang, China

Color Use from Northern Wei to Tang

LISA SHEKEDE · SU BOMIN

Introduction

In 1987, the Mogao Grotto site was inscribed on the World Heritage list. Such a designation is a testament to the remarkable nature of the site and a vindication of the work of the Dunhuang Academy, which has protected it, often in extremely difficult circumstances, since 1944. The site consists of 735 rock-cut caves carved between the fourth and the fourteenth century from a 1.6 km length of conglomerate cliff rising from the surrounding desert. There are 492 decorated caves, containing approximately 45,000 square meters of painting and over 2,000 polychromed sculptures. The scale of the grotto site and the exquisite quality of its paintings owe much to the proximity of the oasis town of Dunhuang, which was, for centuries, the westernmost outpost of Chinese civilization along the Silk Road, beyond which lay the lawless wastes of the Taklamakan desert. Dunhuang drew its wealth from provisioning and providing a marketplace for Silk Road traders, who offered prayers for protection and of thanksgiving at Mogao on their departure or return. Silks, ceramics, and other luxury goods were exported, and metals, wool, ivory, glassware, spices, and other materials were brought into China.[1] Imports also included painting materials such as natural ultramarine from Badakhshan in Afghanistan and dyestuffs from beyond China's southern borders.[2]

Mogao is both the most extensive painted-cave site in China and the repository of some of the world's most accomplished Buddhist art.[3] The site is unrivalled in providing, in a single location, evidence for continuity and change in painting techniques and materials over a millennium of continuous activity. For the last quarter of a century, the Dunhuang Academy, under China's State Administration of Cultural Heritage (SACH; Guojia Wenwu Ju), has been working with the Getty Conservation Institute, Los Angeles, and more recently also with the Courtauld Institute of Art, London, on various aspects of site preservation, including wall-painting conservation and educational initiatives. These collaborations have afforded unprecedented opportunities to study the paintings, and the resulting accumulation of knowledge forms the basis of this paper.

Understanding Materials and Color Change

According to Chinese cosmological systems, colors equate with elemental processes and specific temporal and spatial *loci*, the interrelationship between which governs celestial and earthly harmony.[4] Color in Chinese art, therefore, signals multiple layers of meaning.

1. Susan Whitfield, *Life along the Silk Road* (London: John Murray, 2004), 21–22, 38.

2. For ultramarine, consult Wang Jinyu, "Analysis of SEM on the Lapis Lazuli Pigment of Ancient China," *Sciences of Conservation and Archaeology* 9, no. 1 (May 1997): 25–32. For discussion of dyestuffs south of China, refer to Yu Feian, *Chinese Painting Colors: Studies of Their Preparation and Application in Ancient and Modern Times*, trans. Jerome Silbergeld and Amy McNair (Hong Kong: Hong Kong University Press, 1988), 12–13.

3. Fan Jinshi, *Dunhuang Grottoes* (Beijing: China Travel & Tourism Press, 2004), 18.

4. A.C. Graham, *Disputers of the Tao: Philosophical Argument in Ancient China* (Chicago: Open Court, 1989), 324–58.

For this reason, it is particularly important for scholars to look beyond the condition of aged paintings in their inherited state, the appearance of which may have changed greatly over time, to determine original intent, and thereby meaning.

A majority of the materials constituting the palette used at Mogao are susceptible to various forms of color change in response to aspects of their immediate environment, including light, moisture, salts, and contaminants of various kinds. Blue alters to green; yellow alters to gray or white; red alters to black or purplish brown. Few of Mogao's wall paintings have escaped these processes, and many have altered so drastically in appearance that understanding and interpretation are severely impaired.

The bold colors and strange, stylized facial features of much early painting at Mogao, from Northern Liang (420–439) through to Northern Zhou (557–581), lend the paintings a raw energy and emotional charge, which has earned them many modern admirers. This is, however, far from the initial intent, as testified by paintings in a small number of caves in which the original colors were protected from agents of deterioration by later plaster applications. One such case is Cave 263, dating to the Northern Wei period (439–534), where paintings were covered over by a second scheme in the Western Xia period (1036–1227). In what would now be considered an unethical intervention, the second scheme was partially removed some decades ago to reveal the earlier, largely unaltered one, providing invaluable information for the interpretation of altered early examples in other caves, such as the approximately contemporary paintings in Cave 260. The dark-gray flesh tones and bulging eyes of the figures depicted in Cave 260 contrast dramatically with the harmonious tones and elegance of similar figures in Cave 263. In both, the base color for the flesh is lead white, with red lead and cinnabar used for shading of the breast, neck, and around the face, eye sockets, and cheeks. The eyeballs and the bridge of the nose were then applied using a talc/kaolin-based white, and, finally, the fine outlines of the facial features were added in carbon black. In Cave 260, the lead white has altered to gray and the red lead and cinnabar have changed to dark brown and black, while the stable talc/kaolin-based white of the nose and eyeballs remains unaltered (fig. 1).[5]

For *inorganic* pigments, many forms of alteration are well understood and are generally identifiable using standard analytical techniques. By contrast, altered *organic* colorants are difficult to recognize, let alone identify, due to their susceptibility to color loss through photo-deterioration. A number of sophisticated techniques exist for the analysis of organic materials, but the identification of aged, deteriorated, or impure samples may elude even the most experienced analyst. Optical microscopy is a comparatively blunt instrument and cannot provide qualitative information on organic colorants, though it can readily confirm their presence. In Cave 260, for example, microscopic examination of samples in cross section and dispersion demonstrates the extensive use of translucent organic red glazes. Now highly deteriorated and perceptible only as a gray, dustlike veil over the dull red iron-oxide background, a red organic glaze originally lent the background a rich, glossy crimson (fig. 2). Applied as highlights over natural ultramarine garments, red organic glazes once gave a purplish cast to the drapery folds. An organic blue was also found in Cave 260, its color almost entirely lost in exposed areas and preserved in its original state only beneath subsequent paint layers. Multispectral imaging, although similarly unable to provide precise identification, is invaluable in

5. Dunhuang Academy, Getty Conservation Institute, and the Courtauld Institute of Art, "Cave 260, Mogao Grottoes, Dunhuang: Intervention Proposal" (unpublished report, 2008).

FIGURE 1
The *apsara* from Northern Wei Cave 260 (top) has been exposed to environmental deterioration and the flesh tones have severely altered. Its appearance would have originally been very similar to the *apsara* from Northern Wei Cave 263 (bottom), which was protected until recently by a later layer of plaster.

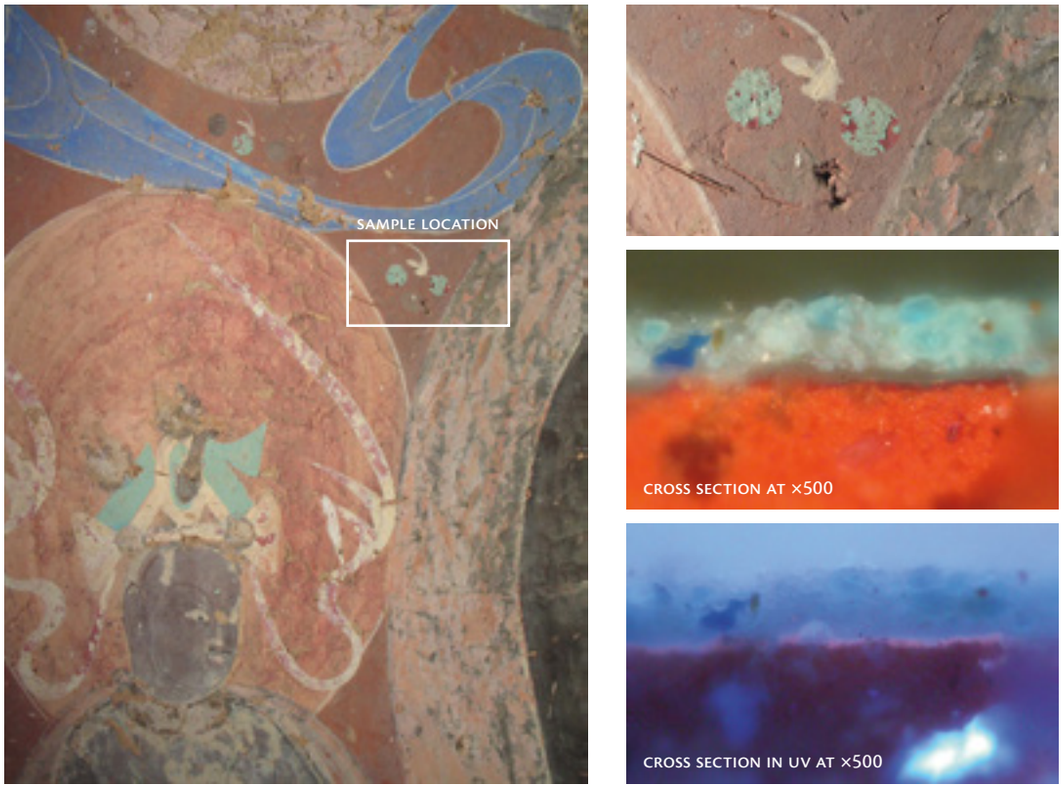

FIGURE 2
A rich crimson organic glaze applied over the iron-oxide red background survives in its unaltered state only where it has been protected by subsequent paint layers (left). A stratigraphic sample obtained from a blue detail (top right) shows a well-preserved layer of organic red beneath the blue when mounted in cross section (center right), which luminesces bright pink under UV excitation (bottom right).

indicating the original extent and topographic distribution of organic colorants since, even when highly deteriorated, many luminesce when excited by light in the ultraviolet spectrum range (fig. 3).[6] Investigations aided by these analytical methods have revolutionized our perceptions of color use at Mogao.

Color Symbolism in the *Thousand Buddha* Schemes

Understanding color transformations is crucial to establishing original patterns of color use and in disentangling aesthetic choices from those dictated by availability, or governed by convention or symbolic meaning. The many *Thousand Buddha* schemes at Mogao are a good starting point for exploring some of these issues, since the enduring popularity of the theme across the centuries and the repetition of its motifs provide a rare opportunity to study changes in color use over time.

The iconography of the *Thousand Buddha* motif, in which repeated rows of seated Buddha figures are depicted, relates to ritual and meditative practices established from the earliest period at Mogao (fig. 4). Each Buddha has a name cartouche, although in most cases these were never inscribed or are no longer decipherable. Exceptionally, in the Northern Wei Cave 254, many of the names can still be discerned, providing evidence that the iconography is loosely based on *foming* (naming) texts that list the names of Buddhas of the past, present, and future. The recital of protective incantations was an important aspect of Buddhist practice at Dunhuang during the Northern Wei period, particularly by travelers through the desert regions to the west of Dunhuang, which were

6. Giovanni Verri, "An Investigation of Corrected UV-induced Fluorescence for the Examination of Polychromy" (master's thesis, Courtauld Institute of Art, 2007).

FIGURE 3
A Buddha sequence of eight from Cave 260, which has been partially exposed to light and partially protected by the cave's central pillar, is shown in normal light (top) and in UV (bottom). UV light reveals details applied using organic colorants, and demonstrates greater survival on the right side of the image, where less photo-deterioration has occurred.

considered to be infested by dangerous evil spirits. Rituals involving the *foming* texts are thought to have been particularly important in this context.[7]

Visual assessment and analysis have established that during the Northern and Western Wei periods (439–556) the *Thousand Buddha* scheme consisted of repeated sets of eight variously arrayed Buddhas, possibly signifying the Noble Eightfold Path, or perhaps the seven Buddhas of the past plus Maitreya Buddha.[8] Underlying each series of eight is a binary sequence of alternating warm- and cool-colored elements. For example, in Cave 260, a Buddha with a cool-colored outer garment and round aureola is seated on a warm-colored lotus throne and enclosed within a warm-colored back aureola, while the sequence is reversed for the Buddhas on either side. It is likely that these alternations allude to the deeply rooted universal complementary principles of *yin* (= shade, dark, etc.) and *yang* (= sunshine, light, etc.).[9]

From Northern Zhou to Sui (557–618), the sequence is reduced to sets of four, but the binary color relationship is retained. From High Tang, sequences are reduced to two, the warm/cool alternations are abandoned, and even fundamental aspects of iconography are occasionally changed.[10] This gradual disengagement of the *Thousand Buddha* scheme from aspects of symbolism fundamental to early representations demonstrates continuous evolution in iconography and color use at Mogao.

One of the cool colors in Cave 260's *Thousand Buddha* sequence is of particular interest. Although now impossible to distinguish visually, the outer garment of the seventh Buddha is composed of a red iron-oxide base layer with an indigo glaze to produce purple. A color reviled by Confucius as both impure and subversive, purple did not entirely shake off the stigma of being a secondary color, despite waves of popularity during the Qin and Han dynasties, until the fifth century under the Northern Wei. The newly established Turkic rulers associated it with nobility and introduced prohibitions on the wearing of purple by commoners.[11] This association was

7. Stanley Kenji Abe, "Mogao Cave 254: A Case Study in Early Chinese Buddhist Art" (PhD diss., University of California, Berkeley, 1989), 30–31; France A. Pepper, "The Thousand Buddha Motif: A Visual Chant in Buddhist Cave-temples along the Silk Road" (master's thesis, McGill University, 1995), 11–12.

8. Ibid., 24.

9. Graham, *Disputers of the Tao*, 325–38.

10. Examples include sequences of three Buddhas enclosed by stupas in the Early Tang Cave 205. In the High Tang Cave 26, the *dhyana mudra* adopted by all previous *Thousand Buddha* representations is replaced by the *dharmacakra mudra* alternating with the *abhaya mudra*.

11. Qu Xiaomeng, "Study on the Prohibition of the Purple Costumes in Ancient China," *Asian Social Science* 8, no. 8 (July 2012): 135.

FIGURE 4
The *Thousand Buddha* iconography constitutes the main compositional element of painting at Mogao during the Northern Wei period. Typically, as here in Cave 251, the scheme dominates the central zone of each wall of the cave, punctuated by centrally positioned scenes from the life of Sakyamuni.

to prove enduring: the awarding of a purple robe to Mogao's Abbot Hong Bian by the Tang imperial court signified the highest honor for Buddhists.[12]

Color Use as a Function of Scarcity

While choice of materials is to a large extent determined by tradition, function, and meaning, selection can also be influenced by more prosaic considerations. A notable feature of Tang wall painting is the near-absence of the highly prized pigments natural ultramarine or lapis lazuli, which, with the exception of the very earliest caves, dominated the palette during the preceding and following periods. Lapis had a special and enduring significance in Buddhism. The Kushans first used the pigment to depict the Buddha's hair in the first and second centuries CE, and in later centuries it became known as "Buddha blue."[13] It was one of the Seven Treasures donated to monasteries by devout Buddhists,[14] and its symbolic association with the iconography of the Medicine Buddha was particularly strong.[15] However, it is *not* found in the otherwise lavish painting in the Late Tang Cave 85—even in the Medicine Buddha iconography—and it is inconceivable that, if available, it would have been omitted from the palette.

The apparent scarcity of lapis during the Tang dynasty has been related to the temporary abandonment of the Silk Road's northern route due to long-term drought conditions in Lop Nor.[16] However, it remains unclear how this would have affected access to the lapis mines, which lie to the south. Whatever the reason, the bluish-green tonality characteristic of many Tang wall paintings, which results from the use of azurite as the principal blue at this period, is likely an outcome less of intent than of necessity.

Changes in Aesthetic Taste

There is some evidence that changes in color use were sometimes governed by aesthetic preference. Atacamite was by far the most commonly used green throughout Mogao's thousand years of activity, but it appears not to have been widely used at sites further east until the Tang dynasty.[17] Its delayed use east of the Mogao caves suggests a western source for the mineral, possibly from copper mines in Huitongshan, just northwest of Dunhuang, or from Hami in northeastern Xinjiang.[18] Other green pigments have also been identified at Mogao, including malachite and antlerite, and green appears to have sometimes been achieved by combining indigo and orpiment.[19] In the Sui dynasty (581–618), however, green attained unprecedented dominance of the palette, often replacing blue. An unusually wide variety of shades and intensities of green can be discerned in Sui painting, with dark, rich, saturated greens being particularly prevalent (fig. 5). None of the blue or green pigments used before or after the Sui dynasty appear to be absent, so these choices seem to be driven not by scarcity, but by taste.

12. Sarah E. Fraser, *Performing the Visual: The Practice of Buddhist Wall Painting in China and Central Asia, 618–690* (Stanford: Stanford University Press, 2004), 4.

13. Liu Xinru, *The Silk Road in World History* (Oxford: Oxford University Press, 2010), 54; Yu, *Chinese Painting*, 8, 55.

14. Liu, *Silk Road*, 54.

15. Ning Qiang, *Art, Religion and Politics in Medieval China: The Dunhuang Cave of the Zhai Family* (Honolulu: University of Hawai'i Press, 2004), 20.

16. Fan Yuquan, discussion with Lisa Shekede at Mogao in April 2013. Dr. Fan Yuquan is associate researcher at the Dunhuang Academy.

17. Francesca Piqué, "Scientific Examination of the Sculptural Polychromy of Cave 6 at Yungang," in *Conservation of Ancient Sites on the Silk Road: Proceedings of an International Conference on the Conservation of Grotto Sites, Mogao, China 3–8 October 1993*, ed. Neville Agnew (Los Angeles: Getty Conservation Institute, 1997), 348–61; Zhou Guoxin, Zhang Jianquan, and Cheng Huaiwan, "Pigment Analysis of Polychrome Statuary and Wall Paintings of the Tiantishan Grottoes," in *Conservation of Ancient Sites on the Silk Road: Proceedings of an International Conference on the Conservation of Grotto Sites, Mogao, China 3–8 October 1993*, 362–68.

18. Fan Yuquan, personal communication.

19. Michael R. Schilling et al.,"Analytical Research in Cave 85," in *Conservation of Ancient Sites on the Silk Road: The Second International Conference on the Conservation of Grotto Sites, Mogao Grottoes, Dunhuang, People's Republic of China, June 28–July 3, 2004*, ed. Neville Agnew (Los Angeles: Getty Conservation Institute, 2010), 440; Nobuaki Kuchitsu, et al., "Color Change of Pigments in the Mogao Grottoes of Dunhuang," in *Conservation of Ancient Sites on the Silk Road: Proceedings of an International Conference on the Conservation of Grotto Sites, Mogao, China 3–8 October 1993*, 329–33.

FIGURE 5
Comparison of the sculpture aureolae from Northern Wei Cave 254 (facing page) and Sui Cave 420 (left) demonstrates a preference during the Sui dynasty for rich, saturated greens, which sometimes replace blue.

Color Change and the Tang Palette

While color change is clearly evident in Mogao's early paintings, for example in the darkened skin tones of the Northern Wei paintings, alteration in Tang-dynasty painting, which is in general technically more complex, takes a greater diversity of forms. This makes the effects of change more difficult to interpret. Patterns of color alteration are typified by painting in the Late Tang Cave 85, where a vibrant palette including blue and a variety of reds at the cave's eastern end gradually dwindles to green, dull red, and black to the west, in response to higher levels of light, salts, and moisture (fig. 6). One of the most widespread changes is the alteration of the blue copper carbonate pigment, azurite, to the green copper chloride, atacamite.[20] Detection of this change is all the more confusing since the product of the alteration is indistinguishable to the naked eye from intentionally applied atacamite. Transformation of lead-based pigments and cinnabar to gray, brown, and black follow the same east-west pattern of deterioration, but even at the eastern end the surviving painting provides only a dim reflection of the original Tang palette.

20. Schilling et al., "Analytical Research," 443.

FIGURE 6
High levels of light, moisture, and salts at the western ends of the caves catalyze color change. The scene on the left, which preserves its blue and a variety of reds, is from the eastern end of Late Tang Cave 85. The scene on the right, from the western end of the same cave, demonstrates alteration of blue to green, and darkening and photo-deterioration of reds.

For example, in Cave 85, as in the majority of Mogao's wall paintings, the highly significant color, yellow, is nowhere to be seen. As well as being the imperial color, yellow for Buddhists represents sanctity through association with the saffron robes worn by Indian monks. It also represents one of the four elements (earth) and one of the cardinal directions (center), and it is unlikely to have been intentionally omitted.[21] Indeed, the small Middle Tang Cave 112 preserves a rare survival of yellow at the protected eastern end, hinting at wider unrecognized use in Tang-dynasty wall painting.

Portable objects from Mogao provide further crucial evidence on this issue. Discovered in 1900 behind a doorway concealed since the eleventh century, the Library Cave (Cave 17) contained thousands of documentary records, sutras, ink drawings, cartoons, and paintings on silk. In the ensuing two decades, many of these invaluable records were acquired by foreign scholars and treasure hunters, and subsequently dispersed worldwide.

A bright, rich yellow is gloriously evident on many of the Library Cave silk paintings, and analysis has demonstrated that orpiment, a yellow arsenic sulfide pigment, was used.[22] The silk paintings were likely to have been made for occasional display and were stored away shortly after they were painted, remaining undisturbed in dark, dry conditions for almost a thousand years, thus ensuring preservation of the pigment's original brilliance. The wall paintings of Cave 85, by contrast, were subjected to environmental exposure, and the original color has been preserved only where protected by subsequent paint layers. Where exposed to oxidation processes, the pigment is invariably altering to white arsenic trioxide (fig. 7).[23]

Exceptionally well-preserved organic colorants are also evident, and their presence

21. Graham, *Disputers of the Tao*, 340–56.

22. Erin R. Mysak et al., "Technical Examination of Several Portable Chinese Buddhist Paintings from the Mogao Caves," in *Preprints of the ICOM-CC 16th Triennial Meeting, Lisbon, Portugal, 19–23 September 2011* (Almada: Critério, 2011), paper 1315.

23. Schilling et al., "Analytical Research," 443–44.

FIGURE 7
The survival of yellow at the eastern end of Middle Tang Cave 112 (top) is unusual. The bright yellow pigment, orpiment, was used profusely, but is susceptible to oxidation and color change through light exposure. A sample taken from an area of altering orpiment from Late Tang Cave 85 (bottom) and mounted in cross section (center) shows clumps of white arsenic-trioxide forming on the surface.

has been confirmed on a number of portable objects from Dunhuang, including organic red and blue colorants on tenth-century silk paintings in collections in the United States.[24] Yellow organic compounds have been isolated on the printed paper *Diamond Sutra* at the British Library.[25] This block-printed sutra perhaps includes material from two different plant sources, probably including Amur cork tree (*Phellodendron amurense*). The significant contribution of organic colorants to Mogao's wall-painting palette technology is also gaining recognition. Analysis of samples from Cave 85 has established the presence of an indigoid blue, at least two organic reds (including lac), and two yellow organic colorants. One of the yellow colorants contains the isoflavone genistein, which is present, for example, in the Asian orange-dye-yielding plant *Flemingia macrophylla*.[26]

Conclusion

The intimate relationship of wall paintings with their environment makes them particularly vulnerable to change over time. For this reason, the wall-painting conservator's ability to link the physical and chemical composition of original materials to causes and patterns of deterioration is fundamental to their interpretation, and provides an invaluable platform for analysis. At Mogao, technical investigations have not only performed an important role in providing a resource for understanding original intent and meaning, but also in preserving highly deteriorated and fragile aspects of technology, which may otherwise be ignored, misinterpreted, or inadvertently destroyed. We hope that this emphasis on scientific investigation will help in the care and protection of vulnerable Asian paintings elsewhere.

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24. Mysak et al., "Technical Examination," 3.

25. Peter J. Gibbs and Kenneth R. Seddon, "Analysis of Ancient Dyed Chinese Papers by High-Performance Liquid Chromatography," *Analytical Chemistry* 69, no. 10 (May 1997): 1965–69.

26. Lori Wong and Neville Agnew, eds., *The Conservation of Cave 85 at the Mogao Grottoes, Dunhuang: Development and Implementation of a Systematic Methodology to Conserve the Cave Wall Paintings and Sculpture* (Los Angeles: The Getty Conservation Institute, 2011), 176; A. Budelman and M.E. Siregar, "Flemingia macrophylla (Willd.)," in *Plant Resources of South-East Asia 4: Forages*, eds. L. 't Mannetje & R.M. Jones, Prosea Handbook, eds. P.C.M. Jansen and E. Westphal (Wageningen: Pudoc Scientific Publishers, 1992), 131–33.

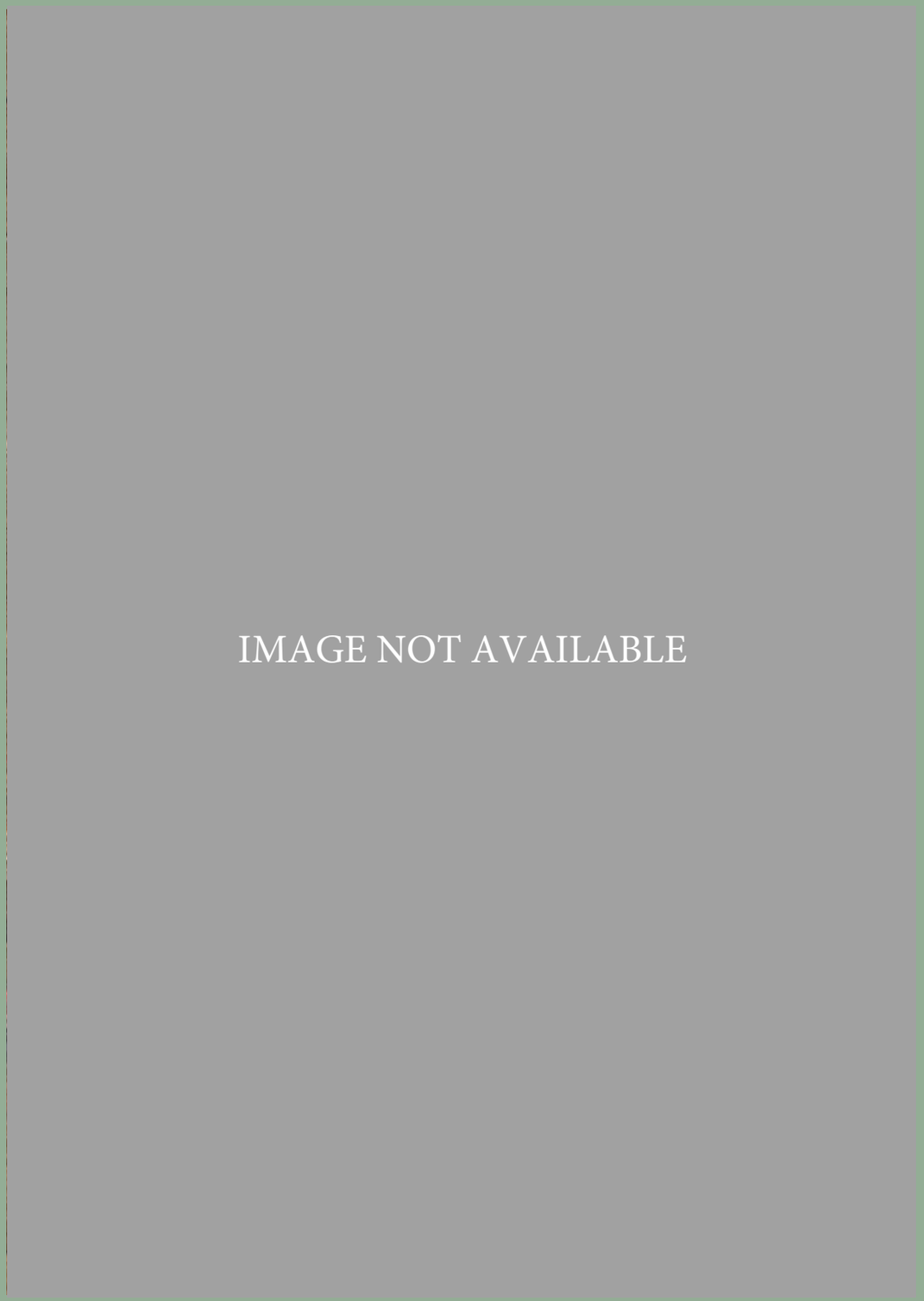


FIGURE 3 (detail)

Colors in Mural Paintings in Goguryeo Kingdom Tombs

PARK AH-RIM

Introduction

The mural paintings decorating many royal and aristocratic tombs in the Goguryeo kingdom (37 BCE–668 CE) have been known to scholars for more than a century, but the designation by UNESCO in 2004 of Goguryeo tomb complexes in North Korea and China as World Cultural Heritage sites focused international attention on the tombs and encouraged further exploration, research, and conservation. To date, more than 120 tombs with murals have been discovered in Jilin and Liaoning Provinces in northeast China and in the adjoining Pyongyang, South Pyeong'an, and South Hwanghae Provinces in present-day North Korea.[1]

At its height, the kingdom of Goguryeo was a major power in Northeast Asia and controlled a vast territory that included most of the Korean peninsula and present-day northeastern China or Manchuria. Located at the eastern edge of the Eurasian continent and the end of the complex of trading routes known collectively as the Silk Road, it absorbed diverse influences from China, from nomadic Steppe culture, from Central Asia, and even from South Asia. Over time, the Goguryeo people developed a distinctive culture forged from these disparate elements and reflected in the vibrant tomb mural paintings. The diverse, rich, and abundant mural paintings on the walls of Goguryeo tombs reveal remarkably realistic details of daily life, the wealth of the Goguryeo ruling elite, and suggestions of the belief systems of the Goguryeo people.

Conducting research on Goguryeo murals is difficult. First, it is not easy to gain access to Goguryeo tombs, which are located mainly in Ji'an in Jilin Province, China and in Pyongyang, North Korea. A second obstacle is the paucity of literary records about the funerary traditions of ancient Korea. A very brief description of funerary traditions and the tomb-guard system of Goguryeo appears in *Samguk sagi* (History of the Three Kingdoms), *Samguk yusa* (Memorabilia of the Three Kingdoms), the Stele of King Gwanggaeto (414 CE), and Chinese official histories.[2] Lastly, as time passes, the colors of the murals inside a tomb tend to deteriorate and discolor, making it difficult to identify the original painting scheme.

Wall paintings in tomb chambers were created to enhance the symbolic meaning of the funerary space. Thus, colors in funerary architecture tend to be associated with the significance and the function of such spaces.

1. Jeon Hotae, *Goguryeo gobun beokhwa yeongu* [Study of Goguryeo tomb murals] (Seoul: Sagyejeol, 2000), 361; Jeong Ho-seop, *Goguryeo gobuneui joyeonggwa jeui* [The construction and ritual of Goguryeo tombs] (Seoul: Seogyeong Culture Press, 2011), 115–16.

2. As regards the tomb-guard system of Goguryeo, in July of 2012 a new Goguryeo stone stele was discovered at Maxian, Ji'an. It contains 218 characters that tell us of the founding of the kingdom and the regulations governing how to select and manage the tomb guards to protect a royal tomb. This Goguryeo stele is the third to be discovered, following the Gwanggaeto Stele in Ji'an, Jilin, China, and the Goguryeo Stele in Chungju, North Chungcheong Province, South Korea. The stele appears to have been created around the same time as the Gwanggaeto Stele. The *Samguk sagi* was compiled in 1145 based on earlier histories that are no longer extant. The *Samguk yusa*, compiled about a century later, focuses on legends and folktales from early Korean history.

The reason certain pigments and colors were selected for a tomb and the way these colors were used to transform the entire funerary space, as well as to demarcate ritually significant areas within the tomb, are important questions that will be considered in this paper. Of course the use of pigments also depends on the availability of materials in the region and, to a certain extent, on the choice of the artisan and patron (the tomb occupant and his family). What kinds of color symbolism were embodied in the murals on Goguryeo tombs? Were rules or conventions regarding the choice and use of colors similar to or different from those of China and Japan? A study of the pigments and colors of Goguryeo murals will address such questions and can also help form a broader understanding of the characteristics and evolution of color decoration in East Asian funerary art.

Samguk sagi includes passages concerning the ritual or symbolic significance of colors associated with the concepts of *yinyang* and the Five Elements including the Four Directional Animals, each associated with a different color.[3] The prevalence of the Four Directional Animals in Goguryeo tomb murals indicates the symbolic importance of the five colors associated with the four cardinal directions and the center.

In this essay, I will first examine the color pigments used in Goguryeo tombs that have been scientifically analyzed. Secondly, to determine the use and meaning of colors in Goguryeo murals within East Asian funerary art, I will compare the pigments and colors found in Goguryeo mural tombs with those found on mortuary objects from the Neolithic period and mural tombs from the Sui (581–618) and Tang (618–907) dynasties in China, and those of the Kofun (ca. 250–538) and Asuka (538–710) periods in Japan. Of necessity this will be a preliminary comparison, as only a few of the murals in Goguryeo and Chinese tombs have undergone pigment analysis.[4] Further scientific research may help to validate the conclusions of this investigation.

Analysis of the Color Pigments in Goguryeo Murals

Tomb murals are closely related to the development of painting techniques and the availability of pigments and binding mediums although, unlike painting on silk or paper, mural paintings are usually executed on lime plaster or directly on prepared stone walls. The most recent significant examination of color pigments in Goguryeo murals was carried out by UNESCO and the South and North Korea Historians Council. Under the UNESCO/ROK Funds-in-Trust Project for the Preservation of Cultural Heritage in the Democratic People's Republic of Korea, the first phase of the UNESCO project began in 2004. Currently, UNESCO is carrying out its third phase of the multiyear project. The South and North Korea Historians Council conducted an investigation of eight Goguryeo mural tombs in the Pyongyang region from 2006 to 2007.[5] In

3. Written records concerning the Five Elements theory are found from the third year of King Dongmyeong, the twenty-ninth year of King Yuri, the third year of King Daemusin, and the third year of King Chadae in the "Annals of Koguryo" in *Samguk sagi*, as well as in the Stele of King Gwanggaeto. Jeon Hotae, *Goguryeo gobun beokhwa yeongu*, 300–301.

4. An Byeongchan and Yi Sangsu, "Goguryeo beokhwa jejak gibeop sigo" [Preliminary study on the technique of Goguryeo murals], *Goguryeo yeongu* [Goguryeo studies] 5 (1998): 195–215; Yi Jongsang, "Hanguk misulsaeseo chajihan Goguryeo byeokhwaui wichi" [Significance of Goguryeo murals in Korean art history with emphasis on the materials and techniques], *Goguryeo yeongu* [Goguryeo studies] 16 (2003): 367–81; Rocco Mazzeo, "Scientific Investigations of the Tokhung-ri Mural Paintings (408 A.D.) of the Koguryo Era, Democratic People's Republic of Korea," in *Conservation of Koguryo Tombs* (Seoul: Cultural Heritage Administration of Korea, UNESCO, 2004), 109–26; Rodolfo Lujan, "Two Similar Tombs with Divergent Conservation Problems Assessment of the State of Preservation and Documentation of the Mural Paintings," *Conservation of Goguryeo Tombs* (Seoul: Cultural Heritage Administration of Korea, UNESCO, 2004); Rodolfo Lujan, *The Conservation-Restoration of the Goguryeo Mural Paintings-1, Technical Report* (Paris: UNESCO, 2005); Rocco Mazzeo et al.,"Scientific Examination of Mural Paintings of the Koguryo Tombs," in *Mural Paintings of the Silk Road—Cultural Exchanges Between East and West: Proceedings of the Annual International Symposium on the Conservation & Restoration of Cultural Properties* (London: Archetype Publications, 2007), 163–72.

5. National Research Institute of Cultural Heritage of Korea, South and North Korea Historians Council, *Goguryeo byeokhwa gobun bojon yeongu bogoseo* [Report on the preservation of Goguryeo mural tombs] (Seoul: National Research Institute of Cultural Heritage of Korea, 2006); National Research Institute of Cultural Heritage of Korea, South and North Korea Historians

addition, the National Museum of Korea possesses fragments of Goguryeo tomb murals, including those of the Twin Pillars Tomb, Tonggu Tomb No. 12, and the Tomb of the Armored Horse. These fragments have been examined to identify the pigments and determine the techniques used to create the murals. The results of the analyses were published in 1998 and 2005.[6]

Pigments in the following Goguryeo mural tombs have been scientifically examined: Anak Tomb No. 3 (357), the Doekheung-ri Tomb (408), the Yaksu-ri Tomb (early fifth century), Tonggu Tomb No. 12 (mid-fifth century), Hahaebang Tomb No. 31 (mid-fifth century), the Tomb of the Beauty (mid-fifth century), the Twin Pillars Tomb (late fifth century), the Susan-ri Tomb (late fifth century), Jinpa-ri Tomb No. 1 (early sixth century), Jinpa-ri Tomb No. 4 (early sixth century), the Tomb of the Four Directional Animals at Honam-ri (early sixth century), Ohoe (C. Wukui) Tomb No. 5 (late sixth century), the Great Tomb at Gangseo (late sixth century), and the Middle Tomb at Gangseo (early seventh century). All of these tombs are located in present-day North Korea, except for Tonggu Tomb No. 12, Hahaebang Tomb No. 31, the Tomb of the Beauty, and Ohoe Tomb No. 5, which are located across the Amnok River in Ji'an, China. The major subject matter of the murals in Jinpa-ri Tomb No. 1, Jinpa-ri Tomb No. 4, the Tomb of the Four Directional Animals at Honam-ri, the Great Tomb at Gangeso, the Middle Tomb at Gangseo, and Ohoe Tomb No. 5 is the Four Directional Animals, while the other tombs have murals depicting scenes of the daily life of the Goguryeo people.

Goguryeo murals were painted on either plaster or prepared stone surfaces. Goguryeo artists used both a damp-surface mural technique, or *buon fresco*, and a dry-surface mural technique, or *a secco*, The two methods were sometimes used in combination. Artists made the initial painting while the plaster was still wet, finishing it after the plaster had dried. Pigments were also applied directly onto prepared stone walls without plaster. Usually, murals from the early and middle phases of Goguryeo murals were created using the *buon fresco* and *a secco* techniques, while painting directly onto polished stone walls was used in the late phase.

Scholars debate whether particular Goguryeo paintings were executed in *fresco* or *a secco*.[7] According to Han Kyeong-soon, Goguryeo employed a mural technique distinct from Western fresco paintings. Han suggests that it is not necessary to divide Goguryeo mural techniques by *fresco* or *a secco* since both possibilities exist. He argues that *mezzo fresco*, or painting on almost dry plaster, is the method most similar to that used for Goguryeo murals, rather than *buon fresco*, or painting on wet plaster. Goguryeo painters probably employed a binding medium with pigments, while *buon fresco* normally used simply water and pigments. After the drying process, Goguryeo artists probably utilized a typical *a secco* painting technique to complete the coloring and to delineate the outlines.[8]

Council, *Goguryeo byeokhwa gobun bojon siltae josa bogoseo* [Research on the preservation of Goguryeo mural tombs] (Seoul: National Research Institute of Cultural Heritage of Korea, 2007).

6. An Byeongchan and Yi Sangsu, "Goguryeo beokhwa jejak gibeop sigo," 195–215; Yu Hyeseon, "Goguryeo Ssangyeongchong byeokhwaui anryo bunseok" [The analysis of pigments of the murals of the Twin Pillars Tomb of Goguryeo], *Bakmulgwan bojon gwahak* [Conservation science in museums] 6 (2005): 47–54.

7. Rocco Mazzeo et al., "Scientific Investigations of the Tokhung-Ri Tomb Mural Paintings (408 A.D.) of the Koguryo Era, Democratic People's Republic of Korea," *Journal of Raman Spectroscopy* 37 (2006): 1086–97. According to this article, all the identified pigments are suitable for use with a fresco technique. Calcite is present in both preparation and paint layers. The author argues that there is clear evidence of the fact that paint colors were applied over a white preparation layer when it was still in a wet lime plaster condition. Thus, the use of a fresco technique in DPRK could present one of the first examples of fresco paintings in Far East Asia, as the majority of the wall paintings studied so far were found to have been painted with *a secco* technique.

8. Han Gyeongsun, "Goguryeo gobun byeokhwa chaesaekgibeope gwanhan yeongu" [Study of the painting techniques of Goguryeo tomb murals], *Ganggwa misulsa* [Art history seminars] 35 (2010): 349–72; Han Gyeongsun, "Goguryeo gobun byeokhwaui hoehwa gibeop" [Painting technique of Goguryeo tomb murals], *Bukhaneui munhwajae semina* [Seminar on cultural heritage of North Korea], Institute of East Asian Buddhist Art 1 (2012): 3–24.

The plaster surfaces of Goguryeo murals both in Pyongyang and Ji'an during the fourth and fifth centuries usually consist of three layers: two preparation layers and a layer of paint. The fifth-century Hahaebang Tomb No. 31 and the Twin Pillars Tomb are each composed of three layers of plaster.[9] At Hahaebang Tomb No. 31 the plaster layer is about 18 mm thick.

The plaster is divided into one or more preparation layers and a paint layer. The final preparation layer provides a smooth, compact surface as well as a background color for the paint layer. One of the features of Goguryeo coloring techniques is the use of lead (Pb) in the preparation layer. By the sixth and seventh centuries, as mural techniques developed, Goguryeo artists began using a single layer of plaster.[10]

More than five pigments have been identified in the color scheme of Goguryeo murals. Most colors used in Goguryeo murals are made from mineral pigments. Red pigments in Goguryeo murals are hematite or red ochre (reddish brown) and cinnabar (vermilion). The yellow pigment is goethite. There are two kinds of green pigments, malachite and green earth. The earliest example of malachite is detected on the sleeve of the upper garment of the portrait of the female tomb occupant at Anak Tomb No. 3, while green earth was found at the Deokheung-ri Tomb. It is interesting that blue pigments including azurite and lapis lazuli have not been detected in Goguryeo murals. Scholars assume that the blue color found in Jinpa-ri Tomb No. 4 and the Yaksu-ri Tomb probably originates from dyes. In addition, gold leaf was found in Jinpa-ri Tomb No. 4, and gold and jade were used in the decoration of Oheo Tomb No. 5.

The white pigments are mostly calcite and lead white, although aragonite was detected in the analysis of a fragment of the Twin Pillars Tomb, which is the earliest example of aragonite discovered in ancient Korea. Scholars have directed attention to the use of lead white and its appearance on the preparation layer of some Goguryeo murals.[11] Lead white is detected in the backgrounds of the portraits of the male and female tomb occupants of Anak Tomb No. 3. The Deokheung-ri Tomb, Twin Pillars Tomb, and Susan-ri Tomb have lead white applied on the surface of lime plaster. In 2010, when UNESCO researchers examined the Yaksu-ri Tomb, they mentioned the possibility that lead white had been applied to the background color of the paintings. In the same year, Han Kyeong-soon found lead white on a mural fragment from the Tomb of the Beauty.[12] Finally in this list, lead white was applied to the background of the painting of the Four Directional Animals in the Great Tomb at Gangseo and the Middle Tomb at Gangseo. Han suggested that lead white must have been used throughout the Goguryeo period, as it appears both on the background of a painting from the beginning period of Goguryeo murals and in later examples at the end of the kingdom. This technique has also been discovered in the Eastern Han tomb murals of China and in the Takamatsu Tomb at Asuka, in Nara Prefecture, Japan.[13]

TABLE 1
Result of the Analysis of Pigments in Goguryeo Murals (2007)[14]

9. An Byeongchan and Yi Sangsu, "Goguryeo beokhwa jejak gibeop sigo," 195–215; Jin Yeongseon et al., *Goguryeo byeokhwaui imiji bokwon* [Goguryeo tumulus paintings with emphasis on image restoration] (Seoul: Goguryeo Research Foundation, 2005), 43–62.

10. Jin Yeongseon et al., *Goguryeo byeokhwaui imiji bokwon*, 43–62.

11. An Byeongchan and Hong Jonguk, "Goguryeo gobun byeokhwaui anryo bunseok" [The analysis of pigments in Goguryeo tomb paintings], in *Goguryeo byeokhwa gobun bojon siltae josa bogoseo* [Report on the preservation of Goguryeo mural tombs] (Seoul: National Research Institute of Cultural Heritage of Korea, 2006), 180–218.

12. Han Gyeongsun, "Goguryeo gobun byeokhwa chaesaekgibeope gwanhan yeongu," 349–72.

13. Han Gyeongsun, "Goguryeo gobun byeokhwaui hoehwa gibeop" [Painting technique of Goguryeo tomb murals], *Bukhanui munhwajae semina* [Seminar on cultural heritage of North Korea], Institute of East Asian Buddhist Art 1 (2012): 3–24.

14. UNESCO, *Preservation of Cultural Heritage in the DPRK, Notably for the Yaksu-ri Tomb, Phase II, and Capacity Building at the Korean Cultural Preservation Centre*, Final Report, Phase II (Paris: UNESCO, 2007), 149.

Tomb	Color	Thickness (microns)	Pigment identification	Other compounds	Method of identification
Deokheung-ri Tomb	Red (dark)	25	Hematite, magnetite	Calcite, carbon	OM, SEM-EDX, μFTIR, μRaman
	Yellow	14-50	Goethite	Calcite	OM, SEM-EDX, μFTIR, μaman
	Green	50	Green earth	Calcite, wax, siloxane	OM, SEM-EDX, μFTIR
	Black/red	180-30 /12	Hematite, carbon black	Calcite, siloxane	OM, SEM-EDX, μFTIR
	Yellow	20	Goethite	Calcite, siloxane	OM, SEM-EDX, μFTIR, μRaman
	Blue	20-60	Green earth, carbon black	Calcite	OM, EP-SEM-EDX
	Red (dark)		Hematite, magnetite	Calcite	OM, EP-SEM-EDX
Yaksu-ri Tomb	Red (dark)	10	Hematite	Calcite	OM, EP-SEM-EDX
	Yellow	10	Yellow ochre	Calcite	OM, EP-SEM-EDX
	Black	5	Carbon black	Calcite	OM, EP-SEM-EDX
	Blue		Carbon black	Calcite	OM, EP-SEM-EDX
Susan-ri Tomb	Green	30	Yellow ochre, carbon black	Calcite	OM, EP-SEM-EDX
	Red	(powder)	Cinnabar, hematite	Calcite	SEM-EDX, μarea-XRD
Jinpa-ri Tomb No. 1	Red	13-50	Hematite	Calcite	OM, SEM-EDX, μarea-XRD

The Use of Color Pigments in Several Important Goguryeo Mural Tombs

Pigments in the Early Phase of Goguryeo Mural Tombs

Scientific analysis has been applied to color pigments from several Goguryeo mural tombs from the early, middle, and late phases of the evolution of Goguryeo mural painting. The earliest dated mural tomb with colored pigments is Anak Tomb No. 3, dated by tomb inscription to 357. Anak Tomb No. 3 is a complex, multichambered structure with an elaborate iconographic program. The tomb paintings exhibit the colors most often used in Goguryeo murals: red, brown, yellow, and green. In 2006, the National Research Institute of Cultural Heritage of Korea and the South and North Korea Historians Council carried out a scientific examination focusing on the wall paintings in the niche on the west side of the front chamber where the tomb occupant and his spouse are depicted. Six colors (white, black, yellow, vermilion, brown, and green) were analyzed. As a tomb from the early phase, Anak Tomb No. 3 is unusual in that the color pigments appear to be applied directly to bare stone walls, a technique not usually employed until the late Goguryeo period. Rodolfo Lujan, a mural preservation specialist of the

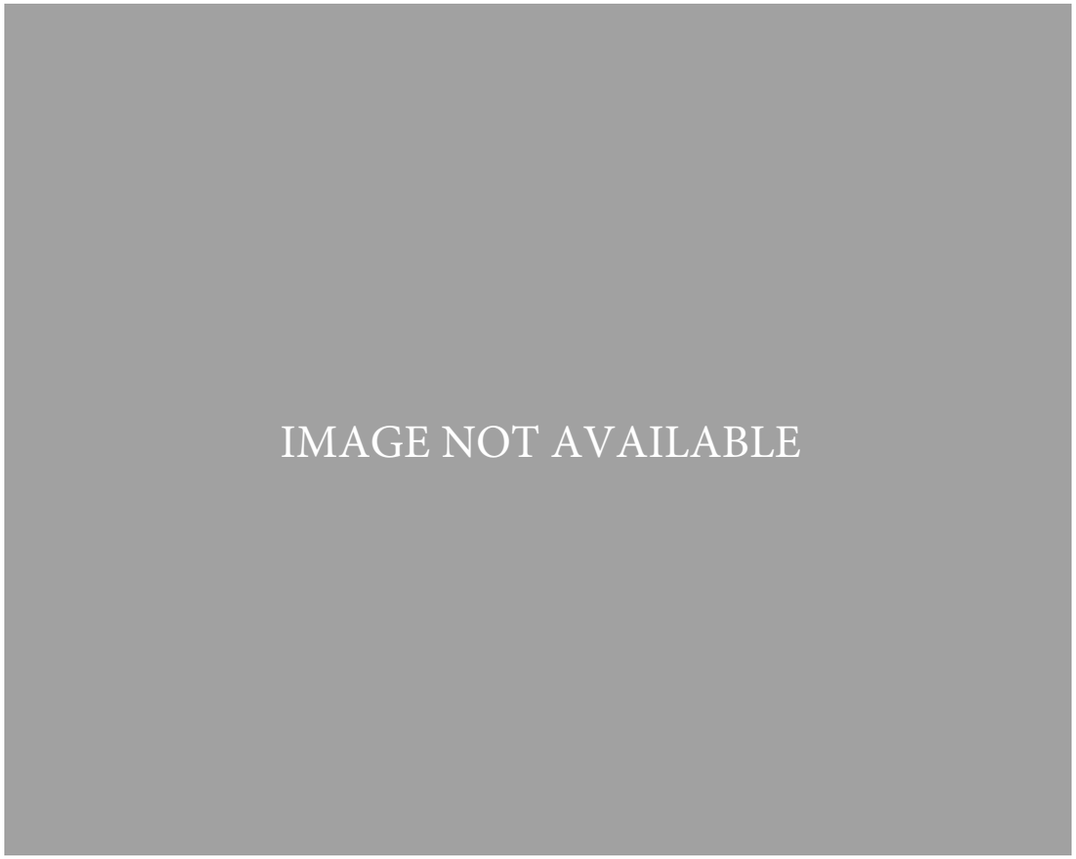
Tomb Color	Anak Tomb No. 3	Deokheung-ri Tomb	Susan-ri Tomb	Jinpa-ri Tomb No. 4	Jinpa-ri Tomb No. 1	Four Directional Animals at Honam-ri	Great Tomb at Gangseo	Middle Tomb at Gangseo
Reddish brown	Hematite	Hematite		Hematite	Hematite	Hematite		
Vermilion	Cinnabar		Cinnabar	Cinnabar	Cinnabar	Hematite	Cinnabar	Cinnabar
Yellow	Goethite	Goethite	Goethite		Goethite	Goethite	Goethite	
Green	Malachite	Green earth		Malachite	Green earth		Malachite	
Blue				?				
Black	Carbon	Carbon		Carbon	Carbon			
White	Lead white		Lead white	$CaCO_3$	Lead white		Lead white	Lead white
Gold			Gold lead Au					

Color Tomb	Reddish brown	Red	Yellow	Green	Black	White	Light pink	Ground
Hahaebang Tomb No. 31					Carbon			
Anak Tomb No. 3	Hematite	Cinnabar	Goethite	Malachite	Carbon	Lead white		Lead white
Deokheung-ri Tomb	Hematite		Goethite	Green earth	Carbon		Lead white + hematite	
Twin Pillars Tomb	Hematite	Cinnabar			Carbon	Lead white, lime, aragonite	Lime + cinnabar	Lead white
Susan-ri Tomb	Hematite	Cinnabar	Goethite	Green earth		Lead white	Hematite	Lead white
Jinpa-ri Tomb No. 4	Hematite	Cinnabar		Malachite	Carbon			
Honam-ri Four Directional Tomb	Hematite	Cinnabar	Goethite					
Jinpa-ri Tomb No. 1	Hematite	Cinnabar	Goethite	Green earth	Carbon	Lead white		
Great Tomb at Gangseo		Cinnabar	Goethite	Malachite		Lead white		Lead white
Middle Tomb at Gangseo		Cinnabar				Lead white		Lead white

TABLE 2
Result of the Analysis of Pigments in Goguryeo Murals (2006–2007)[15]

TABLE 3
Pigments used for mural paintings of Goguryeo tombs[16]

FIGURE 1
Tomb Occupant Portrait, Anak Tomb No. 3. Dated by tomb inscription to 357. Anak, Hwanghae, North Korea.



International Council on Monuments and Sites (ICCROM), visited Anak Tomb No. 3 in 2004 and suggested that a thin layer of limewater might have been applied to the stone wall before it was painted. According to reports by the South and North Korea Historians Council, it is possible that lead white was applied to the surface of the stone wall as a preparation layer since lead was found in most of the pigments analyzed and in many sections of the murals that are painted with different color pigments. For example, in the portrait of the male tomb occupant, the painted part of the wall looks brighter than the unpainted one, probably due to the use of lead white as a ground coating. Lead white is also used as a pigment in the whites of the eyes of the tomb occupant. The employment of lead white in Anak Tomb No. 3 is assumed to be the oldest use of an artificial pigment in ancient Korea.

Researchers found hematite in the dark brown clothing of the portrait of the male occupant. Hematite is a mineral form of iron-oxide and is generally used as a red pigment. The analysis of the pigment as hematite indicates that the occupant's dark brown clothing was probably originally red, which has discolored to brown over time. Cinnabar was used for the vermilion color delineating the folds of the male occupant's clothing (fig. 1). The green hem of the female occupant's garment was painted with malachite. This is the earliest known instance of malachite being used as a pigment in ancient Korea (fig. 2).[17]

15. National Research Institute of Cultural Heritage of Korea, South and North Korea Historians Council, *Goguryeo byeokhwa gobun bojon yeongu bogoseo*, table 24.

16. Yun Eunyeoung, Kim Yuran, and Kang Hyeungtae, "Goguryeo gaemachong yeoin haengryeoldoui anryo bunseok" [The pigment analysis of Procession of the Ladies mural paintings from Gaemachong, Goguryeo], *Bakmulgwan bojon gwahak* [Conservation science in museums] 12 (2011): 53–58.

17. An Byeongchan and Hong Jonguk, "Goguryeo gobun byeokhwaui anryo bunseok," 215.

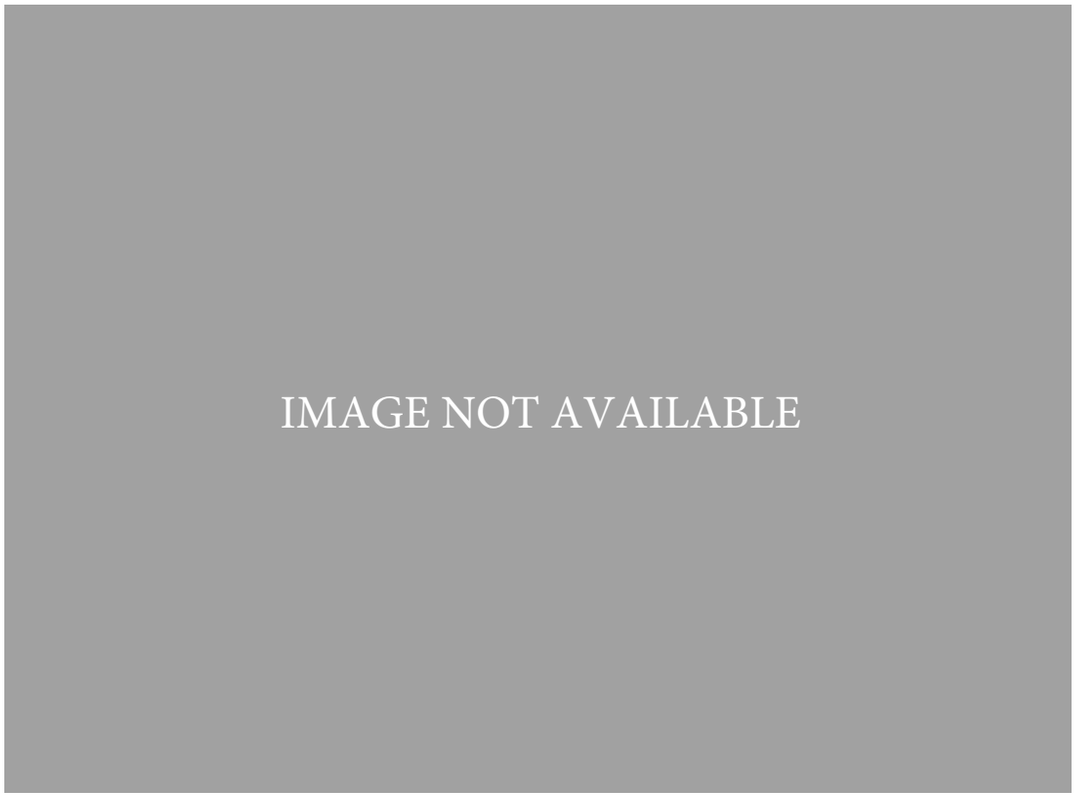


FIGURE 2
Female Tomb Occupant Portrait, Anak Tomb No. 3. Dated by tomb inscription to 357. Anak, Hwanghae, North Korea.

Pigments in the Middle Phase of Goguryeo Mural Tombs

Among those paintings in Goguryeo mural tombs that have undergone pigment analysis, the Twin Pillars Tomb, Susan-ri Tomb, Tonggu Tomb No. 12, and Hahaebang Tomb No. 31 are dated to around the fifth century, the middle phase of Goguryeo mural tombs.

In 2005, the National Museum of Korea published a pigment analysis of a mural fragment from the Twin Pillars Tomb. The painting base is composed of three layers of plaster, measuring about 30 mm in thickness.[18] The preparation layer was composed of calcite and aragonite. It was the first instance that aragonite was detected in the Goguryeo murals. An Byeongchan and Hong Chonguk state in a 2006 article that Pb was found in every color of the Susan-ri Tomb, possibly indicating that lead white was employed as a background color for the paint layer, as in the case of the Twin Pillars Tomb.[19] Because lead was found in all paint layers, it is assumed that artists applied lead white as a ground coating before applying pigments. Colors and pigments found at the Twin Pillars Tomb are white (calcite and aragonite), red (hematite, cinnabar), and black (carbon).[20]

The South and North Korean Historians Council analyzed pigments in the late-fifth-century Susan-ri Tomb. Pigment examination concentrated on the procession painting on the west wall of the tomb chamber of the female tomb occupant because the women's costumes are very similar to those depicted in the late-seventh- or early-eighth-century Takamatsu Tomb in Asuka, Japan. The analysis

18. An Byeongchan, "Goguryeo gobun byeokhwaui jejak gibeop yeongu" [Study on the plaster-wall technique of Goguryeo murals], *Goguryeo yeongu* [Goguryeo studies] 16 (2003): 457–80.

19. An Byeongchan and Hong Jonguk, "Goguryeo gobun byeokhwaeui anryo bunseok," 180–218.

20. Yu Hyeson, "Goguryeo Ssangyeongchong byeokhwaui anryo bunseok," 47–54.

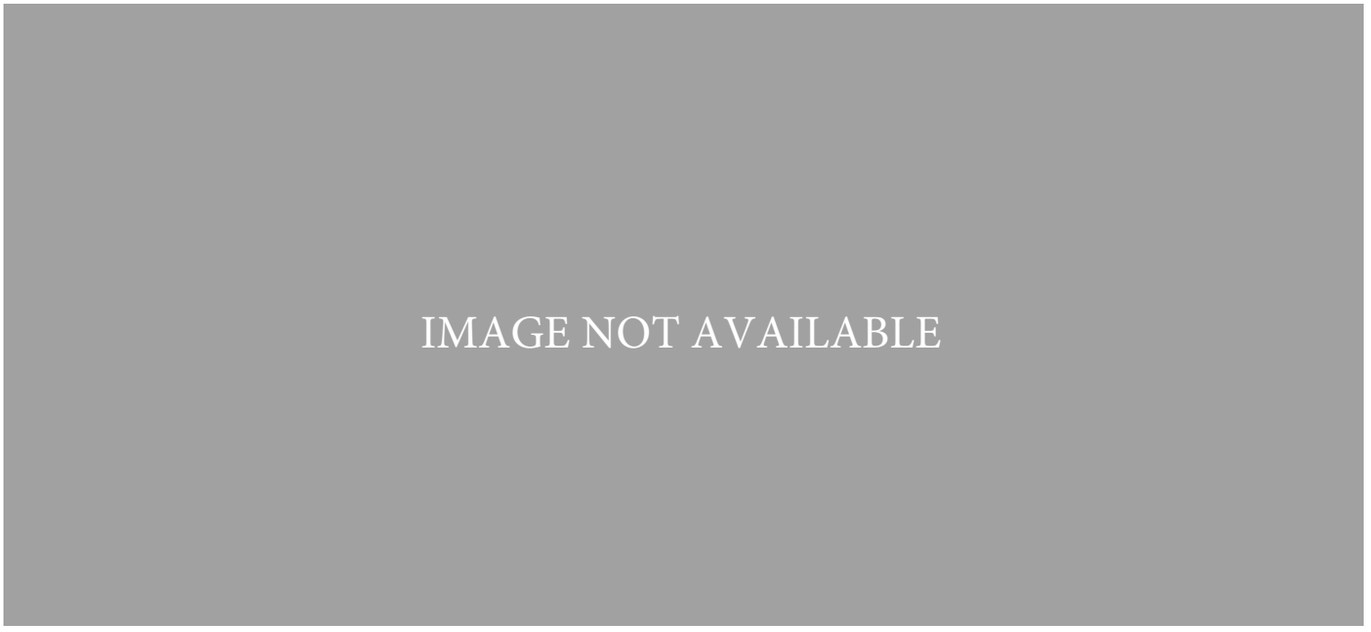


FIGURE 3
Blue Dragon, Great Tomb at Gangseo. Late sixth century. Sammyo-ri, Gangseo, Nampo City, North Korea.

of the multicolored stripes of the women's skirts in the Susan-ri mural reveals the use of vermilion (cinnabar), yellowish green (green earth), white (lead white), and reddish brown (hematite) from left to right. The colors and pigments of the Susan-ri Tomb seem more varied than those of the Twin Pillars Tomb, are better preserved, and were probably created at a later date. In addition, the Susan-ri Tomb was investigated on site, which provided more detailed results.

The most recent analysis of the Goguryeo murals by the National Museum of Korea considered the mural fragments from the Tomb of the Armored Horse from Pyongyang, North Korea. The Museum possesses two mural fragments showing a procession of females that were originally located on the ceiling of a tomb chamber. Due to the small size of the murals, the pigments are not varied. They include cinnabar and hematite (red), carbon (black), and lead white (white). The faces of the female figures appear to be painted with cinnabar and white lead.[21]

Pigments in the Late Phase of Goguryeo Mural Tombs

Pigments from Jinpa-ri Tombs No. 4 and No. 1, the Great Tomb at Gangseo in North Korea, and Ohoe Tomb No. 5 in China were analyzed.[22] The murals in all four tombs feature the Four Directional Animals: the Black Warrior of the North, Red Phoenix of the South (fig. 4), White Tiger of the West, and Blue Dragon of the East (fig. 3). There is, however, a difference in the representation of the subject between the murals at Ji'an and Pyongyang. The Four Directional Animals in the Gangseo Tomb in Pyongyang are depicted either on a plain background or within a landscape, while those at the Ohoe Tomb in Ji'an are incorporated within an intricate decorative scheme.

It is usually assumed that pigments in late Goguryeo murals were applied directly to a bare stone surface. The late-sixth-century Great Tomb at Gangseo is constructed of well-cut and fitted polished stone slabs. A binding medium was probably used with the pigments

21. Yun Eunyeoung, Kim Yuran, and Kang Hyeungtae, "Goguryeo gaemachong yeoin haengyoldoui anryo bunseok," 53–58.

22. An Byeongchan and Hong Jonguk, "Goguryeo gobun byeokhwaui anryo bunseok," 180–218; An Byeongchan, "Jinpa-ri ilhobungwa sahobunui byeokhwa anryoui teukjing bigyo bunseok" [Report on the comparison of the characteristics of mural pigments of tombs no. 1 and no. 4 at Jinpa-ri], *Goguryeo byeokhwa gobun bojon yeongu bogoseo* [Research on the preservation of Goguryeo mural tombs] (Seoul: National Research Institute of Cultural Heritage of Korea, 2007), 50–68.

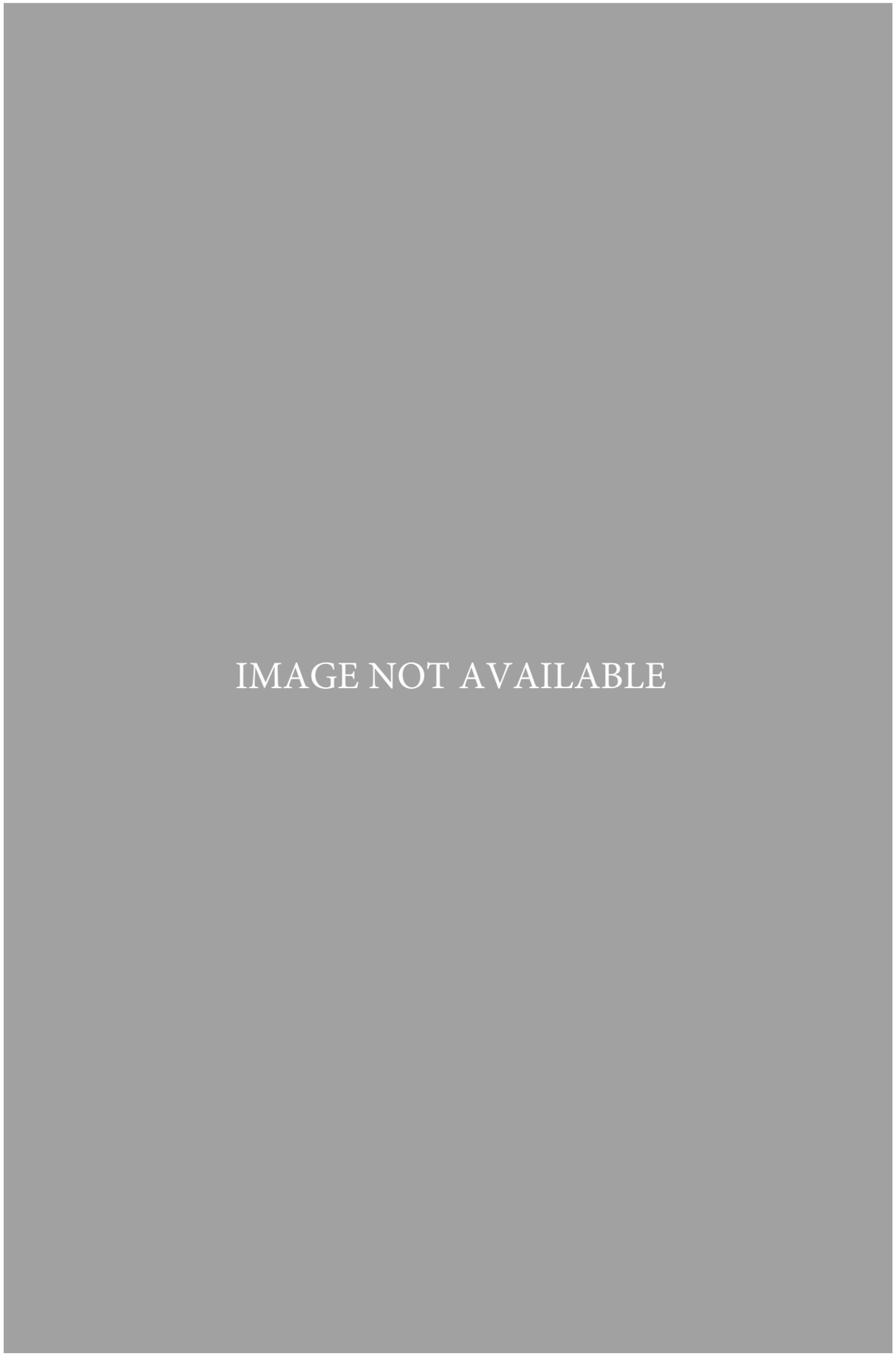


IMAGE NOT AVAILABLE

FIGURE 4
Red Bird, Middle Tomb at Gangseo. Early seventh century. Sammyo-ri, Gangseo, Nampo City, North Korea.

to enable painting directly on the walls. Both the Ohoe Tomb and the Gangseo Tomb are famous for their vivid colors and sophisticated brushwork applied directly to the polished stone walls.

A noticeable feature of the Great Tomb at Gangseo is that lead was detected in several pigments collected from the tomb.[23] This was likewise the case in the portrait of a tomb occupant of Anak Tomb No. 3, one of the earliest dated tombs, which was also painted on bare stone walls. Researchers assume that lead white was used as a ground for the subsequent painting. If this assumption is correct, the employment of lead white as a ground for mural paintings was in use from the earliest Goguryeo mural tombs and continued until the end of their evolution.[24] In addition to the Great Tomb at Gangseo (late sixth century), this lead white technique is found at Anak Tomb No. 3 (357), the Deokheung-ri Tomb (408), Yaksu-ri Tomb (early fifth century), Twin Pillars Tomb (late fifth century), and Susan-ri Tomb (late fifth century), also in the Takamatsu Tomb in Japan (late seventh or early eighth century).

In contrast to the Great Tomb at Gangseo, at Jinpa-ri Tombs No. 1 and No. 4 lime plaster was used as the painting surface rather than stone. Jinpa-ri Tombs No. 1 and No. 4 were probably constructed in the early sixth century and are located in the same tomb complex in North Korea (fig. 5). Even though the two tombs have much in common in terms of iconography and location, they exhibit slight differences in pigments and mural techniques.[25] The composition of the plaster in Tomb No. 1 follows a more common Goguryeo practice in using a great deal of lime, while the plaster underlying the murals in Tomb No. 4 is composed primarily of red clay with only a little lime.[26] For red, Tomb No. 1 uses mainly cinnabar, while Tomb No. 4 uses hematite. The green pigment in Tomb No. 1 is green earth and that in Tomb No. 4 is malachite. The white pigment in Tomb No. 1 is lead white, with calcite used for white in Tomb No. 4. Goethite (yellow) was detected in Jinpa-ri Tomb No. 1 but not in Tomb No. 4.[27]

Murals at Ohoe Tomb No. 5 in China use similar pigments to those found in Goguryeo murals in North Korea. The analysis of color pigments used at Ohoe Tomb No. 5 reveals the use of lead white (white), carbon (black), hematite and cinnabar (red), and malachite (green). Some scholars suggest that lacquer may have been used as a binding medium at Ohoe Tomb No. 5, contributing to the vivid and transparent effects shown on the black and color lines at the tomb.[28]

In sum, Goguryeo murals employ hematite and cinnabar to produce red, goethite for yellow, and malachite and green earth for green. Lead white was the primary pigment used for white, although calcite and aragonite have also been detected. In addition to its use as a pigment, lead white was employed as a ground coating in many Goguryeo mural tombs. The Tomb of the Armored Horse was unusual in its employment of calcite for this purpose. One striking feature of Goguryeo murals is the absence of a blue pigment. Blue pigments such as azurite and lapis lazuli are commonly found in contemporary Buddhist cave temples in parts of present-day China, such as the Mogao caves in Dunhuang, Gansu Province, and the Kizil caves in present-day Xinjiang.

Pigments in East Asian Funerary Art

In the following section, I will examine Chinese and Japanese tomb murals to develop an understanding of the general evolution and use of pigments in East Asian funerary art. Only four or five pigments were used on funerary

23. An Byeongchan and Hong Jonguk, "Goguryeo gobun byeokhwaui anryo bunseok," 209–11.

24. Ibid., 210.

25. Ibid., 180–218; An Byeongchan, "Jinpa-ri ilhobungwa sahobunui byeokhwa anryoui teukjing bigyo bunseok," 50–68.

26. An Byeongchan and Hong Jonguk, "Goguryeo gobun byeokhwaui anryo bunseok," 198.

27. Ibid., 215.

28. Im Gweon-ung and Yi Jong-heon, "Goguryeo Ohoebun ohomyo beokhwaui jobyeokji gibeope daehan yeongu" [A study on the painting technique of Ohoe tombs of Goguryeo, especially on the possibility of the application of lacquer painting technique], *Goguryeo Balhae yeongu* [Study of Goguryeo and Balhae] 30 (2008): 69–85.

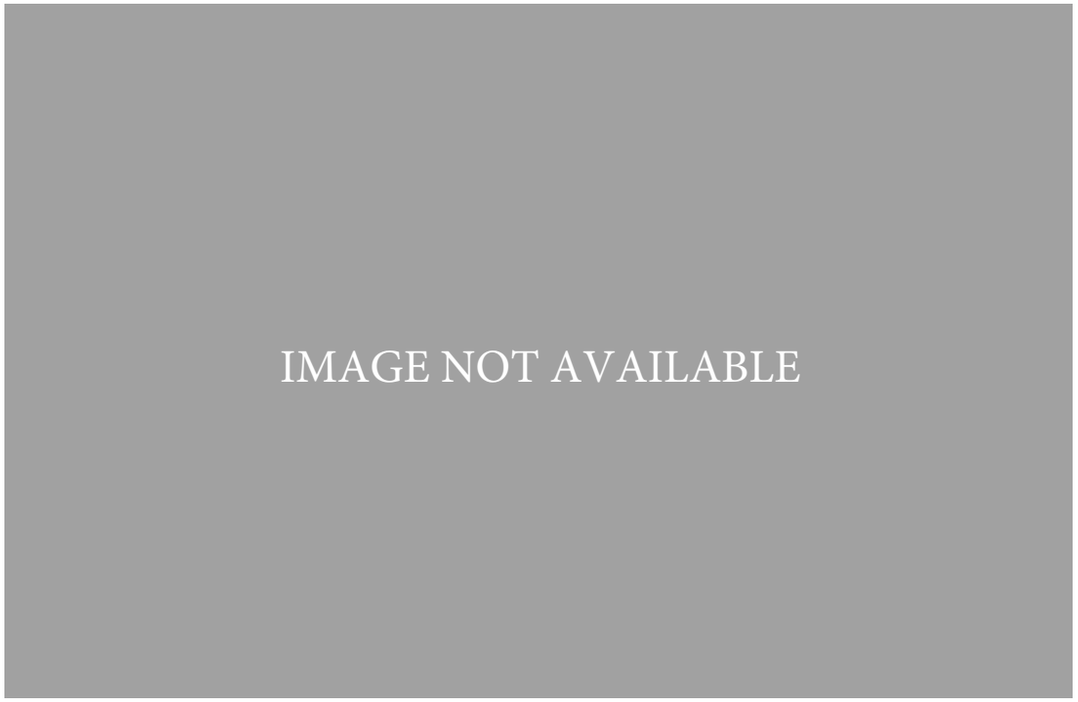


FIGURE 5
Blue Dragon, North Wall, Jinpa-ri Tomb No. 4. Early sixth century. Ryongsan-ri, Ryeokpo District, Pyongyang, North Korea.

objects found in Neolithic-period tombs in China. These included hematite, cinnabar, and calcite. These basic pigments continued to be employed in later dynasties in China and are also commonly found in Goguryeo murals. The blue and green pigments malachite and azurite were added to the palette in the late Neolithic, around 2000 BCE.[29]

In the Neolithic period in China, pigments held a place of prominence in funerary contexts. They were typically applied to the surface of pottery vessels found in tombs to create symbolic or simply decorative patterns. Cinnabar played a particularly significant role and often appears in tombs in a variety of ways. It is sometimes treated as a precious burial object and placed inside pottery vessels. At other times, it is painted on the bones of the deceased or spread around or beneath the human skeleton. It is possible that the conscious action of distributing the pigment around the corpse was associated with funerary rituals. Whatever its specific meaning in a particular tomb context, cinnabar obviously had powerful symbolic significance and was probably believed to have the power to protect the deceased from evil spirits.

From the third century BCE to the late sixth century CE (the Qin, Han, Wei–Jin, and the Northern and Southern Dynasties periods), a greater variety of pigments, including carbon (black), calcite, aragonite, mica (white), hematite and cinnabar (red), malachite (green), and azurite (blue), were used to decorate the walls of palaces, temples, and tombs. The greater availability of a variety of pigments suggests both the development of pigment mining in China and the possibility that pigments were imported over the trade routes that skirted the Taklamakan desert in present-day Xinjiang.

In the Han period, mural tombs were created in Henan, Hebei, and Shaanxi Provinces. The earliest mural tomb yet discovered in China is located at Shiyuan, Yongcheng xian, Henan. It was constructed for Prince Xiao of Liang (184–144 BCE) and his spouse. The ceiling of the main chamber is decorated with a painting of a dragon and a bird flying among clouds

29. Kim Byeongmo, "*Anryoui giwongwa jungguk hoehwae gwanhan yeongu*" [A study of the origin of pigments in Chinese painting from the Neolithic period to the Tang dynasty] (PhD diss., Danguk University, 2009).

against a red background. It is interesting to note the use of mica in the painting. Mica was a mineral pigment associated with longevity and thus often used for the preservation of a corpse. The mural in Prince Xiao's tomb resembles the decoration of a lacquer coffin from the Mawangdui tombs in Changsha, China, constructed about forty years earlier.[30] The subject matter is similar, and both employ a prominent red-colored background. The selection of pigments varies in each mural tomb of the Han dynasty and seems to depend on the painting techniques used and the availability of pigments. The Eastern Han (25–220 CE) Tomb No. 2 at Dahuting, Henan, for example, employs a variety of pigments in its paintings of a banquet scene on the upper part of a wall of the central chamber, a wrestling scene, and a depiction of a heavenly being on the ceiling. The pigments at Tomb No. 2 include carbon, cinnabar, red ochre, and malachite. Other tombs, such as that at Yingchengzi, Liaoning, exhibit very limited use of pigments.

According to the inscription on the entrance to the western side chamber where the tomb occupant is depicted, Anak Tomb No. 3 was constructed to be the tomb of a man who immigrated from Liaodong to Goguryeo in the middle of the fourth century. The tomb structure and subject matter of the murals in this tomb are usually compared with the painted tombs in Liaoyang in Liaoning, China, during the third to the early fifth century (Wei–Jin periods). It has been suggested that the iconography of the depiction of the tomb occupant was transmitted from the Han-dynasty painted tomb at Anping, Hebei, and the Wei–Jin Tomb at Yuantaizi, Liaoning.[31]

The clear iconographic connection between tomb paintings in Hebei and Liaoning in China and Anak Tomb No. 3 in Goguryeo suggests that wall-painting techniques may have also been transmitted. An examination and comparison of color pigments and painting techniques could reveal if there was any direct contact or influence from contemporary Chinese mural tombs to Anak Tomb No. 3 and other contemporary Goguryeo tombs. One of the difficulties in responding to these questions is that the colors used in Chinese mural tombs constructed in the fourth and fifth centuries have not yet been widely examined. If we could obtain information on the pigments used in these Chinese tombs, it might help us determine the relationship between ancient Korean and Chinese tomb murals.

Mural tombs in Gansu Province in China have received more scholarly and scientific attention than contemporary Wei–Jin tombs in Liaoning Province. Jiayuguan Tomb No. 7 in Jiuquan, Gansu, dated to the third century (Western Jin), is a brick-chambered tomb composed of plain bricks interspersed with painted bricks. Paintings are drawn on small-sized bricks, with each brick depicting a particular figure or vignette. Each painted brick is coated with a very thin layer of plaster (about 1 to 2 mm), likely applied with a large brush rather than a plastering tool. There is no sign of underpainting, perhaps adding to the liveliness of the painted scenes. The major colors used are white (lead white), black (carbon), yellow/brown (goethite), and red (cinnabar, hematite). The pigments are similar to those of Goguryeo murals, but there are differences in terms of building materials and method of plastering between the two sets of tombs.

The Goguryeo mural tomb at Deokheung-ri (408), South Pyongan Province, North Korea, and Dingjiazha Tomb No. 5 (Sixteen Kingdoms period, 304–439) at Jiuquan, Gansu, China, are often compared due to the similarities of their tomb structures and paintings. Dingjiazha Tomb No. 5 at Jiuquan is a two-chambered tomb made of bricks. The walls and ceilings of the tomb are covered with a single layer of lime plaster, about 1–3 mm thick. The primary colors used are red and black in addition to the presence of light blue, brown, yellow, and white. The pigments include cinnabar, hematite (red),

30. The Mawangdui tombs were constructed for the Marquis of Dai and his spouse. Marquis Dai died in 186 BCE.

31. Jeon Hotae, *Goguryeo gobun beokhwa yeongu*.

goethite (yellow), carbon (black), azurite (blue), and calcite, quartz, talc, barite (white).[32] It is interesting to note that several varieties of white pigments are found in one tomb. By contrast, Goguryeo tomb murals typically employ only one type of white pigment in each tomb.

Only a few Northern Wei (386–534) mural tombs have been discovered in Datong, Shanxi, and Luoyang, Henan. One of the most famous is the tomb at Shaling, Datong, Shanxi (435). It is a one-chamber tomb with an entranceway made of small bricks. The murals, on a very thin plaster layer of about 0.1 to 0.3 mm, are otherwise quite similar to those of Goguryeo. They depict the tomb occupant, funeral procession, banquet, and mythological figures. A distinctive feature of Northern Wei tombs in Datong is the frequent appearance of lacquer paintings. Fragments of a lacquer-painted coffin were found at the Shaling tomb. Other examples of lacquer paintings during the Northern Wei are the painted screen at the Tomb of Sima Jinlong in Datong and the painted coffin at the tomb in Guyuan, Ningxia. The vivid brightness of the colors and thick volume of the line-work in late Goguryeo murals, such as those in the Ohoe Tomb, may have been the result of the use of lacquer as a binding medium, possibly the result of influence from these Northern Wei tombs.[33]

The tomb at Wanzhang, Cixian, Hebei, and the Tomb of Lou Rui at Taiyuan, Shanxi, are well-known mural tombs from the Northern Qi dynasty (550–577). The former tomb consists of a long entranceway and a single tomb chamber. Paintings are mainly found in the entranceway, depicting a large procession of figures and mythological animals. Pigment analysis at the tomb at Wanzhang revealed cinnabar (red), goethite (yellow), and carbon (black).[34] The Tomb of Lou Rui (d. 570) is a single-chamber tomb. The long entranceway, tomb entrance, and tomb chamber are all elaborately decorated. The paintings were drawn first with light ink and then filled with vivid colors. One can find the names of pigment colors, such as vermilion for cinnabar, written on some parts of the paintings. The major pigments employed are cinnabar, goethite, malachite, and azurite.[35] The thickness of the plaster layer in early and middle phase Goguryeo murals seems to be similar to that of late Northern Dynasties mural tombs. The plaster layer of the Tomb of Lou Rui, for example, is about 5 to 10 mm thick, as are the plaster layers of Goguryeo murals.

Pigments in Buddhist Cave Temples

Buddhist cave temples from the Northern and Southern Dynasties (420–581) and the Sui (581–618) and Tang (618–907) dynasties contain a large number of wall paintings. Two major cave complexes are the Mogao caves in Dunhuang, Gansu, and the Kizil caves in present-day Xinjiang. The Mogao Buddhist cave temples were carved out of the cliffs in the liminal area between China and the treacherous Taklamakan desert where the Silk Road from Xi'an split into two branches, one skirting the desert to the north and one to the south. The decorated rock-cut cave temples at Kizil were constructed from the third to the eighth century at an important oasis and commercial hub on the northern branch of the Silk Road in present-day Xinjiang. Construction did not begin at Mogao until the fifth century but continued longer than at Kizil. Because both cave complexes were located on the Silk Road, their mural paintings benefited from the ability to

32. Chen Gengling and Ma Qinglin, "Jiuquan Dingjiazha wuhao bihuamu xianxiang diaocha" [Investigation on the Dingjiazhan tomb no. 5 at Jiuquan], *Wenwu baohu yu kaogu kexue* [Cultural relics conservation and archaeology science] 14 (2002): 23–28.

33. Im Gweon-ung and Yi Jong-heon, "Goguryeo Ohoebun ohomyo beokhwaui jobyeokji gibeope daehan yeongu," 69–85.

34. Institute of Archaeology, Chinese Academy of Social Sciences, and the Hebei Provincial Institute of Archaeology, *Cixian Wanzhang* [Mural tomb of the Northern Dynasties period] (Beijing: Science Press, 2003), 287–89.

35. Shanxi Provincial Institute of Archaeology and Taiyuan Municipal Institute of Cultural Relics and Archaeology, *Beiqi Donganwang Lou Rui mu* [The tomb of Lou Rui, Prince Dong'an of the Northern Qi] (Beijing: Cultural Relics Publishing House, 2006), 204–05.

move pigments from their place of production to the cave sites along established trade routes. Painters at these sites were not restricted to locally sourced pigments, at least during periods when the trade routes were secure.

Goguryeo mural tombs are contemporary with those of the early phase of the Mogao caves, from the Sixteen Kingdoms period (304–439) to the Northern Dynasties (386–581). The middle phase corresponds to the Sui and Tang dynasties, and the late phase is considered to be after 907.[36]

There are three kinds of red pigments used at the Mogao caves in Dunhuang: hematite, cinnabar, and red lead. The red lead has experienced the greatest discoloration. Red pigments from Kizil caves comprise cinnabar and red lead. Early phase murals of the Mogao caves mostly used hematite. In the middle phase, cinnabar and red lead were mainly employed and the use of hematite decreased, to increase again during the late phase. Because a large amount of hematite was produced in the Hexi region of Gansu, the pigment was cheap and easy to obtain. Cinnabar was rare in the early Mogao caves, but its use increased in the middle phase when it became the main red pigment. This shift suggests that cinnabar was obtained from Central Asia in the early phase, but was produced in the Central Plains region of China during the middle and late phases, making it more accessible and relatively inexpensive.

By contrast, hematite was comparatively rare in mural paintings at Kizil. Cinnabar and red lead were the major red pigments used from the early to late phases, likely a result of the fact that hematite was not produced near the Kizil caves. The cinnabar employed in the early Kizil caves probably came from India or Afghanistan.

Lapis lazuli, imported from mines in northeast Afghanistan, was used for blue in all the decorated caves at Kizil and in the early Mogao caves. Azurite began to be used in the Mogao caves by the middle phase and the employment of lapis lazuli gradually decreased. Initially, azurite may have been introduced to Dunhuang from the Central Plains of China. The increased use of azurite, however, suggests that during the Sui and Tang dynasties azurite could be sourced locally from the Qilian Mountains in the Hexi region of Gansu Province.

The murals at the Kizil and Mogao caves exhibit different kinds of green pigments. Atacamite was used for green in every phase of the Kizil caves and in the early phase of the Mogao caves. Li Zuixiong suggests that atacamite was first introduced from Afghanistan to Kizil, located in the northwest of present-day Xinjiang, and then to Dunhuang, 1500 kilometers further east. Malachite was the primary green pigment used in the middle phase of the Mogao caves and may have been produced near the Qilian Mountains in Gansu. Another possibility is that merchants traveling the Silk Road brought malachite from the Central Plains to Dunhuang.[37]

At the Kizil caves, gypsum is the primary white pigment. At the Mogao caves many different kinds of white pigments were used, including kaolin (during the early phase), calcite (middle phase), and gypsum (late phase).[38]

Pigments in Japanese Tombs

The Takamatsu Tomb and the Kitora Tomb in the Asuka region of Nara Prefecture are often compared with Goguryeo mural tombs because of their iconographic and stylistic similarities, especially in depicting the Four Directional Animals and the constellations, as well as processions of human figures.

The Takamatsu Tomb and the Kitora Tomb (late seventh to early eighth century) have a single layer of plaster. The Takamatsu Tomb has a thin layer of lime plaster (2 to 7mm thick). There is a high lead content to the surface of the lime plaster used for the ground coating of the Takamatsu paintings, indicating

36. Li Zuixiong, *Sichouzhilu shikubihua caisu baohu* [Conservation of the wall paintings and colored statues of the grottoes on the Silk Road] (Beijing: Science Press, 2005), 40–42.

37. Ibid.

38. Ibid.

Color	Pigments
Ground coating	Lime plaster
White	Presence of lead white is suspected
Red	Cinnabar, red ochre
Green	Malachite
Blue	Azurite
Black	Chinese ink
Pink	Possibly a mixture of red and white
Other	Gold, silver

TABLE 4
Pigments used in the Takamatsu Tomb in Asuka, Nara, Japan[40]

probable use of lead white as a coating of the wall surface. It is assumed that the lead white used in the Takamatsu Tomb is not of Japanese origin.[39] Colors found in the Takamatsu Tomb include white (lead white), black (carbon), yellow (yellow ochre), red (hematite, cinnabar), green (malachite), blue (azurite), gold, and silver. Major pigments such as lead white, hematite, cinnabar, and malachite are similar to those found on the Goguryeo murals, while azurite has not been detected in Goguryeo.

The pigments used to decorate the Takamatsu Tomb are of much higher quality than the primitive pigments used in the protohistoric tombs located, for the most part, in northern Kyushu. The range of pigments (and color) is also much greater. The protohistoric mural tombs, constructed from the fifth to the seventh century, are decorated with paintings and line drawings. The best known decorated tomb is the mid-sixth-century Ozuka Tomb in Fukuoka Prefecture. Five kinds of colors were used: white, red, yellow, green, and black. The pigments analyzed are shown in table 5. Other decorated tombs in Kyushu exhibit similar pigments, indicating that these tombs employed pigments found near the region. No azurite, malachite, or cinnabar has been found in Kyushu tombs dated to the fifth to sixth century. No ground coating was used either. Pigments were directly applied to the relatively rough stone surfaces of the funerary chambers.

Mural tombs have also been found in the central and eastern parts of the main Japanese island of Honshu. The Torazuka Tomb, Ibaraki Prefecture, Honshu (early seventh century), shows paintings of circles, triangles, and other geometric shapes depicted in red ochre on a white clay ground. The analysis of pigments shows the use of red ochre, kaolinite, a-quartz, and feldspar. Clay was used as the ground coating, not lime plaster. Takamatsu is the only Japanese tomb that employed lime plaster for the ground coating of the paintings, although some other tombs in the central part of Japan used lime plaster to coat undecorated walls.

The use of lime plaster and the types of pigments used in the Takamatsu Tomb connect it more closely with the mural tradition of Goguryeo and Chinese tombs than with earlier Japanese tomb murals. The range and high quality of the pigments used in the Takamatsu murals are also related to those used in the famous murals in the main hall of the Hōryūji temple in Asuka, Japan (table 6). Comparison of pigments from Japanese tombs with those of Goguryeo and China clearly indicates that the paintings in the Takamatsu Tomb were closely related to the mural traditions of Goguryeo and China.

39. Yamasaki Kazuo and Emoto Yoshimichi, "Coloring Materials Used on Japanese Tumulus Paintings," in *International Symposium on the Conservation and Restoration of Cultural Property* (Tokyo: Tokyo National Research Institute of Cultural Properties, 1983), 143–53; Cultural Heritage Administration of Japan, *National Treasure, Takamatsu Tomb Murals* (Tokyo: Chuo Koron Bijutsu Shuppan, 2004), 15–16, 216.

40. Ibid.

TABLE 5
Pigments used in the Ozuka Tomb in Fukuoka Prefecture, Japan (mid-sixth century)[41]

Color	Pigments
White	Clay
Red	Impure red ochre
Yellow	Impure yellow ochre
Green	Powdered green rock
Black	Black mineral containing iron and manganese

TABLE 6
Pigments used in the Hōryūji paintings (seventh–eighth century)[42]

Color	Hōryūji Golden Hall
Ground coating	Clay
White	Clay
Red	Cinnabar, red ochre, red lead
Yellow	Yellow ochre, litharge
Green	Malachite
Blue	Azurite
Black	Chinese ink

I have examined the analysis of pigments used in Goguryeo mural tombs and compared them with those of Chinese and Japanese mural tombs. The pigments of Goguryeo mural tombs are closely related to those of Chinese mural tombs from the Han dynasty to the Northern and Southern Dynasties. The comparison of pigments in the murals of the Buddhist cave temples in Gansu and Xinjiang shows a change in the major pigments used, a shift likely based on trade patterns and the development of pigment mining in the region. Of all the Japanese tombs, the Takamatsu Tomb bears the closest resemblance to decorated tombs in Goguryeo, especially as regards pigments and preparation of the painting ground.

Constraints on *in situ* examination, sampling, and analysis have hindered research on Goguryeo mural pigments. Moreover, consideration of Goguryeo murals within the wider context of Chinese tomb murals and murals in the Buddhist cave temples in Xinjiang and Dunhuang is restricted by the relative paucity of similar research. If more technical examinations are conducted on earlier Chinese polychrome murals (especially of the Han dynasty and the Northern and Southern Dynasties), we will be able to draw firmer comparisons with Goguryeo mural colors to better understand the possible transmission or interaction of painting materials and techniques.

The Color Symbolism of Goguryeo Murals in East Asian Funerary Art

This essay began with an examination of pigments used in Goguryeo murals and compared them to murals in East Asian funerary contexts and Buddhist cave temples. The use of pigments depends on a number of factors including the availability of materials in the region and the choices of the artisan and patron (the tomb occupant and his family). The meaning embodied in the colors of a tomb's wall paintings needs to be understood within the context of the function of the funerary space.

41. Ibid.

42. Emoto Yoshimichi, "Coloring Materials Used on Japanese Mural Paintings," in *International Symposium on the Conservation and Restoration of Cultural Property—Conservation and Restoration of Mural Paintings (II)* (Tokyo: Tokyo National Research Institute of Cultural Properties, 1985), 158–59.

Colors in a tomb can be approached from two perspectives. One is to represent the actual life and visual culture of people at the time of construction. In the early and the middle phases of Goguryeo mural tombs, the notion of continuity of the present life after death appears to have been widespread among Goguryeo people. Thus, tomb paintings in those periods generally depict the tomb occupant in his daily life, including scenes like hunting, dancing, and banqueting. In this case, the colors employed in the wall paintings act as a visual record of the culture and life of the Goguryeo people. For example, the colors shown in the headdress of a portrait of a tomb occupant could potentially confirm a literary record describing Goguryeo costume, and could indicate the status of a tomb occupant.

Secondly, colors in a funerary space may embody hope for the afterlife and protect the deceased after death. For example, red, black, and yellow are associated with the notion of protection from evil spirits. They were also often used to designate the functions of certain areas of the tomb. Pigments related to these colors are often chemically potent. In later times, a similar color made from a different pigment was sometimes substituted. The color itself was then believed to carry the same potency as the original pigment.

The best example is the highly toxic pigment cinnabar and the color red. Since the Neolithic period in China, cinnabar has been important in funerary contexts. It was used as a precious substance presented in a pottery vessel, painted on the skeleton, or spread around or beneath the corpse. The custom of using cinnabar continued in later periods. An impression of a silk curtain and canopy (*huangwei*) was found on the soil in Tomb No. 1 at the Hengshui cemetery in the western part of Hengbei Village, Hengshui Town, in Jiangxian County, Shanxi Province. The tomb dates from the Western Zhou period (1046–771 BCE).[43] Examination of the red-colored silk canopy showed the use of cinnabar.[44] The Western Han Tomb No. 1 at Baoanshan in Yongcheng County, Henan, consists of a main chamber and side chambers. The side chamber to the south has a raised platform with walls painted red, suggesting that the space was made for a ritual function. In another well-known Western Han tomb at Mancheng, Hebei, the main chamber was made of stone slabs in the shape of a house with inner walls painted red.

Tomb No. 1 at Bailinpo from the Qijiang cliff-tomb complex in Santai County, Sichuan Province, consists of front, middle, and back chambers, besides side chambers. The ceilings of each chamber imitate those of tombs built of wooden timbers. A noticeable feature of the tomb is that a large pillar, painted bright red, stands prominently in the center of the back chamber. Imitation wooden timber structures painted red or black connect to the central pillar. The floor of the back chamber is raised above the other parts of the tomb and its bright red and black pillars and beams emphasize the austere atmosphere of the funerary space.[45]

The use of red and black to represent the underworld or the afterlife are manifested also in the lacquer-painted coffins from the Tomb of Marquis Yi of Zeng in Suizhou, Hubei (Warring States period), and the lacquered coffins from Tomb No. 1 at Mawangdui, Changsha, Hunan (Western Han).[46] During the Han dynasty, large numbers of tombs with relief sculptures were constructed besides tombs with wall paintings. Colors were used to demarcate specific spaces in relief-sculpture tombs, such as the one in Shaanxi Province, as well as in mural tombs. The relief sculptures in the Eastern Han tombs at Mizhi and Suide in northern Shaanxi were painted, especially

43. Shanxi Provincial Institute of Cultural Relics and Archaeology, "Shanxi Jiangxian Hengshui Xizhou mudi" [Western Zhou cemetery at Hengshui in Jiangxian County, Shanxi], *Kaogu* 7 (2006): 16–21.

44. Ma Ying et al., "Xizhou Pengguo mudi chutu huangwei yinhen de keji fenxi" [Scientific analysis of the remains of the Huangwei excavated from the tomb of the Peng State of Western Zhou], *Zhongwen Wenwu* 1 (2009): 102–12.

45. Sichuan Cultural and Archaeological Institute, *Santai qijiang yamu* [Santai Qijiang cliff tombs] (Beijing: Wenwu chubanshe, 2007), 154–55.

46. Guolong Lai's essay "Colors and Color Symbolism in Early Chinese Ritual Art" in this volume discusses the use of color at Mawangdui in more detail.

those at the tomb entrance, which included the lintel, a pillar, and the door. The subjects of the relief sculptures on the tomb entrance are a white tiger, a red phoenix, and the face of a monster, all protective images intended to avert evil spirits. The entrance to the tomb was considered an important liminal space between this world and the next. Depictions of the Gate to Heaven, a similar liminal area at the entrance to the afterlife, are an important subject in Chinese funerary art. A depiction of the heavenly gate on the back wall of the tomb chamber in the Eastern Han tomb at Baizicun, Xunyi, Shaanxi, is painted with bright yellow in a T shape. It emphasizes the role of such a transitional space joining the present world to the next world and probably helped the deceased recognize this important space even after his death.

Anak Tomb No. 3 shows the influence of these Chinese practices on Goguryeo funerary traditions. The portrait of the deceased is on a raised platform, emphasizing the ritual function of the painting and the space. The canopy over his head and his garments are painted vermilion with cinnabar. Aside from the layers of symbolic meaning related to the use of cinnabar, this bright red has a strong visual impact and serves to designate this portrait as the most important image in the tomb.

Goguryeo murals of the early and middle phases use red and black to highlight important architectural elements. The Tomb of the Wrestlers and the Tomb of the Dancers both have a prominent depiction of a red-colored wooden beam and pillar in the front and back chambers. In the Susan-ri Tomb, these red-colored pillars and beams became highly decorative, with elaborate black patterns that evoke lacquerware patterns of the Han dynasty. The function of the depiction of architectural elements inside a tomb could simply be a representation of the actual residence of the tomb occupant, but the red color applied so prominently is probably associated, rather, with the long-standing tradition of the use of cinnabar red in East Asian funerary art since the Neolithic period.

Around the fifth century, tombs with purely decorative motifs began to appear in Goguryeo. These tombs have no depictions of human figures in scenes of daily life, but rather are painted only with decorative motifs such as lotus flowers, concentric circles, and cloud motifs. One such tomb is the so-called Tomb of King Dongmyeong, founder of the Goguryeo kingdom. Located in Pyongyang, the main chamber of the tomb is completely covered in red with a circular lotus-flower motif painted in regular intervals along the walls. The appearance of tombs with purely decorative motifs appears to have been inspired by a sudden surge of worship of the founder of the Goguryeo kingdom, Jumong (King Dongmyeong), and tomb decoration may have derived from the decorations used in the founder's temple. In any event, these examples confirm that the pigment cinnabar and the color red possess prominent roles in demarking and highlighting the function of a ritual space in East Asian funerary art.

In late Goguryeo the symbolic meaning of the five colors associated with the four cardinal directions and the center became apparent with the depiction of the Four Directional Animals in a single chambered tomb. The four walls of a single-chambered Goguryeo tomb from the sixth and the seventh centuries are occupied by depictions of mythological animals. This subject has been attributed to the rise of Daoism in late Goguryeo, encouraged by the powerful general Yeon Gyesomun (603–666). The pigments in most late Goguryeo tombs were applied directly onto the polished stone walls and, even today, their colors appear relatively fresh. That they have been comparatively well preserved suggests the increased technical skill of Goguryeo artists in the late Goguryeo period.

The colors seen in Goguryeo tomb murals provide a vivid record of the visual culture of the Goguryeo people, enhancing depictions of architecture, decoration, furniture, and clothing. In addition, the colors used in Goguryeo tomb murals, and the pigments used to produce them, served symbolic roles in the funerary and ritual space of the Goguryeo kingdom.

SECTION III

The essays in this section focus on the materials used to dye textiles in East Asia, from about 200 BCE to the fourteenth century.

Analysis of the dyes used to color a textile not only helps to determine the original appearance of the textile but can provide clues about its provenance. Textiles were premier trade items and are often found in archaeological sites far from their place of manufacture. Inorganic dye materials could be traded over long distances, as could bark and dried roots, but most organic dye materials from plants were perishable and bulky and it was usual for dyers to rely on locally sourced materials. If they wanted the dye from a plant that did not grow locally, they were more likely to introduce and cultivate the plant than to import fresh or dried dye material.

Significant advances in technology have made it possible to undertake a serious study of the organic materials used to dye textiles in East Asia in the ancient and medieval periods. It is now possible to distinguish not only between various groups of plants that produce red dyes but even between different species within each group. The combinations and proportions of the dye components that produce madder reds, for example, vary distinctly between species. In recent years, Richard Laursen and his team have developed methods to distinguish between flavonoid yellow dyes also, something that had eluded researchers for many years. However, there is as yet no way to distinguish between the many tannin-based brown and black dyes, nor to distinguish between the several plants that produce indigo, the only fast blue. The chemical structures of the compounds in indigo blue are the same even in plants that are botanically unrelated. Most other organic colors, except purple from gromwell roots, are made by using a combination of two dyes or chemically altering a dye with the addition of an alkali or acid or one of a number of metallic mordants (see Appendix: The Substance of Color).

The section begins with an overview essay by Richard Laursen. Laursen examines the results of several years of analysis of red and yellow dyes from textiles found in tombs in Xinjiang to eighth-century textiles that have been preserved in temples in Japan and are now in the collections of the Museum of Fine Arts, Boston. His work is preliminary, but he is able to suggest differences in the species of madder plant and the types of yellow dyes used in various regions of East Asia. His team, for example, discovered a previously unknown yellow dye, derived from the ubiquitous poplar tree, in a textile from an archaeological site in Xinjiang. This is a strong indication that the thread to weave the textile was dyed locally and that the textile itself was produced in Xinjiang.

Chika Mouri focuses her essay on the study of a grass that was used both as a medicine and as a yellow dye. She uses a combination of historical texts and dye analysis to

Dyes in Ancient Chinese and Japanese Textiles

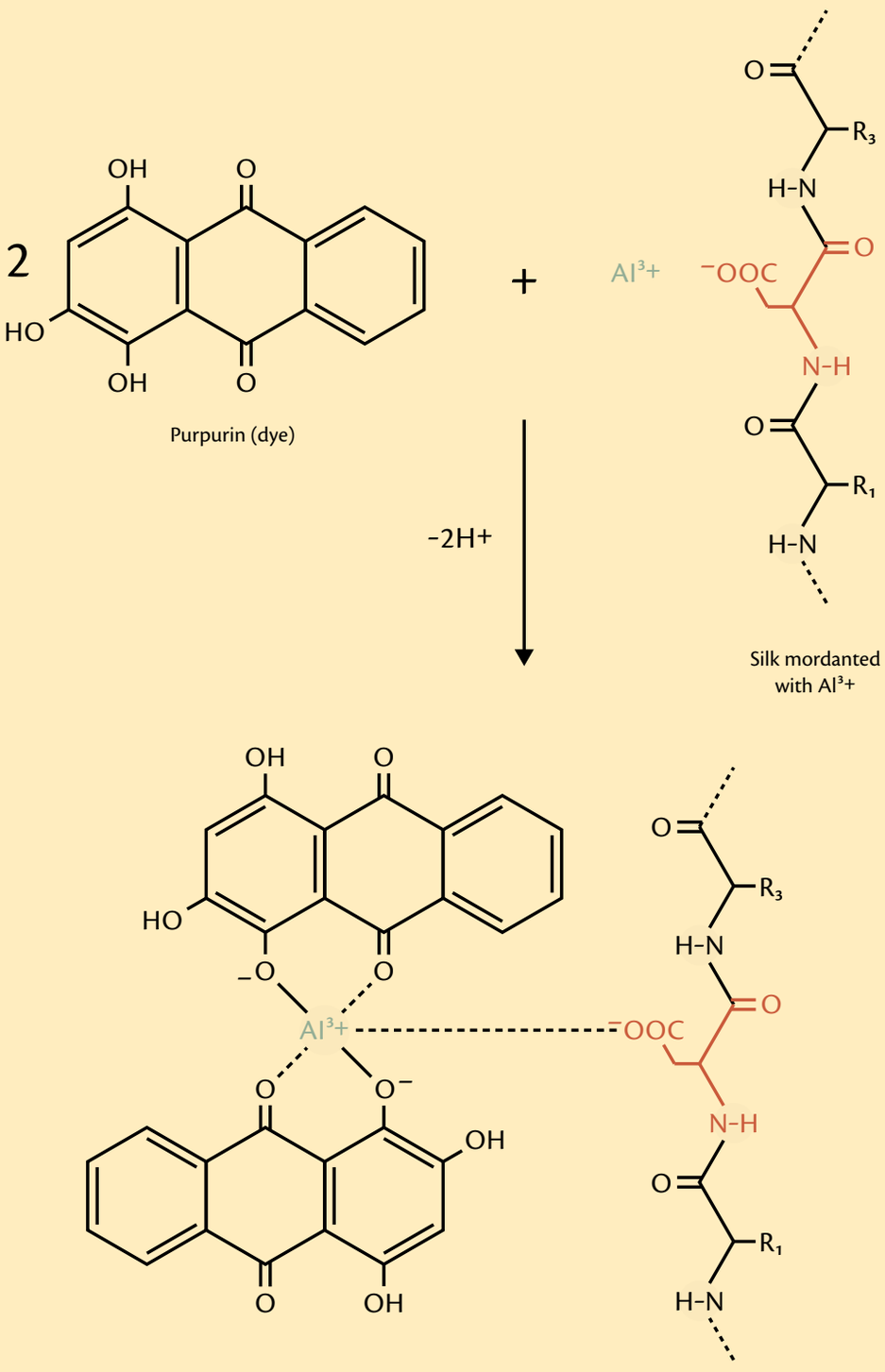
trace the history of the use of *jincao* (*Anthraxon hispidus*; J. *kobunagusa*) and is able to clear up some confusion in the literature. *Jincao* was one of the earliest dyes and medicines recorded in China. Although its use gradually declined in China, it continued to be used as a dye in Japan, and still today provides the distinctive yellow (*kihachijō*) that is a feature of silk kimono woven on the Japanese island of Hachijō.

Zhao Feng and Long Bo combine study of a rare early mention of imperial yellow in the sixth-century *Qimin yaoshu* (Important arts for the people's welfare) with experimentation to discuss the production of a yellow that was reserved for imperial use. Yellow could be derived from several common plants and was often considered a low-ranking or unranked color. The reddish yellow (*chihuang*) described in this text as reserved for imperial use had a specific source—the roots of the rehmannia plant (*dihuang*).

In the final essay of this section, Liu Jian and Zhao Feng use dye analysis to help determine the provenance of a Han-dynasty warp-faced compound tabby and a Tang-dynasty weft-faced compound twill (samite). The weave structure of the first is typical of elite textiles produced in central China at the time. The second is typical of luxury textiles produced in Persia and Central Asia in a weft-patterning method that eventually became a signature technique for woven textiles of the High Tang (eighth century) in China. Weft patterning allows larger, more complex, and more colorful patterns than warp patterning. These samites are often called 'Sogdian textiles' because of their association with the Sogdian merchants who played very active roles in Silk Road trade.[1] Both textiles were found in graves in Xinjiang with no indication of their provenance. The authors conclude that dye analysis supports central China as the place of production of the Han textile and excludes China as the source of the Sogdian silk, suggesting rather that it was woven in Central Asia, perhaps Bukhara.

1. Zhao Feng has referred several times to these textiles as Persian/Sogdian. Personal communication, October 2002, in Qinghai, China.

Diagram related to Appendix,
Section 8, Mordants, page 250



Yellow and Red Dyes in Ancient Asian Textiles

RICHARD LAURSEN

Introduction

Archaeological textiles are scarce. Like other organic matter, most textiles decompose as a result of microbiological degradation. A majority of organisms that cause degradation need liquid water, oxygen, and a relatively low osmotic pressure to flourish, so textiles and other organic materials tend to be preserved only where the environment is dry (deserts; high, cold mountains), anoxic (peat bogs), or salty (salt mines). Most humans, being organisms themselves, tend not to live in these environments—or to leave their textiles in such places.

In this essay I will focus on the yellow and red dyes used to color textiles in ancient and medieval East Asia as these give the most information about resources available to ancient dyers in particular places. There are several classes of red and yellow dyes, and even within classes individuals can often be distinguished one from another and provide specific information about the plant used to color the textile and, therefore, clues about the provenance of the textile. It is more difficult to identify the plant source for yellow dyes than for red dyes because of the huge number of plants that produce yellow dyes, although new methods of extracting colorants from a textile that we have developed or improved upon yield significantly more information about the original dyestuff than is possible to obtain with traditional extraction methods. Blue will be mentioned only in passing because, throughout the world, there is only one blue dye: indigo. Many plants produce indigo, but the chemical components are the same regardless of their source and therefore no conclusions can be drawn from their detection in a textile. Most browns and blacks are tannin-based and so far there are no methods available for distinguishing between them.

Red, yellow, and blue are the primary colors. All of the secondary colors (such as purple, orange, and green) can be made from a combination of two of the primary colors. In East Asia, there is also a plant-derived purple dye. Gromwell roots from *Lithospermum erythrorhizon* and *Lithospermum officinale* produce a deep purple that was apparently very popular in China as far back as the Warring States period (ca. 475–221 BCE).[1]

For this essay, I have divided the regions to be discussed into three parts: the Tarim Basin, China, and Japan (fig. 1). (Korea should be included, but we had no specimens from Korea to analyze.) The Tarim Basin is in present-day Xinjiang in northwestern China, a region that culturally and ethnically was traditionally more closely associated with Central Asia than with China. China exported aspects of its culture, political system, technology, and material culture west to the Tarim Basin, northeast to

1. Cheng Weiji, *History of Textile Technology of Ancient China* (New York: Science Press, 1992), 97–103, 310–20.

Korea, and east to Japan. Many textiles that have been found in these regions originally came from China. Dye analysis, combined with an analysis of textile structure, materials, and motifs, can help to determine a textile's place of origin.

To date, although there has been extensive analysis of the weave structures of textiles found in archaeological contexts and stored in temples and other repositories, there has been almost no analysis of the dyes used to color the textile. An exception is a published study of early Chinese dyes in a report on textiles from the Han tomb at Mawangdui.[2] This study, which was done over thirty years ago, reported finding evidence for yellow from a gardenia dye; it would be interesting to see what additional information modern instrumentation would reveal. Compared to the sophistication of structure analysis, dye analysis of ancient and medieval East Asian textiles is in its infancy.

Analytical Methods

Most dye components are synthesized in plant (or occasionally animal) cells as glycosides consisting of a colored aglycone, which is conjugated to a sugar. Sometimes the sugar is removed at some point before it is used for dyeing, but often it is not. Most natural dyes consist of mixtures of individual colored molecules, both aglycones and glycosides, which provide a profile or fingerprint indicative of the organism it came from. Knowledge of the organism that produced the dye can give clues as to the resources available to the people who dyed a specific textile. Sometimes it can help to determine where something was dyed.

The method we use for analysis of dye mixtures involves separation on an HPLC (high-performance liquid chromatography) column and detection of the eluted dyes by UV/Visible and mass spectrometry.[3] The use of online mass spectrometry, which we pioneered, makes it possible to characterize the glycoside forms of dyes. However, before the mixtures can be analyzed, the dye components have to be extracted from the textile fibers in such a way that the sensitive bonds linking the sugars to the aglycones are not broken. The traditional method involved heating in strong acid, which destroyed all the glycosides. Originally, we used extraction with a mild acid,[4] but now we use a weak base,[5] in both cases in conjunction with a good solvent. In this way we preserve the glycosides. The amount of material needed for analysis is fairly small: a thread or piece of yarn roughly 5 mm long.

Japan

The tenth-century *Kusagusa no some yōdo* (Miscellaneous dyeing supplies), fascicle XIV of the *Engishiki* (Regulations of the Engi era), lists the colors in use at the Heian court (794–1185) in Japan and the materials needed to produce them (table 1).[6]

It is difficult to obtain specimens of ancient Japanese textiles for dye analysis because most of the extant textiles in Japan are from tombs or temple repositories such as the Shōsōin repository at Tōdaiji temple or the Hōryūji Hōmotsukan (Gallery of Hōryūji Treasures) now at Tokyo National Museum. The latter two major collections of seventh- and eighth-century textiles are owned by the Imperial Household, which has placed severe restrictions on destructive dye analysis, even of a sample as small as 5 mm. Nevertheless, some textiles were taken out of Japan in earlier years as purchases or gifts, and we were able

2. Cultural Relics Press, *Report of the Shanghai Textile Research Institute and Shanghai Silk Company on the Analysis of Textiles from Mawangdui* [in Chinese] (Beijing: Cultural Relics Press, 1980).

3. Zhang Xian and Richard A. Laursen, "Development of Mild Extraction Methods for the Analysis of Natural Dyes in Textiles of Historical Interest Using LC-Diode Array Detector-MS," *Analytical Chemistry* 77, no. 7 (April 2005): 2022–25.

4. Ibid.

5. Chika Mouri and Richard Laursen, "Identification of anthraquinone markers for distinguishing *Rubia* species in madder-dyed textiles by HPLC," *Microchimica Acta* 179 (2012): 105–13.

6. Mary McClintock Dusenbury, "Radiance and Darkness: Color at the Heian Court" (PhD diss., University of Kansas, 1999), 165–68.

FIGURE 1
Map showing the three regions under discussion: Tarim Basin, China, and Japan. The dark blue line approximates the Silk Road, and the circles indicate the locations from which textile samples were obtained.

Color	Japanese name	English name	Scientific name	(Dye) or dye type
Red	*Akane*	Madder	*Rubia* spp.	Anthraquinone
	Suō	Sappanwood	*Caesalpina sappan*	(Brazilein)
	Benibana	Safflower	*Carthamus tinctorius*	(Carthamin)
Yellow	*Kuchinashi*	Gardenia	*Gardenia jasminoides*	Carotenoid
	Kariyasu	Dyeing grass	*Miscanthus tinctorius*	Flavonoid
	Hazenoki (Haji)	Wax tree	*Rhus succedanea*	Flavonoid
	Kihada	Amur cork tree	*Phellodendron amurense*	Protoberberine
Blue	*Ai*	Indigo	*Polygonum tinctorium* et al.	Indigoid
Purple	*Murasaki*	Gromwell	*Lithospermum officinale*	(Shikonin)
Brown/ Gray/Black	*Tsurubami*	Oak	*Quercus acutissima*	Tannin

TABLE 1
Japanese dyestuffs (mentioned in the *Engishiki*)

to obtain a few samples from the collection at the Museum of Fine Arts in Boston. Some of these came from the eighth-century Hōryūji temple, and others, of unknown provenance within Japan, were probably produced in the Heian period.

The forty-five specimens that we were able to obtain largely confirm the dye types listed in the *Kusagusa no some yōdo* and displayed in table 1. The most prevalent yellow was *kihada*, a mixture of protoberberine dyes (see fig. 2) generally obtained from the Amur cork tree (*Phellodendron amurense*), although a number of other plants also produce protoberberines.[7] A yellow sutra cover from Japan, thought to date to the Heian period, had been dyed with protoberberines, though it is not certain whether it was dyed in Japan or produced in China and exported to Japan.[8] We also found protoberberines combined with indigo (*ai*) to produce greens.

Of particular interest to us—at least at the time—was finding yellow dyes derived from the grass *kariyasu* (*Miscanthus tinctorius*) or *kobunagusa* (*Arthraxon hispidus*). Dyes from these two plants are chemically indistinguishable. Although old Japanese texts, such as the *Kusagusa no some yōdo*, generally refer to *kariyasu*, it is quite possible that the same word was sometimes used to describe both grasses.[9] From the Edo period (1603–1868) to the present day, *kobunagusa* has been used on the island of Hachijō to dye silk threads a distinctive yellow (*kihachijō*) used for making kimono. In most of the green specimens we analyzed, we found *kariyasu* mixed with indigo. (*Kariyasu* and *kobunagusa* are discussed in more detail in this volume by Chika Mouri.)

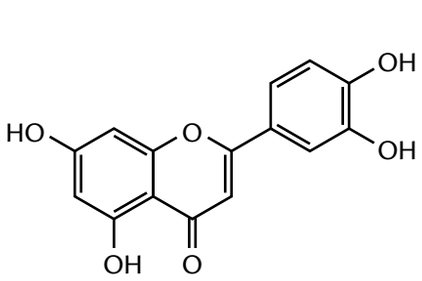
Madder, safflower, and sappanwood are the main red dyes that appear in early Chinese and Japanese texts. Our research has focused on madder both because of the samples that have been available for us to analyze and because madder was the ancient 'correct' red and an important source of red dye throughout East Asia. There are many species of madder and at least three of these have been used extensively for dyeing in East Asia, *Rubia tinctorum*, *Rubia cordifolia*, and, in Japan, *Rubia akane*.[10] The colorants in all species of madder are

7. Zhang Xian, Chika Mouri, Mikage Masayuki, and Richard Laursen, "Identification of Sources of Protoberberine Alkaloids Used as Yellow Dyes in Asian Objects of Historical Interest," *Studies in Conservation* 55 (2010): 177–85.

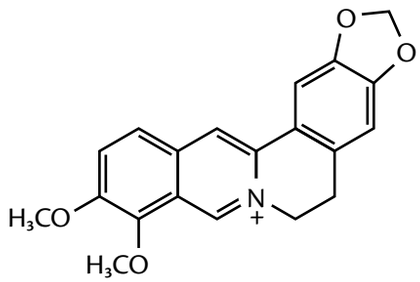
8. Ibid.

9. Chika Mouri and Richard Laursen, "Identification and Partial Characterization of *C*-Glycosylflavone Markers in Asian Plant Dyes Using Liquid Chromatography–Tandem Mass Spectrometry," *Journal of Chromatography A* 1218 (2011): 7325–30.

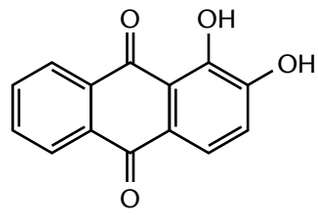
10. Mouri and Laursen, "Anthraquinone Markers," 105–13.



LUTEOLIN (FLAVONOID)



BERBERINE (PROTOBERBERINE)



ALIZARIN (ANTHRAQUINONE)

FIGURE 2
Examples of typical natural textile dye components. Luteolin and its many derivatives are yellow flavonoids, which are found in all green plants. Berberine is typical of the yellow protoberberines, which are typically found in the roots and stems of plants such as species of cork tree (*Phellodendron* spp.). Alizarin is one of the anthraquinones, all of which are red and are found in the roots of various species of madder (*Rubia* spp.).

red anthraquinones (fig. 2), and the predominant red colorants in most species are alizarin and/or purpurin. In *Rubia cordifolia*, the primary colorant is purpurin. *Rubia tinctorum* contains some purpurin but more alizarin. A native Japanese madder, *Rubia akane* (*Nihon akane* or Japanese madder), contains purpurin but is unusual among madder species in that the primary colorant is 6-hydroxyrubiadin, or derivatives of it.[11]

Because purpurin (and other reds, such as those from safflower, sappanwood, lac, etc.) has a more bluish hue than either alizarin or 6-hydroxyrubiadin, red dyes were often, in many countries, applied over a yellow ground to produce a more fiery, orangey-red.[12] In any event, we found only *Rubia akane*–derived dyes in our specimens from Hōryūji, and these were not in conjunction with a yellow dye. We did not find evidence of any other red dyes in the Nara- and Heian-period samples available to us.

China

China is defined here as being the area east of the Qinghai–Tibetan plateau. It was not until Han-dynasty forces first expelled the Xiongnu from the Gansu (Hexi) Corridor in the late second century BCE that the Chinese were able to establish a presence in the Tarim Basin region, although this presence was not maintained.

Ironically, although the culture of silk originated in China, and was exported from there to Korea, Japan, the Tarim Basin region, and beyond, we do not yet have much direct evidence concerning the dyes that were used in ancient China itself. The climate in the ancient heartland of China is not conducive to the preservation of textiles, and few of the textiles that have been excavated have undergone dye analysis. For example, the second-century BCE Western Han royal tombs at Mawangdui at Changsha, excavated between 1972 and 1974, contained a number of well-preserved silk objects, but the dyes have not yet been analyzed using modern technology.

I am unaware of a Chinese document similar to the tenth-century Japanese *Kusagusa no some yōdo*. Perhaps the closest are a seventeenth-century encyclopedia by Song Yingxing (1587–1666)[13] and a late-twentieth-century volume on ancient Chinese textile technologies by Cheng Weiji.[14] Both summarize information about dye materials from earlier sources (see table 2).

According to Cheng, over one hundred plant dyes were utilized between the Qin (221–206 BCE) and Qing (1644–1911) dynasties. Table 2 summarizes their findings. The list

11. Ibid.

12. Dominique Cardon, *Natural Dyes: Sources, Tradition, Technology and Science* (London: Archetype Publications, 2007), 284.

13. Song Ying-Hsing, *T'ien-kung k'ai-wu* [Chinese technology in the seventeenth century] (University Park, PA: Pennsylvania State University Press, 1966), 73–79.

14. Cheng Weiji, *History of Textile Technology*, 97–103, 310–20.

includes two green dyes. However, we know from our own experiments that both of the species listed produce yellow dyes. It is safe to say, based on experiment and the nature of the electromagnetic spectrum, that a true green natural dye does not exist. Green can be obtained (from the known natural dyes) only by combining yellow and blue, although sometimes a greenish yellow can be obtained by using a yellow dye with copper as a mordant. Cheng reports that the use of cupric salt (copper sulfate) in conjunction with a yellow dye to produce green was known in ancient China.[15]

One must maintain some skepticism regarding information in these compilations as they are at best secondary sources;[16] in fact, they may reflect information that has been re-copied many times over a period of more than two thousand years. Also, we know from our own studies that some of what is written is either not entirely correct or indicates a lack of understanding of certain processes. Nevertheless, all the plants listed in table 2 are available in China and produce the colors indicated.

We have not analyzed the dyes from any early textiles known to have come from China, although some that we analyzed from the Tarim Basin and Japan may have originated in China (see the following section).[17] A specimen we analyzed from a tomb in Mongolia probably did come from China. We analyzed a single specimen of red-dyed silk from a first- or second-century CE Xiongnu tomb in Mongolia (see figs. 1 and 3) and found that the dye contained primarily purpurin and munjistin, and lacked alizarin, which is consistent with its having been dyed with madder, specifically *Rubia cordifolia*, and with its having been produced in China. We suspect that it was tribute silk sent from China to placate the Xiongnu.

On the other hand, we also analyzed fibers from a multicolored textile dated to the Song or Yuan dynasty that had clearly been dyed with *Rubia tinctorum* (red), as well as with pagoda-tree buds (*Sophora japonica*; yellow and green) and indigo (blue and green). However, this textile was produced nearly one thousand years later than the the Xiongnu mortuary textile discussed above, by which time trade routes had been well established.

Tarim Basin

The Tarim Basin, because of its extreme aridity, has proved to be an outstanding location for the preservation of organic materials, including not only textiles, but also the desiccated corpses of the individuals with whom the textiles were buried.[18] Consequently, most of the Chinese textile dye analyses to date have been from objects found in this part of the world.

Whereas most preserved textiles in Japan and China are made of silk or a bast fiber (hemp or ramie), the earliest textiles excavated from tombs in the Tarim Basin are wool. The yellow dyes also differ (see table 3). The discovery of woolen textiles is not surprising as pastoralists entered the Tarim Basin at least four thousand years ago, bringing their flocks with them and introducing a wool culture to the region. Some of the mummies have distinctive Caucasoid features, descendants of early inhabitants who had probably migrated from Central Asia or the Russian steppes.[19] The earliest silk excavated in this region dates

15. Cheng Weiji, *History of Textile Technology*, 102.

16. Cheng Weiji, *History of Textile Technology*, 97–103, 310–20; Song Ying-Hsing, *T'ien-kung k'ai-wu*, 73–79.

17. We have, however, analyzed some early-nineteenth-century yellow China-trade textiles and fibers, and found dyes from turmeric (*Curcuma longa*), *huangteng* (*Fibraurea* sp., a source of protoberberines), and pagoda-tree buds (*Sophora japonica*). Zhang et al., "Protoberberine Alkaloids," 177–85; Zhang et al., "Characterization of yellow dyes in nineteenth-century Chinese textiles," *Studies in Conservation* 52 (2007): 211–20.

18. Elizabeth Wayland Barber, *The Mummies of Ürümqi* (New York: Norton, 1999); J.P. Mallory and Victor H. Mair, *The Tarim Mummies* (London: Thames and Hudson, 2000); Dominik Keller and Regula Schorta, eds., *Fabulous Creatures from the Desert Sands* (Riggisberg: Abegg-Stiftung, 2001); Zhang Xian, Irene Good, and Richard Laursen, "Characterization of Dyes in Ancient Textiles from Xinjiang," *Journal of Archaeological Science* 35 (2008): 1095–1103; Liu Jian, et al., "Identification of Ancient Textiles from Yingpan, Xinjiang, by Multiple Analytical Techniques," *Journal of Archaeological Science* 38 (2011): 1763–70; Liu Jian et al., "Characterization of Dyes in Ancient Textiles from Yingpan, Xinjiang," *Journal of Archaeological Science* 40 (2013): 4444–49.

19. Barber, *Mummies of Ürümqi*; Mallory and Mair, *Tarim Mummies*.

TABLE 2
Chinese dyestuffs
(from Cheng and Song)

Color	English name	Scientific name	(Dye) or dye type
Red	Madder	*Rubia cordifolia*	Anthraquinone
	Sappanwood	*Caesalpina sappan*	(Brazilein)
	Safflower	*Carthamus tinctorius*	(Carthamin)
Yellow	Gardenia	*Gardenia jasminoides*	Carotenoid
	Pagoda tree	*Sophora japonica*	Flavonoid
	Turmeric	*Curcuma* spp.	Curcuminoid
	Barberry	*Berberis thunbergii*	Protoberberine
	Venetian sumac	*Cotinus coggygria* (= *Rhus cotinus*)	Flavonoid
"Green" (actually yellow)	Hispid arthraxon	*Arthraxon hispidus*	Flavonoid
	Dahurian buckthorn (Chinese green)	*Rhamnus davurica*	Flavonoid
Blue	Indigo	Various species	Indigoid
Purple	Gromwell	*Lithospermum erythrorhizon*	(Shikonin)

TABLE 3
Tarim Basin dye types
(found in textiles so far)

Color	English name	Scientific name
Red	Madder	*Rubia tinctorum* (on wool and silk)
		Rubia cordifolia (on silk only)
Yellow	Protoberberine	*Phellodendron chinense*? (on silk only)
	Flavonoids	*Populus pruinosa*? (on wool only)

from the Han dynasty in the first or second century BCE, the period when the Han dynasty was beginning to establish trade routes in the region. Although Chinese silk continued to be found in tombs in the Tarim Basin, it appears that sometime during the first centuries of the Common Era silk production was established in several of the oasis towns that skirted the Taklamakan desert, including Khotan (Hetian or Hotan) in the southern part of the Tarim Basin. If silk was produced in the Tarim Basin, presumably it was dyed there, too.

Analytical data on Tarim Basin dyes come from specimens obtained at four locations: Cherchen, Loulan (unpublished results from our lab), Shanpula (near Khotan), and Yingpan (see fig. 1).[20]

The first published data came from woolen objects dating from about the third century BCE to the fourth century CE found at the cemetery at Shanpula in the southwest region of the Tarim Basin.[21] The analyses are incomplete, but show that most of the reds are from madder, although some scale-insect reds are reported, too. The madder is identified as *Rubia cordifolia*, although because of the predominance of alizarin it must be *Rubia tinctorum*.[22] The yellows are reported as flavonoids of some

20. For Cherchen, see Zhang, Good, and Laursen, "Textiles from Xinjiang." For Shanpula, see Keller and Schorta, *Fabulous Creatures*. For Yingpan, see Liu et al., "Identification of Ancient Textiles," and Liu et al., "Characterization of Dyes."

21. Keller and Schorta, *Fabulous Creatures*.

22. Chika Mouri and Richard Laursen, "Identification of anthraquinone markers for distinguishing *Rubia* species in madder-dyed textiles by HPLC," *Microchimica Acta* 179 (2012): 105–13.

sort, but could not be further differentiated because of the limited technology used around 2000 when the studies were conducted. The next set of data came from wool specimens unearthed in Cherchen in the southeast corner of the Tarim Basin and dated to roughly 1000 BCE.[23] In this case the reds were from madder, specifically *Rubia tinctorum*. As in the Shanpula textiles, the yellows were also flavonoids, though it was noticed that the pattern was not that of weld (*Reseda luteola*), which was widely used in Europe and the Middle East. In fact, we detected a distinctive new flavonoid (most likely luteolin 7-glucuronide) that has never been reported in the literature on dyeing and so far seems to occur only in Tarim Basin textiles.

The third set of specimens was wool, from the Stein Collection at the Victoria and Albert Museum in London. These were found at Loulan. The dates are not known exactly because the cemetery appeared to have been used for many years. However, they must be earlier than the fourth century CE because Loulan was abandoned about that time due to the drying up of the lake, Lop Nor. Here again, we found reds from *Rubia tinctorum* and flavonoid yellows, including the distinctive flavonoid seen at Cherchen. There was also one specimen, part of which seemed to have been dyed with the scale insect lac.

Subsequently, Liu Jian analyzed the dyes in a large number of specimens from Yingpan, which is about 200 km west of Loulan. Some of the results are now published.[24] The age of the specimens is not known exactly except that they are probably earlier than the fourth century CE. In this case, both silk and wool specimens were examined. It was found that most of the reddish silk and wool samples had been dyed using *Rubia tinctorum*, an exception being one silk that was dyed with *Rubia cordifolia*. Again, the yellow-green wool specimens had been dyed with flavonoid dyes (plus indigo in the case of the green colors), including the newly found flavonoid found at Cherchen and Loulan. All of the yellow silk textiles had been dyed with protoberberine dyes.

The source of the mysterious yellow dye found at three sites in the Tarim Basin, and unique to it, is not known for sure, but we suspect it may be leaves from one or both of the desert-tolerating poplar trees *Populus pruinosa* and *Populus euphratica*, which have grown in the Tarim Basin for millennia. This would have been a dye source available to the earliest settlers. We have found the same yellow flavonoid (the putative luteolin 7-glucuronide) in both the textiles and the leaves of these trees.

Development and Evolution of the Use of Red and Yellow Dyes in Asia

It seems likely that people initially used whatever colorants they could find around them. Then, as their societies became more complex and as trade routes were established, they developed or imported others. In the areas under discussion, two cultures evolved: a wool culture, originating west or north of the Tarim Basin, and a silk culture, originating in China. The people who settled on the edges of the Tarim Basin three or four thousand years ago probably used local plants to dye their wool, including leaves of the local poplar trees that produce flavonoid compounds that have not been found elsewhere. Sericulture developed in China at least five thousand years ago and by the advent of the Han dynasty (206 BCE), silk cultivation, processing, weaving, and dyeing were highly developed. Most Chinese silks destined for regions to the west passed along the trade routes that skirted the Taklamakan desert in the Tarim Basin, and it appears that

23. Zhang, Good, and Laursen, "Textiles from Xinjiang."

24. Liu et al., "Identification of Ancient Textiles," and Liu et al., "Characterization of Dyes."

TABLE 4
Summary of Asian dyes reported or observed

Color	Tarim Basin (wool & silk)	China (silk)	Japan (silk)
Red	Madder (*R. tinctorum**) (found on wool and silk)	Madder (*R. cordifolia*) (*R. tinctorum*†)	Madder (*R. akane*‡)
		Safflower† (*C. tinctoria*)	Safflower (*C. tinctoria*‡)
	Lac* (?)	Sappanwood† (*C. sappan*)	Sappanwood (*C. sappan*)
Yellow	Flavonoid* (on wool)		
	Protoberberine* (on silk)	Protoberberine† (*Berberis* spp. or *P. chinense*?)	Protoberberine‡ (*P. amurense*)
		Grass (*A. hispidus*)	Grass‡ (*M. tinctorius* or *A. hispidus*)
		Smoke tree (*Rhus cotinus*)	Wax tree (*Rhus succedanea*)
		Gardenia (*G. jasminoides*)	Gardenia (*G. jasminoides*)
		Pagoda tree§† (*S. japonica*)	
		Turmeric† (*Curcuma* spp.)	
Blue	Indigoid*	Indigoid†	Indigoid‡
Purple		Gromwell (*L. erythrorhizon*)	Gromwell (*L. officinale*)

* Observed in ancient (pre-5th century CE) textiles

‡ Observed in 8th- to 12th-century textiles

§ Observed in a Song/Yuan-dynasty textile (10th to 14th century)

† Observed in 19th-century textiles

there was at least rudimentary silk production (if not yet cultivation) in the Tarim Basin in the first century CE.

In Japan, fragments of silk have been found in Yayoi- (300 BCE–300 CE), Kofun- (ca. 250–538 CE), and Asuka-period (552–710) tombs, such as the rich Fujinoki Kofun in Nara Prefecture, dating to the late sixth or early seventh century CE. These precious fragments may have been imported, but by the eighth century (Nara period, 710–794), Japan had absorbed a great deal of continental culture, including textile and dye technologies.

Table 4 summarizes reported and observed information about dyes used in ancient East Asia; figure 3 indicates schematically our ideas regarding the diffusion of dyeing technology during those times.

Conclusions

The following conclusions pertain primarily to red and yellow dyes used in the three areas under discussion (see fig. 3). Some of these hypotheses may be wrong, but they provide a starting point for discussion.

1. The culture of silk developed in China nearly five thousand years ago, and by the time of the Han dynasty many silk dyes,

FIGURE 3
Hypothetical scheme depicting the introduction and dissemination of textile fiber and dye technology in East Asia based on the estimated ages of the specimens analyzed and the dyes found in them. The green lines approximate the growth ranges of the three species of madder (*R. tinctorum*, *R. cordifolia*, and *R. akane*).

including *Rubia cordifolia* for red and protoberberines (e.g., from species of cork tree or barberry) for yellow, had been developed. Silk was always a luxury item and its use was generally restricted to the elite or very wealthy classes. Besides the expense of silk, sumptuary laws restricted its use. An analysis of silk dyes tells us only what dyes were available for the elite. The same dyes might or might not have been available to the majority of the population.

2. The Tarim Basin was originally settled by Caucasoid peoples from the west or north, who brought sheep with them and established a wool culture, using locally available plants for dyeing, *Rubia tinctorum* for red and flavonoid dyes (e.g., poplar leaves) for yellow.
3. During the Han dynasty China established a presence in the Tarim Basin, opening up trade routes that have become popularly known as the Silk Road. Although China tried to protect its silk industry, silk production outside China soon followed. Silk produced in the Tarim Basin presumably was dyed red with the local species of madder (*Rubia tinctorum*); most of the yellow silk was dyed with protoberberine dyes, which may have been imported from China. We do not know why protoberberines were used so exclusively for silk, but we suspect that they may have been dyed with extracts of *Phellodendron chinense*, which grows near Xi'an at the eastern end of the Silk Road, rather than by *Phellodendron amurense*, which grows in northeastern China, Korea, and Japan.
4. Silk was introduced to Japan from China in about 300 CE, and Chinese and Korean craftsmen brought new dyeing technology to Japan from the fourth to the seventh centuries. By the Heian period the use of silk was well established among the elite, and dye technology in Japan had become very sophisticated. The dyes used were similar to those used in China, but occasionally local species were used instead of the imported plant (e.g., in the case of madder, *Rubia akane* for *Rubia cordifolia*).

5. Dyes such as sappanwood and lac may have been introduced later to both China and Japan. They would have had to be imported from more tropical locales.
6. Safflower (the source of the red dye carthamin) is thought to have originated in Egypt and to have been brought to China along the Silk Road during the Han dynasty. From there, it could have been introduced to Japan.
7. The opening of the Silk Road during the Han dynasty began a dynamic era of cultural and economic exchange between East and West, and likely resulted in the availability of new dyes and dye technologies throughout Asia.

Acknowledgments

I would like to give special thanks to Chika Mouri, Liu Jian, and Zhang Xian, who analyzed most of the specimens discussed here.

PHOTO 1
Woman wearing *kihachijō* (yellow) dyed silk kimono woven on the island of Hachijō.

Jincao (*Arthraxon hispidus*)

A Plant Used in Traditional Chinese Medicine and for Dyeing Yellow

CHIKA MOURI[1]

Throughout history, many plants used in Chinese and Japanese traditional medicine have also been used for dyeing. One of these is a species of grass, *jincao*. It has generally been thought that *jincao* is *Arthraxon hispidus* (Thunb.) Makino (photo 2), which, even today, is used to dye silk yellow on the island of Hachijō in Japan (photo 1). However, Makino Tomitaro, a Japanese botanist, has suggested that *jincao* might be a different grass, *Cleistogenes hackelii* (Honda) Honda (photo 3).[2] The dye compounds in *A. hispidus* have been studied, but not those in *C. hackelii*.[3]

According to the *Mingyi bielu* (Supplementary records of famous physicians), written during the second or early third century CE, the best location for growing *jincao* is in Sichuan Province and the best times for harvesting are the ninth and tenth months in the old Chinese calendar,[4] approximately August and September in the present calendar.[5] On the island of Hachijō in Japan, it is said that harvesting of *A. hispidus* earlier or later produces greenish or reddish yellows, respectively.[6] The brightest yellow is produced when the plant is harvested just before the formation of spikes (i.e., flowering or inflorescence).[7] The grass called *kariyasu* (*Miscanthus tinctorius* [Steud.] Hack.) in Japan (photo 4) contains dye compounds similar to those in *A. hispidus*;[8] it is said to grow best on Mount Ibuki in central Japan.[9] Dyers probably noticed years ago that the color was influenced by where the grass grew and when it was harvested. I therefore thought it would be meaningful to study the color of textiles dyed with extracts of those plants that had been collected at various locations and had been harvested at different times.

Like other resources used in both countries, it is known that *A. hispidus* was used in China and that *A. hispidus* and *M. tinctorius* were used in Japan, but differences in *how* they were used in the two countries has not been recognized, except for the use of *jincao* in China for

1. The primary research for this essay was conducted in Richard Laursen's laboratory at Boston University. I would like to express my thanks for his guidance, interest, and support. The 'we' and 'our' in this essay refer to Dr. Laursen and myself.

2. Makino Tomitaro, *Shokubutsu ichinichi ichidai* [One plant topic each day] (Tokyo: Hakuhinsha, 1998), 107–10.

3. Chika Mouri and Richard Laursen, "Identification and Partial Characterization of *C*-Glycosylflavone Markers in Asian plant dyes using liquid chromatography–tandem mass spectrometry," *Journal of Chromatography A* 1218 (2011): 7325–30.

4. Okanishi Tameto, *Jūshū Shinshū honzō* (*Xinxiu bencao*) [*Materia medica* commissioned by the Tang government in 659 CE] (Hyōgo: Gakujutsu Tosho Kankōkai, 1978), 67. The text is in Chinese with a Japanese introduction.

5. Yamazaki Seijū, *Kusakizome: senryō shokubutsu zukan* [Illustrated book of dye plants], vol. 1 (Tokyo: Bijutsu Shuppansha, 1985), 108–09; Dominique Cardon, *Natural Dyes: Sources, Tradition, Technology and Science* (London: Archetype Publications, 2007), 204; Hata Hideo, "Hata Hideo somemono chōsa hikae" [Research notes on dyes by Hata Hideo], in *Senryō shokubutsu fu* [Information on dye sources], Gotō Shōichi and Yamakawa Ryūhei, eds. (Kyoto: Hakuhōsha, 1972), 1058. Records made in 1930 by Hata are reprinted in the 1972 version of the Gotō and Yamakawa book.

6. Arazeki Tetsuji, *Kihachijō sono rekishi to seihō* [History and dyeing procedures of Kihachijō silk textiles] (Tokyo: Suiyōsha, 1978), 28–31; Saijō Yoshihiro (Kihachijō dyer on the island of Hachijō), in discussion with the author, Tokyo, December 2011.

7. Cardon, *Natural Dyes*, 204.

8. Mouri and Laursen, *Journal of Chromatography A* 1218 (2011): 7325–30.

9. Yoshioka Sachio, *Nihon no iro o someru* [Dyeing colors in Japan] (Tokyo: Iwanami shoten, 2002), 67–68. Ono Ranzan, *Honzō kōmoku keimō: honbun kenkyū sakuin* [Compendium of *materia medica* for enlightenment], ed. Sugimoto Tsutomo (Tokyo: Waseda Daigaku Shuppanbu, 1974), 220–21.

dyeing.[10] In this essay, I would like to add some information about the use of *M. tinctorius* in Japan and try to clear up some of the confusion regarding the use of *A. hispidus*, *M. tinctorius*, and other Gramineae (grass family) plants as sources of yellow dye.[11]

In this study, we compared dye compounds in *A. hispidus* and *C. hackelii*, and measured the color of the silk dyed with *A. hispidus* and *M. tinctorius* grown in different locations and harvested at different times. In addition, we searched the literature to reveal the history of the use of *A. hispidus* and *M. tinctorius* in dyeing and medicine in China and Japan.

Experiments

Plant Materials

All plant materials were obtained in Japan. For comparison of chemical components, *A. hispidus* was collected on September 2, 2010, in Kanazawa City, Ishikawa Prefecture, and *C. hackelii* was collected on August 30, 2010, in Tokushima City, Tokushima Prefecture. For dyed silk color comparisons, *A. hispidus* was collected at a sunny site in the town of Kakumamachi, Kanazawa City, four times and seven times during the summer and fall of 2009 and 2010, respectively. Collection locations and conditions for *M. tinctorius* were Mount Takao, Kanazawa City (wild plants in a sunny place), Mukoterayama, Tokushima City (cultivated plants in a sunny location), and the town of Echizen, Nyū district, Fukui Prefecture (wild, in the shade). At each place, plants were collected four to eight times during the summer and fall of 2010. The origin of cultivated plants in Tokushima City was Mount Iwo, Kanazawa City.

Dyeing of Silk

Five grams of silk cloth was mordanted in 300 mL of water containing 3g of alum [$AlK(SO_4)_2.12H_2O$] and 0.9g potassium hydrogen tartrate. The mixture was heated at a simmer for thirty minutes and allowed to cool

PHOTO 2
Arthraxon hispidus (Thunb.) Makino at Kakuma, Kanazawa, on September 25, 2009.

PHOTO 3
Cleistogenes hackelii (Honda) Honda at Takasa, Echizen-cho, Nyū-gun, Fukui-ken, on August 7, 2010.

PHOTO 4
Miscanthus tinctorius (Steud.) Hack., at Kigoyama, Kanazawa-shi, Ishikawa-ken, on September 16, 2009.

10. Zhao Feng, ed., *Zhongguo sichou tongshi* [General history of Chinese silk] (Suzhou: Suzhou University Press, 2005), 56.

11. Gotō Shōichi and Yamakawa Ryūhei, eds., *Senryō shokubutsu fu* [Information on dye sources] (Kyoto: Hakuhōsha, 1972), 307–308.

overnight. The silk was rinsed with tap water and allowed to dry at room temperature.

Dried leaf material (ca. 80 mg of *M. tinctorius* or ca. 25 mg of *A. hispidus*) was chopped into small pieces and soaked in 10 mL of deionized water for thirty minutes. The mixture was heated to boiling on a hot plate for ten minutes and allowed to cool, after which time the liquid was decanted. A sample of mordanted silk cloth (1 × 1 cm; ca. 80 mg) was put into the dye bath and the mixture was simmered for thirty minutes. Water was added as necessary to maintain the original volume. After heating, the mixture was allowed to cool to room temperature and the silk sample was removed, washed with tap water followed by deionized water, and then dried at room temperature.

Extraction of Dyes from Textiles

Dyed textiles were extracted using a "soft" procedure, namely, by heating approximately 0.1–1 mg of fibers in 200 µL of a solution of pyridine/water/1.0 M oxalic acid in water (95:95:10) at 100°C for fifteen minutes, as described in detail.[12]

Analysis of Dye Components

Extracts of dyed silk were analyzed by a high-performance liquid chromatography (HPLC) system with photodiode array and mass spectrometric detection using an Agilent 1100 HPLC consisting of an automatic injector, a gradient pump, a Hewlett-Packard series 1100 diode array detector, and an Agilent series 1100 VL online electrospray ionization mass spectrometer, essentially as described earlier.[13] Operation of the system and data analysis were done using ChemStation software and detection was done in the negative ion [M-H]-mode. Separation of dye components was made on a Vydac C18 reversed phase column (2.1 mm diameter × 250 mm long; 5-µm particle size). Columns were eluted with acetonitrile-water gradients containing 0.1 percent formic acid in both solvents.

Color Measurement

Textile color measurements were made using a fading tester.[14] The textile samples were illuminated with a xenon lamp, and reflected light was gathered at forty-five degrees and transmitted through an optical fiber to a photodiode array detector. The reflected light was analyzed numerically using L*a*b* color space (CIELAB) coordinates. Each dyed-silk sample was measured five to seven times. The value shown for each sample is an average of these measurements.

Results and Discussion

Comparison of Chemical Components in Silk Dyed with *A. hispidus* and *C. hackelii*

Analyses of the extracts of silk dyed with *A. hispidus* and *C. hackelii* (fig. 1) showed not only that the silk dyed with *C. hackelii* was considerably less saturated than the silk dyed with *A. hispidus*, but also that few of the most prominent dye components were present. This experiment suggests that *C. hackelii* is not an effective dyestuff and probably was not *jincao*.

Measurement of L*a*b*color Values for Silk Dyed with *A. hispidus* and *M. tinctorius* Collected at Different Locations and Times of Harvest

The CIEL*a*b* color scale (CIE refers to Commission Internationale de l'Éclairage) is a means of numerically describing colors, or in this case, color changes. L* refers to the

12. Mouri and Laursen, *Journal of Chromatography A* 1218 (2011): 7325–30.

13. Zhang Xian and Richard A. Laursen, "Development of Mild Extraction Methods for the Analysis of Natural Dyes in Textiles of Historical Interest Using LC-Diode Array Detector-MS," *Analytical Chemistry* 77, no. 7 (April 2005): 2022–25.

14. Paul M. Whitmore, Pan Xun, and Catherine Bailie, "Predicting the Fading of Objects: Identification of Fugitive Colorants Through Direct Nondestructive Lightfastness Measurements," *Journal of the American Institute of Conservation* 38 (1999): 395–409.

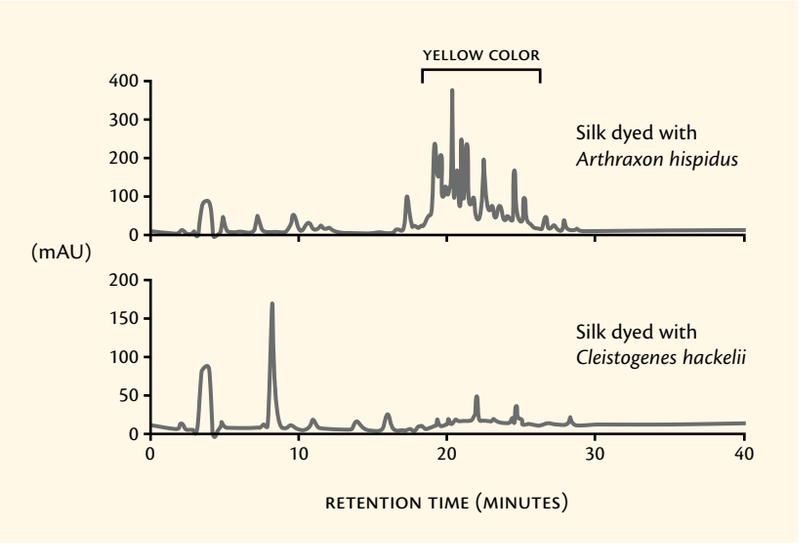


FIGURE 1
Chemical difference between silk dyed with *Arthraxon hispidus* and with *Cleistogenes hackelii*.

brightness of a color, with 100 being perfectly white and 0, black. A positive value for a* indicates a tendency toward red; a negative value, toward green. A positive value for b* indicates a tendency for yellow; a negative value, toward blue.

The objective of this experiment was to see whether growth site and/or harvest time had an effect on the color of silk dyed with *A. hispidus* and *M. tinctorius*. Measured L*a*b* values for silk dyed with all collected plants are shown in figure 2. There are not huge differences, but there are some trends. In the case of both *M. tinctorius* and *A. hispidus*, there is a tendency for the general brightness (L*) to decrease (figure 2, top panels: *M. tinctorius* is on the left, *A. hispidus* is on the right) after the tenth month (October), by which time the spikes (flowers) had appeared and seeds were forming. In the case of *M. tinctorius*, there is not an obvious change in a*, but there is for *A. hispidus*. Silk dyed with *A. hispidus* late in the season shows a tendency toward red that increases as the season progresses (figure 2, middle panels). This is consistent with Arazeki Tetsuji's observations of silk dyed with *A. hispidus* on the island of Hachijō.[15] Finally, for *M. tinctorius*, and especially for *A. hispidus*, there is a general decrease in b* value (figure 2, lower panels) after about mid-September. This means a decrease in yellowness. In the lower right panel of figure 2, the September 2010 material was harvested before spike formation and the September 2009 material five days *after* spike formation. As to the effect of sunlight at the plant growth site, silk dyed with *M. tinctorius* grown in a shady site showed a lower b* value, i.e., less yellow, than did *M. tinctorius* grown in a sunny site. Figure 3 shows samples of silk dyed with *M. tinctorius* growing in sunny and shady sites and with *A. hispidus* harvested before and five days after spike formation.

Mount Ibuki, which lies on the border of Shiga and Gifu Prefectures northeast of Kyoto, is well known for production of good quality *M. tinctorius*.[16] This mountain can provide a sunny habitat for plants because it is the highest mountain in the area and there are few tall, shade-making trees.[17] One of the functions of flavonoids is to protect plants from UV

15. Arazeki Tetsuji, *Kihachijō sono rekishi to seihō*, 28–31; Saijō, personal discussion.

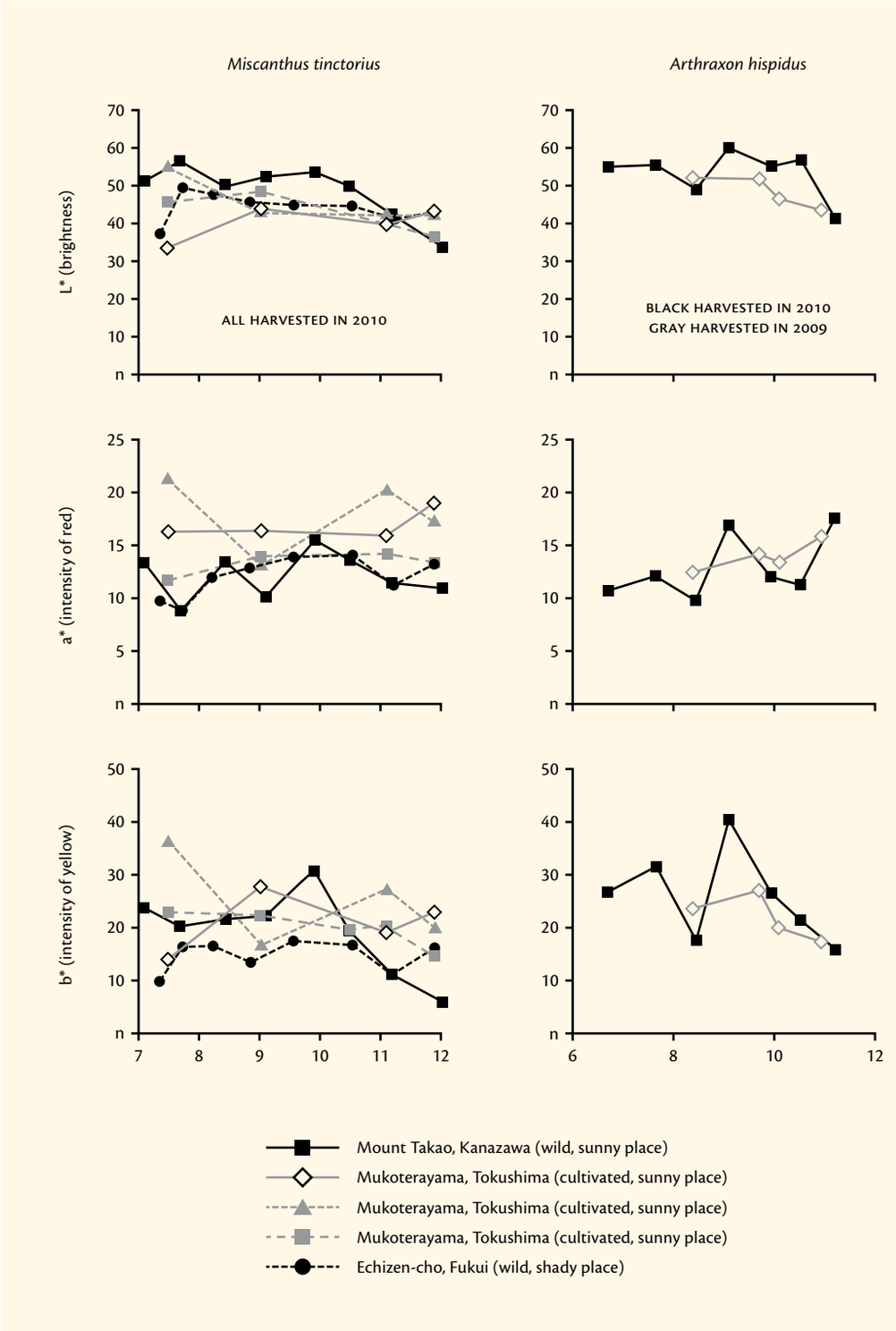
16. Yoshioka Sachio, *Nihon no iro o someru*, 67–68.

17. Shigaken Hikone Sokkōjo, ed., *Ibukiyama kansokujo hōkoku* [Report of an observatory on Mount Ibuki] (Shiga: Shigaken Hikone Sokkōjo, 1919), http://dl.ndl.go.jp/info:ndljp/pid/984904/16; Murase Tadayoshi, Sudō Kazunari, and Kusagawa Keizō, *Ibukiyama shizen kansatsu gaido* [Guide for nature on Mount Ibuki] (Tokyo: Yama to Keikokusha, 2007), 11.

FIGURE 2
Change in color of silk dyed with *Arthraxon hispidus* and *Miscanthus tinctorius* as a function of growth location and harvest time.

Y axis: L* refers to the brightness of a color, with 100 being perfectly white and 0, black. Positive values for a* and b* indicate a tendency toward red and yellow; negative, toward green and blue, respectively.

X axis: month of harvest.



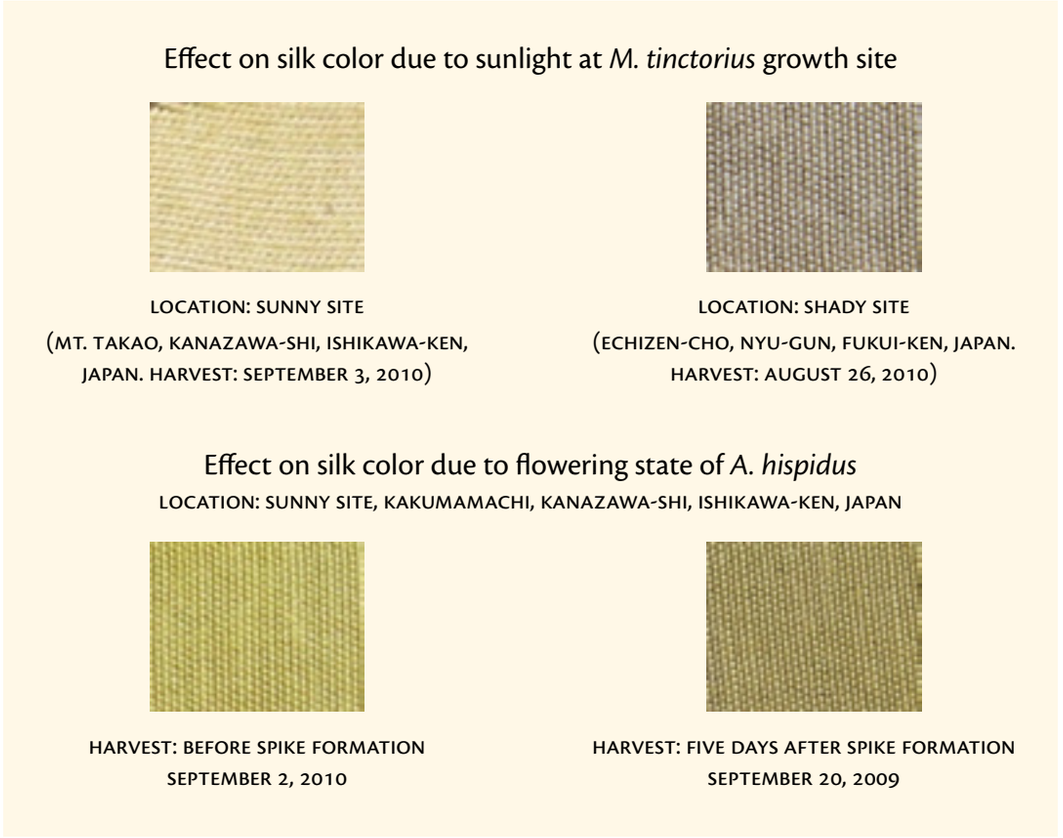


FIGURE 3
Effect of sunlight and time of harvest on color of silk dyed with *A. hispidus* and *M. tinctorius*.

radiation,[18] so a higher level of flavonoids for plants grown in sunny areas is consistent with this observation. Another example is that of sawwort (*Serratula tinctoria*), which produces more flavonoid dyes when grown in a warmer and sunnier climate.[19]

Our results indicate that for *A. hispidus*, the best time for harvesting to get the most intense yellow is just before the spikes appear. This is consistent with the well-known observation that the best time to collect medicinal plants is just before flowering. Our results also suggest that *M. tinctorius* grown in a sunny location gives a more intense yellow. This is consistent with the observations of others.[20]

The History of *A. hispidus* and *M. tinctorius* in China and Japan

Use of *Jincao*, *A. hispidus* in China

From references to *jincao* in the *Shijing* (The Book of Songs),[21] a compilation of over three hundred poems and songs dating from the eleventh to the seventh century BCE, it seems to have been one of the oldest dye plants used in China. It is also one of the earliest recorded medicinal herbs. The *Shen Nong bencao* (Shen Nong's *materia medica*), thought to be the earliest book on medicinal plants, was compiled in the late Western Han dynasty (206 BCE–9 CE).[22]

18. Martyn M. Caldwell, Robert Robberecht, and Stephan D. Flint, "Internal filters: prospect for UV-acclimation in higher plants," *Physiologia Plantarum* 58 (1983): 445–50; Gerald J. Smith and Kenneth R. Markham, "Tautomerism of Flavonol Glucosides: Relevance to Plant UV Protection and Flower Colour," *Journal of Photochemistry and Photobiology A: Chemistry* 118 (1998): 99–105.

19. P. Guinot, A. Gargadennec, P. La Fisca, A. Fruchier, C. Andary, and L. Mondolot, "*Serratula tinctoria*, a Source of Natural Dye: Flavonoid Pattern and Histolocalization," *Industrial Crops and Products* 29 (2009): 320–25.

20. Ibid.

21. Arthur Waley, trans., and Joseph R. Allen, ed. and trans., *The Book of Songs* (New York: Grove Press, 1996), 46–47, 215. *Shijing* [The book of songs] online, accessed January 4, 2014, http://ctext.org/book-of-poetry/odes-of-wei/zh, http://ctext.org/book-of-poetry/cai-lu/zh.

22. Okanishi Tameto, *Honzō Gaisetsu* [Guidance for *materia medica*] (Osaka: Sōgensha, 1977), 19–22. Shen Nong was the god of medicine and agriculture.

The text describes *jincao* as a bitter but non-poisonous plant that is useful for treating persistent coughs, itchy scabs, etc.[23]

Both *Erya*, the oldest Chinese encyclopedia, dating to the third century BCE, and the *Book of Songs* refer to *jincao* as "green."[24] Although *jincao* is normally used as a yellow dye with an aluminum mordant, the use of cupric salt (copper sulfate) as a mordant yields a bright green. Possibly the texts refer to *jincao* mordanted with cupric salt.[25] The first specific mention of *jincao* as the source of a yellow dye was in the *Mingyi bielu*. The author and date of the *Mingyi bielu* are unknown, but based on place names in the text it probably existed in the second or early third century CE.[26] The text states that "It is possible to dye yellow and make a gold color by using this plant"; that the best place to grow *jincao* is in Qingyi in Sichuan; and that the best time to harvest is September and October in the old Chinese calendar.[27] Because the only other descriptions of dyes in the *Mingyi bielu* were of madder (*Rubia* spp.) for red and indigo (*Polygonum tinctorium* Lour.) for blue,[28] we may suppose *jincao* was a major source of yellow dye in the third century CE.

The early-sixth-century *Jizhu bencao* (Collected commentaries on the pharmacopoeia), mentions *jincao*, but also includes gardenia (*Gardenia* spp.) as a source for yellow dye.[29] The *Xinxiu bencao* (659) includes excerpts about dye plants from the earlier *Shen Nong bencao*, *Mingyi bielu*, and *Jizhu bencao*, and adds a statement that the people in Jingxiang, Hubei, produced a vivid yellow dye from *jincao*.[30]

Later *materia medica* and other documents indicate that by the twelfth century *jincao* had become less prominent as a source both of dye and of medicine. At least it received less attention in written documents. The *Eryayi*, a dictionary compiled by Luo Yuan (1136–1184) and often quoted in later literature, states that the original *jincao* plant was a kind of bamboo.[31] Although *jincao* may still have been recognized as a source of yellow dye, either more than one plant species was called *jincao* or there was confusion as to what *jincao* really was. References to *jincao* in later *materia medica*, such as the *Jing shi zheng lei da guan ben cao* (Classic and historical classified *materia medica*), promulgated by the Song government in 1108, also by the *Bencao gangmu* (Compendium of *materia medica*) during the Ming dynasty (1368–1644), were basically copies of those used in earlier versions and did not include new medicinal or dye information.[32] *Tian gong kai wu* (Exploitation of the works of nature), an encyclopedia published in 1637, does not

23. Okanishi Tameto, *Jūshū Shinshū honzō*, 67.

24. *Erya* [Chinese encyclopedia of the third century BCE] online, 9th description, accessed January 4, 2014, http://ctext.org/er-ya/shi-cao/zh; Waley and Allen, *Book of Songs*, 215. *Shijing* [The book of songs] online, accessed January 4, 2014, http://ctext.org/book-of-poetry/cai-lu/zh.

25. The use of cupric salt as a mordant apparently started quite early in China. See Cheng Weiji, *History of Textile Technology of Ancient China* (New York: Science Press, 1992), 102.

26. Okanishi Tameto, *Honzō Gaisetsu*, 34–37.

27. Okanishi Tameto, *Jūshū Shinshū honzō*, 67.

28. Ibid., 47, 49.

29. Ibid., 77.

30. Ibid., 67.

31. *Eryayi* [Chinese dictionary compiled by Luo Yuan (1136–1184)], online edition, accessed January 4, 2014, http://ctext.org/library.pl?if=gb&file=9012&page=135, http://ctext.org/library.pl?if=gb&file=9012&page=136, http://ctext.org/library.pl?if=gb&file=9012&page=137.

32. *Jing shi zheng lei da guan ben cao* [Classic and historical classified *materia medica*] online, http://ethmed.u-toyama.ac.jp/honzou/list/honzouImage.do; *Bencao gangmu* [Compendium of *materia medica*] online, http://ccs.lib.ksu.edu.tw/DRS/bitstream/987654321/3834/2/013-%E6%9C%AC%E8%8D%89%E7%B6%B1%E7%9B%AE.pdf.

33. Yabuuchi Kiyoshi, trans. *Tenkō kaibutsu* [The exploitation of the works of nature] (Tokyo: Heibonsha, Tokyo, 1969), 78–84. This is a translation of *Tian gong kai wu*, by Song Yingxing. In addition to the *materia medica*, the following literary sources dating from the Song through the Qing dynasties mention *jincao*: Chen Dazhang, "Shi zhuan ming wu ji lan" [Annotation for the Book of Songs], in *Si ku quan shu zhen ben 12 ji* [Complete library in four sections, part 12] (Taipei: Shangwu, 1982), 7:10/15a–16a; Yao Bing, "Shi zhi ming xie" [Interpretation of the Book of Songs], in *Si ku quan shu zhen ben 5 ji* [Complete library in four sections, part 5] (Taipei: Shangwu, 1974), 24:8/25a–26a; Chen Yuanlong. *Ge zhi jing yuan* [Encyclopedia of the Qing dynasty] (1735), 68/23b; Zhou Qi, "Ming yi kao" [Encyclopedia of the Ming dynasty], in *Si ku quan shu zhen ben 5 ji* [Complete library in four sections, part 5] (Taipei: Shangwu, 1974), 234:9/1b–2b; Fang Yizhi, "Tongya" [Encyclopedia of the Ming dynasty], in *Si ku quan shu zhen ben 3 ji* [Complete library in four sections, part 3] (Taipei: Shangwu, 1972), 209:42/26a–27b; Renjie Wu zhuan, *Li sao cao mu shu* [Plant dictionary in the Song dynasty] (Beijing: Zhonghua shuju yingyin, Xinhua shudian Beijing faxing suo faxing, 1987); 4/1b; Zhang Ying, *Yu ding Yuan jian lei han* [Encyclopedia commissioned by the Kangxi emperor, Qing dynasty] (Shanghai: Dong wen shuju, 1892), 411/5b; Zheng Qiao, *Tong zhi* [Laws and ordinances from early Han to the Sui, Tang dynasties] (Beijing: Zhonghua shuju, 1987), 1:75/870.

mention *jincao* at all.[33] In China today, *jincao* is no longer used either as a dye or as a medicine and is regarded as a weed.[34]

Despite the absence of active references to *jincao* in later texts, Jan Wouters's analyses of yellow dyes on a fourteenth-century Tibetan textile and a Chinese textile from the Qing dynasty (1644–1911) suggest that in practice the use of *jincao* (and/or *Miscanthus tinctorius*), continued.[35] Perhaps *jincao* was used until recent times, but not as much as some other dyestuffs. Further analysis of the yellow dyes used on East Asian textiles will undoubtedly reveal more about the historical and geographic extent of the use of *jincao* as a source for yellow dye.

Use of *kobunagusa* and *kariyasu* in Japan

Kobunagusa and *kariyasu* are the common Japanese names for *A. hispidus* and *M. tinctorius*, respectively. *Kariyasu* has been known as a yellow dye source from ancient times, but the word *kariyasu*, when used to refer to a dye source, does not refer only to *M. tinctorius*. Shirai has pointed out that some old names for *M. tinctorius* and *A. hispidus* were interchangeable in the *Wamyō ruijū shō*, a Japanese dictionary dating from 931–938[36] that was influenced by the *Erya* and *Honzō wamyō*, the oldest Japanese medicinal dictionary (901–923).[37] *A. hispidus* and *M. tinctorius* may not have been distinguished from each other as sources of yellow dye. Some other grass plants also seem to have been used for yellow dyes,[38] although our own (unpublished) studies on ten different kinds of grass did not reveal significant amounts of the flavonoids found in *A. hispidus* and *M. tinctorius*.[39]

There are several opinions as to when *kariyasu* was first used as a dye in Japan. Shirai suggests that it was brought from China with the *Xinxiu bencao* in the eighth century.[40] In Japan, yellow was not as important as in China, where it symbolized the emperor. In 693, according to a declaration by Empress Jitō in the *Nihonshoki* (Chronicles of Japan) of 720, farmers should wear yellow clothing,[41] which might have been dyed with *kariyasu*, Amur cork tree, gardenia, etc.[42] Recently, LC-MS analysis has shown that *kariyasu* or *kobunagusa* was used for some yellow and green textiles stored at the Horyūji temple.[43] In the *Engishiki* (Regulations of the Engi era), a book of laws and regulations commissioned by Emperor Daigo in 927, *kariyasu* was mentioned as being used for yellow, also green when used with indigo;[44] the *Engishiki* also noted that the Omi and Tanba regions produced *kariyasu*.[45] Mount Ibuki, mentioned above in the section describing dyed silk colors,

34. A recent search for *jincao* among the hundreds of herbs sold at one of China's biggest traditional herb markets, *Hehuachi shengyao shichang*, in Chengdu, Sichuan, was unsuccessful. Yoshimitsu Michiyo (Chongqing Academy of Chinese Materia Medica), in discussion with the author, 2011.

35. Jan Wouters, "Dye Analysis of Chinese and Indian Textiles with Special Emphasis on the Recognition of *Miscanthus tinctorius* and *Sophora japonica* and the Composition of Green and Blue Colours," *Dyes in History and Archaeology* 12 (1994): 12–22; unpublished experimental data analyzed by Ana Claro (object No. F1915.288, Qing-dynasty brocade, Freer Gallery of Art). It is not possible to distinguish chemically between *jincao* (*Arthraxon hispidus*) and *Miscanthus tinctorius*. Both grasses were used in ancient and medieval East Asia as sources of yellow dye and it is likely that in old texts a single name was sometimes used to refer to both.

36. Shirai Mitsutarō, *Senryōshokubutsu oyobi senshoku hen* [Dye plants and their dyeing procedures] (Tokyo: Ōkurashoten, 1918), 25–27. Minamoto Shitagō, *Wamyō ruiju shō* [Japanese names, classified and annotated, in the dictionary compiled ca. 931–938] (Osaka: Shibukawa Seiemon, 1667), 4:14/9b.

37. Fukae Sukehito, *Honzō Wamyō* [Japanese names of herbs in the ninth to tenth century] (Edo: Izumiya Shōjirō, 1796), 1:45a–b; Yosano Hiroshi, ed., *Honzō Wamyō jo* [Japanese names of herbs in the ninth to tenth century, first half], Nihon koten zenshū (Tokyo: Nihon koten zenshū kankokai, 1926), http://dl.ndl.go.jp/info:ndljp/pid/1021074/61-62.

38. Gotō Shōichi and Yamakawa Ryūhei, eds., *Senryō shokubutsu fu*, 307–09; Shirai Mitsutarō, *Senryōshokubutsu oyobi senshoku hen*, 25–27; Yamazaki Seijū, *Kusakizome: senryō shokubutsu zukan* [Illustrated book of dye plants], vol. 2 (Tokyo: Bijutsu Shuppansha, 1987), 38–39, 86–87, 118–19, 150–51; Yamazaki Seijū, *Kusakizome: senryō shokubutsu zukan* [Illustrated book of dye plants], vol. 3 (Tokyo: Bijutsu Shuppansha, 1996), 60–61, 112–13.

39. Mouri and Laursen, *Journal of Chromatography A* 1218 (2011): 7325–30.

40. Shirai Mitsutarō, *Senryōshokubutsu oyobi senshoku hen*, 30.

41. Inoue Mitsusada, *Nihonshoki* [Chronicles of Japan] (Tokyo: Chūōkōronsha, 1987), 2:391, 608–09.

42. Yamazaki Seijū, *Kusakizome: senryō shokubutsu zukan*, 1:66–67.

43. Mouri and Laursen, *Journal of Chromatography A* 1218 (2011): 7325–30.

44. Gotō Shōichi and Yamakawa Ryūhei, eds., *Senryō shokubutsu fu*, 529–40; Mary McClintock Dusenbury, "Radiance and Darkness: Color at the Heian Court" (PhD diss., University of Kansas, 1999), 167.

45. Shintō Taikei Hensankai, Shintōtaikei koten hen *Engishiki* (second half) [Regulations of the Engi era] (Tokyo: Shintō Taikei Hensankai, 1992), 101–02.

is located in Omi. This mountain may have produced *kariyasu* during the Heian period. In the Edo period (1603–1868), besides yellow and green, *kariyasu* was used for various browns. While ordinary people were prohibited from wearing bright and beautiful colors, they created and enjoyed a variety of brown and gray colors. The phrase "forty-eight browns and a hundred grays," used during the second half of the Edo period, relates to an aspect of Edo culture,[46] and *kariyasu* can be said to have supported the culture of textiles and dyeing. When *kariyasu* was used for brown colors, usually an iron mordant was used with it or with several tannin-rich plants. *Kobunagusa* was cultivated as a yellow dye source in the Edo period.[47] *Kariyasu* may have been similarly cultivated, though that name was not mentioned.

Medicinal information regarding *jincao* was brought to Japan with the Tang-dynasty *materia medica*, *Xinxiu bencao*, and it was referenced in *Ishinpo*, a medicinal book of the Heian period.[48] Besides these references, *jincao* was not mentioned in Japan as a medicine so far as I have been able to find.

Although the use of *A. hispidus* in medicine and for dyeing declined in China, both *A. hispidus* and *M. tinctorius* remained major sources of yellow dye in Japan. In medicinal books written in Japan there seem to be few references to either plant being used as a medicine in Japan. Chemically, the yellow dyes in these plants are more stable than those obtained from the flower-buds of the pagoda tree. However, we suspect that the use of *A. hispidus* in China was abandoned not because of chemical stability but for other reasons that we do not currently understand.

Conclusions

1. Chemical analysis of *A. hispidus* and *C. hackelii* suggests that *jincao*, as mentioned in historical texts, was probably *A. hispidus*.
2. The specific locations where *A. hispidus* and *M. tinctorius* were grown, as well as the time of year in which they were harvested, appear to affect the color of the silk they produce when used as dyestuffs.
3. *Jincao*, one of the oldest yellow dye sources in China, gradually declined in use both as a medicine and as a dyestuff, and there is little evidence that it was ever used as a medicine in Japan. Both *A. hispidus* and *M. tinctorius*, however, continued to be used in Japan as sources of yellow dyes until they were largely replaced by synthetic dyes in the late nineteenth century.

Acknowledgments

This study was supported in part by the Mishima Kaiun Memorial Foundation. I would like to thank Dr. Richard Laursen of Boston University for his help with this study. I would also like to thank Dr. Yasushi Ibaragi of the Tokushima Prefectural Museum, Dr. Eisuke Hayasaka of the Fukui Botanical Garden, and Dr. Yohei Sasaki of Kanazawa University for collecting plants; Richard Newman of the Museum of Fine Arts, Boston, for allowing me to do color analysis there; Dr. Yoshimitsu Michiyo of the Chongqing Academy of Chinese Materia Medica; and the *Kihachijō* organization and Yoshihiro Saijō, *kihachijō* dyer, for plants and for dye information.

46 Nagasaki Seiki, *Nihon no dentō shikisai* [Traditional colors in Japan] (Kyoto: Kyoto Shoin, 1988), 200–203; Kanazawa Yasutaka, *Edo fukushoku shi* [History of clothing in the Edo period] (Tokyo: Seiabō, 1998), 129–30, 334–40, 350–53, 356–62, 371–88; Maruyama Nobuhiko, *Nihon bijuaru seikatsushi: Edo no kimono to iseikatsu* [History of lifestyle in Japan: clothes and life in the Edo period] (Tokyo: Shogakukan, 2007), 46–47.

47. Miyazaki Yasusada, *Kaitei nōgyō zensho* [A revised compendium of agriculture] (Fukuoka: Hayashi Onosuke, Yamazaki Noboru, 1882), 6:21–22.

48. *Ishinpō* [The oldest medical treatise in Japan, written by Tamba Yasuyori in 984] online, accessed April 7, 2014, http://oa.lib.ksu.edu.tw/OA/bitstream/987654321/58091/2/054-%E9%86%AB%E5%BF%83%E6%96%B9.pdf, 13, 22 [in Chinese].

FIGURE 7.2

Imperial Yellow in the Sixth Century

A Preliminary Attempt to Reproduce Imperial Yellow Based on Instructions in the *Qimin yaoshu*

ZHAO FENG · LONG BO

The sky is blackish blue and the earth is yellow.[1]
Ancient Chinese saying

Yellow was associated with imperial rule in China at least since the Han dynasty (206 BCE–220 CE). As one of the five 'correct' colors in the system of correlative cosmology, often known as Five Element or Five Agent theory, it represented the element of earth and, as a direction, the center. The earliest textual references to yellow as an imperial color are in two Han-dynasty texts. The *Chun qiu fan lu* (Rich dew of the Spring and Autumn Annals), attributed to the Han-dynasty scholar Dong Zhongshu (179–104 BCE), states that yellow is the color of rulers.[2] The *History of the Han Dynasty* says that the color yellow expresses the central location and should be reserved for kings.[3] The earliest surviving recorded law restricting the use of yellow dates from 618, at the beginning of the Tang dynasty (618–907). The law, reserving reddish yellow (*chi huang*) for imperial use, stated that "common people and officials are forbidden to wear clothes or accessories in reddish yellow,"[4] and introduced a pattern of regulation that continued through all subsequent dynasties.

Many plants yield a yellow dye, and in most temperate environments yellow is more readily available from common materials than any other color except brown or gray. Archaeological evidence demonstrates that yellow was often used in non-imperial textiles, indicating that 'imperial yellow' was a very specific color, as the law of 618 suggests. The earliest text that discusses dyeing imperial yellow is a sixth-century compendium of agricultural and production practices, the *Qimin yaoshu* (Important arts for the people's welfare). Jia Sixie, author of the *Qimin yaoshu*, was born in Yidu County, present-day Shouguang County, Shandong, and likely served as governor of Gaoyang Commandery, present-day Linzi District, Zibo City, Shandong. His familiarity with agricultural and production practices in northern China suggests that he traveled widely through present-day Hebei, Henan, and Shanxi. His observations laid a solid foundation for his writing of *Qimin yaoshu*, which was probably completed between 533 and 554.[5]

Qimin yaoshu, a key text in the history of Chinese technology, presents a thorough elucidation of almost all agricultural production and crop processing of the period. Its text is divided into ten volumes and ninety-two chapters. The first five volumes are devoted to the cultivation of various crops. The next volume describes how to raise livestock, poultry, fish, and mulberry silkworms, as well as how

1. *Qian zi wen* [New transcription of the thousand-character classic] (Beijing: Zhen bei shi yin guan, 1907), 4.

2. Dong Zhongshu, *Chun qiu fan lu* [Rich dew of the Spring and Autumn Annals] (Shanghai: Shanghai guji chubanshe, 1989), vol. 10.

3. Ban Gu, *Han Shu · Lu Li Zhi* [History of the Han dynasty], vol. 21 [History of the law], chapter 1.

4. Xiu Ouyang and Song Qi, *Xin Tang shu* [The new book of Tang] (Beijing: Zhonghua shuju, 1975), vol. 24.

5. Jia Sixie, *Qimin yaoshu yizhu* [Translation and annotation of *Qimin Yaoshu*, Important arts for the people's welfare], trans. into contemporary Chinese and edited by Miao Qiyu and Miao Guilong (Shanghai: Shanghai guji chubanshe, 2009).

FIGURE 1.1
Rehmannia glutinosa Libosch. (Chinese foxglove).

FIGURE 1.2
Rehmannia roots.

to prevent and cure the diseases they might catch. In volumes seven, eight, and the first half of volume nine, the author tells the reader how to process crops and livestock products, how to make fermented seasonings and alcoholic drinks, and how to process foodstuffs.

The book's careful descriptions of dye plants and dyeing techniques are exceptional, as such topics rarely appear in ancient Chinese books on agriculture. Four chapters of volume five are dedicated to six dyestuffs: birch-leaf pear, safflower, gardenia, indigo, gromwell, and rehmannia. In a section entitled "Dyeing of Imperial Yellow in Hedong," the author records details about the production of imperial yellow from the roots of rehmannia (*Rehmannia glutinosa* Libosch., or Chinese foxglove).[6]

The Hedong Commandery of that period was probably located northeast of the junction of the Yellow and Wei Rivers, situated between two ancient cities that served as capitals in various dynasties. Luoyang was capital of the Eastern Han (25–220 CE) and Chang'an, present-day Xi'an, was capital of the Western Han (206 BCE–9 CE). In the sixth century Hedong was part of the Northern Wei (386–534), Eastern Wei (534–550), and Northern Qi (550–577) dynasties, with capitals first at Luoyang and then at Ye Cheng, another city on the Yellow River. Hedong was ideally positioned to supply goods to these royal courts.

Raw Materials for Imperial Yellow in *Qimin yaoshu*

The raw materials mentioned in "Dyeing of Imperial Yellow in Hedong" are the roots of the rehmannia plant (*dihuang*) as the dyestuff, *huizhi* (ash juice) as the mordant, and raw, plain-weave silk (*juan*) as the material to be dyed.

Rehmannia

Rehmannia roots come from the plant rehmannia, a flowering plant that produces purple flowers with yellowish-white tubers underground (figs. 1.1 and 1.2).[7] The first character of its Chinese name *di* means 'earth' and the second character *huang* means 'yellow.' Rehmannia grows in northern temperate regions, such as the present-day provinces of Liaoning, Hebei, Henan, Shandong, Shanxi, Shaanxi, Gansu, Inner Mongolia, and Jiangsu. In *Qimin yaoshu*

6. Jia Sixie, *Qimin yaoshu yizhu*, vol. 3, *He dong ran yu huang fa* [Dyeing of imperial yellow in Hedong], 205; Jia Sixie, *Qimin yaoshu yizhu*, vol. 5, *Zhong di huang fa* [Cultivating of rehmannia], 329.

7. There are five kinds of rehmannia: *Rehmannia chingii* Li, *Rehmannia elata* N. E. Br. ex Prain, *Rehmannia henryi* N. E. Br., *Rehmannia piasezkii* Maxim., *Rehmannia solanifolia* Tsoong & T.L. Chin. Some varieties are used for medicine, others are used for food, dyeing, or container gardening.

Jia Sixie states that the roots of rehmannia mature at the end of the eighth lunar month and the beginning of the ninth lunar month and are then ready for use in dyeing. This comment suggests that the rehmannia roots used to produce imperial yellow in the sixth century were most likely fresh rehmannia roots.

An early textual reference to rehmannia as a medicinal Chinese herb is in *Shen Nong ben cao jing* (The divine farmer's *materia medica*) (first century BCE–first century CE).[8] The text states that rehmannia is used in three forms: fresh, dried, and baked.[9] The earliest textual reference to rehmannia as a dye material can be found in *Han shi wai zhuan* (Outer commentary to the *Book of Songs* by Master Han), commentaries collected by Han Ying, a second-century BCE Confucian scholar. In volume five, the author states, "Rehmannia roots are yellow; they are used to dye silk; the color [of the dyed silk] is yellower than the rehmannia [roots]."[10] From this reference, we can infer that rehmannia was used for dyeing at least by the Former Han dynasty (206 BCE–9 CE).

Huizhi, Ash Juice (metallic ions, pH)

"Ash" here refers to ashes from burned plant material. Jia Sixie explains in his text that "oak, mulberry trees, or the herb beach wormwood [*Artemisia stelleriana*, also known as dusty miller] is burned to ashes. Some water is added to the ashes. And now we have ash juice."[11] Oak refers to *Quercus acutissima* (family: Fagaceae), which can be cultivated, as discussed in *Qimin yaoshu*. There are several kinds of mulberry trees mentioned in *Qimin yaoshu*. Although their appearance varies, most belong to the species *Morus* spp. The text states that when mulberry leaves are picked, the branches should be trimmed. The trimmings can be used to stoke a fire. The "mulberry firewood" mentioned in this book probably consists of trimmings from mulberry trees grown to raise silkworms. Beach wormwood cocooning frames can also be burned to ashes for use as a mordant. All plant ashes have metallic elements, of which potassium and aluminium make up a large proportion. When water is added to plant ashes, aluminium potassium sulfate ($KAl(SO_4)_2$) is formed, which can act as a mordant.

Raw *juan*-silk (undegummed silk in plain weave) (protein)

During the Han and Northern dynasties (206 BCE–581 CE), *juan*-silk became the general term for plain-weave silk. The term '*juan*-silk' appears in an inventory of the clothing buried with a concubine of Emperor Liu Hong in 386 CE, excavated from Astana, Turfan, Xinjiang, and there is more evidence for its use as a term in the Tang dynasty.[12] There are two kinds of *juan*-silk, raw and degummed. Jia Sixie calls for raw *juan*-silk in his instructions for producing imperial yellow.

Proportion of *Rehmannia glutinosa* Libosch. to Silk: 3 *sheng* to 1 *pi*

Qimin yaoshu states that 3 *sheng* of rehmannia roots are needed to dye 1 *pi* of imperial yellow *juan*-silk. *Sheng* is a unit of volume in the Wei-dynasty Customary System, a unit equal to 400 milliliters. Thus, 3 *sheng* equals 1.2 liters. For imperial yellow, fresh rehmannia roots are used, which are heavier than dried or cooked rehmannia roots. A single *pi* of silk in the Han-dynasty Customary System is a piece of silk 4 *zhang* long with a loom width of 2 *chi* and 2 *cun*. In the Han-dynasty Customary System, 1 *zhang* equals 10 *chi*, and 1 *chi* equals 10 *cun* or 23 centimeters, so 1 *pi* equals 4.6 square meters. Thus, it takes 1.2 liters of rehmannia roots to dye 4.6 square meters of

8. Huang Shi, ed., *Shen Nong ben cao jing* [Shen Nong's *materia medica*] (Beijing: Zhong yi guji chubanshe, 1982), 1:35.

9. Ibid.

10. Han Ying, *Han shi wai zhuan* [Outer commentary to the *Book of Songs* by Master Han], vol. 5.

11. Jia Sixie, *Qimin yaoshu yizhu*, 3:205.

12. Helen Wang, "Textiles as Money on the Silk Road?" *Journal of the Royal Asiatic Society* 23, no. 2 (2013): 165–74.

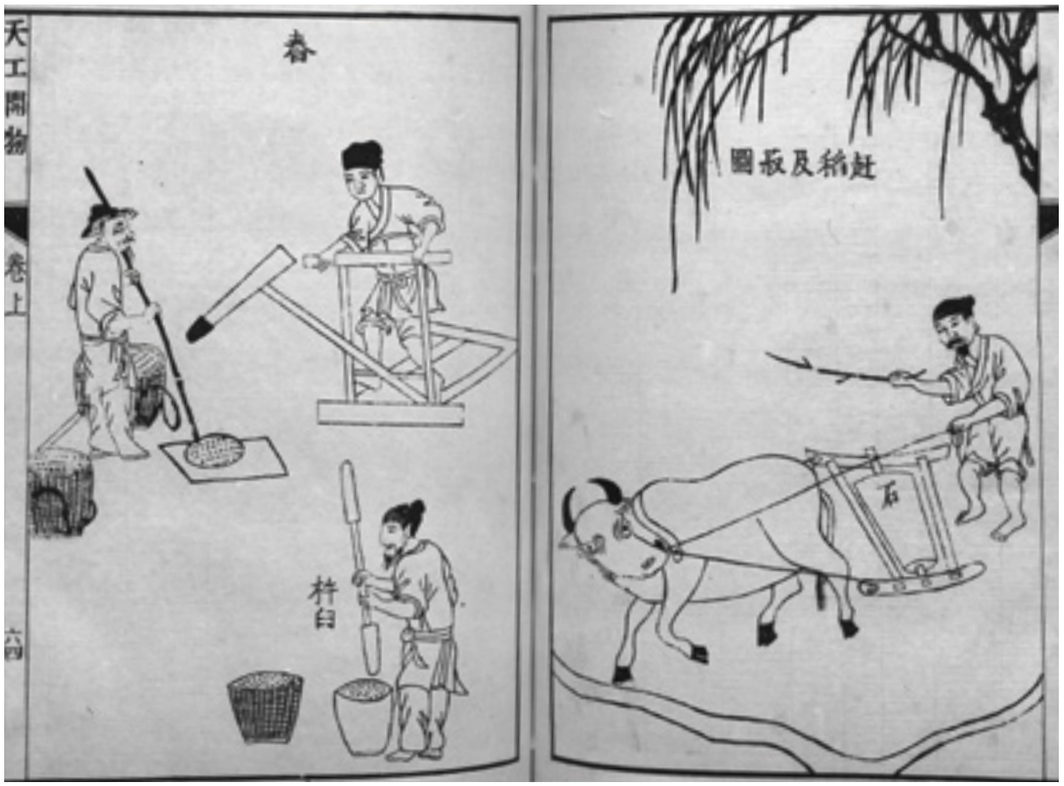


FIGURE 2
Dui from Song Yingxing, *Tian gong kai wu* (Lang hua shu lin, Ming Chongzhen ding chou, 1637).

juan-silk, or a 9.2 meter length of cloth that is 50 cm wide.

Tools for Dyeing Imperial Yellow in *Qimin yaoshu*

"Dyeing of Imperial Yellow in Hedong" also mentions the tools required to produce imperial yellow. The same actions are used to pound rehmannia roots as to crush grain, and the same tools were used. These included a mortar and hammer for grinding, or a *dui*, a treadle-operated hammer, for crushing large amounts of grain or plant matter. Other equipment necessary for the process includes pots to hold dye liquor temporarily and tubs in which the dyeing takes place.

Tools for Crushing *Rehmannia* Roots

Dui, a common tool to press and crush grain, consists of a wooden handle and a stone hammerhead, and works like a trip hammer (fig. 2). To use it, grain is added to a large stone mortar, and then the *dui* is put on a set of trestles. Its handle is first trodden down, so that when the handle is freed the hammerhead will fall and strike the grain in the mortar. Large quantities of stone *dui* from the Han dynasty have been excavated. For example, a green-glazed pottery *dui*, now stored in the Cultural Relics Institute, Hebei, was excavated from Gezi Village, Zhao County, Hebei. Images of *dui* can also be found on stone reliefs of the Han dynasty in Sichuan. These and many other examples indicate the widespread use of *dui* and explain the prosperous *dui* industry at the time.

Stone mortars and stone hammers in use during the Han dynasty have been found in such places as Shaogou Village and Xijiao in Luoyang City, Ding Yuan County in Anhui, Taizhou City in Jiangsu, and courtyards of the Sanyangzhuang site in Neihuang County, Henan. Other tools, such as wooden hammers, were still used during the Han dynasty to pound grain, and would have been used together with a mortar when preparing small amounts of dyestuff. This method is depicted

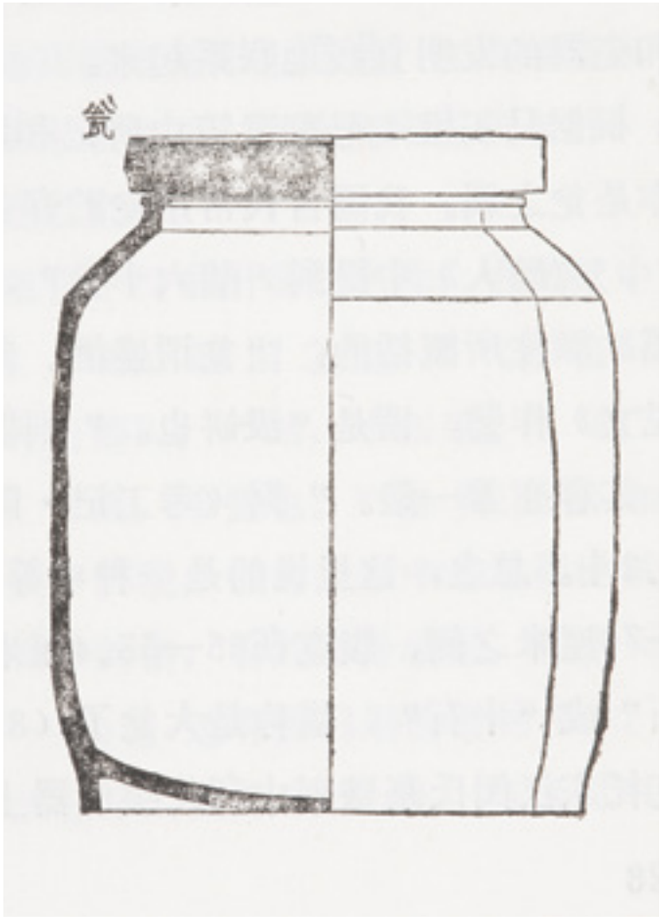


FIGURE 3
Qi, excavated in the city of Lingshan, Mancheng County, Hebei, China. Height 66–76 cm, width 55–65 cm. Pottery. Western Han dynasty. Drawing by Zhang Guangli. From Sun Ji, *Han dai wu zhi wen hua zi liao tu shuo* [Illustrated explanations of the material culture of the Han dynasty] (Beijing: Wenwu chubanshe, 1991), 327, figure 83-17.

FIGURE 4
A set of cauldron and *zeng*, excavated in Fufeng County, Shaanxi, China. Bronze. Han dynasty. Shaanxi Provincial Museum, Xi'an, Shaanxi, China. Drawing by Li Zhitan. From Sun Ji, *Han dai wu zhi wen hua zi liao tu shuo* [Illustrated explanations of the material culture of the Han dynasty] (Beijing: Wenwu chubanshe, 1991), 333, figure 84-12.

in images of "rabbits crushing herbs on the moon," which can be seen on many stone reliefs of the Han dynasty.

Qi, Container

Qi (container) is another term that appears frequently in discussions about imperial yellow in *Qimin yaoshu*. *Qi* can take many shapes, including a jar-shaped vat, a bowl, a bottle, or a vase. A *qi* can be made of copper, bronze, pottery, or lacquer, with an earthenware vat being most common. Many jar-shaped vats of the Han and Jin dynasties (206 BCE–420 CE) have been excavated. Of varying simple shapes and sizes, the largest is a pottery wine-jar from a Han-dynasty tomb in Mancheng County, a vessel similar to the vats used today (fig. 3). This example is around 66 to 76 cm tall with a diameter of 55 to 65 cm at the widest part.

Fu, Rust-proof Cauldron

Cauldrons are flat-bottomed round iron vessels used for cooking. They have narrow tubular sections on the upper portion called necks that open at the top, while the middle or upper parts of their bodies are larger. Each cauldron has two loop-shaped carrying handles. A *zeng* (pot with holes in the bottom) could be placed on top of a cauldron to steam food. Cauldrons have been frequently excavated. For example, a set of cauldron and *zeng* from the Han dynasty has been unearthed from Fufeng County, Shaanxi (fig. 4).

Cauldrons mentioned in *Qimin yaoshu* are made of rust-proof iron, and differ from those described above. According to a section in the *Qimin yaoshu* whose title translates as, "the way to make cauldrons that do not rust," these cauldrons are made of iron that has been specially

treated to resist rusting by repeatedly washing it with water, parching it, and then smearing it with oil. It is essential to use a rust-proof vessel to dye imperial yellow because loose iron ions (as in rust) will act as a mordant, chemically reacting with the dye and silk in the dye bath and dulling the color produced.

Pen, Tub

Tubs of the past and tubs of the present are almost the same. They are common, wide-mouthed vessels made of various materials, including wood, pottery, and copper. A set of copperware was excavated from an anonymous tomb of the Han dynasty at Maoling (fig. 5). This set includes a copper tub, 8.1 cm in height, 18.1 cm in diameter at the mouth, 6.1 cm in diameter at the bottom, and 2 liters in volume. Copper tubs are not suitable for dyeing imperial yellow because copper ions act as a mordant and affect the color.

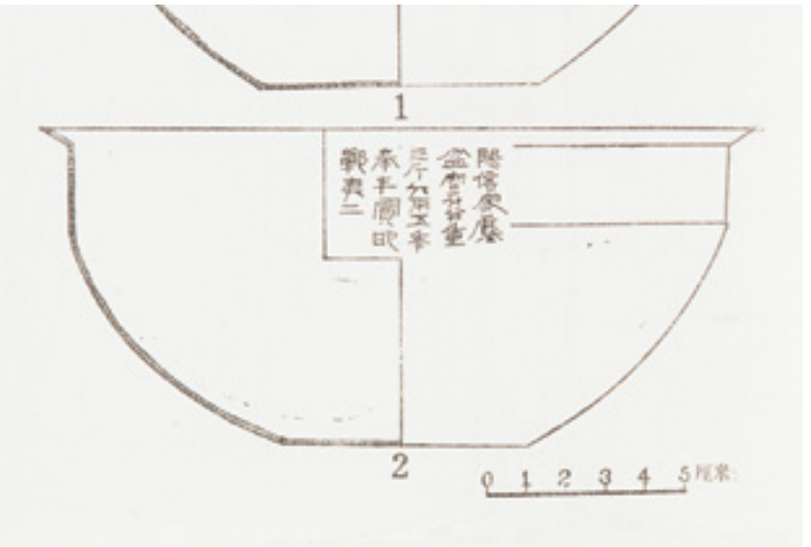


FIGURE 5
Tub, excavated in Maoling, Shaanxi, China. Height 8.1 cm, diameter at the mouth 18.1 cm, diameter at bottom 6.1 cm. Copper. Han dynasty. From Cultural Artifact Management Bureau of Xianyang Region and the Maoling Museum, "Xaanxi Maoling yi hao wu ming zhong yi hao chong zhang keng de fa jue" [The excavation of no. 1 immolated pit of no. 1 nameless grave in Maoling, Shaanxi], *Wenwu* [Cultural relics] 9 (1982): 14.

The Dyeing Process as Described in *Qimin yaoshu*

The following is a translation of the dyeing process as described in volume three of *Qimin yaoshu*; see figure 6 for a flowchart of the process based on this translation.

1. Fresh rehmannia roots are pounded at length into a smooth paste. Ash juice is then added to the paste and given a good stir.
2. Juice of the mix [the first juice] is squeezed out and poured into a vat [*qi*].
3. Then fresh ash juice is added to the residue and stirred until a thin gruel-like juice is formed.
4. This second juice is decanted into a rust-proof cauldron [*fu*]. Raw *juan*-silk is put in the juice and boiled. When boiled, the silk has to be stirred continuously to make sure the shade is uniform. The silk is degummed when it can hold water. At this stage, the silk is taken out and put in a tub [*pen*].[13]
5. The silk is unfolded. Part by part, the silk fabric is first twisted and then taken out [to be made smooth]. A dry soft cloth is pressed on the silk, section by section, to absorb moisture from inside the silk. Dyestuff residues are removed from the surface of the silk. Next, the silk is dried in the sun. The first juice is filtered through a piece of *juan*-silk.
6. The filtered juice is heated and decanted into a tub [*pen*]. The dry yellow *juan*-silk is put into the tub for a second dyeing. The silk is vigorously stirred to unfold it and produce an even color. The silk is taken out when the tub has cooled thoroughly and dried in the sun. This is called imperial yellow. About three *sheng* of rehmannia roots are needed to dye one *pi* of imperial yellow *juan*-silk. The more rehmannia roots, the better. Ashes of oak, mulberry trees, and beach wormwood are all useful in dyeing.

13. Ash juice is a base and has a high pH. When the raw silk is put in the dye bath, the ash juice dissolves the gum or sericin encasing the silk threads, thus "degumming" it.

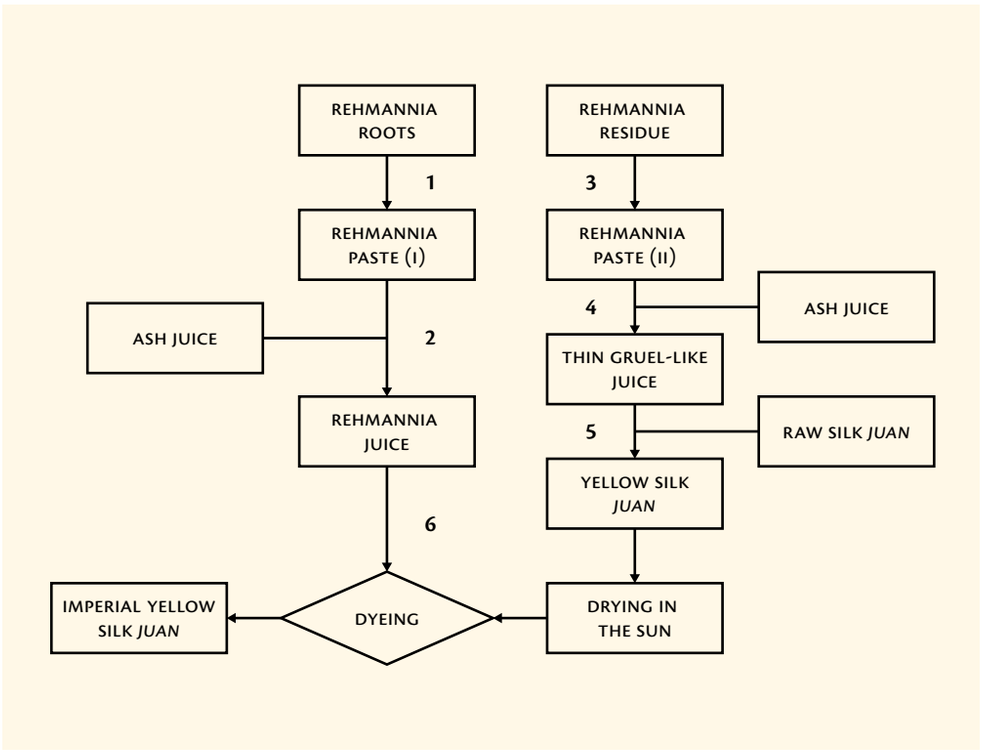


FIGURE 6
A flow diagram of the dyeing process.

Photos taken during the dyeing experiment, China National Silk Museum, Hangzhou, China.

FIGURE 7.1
Ash.

FIGURE 7.2
Using pestle and mortar to make rehmannia paste.

FIGURE 7.3
Dyeing in process.

Experimental Re-creation of the Imperial Yellow Dyeing Process in *Qimin yaoshu*

TIME: January 2013

PLACE: Research Base for Textile Conservation, State Administration for Cultural Heritage, China National Silk Museum (CNSM)

MATERIALS: Fresh rehmannia roots; mulberry branches collected from the mulberry garden in CNSM: 7 or 8 branches, about 300 grams; silk: 3.3 grams of undyed *habutai* (a Japanese degummed, plain-weave silk), about 20 cm in length and 15 cm in width.

TOOLS: Steel pans, beakers, induction cookers, and other tools.

Procedures (see figure 6)

Preparation of Mulberry Ashes. About seven or eight branches of mulberry were collected from the mulberry garden in CNSM and burned to ashes (fig. 7.1). The weight of the ashes was 20 grams. The solution of ash had a pH of 9.0, and K and Ca (potassium and calcium) were detected by SEM-EDS.

Preparation of the First Juice. 10 grams of mulberry ashes were added to 1000 milliliters of pure water and given a good stir. The solution was then added to 50 grams of pounded rehmannia roots (fig. 7.2). The rehmannia roots were soaked in the solution for four hours.

Preparation of the Second Juice. The solution was filtered. The residue (previously soaked roots) was soaked for one hour in a new solution of 10 grams of mulberry ashes and 1000 milliliters of pure water.

Dyeing with the Second Juice. The second juice was filtered and poured into a pan to be heated. After the juice came to a boil, a piece of white *juan*-silk weighing 3.3 grams was put in the juice and boiled for thirty minutes. The silk was then rinsed and blow-dried (fig. 7.3).

Dyeing with the First Juice. The silk was boiled again in the first juice for thirty minutes. Then it was rinsed and blow-dried.

FIGURE 8
Dyed sample. China National Silk Museum, Hangzhou, China.

Results: The Color and the Pigments

The color measurement was performed on a dyed sample (fig. 8) with a portable spectrophotometer. L, a, b values were respectively, 69.33, 3.93, 59.23.

An extract of fresh rehmannia roots on silk was analyzed by HPLC-MS. The HPLC profile shows four major peaks with [M+H]+ ions at m/z 444, 524, 510, and 316 in the positive ion mode, respectively (fig. 9). Unfortunately, we were not able to designate the structure of these four compounds. However, the fingerprinting profile with L, a, b values could be useful for identification of the species of rehmannia in historical textiles.

Discussion

While imperial yellow should be highly saturated, the sample dyed in this experiment has low saturation and is not as attractive as we had hoped. The problem most likely derives from the materials we used. According to the *Qimin yaoshu*, imperial yellow is dyed in the eighth lunar month. From this evidence, we deduce that fresh rehmannia roots should be used for dyeing. However, even with fresh roots, we were not able to dye silk the expected color with this species of rehmannia root (*Rehmannia glutinosa* Libosch., or Chinese foxglove), which today is typically used only for medicinal purposes. Also, according to the text, raw *juan*-silk was used to dye imperial yellow. We used degummed *juan*-silk, which may have made a difference.

Conclusion

There has been little research until now on the history and production of imperial yellow or any attempts to re-create this important color. For this essay, we examined early texts for references to imperial yellow. Among these documents, the earliest to discuss the production of imperial yellow is *Qimin yaoshu*, which

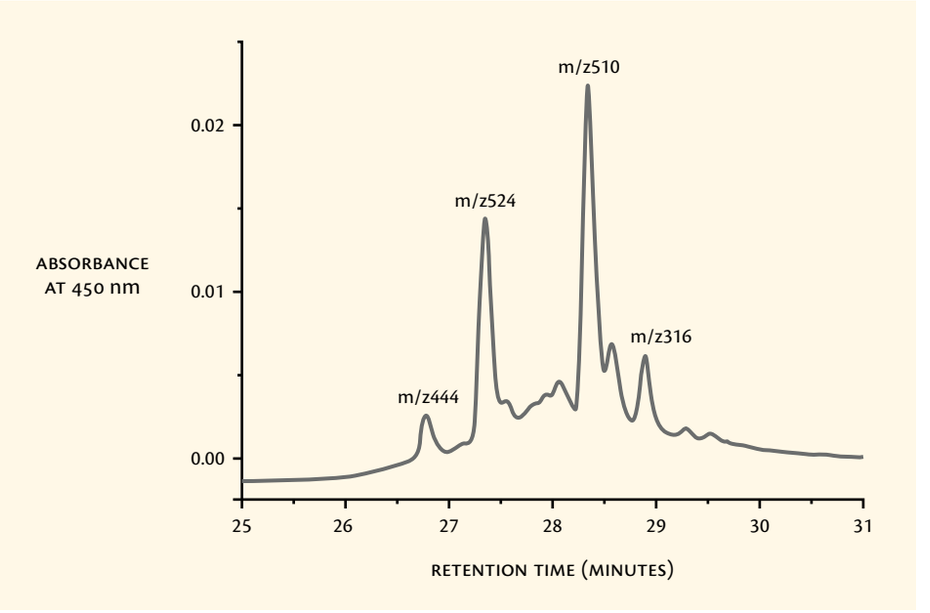


FIGURE 9
HPLC profile of an extract of rehmannia roots on silk.

identifies rehmannia roots (*dihuang*) as the material used to produce this color. The fact that rehmannia does not appear in later texts about dyeing may suggest that it continued to be reserved for imperial use. While our first attempt to reproduce imperial yellow was not entirely satisfactory, it did demonstrate that the material and process described in *Qimin yaoshu* have the potential to produce this exceptional color.

Acknowledgments

I would like to thank Liu Jian of the Chinese National Silk Museum for carrying out dyeing experiments and color measurements with Long Bo. We are also grateful to Jin Shao of East China Normal University for the English translation.

Note: We consider this research to be only a start. We wish to collect and experiment with various types of rehmannia roots, carry out experiments at the proper time during the eighth lunar month according to *Qimin yaoshu*, and conduct many more analyses and tests with a higher degree of accuracy, in order to more precisely reproduce the ancient imperial yellow. Beyond that, we hope gradually to revitalize the precious dyeing techniques of ancient China.

FIGURE 4 (detail)

Dye Analysis of Two Polychrome Woven Textiles from the Han and Tang Dynasties

LIU JIAN · ZHAO FENG

This essay examines the dyes in two luxury textiles typical of their respective periods. The first is a Han-dynasty (206 BCE–220 CE) warp-faced compound tabby, and the second, a Tang-dynasty (618–907) weft-faced compound twill (samite). The dyes were analyzed by high-performance liquid chromatography with photodiode array and mass spectrometric detection (HPLC-PDA-MS). Both archaeological textiles, which are housed in the China National Silk Museum, were previously in private collections. Although the technical structure of the former textile indicates that it was probably produced in central China, it was excavated from a grave in Loulan in northwestern China.[1] The structure of the second textile is typical of Sogdian silk manufactured in Central Asia. It is unclear whether the weavers of these textiles were working in Central Asia, northwestern China, or central China. A comparison of the dyes in the two textiles, in conjunction with other evidence, may help determine patterns of production and trade.

Introduction

During the Han and Tang dynasties, China was widely known as an important supplier of silk goods. Regular commerce in silk may be traced to the journey of the imperial envoy Zhang Qian (200–114 BCE), although the silk trade between East and West had a longer history. The fall of the Eastern Han dynasty in 220 CE led to the virtual cessation of the Silk Road trade, as China was fragmented and lost control of the trade routes encircling the Taklamakan desert in what is today northwestern China. When the Tang dynasty reunified China in the early seventh century and embarked on an expansionist foreign policy, the silk trade increased rapidly.[2] At the same time as there was a high demand for Chinese silk in Central and West Asia, a demand developed in China for 'western-style' silk imported into China along the Silk Road by Sogdian merchants.[3] It is unclear whether specific examples of this so-called Sogdian silk found in China were woven in Central Asia (most probably Bukhara), or produced by Sogdian weavers living in China, or even by Chinese weavers who had adopted new techniques and motifs from Sogdian weavers.

For this study, we used high-performance liquid chromatography with photodiode array and mass spectrometric detection (HPLC-PDA-MS) to analyze the Han *jin* textile and the Tang-dynasty Sogdian samite. Our results suggested that the silk threads that appear brown in the Han-dynasty textile were originally red, dyed with madder (*Rubia cordifolia*), whereas the red threads of the Tang-dynasty textile were probably dyed with an unusual mixture of madder (most probably *Rubia tinctorum*), lac, and a carmine scale insect. Both textiles contained

1. Archaeological team of Loulan, Xinjiang, "Excavation report of tomb groups on the outskirts of Loulan," *Cultural Relics* 7 (1988): 23–39.

2. James C.Y. Watt and Anne E. Wardwell, *When Silk Was Gold: Central Asian and Chinese Textiles* (New York: Metropolitan Museum of Art, 1998), 7.

3. Zhao Feng and Wang Le, "Central Asian Textiles Found in Dunhuang," *Dunhuang Research* 4 (2009): 38–46.

protoberberines (yellow), indigotin (blue), and ellagic acid (black/brown). A comparison of the dyes in the two textiles, in conjunction with other evidence including the motifs and technical structures of the two samples, may help determine the sources of production.

Method

The dye was extracted from a thread (0.2–1mg) of the archaeological object in a solution of pyridine/water/1.0M oxalic acid as described by Mouri and Laursen.[4] The solution was evaporated to dryness under a nitrogen flow, and redissolved in 50μL MeOH/H_2O (1/1); subsequently, 20μL of dye solution was injected onto HPLC column.

An extract was analyzed on an HPLC-PDA-MS system consisting of a Shimadzu LC-20A high-performance liquid chromatography, a Shimadzu SPD-M20A photodiode array detector and a Thermo LTQ XL ion trap mass spectrometer. The separation was performed on a Shim-pack XR-ODS column (3.0 × 75mm, 2.2-μm particle size) and a Phenomenex Luna C18 column (2.0mm × 150mm, 3-μm particle size). Columns were eluted with acetonitrile-water gradients containing 0.1% formic acid at a flow rate of 0.3 mL/min.

Discussion and Results: Polychrome-Patterned *Jin* Silk with Clouds and Animals

Illustrated is a fragment of warp-faced compound tabby with clouds and animals (fig. 1). It may depict an animal with one horn and wings, namely a *qilin* (an auspicious beast somewhat akin to a unicorn). The piece is a multicolored Han *jin*, or Han brocade, with a typical warp-faced compound tabby structure. The ground appears blue, supporting brown, green, and yellow motifs.

FIGURE 1
Polychrome-patterned *jin* silk with clouds and animals, from Khotan, Xinjiang. 28 cm × 2.8 cm. Silk. Western Han dynasty. China National Silk Museum, Hangzhou, China.

4. Chika Mouri and Richard Laursen, "Identification and Partial Characterization of C-Glycosylflavone Markers in Asian Plant Dyes Using Liquid Chromatography–Tandem Mass Spectrometry," *Journal of Chromatography A* 1218 (2011): 7325–30.

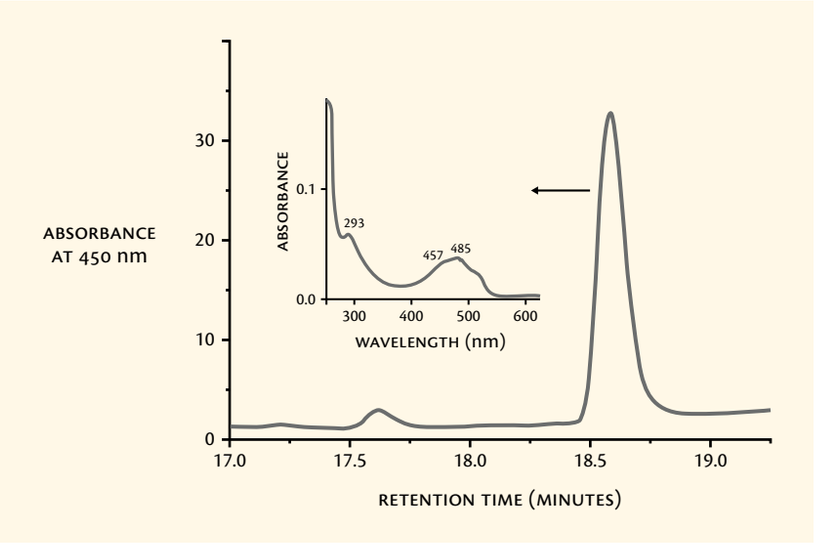


FIGURE 2
HPLC profile of extract from a brown sample of the polychrome-patterned *jin* silk with clouds and animals monitored at 450 nm; inset, UV-Vis spectrum of purpurin.

A strong purpurin peak with absorption maxima at 293,457,485 nm was observed, as shown in figure 2. The results indicate that the threads that appear brown today were originally dyed red with madder (*Rubia cordifolia*) (fig. 2). Since the Shang dynasty (sixteenth century BCE to ca. 1045 BCE), Chinese dyers have used this species of madder, with alum, to dye silk in shades of orange, red, or crimson. The saturation could be deepened by increasing the number of dips in the dye bath.[5] The presence of purpurin and the absence of alizarin make it likely that this silk textile was dyed with *Rubia cordifolia* rather than another species of madder.

Yellow Dye

Berberine (MW = 336 Da) and traces of palmatine (MW = 352 Da) and jatrorrhizine (MW = 338 Da) were detected in yellow threads from the *jin* silk fragment (fig. 3). Species of both *Phellodendron*, mentioned in Ming-dynasty (1368–1644) documents,[6] and *Berberis*, mentioned in Tang-dynasty documents,[7] contain primarily berberine. Berberine, with palmatine and jatrorrhizine, has also been found in the paper of the Dunhuang *Diamond Sutra* (868).[8] Berberine was also detected, using excitation-emission matrix fluorescence and ultraviolet-visible reflectance spectroscopic techniques, on the toes of eighth-century Chinese embroidered shoes that have been stored in the Shōsōin repository at the temple of Tōdaiji in Nara, Japan, for more than 1250 years. The presence of berberine suggests that they were dyed with a species of *Phellodendron*.[9] Our analysis of the third-century Han textile revealed that a berberine-containing dye was used to dye the yellow threads. This is the earliest berberine found to date on Chinese textiles.

Blue Dye and Green Dye

As expected, indigotin and its isomer indirubin were detected in an extract obtained from a blue thread of the Han silk. It is impossible

5. Cheng Weiji, *History of Textile Technology of Ancient China* (Beijing: Science Press, 1984), 80.

6. Li Shizhen, *Bencao gangmu* [Compendium of *materia medica*] (Beijing: Hua Xia Publishing House, 2008), 1328.

7. Su Jing, *Tang ben cao* [*Materia medica* of the Tang dynasty] (Hefei: Anhui Science and Technology Publishing House, 2005), 351.

8. Peter J. Gibbs, et al., "Analysis of Ancient Dyed Chinese Papers by High-Performance Liquid Chromatography," *Analytical Chemistry* 69, no. 10 (May 1997): 1965–69.

9. Nakamura Rikiya et al., "Dye Analysis of Shōsōin Textiles Using Excitation–Emission Matrix Fluorescence and Ultraviolet–Visible Reflectance Spectroscopic Techniques," *Analytical Chemistry* 81, no. 14 (July 2009): 5691–98.

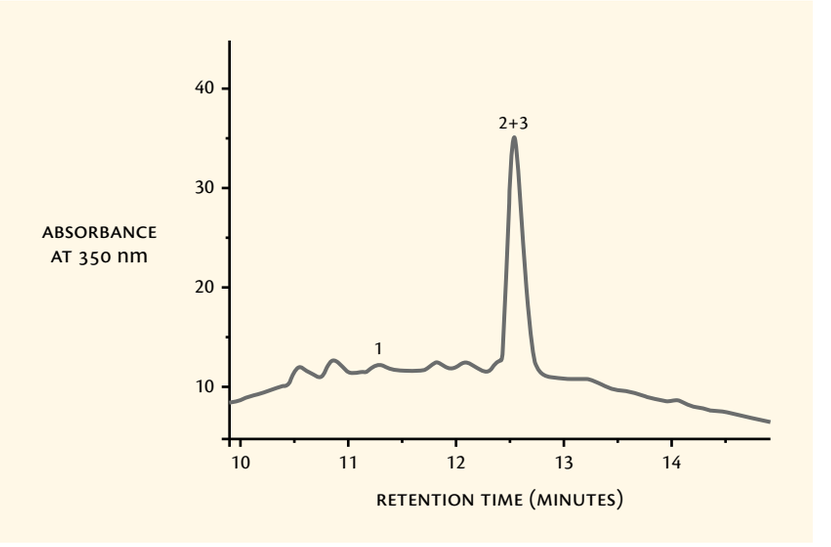


FIGURE 3
HPLC profile of extract from yellow sample of the polychrome-patterned *jin* silk with clouds and animals monitored at 350 nm. 1. jatrorrhizine; 2. berberine; 3. palmatine.

to identify the dye source of the blue sample since many plants, such as *Indigofera tinctoria*, *Polygonum tinctorium*, *Isatis tinctoria*, etc., produce indigo (indigotin + indirubin), and the chemical compound that produces the dye is the same regardless of its source. Many species of plants containing indigo grow in China today. Cheng Weiji suggests that *Polygonum tinctorium* may have been the main source of indigo in ancient China.[10] For green, HPLC-PDA-MS revealed both indigo and protoberberines.

Discussion and Results: Samite with Roundels of Birds on a Red Ground

Figure 4 shows a fragment of part of a samite with roundels of birds. It includes a bird with a ribbon in its beak in each roundel (fig. 4). The medallions are surrounded with symmetrically placed flowers. This is a weft-faced compound twill silk with Z-twisted warp threads (fig. 5). The ground is red and the figures are yellow and blue. Similar objects, dating back to the middle and end of the Tang dynasty (eighth to ninth century), have been discovered in Tibetan tombs in Dulan, Qinghai.[11] The motif and technical structure of the object is typical of Sogdian silk, indicating that it was probably either produced in Central Asia or woven by Sogdian weavers who had migrated to Qinghai, Xinjiang, or some other part of China.

Red Dye

A mixture of dyes derived from one of several species of carmine scale insects (I), lac (II) and madder (III) was detected by HPLC-PDA-MS (fig. 6) in a red thread from the samite fragment. Compounds 1–6 were identified, respectively, as carminic acid (MW = 492 Da), carminic acid-like (MW = 536 Da), laccaic acid A (MW = 537 Da), laccaic acid B (MW = 496 Da), laccaic acid A-like (MW = 581 Da), laccaic acid B-like (MW = 540 Da), and kermesic acid (MW = 329 Da) (table 1). Wouters and Verhecken have studied the red dyes of the *Coccoidea* insects, both American cochineal (*Dactylopius coccus*) and Ararat cochineal (*Porphyrophora hamelii*). They find that both contain primarily carminic acid (≥94%),[12] and that *P. hamelii* can

10. Cheng Weiji, *History of Textile Technology*, 79.

11. Xu Xinguo, "Studies on Samite with Birds from Tibetan Tombs in Dulan of Qinghai," *China Tibetology* 1 (1996): 3–26.

12. Jan Wouters and André Verhecken, "The Coccid Insect Dyes: HPLC and Computerized Diode-Array Analysis of Dyed Yarns," *Studies in Conservation* 34, no. 4 (1989): 189–200.

FIGURE 4
Samite with bird roundels on a red ground. 25 × 21.5 cm. Silk. Tang dynasty. China National Silk Museum, Hangzhou, China.

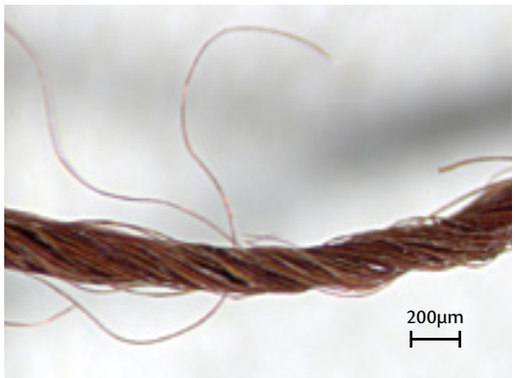


FIGURE 5
Micrograph of Z-twisted warp thread of samite with bird roundels on a red ground (50×).

be distinguished by having a little more kermesic acid and flavokermesic acid.

It is difficult to identify the species of carmine scale insect that produced this red dye since kermesic acid is found not only in different proportions in all species of carmine scale insects studied so far, but has also been identified in *Kerria lacca*. Laccaic acids A and B are the two major coloring matters in lac dye. Lac is an ancient dyestuff used especially in India, South Asia, and parts of China. It is derived from different species of coccid insects belonging to the *Kerria* genus that live wild or are bred in colonies on different tree species. It has been mentioned in a few historical documents, for example, *Tang ben cao* (*Materia medica* of the Tang dynasty, 659). People in southern China and northern Vietnam are known to have collected lac for dyeing and lacquering.

In addition, two strong peaks corresponding to alizarin (MW = 240 Da) and purpurin (MW = 256 Da) were eluted between 14–16 minutes (fig. 7). Thus, it is clear that a species of madder, most likely *Rubia tinctorum*, one of the most common red dyes in ancient and medieval East Asia, was used to produce red threads in the samite with bird roundels.

It is very interesting to analyze the red dyes used in this Tang-dynasty silk textile. Reds derived from two scale insects and one plant in a single thread suggest that the dyers of the threads for this textile considered not only the expected color, but also the fastness of the dyes at this time. Although the chemical compounds in carmine scale insects, lac, and madder are all anthraquinones, madder is slightly more colorfast than the two *Coccoidea* red dyes. Another, more probable, reason to use all three dyestuffs on a single thread may be economic, since madder is normally considerably less expensive than scale-insect dyestuffs.

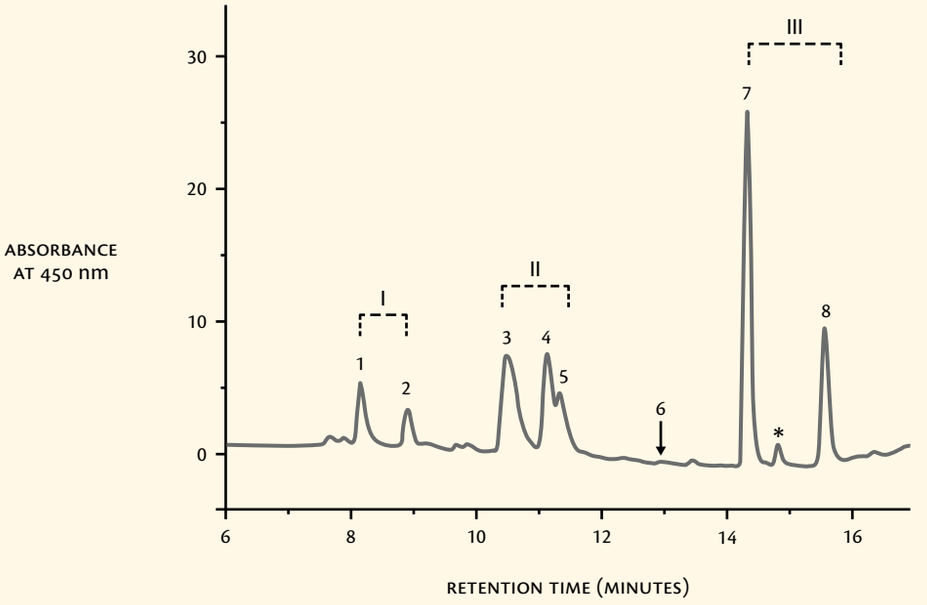


FIGURE 6
HPLC profile of an extract of the red ground from the samite with bird roundels, monitored at 450 nm (assignments of peaks presented in table 1).

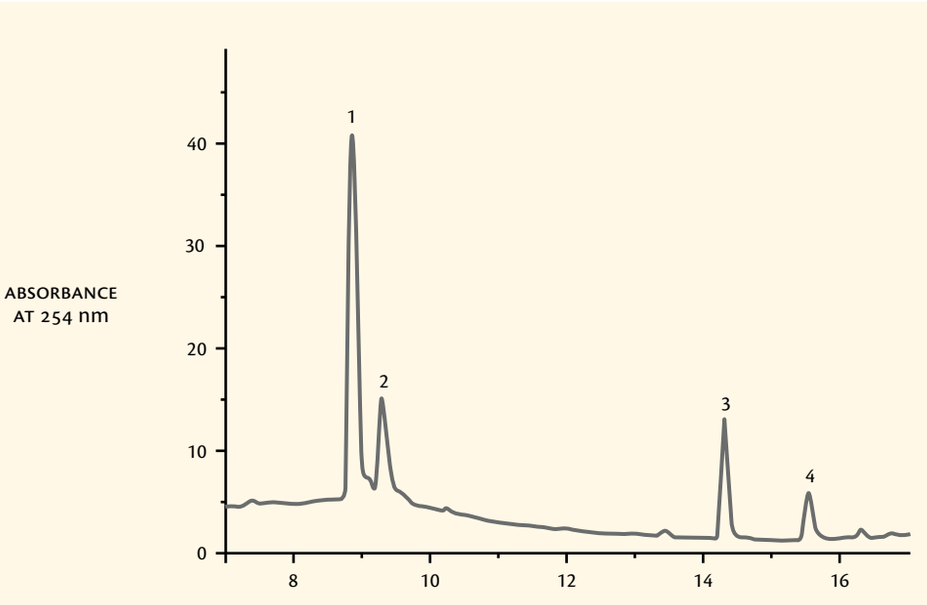


FIGURE 7
HPLC profile of extract from crimson threads from the samite with bird roundels on a red ground monitored at 254 nm. 1. ellagic acid; 2. ellagic acid-like; 3. alizarin; 4. purpurin.

TABLE 1
Tentative identification of compounds in the red ground of the samite with roundels of birds.

Peak no.	λ_{max}(nm)	Mass (Da)	Possible compound
1	276,485	492	Carminic acid
2	275,349,485	536	(Carminic acid-like)
3	287,485	537	Laccaic acid A
		496	Laccaic acid B
4	287,485	581	Laccaic acid A-like
5	287,485	540	Laccaic acid B-like
6	279	339	Kermisic acid
7	247,278,430	240	Alizarin
8	293,457,485	256	Pupurin

Crimson Dye

A madder-type dyestuff with tannin was identified in the crimson sample. The large amount of alizarin seen especially in the HPLC profile monitored at 450 nm (not illustrated) indicated the presence of *Rubia tinctorum*. Ellagic acid, which is indicative of tannin-containing plants, and an unknown ellagic acidlike compound were detected at 350 nm. Tannin was often used as a dye, a mordant, and a weighting agent for silk in ancient times.

Blue Dye

As described above, the blue dye present in this object can be obtained only from plants that contain indigo. It is impossible to identify the particular species at the present time.

Conclusion

Dye analysis of two polychrome woven textiles from the Han and Tang dynasties were carried out by using HPLC-PDA-MS. Madder-type and protoberberine-type dyestuffs were identified in the Han *jin* silk with clouds and animals, and three red dyes, namely madder, lac, and a carmine scale insect, were detected in a red thread of the Sogdian samite with bird roundels. Indigo, the blue dye used from ancient times until the present, was found in both textiles. It seems likely that the Han-dynasty textile was produced in Central or Eastern China, judging from its technical structure and from the dyes. A similar analysis of the motifs and technical structure of the second object, a Tang-dynasty textile, suggests that it was made of Sogdian silk, probably in Central Asia, perhaps Bukhara, and exported to northwestern China. It is interesting that dyes derived from madder, lac, and a carmine scale insect appeared in the red ground of the Sogdian silk. The presence of three different dyes originating from quite distant places is surprising. It seems likely that the same thread was dyed with both lac and a carmine scale insect to achieve a saturated color, and that madder, the most common red dyestuff, was used to reduce expenses and improve fastness to washing.

Acknowledgments

This study was supported by grants from the Moonchu Foundation (Hong Kong, 2012). The authors would like to thank Professor Richard Laursen of Boston University for editing the English text.

SECTION IV

The essays in this section draw on literature, government documents, extant textiles, and other material culture to examine the use of color among the elite of Japan during the Asuka, Nara, and Heian periods (ca. sixth–twelfth century).

In ancient Japan, as in China, materiality mattered. Colors were earth-bound, linked to the dye plant or mineral pigment that produced them. Many dye plants were also medicinal herbs. Able to heal illness and to produce vibrant colors from nondescript materials, the spirit or *kodama* of a dye or medicinal plant was believed to have power and to transfer that potency to cloth dyed from it.

In the opening essay, Dusenbury discusses the use of color in politics, poetry, and material culture in Japan during the Asuka (538–710) and Nara (710–794) periods. She traces the introduction of continental ideas about color and advanced technologies of dye production from the mainland to Japan, mostly in conjunction with a nascent rank system, part of a new political organization based on continental models. The Japanese elite appear to have delighted in their newfound ability to produce brilliant colors and occasionally seem to have favored their pleasure in a color over Confucian restrictions on its use. Japanese had a tolerance for contradiction, preferring both/and to either/or, even when two ideas appeared to be in conflict. Thus, in Japan, the brilliant but fugitive scarlet from safflower was used both as an example of frivolity and unfaithfulness (as it was in China), and elevated to a color used to designate high political rank, something that in China would have been unthinkable. The essay concludes with a discussion of the continuation of Tang/Nara aesthetic concepts and a preference for vibrant colors into the Buddhist and secular art and material culture of the Heian period (794–1185).

In the second essay, Monica Bethe looks closely at the expression and function of color in the eighth-century collection of poetry, the *Man'yōshū*, especially the use of *murasaki*, or purple, from the roots of the gromwell plant. Many of the poems were originally 'songs,' anonymously written, reflecting more of the life, thought, and emotion of all stages of society than later imperially commissioned volumes of poetry. Color was significant in many of these poems. Readers and listeners were sufficiently familiar with the colors, the plants they came from, their properties, and even dyeing processes that these could be used metaphorically within a poem. The meaning of a poem might even hinge on a reader's understanding of these matters.

In the third essay, Tanaka Yoko examines four pairs of women's embroidered slippers that have been housed in the Shōsōin Repository of the Tōdaiji in Nara since the mid-eighth century. All four pairs had belonged to Emperor Tenmu and were donated to the temple by his widow after his death in 756. Tanaka presents a thorough analysis of their structure, style, ornamentation, and the dyes used to color them. 'Slippers with upturned toes' were popular in China at the time, and these were constructed with a rare compound

Color at the Court of Japan

weave that has also been found in contemporary Chinese textiles. Her analysis suggests that all four pairs of slippers were made in a single workshop in China.

In the fourth essay, Monica Bethe discusses the use of color at palace rituals in the Nara and Heian periods. She uses extant objects from the collection of the Shōsōin Repository in Nara and court documents to focus on the use of color in the *Tango no hi* festival (now Children's Day) celebrated on the fifth day of the fifth month and the *Tanabata* (Star Festival) celebrated on the seventh day of the seventh month. In both of these festivals, color was significant and often used within situations or material expressions that evoked the concepts of *yinyang* and *wuxing* (five phases or elements), ancient Chinese concepts that had become deeply embedded in Japanese thought and expression.

In the final essay in this section, Dusenbury uses Heian-period women's literature and court documents to consider the roles that color played in the life of the Heian court. Women's popularly named *junihitoe* (twelve-layered robes) were composed of multiple layers of single-colored kimono-shaped garments, dyed in sharply contrasting or subtly graduated shades of color. The elegance and distinction of the color arrangements of her formal robes was a significant factor in a court lady's advancement within the small world of Heian aristocratic society. At a more profound level, color was a signifier in a basic dichotomy that ran deep within Heian society between the enlightened civilization associated with high Chinese (and now Japanese) culture and uncivilized, indigenous ways. A section of the tenth-century *Engishiki* (Regulations of the Engi era [901–923]) gives instructions to commissaries of the imperial dyeworks on the production of the colors required for court use and reveals the skill of Heian court dyers. The 123 entries in fascicle XIV of the *Engishiki* were produced from a modest palette of ten dye plants, modified only with vinegar and ash lye.

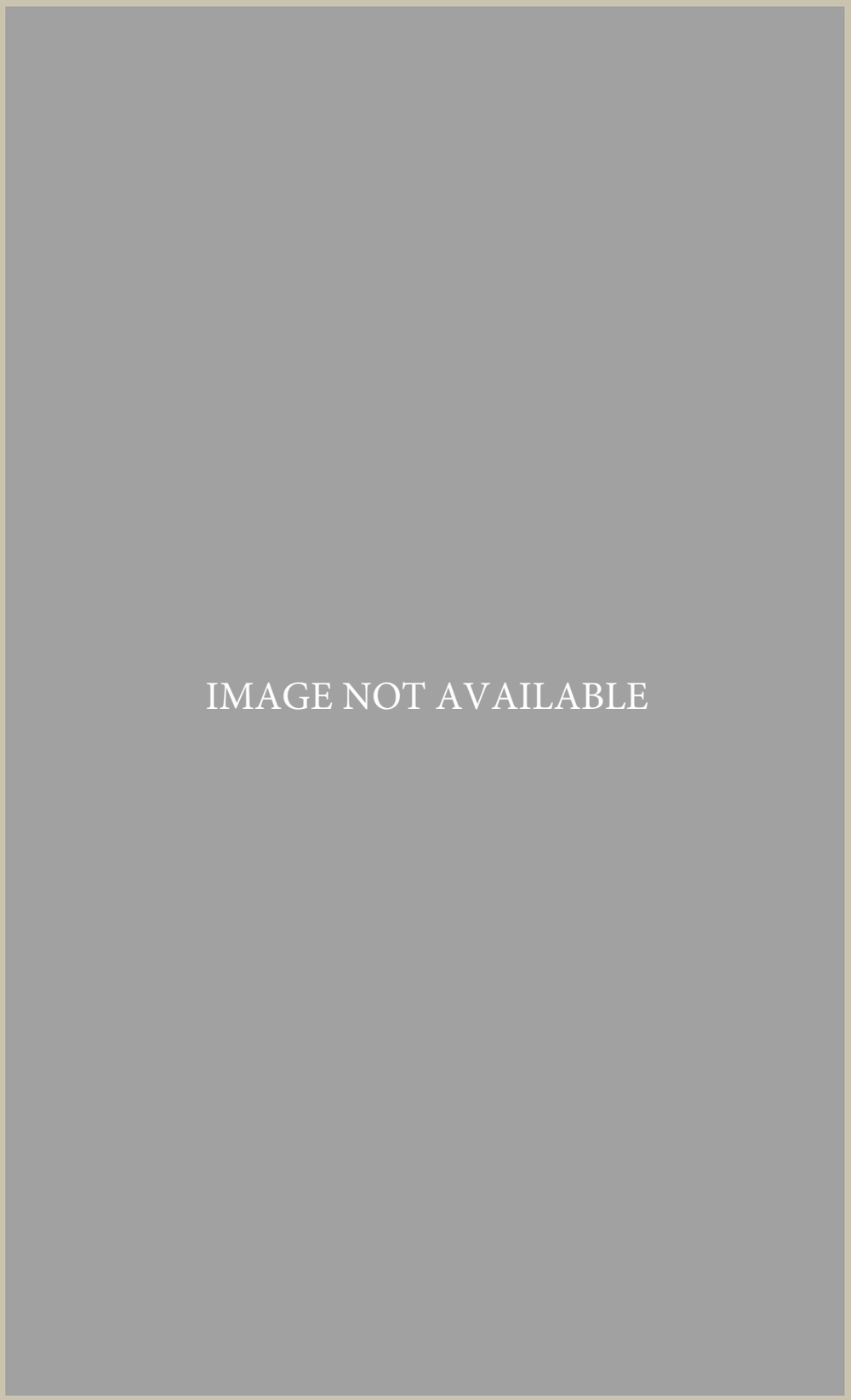


PLATE 1
Portrait of Shōtoku Taishi. 101.3 × 52.5 cm. Ink and colors on paper. Late seventh or early eighth century. Imperial Household Agency, Nara, Japan.

Color at the Japanese Court in the Asuka and Nara Periods

MARY M DUSENBURY

This essay will trace the introduction of dye technology and ideas about color from the continent to Japan and discuss the use of color in politics, poetry, and material culture during the Asuka (538–710) and Nara (710–794) periods. The practice of indicating rank in the Chinese imperium and within several Korean kingdoms by employing colors derived from particular dye plants (the 'correct' colors) was a model for a similar system in the emerging Japanese state, and seems to have been a catalyst for the introduction of continental dye technology to Japan in the seventh century. The essay begins with an introduction to the perception of color that underlay its multiple uses during the ancient and medieval periods in Japan, together with a discussion of the documentary basis for a study of color in seventh- and eighth-century Japan. The first section of the essay will examine how color was used for political purposes through manipulation of the colors used to indicate rank. The next section discusses the use of color as metaphor in an eighth-century poem, a use that presupposed a readership with a thorough knowledge of colors and the properties of the dye plants that produced them. The final section describes *ungen*, or bands of color radiating from a central core, an artistic device that is found on objects of many types in the mid-eighth-century Shōsōin Repository in Nara and that foreshadowed multiple expressions of color in the succeeding Heian period (794–1185).

Introduction

In Japan, as in other parts of East Asia, color played a significant role in thought, ritual practices, literature, and material culture. Color was understood to be a material substance, linked to a specific plant or mineral rather than to a point on a spectrum of light. Colors were usually named after the substance they came from. The earliest beliefs about the potency of colors are reflected in the concept of the *kodama* or spirit of a plant, part of a larger belief in a numinous world inhabited by *tama* (spirits) that resided in many objects, animate and inanimate. There were beneficial *tama* (*nigitama*) as well as harmful *tama* (*aratama*, or rough spirits). The *kodama* of medicinal plants was particularly strong, able to overcome the *aratama* of illness. Most of the old dye plants were also medicinal plants. Able to heal illness and to produce vibrant colors from commonplace materials, these plants were believed to hold formidable power. Belief in the *kodama* was part of a nebulous web of beliefs that eventually took form as Shinto, Japan's indigenous religion. The dyer and color-historian Maeda Ujō points out that it is by the power of the *kodama* that plants grow, flowers bloom, and fruit blossoms.[1]

1. For a discussion of *kodama*, see Maeda Ujō, *Nihon kodai no shikisai to some* [Color and dye in ancient Japan] (Tokyo: Kawade Shobōshinsha, 1982), 15–18. A similar belief in the power of certain words to evoke the essence of the things they stood for (the *kotodama* or spirit of a word) underlay much ancient poetry. Scholars now recognize the function of *kotodama* within ancient poetry and its use in ritual contexts. See H.E. Plutschow, *Chaos and Cosmos: Ritual in Early and Medieval Japanese Literature*, Brill's Japanese Studies Library, vol. 1 (Leiden: E.J. Brill, 1990), 11.

A second set of beliefs about color, and one more easily analyzed through documentary records, entered Japan from the continent in conjunction with *wuxing*, a Chinese paradigm of the working of the cosmos that presupposed the potency of colors from particular plants and mineral pigments. As in China and several kingdoms on the Korean peninsula, the so-called 'correct' colors associated with this 'five agent' concept were used to designate rank and status. Although not one of the correct colors, the purple obtained from gromwell roots indicated that the wearer was of very high rank, as it did on the continent.

Documentation

There is nothing in the records of the Asuka and Nara periods in Japan to compare to the abundant discourse about color in the Chinese classics and other early Chinese documents. The two primary written sources are the imperially commissioned *Nihonshoki* or *Nihongi* (Chronicles of Japan), compiled in 720, and its continuation, the *Shokunihongi*, in 797. These two histories were written in classical Chinese, the language for official documents at that time. In format, they were based not so much on Chinese official histories as on the Chinese court chronicles, the raw material from which official Chinese histories were later composed. The *Nihonshoki* opens with Japan's foundation myths and a semimythical early history that was designed to strengthen the claims of the current imperial family, but it is considered to be a comprehensive and reliable record for the reigns of Emperors Tenji (r. 668–672), Tenmu (r. 672–686), and Empress Jitō (r. 687–697). Both chronicles record, with journal-like detail, the movement of the emperor, court edicts, natural catastrophes, and the like.[2] The two histories present their material with neither explanation nor analysis. It is left to the reader to retrieve the complex of philosophical, political, and symbolic meanings embedded in these basic entries and, if one is so inclined, to attempt to disentangle continental and native ideas.

The stark information about color in these two chronicles—primarily information about the prescribed use of color in official garments—is enriched by the descriptive and symbolic use of color in the poems or songs (*uta*) of the *Man'yōshū* (Ten thousand leaves) and the legends and poetry of the *Kojiki* (Record of ancient matters). The *Man'yōshū* is a collection of fourth- to eighth-century poems compiled in the late eighth century and explored more fully by Monica Bethe in her essay, "Color in the *Man'yōshū*, an Eighth-Century Anthology of Japanese Poetry" in this volume. The early-eighth-century *Kojiki* is a collection of legends, ancient history, and poetry chronicling the creation of Japan, its *kami* (deities), early emperors, and genealogies that served to link Empress Suiko (554–628) with the mythic founding emperors.[3]

2. The *Nihonshoki* or *Nihongi* [Chronicles of Japan] is the first of six imperially commissioned histories of early Japan. Unlike an earlier history, the *Kojiki*, it was written in classical Chinese, the standard language for official documents at the time. It was commissioned by Empress Genshō (r. 715–724) and compiled in 720 by Prince Toneri with the assistance of Ō no Yasumaro. The compilers of the *Nihonshoki* relied on earlier records, including court records kept by the Ministry of Central Imperial Affairs and biographies of important officials composed within the Ministry of Ceremonial Affairs. Many of these records had been written by immigrant scribes. Scribes from Baekje had begun keeping records for the Yamato court perhaps as early as 400 CE. There were several early histories as well, including one commissioned by Shōtoku Taishi in 620. None of these materials is now extant. The *Shokunihongi* [Chronicles of Japan continued], the second of the six histories (*Rikkokushi*), covers the period from 697 to 791. Edited by Fujiwara no Tsugatada and Sugano no Mamichi, it was a forty-volume work completed in 797. See Edwin O. Reischauer and John K. Fairbank, *East Asia: The Great Tradition* (Boston: Houghton Mifflin Company, 1958), 464–69, 495–96; and Robert Karl Reischauer, *Early Japanese History (c. 40 B.C.–A.D. 1167)* (Princeton: Princeton University Press, 1937), part A:125.

3. The *Man'yōshū* [Collection of ten thousand leaves] contains poems dating from 347 to 759, written in Japanese in a combination of Chinese ideographs and an early phonetic alphabet. It was compiled sometime after 759. The poet Ōtomo no Yakamochi (718–785) has long been associated with its editing and compilation. For information on the *Man'yōshū* and an English translation with extensive commentary, see Edwin A. Cranston, *A Waka Anthology*, vol. 1, *The Gem-Glistening Cup* (Stanford: Stanford University Press, 1993). See also Ian Hideo Levy, *The Ten Thousand Leaves: A Translation of the* Man'yōshū, *Japan's Premier Anthology of Classical Poetry*, Princeton Library of Asian Translations (Princeton: Princeton University Press, 1981). The *Kojiki* [Record of ancient

Rank Colors (*kurai iro*) in the Asuka Period: The Color of Power / The Power of Color

In 603 Empress Suiko (r. 592–628) and her regent and nephew Shōtoku Taishi (regent 592–622) instituted a set of court ranks distinguished by color and details of costume (plate 1).[4] These ranks were designed to replace the clan-based (*uji-kabane*) structures of power with a court-centered system based on continental prototypes. They were instituted as part of a much larger effort to centralize political control on the imperial institution and its supporters and to model the Japanese polity on that of China and the sinified kingdoms of Baekje (18 BCE–660 CE), Goguryeo (37 BCE–668 CE), and Silla (57 BCE–935 CE) on the Korean peninsula. The institution of a rank system in 603 marked the beginnings of the emergence of a centralized state with a written language, art, architecture, technologies, and statecraft, which were patterned on continental models. The colors that were used to indicate rank, the *kurai iro* or rank colors, were primary markers of a radically new concept of government. Although, at first, new ranks were given primarily to already established chiefs—constituting a new system but with more or less the same players—the groundwork had been laid for major reallocations of power. The *Nihonshoki* reports that in 603 there were six ranks, divided into upper and lower grades, each named after a Confucian virtue and distinguished visually by differences in the color and details of elaborate headdresses.[5]

In 647, Emperor Kōtoku (r. 645–654) added an entry-level position and named the ranks. In the mid-seventh century, distinctive headgear apparently served as the primary rank marker. These elaborate *kōburi* (later pronounced *kanmuri* or *kammuri*) were distinguished by material and color (plate 1a).[6] The *Nihonshoki* describes them in great detail, including the various types of complex woven textiles required for each rank as well as the appropriate rank colors. Maeda Ujō has suggested that the most complex textiles and some, at least, of the cloth dyed with the rank colors were precious imports.[7] Beginning with the rank order promulgated in 647, the official chronicles specify a garment color for each rank and grade (table 1). The change from a tiny piece of fabric to a whole garment or set of garments dyed in the prescribed colors suggests the presence of skilled dyers and a relatively large supply of the appropriate dye materials. It was likely immigrant master dyers who established the first sophisticated dye workshops and the court and aristocracy who allocated land for growing fields and sponsored the cultivation of the requisite dye plants.

Although the rank colors had been adopted primarily for political purposes, the Japanese elite appear to have taken great delight in the new colors. The *Nihonshoki* traces a quick proliferation of shades and tones of the correct rank colors, suggesting both the pleasure that

matters] was commissioned by Empress Genmei (660–721) and written ca. 712 by the statesman and poet Ō no Yasumaro, based on earlier records and oral histories. *Kojiki* [Record of ancient matters], eds. Kurana Kenji and Takeda Yūkichi, NKBT 1 (Tokyo: Iwanami Shoten, 1958). Of interest also are the few surviving *fudoki* or local gazetteers commissioned by Empress Genmei in 713. The *fudoki* describe the geography, products, institutions, and legends of each province. See Edwin A. Cranston, "Asuka and Nara Culture: Literacy, Literature, and Music," in *The Cambridge History of Japan*, vol. 1, *Ancient Japan*, ed. Delmer M. Brown (Cambridge: Cambridge University Press, 1993), 453–86.

4. The primary source for the study of the *kurai iro* is the *Nihonshoki* [Chronicles of Japan]. See: *Nihonshoki*, eds. Sakamoto Tarō, Ienaga Saburō, Inoue Mitsusata, and Ōno Susumu, NKBT 67–68 (Tokyo: Iwanami Shoten, 1967). W.G. Aston, *Nihongi: Chronicles of Japan from the Earliest Times to A.D. 697* (First published 1896; London: George Allen & Unwin, 1956), 228–30. See also Maeda Ujō, *Nihon kodai no shikisai to some*, 39–55; Nagasaki Seiki, *Iro no Nihon shi* [History of color in Japan] (Kyoto: Tankōsha, 1974), 85–93; Mary McClintock Dusenbury, "Color, Rank, and Status in Japan," in "Radiance and Darkness: Color at the Heian Court" (PhD diss., University of Kansas, 1999), 103–28.

5. *Nihonshoki* II, NKBT 68, 180–81, entry for the eleventh month of the eleventh year of Suiko.

6. Pronunciations follow those given in NKBT, which specifically notes the pronunciation *kōburi* for a character that was later read *kammuri*. For this reading of *kōburi*, see also Suzuki Keizō, *Yūshiki kojitsu daijiten* [Encyclopedia of ancient manners and customs of the intelligentsia] (Tokyo: Yoshikawa Kōbunkan, 1995), 187.

7. Maeda Ujō, *Nihon kodai no shikisai to some*, 47.

Rank Colors of 647[8]		
Rank	Headdress	Garment
Rank I		dark purple (*fuka murasaki*)
Rank II		dark purple (*fuka murasaki*)
Rank III	purple (*murasaki*)	light purple (*asa murasaki*)
Rank IV		madder red (*ake*)
Rank V	blue/green (*ao*)	deep blue (*fukaki hanada*)
Rank VI	black (*kuro*)	green (*midori*)
Rank VII		

TABLE 1

they took in the new colors and the increasing skill of court dyers.

The rank color order of 647 was similar to that of Tang China (618–907).[9] In Baekje and Silla on the Korean peninsula, the same rank colors were used with purple and madder-red for the top ranks and blue (indigo) and green (indigo probably with a yellow) indicating lower ranks. The rank order in Silla in 520 designated yellow for the lowest rank.[10] In all cases, throughout East Asia, the deepest shade of a color was considered superior to a lighter shade.

In 648, Emperor Kōtoku increased the number of ranks to seventeen (an upper and a lower grade each of eight ranks plus the initial, highest, rank) but changed neither the composition nor the order of rank colors.[11] The color rank system established by Emperor Tenji's successor, however, marked a radical departure from precedent.

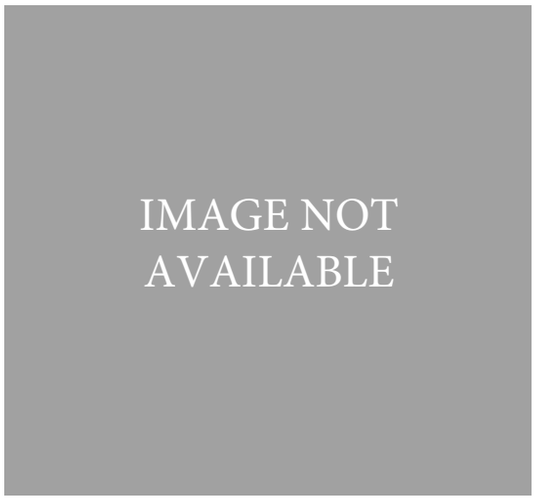


PLATE 1a
Detail of *Portrait of Shōtoku Taishi* showing his *kanmuri* (*kōburi*) headwear.

8. *Nihonshoki* II, NKBT 68, 303–04. The *Nihonshoki* does not give a garment color for the seventh or entry-level rank in 647. There are several possible reasons for this. Perhaps those at the entry level were not allowed to wear any of the special, and precious, colors reserved for those in higher ranks. A later entry describing hair ornaments specifically notes that this lower rank was not permitted to wear such ornaments. There may have been a standard clothing color for court appearances by the unranked that was so well known that it did not merit attention in the chronicles. Yellow would be a likely candidate. This was the lowest ranking color in Han China and in Silla, and a number of common plants could produce a yellow. (This common yellow should not be confused with *chihuang*, the reddish yellow produced from rehmannia roots, *dihuang*, for imperial use and described in the sixth-century *Qimin yaoshu* [See Zhao and Long in this volume]). Another possibility would be a brownish black. Black was the color of the *kōburi* or headdress for the lowest ranks and, even more than yellow, could be produced easily from the bark or nuts of a variety of local trees. It might also be that the entry was inadvertently omitted by a weary or careless scribe as the text was copied and recopied over the years.

9. Zhou Xibao, *Zhongguo gu dai fu shi shi* [History of ancient Chinese clothing] (Beijing: Zongguo xi ju chubanshe: Xi hua shudian Beijing faxing suo faxing, 1984), section 5, 4.

10. Kim Pu-sik, *Samguk sagi* [Historical records of the three kingdoms], trans. into Japanese by Rin Eiju (Tokyo: San'ichi Shobō, 1974), 2:150, 3:26. See also Lee Ki-baik, *A New History of Korea*, trans. Edward W. Wagner (Cambridge, MA: Harvard University Press, 1984), 52. The *Samguk sagi*, Korea's oldest extant history, was an official court-sponsored history compiled by Kim Pu-sik (1075–1151) during the reign of King Injong (1122–1146).

11. *Nihonshoki* II, NKBT 68, 305–06. Aston, *Nihongi*, 231–32. In 664, Emperor Tenji (r. 661–672) increased the number of ranks to twenty-six; in 667 he slightly revised the designated rank colors for the *kōbori* and official garments, and changed the garment color for rank VI from green to black. *Nihonshoki* II, NKBT 68, 360, entry for the

A Radical Departure from Precedent

In 685, Emperor Tenmu promulgated the following rank colors and order:

Rank Order of 685[12]	
Ranks I and II (princes, 12 grades)	Scarlet (*hanezu*) from safflower
Rank III	Deep purple (gromwell)
Rank IV	Light purple (gromwell)
Rank V	Deep green (indigo and a yellow)
Rank VI	Light green (indigo and a yellow)
Rank VII	Deep grape (source unknown)
Rank VIII	Light grape (source unknown)

Scarlet heads the list.[13] In China, safflower scarlet had been denounced by Confucian scholars for centuries as an example of wasteful frivolity, the very antithesis of a ritually 'correct' color. Nevertheless, once safflower appeared, seemingly from nowhere, to top the rank list in Japan—perhaps when safflower fields had been established and the dye technology to extract scarlet from the small yellow florets of the thistlelike heads had been imported from the continent—it remained at or near the top in most subsequent rankings.

The rank colors of 685—safflower scarlet, shades of gromwell purple, green, and 'grape'—were unusual. They represented a distinct break with tradition and the continental prototypes that had been so important to Prince Shōtoku and Empress Suiko a few decades earlier. This remarkable set of rank colors suggests contemporary Japanese pleasure in a newfound ability to produce stunning colors and perhaps reflects the aesthetic preferences of Emperor Tenmu and his mid-seventh-century court. The rank colors of 685 were later among the most popular colors at the Heian court. Their primary purpose in the seventh century, however, was political.

Emperor Tenmu had succeeded his brother only after a contentious war with a nephew that left the country divided. The situation was complicated by the continued presence of numerous local chieftains who had never been fully integrated into the Japanese imperium. In addition, there were foreign states—Baekje in particular—that had supported Tenmu's nephew in the Jinshin war of 672.[14] Tenmu and his consort, the future Empress Jitō, used the rank system with its rights and responsibilities to incorporate more provincial rulers into the imperial system, to empower his strongest supporters, and to unempower those who had not supported him in his bid for the throne. Between 680 and 684, Tenmu issued 201 new grants of *kabane* title to 177 families. In late 684, he radically reordered the titles themselves, moving older titles to the bottom of the list and raising newer titles to the top. In effect, this reduced the prestige of the once-powerful clan chieftains and augmented that of his supporters. Among these supporters were immigrants from China and kingdoms on the Korean peninsula who included members

third year of Tenji, second month, ninth day. The names of the ranks were changed somewhat at this point also.

12. *Nihonshoki* II, NKBT 68, 470–71; Aston, *Nihongi*, 370; Maeda Ujō, *Nihon kodai no shikisai to some*, 52.

13. The appearance of safflower (*hanezu*) in the rank order of 685 is the first indication of its use as a dye material in Japan. Many scholars believe that the appearance of safflower in the rank colors of 685 signals the entry of safflower both into the stock of the dyer's trade and into the vocabulary of dyed color in Japan. See, for example, Yamazaki Seijū, *Kusakizome: senryō shokubutsu zukan* [Illustrated book of dye plants] (Tokyo: Bijutsu Shuppansha, 1985), 1:202. The only earlier evidence of the use of safflower in Japan was Masaaki Kanehara's discovery of large amounts of safflower pollen at the early-third-century CE Makimuku site at Sakurai City in Nara Prefecture. The pollen was found in a toilet facility in association with liver flukes. Safflower was a known remedy for liver flukes and was undoubtedly being used as a medicine. See Akira Matsui, Masaaki Kanehara, and Masako Kanehara, "Palaeoparasitology in Japan—Discovery of Toilet Features," *Memórias do Instituto Oswaldo Cruz* 98, suppl. 1 (January 2003): 127–36.

14. Inoue Mitsusada with Delmer M. Brown, "The Century of Reform," in *The Cambridge History of Japan*, vol. 1, *Ancient Japan*, ed. Delmer M. Brown (Cambridge: Cambridge University Press, 1993), 216–20; Joan R. Piggott, *The Emergence of Japanese Kingship* (Stanford: Stanford University Press, 1997), 129.

of distinguished families, accomplished artisans, and people with other useful skills. Emperor Tenmu awarded generous grants of land to many of these immigrant households and brought their leaders into the polity by integrating them into the rank system, some with high rank.[15]

The color rank system of 685 included none of the ancient correct colors except green (an alternate for blue). The ranking was visually so different from the system of 667 that robes that had indicated power and prestige in 684 no longer had significance after 685. Joan Piggott has described Emperor Tenmu's radical consolidation and reordering of the structures of prestige as "the broadest application of symbolic violence in the entire history of Great Kingship."[16] The colors of the 685 rank system were a visual embodiment of the new political system. The court *looked* radically different from the way it had looked in 667. The sudden and startling appearance of safflower scarlet, worn by the princes, was set off by courtiers robed in various shades and tones of purples and greens.

Return to Chinese Prototypes

Four years later, in 689, Empress Jitō (regent 686–689; r. 690–697), changed the rank color system once again, reintroducing the ancient correct colors, although still with the Japanese addition of safflower scarlet. Never again would the rank color system move so far outside the metaphorical structure of the correct colors and their long and weighty association with proper governance.

The technologies needed to produce the *kurai iro* were almost all imported from the continent along with several of the dye plants. Safflower and gromwell plants were imported, as were Chinese varieties of madder and indigo that had stronger dye components than native species. Once established, these new dye plants and the sophisticated technology required to use them transformed the court, as their uses expanded well beyond the requirements of formal, rank-specific costume.

Nara Period, Color as Metaphor in Poetry and Politics

At least by the eighth century, when Japan's first extant literary works were produced, poets had begun to use color as a metaphorical language. Ōtomo no Yakamochi (715–785), governor of the province of Etchū, could rely on his readers' knowledge of color and the properties of dye plants to reprimand a minor official in his employ. In a long poem, he rebukes Owari Okuhi for a scandalous love affair with a local belle while his faithful wife waited in the capital for his summons. The poem concludes:

kurenai wa utsurou mono zo
tsurubami no
narenichi kinu ni
nao shikameyamo[17]

Scarlet is fleeting!
how can you compare it to
familiar robes
dyed acorn-gray

Yakamochi's metaphorical contrast of *kurenai* (scarlet from safflower) and *tsurubami* (gray-brown from acorns)[18] in this poem assumes the reader's knowledge of the specific properties of the dye plants used to produce these colors. Safflower faded quickly, but the clarity and range of the shades it produced, from the palest pink to a vibrant scarlet, were exciting to contemporary Japanese accustomed to the familiar red obtained from indigenous madder roots. Safflower was labor-intensive and costly to cultivate and harvest. The dye process required an unusually high level of

15. See *Nihonshoki* II, NKBT 68, 470–71; Piggott, *Emergence*, 129, 138, 201; Aston, *Nihongi*, 368.

16. Piggott, *Emergence*, 138.

17. *Man'yōshū* IV, NKBT 7, Book 18, poem #4109 (Tokyo: Iwanami Shoten, 1957), 289.

18. Acorns can produce a range of colors from tan to brown and gray to black.

skill. The gray-brown range of *tsurubami*, on the other hand, was derived from the acorns of a native oak. The oak grew wild and acorns were plentiful and easy to gather. Moreover, the dye process was simple, and the results were predictable and lasting.

To an eighth-century reader, the single word *kurenai* would have evoked a complex of associations that at once alluded to the excitement and allure of Owari Okuhi's paramour and conveyed a sense of the extravagance of the affair. At the same time, reference to the gray-brown robes of Owari Okuhi's wife would have eloquently suggested her patience, faithfulness, and frugality.

Color in the Shōsōin Repository: Tang Aesthetics and Nara *ungen*

In 741, after a series of natural and human disasters, Emperor Shōmu (r. 724–749) ordered the establishment of a Buddhist temple in each province and the construction of a major temple in Nara to serve as head temple. The Tōdaiji (Great Eastern Temple) in Nara was a monastery complex that included a hall to house a monumental cast-bronze statue of the Buddha Vairocana. After three attempts, the statue was completed in 751 and the consecration ceremony scheduled for 752. The Eye-Opening Ceremony of the Great Buddha was a major international event. Delegates and priests came from throughout East Asia, and gifts poured in from Tang China, Bohai (present-day Manchuria), and kingdoms on the Korean peninsula. Bodhisena, the priest who painted in the eyes of the Great Buddha, was originally from India.[19]

The Shōsōin was one of several treasure houses belonging to Tōdaiji; it is now the only one extant. It houses more than nine thousand objects from the mid-eighth century. There are three major categories of collections: objects associated with the eye-opening ceremony, including gifts from foreign emissaries; objects associated with the memorial services for Emperor Shōmu in 756 and other temple ceremonies; and objects that Emperor Shōmu used in the palace, including Buddhist ritual objects he used for private devotions. These personal objects were donated to the temple in 756 by Shōmu's widow, Empress Kōmyō.[20]

Taken as a whole, the Shōsōin Collection represents the technical prowess and aesthetic sensibility of Tang China. Many of the objects were imports, or gifts, from Tang. Others came from surrounding countries whose art and culture were heavily influenced by Tang China. Still others were made in Japan in Tang style, often by immigrant Korean or Chinese master-craftsmen working in or near the capital at Nara, or by Japanese artisans they trained. Some of the objects made in Japan are indistinguishable from imports, others show a marked Japanese sensibility distinct from that of Tang China.

More than a millennium later, many of the colors on these objects are still fresh and bright. By the mid-eighth century, artisans working in Japan had fully mastered the production of color and employed it with skill. Although there are works with a gentle balance of closely related monochromes, many of the objects in the Shōsōin are noteworthy for their rich polychromatic color schemas.

The most distinctive feature of Tang/Nara use of color—and one of the most interesting uses of polychrome—was the variety of banded shades known collectively as *ungen*. An *ungen* sequence could be as simple as three or four bands of varying width of different hues forming a border for a central motif, or as complex as expanding several, but not all, of those hues into interior stepped sequences of shades

19. For a description of the Eye-Opening Ceremony, see Hayashi Ryōichi, *The Silk Road and the Shoso-in*, trans. Robert Ricketts, The Heibonsha Survey of Japanese Art, vol. 6 (New York and Tokyo: Weatherhill/Heibonsha, 1975), 54 ff.

20. Among the most useful sources of information about objects in the Shōsōin are the annual exhibition catalogues published by the Shōsōin Office: *Shōsōinten: Exhibition of Shōsō-in Treasures* (Nara: Nara National Museum). Of note also is Matsumoto Kaneo's study of textiles in the Shōsōin Collection. Matsumoto Kaneo, *Jōdaigire: 7th and 8th Century Textiles in Japan from the Shōsō-in and Hōryūji*, trans. Shigetaka Kaneko and Richard L. Mellott (Kyoto: Shikosha, 1984) [in Japanese and English].

PLATE 2
Eight-lobed offering stand. Diameter 41.0 cm, height 9.3 cm. Wood and pigments. Eighth century. Shōsōin Treasure House, Middle Section, Imperial Household Agency, Nara, Japan.

PLATE 3a
Lotus pedestal, probably for an incense burner. Diameter 55.6 cm, height 18.5 cm. Wood, lacquer, and pigments. Eighth century. Shōsōin Treasure House, South Section, Imperial Household Agency, Nara, Japan.

PLATE 3b
Detail of the outside of the lotus pedestal showing radiating bands of color (*ungen*).

and tones of color radiating out from the primary hue. *Ungen* could be used to achieve subtle harmonies or to emphasize bold contrast. In most Tang- and Nara-period works, the primary effect is a complex polychromatic combination of contrast and shading (plates 2 and 3a, 3b).[21]

Most scholars believe that *ungen*, together with the popularity of several colors (especially purple) and color combinations (red/blue and purple/green), developed as a result of contact between the far-ranging and cosmopolitan Tang empire and regions to the west, particularly Iran and several small Central Asian polities. The red/blue and purple/green combinations appear, for example, on artifacts from the oasis cities of Khotan and Turfan on the southern and northern branches of the Silk Road, respectively, as they skirted the Taklamakan desert in what is today the Xinjiang Uyghur Autonomous Region in northwest China. They are evident also on wall paintings and painted sculpture at Dunhuang, the large Buddhist cave-temple complex that marked the meeting point of the two branches before the old trading route led east to Chang'an, the capital of Tang China.[22] *Ungen* is usually employed as a border motif or to add interest to interior details. It was not designed to be the focus of interest. Although it is given only a subsidiary role in the vocabulary of Tang/Nara design, Tang- and Nara-period artists used *ungen* schemas to experiment with color juxtapositions in very interesting ways. Stripped of the content of the images and patterns that they border, these eighth-century sequences have echoes in the twentieth-century experiments of colorists such as Josef Albers. Like Albers, Tang/Nara artisans and their patrons were keenly interested in the "interaction of color."[23]

Ungen, in its various forms, was used on secular as well as sacred objects and in many media. It is commonly found, for example, in depictions of the ubiquitous abstracted *karahana*. This "Chinese-flower" motif was

21. See also Bethe, "Color and Yearly Palace Rituals in Japan during the Nara and Heian Periods," plates 1, 1a, and 1b, and Tanaka, "Embroidered Slippers in the Shōsōin Repository," figures 3–6.

22. Hayashi Ryōichi, *Silk Road*, 135–38; Akiyama Terukazu, *Heian jidai sezokuga no kenkyū* [A study of Heian-period secular painting] (Tokyo: Yoshikawa Kōbunkan, 1964), xviii.

23. Josef Albers, *Interaction of Color* (New Haven: Yale University Press, 1963).

PLATE 4
Felt rug with floral design, Bohai (present-day Manchuria). Length 275 cm, width 139 cm. Wool. Eighth century. Shōsōin Treasure House, North Section, Imperial Household Agency, Nara, Japan.

constructed of lotus-shaped blossoms with bands of color that typically radiated out from a central core. One example is a large felt rug probably from Bohai (plate 4). Two floral medallions set against a blue ground dominate the carpet, providing a focus for the exuberance of overlapping floral motifs that make up the background. The two *karahana*, and also the background motifs, are formed of rounded petal and leaf forms composed of radiating bands of different shades of red (the dominant color), greens, and a few blues. Light yellow acts as a foil for the palest interior bands of pinks, greens, and blues, and borders the edges of the background blossoms and leaves that encroach on the blue ground. Narrow black borders, by contrast, surround the outer leaves of the medallions, setting off the *karahana* from their ground so that they appear to float like lotus blossoms on a blue sea. In this rug, skillful *ungen* techniques enrich the jewel-like color scheme and, by causing certain motifs to stand out and others to recede, create a three-dimensional perspective that distinguishes primary from secondary motifs and helps to order the rich complexity of pattern and color.

Conclusion: Toward the Heian Period

Despite a complex of beliefs about color shared with and often imported from the continent, and a sustained effort to model the emerging Japanese state on Chinese models, Japanese courtiers, politicians, artists, writers, and religious leaders sometimes departed from Chinese prototypes and established practices to develop the multiple roles that color came to play in ancient and medieval Japan in ways that reflected indigenous needs, proclivities, and aesthetic sensibilities.

An example of these was the liberty that Emperor Tenmu took with the colors used to indicate rank, jettisoning the correct colors in 685 as part of an effort to disenfranchise powerful opponents and establish his supporters in positions of high rank and authority. Safflower scarlet appeared for the first time at the head of the 685 list. Never considered appropriate as a rank color in China or the kingdoms on the Korean peninsula, it nevertheless continued to appear at or near the top of the rankings in Japan even after the old system was reestablished in 689. The most reasonable explanation is that safflower had become a highly prized color and that this factor weighed more heavily with contemporary Japanese than ancient Chinese ideas about the authority of the correct colors.

Court documents and Heian women's informal literature alike attest to the importance that color came to play in the Heian period. This author believes that after Japanese artisans mastered the technical complexities of producing multiple shades and tones of color from a limited palette of dye plants, the Tang preference for strong bold colors was internalized and an aesthetic appreciation developed for the *ungen* color schemes that are so pervasive on objects in the eighth-century Shōsōin Treasure House. There is a strong connection—a constant pleasure in pure color and in its juxtapositions—between Tang/Nara *ungen* and the mandorlas surrounding Heian-period Buddhist images and the subtly gradated or boldly contrasting color schemas of Heian women's multilayered court costumes. This topic is explored more fully in Dusenbury, "Color at the Court of Japan in the Heian Period," in this volume.

NKBT–*Nihon koten bungaku taikei* [Compendium of classical Japanese literature]. Tokyo: Iwanami Shoten, 1958.

PHOTO 2 (detail)

Color in the *Man'yōshū*, an Eighth-Century Anthology of Japanese Poetry

MONICA BETHE

The materiality of color played an integral part in Japanese cultural heritage during the Nara period (710–794). Eighth-century Japanese were aware of the correspondences between medicinal herbs and dye plants and, because of these correspondences, thought that the colors produced by the dyes had protective powers.[1] They believed that the *kodama*, spirit, of a tree or flower, was transferred to the fabric during the dye process. Drawn by the beauty of the color as it emerged from plant to dye bath to garment, and the magic of the transformation as it was fixed by a mordant, the Nara elite incorporated their experiential knowledge of dyeing into standard metaphors and daily expressions. We know from the poems they exchanged that even the highest courtiers were aware of the dye processes and the peculiarities of each color.

One reason for this cognizance was the need to produce ceremonial court garments according to a color code imported from China. The Japanese cap rank (*kan-i*) system reflected the extensive color philosophy inherited from the continent. The ranked colors (*kurai iro*) themselves were created in special government dye workshops.[2] Women from many stations in life were also involved in adding color to clothing, paper, and decorations.

Tangible sources give concrete evidence as to how colors, dyes, and pigments were viewed and used in the eighth century. On the one hand, dyed items from the seventh and eighth centuries have been preserved at Nara temples such as Hōryūji (and are presently in the Tokyo National Museum) and Tōdaiji (in its Shōsōin Repository). The Shōsōin contains clothing, screens, curtains, decorative papers, and banners, as well as medicines, pigments, powders, and relevant documentation that has remained relatively untouched for over twelve hundred years. On the other hand, literary sources, like the ancient chronicles and the oldest anthology of Japanese-style poetry, the *Man'yōshū*, provide insight into how the dyes were incorporated into the lives of the Japanese people. The *Man'yōshū* contains some 4500 poems composed by emperors, courtiers, and commoners, describing their lives, personal relationships, and travels.[3] Since

1. Maeda Ujō, *Nihon kodai no saishiki to some* [Colors and dyeing in ancient Japan] (Tokyo: Kawade Shobōshinsha, 1975), 9, 17.

2. For further discussion of the rank system, see Dusenbury, "Color at the Japanese Court in the Asuka and Nara Periods" in this volume. The color philosophy contained in the Chinese *wuxing* (J. *onmyō gogyō*) system is introduced in the introduction to this volume and explored further in Lai, "Colors and Color Symbolism in Early Chinese Ritual Art." For the ranking of colors, see Monica Bethe, "Color, Dyes and Pigments," in *Kosode: 16th to 19th Century Textiles from the Nomura Collection* (New York: Japan Society, and Tokyo: Kodansha International, 1984), 59–60.

3. The poems date mostly from the seventh and eighth century until 759. Edwin A. Cranston, "Asuka and Nara Culture: Literacy, Literature, and Music," in *The Cambridge History of Japan*, vol. 1, *Ancient Japan*, ed. Delmer M. Brown (Cambridge: Cambridge University Press, 1993), 473–74. For English translations of some of the poems, refer to Donald Keene, *The Manyōshū, The Nippon Gakujutsu Shinkokai Translation of One Thousand Poems* (New York: Columbia University Press, 1965), translation originally published in 1929 by Nippon Gakujutsu Shinkōkai [Japan Society for the Promotion of Scientific Research]; Ian Hideo Levy, *Hitomaro and the Birth of Japanese Lyricism* (Princeton: Princeton University Press, 1984); Edwin A. Cranston, *A Waka Anthology*, vol. 1, *The Gem-Glistening Cup* (Stanford: Stanford University Press, 1993); and Shirane Haruo, *Traditional Japanese Literature: An Anthology, Beginnings to 1600* (New York: Columbia University Press, 2007).

many of the poems are longer than the five-line *waka* that became standard in later centuries, and since the rules of composition were far freer, these poems cover a range of experience, emotion, and activity unseen in later poetry.

Here, I wish to investigate the mindset toward color evidenced in the *Man'yō* poems. This is not straightforward, since poetry relies as much on implication, double entendre, and associations as on explicit statements. Yet it is precisely because of the use of allusions and inferences that we can see in the poems a reflection of a common culture, of assumed facts and values that can be drawn on to express the inner world through metaphor or analogy. Dyes, dye plants, and the dye process serve to reveal longings, fears, ambitions, secrets, and warnings. The problem remains, of course, whether we today, separated by over a thousand years, speaking a different language, and facing a very different daily life, can be sure we are reading those undercurrents of expression correctly.

My interest in the color poems in the *Man'yōshū* grew from reading books written by natural dyers. In the early twentieth century, when commercial use of chemical dyes threatened to put an end to traditional dye methods, a number of Japanese dyers and anthropologists began to research and record the history of Japanese color.[4] They turned to the *Man'yō* poems as an early documentary source. Even recent popular books on natural dyeing continue to include references to *Man'yō* poems when introducing dye plants, adding a cultural tidbit. The dyer's focus is on possible implications related to dye process, rather than on a literary appreciation. On the other hand, scholars of classical literature have looked at the use of color words within the context of individual poems.[5] My approach lies somewhere in between the practitioner's and the literary scholar's. I began by collecting all the poems related to key dye plants, then grouped them by the way they employed the color imagery in relation to the dye processes. To clarify the implications, it was often necessary to look at surrounding or related poems. Here I have space to indicate only a few of the correlations that emerged.

Japanese Poetic Techniques and Dye References

The techniques that inform the composition of *Man'yō* poems include many familiar in the West: metaphors, similes, and repetition of sounds, words, and phrases. Built loosely on lines of five and seven syllables, the poems rely on associations that reach beyond the poem and draw in extraneous references to fill out the expression. Several lines might serve merely to introduce a word (*jo*) that then begins the "content" of the poem. Pivot words (*kakekotoba*) are read with two meanings, one completing what came before and the other beginning a new thought. Pillow words (*makura kotoba*), or set epithets preceding key words, often are disconnected from the syntax and yet lend a flavor to the whole, filling out the rhythm and adding audial and imagistic echoes.

A good example of a pillow word is "madder-streaked" (*akane sasu*), which functions much like the Homerian "rosy-fingered dawn." Although madder, which dyes red, does not appear in any other context, twelve *Man'yōshū* poems use this epithet. Most commonly the madder-streaked [sky] modifies "daytime" (*hiru*) or "sun/day" (*hi*; nine examples) and is coupled with a contrasting "dark jeweled night" (*mubatama no yoru*; six of the nine).[6] Sometimes the contrast of day and night is conflated, so the epithet introduces the "shining moon" (two examples) or "evening sky" (one example). In all these cases, it seems to evoke a

4. Early dyer-scholars include Maeda Ujō, Nagasaki Seiki, Yoshioka Tsuneo, Yamazaki Seijū, and Murakami Rokuro. Their sons have often followed in their footsteps.

5. Literature scholars like Ihara Aki and Ando Takeko rely on dye experts for their knowledge of practical implications. Murakami Michitaro straddles the two worlds, with both literary and dye experience.

6. For example, Kakenomoto Hitomaro in one poem (Book 2, poem 169) contrasts "madder-streaked sun" with "dark black night" and then interweaves these opposites by following "sun" with "shine," but "night" with the "wandering moon."

time of day when the sky has a rosy hue and/or a glowing luminosity.

How then should one interpret the famous poem where "madder-streaked" introduces "purple"? Most likely the expectations set by the standard use of the pillow word indicate daytime. As one reads on, however, the purple turns out to be not the color but the plant, gromwell. A field of white-flowering gromwell echoing the luminous imagery seems implied in the epithet. The field is roped off and guarded, because gromwell is a precious herb used as a medicine as well as a dye source of the highest-ranking color. The poem is by a court lady, Princess Nukata, who chides her former lover, Prince Ōama (later Emperor Tenmu, r. 673–686) for flaunting their prior relationship in public.

akane sasu
(Madder-streaked) purple
murasaki no yuki
gromwell fields roaming round
shime no yuki
roped-off fields roaming round them.
nomori wa mizu ya
Don't think the guard won't see
kimi ga sode furu
you waving your sleeve?[7]

Some dye historians have taken the use of the epithet "madder-streaked" here as implying that the purple-dyed cloth was top-dyed (*sasu*) with madder to create a reddish overtone.[8] Though this seems like a huge leap of the imagination, when one considers the range of dye-related information imbedded in other poems and various methods of dyeing purple in later centuries, there is a chance that this was indeed the intention.

Purple from Gromwell: *Murasaki*

The various ways purple (*murasaki*) and gromwell, the "purple [producing] plant" (*murasaki kusa*), are incorporated into poetic fabric can serve to illustrate the breadth of poetic uses. First, *murasaki* functions as an epithet in its own right. It precedes "esteemed name/lofty" (*nataka*), which in turn introduces a place name, and thus it infuses the place with an atmosphere of rank and nobility.[9] In all three poems where *murasaki* appears as an epithet, the place is a bay (*murasaki no nataka no ura no . . .*), the object a potential love, where swaying movement, such as waving sleeves or swaying seaweed, becomes a metaphor for a natural drifting together of lovers.[10] Can one infer that not only the place but also the object of desire is both lofty and alluring, like the color purple?

In addition, a literal reading of similar set phrases provides information on where gromwell was cultivated or harvested wild. The formulaic opening phrase (*jo*) "Gromwell growing in . . . (place name)" (*. . . ni ouru murasaki*) names the Tsukuma moor, located by some scholars near Maibara in present-day Shiga Prefecture.[11] This is not far from Kamafu fields, the location of the imperial outing that occasioned the poem by Princess Nukata quoted above. Both the prose headnote and comment at the end of Nukata's poem establish that the event took place on the north shore of Lake Biwa. Today, the Kamafu fields are again covered with white gromwell flowers (photo 1).

While the Kamafu fields were roped off and guarded, gromwell growing in the wild, the more common form, had no such demarcation. Yet one *Man'yōshū* poem emphasizes that even the deer recognized the sacred status of *murasaki*, for when they chose a place

7. Kojima Noriyuki, Inoshita Masatoshi, and Satake Akihiro, eds., *Man'yōshū* (Tokyo: Shogakkan, 1972), 1:75.

8. For reddish versus bluish purple dye and the cultural/regional implications, see Maeda Yukichika, *Murasaki kusa* [Gromwell] (Tokyo: Kawade Shobō, 1957), 40–47. Maeda Ujō discusses the custom of top-dyeing madder over gromwell in *Nihon kodai no shikisai to some*, 57.

9. Purple is used as a pillow word in *Man'yōshū* (MYS) Book 7, poems 1392 and 1396; Book 11, poem 2780; Kojima, *Man'yōshū*, 2:277–78, 3:265–66.

10. An example is Book 11, poem 2780: *Murasaki no, nataka no ura no, nabiki mo no, kokoro ha musume ni, yori ni shi mono o* (In the Bay of Nataka/called purple for its lofty name)/the drifting seaweed/like my heart has washed ashore/drawn toward my cherished maiden.).

11. MYS Book 3, poems 395–97; Kojima, *Man'yōshū*, 1:252. This phrase reappears in *Kokinshū* 867, an early-tenth-century imperially commissioned anthology of poetry, as "Gromwell growing in Musashino" (present-day Saitama Prefecture).

to repose, they instinctively abstained from lying on gromwell, distinguishing it from ordinary vegetation where they could settle down to rest.[12]

Horticultural Metaphors

Metaphorical use of the word *murasaki* can focus on characteristics of the plant, on methods of extracting the color, and on the implications of having dyed the color. For instance, the perennial gromwell plant grows very long roots, which are harvested in the third or fourth year and then dried to mature the color before extracting the dye (photo 2). Two poems compare the length of the roots to the depth of attachment.[13] In poem 3500, the roots (*ne*) are homonymous with "to sleep" (*ne*) and while the one "grows long" (*ouru*), the other should "never end" (*oenaku*).

murasaki wa
  The gromwell
ne o kamo ouru
  roots grow long, so long:
hito no ko no
  with his lovely daughter
uraganashike o
  would I, without regrets,
ne o oenaku ni
  sleep on and on[14]

Dyeing Methods

Although the harvested roots appear reddish purple, extracting and fixing the color requires expertise. Poem 569 in Book 4 suggests that Koreans introduced a superior art of dyeing gromwell to the Japanese. In the seventh and early eighth centuries, when the *Man'yō* poems were being composed, unsettled circumstances on the Korean peninsula led to waves of immigration into Japan. Many of the newcomers were artisans bringing new techniques and materials.[15] The poem is couched in a love analogy loosely translated as: "Like the purple color dyed on clothing by the Koreans, you have stained my heart and how I yearn for you" (*karabito no/koromo somu to iu/murasaki no/kokoro ni somite/omouyuru ka mo*).[16]

Here the cumulative reverberation set up by a repetition of *k* words (*karabito*: Korean; *koromo*: clothing; *kokoro*: heart) intensifies the impression that the Korean purple was particularly vivid. By using the same verb "to dye" (*somu/somite*) both for coloring a garment and for coloring the heart, the poem underscores a correlation between the activity of dyeing and the awakening of feelings.

The correspondence between dyeing cloth and dyeing the heart is given a twist in a poem exchange between a boy and girl who meet in a busy market. Here a playboy makes an advance to a pretty girl by referring to the method of dyeing purple (that is, initiating intimacy) from the gromwell roots. Both the extraction of the purple dye and the transference of the color to thread, cloth, or paper are rather difficult, delicate processes. In order to facilitate the absorption of the dye by promoting molecular bonding, the silk has to be thoroughly pre-mordanted in an alkaline solution containing alum. In the Nara period, alkaline was obtained by passing water through newly burned ashes to extract lye. The lye had different properties depending on the chemical composition of the wood or straw that was burned. Camellia (*tsubaki*) lye contains a high level of alum, and its effectiveness in dyeing purple is expressed in the young man's poem quoted below. The word *tsubaki* functions here as a pivot word with a double reading: first, as the plant, and second, as the name of the market, or one could also interpret the first two

PHOTO 1
Gromwell in bloom. Manyō no Mori, Funaoka, Higashi Ōmi City, Shiga Prefecture. Photo taken July 2, 2013.

PHOTO 2
Gromwell roots. Photo taken January 26, 2013.

12. MYS Book 12, poem 3099; Kojima, *Man'yōshū*, 3:342.

13. MYS Book 10, poem 1825; Book 14, poem 3500; Kojima, *Man'yōshū*, 3:48, 3:487.

14. MYS Book 14, poem 3500; Kojima, *Man'yōshū*, 3:487.

15. References to the political, cultural, and religious impact of Koreans appear in Delmer M. Brown, ed., *The Cambridge History of Japan*, vol. 1, *Ancient Japan* (Cambridge: Cambridge University Press, 1993), 31, 39, 157, 308–11, 494

16. MYS Book 4, poem 569; Kojima, *Man'yōshū*, 1:331.

lines as being an introduction (*jo*) to *tsubaki*. In either case, *tsubaki* ties the two halves of the poem together.

murasaki wa
Murasaki purple
ai sasu mono zo
needs ashes, yes, from
tsubaki ichi no
camellia, in Tsubaki market at
yaso no chimata ni
Yaso crossroads
aeru ko ya tare
who is this maiden I meet?[17]

The maiden's answer to this come-on is a clear-cut refusal: "I would not mind telling you the name my mother calls me, but you are just passing through, and anyway, I don't know who you are."[18] That the eighth-century audience would understand the implications of this exchange of anonymous poems indicates how close dyeing was to their daily lives.[19] Either the young man was referring to commonplace knowledge about mordanting, or he was exposing a secret as a personal selling point. If the latter, perhaps it strengthened the sense of his impropriety in the girl's mind.

Dyeing the Cloth—Coloring the Heart

The analogy between colors affecting fabric and feelings altering the mind or heart appears in quite a number of poems.[20] The means by which a color was transferred was reflected in the verbs used and echoed the depth of saturation. Some colors, like blue from iris or wild indigo leaves, were rubbed (*suri*) into cloth.[21] Earth colors, like ochre (*ōdo*) or lead red (*ni* or *tan*), could be rubbed in, but of course also washed out. A purplish smudge picked up (*utsuru*) when passing by flowering bush clovers or Asiatic dayflower (*tsukigusa*) might inadvertently expose one's activities to the public.[22] The color might seep in (*shimu*) and become a permanent stain harbored in the mind. The fear of exposure and feelings of longing went deeper when the color was vat dyed (*someru*). In this context, the challenges of dyeing *murasaki* gave purple particular poignancy.

Dyeing cloth purple and draping it on the body could be accomplished with a variety of intentions. One poet tie-dyed a strip of silk purple using a technique known as *kōkechi*. Winding the silk around his head, the poet flaunted his mottled purple turban and set out with high expectations of finding a partner: "today's chance meeting might stir tomorrow's longing" (photo 3).[23]

The metaphorical analogies between dyeing and feelings are fully developed in a poem by Lady Kasa. She writes to the poet Ōtomo no Yakamochi, telling him that she has dyed cloth purple (fallen in love), but even without her wearing the cloth (consummating the love), the color (her emotion) has been revealed. "With the purple plant/growing on Tsukuma moor/I stained my cloth/but before I could wear the dress/its color was revealed."[24]

Despite herself, Lady Kasa's yearnings showed on the outside, but not everyone was so bold. One man wears his purple (desires) as a thin undersash totally obscured by the folds of his clothing. He bemoans his lack of courage saying, "I have not even tried to unknot my

17. MYS Book 12, poem 3101; Kojima, *Man'yōshū*, 3:341.

18. MYS Book 12, poem 3102; Kojima, *Man'yōshū*, 3:341.

19. MYS Book 12 collects mostly anonymous poems that scholars believe might have been for recitation; many like these are coupled as exchanges between people. Kojima, *Man'yōshū*, 3:17–22.

20. This is not limited to purple. It is particularly prevalent with references to safflower-dyed scarlet and also is expressed in the use of the generic term '*iro*.'

21. For example, MYS Book 9, poem 1742 is a long poem including a description of a girl walking across a vermilion bridge in safflower-dyed red skirts and a mountain-indigo-blue printed robe (*sani-nuri no / oohashi no ue / kurenai no / aka-mosuso hiki / yamaai mochi / sureru kinu kite /*). MYS Book 17, poem 3921 begins with "iris-rubbed robe" (*kakitsubata koromo ni suritsuke*).

22. Dayflower leaves its traces easily, but also fades easily. MYS Book 4, poem 583; Kojima *Man'yōshū*, 1:335. Ironically one way of writing dayflower (*tsukigusa*) is "moon flower."

23. MYS Book 12, poem 2993; Kojima, *Man'yōshū*, 3:318. *Murasaki no/madara no kazura/hanayaka ni/kyō mishi hito ni/ nochi koimu ka mo.*

24. Translated by Cranston, *A Waka Anthology*, poem 753, 426. MYS Book 3, poem 395; Kojima, *Man'yōshū*, 1:252.

PHOTO 3
Plain-weave silk fabric dyed purple with design of wax-resisted (*kyōkechi*) small yellow flowers. Silk. Eighth century. Shōsōin Treasure House, Imperial Household Agency, Nara, Japan.

purple sash [express my love], yet my desire reaches out for that lovely girl."[25] A poem shortly after this may be the girl's response. If so, it seems she would have needed only a small encouragement: "The purple dyed in my undersash does not show its color on the surface. So perhaps the love might fade, and there should be no meeting?"[26]

Overdyeing the Imagery

To return to Princess Nukata's poem: when she chides Prince Ōama for waving at her so openly on a public outing, she is, so to speak, asking him to keep his purple cords tightly tied. His answer, however, is to praise her beauty and say he is helpless in the face of his love. Thus, their exchange plays on a delicate balance between the revealed and hidden, the expressed and the concealed, honesty and propriety.

murasaki no
  Purple
nioeru imo o
  radiant lovely lady
nikuku araba
  were she at all offensive
hitozuma yue ni
  knowing she belongs to another
are koime ya mo
  why would I keep longing for her?[27]

Here the prince picks up on Nukata's reference to the white-blooming gromwell fields by specifying the color yielded by their roots, and takes the color association farther with the modifier "radiant" or "glowing" (*nioeru*). It will be recalled that she used "madder-streaked" in an unusual way, and his choice of "radiant" calls on imagery associated with the scarlet (*kurenai*) from the petals of safflower. A quarter of the twenty-seven poems containing the word *kurenai* couple it with *nioeru*. With fugitive safflower dye, however, the radiance is bound to fade with time, wear, and water.

Combining these various references to *murasaki* creates a cumulative image that purple, unlike the transient *kurenai*, is deep-rooted, enduring, lofty, and glowing. Indeed it is so alluring that while the reckless may flaunt it, the timid are afraid to expose the purple they keep close to their body, and the sincere may let it shine through inadvertently. Each of these literary implications derives not so much from an abstract impression of the color or association with things that are purple, but from characteristics of the gromwell plant, the dye processes, and the properties of the dyed color. Although I have focused the discussion on purple and gromwell, these are but representative examples of a broader cultural engagement with colors and their sources that served as a common reference among the Japanese in the Nara and Heian periods.

25. MYS Book 12, poems 2974 and 2976; Kojima, *Man'yōshū*, 3:314. *Murasaki no / obi no musubi mo / toki mo mizu / motonaya imo ni / koiwatari namu.*

26. MYS Book 12, poem 2976; Kojima, *Man'yōshū*, 3:315. The meaning here can be taken two ways. The fear of not expressing her feelings might lead her to waste away with longing, never having a chance to meet. On the other hand, she might wish to hide her purple feelings in the hope that the love might thereby weaken and the chance of meeting be avoided.

27. MYS Book 1, poem 21; Kojima, *Man'yōshū*, 1:75.

FIGURE 1
Chinese lady under a tree wearing slippers with upturned toes. Folding screen panel. Height 136.2 cm, width 56.2 cm. Ink and colors on paper, traces of feathers from a copper pheasant. 752–756. Shōsōin Treasure House, North Section, Imperial Household Agency, Nara, Japan.

Embroidered Slippers in the Shōsōin Repository

TANAKA YOKO

History of the Embroidered Slippers

The Shōsōin treasure house served for many centuries as a repository for items related to the Tōdaiji temple. In 1875, it was placed under the jurisdiction of the national government, and today is administered by the Imperial Household Agency. It preserves around nine thousand items related to Japanese court culture, Buddhist culture, and daily life in the Nara period (710–794 CE).

Among these items are four pairs of embroidered slippers (*nui no sengai*) (figs. 3–6). Their name derives from the way they are recorded in the Nara-period *Byōbu kasento chō* (Record of folding screens, patterned rugs, etc.) (fig. 7), which lists treasures given as offerings to Tōdaiji. The entry states that Empress Kōmyō (701–760, wife of Emperor Shōmu, 701–756) presented the embroidered slippers to Tōdaiji on the twenty-sixth day of the seventh month of Tenpyō Shōhō 8 (756).

Slippers with Upturned Toes

The slippers belong to a style of footwear known as "slippers with upturned toes" (*bikōno kutsu*) and are influenced by Chinese dress culture. The salient characteristics of this type of shoe include low sides similar to slippers and a front portion that curves upward initially and then bends back. In China, men wore slippers with upturned toes for important rituals as part of ceremonial costume (C. *lifu*, J. *raifuku*) and with the official attire (C. *chaofu*, J. *chōfuku*) of those serving at the Imperial Court. Slippers with upturned toes were also very popular among women. Records from the early period (713–741) of the Tang dynasty (618–907) state that women liked these light, easy-to-wear shoes.[1] A well-known example is the pair of slippers with upturned toes excavated in Astana, Turfan (seventh to eighth century). These are very similar to the embroidered slippers in the Shōsōin.

Slippers with upturned toes became popular in Japan during the Nara period, at the same time as they were fashionable in Tang China. Several other examples of this style of footwear can be found among the Shōsōin treasures. One example is the pair of leather shoes said to have been used by Emperor Shōmu and known as *nō no gorairi* (dedicated ceremonial shoes). Also in the Shōsōin collection are twenty pairs of leather shoes thought to belong to costumes for the stately court dance known as *bugaku*. In addition, representations of shoes with upturned toes appear in paintings (fig. 1).

The Construction, Materials, and Colors of the Embroidered Slippers

The outside of the embroidered slippers is covered with beautiful compound weaves (*nishiki*), yellowish green plain-weave silk, and embroidery in gradated colors (*ungen*). The inner

1. "*Yu fu zi*" [Ceremonial attire], in *Jiu tang shu* [Early Tang historical documents], reprinted in Liu Xu, ed. *Jiu tang shu* (Beijing: Zhonghua shuju, 1975), 1958.

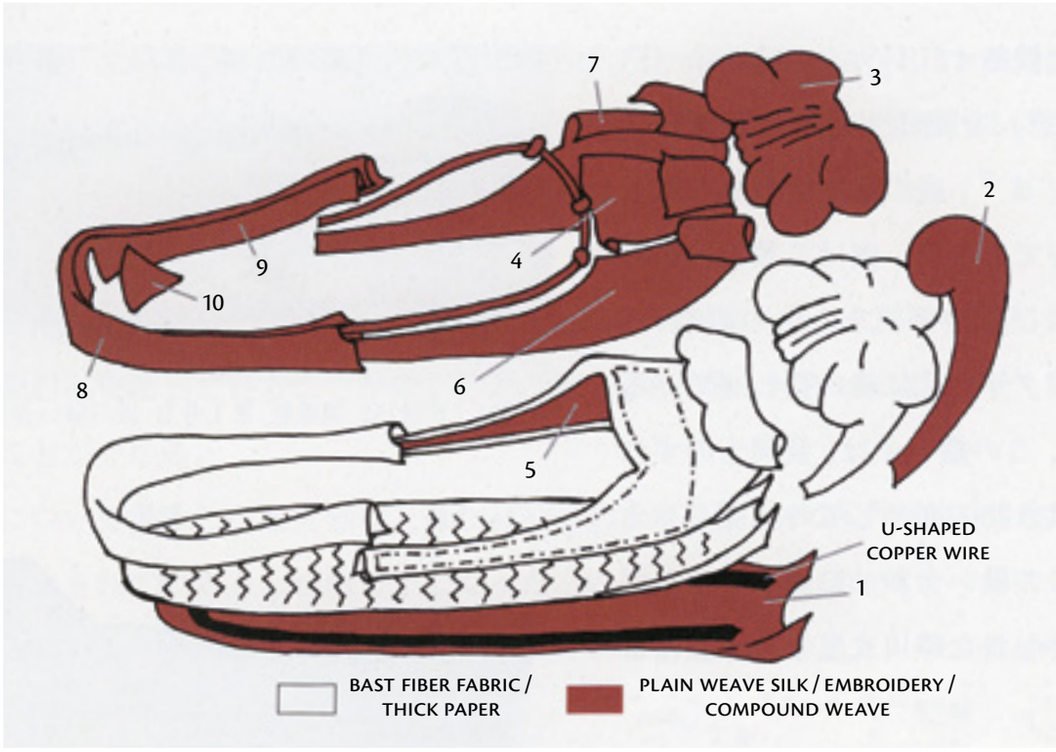


FIGURE 2
Diagram of the construction of the slippers with upturned toes.

facing is made of bast-fiber cloth and paper. Being constructed of fabric and paper, the slippers are very light; one shoe weighs only fifty to seventy grams.

The silk fabrics decorating the surface can be divided into ten component parts (fig. 2).

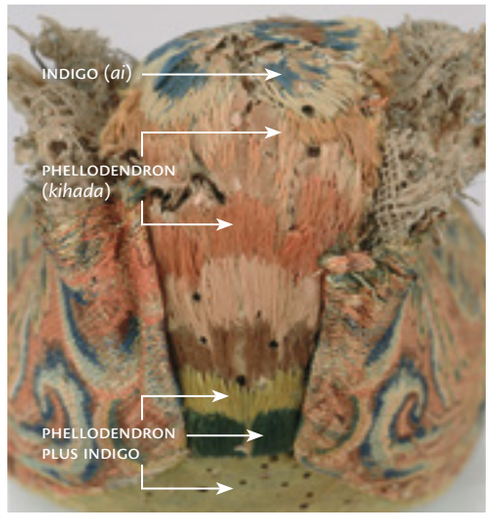
1. The soles of the slippers are a yellowish green plain-weave silk.
2. The outer face of the upturned toe is embroidered on white plain-weave silk backed with a paper base.
3. The flower-shaped decoration on the toe is a compound weave.
4. The vamp (upper part of the slipper) is a compound weave.
5. The vamp lining is a compound weave.
6. The outer side-vamp is a compound weave.
7. The inner side-vamp is a compound weave.

8, 9, and 10. The three parts comprising the heel are all compound weaves.

The bast-fiber fabric used for the inner facing is not as minutely divided as that used for the outside, consisting of only four components. These are indicated in white in the illustration and comprise one piece for the sole, one piece for the toe that combines the front upturn and the flower decoration, one piece for the whole vamp, and one piece for the heel. The bast-fiber fabrics range from coarse to fine and are used in layers of two to four. In addition, thick paper pasted onto the bast fabrics from the inside acts as backing. Presumably the silk fabrics, bast-fiber cloths, and paper were joined with adhesive using a cobbler's wooden form, likely stitched together in some places. X-ray photographs reveal that one of the four pairs of embroidered slippers contains a U-shaped copper wire in the sole. Its purpose is unclear.

Colors

The plain-weave silk used for the soles of all four pairs of slippers is a yellowish green, which recent dye analysis found to be dyed with phellodendron (*kihada*) that had been overdyed with indigo (*ai*) (fig. 4). Some of the four pairs of slippers retain areas of embroidery



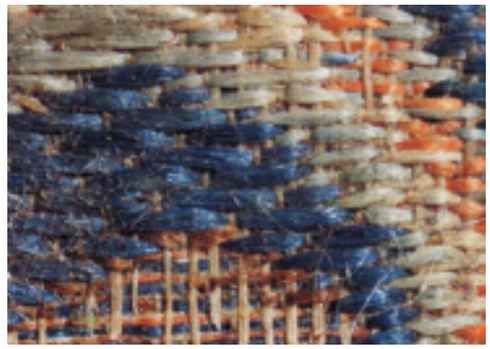


FIGURE 3
Embroidered slippers with upturned toes. Length 26.5 cm, width 7.8 cm, weight 59.3 g and 61.9 g. Paper, silk, and bast fiber. Eighth century. Shōsōin Treasure House, North Section 152–No. 4, Imperial Household Agency, Nara, Japan.

FIGURE 4
Detail of the embroidery on the upturned toe of the slippers.

FIGURE 5
Detail of the compound weave (*nishiki*) with design of birds and flowers on the sides of the slipper.

FIGURE 6
The weave structure of the satin samite used on the slippers.

on the upturned toes, while other pairs have lost this part due to damage. Those slippers that still have this portion employ a white plain-weave silk backed by a paper support. An outline of the pattern was drawn in ink with the embroidery added in bright, gradated colors of silk thread. The long-and-short stitch (*sashinui*) that was used accentuates the sheen of the untwisted embroidery floss. In the example shown in figure 4, the colors of the flower design at the top are, from the center of the flower moving out, brown, blue, and light yellow. The embroidery on the toe front has stripes of gradated colors; starting from the bottom, these are blue, yellowish green, brown, light brown, orange, light yellow, and yellow. The yellow and blue embroidery threads are dyed with phellodendron and indigo, respectively.

Demonstrating that the slippers were made at the same workshop, all four pairs use many of the same compound-weave silk fabrics attached to the outer surface of the slippers. The beautiful design of flowers and birds on the compound-weave fabric is made from silk threads dyed with safflower (*benibana*), phellodendron, and indigo. The woven design of the colorful phoenix still retains its particularly bright red hue, which remains vibrant after 1250 years (fig. 5).

Shades of Safflower Red

The brilliant reds found in the compound-weave fabrics on the embroidered slippers were dyed with safflower, a standard natural dye derived from petals of the flower heads that was used from ancient times, as was madder (*akane*). Although safflower produces a bright red, it also discolors when exposed to light and time, fading easily. Considering that most of the Shōsōin treasures have survived

for over 1250 years since their production, the task of identifying items dyed with something as fugitive as safflower was deemed difficult. Recently, however, as a result of the use of analytic instruments, researchers have identified many examples of safflower-dyed objects.

The use of safflower as a dye appears to have originated in the Middle East or Egypt and traveled from there along the Silk Road to China, arriving during the Former Han dynasty (206 BCE–9 CE).[2] Documents that record methods for extracting red dye from safflower date to the sixth century, during the Northern Wei dynasty (386–534) of the Six Dynasties period (222–589). Tang-dynasty documents note widespread cultivation of safflower in China.[3]

For a long time, scholars have believed that safflower was brought to Japan around the fifth century CE, but recently safflower pollen was found in an archaeological site in Nara Prefecture, making it clear that safflower was already in Japan by the third century CE.[4] A document from the Nara period states that safflower was among the materials used for sutra wrappers and sutra copying.[5] A tenth-century text describes the ingredients necessary for dyeing with safflower.[6] The same document notes that twenty-four of the sixty-eight provinces cultivated safflower at that time.

Provenance

The above makes it clear that dyeing with safflower took place in both Tang-dynasty China and Nara-period Japan. Among the Nara-period Shōsōin treasures, many items, including garments, banners, and carpets, in addition to the embroidered slippers, were dyed red using safflower. This raises the question of whether the compound-weave silk in safflower red found on the embroidered slippers was dyed in China or in Japan.

Integral to answering this question is the weave structure of the compound weave. Close inspection of this compound weave reveals that it is a weft-faced compound satin weave, called satin samite. Examination of the obverse and reverse sides shows that the obverse has a weft-faced satin weave (fig. 6), and the reverse side has a warp-faced satin weave. This is an extremely rare type of compound weave and there are hardly any other examples of this structure originating from Nara-period Japan. Recent publications, however, report similar examples among Chinese textiles.[7] Considering that shoes with a shape similar to the embroidered slippers were excavated at Astana, Turfan, in northwest China, it is highly probable that the four pairs of embroidered slippers in the Shōsōin were made in a single workshop in China, using Chinese satin samite fabric and Chinese dyed materials. Then, during the Nara period, the slippers crossed the ocean from China to Japan and were preserved there until the present.

Conclusion

The history, structure, materials, and colors of the slippers, with particular consideration for the weaving technique of the compound-weave silk, indicate that the slippers were made in Chinese workshops and brought to Nara from Tang China. Subsequently, in 756, after the

2. Early records of safflower dyeing appear in *Bowuzhi* [Encyclopedic stories of things] by Zhang Hua of the Jin dynasty (265–316). Though no longer extant in the original, this was reproduced and referenced in the Northern Song (960–1127) book by Zhao Yanwei, *Yunlu manchao* [Loose notes of the cloud-covered foothill] (Beijing: Zhonghua shuju, 1996), 7:126.

3. "Fu yong bu" [Apparel], in the encyclopedic *Taiping yulan* [Imperially inspected anthology of the Taiping era: 976–983], vol. 19. Li Fang (comp.), *Taiping yulan* (Beijing: Zhonghua shuju, 1960), vol. 3, book 719, 3186. Also in the first volume, the compendium on agriculture, of *Qi min yao shu* [Important arts for the people's welfare] by Jia Sixie, *Seimin yōjutsu*, ed. and trans. Nishiyama Takeichi and Kumashiro Yukio (Tokyo: University of Tokyo Press, 1957), 1:239–245.

4. Masaaki Kanehara, "Kafun ga kataru kodai benibana" [Pollen and safflower in ancient times], *Nihon bunkazai kagaku gakkai gappō* [Annals of the Japan Society for Scientific Study on Cultural Properties] 57 (December 2008): 1–44.

5. *Dainihon komonjo* [Old documents of Japan] (Tokyo: University of Tokyo Press, 1904), 6:412.

6. "Nuidonoryō" [Department of embroidery], in *Engishiki chū* [Codes of the Engi era], ed. Torao Toshiya (Tokyo: Shūeisha, 2007), 259–61.

7. "Sui tang wu dai de sichou" [Silk during the Sui, Tang, and Five dynasties], in Zhao Feng, ed., *Zhongguo sichou tongshi* [General history of Chinese silk] (Suzhou: Suzhou University Press, 2005), 217–18, 286–87.

FIGURE 7
Record of Folding Screens, Patterned Rugs, etc., Byōbu kasento chō. Ink on paper. Eighth century. Shōsōin Treasure House, North Section, Imperial Household Agency, Nara, Japan.

death of Emperor Shōmu, his wife, Empress Kōmyō, dedicated them to Tōdaiji along with other artifacts from their daily life in the palace, giving them a verifiable provenance.

Even though the bright colors of these slippers remain beautifully preserved, there remain concerns that they will fade in the future. These types of precious items should be preserved with the greatest care, yet they should also be seen by as many people as possible. One wants to promote both their use and their preservation.

The content of this essay is based on articles published in the Bulletin of the Office of the Shōsōin, the *Shōsōin kiyo*, an annual publication of research results and essays issued each March. Members of the Office of the Shōsōin conducted the research; they include Tanaka Yoko (Research Manager, Textile Arrangement and Research), Nakamura Rikiya (Conservation Science Section, Preservation Division), Ogata Atsuhiko (Chief of Textile Arrangement and Research), and Naruse Masakazu (Director of Preservation Division). All the relevant articles can be downloaded in pdf format from the Shōsōin website. I would like to thank Monica Bethe for this translation.

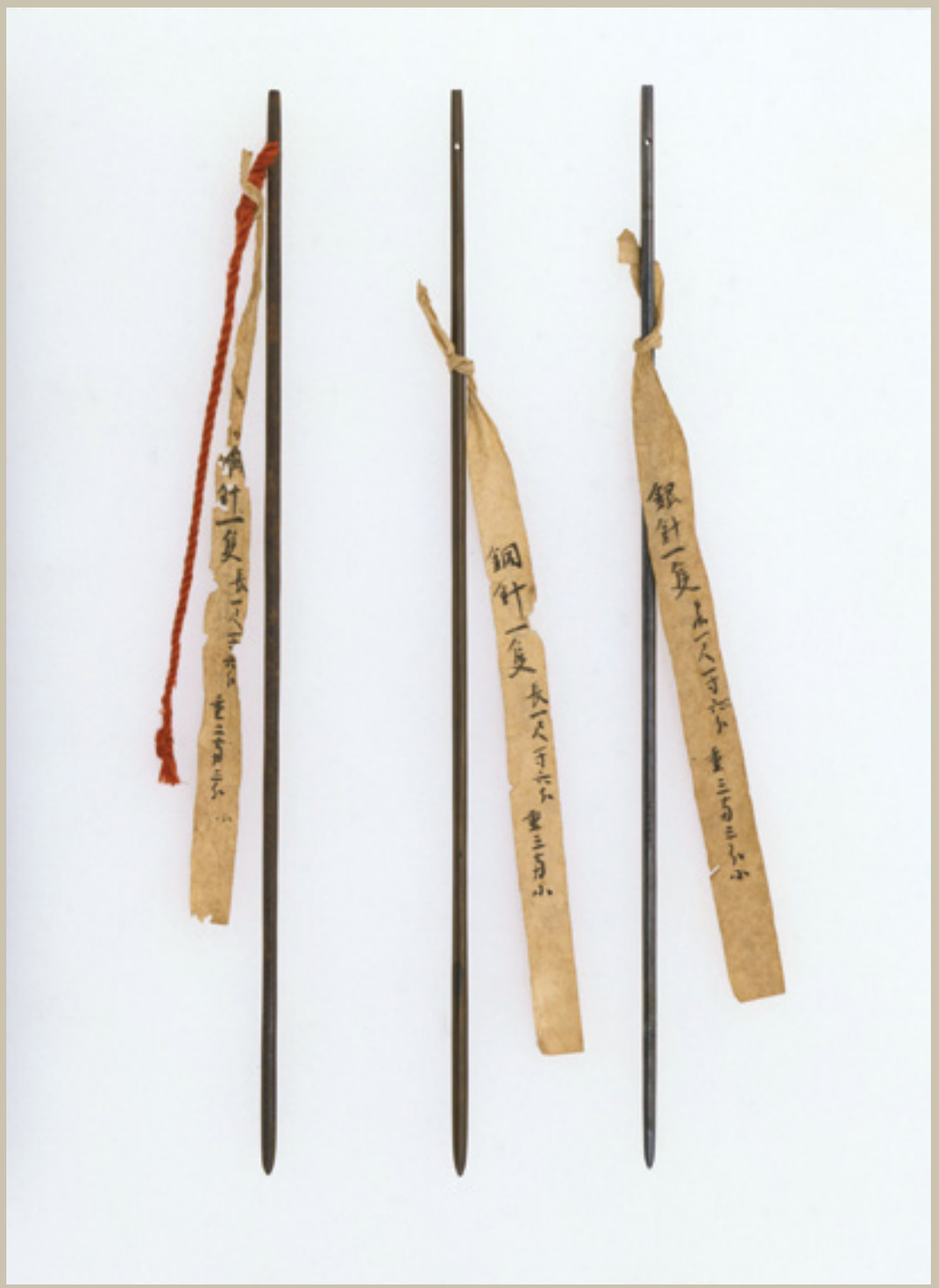


PLATE 6

Color and Yearly Palace Rituals in Japan during the Nara and Heian Periods

MONICA BETHE

Colors, particularly the five primary colors associated with personal and political health and harmony, played an important role in the lives of ancient Japanese. The colors themselves were seen as talismans protecting against disease, warding off evil, and celebrating harmony. From the sixth through the twelfth century these functions of color were especially apparent in two of the yearly palace rites marking the change of seasons, one conducted on the fifth day of the fifth month (*gogatsu no itsuka*), the other on the seventh day of the seventh month (*tanabata/kikōden*).[1] Although these calendrical events are still celebrated today as *Tango no hi* (Boy's Day)[2] and *Tanabata* (Star Festival),[3] respectively, the rites and customs presently associated with them differ vastly from those practiced among the nobility prior to the thirteenth century. Objects preserved in the eighth-century Shōsōin Repository at Tōdaiji in Nara provide clues to the ancient customs. The first example I will consider is the *Hyakusakuru no jiku* (Spool for Cord(s) of a Hundred Colors) that was intended for use in rites that took place on the fifth day of the fifth month. Next, I will discuss colored threads and needles used in the *kikōden* rituals performed on the seventh day of the seventh month. To put these eighth-century objects and their color associations in context, I will look at historical Chinese and Japanese documents, including poems, related to the rites, and also introduce studies on the objects made by the Office of the Shōsōin.

Multicolored Cords for the Fifth Day of the Fifth Month

The idea that the fifth month was a particularly ill-omened month, and therefore required special precautions to exorcise malicious spirits, originated in China at least as early as the Han dynasty (206 BCE–220 CE) and is explained in the sixth-century *Xingchu suishiji* (Almanac of the Xingchu district; J. *Keisō saijiki*).[4] This almanac describes the custom of tying five-color cords known as "long-life cords" or "cords for prolonging life" to the elbows in order to ward off evil and to protect against catching diseases when out in the fields. One entry in *Xingchu suishiji* related to these cords reads as follows:

1. Before the Meiji Restoration in the late nineteenth century, the Japanese used the Chinese lunar calendar. Although the exact alignment with the solar calendar shifts year by year, the fifth month generally corresponds to "mid-summer," that is, late June into July, and the seventh month is considered "early autumn," coming at the end of August into September.

2. The first reference to *Tango no hi* is in 839 (Shōwa 6) during the reign of Emperor Ninmyō (833–850). But the rites are older than the name. The fifth day of May became associated with Boy's Day quite recently.

3. As will be discussed later in the essay, although the name Tanabata is old and the association with the legend of the Weaving Girl and Ox Herd boy stars was already the focus of the festival in the Nara period, the present-day practice of hanging strips of colored papers inscribed with wishes on a bamboo branch dates to the Edo period (1603–1868).

4. Refer to Moriya Mitsuō's annotated translation of the almanac into Japanese. Moriya Mitsuō, trans., *Keisō Saijiki* [Almanac of the Xingchu district] (Tokyo: Heibonsha, 1978), 141–44. The fifth day of the fifth month rites are discussed on pages 141–72.

SECTION 31. Five-Color Cords. Bracelet Presents. Catching Birds

Tie cords of five colors to your elbows. This is called "averting [military] disaster." This way people avoid catching contagious diseases. . . .

According to the [Chinese] Sui Dynasty [581–618] text *Xiaojing yuanshenqi* [Classic of filial piety and celestial vows; J. *Kōkyō enshinkei*], during this season the silkworms come out for the first time and the women are busy dyeing and glossing the silk. Their jobs are many. . . .

[They make] what are called "long-life cords," "cords for continuing life," "talismans to avoid army devastation," "five-color cords," and "red ropes." Many of the cords have similar names. Red, blue, white, black are put in the four corners [of embroidered amulets and bracelets], yellow placed in the center. This is called "averting evil from all directions."[5]

Placing the primary colors at the four corners with yellow at the center is, of course, based on the five elements theory.

The association of colored cords with health and long life appears again in the next section concerning food to be eaten on the first day of summer, when the day is longest. These rites often seem to have coincided with the fifth day of the fifth month. Section 32, titled "Eat *chimaki* at the Summer Solstice," describes making triangular rice cakes (*chimaki*) wrapped in bamboo leaves, placing a leaf on one's head, and tying "five-color cords to the elbows" in order to ensure long life.

In addition, records of the Later Han dynasty (25–220 CE) make clear that such cords were not only worn on the body, but could also be attached to the gate of the house to protect the property.[6] Red ropes were particularly effective.

Nara-period Japanese, in their efforts to emulate China as a model for rituals that would ensure good government, may have used *Xingchu suishiji* as a source, or at least learned from Chinese who were following the customs outlined in it. The Japanese, however, did not incorporate the rituals in their entirety, but borrowed selectively, over time, combining the imported rites with preexisting Japanese customs associated with the same days.

Early records dated to the fifth day of the fifth month suggest that Japanese celebrated this day with various special activities. The *Nihongi* (Chronicles of Japan) notes that people gathered medicines on that day in 610 (Suiko 20) and that they held a banquet with dances in 671 (Tenchi 27).[7] The *Zoku nihongi* (Continuation of the Chronicles of Japan) mentions that Emperor Shōmu (701–756, r. 724–749) enjoyed horse races on that day in 747 (Tenpyō 19) and that he also reinstated the "old" custom of wearing head garlands made from aromatic sweet flag (*Acorus calamus*; J. *shōbu*).[8]

Dated poems in the Nara-period anthology, *Man'yōshū* (Ten thousand leaves), corroborate that gathering medicines (also used as dyes), banqueting, and composing poetry were among the customs associated with the day. According to the introductory note, poems 20 and 21 in Book 1 of the *Man'yōshū* were recited at a banquet held on the fifth day of the fifth month. In Poem 20, Princess Nukata chastises the Crown Prince (future Emperor Tenmu, r. 673–686) for overtly drawing attention to their relationship while he is gathering medicinal herbs in roped-off fields.[9] Did he not realize that the guardsman would see

5. Ibid., 158–59.

6. Ibid., 159. Moriya quotes the *Feng su fong yi* [J. *Fūzoku tsūgi*; Customs of the commoners] and the *Hou han shu* [J. *Gokanjo*; Writings from the Later Han].

7. W.G. Aston, trans., *Nihongi: Chronicles of Japan from the Earliest Times to* A.D. *697* (Tokyo: Tuttle, 1972), 2:143, 296.

8. Ujitani Tsutomu, *Zoku Nihongi gendaigoyaku* [Continuation of the Chronicles of Japan translated into modern Japanese] (Tokyo: Kōdansha, 1992), year 747. "In the past, they always made head garlands out of sweet flag for the fifth month rite. This custom has died out, but from now on, people without head garlands will not be allowed to enter the palace." Homonyms for sweet flag (*shōbu*) include "iris" (written with the same characters) and winning at competitive sports like wrestling and horse races.

9. The context of the poem makes it clear that the Crown Prince was "hunting" for medicinal herbs, not animals. Edwin A. Cranston, *A Waka Anthology*, vol. 1, *The Gem-Glistening Cup* (Stanford: Stanford University Press, 1993), 486. The *Nihongi* verifies that the day when the Sovereign, Crown Prince, and many others "hunted" on Kamafu fields was in the seventh year of his reign, 667. For further discussion see Bethe, "Color in the *Man'yōshū*," in this volume.

him waving at her? The fields they were in contained gromwell (*Lithospermum* spp.), the roots of which were used as an antiviral medicine and also yielded a valued purple dye. Poem 21 is his answer: her beauty, like gromwell purple, so devastates him that he cannot desist, despite knowing she belongs to another (his brother, then reigning Emperor Tenjin). Each of the above activities—banquets, special food, gathering medicinal herbs in the fields, races (boat races in China, horse races in Japan), and sweet flag—are detailed in the Chinese almanac *Xingchu suishiji* along with a variety of other activities.[10]

In addition to such documentary sources, objects stored in the Shōsōin provide tangible evidence of these rites, including multicolored threads and a wooden spool painted in shades of many colors. The spool (plate 1) is stored in the North Section of the Shōsōin Repository along with other personal belongings of Emperor Shōmu, sponsor of the building of Tōdaiji, the central temple of a national temple network (*kokubunji*), and of the construction of the Great Buddha at Tōdaiji. The spool is listed among his personal belongings in the *Kokka chinpōchō* (Record of the nation's rare treasures), dated 756, as "One spool of hundred-color cord (*hyakusakuru no jiku*), painted spool." "Hundred-colored" stands for multicolored and echoes the names for "long-life" cords used in documents on the rites on the fifth day of the fifth month. Elsewhere the cord is referred to as a cord of "a hundred good fortunes and a hundred years."[11]

The existence of the spool supports the idea that the Japanese incorporated the custom of tying multicolored cords to their bodies to prolong life. Miyake Hisao suggests, however, that this particular spool and the cord it held may never have been used.[12] He postulates from circumstantial evidence that, following the Tang tradition, the spool of cords might have been intended as an offering to Emperor Shōmu on the fifth day of the fifth month in 756, but that the retired emperor passed away on the second of the month, three days too early to receive the effects of the magical, life-prolonging cords. Celebrating the day, he adds, was subsequently banned for some time and the spool laid to rest with the emperor's other belongings.

The custom of presenting long-life cords to important figures seems to have been revived in the Heian period (794–1185). The tenth-century *Engishiki* (Regulations of the Engi era, 901–922) lists necessary preparations for these rites in the section on "Rituals" (*gishiki*) and mentions court women presenting the crown prince with a life-prolonging cord.[13]

The *Kyūreki* (Historical notes of the Kujō family), a mid-Heian-period diary kept by Fujiwara no Moronosuke for the Kujō family, describes the method of tying these many-colored cords.

> Begin at the left side of the body. Bring one cord over the right shoulder. Take another cord to the left front. Tie them in front so they join. Next, place two cords on your leather belt and wrap one to the back, the other to the front. Tie both together below the right sleeve. That is, the four strands make a double layer or set of cords and these are tied in a knot so they become a dangling flower ornament.[14]

Here, the Chinese custom of tying the cords at the elbows has evolved into binding the body with a talisman enhanced by a decorative tie.

Multicolor-cord talismans could also be hung about a room or building to protect the space. In the *Makura no sōshi* (The pillow book), Sei Shōnagon (ca. 966–1017) lists the celebrations of the fifth day of the fifth month as her favorite seasonal palace rite. In particular,

10. In addition, the almanac *Xingchu suishiji* mentions constructing dolls out of mugwort (*yomogi*) and setting them in the eaves, 144–45; exchanging special bracelets and amulets, some embroidered in five colors, 158–59; throwing *chimaki* into the river, 162–64; catching toads, depicted as protective symbols in tomb paintings in both Korea and Japan, 165–66; and trapping birds so as to teach them to speak, 159.

11. Moriya, *Saijiki*, 158.

12. Miyake Hisao, "*Hyakusakurunojiku*" [Spool for cord(s) of a hundred colors], *Shirokuni uta* [Songs from the white land] (October 2002): 17.

13. Quoted in Kōda Rio, *Nenjū gyōji onshōjimon chūkai* [Annotated notes on yearly events] (Tokyo: Gunsho Ryujū Kanseikai, 1981), 203.

14. Yamanaka Yutaka, *Heianchō no nenjū gyōji* [Yearly events of the Heian court] (Tokyo: Gyōshobo, 2002), 203.

PLATE 1
Spool for Cord(s) of a Hundred Colors. Length 33.2 cm, diameter at lip 5.4 cm. Pigments on wood. Eighth century (ca. 756). Shōsōin Treasure House, Imperial Household Agency, Nara, Japan.

she enjoys the "little decorative herbal balls that are hung for this festival, with a colorful array of braided threads dangling from them, and we put them up on the pillars to the left and right of Her Majesty's curtained dais in the Inner Chamber."[15] The "decorative herbal balls" (*kusudama*) mentioned here have aromatic sweet flag and mugwort in them, thus combining several elements mentioned in the *Xingchu suishiji*—gathering herbal medicines, sweet flag decorations, and mugwort dolls—and enhancing them with yet another element, multicolored cords. These decorative herbal balls were associated with the power to frighten off malicious spirits and prolong life.[16] Sei Shōnagon's appreciation of these herbal balls, however, illustrates the extent to which the original purpose had given way to aesthetic pleasure by the eleventh century.

Multicolored Cords in the Shōsōin

Today, only the spool that held the multicolored cord remains. Records of periodic inventories taken of the Shōsōin treasures indicate that the cord was still there in 811 (Kōnin 2), but by 822 (Kōnin 13) it had vanished.[17] Whether it was borrowed and never returned, or returned and placed in another section of the Repository, is unclear.

So what did this cord (or cords) look like? The lack of distinction between singular and plural in Japanese makes it unclear whether several cords, each of a different color, or shades of the same color, were wound on this rather large spool, or if a single cord with several colors plied together was used. A third possibility would be a single cord that was resist dyed (*ikat* or *kasuri*) with several colors, but that likelihood is small.

The argument for several cords of solid color is suggested by the single Chinese character for 'six' (*roku*) that appears on the body of the spool. Whether that constitutes a note that this is number six of several spools, or that the body of the spool ought to have been painted green with malachite (*rokusho*), or that the spool was intended for green cords, is a matter of scholarly debate.[18]

The argument for one or more multicolored cords (*zatsushiki ru*) comes from several such cords being stored in the South Section of the Shōsōin Repository. One such (South Section no. 82/8, plate 2) consists of five strands of different colored S-twist silk threads plied together with a Z twist over a core to form a cord of 0.3 cm diameter. The threads are white, green, light green, blue, and black, forming a gradated spectrum of shades (*ungen monyō*) with a green hue.[19] A similar cord stored in the same group has gradated shades of blue (South Section, no. 82/7), and a third seems to include yellow and red (South Section, no. 82/10). Although no records substantiate the use of these cords, scholars believe they had some ritual purpose.[20]

Of note is the use of gradated colors covering a "rainbow" spectrum. Such *ungen* arrangements can be found in braids, compound and plain-weave textiles, and painted on furniture, implements, and buildings of the time. In Japan, concentric *ungen* bands came to have Buddhist overtones. The relationship between *ungen* schema within Buddhist iconography and five elements theory and five-color geomancy (*onmyō gogyō*) deserves further investigation.

Hyakusakuru no jiku, Spool for Cord(s) of a Hundred Colors

Hyakusakuru no jiku (plate 1) is a wooden cylinder 33.2 cm long with a bulging center and flared ends that is constructed by joining two identical halves in the middle with a tenon and mortise. It is somewhat large, but can be

15. Sei Shōnagon, *Makura sōshi: The Pillow Book*, trans. Meredith McKinney (London: Penguin Classics, 2006), 42.

16. *Engishiki*, entry 45, quoted in Yamanaka, *Heianchō no nenjū gyōji*, 202.

17. Miyake, "*Hyakusakurunojiku*," 17.

18. Ibid., 6. Most other descriptions merely say that the implication of the character is unclear.

19. *The 57th Annual Exhibition of Shōsō-in Treasures* [English version] (Nara: Nara National Museum, 2005), 14 (English version); 15 (Japanese version).

20. Ibid., 14 (English version), 15 (Japanese version).

PLATE 2
Multicolor silk cord. White, yellow, light green, blue, and black S-twist threads in Z-ply. Long diameter of the bundle about 22 cm, diameter of the cord 0.3 cm. Mid-eighth century. Shōsōin Treasure House, Imperial Household Agency, Nara, Japan.

held easily in one hand. Although the center section, on which the Hundred-Color Cord would have been wound, is plain unadorned wood, the two flared ends have been painted with stripes and flowers in shaded greens, reds, and purples. The decoration provides a typical example of *ungen* shading in various colors and, thanks to careful color analysis done by the Office of the Shōsōin and reported in 1989, we have a good idea of the pigments used and how they were applied.[21]

The round ends (plate 1a) have a complex floral pattern consisting of a central four-petal flower in shades of green with a red center and red outline. This is surrounded by a nine-petal flower in shades of red (yellow, orange, red, deep red) and outlined with a thin red line. Encircling this are six large petals curled in so their undersides show at the periphery. The inner side of these petals has been depicted in shades of green (yellow, light green, dark green, black) outlined in red, and the curled outer side of the petals has been painted with shades of purple (white, light purple, purple, and dark purple). Concentric rings of yellow, light green, and dark green form a border enclosing the composite flower.

On the sides of the flared section (plate 1b), five-petal floral motifs appear between borders of shaded bands. The ground surrounding the four floral motifs is green, as are the centers of the flowers, shading to lighter hues at the edges (white, light green, green, dark green, and a dab of red at the very center of the flowers). The petals are in shades of red (white, orange, red, dark red, black). The border strips have red shades (yellow, orange, red, reddish-black purple) followed by shades of purple (white, light purple, dark purple, black purple).

Of interest is that the greens have been produced in two different ways. X-ray analysis disclosed that the green used for the central four-petal flowers and for the flared sides was obtained by painting an organic green over azurite ($Cu_3(CO_3)_2(OH)_2$).[22] The six-petal rim of the complex flowers on the ends and the concentric circles that border them use malachite ($Cu_2CO_3 \cdot Cu(OH)_2$) for green.

The investigation also showed that the shading was produced by overlaying colors.

21. The detailed information on pigments that follows appears in the *Shōsōin Nenpyō* [Yearly report from the Office of the Shōsōin], March 11, 1989.

22. Ibid.

PLATE 1a
Round ends of the spool showing a complex floral pattern.

PLATE 1b
Sides of the flared section of the spool with five-petal floral motifs appearing between borders of shaded bands.

The entire painted area has a white base, which Shōsōin researchers found to be lead white (hydrocerussite, J. *enpaku*, $2PbCO_3 \cdot Pb(OH)_2$).[23] Here the white functions both as a base coat and as an element in the *ungen* shading. For certain colors, lead white was also mixed with organic colors to form pigments. John Winter claims that the Japanese imported all their lead white from China and called it *tōgofun* (Chinese gesso).[24] According to Naruse Masakazu at the Office of the Shōsōin, lead white such as was used on the Spool for Cord(s) of a Hundred Colors could have been produced in Japan by adding ash lye and allowing the particles to sediment.[25]

The other pigments are layered on top of the white. In some places there are as many as five layers of pigment. The reds are cinnabar (HgS; J. *shu*), the orange is minium (Pb_3O_4; J. *entan*), the purples are organic purple mixed with lead white. Layers of azurite were found beneath other pigments. Azurite was one of the most expensive pigments and its use hidden underneath other layers of paint remains an intriguing puzzle.

Five-Color Threads and Needles: Implements Used in the *Kikōden* Rites on the Seventh Day of the Seventh Month

The South Section of the Repository contains four balls of twisted, plied colored silk thread (one yellow, one red, and two white; plates 3, 4, and 5). It also has a set of seven needles:

23. A discussion of the various whites used on Shōsōin objects can be found in Naruse Masakazu, "Nara jidai no enkei hakushoku ganryō" [Lead-related white pigments used in the Nara period], *Shōsōin kiyo* [Bulletin of the Office of the Shōsōin] 14 (1992): 33–58; "Shōsōin hōmotsu ni mochiirareta muki ganryō" [Inorganic pigments used on the Shōsōin treasures], *Shōsōin kiyō* [Bulletin of the Office of the Shōsōin] 26 (2004): 13–61. Both are available at: http://shosoin.kunaicho.go.jp/shosoinPublic/bulletin.do. There are two samples of actual lead white pigment stored in the Shōsōin Repository's Middle Section, no. 42.

24. John Winter, "Lead White in Japanese Paintings," *Studies in Conservation* 26 (1981): 89–101.

25. Naruse, "Shōsōin hōmotsu ni mochiirareta muki ganryō," 15.

two silver and two iron short needles (19.5 cm; plate 6), and one each of long needles (approx. 34–35 cm) made respectively from silver, copper, and iron. One long needle still retains a loose red silk thread in its eye. In addition, there is one needle case of green hemp paper.

Since the quality, diameter (0.25 cm), twist (S) and ply (three elements in Z direction) of the red thread still threaded through one needle corresponds exactly with the characteristics of the other threads, all the threads and needles are thought to belong together. The longer needles are much too long to be used for sewing, so it is assumed that these were ritual implements. Further clues make it clear that they were used during the *kikōden* rites performed in the palace on the seventh day of the seventh month.

Paper tags attached to the needles indicate that each was once threaded with a long silk thread. For example, the back of the tag on the silver needle reads: "Length of thread: 1134 *shaku*" and the tags of the others indicate a similar length, somewhere around 360 meters.[26] In addition, two tags, one of silk and one of paper, accompany the skein of white thread. The plain-weave silk tag bears the title of a senior woman at court; she may have donated the thread, or the ritual may have been held in her apartments.[27] In either case, the tag indicates the central role women played in the rites. The white paper tag lists various stringed instruments: *kin*, *sō* (both are types of zithers), *shuryo* (meaning unclear), *biwa* (lute), and *ginsō* (silver zither). Although one might wonder what relationship musical instruments had to threads and needles, it should be noted that all were instruments with silk strings. To understand the importance of the threads, needles, and silk-string instruments to the seventh day of the seventh month, we must turn to the Chinese origins of the *qiqiaodian* (J. *kikōden*) rites and then to the Japanese reinterpretation of these rites within the context of earlier ceremonies associated with the same day of the year.

Chinese Sources for *Qiqiaodian* (*Kikōden*) Rites

In China, the *qiqiaodian* rites were grafted onto earlier observances commemorating the seventh day of the seventh month as the one day in the year when the Weaving Girl (the star Vega; J. *orihime*) and the Ox Herd Boy (the star Altair; J. *hikoboshi*) are allowed to meet. These two lovers were forcibly separated when they became so enamored of each other that they neglected their jobs. To keep them focused on their work, they were set at opposite sides of the Milky Way (The Heavenly River; J. *Amanogawa*) and allowed to cross over and meet only once a year. According to some legends, magpies would build a bridge of wings, or the Ox Herd Boy would row across, but in either case, the possibility of their meeting depended on the sky being clear. Those on earth would spend the night stargazing, anxiously wishing the lovers well. Banqueting and music served to liven the event, and an element of fortune telling entered the picture early on.[28]

By extension, what transpired in heaven on this night might be reflected below, and girls wished for fulfillment of their desires. The *qiqiaodian* rites extended and developed the theme by providing a platform to display female accomplishments, such as sewing, working in silk, and later also music.

Several Chinese sources offer insight into models for the *qiqiaodian* rites as they might have been introduced to Japan.[29] Under the seventh day of the seventh month, the *Xingchu suishiji* notes the following:

PLATE 3
Yellow silk thread. 3Z-ply glossed silk. Long diameter of ball 18 cm, short diameter of ball 10 cm, thread diameter 0.25 cm. Mid-eighth century. Shōsōin Treasure House, Imperial Household Agency, Nara, Japan.

PLATE 4
Red silk thread. 3Z-ply glossed silk. Long diameter of skein 20 cm, thread diameter 0.25 cm. Mid-eighth century. Shōsōin Treasure House, Imperial Household Agency, Nara, Japan.

PLATE 5
White silk thread. 3Z-ply glossed silk. Diameter of skein 62 cm. thread diameter 0.3 cm, length of thread over 340 meters. Mid-eighth century. Shōsōin Treasure House, Imperial Household Agency, Nara, Japan.

26. *The 53rd Annual Exhibition of Shōsō-in Treasures* (Nara: Nara National Museum, 2001), 42 (Japanese version); 16 (English version).

27. Ibid., 44 (Japanese version); 17 (English version).

28. In Japan, this same story is associated with the *tanabata* festival, celebrated by all levels of society. The *kikōden* rites, however, never spread beyond the palace aristocracy.

29. These include the *Fudōki* [Local chronicles and legends], the *Shimin Getsurei* [People's monthly], and the *Jūsekki* [Calendrical rites].

> The seventh day of the seventh month is the night when the meeting of the Ox Herd Boy and the Weaving Girl takes place. On this night, the women in the house knot beautifully colored threads and pass them through seven holes in needles, using gold, silver, and brass-colored needles. They display these along with wine, dried meat, melon and fruit on tables and straw mats set in the garden so as to pray for skill in needlework. If the spiders make their webs on the melons, their desires will be realized.[30]

These rites focus on sewing skills, particularly embroidery done in rainbow colors: occupations of the court ladies symbolized by the act of threading needles.

The colorful materials and food of these rites must have formed a striking contrast with the black and white moonlit scene evoked by a poem composed during the seventh day of the seventh month rites and quoted in the Chinese almanac, *Xingchu suishiji*:

> The fourth emperor of the Liu-Song dynasty [420–479], Xiaowu [J. Koobu; 430–464], composed the following poem: "Facing the wind, one takes out the colored thread. Facing the moon, one threads the dark needle."[31]

The challenge of threading needles by the light of the moon is reiterated in the *Kaixuan tianbao yishi* (Legacy of Tang Emperor Xuanzong; J. *Kaigen Tenpō iji*), which also elaborates on the colorful gay setting:

> In the palace, they construct a space using joined cloths of colorful woven designs. It takes dozens of people to build the hundred *shaku* [approx. 30 meters] tall structure. They lay out melons, fruit, wine, and braised food, and seated on mats they celebrate the two stars. The princess(es) take each of nine holed-needles and thread them with five-colored threads. Passing the thread through the eye of the needle is done facing the moon. Those who manage are deemed skillful. Music and banqueting lasts till the morning.[32]

PLATE 6
Silver, copper, and iron needles. Length of silver needle 34.8 cm, diameter 0.5 cm, weight 49 gm. Length of copper needle, 35.0 cm. Length of threaded iron needle 34.0 cm. Silver, copper, and iron. Mid-eighth century. Shōsōin Treasure House, Imperial Household Agency, Nara, Japan.

The number of colored threads (five) does not correlate with the number of needles (seven or nine, depending on the text) or the number of holes to be threaded, but the recurrence here of the five basic colors has obvious Daoist overtones, as does the variety of metals, each of a different color, from which the needles are forged: gold, silver, brass, and if the Shōsōin needles are included, also iron.

The early-eighth-century *Tang liudian* (The six statutes of the Tang dynasty), which describes the structure and activities of state offices during the Tang dynasty (618–907), mentions the production of special needles specifically for the *qiqiaodian* rites. It further specifies that the court office responsible for decorative arts should make an offering of seven fine gold needles on the seventh day of

30. Text from Kōda, *Nenjū gyōji onshōjimon chūkai*, 190. Japanese reading from Moriya, *Keisō Saijiki*, 179–80. Here the Chinese character for 'skill' incorporates a pun on praying to get a good husband.

31. Moriya, *Keisō Saijiki*, 179–80.

32. Ibid., 191. Quote from *Kaixuan tianbao yishi* [Legacy of Emperor Xuanzong, J. *Kaigen Tenpō iji*].

the seventh month.[33] Presumably the needles in the Shōsōin served as a similar offering.

Japanese *Kikōden* Rites, Background and Practice

In Japan, the *kikōden* rites were introduced as palace events around the year 755 (Tenpyō Shōhō 7) during the reign of Empress Regnant Kōken (r. 749–758), a year before the death of her father, the retired Emperor Shōmu.[34] Around this time, Empress Kōken was sponsoring research into Chinese rituals, and some ritual objects in the Shōsōin have dedication dates from 758 (Tenpyō Hōji 2).

The time frame suggests that *kikōden* rites were a rather late addition to two older traditions also linked with textiles. The oldest practice, which comes to us through *Man'yōshū* poems and folk tradition, concerns a girl shaman (*Tanabata tsume*) who weaves a robe to be offered to the deity in a temporary shelter on a platform (*tanabata* or shelf-loom) by the riverside. A poem attributed to Kakimoto no Hitomaro (660–ca. 720) takes the voice of the expectant deity: "Just for me, Tanabata tsume, shut in her shed, has been weaving white cloth. I wonder if it is finished?"[35]

At some point, possibly in the seventh century, this early *tanabata* folk practice was combined with the celebration of the Weaving Girl and the Ox Herd Boy brought from China. For the Japanese, the night of stargazing and banqueting focused on the composition of poems. The *Man'yōshū* contains some 123 poems about the seventh day of the seventh month. Most of these evoke the Weaving Girl and the Ox Herd Boy, though some recall the older Tanabata tsume.[36] Only a few refer to sewing, corroborating that the *kikōden* rites with their focus on needlework were a later addition.[37]

By the Heian period, the *kikōden* rites were fully integrated into the palace rituals for the seventh day of the seventh month, though they never became part of a more popular tradition. A number of noble families preserve records documenting the procedures, such as the early-twelfth-century *Unzushō* (Illustrated palace ceremonies), which presents diagrams of various court ceremonies and rites. Likewise, the *Gōke shidai* (Customs of the Gō family) compiled by Ōe Masafusa (1041–1111) gives a lengthy description of mid- to late-Heian-period practices, including diagrams of how they arranged the offerings in the garden. One section stipulates the layout, including not only five-color threads and cloth, but also a color-coded array of fruit and vegetables displayed on black and red implements. Here is a summary of the comments on the diagram:

> Four red lacquered tables were set in the garden, in two rows of two aligned to the compass directions. A zither bridged the two southern tables. At its head and foot were incense and [lotus] flower offerings. In the front of the zither were large catalpa leaves with needles threaded in five colors. On the back tables, red lacquer dishes were arranged with melon, eggplant, peach, pear, sake, black/red and white beans, abalone, and sea bream: a multi-colored array. Lights were set at intervals around the tables and straw mats spread on the ground.[38]

The section on the colored threads and needles reads as follows:

33. *The 53rd Annual Exhibition of Shōsō-in Treasures*, 43.

34. The *Kōji kongen* [The Source of Court Functions] gives 755, but according to Kōda this is based on a mistaken entry in the *Nenjū gyōji hisho* [Secret writings on yearly events]. Kōda Rio, *Heianchō saiji kōji rakukai* [Notes to court functions and calendrical activities at the Heian court] (Tokyo: Gunsho Ryujū Kanseikai, 1981), 193.

35. Kojima Noriyuki, Kinoshita Masatoshi, and Satake Akihiro, eds., *Man'yōshū* (Tokyo: Shōgakkan, 1973), 3:94 ; MYS Book 10, poem 2027. *Agatame to/tanabatatsume no/sono yado ni/oru shirotae wa/oritekemu ka mo.*

36. According to the entry in the *Nihongi* [Chronicles of Japan] for the year 691 (Jitō 5), there was a banquet and garment distribution. By the eighth century such banquets were staged as poetry parties. Poems in the *Man'yōshū* about the Seventh Night (Tanabata) include ones composed in the years 723, 724, 729, 730, 738, 749, and 754.

37. The topic is sewing clothes rather than embroidery. Poems 2064 and 2065 in Book 10 of the *Man'yōshū* seem to combine references to Tanabata tsume with the Weaving Girl star, in the hope that maidens invest in their sewing.

38. Kōda quotes heavily from the *Gōke shidai shidai* [Customs of the Gō Family], compiled by Ōe Masafua (1041–1111), in *Heianchō saiji kōji rakukai*, 196–97.

> One catalpa leaf: pin it with seven gold needles and seven silver needles. In addition have seven ordinary needles. Pass threads of five colors through the eyes of these needles.[39]

The threaded needles here seem to have been pinned in place and laid out as an offering. The contest of threading needles by moonlight does not get special mention and may not have taken place; instead, poems composed on the spot were inscribed on catalpa leaves. A custom developed of floating these leaves in thin gruel so as to observe the stars reflected on the water's surface.

Today, certain court families, like the Reizei family in Kyoto, continue to observe the *kikōden* rites in much the same way as they are described in the twelfth- or early-thirteenth-century *Gōke shidai*. Music and poetry play a prominent role, and the family also hangs five color curtains as a backdrop and lays out offerings of silk thread and fabric dyed in yellow, red, blue, and black, with one set left white.[40]

The Shōsōin Threads

These late-Heian-period records detail that the *kikōden* rites included offerings of threads dyed in the five primary colors, making it likely that originally the threads in the Shōsōin included blue and black in addition to the white, red, and yellow threads presently in the Repository. Since the responsibilities of court ladies included dyeing, the beauty of the colors they produced for the offerings of thread and cloth may have served to recommend their talents in much the same way as embroidery did for the Chinese.

The Shōsōin threads have been preserved in different stages of handling. The white skein with the two labels (plate 5) discussed earlier remains as a skein, a form convenient for vat dyeing. The red yarn (plate 4) appears to be a similar skein, half-used, with the loose end wrapped around the center. Its color is listed as *hi*, which generally refers to materials dyed with madder (*Rubia akane*, four-leaf variety).[41] To produce the dye, madder roots were washed, dried in the sun, and when mature pounded and soaked before they were heated in water to extract the color. In the Nara period, the most common method of producing a mordant was to use ash lye, or water passed through ashes that had picked up the chemicals in the burnt wood. According to the tenth-century *Engishiki* (Codes of the Engi era), commonly regarded as reflecting dye methods used in the previous Nara period, dyeing madder required not only (alum-rich) ash, but also rice, presumably to help purify the color.[42]

The yellow thread (plate 3) presumably preserves the form in which such threads were set out as offerings, or stored: a tight ovoid ball 18 cm long and 10 cm in diameter. The long thread forming the ball is held secure by a single-strand thread dyed the same color and wound first on the long axis and then around the girth. The main dyes commonly used for yellow in ancient times were Amur cork tree (*Phellodendron amurense*; J. *kihada*) and eulalia (*Miscanthus tinctorius*; J. *kariyasu*). They were sometimes combined with other dyes, making analysis more complex. While Amur cork

39. Ibid.

40. Reizei-ke Shiguretei Bunko, Nihon Hōsō Kyōkai, Tōkyō-to Bijutsukan, *Reizei-ke no shihōten* [Treasures of the Reizei family] (Tokyo: NHK Puromōshon, 1997), 49.

41. Nakamura Rikiya, Tanaka Yoko, Ogata Atsuhiko, and Naruse Masakazu, "Dye Analysis of Shōsōin Textiles Using Excitation–Emission Matrix Fluorescence and Ultraviolet–Visible Reflectance Spectroscopic Techniques," *Analytical Chemistry* 81, no. 14 (July 2009): 5698.

42. The *Engishiki* lists materials needed to dye red with *Rubia akane* both in the fourteenth book under the dye materials used in the Office of Palace Embroidery (*nuidono no tsukasa*) and in the seventeenth book under costumes to be provided by the Bureau of Construction (*takumiryō*). According to Maeda Ujō, the rice was boiled with the madder roots, and when the liquid became slightly acid, but not yet vinegar, the red was released from the roots. *Iro some to shikisai* [Color, dyeing and coloring] (Tokyo: Hosei University Press, 1983), 164. According to Yoshioka Tsuneyoshi, the rice starch as it turned into paste would absorb the yellow contained in the madder roots and thus facilitate the production of a clear, clean red dye bath. *Tennen senryō no kenkyū* [Study of natural dyes] (Kyoto: Mitsumura Hirafuru Shoin, 1974), 168. The text for these sections of the *Engishiki* can be accessed at Miko.org: http://miko.org/~uraki/kuon/furu/text/rituryou/engi/engi.htm and an early printed text at the Kindai Digital Library site: http://kindai.ndl.go.jp/info:ndljp/pid/991103/51.

tree requires no mordant, eighth-century documents suggest *miscanthus* was dyed using camellia ash.[43]

A green hemp-paper needle case completes this set of ritual objects. Almost a perfect square (24.5 cm × 23.0 cm), it has been folded in half lengthwise and then again in thirds lengthwise to make a long, narrow wrapper open at both ends. The inscription on the outside reads: "One strand of light green thread. One iron needle: weight, a little over 2 *ryo* 2 *bu*." This weight essentially matches that indicated on the tag attached to the long iron needle, which reads: "One iron needle. Length: 1 *shaku* 1 *sun* 1 *bu*; weight: a little less than 2 *ryo* 3 *bu*." The length of the needle (34.9 cm) exceeds the height of the paper case by over ten centimeters.[44] Perhaps the paper was a base for displaying the threaded needles, like the catalpa leaves used in later centuries.[45]

In Summation

The rites observed on the fifth day of the fifth month and the seventh day of the seventh month drew on the efficacy of the five basic colors associated with the five elements, but put them to different uses. On the fifth day of the fifth month, multicolored cords and decorations using the five colors served as talismans to ward off unseen dangers and contagious diseases, and thus ensure long life. In contrast, the threads, textile yardage, and food in the five colors set out on the night of the seventh day of the seventh month served as symbols of women's work: sewing, dyeing, weaving, and cooking. Their display in the garden formed a wish for the skills to secure success as a woman. The five-color symbolism in this assemblage was clearly tied to geomancy and the rite imbued with elements of fortune telling.

Both the yearly events discussed in this essay drew on native and imported traditions, adopting, discarding, and reinterpreting them over the years. In both cases, records of special events on these calendrical days go back to the seventh century and may draw on early native observances, but the Chinese model provided guidelines for establishing the various activities practiced as palace rites. Over time, in Japan, the talismanic multicolored cords associated with the fifth day of the fifth month evolved into decorative amulets and later into the five-color streamers that top the fish-flag poles (*koinobori*) set up in May today. Similarly, the five-color offerings of the *kikōden* rites grew more elaborate and decorative during the Heian period. In later centuries, the specific implications of the colors slowly lost their meaning, but the modern popular practice of inscribing colored slips of paper with wishes addressed to the star lovers and attaching them to bamboo branches set out on the night of the seventh day of July still carries echoes of the ancient beliefs.

Though it is beyond the scope of this essay, developing a full understanding of the development and ramifications of these two yearly events requires one to consider all the other elements involved, such as races, wrestling, decorations, poems and poetry banquets, special foods, emblematic flowers, and references to the events in court literature. This careful analysis of a few items still preserved from the eighth century provides concrete source material from which to build an image of court rituals as practiced over a thousand years ago.

Acknowledgments

I would like to express sincere thanks to the Office of the Shōsōin for providing the photographs used in this essay.

43. Nakamura et al., "Dye Analysis," 5696.

44. *Shōsōin hōmotsu* [Treasures of the Shōsōin] (Nara: Nara National Museum, 1998), 91. Since the shorter iron needles (19.5 cm) would fit nicely within the case, some scholars have argued that the case was intended for a shorter needle, with the attached thread used to keep the needle from slipping out of the top or bottom.

45. It is curious that the green paper case held green thread, as green is not one of the five primary colors associated with *kikōden* rites. Green was often used as a substitute for blue, particularly because it had to be dyed in indigo blue before overdyeing with a yellow, and because one character for green, *ao*, can also be read blue, but in this case the character used, *midori*, refers exclusively to the color green. The label may date from a later time.

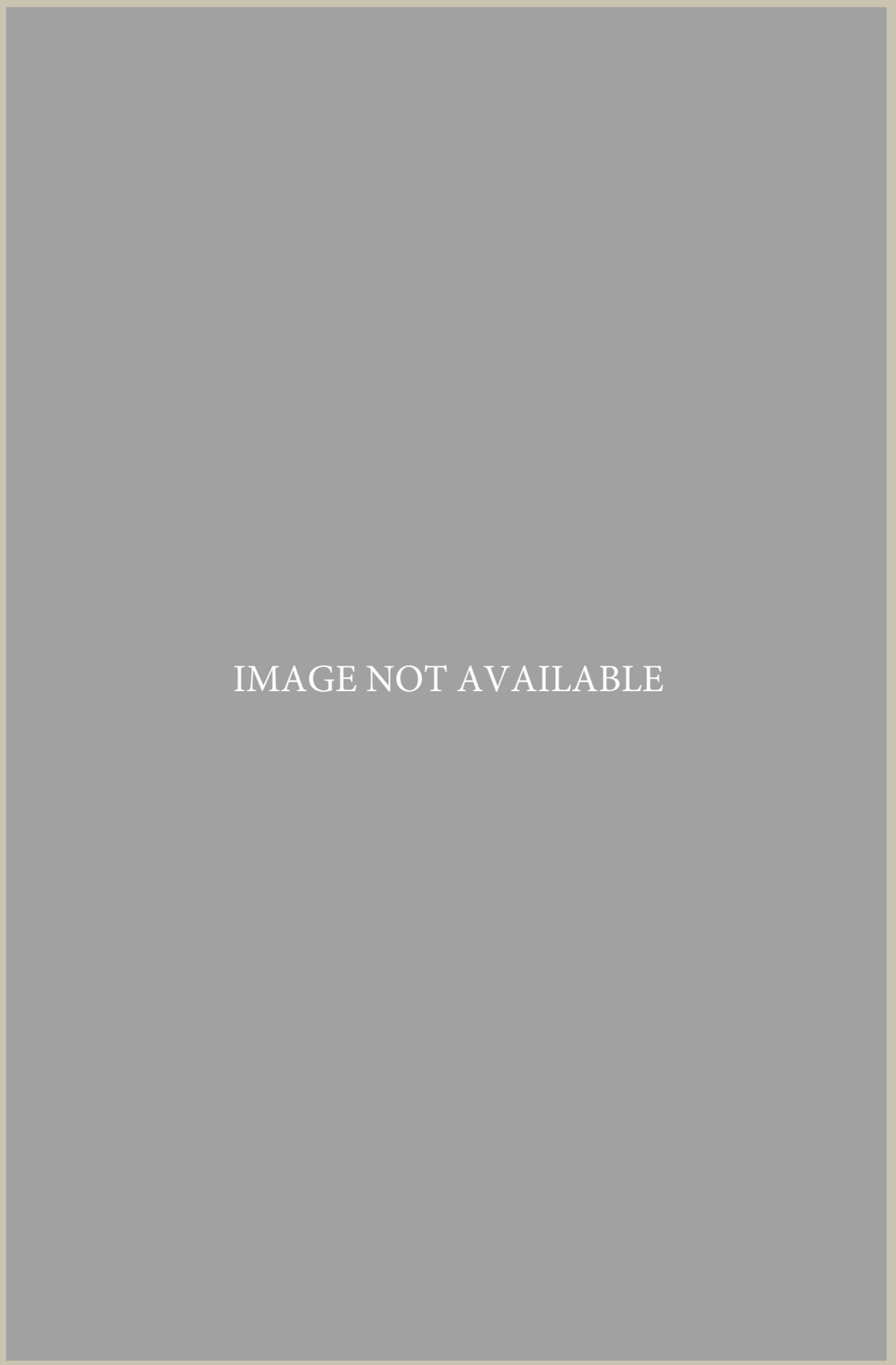


PLATE 1 (detail)

Color at the Court of Japan in the Heian Period

MARY M DUSENBURY

In 794 Emperor Kammu (737–806) moved the Imperial Court from Nara to Heian-kyō (present-day Kyoto) where it remained for over a thousand years. During the Heian period (794–1185), color was employed at the court as an artistic medium that ranked with poetry, calligraphy, and music. The primary focus was on the colors and juxtaposition of colors in court costume, particularly the *nyō-boshōzoku*, or women's multilayered ensembles. Color fills the journals of Heian women writers, such as those assembled at the rival salons of the imperial consorts Teishi and Shōshi in the early eleventh century. Murasaki Shikibu, in particular, employed color as a significant symbolic device both in her journal and in her monumental novel, *Genji monogatari* (Tale of Genji). This essay will conclude with a discussion of the production of colors during the Heian period and an examination of a tenth-century document written for commissaries in the imperial dye workshop detailing the materials needed to produce the multiple hues, shades, and tones of color described in Heian literature.

Introduction

By the end of the eighth century the Tang dynasty in China (618–907) was in decline and its central authority disrupted. In 894, the Japanese Emperor Uda (r. 887–897) canceled a diplomatic embassy to the Tang court and ushered in a period of relative seclusion. Although traders and Buddhist monks continued to travel to the continent, for the next several centuries there was little official contact between China and Japan. After three centuries in which the Japanese court had looked across the Sea of Japan to model itself on Tang China, it now focused its attention inwards, forging a distinctive, refined culture from the far-reaching and rich resources of continental culture that it had absorbed during the Asuka (538–710) and Nara (710–794) periods. The Heian period was fertile, producing a classical Japanese culture that included imperially sponsored anthologies of both Chinese and Japanese poetry and the great women's literature of the mid-Heian period. This literature included the *Genji monogatari* (Tale of Genji) of Murasaki Shikibu and *Murasaki Shikibu nikki* (her Diary); *Izumi Shikibu nikki* (Diary of Izumi Shikibu) and *Izumi Shikibu shū* (The Collected Poems of Izumi Shikibu); and the *Makura no sōshi* (Pillow Book) of Sei Shōnagon, to name only a few.[1]

The splendid colors originally associated with High Tang culture retained their importance in the political, religious, and cultural life of the Heian court. Heian courtiers exhibited the same keen interest in pure color and

1. These three remarkable women were contemporaries serving at the courts of Emperor Ichijō's two primary consorts, Teishi (977–1001) and Shōshi (988–1074). Little is known of their lives apart from their parentage and the years they were at court. Murasaki Shikibu may have died ca. 1014; Izumi Shikibu may have been born about 976; Sei Shōnagon may have been born about 966, and the last contemporary reference to her was in 1017. Earl Miner, Hiroko Odagiri, and Robert E. Morrell, *The Princeton Companion to Classical Japanese Literature* (Princeton: Princeton University Press, 1985), 170, 202, 227.

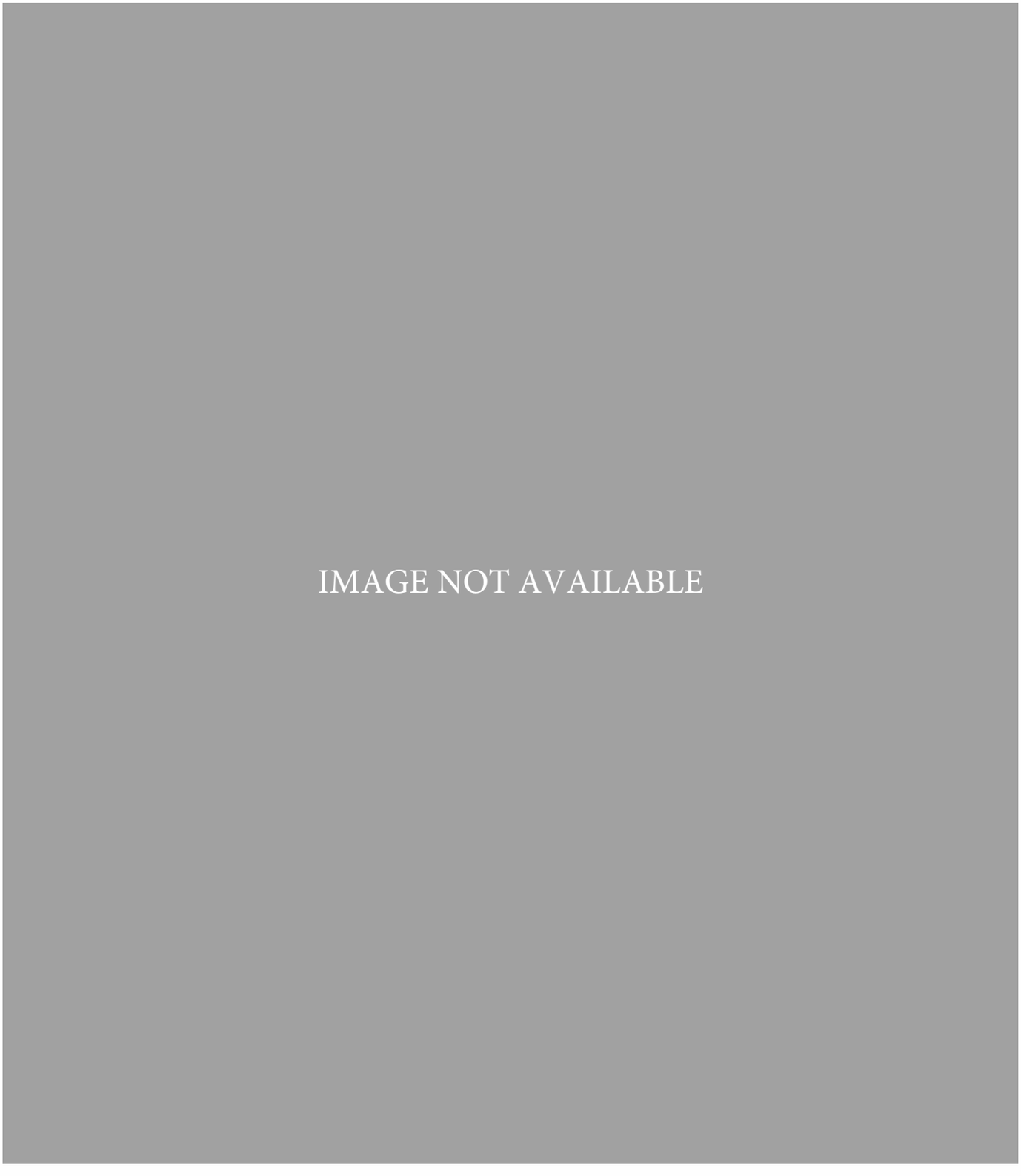
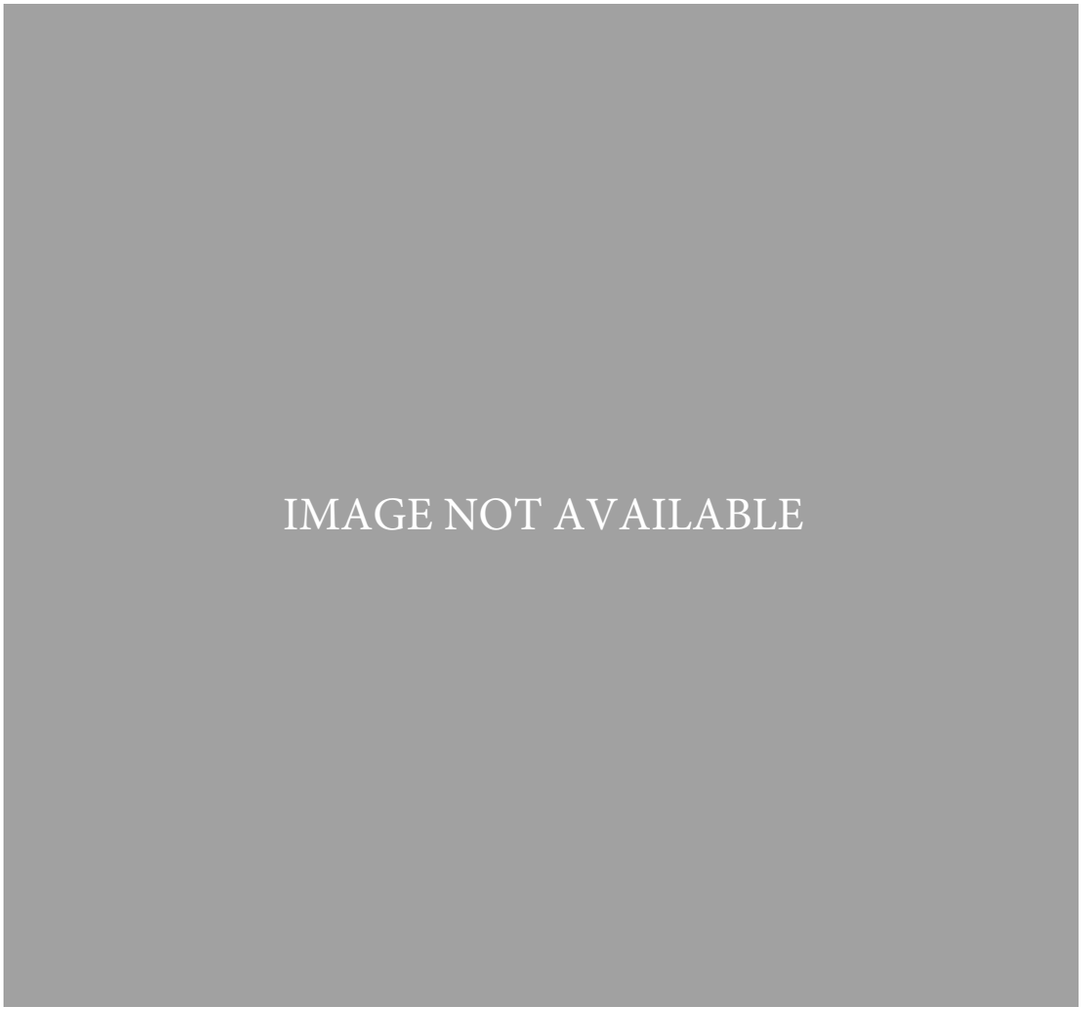


IMAGE NOT AVAILABLE

PLATE 1
Mandala of the Two Worlds from the *Womb World Mandala* (Taizōkai mandala or Womb mandala of great compassion). 183.6 × 164.2 cm. Hanging scroll, ink and colors on silk. Heian period, ninth century. Saiin, Kyōōgokukuji (Tōji), Kyoto.

PLATE 1a
Detail of the center section, *Hall of the Central Dais Eight Petals*.



its juxtapositions that was evident in Tang/Nara material culture. They surrounded images of the Buddha with aureoles in radiating bands of color and positioned them on lotus stands decorated in similar fashion (plates 1 and 1a). Elite Heian women developed distinctive styles of dress, clothing themselves in layers of solid-colored silk garments dyed in sharply contrasting and/or subtly gradated colors (plates 2, 2a, and 2b).

In the seventh century, a system of rank colors was the vehicle that introduced new colors to Japan. It was also the conduit for the resources necessary to produce these colors. These resources included several of the dye plants themselves, the practical knowledge to cultivate and harvest the dye plants, and the considerable technical skill needed to extract the dyes and use them to give a piece of cloth the desired shade and tone of a particular color. The new continental colors produced unusually rich, vibrant colors and required sophisticated knowledge to cultivate and handle. Few people had access to these exciting reds, blues, purples, and greens, and only a small number of government-sponsored craftsmen (probably foreign at first) had the necessary skills to produce them. The *kurai iro*, or rank colors, were therefore the primary locus for the introduction of new colors and new shades and hues of color.

The situation was different in the tenth and eleventh centuries. By the mid-Heian period, private residences of the elite had their own dye workshops that vied with one another to produce ever more interesting shades of

PLATE 2
Illustration of Tamakazura's daughters playing *go* from *Genjimonogatari emaki* (Illustrated Scroll of the Tale of Genji), chapter 44, Takegawa II (second illustration from Bamboo River). Ink and colors on paper. Early twelfth century. The Tokugawa Art Museum, Nagoya, Japan.

PLATES 2a and 2b
Details of Plate 2.

color.[2] Skilled as they were, the palace dyers had become just one workshop among many. The primary locus of color innovation was no longer in formal male court robes with their established rank colors, but in unofficial costumes. Women's dress, in particular, became the focus of innovation and experimentation. Women explored new shades and tones of color and paid a great deal of attention to the way colors worked together. They experimented with multiple combinations of softly graduated shades and sharply contrasting hues in schemas that eventually became codified in a variety of so-called *kasane* (layered) and *awase* (matched) combinations.

Radiance and Darkness

A dichotomy between colors associated with radiance and those associated with darkness informs the discourse on color during the Heian period. The following two quotations suggest Heian perceptions of these two categories of color. The first is from the *Eiga monogatari* (A Tale of Flowering Fortunes), a chronicle centering on the life and career of Fujiwara no Michinaga (966–1028). The chronicle was probably written around 1092 by one or more anonymous female authors.[3] The scene is Koichijōin's marriage to Michinaga's daughter, Kanshi; Koichijōin (994–1051) was in mourning for his father, Emperor Sanjō (975–1017).

> Michinaga appeared in magnificent attire to offer the winebowl. It was a spectacle brilliant beyond description. [In this setting] . . . Koichijōin was extremely embarrassed by the [somber] colors of his [mourning] robes. The subject admitted no discussion, however, and he could only reflect in chagrin that he must be making a wretched appearance.[4]

The second quotation is from Sei Shōnagon's *Makura no sōshi*, a collection of random thoughts, poems, and diary entries. Sei Shōnagon was a lady-in-waiting to Empress Teishi.

2. There are numerous oblique references to private workshops in Heian-period literature, including one quoted later in this essay. See, for example, Murasaki Shikibu, *The Tale of Genji*, trans. Royall Tyler (New York: Viking, 2001), 426.

3. Miner et al., *Classical Japanese Literature,* 141, 146–47. Akazome Emon (fl. 976–1041) is often believed to have had some part in the production. She served for a time in the palace of Fujiwara no Michinaga and later in the entourage of Jōtōmon'in, the former Empress Shōshi (988–1074).

4. *Eiga monogatari* [A Tale of Flowering Fortunes], ed. Matsumura Hiroji, 4 vols., NKZ 28 (Tokyo: Asahi Shimbunsha, 1956), 2:225. Translation adapted from William H. and Helen Craig McCullough, trans. and eds., *A Tale of Flowering Fortunes: Annals of Japanese Aristocratic Life in the Heian Period* (Stanford: Stanford University Press, 1980), 468.

In this passage, Sei Shōnagon, in conjunction with Empress Teishi's other ladies-in-waiting, is in the final stages of mourning for Teishi's father, Fujiwara no Michitaka. She and the other women in the room were dressed appropriately in very pale colors. Her lover Tadanobu enters, making a magnificent appearance against the scattering plum blossoms. As she looked at Tadanobu from behind her blinds, Sei Shōnagon felt that her age (thirty), lackluster hair, and her pale mourning garments ruined a scene that without her presence would have been ideally beautiful:

> [Tadanobu] looked magnificent as he came towards me. His resplendent cherry-coloured court cloak was lined with material of the most delightful hue and luster; he wore dark, grape-coloured trousers, boldly splashed with designs . . . his crimson underrobe was so glossy that it seemed to sparkle, while underneath one could make out layer upon layer . . . He looked like one of the gentlemen who are depicted by painters or celebrated by the writers of romances.
>
> The plum blossoms in front of the Palace . . . were just beginning to scatter, yet they were still very beautiful. The sun brilliantly lit up the whole scene. . . . [W]e were still in mourning . . . [my robes] being of such a light grey hue that they hardly seemed to have any colour at all and one could not tell one garment from another. . . . Alas there was not one good thing about me, and I quite spoiled the beauty of the scene.[5]

Heian writers praised the colors associated with the court in terms such as *hikaru*, *mabayushi*, *imijiki*, *azayaka*, best translated as radiant, shining, brilliant, splendid, magnificent, resplendent, dazzling, a vocabulary also used to describe the Western Paradise of the Amida Buddha, whom Heian courtiers worshipped with fervor. The most highly prized colors were deeply saturated versions of the privileged court colors. These were perceived as being full of life and described as 'radiant,' even if they were so dark as to appear almost black. A deep shade of *murasaki* purple or safflower scarlet required a substantial investment in expensive dye materials, time, and skill, and represented the height of prestige, luxury, and elegance. Except when they were used for a deliberate effect within an otherwise colorful assemblage, very pale renditions of these same colors, appropriate for the final stages of mourning, or mourning for a distant relative, were generally described as colorless, unattractive, or simply uninteresting.

The dark, somber, muted colors used for deep mourning were, almost without exception, obtained from native plants, such as acorns from the oak trees that grew wild in the forested mountains of Japan. These dull browns, grays, and blacks were associated with the feared worlds of death, desertion, pollution (*kegare*), exile, and the untamed wilds beyond the reach of the civilized and civilizing court. They were regarded as not only unattractive but as sharing in the death they represented. They prevented a mourner from participating in celebratory occasions or in court business for fear of introducing pollution or misfortune to a place or occasion. At best they were considered nondescript or ugly.[6]

5. Sei Shōnagon, *Makura no sōshi* [Pillow book], eds. Matsuo Satoshi and Nagai Kazuko, KNK 12–13 (Tokyo: Shōgakkan, 1984), 1:111–12. Translation adapted from Ivan Morris, trans., *The Pillow Book of Sei Shōnagon* (New York: Penguin, 1971), 94.

6. This is not the only instance of light/radiance being associated with civilization/continental culture, and darkness associated with older indigenous ways and rough materials. In the first year of each emperor's reign, the emperor performed the annual offering of the first fruits in a ceremony known as the Daijōsai (Great Offering Ceremony). He performed the first offerings at night in a specially constructed eastern hut, moving to a western hut at dawn to make the second offerings. In each hut, roughly crafted objects were paired with finely crafted ones, millet with rice, black sake with white sake, and rough cloth made of mulberry bark with smooth cloth made of finely woven hemp or ramie. Louise Cort has pointed out that the purpose of the ceremony was to harmonize "the contrasting worlds of rough and smooth, dark and light, east and west, even native and continental. . . . [O]n the cultural level it continued the process whereby the old elements were gradually overwhelmed and obliterated by the new." See Louise Allison Cort, "The Changing Fortunes of Three Archaic Japanese Textiles," in *Cloth and Human Experience*, eds. Annette B. Weiner and Jane Schneider (Washington, D.C., and London: Smithsonian Institution Press, 1989), 383–86. See also Robert S. Ellwood, *The Feast of Kingship: Accession Ceremonies in Ancient Japan* (Tokyo: Sophia University, 1973).

> Michinaga was deeply saddened by the ex-Emperor's death. He regretted that he could not go into mourning, but his duties as Regent made it impossible. Numerous important matters were pending . . .[7]

Michinaga's choice not to don mourning garments for his son-in-law, the retired emperor Sanjō (976–1017; r. 1011–1016), had nothing to do with the constraints of time. It related solely to the potentially frightening consequences of having someone tainted with death attending to state business. If Michinaga had gone into mourning, he would have had to abstain from state business during the prescribed mourning period and then undergo ritual purification before changing back to court costume and resuming his normal life and duties.

On another occasion, the brothers Korechika and Takaie dearly wanted to serve as escorts for their sister, the princess Bishi, when she first went to serve at court. However, they were still in mourning for their father and "judged it best to be cautious." In other words, as the note to this passage suggests:

> the presence of people in mourning costumes might have been unlucky at this crucial juncture in the young Princess's life.[8]

In a world where jealousy could kill its object—as the jealous spirit of the Rokujō lady in *Genji monogatari* killed her rival, Genji's wife Aoi—colors had potency beyond simple association.[9] The radiance/darkness dichotomy was more than a matter of aesthetic preference, although, of course, it was that too.

Heian Japanese were certainly not unusual in associating dark, somber colors with death and mourning. Their choice of pale, almost colorless colors for some types of mourning garments and furnishings has parallels in other times and places. What is notable is that they found these colors so very unattractive, and that the colors of mourning garments themselves were thought to absorb the defilement of death and therefore endanger the well-being of a person or even of the state.

It is somewhat surprising that Heian writers reserved their highest praise for colors that they described as brilliant and dazzling. These are the same authors who took such pains to describe the subtle nuances of the finely honed emotional and aesthetic sensibilities of the men and women they wrote about, sensibilities that were defined by an appreciation of the poignant beauty inherent in the transience of life (*aware* or *mono no aware*). One might expect that the creators of a literature filled with the sense of gentle melancholy evoked by a pervasive sense of *aware* would value subdued, quiet, and complex colors, but they did not. Heian authors clearly described the colors they found the most beautiful. They did it many times, throughout their writings. It is impossible not to acknowledge that the highest praise of Heian writers was reserved for colors and color schemas that they found to be 'dazzling,' 'brilliant,' and 'magnificent.'[10]

Layering Color: A Court Lady's Formal Costume (*nyōboshozoku*)

> The sleeves, each lovelier than the last, spilling out from where each lady sat, recalled by the brilliance and the beauty of their colors spring brocade glowing through the mists of dawn.[11] (plate 3)

Heian material culture did not display the full range of technical virtuosity seen in many of the objects in the Shōsōin treasure house of

7. *Eiga monogatari*, NKZ 2:208–09, and McCullough and McCullough, *Flowering Fortunes*, 456.

8. *Eiga monogatari*, NKZ 1:364, and McCullough and McCullough, *Flowering Fortunes*, 233.

9. Murasaki Shikibu, trans. Tyler, *The Tale of Genji*, chapter 9.

10. That the undeniable pervasiveness of *aware* in Heian texts should, logically, have meant that Heian writers preferred subtle, perhaps even somber, colors was widespread enough in the twentieth century that a number of translators toned down the original vocabulary. It was something of a shock to this author to go to the classical texts after reading English translations of Heian literature.

11. Murasaki Shikibu, trans. Tyler, *The Tale of Genji*, 438. The description is of court ladies watching mummers in their garden at dawn on a snowy winter morning.

PLATE 3
Kashiwagi chapter of *Genji-monogatari emaki* (Illustrated Scroll of the Tale of Genji). Ink and colors on paper. Early twelfth century. The Tokugawa Art Museum, Nagoya, Japan.

Tōdaiji in Nara. In general, textile patterning was less complex than in the eighth century, but Heian dyers had fully mastered their craft and used the rolls of plain woven silk coming into the capital from private estates and as tax cloth to produce bolts of silk dyed in a wide variety of colors.

The *nyōboshozoku* (court lady's costume), popularly known as *junihitoe* (twelve robes), was composed of many layers of solid-colored silk kimono-shaped garments, each with sleeves slightly smaller than the last, worn one over the other in such a way that each layer showed at the neck, sleeve, and hem openings. One or more of the garments in the assemblage might have several extra cuffs attached to its sleeves to add yet more layers of color. Other garments might be lined in a contrasting color with the lining protruding beyond the face of the garment.

Heian paintings portray aristocrats with almost featureless countenances, focusing instead on their sculpted costumes and women's long, black hair. Contemporary authors likewise eschew details of a woman's person, describing instead her costume, particularly the colors and color combinations of her robes. In the secluded world of women, skill in the use of color ranked with skill in poetry and calligraphy as a measure of her aesthetic sensibility, a primary marker of her 'worth.' In her diary, Murasaki Shikibu notes that at the fiftieth-day celebrations of the birth of Prince Atsunaga, son of Emperor Ichijō and Empress Shōshi, the two ladies-in-waiting who brought out the ceremonial food for the infant prince 'scandalized' a higher-ranking lady-in-waiting by their choice of colors, while the courtiers 'stared.' The two women were not immodest, nor had they breached a dress code. They simply showed a lack of sensibility in choosing the colors and assembling the color combinations of their formal garments.[12]

Color fills the writings of Heian women—color in nature and the colors and color combinations of male and female court costume. The colors themselves were usually named for the dye plant that produced them, so that it is possible, even after a thousand years, to understand and identify a named color. *Kasane*

12. Richard Bowring, *Murasaki Shikibu: Her Diary and Poetic Memoirs: A Translation and Study* (Princeton: Princeton University Press, 1982), 152–53.

PLATE 3a
Detail of plate 3.

and *awase* color combinations, however, were given poetic names that evoked some aspect of nature without revealing the colors of the different layers. The names often indicate a flower or other plant, with an unexplained reference to the way the plant looked at a certain time of year, at a certain stage of growth, or in a particular seasonal environment. No extant mid-Heian text documents the composition of any of these combinations—the color of each layer—and we know from comparing descriptions in later documents that the composition of a *kasane* or *awase* combination could change dramatically from period to period.[13]

Heian writers and their contemporaries undoubtedly shared a common vocabulary that included *kasane* and *awase* combinations. Murasaki Shikibu needed only to refer to *hagi* (bush clover) or *shion* (aster) for her reader to imagine the layered color combination she was evoking. Much of this is lost to us. The name of a mid-Heian-period *kasane* combination is like a reference to a lost poem rather than the poem itself.

The art of arranging the colors of one's garments was called *iro* (color) *awase* (to combine, compare, or match). *Iro awase* was one of a number of *awase* sets. Included among these sets was the comparison of natural objects such as flowers, roots, seashells, birds, and insects, besides products of human skill and ingenuity such as incense, fans, and paintings. Often these comparisons were set up as competitions between two teams. There is no record that *iro awase* was ever more than an informal competition, but the color arrangements of a court lady's costume were scrutinized by her contemporaries with the same discerning eye as if she were a contestant in a game with high stakes. In fact she was. A newcomer at court needed support from her father and male relatives and then had to rely on her accomplishments to win favor and advancement. The elegance and distinction of her layered court robes coupled with her skill in poetry, calligraphy, and music were major factors in her advancement at court and within the small world of Heian elite society.

Empress Shōshi (Jōtōmon'in) and Her Literary Salon

In 999, the powerful statesman Fujiwara no Michinaga sent his eleven-year-old daughter Shōshi (988–1074) to court.[14] She became an official consort the following year. In order to assure his young daughter's place in Emperor Ichijō's favor and her influence at court amidst the competitive claims of the higher-ranking and more sophisticated Empress Teishi and the allure of a number of well-born and accomplished unofficial consorts, Michinaga surrounded his daughter with a small group of talented women. The rival salons of Teishi and Shōshi were at the center of the cultural efflorescence of the early eleventh century and nurtured several of its finest writers. Sei Shōnagon, author of *Makura no sōshi*, was a lady-in-waiting to Empress Teishi. Michinaga provided Shōshi with the poetesses Izumi Shikibu and Akazome Emon (fl. 976–1041). In 1006, he invited Murasaki Shikibu to join Shōshi's entourage.

These women were minute observers of the elegant world they inhabited and sensitive to nuances of seasonal changes as they appeared in the choreographed gardens of Heian palaces and in the surrounding hills that they observed on occasional pilgrimages to Buddhist temples. The wistful sorrow that could be elicited by

13. To reconstruct a *kasane* or *awase* combination today, scholars must search a variety of historical documents that span a period of seven hundred years, starting more than a century after the height of court culture in the early eleventh century, the culture recorded by Murasaki Shikibu and her contemporaries. *Kasane* and *awase* combinations were a fashion statement in the early eleventh century, a time when innovation with color and color combinations was highly valued. It seems doubtful that a combination described in a late-twelfth-, let alone a fifteenth- or even eighteenth-century document accurately reflects early-eleventh-century practice. Descriptions of some *kasane* combinations vary widely between documents. For a discussion of the problems in documenting *kasane* combinations, see Mary McClintock Dusenbury, "Layered Colors (*kasane no irome*)," in "Radiance and Darkness: Color at the Heian Court" (PhD diss., University of Kansas, 1999), 31–39. See also Nagasaki Seiki, *Kasane no irome* [Kasane colors] (Kyoto: Kyoto Shoin, 1988).

14. Shōshi is better known as Jōtōmon'in, her name after she took Buddhist vows in 1026.

this evidence of the passage of time and the inevitable change and decay brought in its wake was accompanied by a heightened appreciation of the beauty of the moment (plates 2, 2a, and 2b).

Murasaki Shikibu

Of all her colleagues, Murasaki Shikibu perhaps used color the most effectively in her writings. She sculpted her characters, both real and fictional, by describing the colors of their robes. She played the beauty of the colors of garments against the beauty of natural scenery, in a way also seen in the early-twelfth-century scrolls (*Genji monogatari emaki no kotoba*) that illustrated her novel (plates 2, 2a, and 2b). She used the radiance/darkness paradigm as a metaphorical language running deep within the text of *Genji*, informing the reader, for example, that the 'shining prince' (*hikaru Genji*) was the true heir to the throne, despite the fact that his imperial father had demoted him to commoner status when he came of age.[15]

In her diary also she used color and the closely related vocabulary of light and radiance to turn a simple description of the imperial couple, Emperor Ichijō and Empress Sōshi, into a complex statement of heritage, legitimacy, and style.

> The Emperor and Empress sat in their respective curtained daises. They were as radiant as the morning sun, dazzling in their brilliance. The Emperor wore ordinary court dress with wide trousers drawn in at the ankles. Her Majesty wore her usual scarlet robe [under] layered robes of red plum, sprout green, willow and globeflower. Her gown was a grape-colored figured silk over which she wore a white informal outer robe with willow lining. The pattern and colors were most unusual and fresh.[16]

This passage is from Murasaki Shikibu's diary entry for the fifteenth day of the first month in the year corresponding to 1010. She used these words to sum up her description of the imperial couple as they sat in state presiding over the fiftieth-day celebrations that followed the birth of their second son Atsunaga, the future emperor Go-Suzaku (1009–1045; r. 1036–1045). As was customary in the early eleventh century, her descriptions have little to do with the persons of the emperor and empress but focus on their clothing, particularly the colors and color combinations of Empress Shōshi's ceremonial costume. She states that the emperor and empress were 'radiant' and 'dazzling,' and immediately supports her statement with a description of the colors of their robes.

In her description of the imperial couple, Murasaki Shikibu combines the particular with the universal. Within the constraints of formal costume, we are told, Empress Shōshi achieves effects that are fresh and interesting. In other words, the empress sets a high mark for her ability to make a fashion statement. At the same time, the words Murasaki Shikibu uses to describe the colors of the emperor's and empress's robes connects them both to ancient Chinese court culture (through the court colors themselves) and to a mythic native past. The author's direct reference to *asahi no hikari ahite*, radiant as the morning sun, served to link the imperial couple with the sun goddess Amaterasu Ōmikami, divine progenitor of the imperial family. Thus, the author at once, and very skillfully, presents us with an image of a mythic imperial couple, the emperor of divine descent, presiding over a court with ties to ancient Chinese culture, and a very human empress known for her skill with color.

15. Genji, the protagonist of Murasaki Shikibu's novel, was the son of a relatively low-ranking woman in the emperor's entourage of whom the emperor had been unduly fond. The emperor had demoted Genji to commoner status, believing that he could have a more productive life as a courtier, able to engage in politics, than as a somewhat outcast member of the imperial family.

16. Murasaki Shikibu, *Murasaki Shikibu Nikki* [Diary of Murasaki Shikibu], in *Makura no sōshi; Murasaki Shikibu nikki*, eds. Ikeda Kikan and Kishigami Shinji, NKBT 19 (Tokyo: Iwanami shoten, 1958), 507. Translation adapted from Bowring, *Murasaki Shikibu: Her Diary and Poetic Memoirs*, 151.

> "Mourning robes have their own beauty," Murasaki thought, watching Genji one evening.[17]

It is beyond the scope of this study to explore the beginnings of a darker medieval aesthetic generally understood to have appeared first in the poetry and poetics of Fujiwara Shunzei (1114–1204) and the poet-priest Saigyō (1118–1189) more than a century later than the literature discussed here. However, it would be negligent to ignore these passages: they are important not only as harbingers of an aesthetic to come, but also because they add complexity and depth to the discourse as they question or even subvert the primary mid-Heian aesthetic.

At his wedding feast, Koichijōin, as we have seen, is deeply embarrassed (*itotsutsumashu*) by his drab mourning robes. The author of the *Eiga monogatari* notes, however, that

> the somber shades stood out with dramatic clarity in the artificial light. . . . Someone really ought to paint him as he appeared on that night, with the impressive dignity and elegance of his bearing.[18]

Here the elegance of dark colors is perceived in contrast to the splendor and rich brilliance of the surroundings.

One can find suggestions of a different way of looking at somber colors in other Heian texts, such as the passage just cited, but it is in the early-eleventh-century *Genji monogatari* that this aesthetic is most fully explored. The creator of the 'shining prince' was, herself, deeply interested in exploring the dark side of life, and she used the mature Genji to do so.

One of the first passages to show a shift in aesthetic perception—or an appreciation of an alternate perception—occurs when Genji first visits his young, widowed stepmother Fujitsubo after she has taken vows and transformed her quarters appropriately. Genji has not visited for a long time. He had been stunned by Fujitsubo's announcement during memorial services for her imperial husband that she would take religious vows. Spectators were shaken and incredulous. For Genji, "it was as if darkness had settled over the land."[19] Genji had had to struggle to hide the depth of his feelings as it was imperative no one learn of his secret liaison with Fujitsubo.

Genji's first visit to Fujitsubo in her converted surroundings takes place, appropriately, during the calling days of the New Year's celebrations. Genji found her palace and grounds "silent and almost deserted," the few attendants who remained with her "downcast and subdued." Her dwelling had become "in every way a nunnery" with its "blinds and curtains, all a drab gray-green, glimpses of gray and yellow sleeves. . . ."[20] As Genji looked about him at the transformation that had taken place since his last visit, he noticed not only the dullness and desolation of the "melancholy precincts" (*aware naru keshiki*, landscape that evokes sadness) but perceived that they were *nakanaka namamekashū okuyukashū omoiyarare tamao* (had a simple refined elegance). Seidensticker translates this passage as "quietly, mysteriously beautiful."[21]

The beauty Genji perceives here in the dreary, complex colors of Fujitsubo's bleak surroundings is not a perception of a beauty "despite" the surroundings. Nor is it a beauty of contrast. It is, rather, a perception of a radically different sense of beauty, one that will be described in a totally new vocabulary more than a century later.

The Production of Color

In a scene from the *Tale of Genji*, the prince and his most beloved consort, Murasaki, assemble sets of robes for Genji's various other women.

17. Murasaki Shikibu, *The Tale of Genji*, trans. Edward Seidensticker (New York: Knopf, 1976), 353.

18. McCullough and McCullough, *Flowering Fortunes*, 468, and *Eiga monogatari*, NKZ 2:225.

19. Murasaki Shikibu, trans. Siedensticker, *The Tale of Genji*, 205 ff.

20. Murasaki Shikibu, trans. Siedensticker, *The Tale of Genji*, 207.

21. Murasaki Shikibu, *Genji monogatari*, ed. Yoshizawa Yoshinori, NKBZ 4–6 (Tokyo: Chikuma Shobō, 1961): 2:127–128. Murasaki Shikibu, trans. Siedensticker, *The Tale of Genji*, 207.

As he looks at the robes that Murasaki and her ladies have dyed and assembled we are told that

> [Murasaki's] dyeing yielded such superb colors and shadings that [Genji] viewed her work with wonder.[22]

Documentation concerning private dye workshops in the Heian period is very scarce, consisting of a few scattered comments in contemporary writings, such as the one above. Better documentation exists for the official court dye workshop. In the mid-Heian period, the palace dye workshop was organized within the Bureau of the Wardrobe (*Nuidonoryō*, literally Bureau of Needlework).[23] The *Nuidonoryō* offices had their own building or set of buildings to the north of the palace. The facilities must have been impressive as they were used for several important court functions.[24] The Bureau was responsible for the ceremonial costumes used at court and for national ceremonies, with the exception of robes used by upper-ranking members of the nobility who, it seems, provided their own. The Bureau dyed, constructed, and prepared informal and ceremonial robes for the emperor and empress, costumes for participants in national ceremonies, and robes to be used as gifts, such as the robes given to priests who officiated at New Year ceremonies at the palace. The Bureau was also responsible for providing at least some of the clothing worn by palace women.[25] A number of women, such as Murasaki Shikibu, maintained their own households and staff apart from the palace and provided some of their own supplies. Many other women received support from outside sponsors. Empress Shōshi, as noted above, received lavish support from her father, Fujiwara no Michinaga.

The Director of the Bureau was often, perhaps usually, a member of the emperor's privy council. The position demanded that he be practiced in the regulations governing formal and ceremonial costume, including the appropriate use of rank colors, restricted colors, and the ceremonial and informal motifs reserved for imperial attire.[26]

By the beginning of the eleventh century, although the organization of the Bureau of the Wardrobe remained intact, much of the actual production of imperial robes had been taken over by a new, extra-official Office of the Imperial Wardrobe, which was headed by a Keeper of the Robes and staffed by women chamberlains. During the period when Sei Shōnagon was writing her *Makura no sōshi* early in the eleventh century, the Keeper of the Robes was Empress Teishi's sister. Sometimes the position was filled by a secondary imperial consort.[27]

A Manual for Commissaries at the Imperial Dyeworks

A tenth-century manual written for commissaries and dyers in the Bureau of the Wardrobe provides a wealth of concrete information about the production of dyed colors during the Heian period. The manual is included in a voluminous compendium of information about the actual workings of government and the rites and ceremonies regarded as an integral and essential part of correct governance.

In 905, Emperor Daigo (r. 897–930) ordered a new compilation of government and ceremonial regulations. It was an important project

22. Murasaki Shikibu, trans. Tyler, *The Tale of Genji*, 426.

23. This section is based on the work of Francine Hérail. See her *Fonction et fonctionnaires japonais au debut de XIe siècle* [Functions and functionaries in Japan at the beginning of the eleventh century] (Paris: Publication Orientalistes de France, 1977), 200–203.

24. Women who were to perform a ceremonial function in the *Niiname sai* (Feast of the first fruits) lived there for the month preceding the ceremonies to maintain ritual purity. The promotion ceremony of the Palace Mistress (*Naishi no kami*) was also held in the *Nuidonoryō*. Fujiwara no Michinaga described this ceremony in his journal, *Midō kanpakuki* [Journal of the chief advisor to the emperor], when his second daughter became Palace Mistress on the twenty-seventh day of the twelfth moon of Kankō 1 (1004). See Francine Hérail, ed. and trans., *Notes journalières de Fujiwara no Michinaga* [Journal of Fujiwara no Michinaga] (Geneva: Droz, 1987), 472–75 and *Fonctions et fonctionnaires*, 202.

25. Morris, *The Pillow Book of Sei Shōnagon*, footnote 116, 292.

26. For a study of the career paths of several of the directors of the Bureau of the Wardrobe, including Murasaki Shikibu's son-in-law, Fujiwara no Yorinobu, see Hérail, *Fonction et fonctionnaires*, 200–201.

27. Morris, *The Pillow Book of Sei Shōnagon*, footnote 197, 308. Teishi was also known as Sadako.

and he placed his highest-ranking minister, Fujiwara no Tokihira (871–909), the *Saidaijin*, Minister of the Left, in charge of the project. The resulting fifty fascicles of the *Engishiki* (Regulations of the Engi era) codified and preserved a vast amount of data about the ceremonial life of the court, including information about formal and ceremonial costume and the colors that distinguished these garments. Fascicle XIV of the *Engishiki*, the *Kusagusa no some yōdo* (Miscellaneous dyeing supplies), was written as a guide for dyers and commissaries in the Bureau of the Wardrobe.[28]

The *Kusagusa no some yōdo* reveals the high level of sophistication of court dyers in the early tenth century. It presents a detailed list of the colors produced in the court dye workshop for use by the imperial family and the noblewomen who served at court, as well as for costumes for court functionaries and visiting dignitaries. These included uniforms for timekeepers and other low-ranking officials, costumes for officiants at state ceremonies, and appropriate gifts of clothing for everyone from high-ranking priests and visiting dignitaries to students. These gifts, usually given on congratulatory occasions and as payment for services rendered, often consisted of a set of court robes dyed the appropriate color(s) for the person's rank and status. Because the color names in fascicle XIV are supported by a list of the materials necessary to produce them, it is possible to identify most of these colors, even a millennium later.

The *Kusagusa no some yōdo* consists solely of lists of supplies needed to make varying shades and tones of color. Purple (from the roots of the gromwell plant) and a range of pale pink to scarlet (from safflower florets) were probably the two most highly valued colors during the Heian period. Reds were also obtained from madder roots and sappanwood bark. Yellows came from gardenia hulls, *miscanthus* grass, the inner bark of the Amur cork tree, and wax-tree bark. Blue and green came from indigo leaves and by overdyeing indigo with a yellow. There are also two entries for what were probably intended as mourning colors, one made from madder red and acorns and the other from gromwell purple and acorns. Otherwise, there are no entries for the brown-gray-black range of colors. The supplies needed were limited. Most colors required only one or at most two of ten basic dye plants, in addition to vinegar, ash, and the firewood necessary to heat the dye vat. Occasionally, a particular type of vinegar was specified or another ingredient, such as bran, was added to the list.

Not including the first two groups of entries (the imperial *kōro*, a rich, complex red-brown made from sappanwood crimson and wax-tree yellow, and the heir apparent's *ōni*, a complex orange made from safflower scarlet and gardenia yellow),[29] fascicle XIV contains supply lists for thirty-seven shades and tones of ten colors rendered on a variety of types of silk, bast-fiber cloth, and silk thread, for a total of more than one hundred entries. All the colors were produced from one or two of ten dye plants, and all without the use of metallic mordants.[30] This does not include the notes to the entries in smaller print informing the reader of other materials that could be dyed with the same materials used in the same quantities. The repetition of list after list with only very small variations—twenty-two entries for purple produced solely by varying the proportions of the roots of a gromwell plant, vinegar, ash, and firewood, for example—underscores the knowledge and scrupulous

28. For a discussion and annotated translation of the *Kusagusa no some yōdo*, see Mary McClintock Dusenbury, "Court Colors: The *Kusagusa no some yōdo* in Fascicle XIV of the *Engishiki*," in "Radiance and Darkness: Color at the Heian Court" (PhD diss., University of Kansas, 1999), 145–210.

29. See Suzuki Keizō, *Yūshiki kojitsu daijiten* [Encyclopedia of ancient manners and customs of the intelligentsia] (Tokyo: Yoshikawa Kōbunkan, 1995), 286, 288; Nagasaki Seiki, *Iro no Nihon shi* [History of color in Japan] (Kyoto: Tankōsha, 1974), 93; and Maeda Ujō, *Nihon kodai no shikisai to some* [Color and dye in ancient Japan] (Tokyo: Kawade Shobōshinsha, 1982), 95, 173. Pronunciations follow Maeda Ujō.

30. A mordant is a substance that forms a bridge between a dye molecule and a fiber molecule, forging a chemical bond between dye and fiber. The word comes from the Latin *mordere*, which means "to bite." An alkali liquid made by dripping water through ash (ash lye) was the most common mordant in Heian-period Japan. Metallic mordants such as iron, copper, and tin serve not only to forge a bond between dye and fiber but also to increase the range of colors that can be obtained from a single dye.

care of tenth-century court dyers who could wheedle so many shades and tones of color from a single species of plant.

Conclusion

Color enlivened the court and filled the works of Heian women writers. Skill with color was as essential to a cultivated woman's advancement as skill with poetry, calligraphy, and music. Heian writers could use color metaphorically, confident that their readers understood not only poetic allusions to particular color combinations, but the properties of dye plants and the processes of dyeing. The preferred colors were described as radiant and brilliant, even dazzling. The dye plants and dye processes that produced these colors were associated originally with the culture of China and served, among other important aspects of Chinese culture (including written language), to link the Japanese court and ruling elite with those of China. In Murasaki Shikibu's skilled hand, color shaped the characters of the individuals in her stories and provided a metaphorical understructure to her writing, widening and deepening the meanings of her text. Even a cursory glance at the tenth-century manual for commissaries at the imperial dyeworks, *Kusagusa no some yōdo*, reveals the sophistication of Heian dyers. Today, in Japan, master dyers still look to the Heian period for inspiration. Fascicle XIV of the *Engishiki* was written to help dyers and commissaries in the Bureau of the Wardrobe supply the needs and desires of the court. It would not have been written unless the court had demanded the levels of skill and attention to detail that is evidenced by the painstaking lists of dye ingredients. Behind the section on "Miscellaneous dye supplies" in fascicle XIV was a long history of a small group of elite families, centered around an imperial couple, who paid attention to color, valued and employed it for its political, aesthetic and symbolic content, and used it as a visual language to distinguish players in the formal and informal rituals of the court.

KNK–*Kan'yaku nihon no koten* [Concise series of classical Japanese literature]. Tokyo: Shōgakkan, 1984.

NKBT–*Nihon koten bungaku taikei* [Compendium of classical Japanese literature]. Tokyo: Iwanami Shoten, 1958.

NKBZ–*Nihon koten bungaku zenshū* [Collected works of classical Japanese literature]. Tokyo: Chikuma Shobō, 1961.

NKZ–*Nihon koten zensho* [Compilation of classical Japanese literature]. Tokyo: Asahi Shimbunsha, 1956.

SZKT–*Shintei zōho kokushi taikei* [Newly revised compendium of Japanese history]. Tokyo: Yoshikawa Kōbunkan, 1965.

SECTION V

Color in Religious Art in Medieval East Asia

The final section looks at color in Buddhist and Daoist ritual, art, and literature in Korea, Japan, and China, focusing primarily on the ninth to the fourteenth century.

Sim and Lee open the section to present their research on the sacred bundles that have been discovered within Buddhist statues in Korea when sculptures were opened for conservation. The enshrinement bundles, intended to animate the statues, display the integration of Buddhist ideas with those derived from Confucian concepts of correlative cosmology (*wuxing*, or the five elements).

Pedersen focuses on groupings of five deities in the Esoteric Buddhist tradition in Japan, each deity with its own color. She uses a discussion of the groupings, and the way in which some were rearranged over time, to examine the multivalent character of Japanese Buddhist art. She traces the colors and the way they were combined to Chinese five-phases correlative cosmology and to Indian elemental schemes. She proposes that sculptors, painters, and their patrons conflated these different systems in order to draw on the powers of each and increase the efficacy of the sacred grouping.

In the third essay Kaminishi discusses an important aspect of Japanese thinking about color that is not explored elsewhere in this volume. The Japanese word for color, *iro*, is not neutral but refers quite specifically to eroticism and sexuality. Within Buddhism, it refers to the world of desire, 'form,' and impermanence, and is contrasted with Buddhist concepts of non-duality and a state beyond desire. The author situates this discussion within an examination of a thirteenth-century handscroll illustrating the founding story of the Buddhist Kegon sect. The *Kegonshū soshi eden* (Illustrated history of the founders of the Kegon sect) was commissioned by Myōe Kōben, abbot of the Kyoto temple Kōzanji, and produced in 1224–1225.

In the final essay, Huang examines the uses of color in Daoist visualization and ritual practices. Meditative manuals dating from the fifth to the thirteenth century and included in the imperially commissioned *Daozang* (Daoist canon), published in 1445, provide adepts with instruction on meditative and visualization practices. Although the *Daozang* is usually printed in black on white paper, giving the impression of a colorless world, notations about color in the text, other extant documents, and material culture suggest that color played an essential role in Daoist visualization practices. Twelfth- and thirteenth-century Daoist liturgical manuals provide information about the use of color in banners, paper, and written documents used in public Daoist rituals. Color was a significant factor in private and public Daoist practices.

FIGURE 1

Colors of the Five Directions Associated with Deposits Enshrined in Buddhist Statues in Korea

SIM YEON-OK · LEE SEONYONG

Introduction

Buddhist statues must be dedicated before they are considered to be effective. Part of the dedication or enshrinement ceremony is the ritual of sealing a deposit of sacred objects within the sculpture. The origin of enshrinement rites and the religious foundations of objects sealed inside a statue (*bokjang*, enshrinement deposits) are unclear. The earliest indication on the Korean peninsula of the practice of depositing objects within a sculpture is a dated inscription on a jar found inside the pedestal of a stone statue of the Vairocana Buddha. The jar, made of agalmatolite, a soft gray stone often used for carving Buddhist images, was dated the second year of Yeongtae (766). The earliest instance of an enshrinement deposit sealed inside the body of a Buddhist sculpture dates from the Goryeo dynasty (918–1392). The *Josanggyeong* (Creating Statue) sutra, a non-canonical Korean sutra, describes rituals and procedures relating to the creation of Buddhist sculptures and instructions for creating and enshrining sacred deposits. The sutra was woodblock-printed several times during the Joseon dynasty (1392–1910). The earliest extant version is at Yongcheon temple (Yongcheonsa) in Hampyeong-gun, Jeollanam-do, and dates to 1575. Later versions are located at the following temples: Neunggasa (1697); Hwajangsa in Seoul (1720); Geumryongsa in Sangju-gun, Gyeongsangbuk-do (1746); and Yujeomsa on Mount Geumgang in Gangwon-do (1824). Although the earliest extant version of the sutra is considerably later than Goryeo-dynasty enshrinements, it appears to reflect earlier practices and can be presumed to shed light on the theoretical foundations of earlier enshrinement rites.

Enshrinement rites are believed to have been practiced in China in the eighth century, but the earliest existing enshrinement deposits in China are found in sculptures of the Song dynasty (960–1279). The Seiryōji temple in Kyoto, Japan, owns a standing sandalwood statue of the Sakyamuni Buddha that was brought from China. The statue contains an enshrinement deposit including padded textile shapes symbolizing various human organs through the colors of each object. A 'prayer record' (*balwonmun*) found inside the statue noted that it was dedicated on the seventh of August, in the second year of Onghui, or 985. The deposit contained textiles representing the five vital organs and the six viscera: white (stomach), red (heart), dark red (liver), dark blue (gall), alum white (lung), white (back skin), and yellow (spleen).

The original purpose of the practice of placing such enshrinement deposits inside Buddhist statues was to animate the statue so that it could be deemed a living body. With the lapse of time, the forms of statues became more diverse, as did the types of objects sealed inside them. These came to include prayer documents, a container or *huryeongtong*, Buddhist scriptures, transcriptions, *dharani* (sacred Sanskrit phrases), clothing, and many kinds of textiles.

The container known as *huryeongtong* in Korea is usually the main object found in an enshrinement deposit. The *huryeongtong* was believed to function like the heart in a human body. The contents of the *huryeongtong* and its placement within the totality of the deposited objects were strictly determined by *yin-yang* and the Five Elements paradigm. *Yinyang* and the Five Elements concept had originally developed from an admixture of Confucian and Daoist ideas and later became deeply rooted in Buddhist thought and practice.

Among other phenomena, each of the five colors was linked to a direction. In Buddhist enshrinement deposits, the five so-called 'pure' colors associated with the five elements were used to represent the five directions: east (blue-green), south (red), west (white), north (black), and center (yellow). These deposits give an indication of people's understanding of the five colors during the Goryeo and Joseon dynasties and are also invaluable for studying the colors themselves. Since the objects have been preserved without exposure to light for centuries, the original colors have changed very little.

This essay will begin with the introduction of enshrinement deposits in monumental Buddhist statues in Korea from the Goryeo and Joseon dynasties. The focus will be on people's understanding of the five directional colors, differences in the actual colors used at various times and places, and differences in the quality and use of the five directional colors between enshrinement deposits in Buddhist statues commissioned by the royal family and those within statues intended for the general public.

The Buddhist statues with enshrinement deposits that we will consider in this study are listed in table 1.

Huryeongtong Containers and Symbols Indicating the Five Directions

The *huryeongtong* is a container for *obobyeong*. The *obobyeong* is a pouch containing a variety of sacred objects. The *obobyeong* itself and the objects it contains symbolize the five directions of east, west, south, north, and center. In the Goryeo dynasty a *huryeongtong* container was placed at the center of the statue's chest cavity with various other objects. This type of enshrinement deposit continued until the Joseon dynasty.

The Korean *Gwansang uigwe* (Rite of visualization sutra, 1677) and the *Josanggyeong* sutra state that a *huryeongtong* container should be shaped like a bowl and made of silver. In practice, however, wood or other materials were sometimes substituted for silver. In the Joseon dynasty, *huryeongtong* generally were made of metal, but other materials were used also, including wood, paper, and bamboo. A *huryeongtong* is generally no longer than 10 cm, though that of Jaunsa is 17.2 cm, much larger than the others.

In the Goryeo dynasty *huryeongtong* were bowl-shaped. Examples are *huryeongtong* containers deposited within an Amida Buddha, dated 1302, a bronze Amida Buddha in Munsusa, dated 1346, and a bronze Medicine Buddha in Janggoksa, also dated 1346. Later *huryeongtong* containers were generally narrower and cylindrical in shape with a stem-shaped open spout (*huhyeol*) at one end. Examples are the *huryeongtong* deposited in a ten-thousand-armed Avalokitesvara, dated 1322, and a wooden Amida Buddha in Jaunsa made at the end of the Goryeo dynasty.

Various methods were used to indicate the directions on *huryeongtong* besides colors. In some instances, symbols were used on the surface, body, and/or lid of the container (see table 3). In other cases, metal 'mirrors' in the established directional shapes were attached to the outside of the *huryeongtong* container (see table 4).

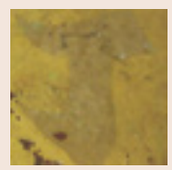
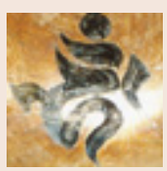
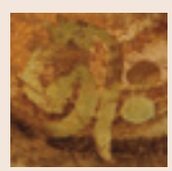
TABLE 1
Details of the enshrinements studied

Date	Temple	Type of Buddhist statue
1346	Munsusa	bronze Buddha
end of 14th to beginning of 15th century	Haeinsa	bronze Vairocana Buddha
end of 14th to beginning of 15th century	Jaunsa	wooden Amida Buddha
16th–17th century	unknown (private collection)	unknown
1639	Sudeoksa	wooden seated Triad Buddha
17th century	Hwagyesa	Ksitigarbha
18th century	Samgilsa	wooden seated Bodhisattva

TABLE 2
Shapes of *huryeongtong* containers in chronological order

14th Century	14th Century	15th Century	15th Century	16th Century	17th Century
					
bronze Medicine Buddha in Janggoksa	bronze Amida Buddha in Munsusa	wooden Amida Buddha in Jaunsa	bronze Vairocana Buddha in Haeinsa	private collection	wooden seated Triad Buddha in Sudeoska

TABLE 3
Signs of the Five Directions

	Huryeongtong	East	South	West	North	Center
Four Directions mantra (bronze Vairocana Buddha, Haeinsa)						
						

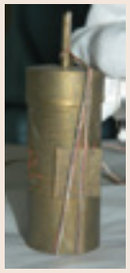
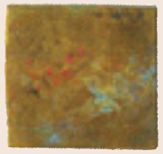
	Huryeongtong	East	South	West	North	Center
Five Directions mirror						
(bronze Amida Buddha, Munsusa)						

TABLE 4
Mirrors in shapes of the Five Directions

TABLE 5
Contents encased in *obobyeong* pouches

TABLE 6
Procedure of putting an *obobyeong* pouch into a *huryeongtong* container

Contents of *Huryeongtong* Containers and Colors of the Five Directions

1. Contents of *huryeongtong* containers

The *obobyeong* pouch is the most important object in the *huryeongtong* container and occupies a central position among other objects. The *Josanggyeong* sutra states that an *obobyeong* should be made from agate, coral, glass, or crystal, but in fact all the extant *obobyeong* are made either of five color textiles or, occasionally, of Korean papers that symbolize the five directions. According to the *Josanggyeong* sutra there are sixty-five types of objects that may be deposited in the *obobyeong* pouch. All represent the five directions in some way (see table 5).

As can be seen in table 5, each of the thirteen categories of objects that can be contained in an *obobyeong* comprise five objects, each of which symbolize one of the five directions. Among them, the *vajra*, ritual flags, canopies, and aromatic leaves from the *bo* tree used textiles of the five colors to indicate the directions.

Most of the objects contained in the *obobyeong* pouch are individually wrapped in cloth or Korean paper of one of the five colors. In the Joseon dynasty, the corners were folded to form a triangle and the bundle rolled up into a cylinder and tied with five-colored threads. The yellow bundle was placed in the center of the *obobyeong* pouch and surrounded by blue, white, red, and black bundles arranged according to the directions. The whole *obobyeong* pouch was then tied with a five-colored thread and the *obobyeong* was placed in the *huryeongtong* container, facing the correct direction. Finally the lid was closed. Table 6 shows the procedure for putting an *obobyeong* pouch into a *huryeongtong* container.

2. Comparison of the shape and contents of extant *obobeyong* pouches and use of the colors of the five directions

The shape and contents of *obobeyong* changed over time. Five small silk purses colored yellow, red, indigo, white, and green were found within the 1346 bronze Medicine Buddha of Janggoksa. Each purse contained five types of grain, five types of medicine, five gems, and five aromas.

The 1346 Buddha from Munsusa contained a blue square-shaped figured silk symbolizing east, an orange triangular figured silk for south, a yellow square-shaped figured silk for west, a deep blue heart-shaped gauze-weave silk textile for north, and a light yellow round figured silk for the central cardinal point.

Haeinsa's bronze Vairocana Buddha was commissioned in 1409 by the royal family and its enshrinement deposit is distinguished from others by its large size and excellent preservation. The *obobyeong* pouch, like that of the Buddha of Munsusa, contains a blue square textile for east, a triangular red textile for south, a square white textile for west, a semicircular black textile for north, and a round yellow textile to represent the center. All five *obobyeong* from the deposit in

	East	South	West	North	Center
five grains	barley	millet	rice	mung bean	flax
five jewels	gold	pearl	silver	glass	amber
five medicines	ginseng	licorice root	cinnamon	*ari*	aconite
five aromas	green tree aroma	clove	bean-leaf aroma	dipped aroma	milk aroma
five bezoars	big bezoar	bear bezoar	little bezoar	purple bezoar	ox bezoar
five mustards	dropwort mustard	purple mustard	white mustard	vine-leek mustard	yellow mustard
five colored flags	green colored flag	red colored flag	white colored flag	black colored flag	yellow colored flag
five yarns	green yarn	red yarn	white yarn	black yarn	yellow yarn
five flowers	green seasonal flower	red seasonal flower	white seasonal flower	black seasonal flower	yellow seasonal flower
five aromatic leaves	green aromatic leaf	*catalpa ovata* leaf	silk-tree leaf	paulownia leaf	oak-tree leaf
five aromatic plants	*kusacho*	*maga*	*silri*	*pilchu*	*sildang*
five canopies	green canopy	red canopy	white canopy	black canopy	yellow canopy
five *vajra*	green silk *vajra*	red silk *vajra*	white silk *vajra*	black silk *vajra*	yellow silk *vajra*

bundles of each of the five colors wrapped with five-colored thread from within an *obobyeong*

obobyeong pouches placed inside the *huryeongtong*

lid (*palyeop*) placed on the container

mirrors of the five directions secured on the outside of the container with five-colored thread

huryeongtong container in its yellow wrapping cloth (*hwangchobokja*)

the bronze Vairocana Buddha at Haeinsa are made of satin damask (fig. 1). The directional colors were vividly dyed and the colors remain remarkably fresh.

Within the upper part of the *obobyeong* pouch at Haeinsa were two kinds of patchwork wrapping cloths. One, constructed of pieces of complex gauze dyed in the five colors (fig. 2), was used for wrapping a glass bottle containing *sarira* (crystal-like bead-shaped objects purportedly found among the cremated ashes of Buddhist holy men). The second (fig. 3) was made of pieces of simple gauze dyed in the five colors and was found wrapping the green textile. The patchwork pieces were dyed the five 'pure' colors of the Five Elements paradigm—red, blue, yellow, white, black—and the 'intermediate' colors, pink and green.

As table 7 illustrates, until the sixteenth century both shape and color were used to symbolize the five directions. From the sixteenth century onward, all the textiles were square and the directions were indicated only by the five colors.

Obobyeong pouches found within six statues in the royal Haein temple, dating from the Goryeo to the early Joseon dynasties, contained bundles of monochrome cloth dyed red, blue, brown, white and black, which were layered and wrapped tightly with thread. Among other textiles the materials included cotton, tabby silk, ramie, satin damask, and patterned simple gauze. The fourteenth- to fifteenth-century *obobyeong* in Jaunsa contained only large flag shapes. After the sixteenth century, *obobyeong* pouches generally contained small cloth representations of flags, *vajra*, and canopies, each dyed one of the five colors. The actual colors used varied as shown in table 8.

Table 8 shows that both the five pure colors and the five intermediate colors were used in enshrinement deposits in Korea during the Goryeo and Joseon dynasties. In *yinyang* and the Five Elements paradigms, the five pure colors represented *yang* and the five cardinal directions: blue for east, red for south, white for west, black for north, and yellow for the center. The five intermediate colors represented

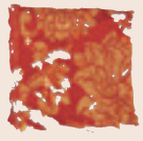
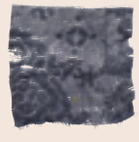
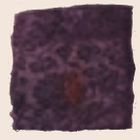
FIGURE 1
The *obobyeong* pouch in the deposit in the bronze Vairocana Buddha of Haeinsa

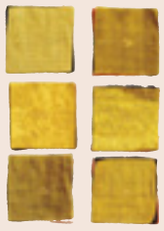
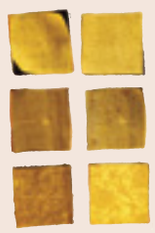
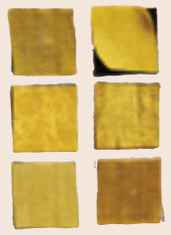
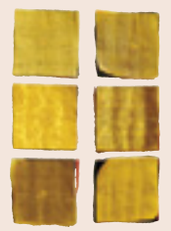
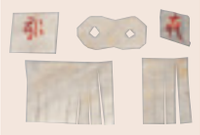
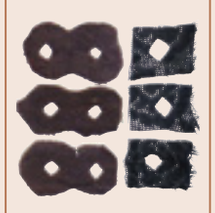
yin, green as a combination of the blue of the east and yellow of the center, light blue from the blue of the east and white of the west, pink from the red of the south and white of the west, sulfur yellow from the black of the north and yellow of the center, and purple from the black of the north and red of the south.

3. Assembling and packing the *huryeongtong* container

After the *obobyeong* pouch was placed in its container, the *huryeongtong* itself was wrapped in cloth. During the Goryeo dynasty four or five kinds of textiles were used for this wrapping cloth or *hwangchobokja*. The bowl-shaped

TABLE 7
Shape and color of *obobyeong* pouches in the late Goryeo and Joseon dynasties

	East	South	West	North	Center
Munsusa 1346					
	tabby silk	tabby silk	tabby silk	four-end complex gauze silk	tabby silk
Haeinsa 14th–15th century					
	satin damask	satin damask	satin damask	satin damask	satin damask
private collection, 16th–17th century					
	tabby damask	satin damask	paper	tabby silk	patterned simple gauze
private collection, 16th–17th century					
	twill damask	paper	paper	paper	satin with supplementary weft
Sudeoksa 1639					
	tabby silk	satin damask	tabby silk	tabby silk	tabby silk
Hwagyesa 17th century					
	tabby silk	satin damask	tabby silk	patterned simple gauze	patterned simple gauze
Samgilsa 18th century					
	tabby silk	satin damask	tabby silk	satin damask	satin damask

	East	South	West	North	Center
Haeinsa 14th–15th century					
Jaunsa 14th–15th century			not found		
private collection, 16th–17th century					
private collection, 16th–17th century					
Sudeoksa 1639					
Hwagyesa 17th century					
Samgilsa 18th century					

COLORS OF THE FIVE DIRECTIONS ASSOCIATED WITH DEPOSITS ENSHRINED IN BUDDHIST STATUES IN KOREA

TABLE 8
Colors of the contents of *obobyeong* pouches

FIGURE 2
Complex gauze patchwork

FIGURE 3
Simple gauze patchwork

huryeongtong container deposited within the bronze Medicine Buddha of Janggoksa of 1346 was wrapped in layers of silk. The outermost layer was yellow with interior layers of light red, dark black-blue, green, deep red, and white silk textiles. The *huryeongtong* container found within the bronze Amida Buddha of Munsusa of 1346 was wrapped in layers of pale yellow silk, indigo-dyed tabby silk, complex gauze with small floral patterns, and complex gauze with a design of floral scrolls and dragons. Photographic records of the regilding of the wooden Amida Buddha at Jaunsa dating from the late Goryeo or early Joseon revealed square textiles in yellow, red, and green wrapping the *huryeongtong* container. The *huryeongtong* deposited within the main Buddha image in the royal Haein temple from the same period had both an outer and an inner *hwangchobokja* wrapping cloth, both yellow (fig. 4).

Conclusions

Our research revealed that both the 'five pure colors' and the 'five intermediate colors' of the Five Elements paradigm were used consistently in enshrinement deposits sealed within Buddhist statues in Korea from the earliest example in the fourteenth century through the end of the Joseon dynasty. The colors we found were as follows:

East: blue, the pure color representing the east. We also found light blue, green, and bluish green.

South: red, the pure color representing the south. We also found scarlet, and in the Sudeoksa deposit, light violet.

West: white, the pure color representing the west. We also found light yellow.

North: pure black, the pure color representing the north, was found only in the Buddhist image at Haeinsa. Generally we found a bluish or purplish black. Purple was used in the deposit in the main Buddha image at Samgilsa.

Center: pure yellow, the pure color representing the center, was found in the deposit at the royal Haein temple. Generally the deposited textiles indicating the center were shades of yellow, although we found some exceptions, such as textiles with a yellow pattern on a red ground, a golden pattern on a yellow ground, and plaid patterns in five colors. At Samgilsa green was

used to indicate the center. Particularly high-quality colorful textiles were often used to indicate the central cardinal point. From this we can deduce that the center was considered to be a symbol of the highest authority and dignity.

The five directional colors found in enshrinement deposits commissioned by the royal family for Haeinsa are vividly dyed in the five pure colors, while enshrinement deposits found within Buddhist statues made for the populace often used a combination of the five pure colors and the five intermediate colors. In the Joseon dynasty, a professional dyeing workshop was established to produce high-quality dyed cloth for the court. This workshop made it possible for the royal family to have access to textiles dyed the five pure colors with the finest dye materials and workmanship available. Hence, colors from the enshrinement deposits in both Buddha statues at Haeinsa, sponsored by the royal family, probably epitomize the ideal representation of the five directional colors and the highest-quality rendition of the five pure colors.

The enshrinement deposits sealed in Buddhist statues during the dedication rites were made in accordance with the five directions on the basis of *yinyang* and the Five Elements paradigm. The dedication ritual—including the sealing and deposit within the sculpture of the *huryeongtong* container, with its enclosed *obobyeong* pouch and contents—was believed to animate the statue, making it efficacious and transforming it from a simple inanimate object into the subject of religious belief and devotion.

FIGURE 4
Hwangchobokja wrapping cloth in the bronze Vairocana Buddha of Haeinsa

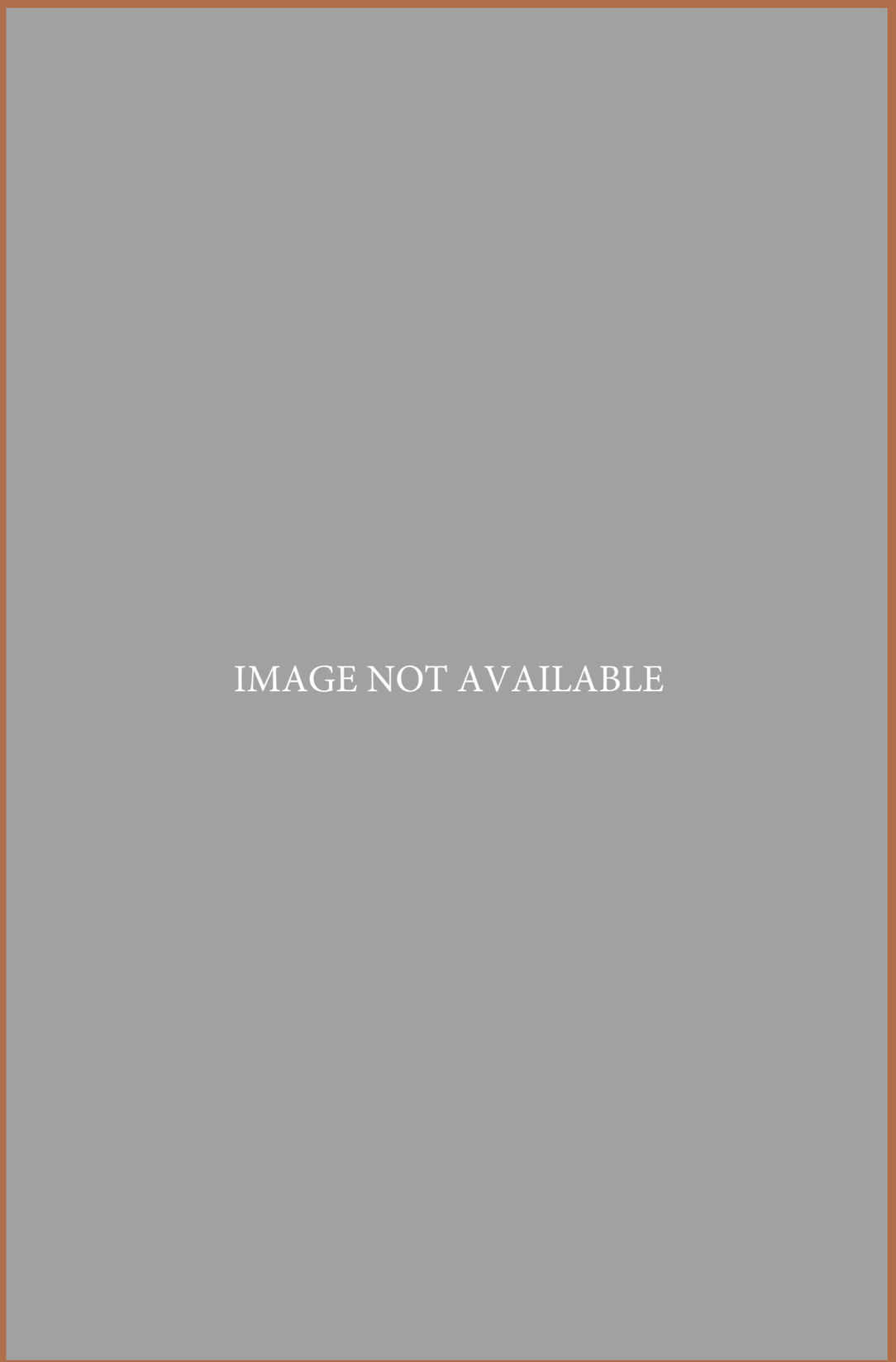


FIGURE 2 (detail)

Color Schemes in Early and Medieval Japanese Buddhist Imagery

HILLARY PEDERSEN

Imagery lies at the heart of Buddhist practice. Whether used as the focal point of ritual or to adorn sacred spaces, sculptures and paintings of deities, patriarchs, patrons, or symbolic objects have for millennia served as indispensable and ubiquitous elements of the Buddhist tradition. The visual qualities of such images vary widely depending on myriad factors, such as regional style, period, or material, but an important common feature was their perceived efficacy; images were considered to be efficacious if, as a result of their veneration, sicknesses were cured, rain fell, or famines or plagues ceased.

Buddhist clerics in East Asia strategically selected elements of various belief systems, such as color schemes, in order to create dynamic deity configurations. Groupings of several deities were believed to be more efficacious than a statue of a single deity. This was the case especially in the Esoteric Buddhist tradition (C. *mijiao*, J. *mikkyō*, literally "secret teachings"), the practice of which included the secret transmission of teachings from master to disciple and elaborate rituals that emphasized visual media and ritual language to assist in the grasping of complex theories.[1] While academic-based Buddhism prevailed in Japan during the seventh and eighth centuries, in the ninth century aspects of *mikkyō* were brought from China to Japan during a period of thriving Central and East Asian Buddhist exchange. Sutras, commentaries, ritual manuals and implements, and paintings and drawings detailing the iconographic features of deities were transmitted across Central and East Asia and reached Japan, where they were refigured and woven into the fabric of Japanese Buddhism.

Complex visual programs that included multiple deities (such as Buddhas and bodhisattvas) were often installed in Esoteric temples and used in rites. Multicolored deity pentads, such as versions of the Five Wisdom Buddhas (J. Gochi Nyorai) and the Five Great Space Repository Bodhisattvas (J. Godai Kokūzō Bosatsu, hereafter Five Kokūzō Bosatsu) are examples of this phenomenon. The Five Kokūzō Bosatsu are known as manifestations of the Five Wisdom Buddhas, with each Buddha having a corresponding bodhisattva.[2] Furthermore, each Buddha and its related bodhisattva are associated with a specific color and direction that resonate both with correlative Chinese five phases and Indian elemental schemes. During the ninth century in Japan these pentads appear in textual sources and in two- and three-dimensional forms. Elaborate paintings of the Five Kokūzō Bosatsu were prevalent from the eleventh through fourteenth century, when disaster-prevention rituals fueled a demand for their production. This essay will

1. See Ryūichi Abé, *The Weaving of Mantra: Kūkai and the Construction of Esoteric Buddhist Discourse* (New York: Columbia University Press, 1999), 1–4.

2. Buddhism emphasizes the non-duality of all phenomena. This concept manifests itself in Esoteric Buddhism through deities that have corresponding forms serving different purposes within Buddhist practice, but still retain the basic essence of the other deities.

utilize textual and visual sources to introduce these images and demonstrate how color increased the efficacy of both the Buddha and bodhisattva pentads by imbuing them with an additional layer of symbolic authority in state-protection rituals during the early and medieval period (from the eighth through fourteenth century) in Japan.

The inclusion of Chinese five phases and Indian five elements concepts in Buddhist imagery produced a rich and varied tradition of Buddhist visual culture and system of practice. Understanding the multiple sources from which these deities' iconographic features developed reveals this multivalence.

Five Kokūzō Bosatsu

The Five Kokūzō Bosatsu (Five Great Space Repository Bodhisattvas) are five different manifestations of the single deity Kokūzō Bosatsu (Space Repository Bodhisattva, Sk. Ākāśagarbha, C. Xukongzhang Pusa), a deity seen in texts as early as the eighth century in Japan. In single form, this deity is venerated in a rite called *gumonjihō* (memory-retention rite) that incorporates the planet Venus. This rite was introduced into Japan during the eighth century and is still practiced today.[3] The relationship between the deity and the celestial body has important implications for the Five Kokūzō Bosatsu iconography, as will be explored below. The deity is also venerated in another rite called *fukutokuhō* (rite for the attainment of merit and virtue)[4] that emphasizes two of the key elements necessary for attaining Buddhist enlightenment.

In pentad form, each of the Five Kokūzō Bosatsu is a manifestation of one of the Five Wisdom Buddhas and is venerated for favorable blessings and disaster prevention.[5] Visual and textual depictions of this pentad indicate that each of the deities was associated with a different color. The individual names by which each of the bodhisattvas is known and its corresponding color are: Hōkai (Dharma Realm) Kokūzō Bosatsu, which corresponds with white; Kongō (Adamantine Truth) Kokūzō Bosatsu with yellow; Gōyō (Karmic Functions) Kokūzō Bosatsu with black/purple; Renge (Lotus Flower) Kokūzō Bosatsu with red; and Hōkō (Jewel Light) Kokūzō Bosatsu with green/blue.[6]

Sculptures of the Five Kokūzō Bosatsu are exceedingly rare; those that are extant date from the ninth century. The first pentad I will discuss is located in the Shingon temple of Jingoji in northwest Kyoto. Designated National Treasures by the Japanese Agency for Cultural Affairs, the Jingoji Five Kokūzō Bosatsu presently sit in a single row against the rear wall of a five-story pagoda facing south. Although portions of the images have undergone repair since the ninth century, the original components are stylistically and technically consistent with other imperially commissioned sculptures from the same period (fig. 1a).

The exposed skin of each figure, including the face, neck, arms, torso, and right foot, is pigmented with a different color. According to an early-tenth-century document, the paint was restored in 899 (Shōtai 2).[7] There is no evidence of the pigments having been restored after that

3. Takakusu Junjirō and Watanabe Kaigyoku, eds., *Taishō shinshū daizōkyō* [Taishō-period revised Tripitaka] (Tokyo: Taishō issaikyō kankōkai, 1924–35), hereafter "T", 20:1145, 601c9–603a4. For a detailed description of this rite in English, see Yamasaki Taikō, *Shingon: Japanese Esoteric Buddhism* (Boston and New York: Shambhala Publications, 1996), 182–90.

4. T20:1146, 603a9–604c4.

5. Tanabe Saburōsuke and Konno Toshifumi, *Bosatsu* [Bodhisattvas], vol. 2, *Nihon no butsuzō dai hyakka* [Encyclopedia of Japanese Buddhist images] (Tokyo: Gyōsei, 1990), 182; Murayama Shūichi, *Shūgendō/onmyōdō to shaji shiryō* [Historical data on mountain ascetic practice and yinyang divination, temples and shrines] (Kyoto: Hōzōkan, 1997), 493.

6. While contemporary readers may consider blue and green to be distinct colors, in early and medieval East Asia blue and green were often described by the same Chinese ideogram and were both considered to express the concept of growth, renewal, and life. I am grateful to Dr. Amy McNair of the University of Kansas for this clarification. In the same vein, I believe that purple and black were also considered to exist on the same end of the color continuum, and to express the concepts of darkness, stillness, or death.

7. Maruō Shōsaburō et al., eds., *Jingoji Jōhei jitsurokuchō* [Veritable record of the Jōhei era (931–38)], reproduced in *Nihon chōkokushi kiso shiryō shūsei: Heian jidai; jūyō sakuhinhen* [Compilation of fundamental data on the history of Japanese sculpture: Heian period; important cultural properties], 5 vols. (Tokyo: Chūō Kōron Bijutsu Shuppan, 1973–97), hereafter "NCKSS jsh," 2:12.

FIGURE 1a
Five Kokūzō Bosatsu. Heights of seated images (not including lotus base) 95 to 101.4 cm. Wood, lacquer, and pigment. Mid-ninth century. Jingoji, Kyoto.

date. A twelfth- to thirteenth-century iconographic compendium, *Kakuzenshō* (Kakuzen's notes), includes a diagram of the Jingoji images with the same colors they have now, suggesting that in the restoration of 899 they were repainted in the original colors. The arrangement, however, appears to have changed. *Kakuzenshō* depicts the sculptures in a concentric arrangement with Hōkai Kokūzō (painted white, fig. 1b) in the center, rather than in the linear arrangement in which they now sit.[8] In their present arrangement, the deities (facing the images, from right to left) are Hōkō, Renge, Hōkai, Gōyō, and Kongō Kokūzō Bosatsu.

These images were commissioned by Emperor Ninmyō (r. 833–850) and were installed in the Jingoji pagoda under the auspices of the head priest at Jingoji at the time, Shinzei (800–860).[9] Shinzei was a disciple of the priest Kūkai (774–835), who is best known for the incorporation of Esoteric teachings into the ninth-century Buddhist framework and as a patriarch of what would later be known as the Shingon school of Buddhism.[10] As I will demonstrate, most of the early images and texts dealing with the Five Kokūzō Bosatsu are related to Kūkai and his lineage.

Another set of ninth-century Five Kokūzō Bosatsu sculptures was originally housed in the now-defunct temple of Anjōji in northeast Kyoto, and is currently located in the Kanchiin of Tōji (another Shingon temple) in southern Kyoto. Each of these bodhisattvas sits upon a lotus pedestal that is perched on the back of an animal (fig. 2). Facing the images, from right to left, the deities are Kongō Kokūzō Bosatsu seated on a lion, Hōkō Kokūzō Bosatsu on an elephant, Hōkai Kokūzō Bosatsu on a horse, Gōyō Kokūzō Bosatsu on a *garuda* (a mythical bird), and Renge Kokūzō Bosatsu on a peacock.

An examination in 2003 revealed traces of pigment on the surface of each sculpture, pigment that had almost completely flaked away, exposing the dark wood underneath.[11] Like the Jingoji images, the sculptures are currently arranged in a single row, in this case

8. Takakusu Junjirō and Watanabe Kaigyoku, eds., *Taishō shinshū daizōkyō zuzōbu* [Taishō- period revised Tripitaka, iconographic drawings], 12 vols. (Tokyo: Taishō issaikyō kankōkai, 1924–35), hereafter "TZ," 5:265.

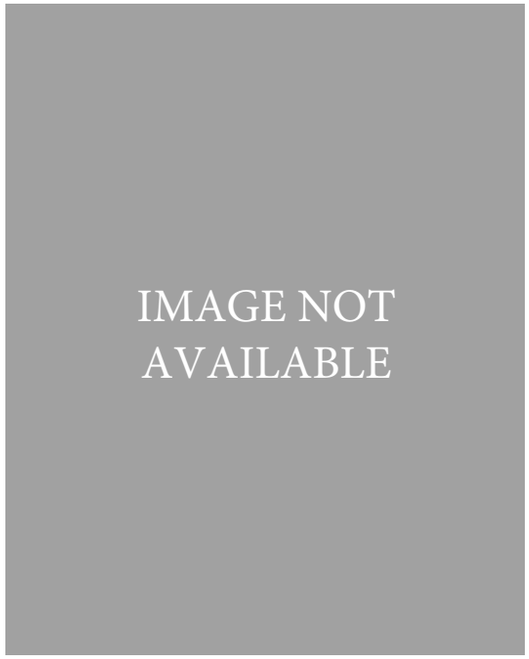
9. Kokushi taikei henshūkai, eds., *Nihon sandai jitsuroku* [Veritable record of the reigns of the three emperors], vol. 4, *Shintei zōho kokushi taikei* [Compendium of Japanese history, new and expanded version] (Tokyo: Yoshikawa Kōbunkan, 1964–67), 48.

10. For more on Kūkai and ninth-century Esoteric teachings, see Abé, *The Weaving of Mantra*, chapters 5 and 6.

11. Okada Ken, "Tōji Kanchiinzō Godai Kokūzō Bosatsuzō" [The Five Kokūzō Bosatsu from Tōji Kanchi'in], in *Tōji Kanchiinzō Godai Kokūzō Bosatsuzō* [The Five Kokūzō Bosatsu from Tōji Kanchi'in], ed. Tokyo Bunkazai Kenkyūjo (Tokyo: Chūō Kōron Bijutsu Shuppan, 2003): 80–89.

FIGURE 1b
Hōkai Kokūzō Bosatsu. Height of seated image (not including lotus base) 100.9 cm. Wood, lacquer, and pigment. Mid-ninth century. Jingoji, Kyoto.

FIGURE 2
Five Kokūzō Bosatsu. Heights of seated images (not including lotus base) 70.1 to 75.4 cm. Wood, lacquer, and pigment. Mid-ninth century. Kanchiin, Tōji (Kyōōgokokuji), Kyoto.



against the rear wall of the Kanchiin main hall. *Kakuzenshō*[12] and another late-twelfth- to early-thirteenth-century iconographic manual, *Shoson zuzō* (Drawings of various deities),[13] contain drawings that reference the Kanchiin Five Kokūzō Bosatsu; these also depict the sculptures as pigmented and placed concentrically with Hōkai Kokūzō in the center. The sculptures themselves are said to have been brought to Japan by the priest Eun (798–869), a disciple in Kūkai's lineage. Eun reportedly acquired the images while studying Buddhism in China and then installed them in Anjōji at the request of Emperor Montoku (r. 850–858), Ninmyō's son.[14]

There is a striking correlation between the large number of recorded natural disasters and resulting famines during the reigns of Ninmyō and Montoku[15] and the production of the three known Five Kokūzō Bosatsu sculptural pentads.[16] This may explain why the only known sculptures of these deities are from the ninth century. Fear of natural disasters during this specific period may have inspired the production of deity configurations that embodied various belief systems, thus compounding their efficacy, and that could be venerated in rituals designed to protect the nation from disasters.

Early Textual References to the Five Kokūzō Bosatsu

Textual sources also indicate that each of the Five Kokūzō Bosatsu were painted a different color. One of the earliest texts related to the pentad in Japan is *Kongōbu rōkaku issai yuga yugikyō* (C. *Jingang feng louge yiqie yujia yuji jing* [The scripture of all the yogas and yogis of the Adamantine Peak Pavilion]), hereafter, *Yugikyō*.[17] The earliest concrete evidence of this sutra's existence in East Asia is found in the inventory section of *Shōrai mokuroku* (Catalogue of imported items), Kūkai's 806 record of Buddhist texts and objects that he brought with him from Tang (618–907) China.[18]

12. TZ5:258.

13. TZ4:73.

14. Kyoto daigaku bungakubu and Nihonshi kenkyūjo, eds., *Anjōji shizaichō* [Record of Anjōji temple assets], vol. 17, *Kyoto daigaku shiryō sōsho* [Kyoto University series on historical archives] (Kyoto: Shibunkaku Shuppan, 2010), 91–96. There is scholarly consensus based on stylistic and technical analysis that the images were created in China. See, for example Nedachi Kensuke, "Anjōji no bukkyō chōkoku o meguru shomondai: sōkenki chōzō no kokusaisei to shinkisei no mondai o chūshin ni shite" [Issues surrounding the Buddhist sculptures at Anjōji: questions of the international and novel characteristics of sculptures in the temple's early history], in *Kōtaigō no yamadera: Yamashina Anjōji no sōken to kodai sanrin jiin* [The Empress Dowager's mountain temple: ancient mountain temples and the construction of Anjōji in Yamashina], ed. Uehara Mahito (Kyoto: Yanagihara Shuppan, 2007), 267–92, and Okada, "Tōji Kanchiinzō Five Kokūzō Bosatsuzō," 61–77. However, there are no reliable texts or other extant images from China indicating that this particular deity configuration was a major part of the Chinese Buddhist tradition.

15. William Wayne Farris, "Famine, Climate and Farming in Japan, 670–1100," in *Heian Japan, Centers and Peripheries*, eds. Mikael S. Adolphson, Edward Kamens, and Stacie Matsumoto (Honolulu: University of Hawai'i Press, 2007), 294, 296. *Zoku Nihon koki* [Later chronicle of Japan continued], an imperially commissioned history, records several such instances in the year 836 (Jōwa 3), a year during Ninmyō's reign. Fujii Jōji and Yoshioka Masayuki, eds., *Junna tennō jitsuroku; Ninmyō tennō jitsuroku* [Veritable record of the reign of Emperor Junna; Veritable record of the reign of Emperor Ninmyō], vol. 10, *Tennō kōzoku jitsuroku* [Veritable record of the Imperial Family] (Tokyo: Yumani Shobō, 2007), 58–67.

16. In addition to those at Jingoji and Anjōji, a third set was installed in the southern Kyoto temple of Jōganji, but neither the images nor the temple survive.

17. T18:867, 253c13–259c29; Sasaki Moritoshi, "Jingoji Godai Kokūzō Bosatsu zazō no zuzō ni tsuite" [On the iconographic drawings of the Five seated Kokūzō Bosatsu sculptures at Jingoji], *Bijutsushi* [Art history] 147 (October 1999): 1. The English translation of this sutra's title is from Pol Vanden Broucke, "The Twelve-armed Deity Daishō Kongō and his Scriptural Sources," in *Tantric Buddhism in East Asia*, ed. Richard Karl Payne (Boston: Wisdom Publications, 2006), 148. I have translated portions of this text with the assistance of Otsuka Yoshio, Michael Jamentz, and Nedachi Kensuke.

18. T2161:55, 1062b29.

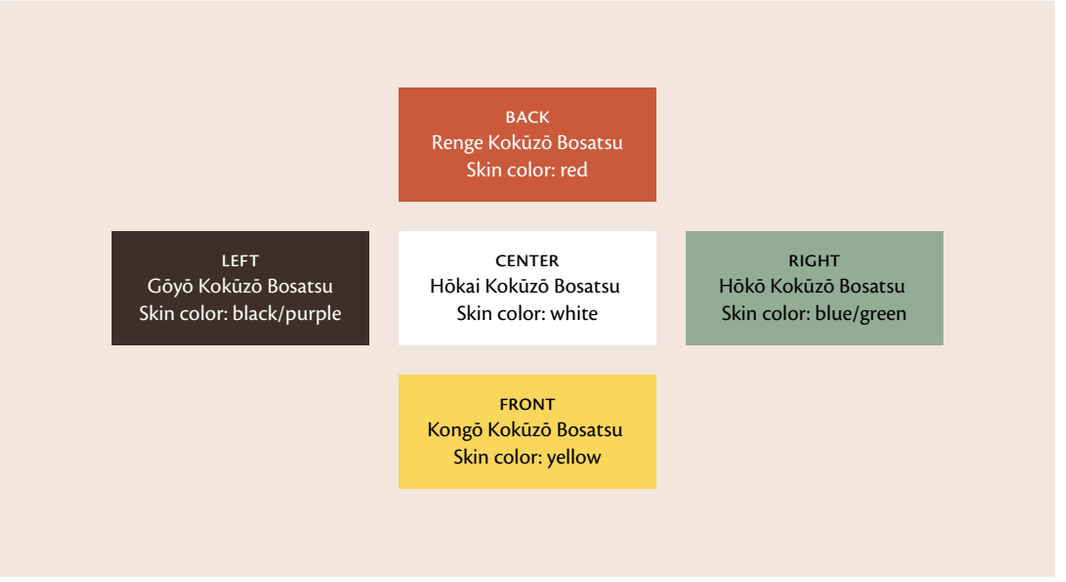


DIAGRAM 1
Five Kokūzō Bosatsu according to *Yugikyō*.

Although the position of this text in China is uncertain,[19] due to its circulation in Japan in the ninth century, *Yugikyō* nevertheless serves as a possible source for examining the early history of the pentad configuration in Japan during this period.

Yugikyō explains that the Five Kokūzō Bosatsu configuration resulted from the division of a single Kokūzō Bosatsu into five, and that the deities represent the five wisdoms of the Five Wisdom Buddhas of the Diamond World Mandala.[20] The reference to the Five Kokūzō Bosatsu in this text includes instructions for a ritual procedure and describes how to create the five main images (noted in the text as 'paintings' rather than 'sculptures') to be venerated in the rite. The colors given to each of the Five Kokūzō Bosatsu in this text are the same colors as each of the Five Kokūzō Bosatsu sculptures at Jingoji and in the later iconographic drawings of the Kanchiin pentad. Diagram 1 shows the colors and directional placement of each of the deities as noted in this text.

Many of the earliest extant Buddhist iconographic compendiums have similar descriptions (and feature the white-pigmented Hōkai in the center) and are likely based upon *Yugikyō*.[21]

The priest Shinzei, who was in charge of Jingoji at the time the Five Kokūzō Bosatsu were installed in the temple, also wrote a text dealing specifically with these deities.[22] Entitled *Gobu kanjinki* (Account of the fundamental principle of the five parts),[23] this is a short and somewhat disjointed text written during his residence at Jingoji between 832 and 840. The text gives directions for drawing an image of five *Buddhas*, but the description matches the iconography of the Five Kokūzō Bosatsu (that is, *bodhisattvas*) as noted in *Yugikyō* in terms of the deities' colors and directional associations. Each of the Five Kokūzō Bosatsu are named, with the same

19. Vanden Broucke, "Twelve-armed Deity," 149–50.

20. Mikkyō jiten hensankai, *Mikkyō daijiten* [Dictionary of Esoteric Buddhism] (Kyoto: Hōzōkan, 1983), 616; Nakamura Hajime, *Iwanami Bukkyō jiten* [Iwanami dictionary of Buddhism] (Tokyo: Iwanami Shoten, 1989), 277.

21. *Besson zakki* (Miscellaneous record of classified sacred images, late twelfth century, TZ3:313–15) and *Zuzōshō* (Selected iconographic drawings, late twelfth century, TZ3:15) are two such examples.

22. Shinzei wrote more about this configuration than did any of Kūkai's other disciples. Uehara Shōichi, "Jingoji Tahōto Godai Kokūzō Bosatsu zazō" [The Five seated Kokūzō Bosatsu in the Jingoji pagoda], *Kokka* [Flowers of the nation] 848 (November 1962): 505.

23. T78:2467, 37c09–39b27. Here I utilize Brian Ruppert's translation of the title of the text. Brian Douglas Ruppert, *Jewel in the Ashes: Buddha Relics and Power in Early Medieval Japan* (Cambridge, MA: Harvard University Asia Center, 2000), 130.

nomenclature and iconographic features as noted in *Yugikyō*.

The depictions of the Five Kokūzō Bosatsu in *Yugikyō* and *Gobu kanjinki* illustrate what I believe to be the most pervasive form of the pentad in ninth-century Japan and beyond, with each deity associated with a specific color and Hōkai Kokūzō (associated with white) placed in the center. However, I do not suggest that these two texts were the sole sources upon which the pentad's iconography was based. Rather, I accept these texts as part of an array of sources that give clues as to what elements comprised the early Five Kokūzō Bosatsu iconography.

Later Paintings and Texts

There are no extant images of the Five Kokūzō Bosatsu pentad between the mid-ninth and the eleventh century. It is possible that production of such images slowed or ceased after the ninth century and started again in the eleventh century when shifts in belief among imperial family members and the elite prompted increased requests for the performance of Five Kokūzō Bosatsu–related rituals.[24] One piece of evidence indicating such a trend is the existence of several records from the eleventh through fourteenth century noting the performance of a ritual called *Godai Kokūzō hō*, or Ritual of the Five Kokūzō.[25] Because of its absence from inventories of objects brought to Japan from China by priests, the text was likely composed in Japan rather than in China or India.

The Ritual of the Five Kokūzō was performed in order to avoid calamities such as famine, disease, and natural disasters.[26] References to performances of the rite abound during the eleventh and twelfth centuries.[27] Indeed, during the mid-eleventh century, as in the mid-ninth century, Japan was in a state of depopulation, famine, and an unbalanced social structure,[28] which perhaps necessitated these rites and images.

The relatively short ritual manual describes the five deities to be drawn for the ritual, including their directional associations and colors. The names, colors, and directional placement of the deities differ from those noted in *Yugikyō*: Gedatsu (Liberation) Kokūzō Bosatsu is in the center and is yellow; Fukuchi (Merit and Knowledge) Kokūzō Bosatsu is located in the east and is also yellow; Mukō (Free of Defilement) Kokūzō Bosatsu is in the north and is "water-white"; Seigan (Bestower of Blessings) Kokūzō Bosatsu is in the west and is crimson; and Nōman (Full Ability) Kokūzō Bosatsu is in the south and is red.[29] Here we have a second system of nomenclature for the Five Kokūzō Bosatsu. When compared to the depiction of the deities in *Yugikyō*, it is clear that the colors of the deities differ as well. The central Kokūzō Bosatsu in Ritual of the Five Kokūzō, for example, is yellow, not white as is the central deity in *Yugikyō*. One interpretation associates each deity mentioned in this ritual text with one in

24. The production of Five Kokūzō Bosatsu paintings and iconographic drawings increased from the eleventh to the fourteenth century as part of the surge of ritual and iconographic manual copying that occurred during this time. This phenomenon is seen in the twelfth-century *Kakuzenshō*, the Kamakura-period (1189–1333) *Godai Kokūzō zai sho zuzō* [Iconographic drawings of the positions of the Five Kokūzō], housed at Daigoji, and the Nambokuchō-period (1336–92) *Godai Kokūzō yō* [Forms of the Five Kokūzō Bosatsu], housed at the Tōji Kanchiin. All are reproduced in Manabe Shunshō, "Omuro kanjōdō mandara shuhen no shiteki kōsatsu: oyobi Jōki'inbon 'Godai Kokūzō zai shozuzō'" [Considerations of the historical circumstances of the Omuro Buddhist initiation hall mandala: the 'various iconographic drawings of the Five Kokūzō Bosatsu' from Jōki'in], *Mikkyō bunka* [Esoteric Buddhist culture] 88 (1969): 73–81.

25. T20:1149, 607a25–609a24.

26. Murayama Shūichi, *Shūgendō/onmyōdō*, 492–93; Sano Kenji, ed. *Kokūzō Bosatsu shinkō no kenkyū* [Research on Kokūzō Bosatsu belief] (Tokyo: Yoshikawa Kōbunkan, 1996), 25–26. For a description of this rite in Japanese, see Naitō Sakae, *Shari shōgun bijutsu no kenkyū* [Research on the art of relic adornment] (Tokyo: Seishi Shuppan, 2010), 194–96.

27. Ruppert, *Jewel in the Ashes*, 189, 217, 420, n 47. Perhaps the best-known practitioner was the prelate Ningai (951–1046) from the Ono branch of Shingon. Among Ningai's many written works is *Godai Kokūzō shidaitō* [Ritual procedures related to the Five Kokūzō Bosatsu]. This entry is noted in *Shoshi seisaku mokuroku* [Catalogue of works produced by various authors] reproduced in Bussho kankōkai, ed., *Dai Nihon Bukkyō zensho* [Compendium of Japanese Buddhist texts] (Tokyo: Bussho kankōkai, 1912–22), 2:320. Unfortunately, I have not been able to locate this text.

28. William Wayne Farris, *Japan to 1600: A Social and Economic History* (Honolulu: University of Hawai'i Press, 2009), x.

29. I have translated this passage with the assistance of Otsuka Yoshio.

the *Yugikyō* (Hōkai = Gedatsu, Kongō = Fukuchi, Hōkō = Nōman, Renge = Seigan, Goyō = Mukō);[30] the reasons for the two systems of nomenclature are unclear.

Interestingly, despite the prevalence of documented performances of Ritual of the Five Kokūzō, painted images of the pentad, presumably those used in the rite, follow the iconography of *Yugikyō* rather than that noted in the ritual manual described above.[31] An early-thirteenth-century painting housed at the Kyoto temple of Daikakuji, for example, depicts the Five Kokūzō Bosatsu in a white circle, arranged concentrically (fig. 3). The colors of the deities follow the scheme described in *Yugikyō* with the white deity placed in the center. Although this image was created in the early thirteenth century, the full shoulders and the style of the objects held in the hands of each deity indicate that they were based on older models.[32]

A thirteenth- or fourteenth-century painting housed at Seinan'in at the Shingon center of Mount Kōya also follows the standard Five Kokūzō Bosatsu iconography (fig. 4). The painting comprises two square concentric registers containing multiple deities. The Five Kokūzō Bosatsu are depicted within a white circle located in the center of the inner register. Within this circle, four Kokūzō Bosatsu (red, green/blue, purple, and dark yellow) surround a pale pinkish-hued Hokai Kokūzō. Four smaller bodhisattvas sit in each of the four corners of this inner register, while the outer dark green register contains other protective deities. The vivid color and fine detail indicate a high level of artistic skill. Both this and the Daikakuji painting feature five seated, red-robed Buddhas in the crowns of each of the Kokūzō Bosatsu, a reference to their manifestations of the Five Wisdom Buddhas.

A third example, dated to the fourteenth century, is housed at the Tokyo National Museum, although it was formerly in the collection of Myōō-in in Hiroshima Prefecture.[33] The painting is mounted as a double-sided panel. On one side are the Five Kokūzō Bosatsu painted in a large circle, with the white Kokūzō placed in the center. The opposite side features a painting of Tushita heaven, said to be the residence of Miroku Bosatsu (Sk. Maitreya, C. Mile), the future Buddha. Further research is needed to discern the connection between these two subjects, but the Five Kokūzō image is standard in its iconography. The only anomaly is the grayish-white color of the image situated in the east, which, if it is Goyō Kokūzō, should be painted black or purple; it is possible

FIGURE 3
Five Kokūzō Bosatsu. Height 147.5 cm, width 133.0 cm. Ink and color on silk. Kamakura period. Daikakuji, Kyoto.

30. Kamata Shigeo et al., eds., *Daizōkyō zenkaisetsu daijiten* [Encyclopedia of Tripitaka commentaries] (Tokyo: Yūzankaku Shuppan, 1998), 966.

31. It is worth noting that Buddhist painters were also likely responsible for the pigmentation of sculptures. Dr. Nedachi Kensuke (Faculty of Art History and Aesthetics, Kyoto University), in discussion with the author, September 13, 2012.

32. Daihonzan Daikakuji, ed., *Daikakuji no meihō: Go-Uda hōō gonyūzan 700 nen kinen* [Treasures of Daikakuji: the 700th year anniversary of Emperor Go-Uda's abdication and ordination] (Kyoto: Daihonzan Daikakuji, 2007), 16.

33. Tokyo National Museum Archives, http://webarchives.tnm.jp/imgsearch/show/C0030040, accessed December 6, 2012.

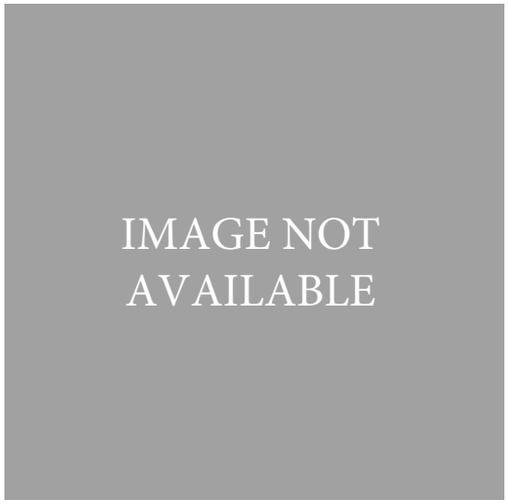


FIGURE 4
Five Kokūzō Bosatsu. Height 127.3 cm, width 127.1 cm. Ink and color on silk. Thirteenth to fourteenth century. Sainan'in, Kōyasan, Kōya, Ito District, Wakayama Prefecture.

that the pigment has flaked off or faded. These paintings exemplify the most pervasive iconographic form of the Five Kokūzō Bosatsu during the medieval period (with the central deity painted white, and the four surrounding ones painted red, yellow, green, and purple/black), and suggest that rituals focused on this pentad were conducted during this time.

Five Wisdom Buddhas Images and Texts

The color schemes of the Five Wisdom Buddhas, the deities from which the Five Kokūzō are said to be manifested, show resonances with the color programs described above. Conceptually, the Five Wisdom Buddhas are located in the center of the Diamond World Mandala, a multideity cosmic diagram that is one of the major images used in Japanese Esoteric Buddhist practice.[34] Many painted versions of this mandala exist, the ninth-century one housed in the Saiin of Tōji in Kyoto being the best known.[35] In the setting of this mandala, the Five Wisdom Buddhas each represent idealizations of five aspects of wisdom.[36] The five deities are: Dainichi Nyorai (Sk. Mahāvairocana, the primary deity within Esoteric teachings), Ashuku Nyorai (Sk. Aksobya), Hōshō Nyorai (Sk. Ratnasambhava), Amida Nyorai (Sk. Amitābha), and Fukūjōju Nyorai (Sk. Amoghasiddi). These five Buddhas are all depicted in the Saiin mandala with pinkish-hued skin, rather than the vibrant colors of the Five Kokūzō Bosatsu.

The imagery in the Diamond World Mandala is linked to a sutra entitled *Kongōchō issai nyorai shinjitsu shōdaijō genshō daikyōōkyō* (C. *Jingangding yiqie rulai zhenshi shedasheng xianzheng dajiaowang jing*), which I will abbreviate and translate as Adamantine Peak sutra.[37] This three-scroll text is noted in Kūkai's Catalogue of imported items, and was also imported to Japan by other later priests.[38]

The sutra describes the Diamond World Mandala, besides rites that involve images of the mandala, such as disciple initiations.[39] The text also classifies Buddhist divinities into five "families": Buddha, adamantine, jewel, lotus, and *karma* (action).[40] These classifications are common within Esoteric teachings and apply to deities within the Diamond World Mandala, such as the Five Wisdom Buddhas and Five Kokūzō Bosatsu, as noted in table 1.[41]

Because the Five Kokūzō Bosatsu are said to be manifestations of the Five Wisdom

34. Cynthea J. Bogel, *With a Single Glance: Buddhist Icon and Early Mikkyō Vision* (Seattle: University of Washington Press, 2009), 252; Elizabeth ten Grotenhuis, *Japanese Mandalas: Representations of Sacred Geography* (Honolulu: University of Hawai'i Press, 1999), 40–41.

35. For an image of the mandala, see ten Grotenhuis, *Japanese Mandalas*, plates 8 and 9.

36. Amy Livingston, "Goal of the Transformed Mind: Enlightenment Symbolized, the Five Jina Buddhas," in *The Circle of Bliss: Buddhist Meditational Art*, eds. John Huntington and Dina Bangdel (Columbus: Columbus Museum of Art, and Los Angeles: Los Angeles County Museum of Art, 2003), 90–91. I am grateful to Prof. Katherine Harper for this reference. Charles Muller, "Gochi Nyorai," Digital Dictionary of Buddhism, http://www.buddhism-dict.net/cgi-bin/xpr-ddb.pl?q=%E4%BA%94%E6%99%BA%E5%A6%82%E4%BE%86, accessed June 24, 2012.

37. T18:865, 207a3–212c29.

38. Mikkyō jiten hensankai, Mikkyō daijiten saikan iinkai, and Mikkyō gakkai, eds., *Mikkyō daijiten* [Dictionary of Esoteric Buddhism] (Kyoto: Hōzōkan, 1969), hereafter "MD", 2:705–06.

39. Kamata Shigeo et al., *Daizōkyō zenkaisetsu daijiten*, 255.

40. Lokesh Chandra and David L. Snellgrove, *Sarva-Tathāgata-tattva-sāngraha: Facsimile Reproduction of a Tenth-Century Sanskrit Manuscript from Nepal* (New Delhi: Sharada Rani, 1981), 11; Yoshito S. Hakeda, *Kūkai: Major Works* (New York: Columbia University Press, 1972), 143; Charles Orzech, "Mandalas on the Move: Reflections from Chinese Esoteric Buddhism circa 800 CE," *Journal of the International Association of Buddhist Studies* 19, no. 2 (Winter 1996), 224; Charles Orzech, *Politics and Transcendent Wisdom: The Scripture for Humane Kings in the Creation of Chinese Buddhism* (University Park, PA: Pennsylvania State University Press, 1998), 225–26.

41. Hakeda, *Kūkai: Major Works*, 83–84.

Family	Five Wisdom Buddhas	Five Kokūzō Bosatsu
Buddha	Dainichi Nyorai	Hōkai (dharma realm) Kokūzō
adamantine	Ashuku Nyorai	Kongō (adamantine) Kokūzō
jewel	Hōshō Nyorai	Hōkō (jewel light) Kokūzō
lotus	Amida Nyorai	Renge (lotus) Kokūzō
karma (action)	Fukūjōju Nyorai	Gōyō (karmic actions) Kokūzō

TABLE 1
Five "families" classification as noted in the Adamantine Peak sutra and corresponding Five Wisdom Buddhas and Five Kokūzō Bosatsu.

Buddhas as based on the Diamond World Mandala and Adamantine Peak sutra, one would think that there would be examples of, or references to, multicolored images of the Five Wisdom Buddhas in these texts. However, the Adamantine Peak sutra indicates that the Buddhas are gold, not pigmented. Moreover, known sculptural examples (for example the ninth-century set at the Kyoto National Museum[42]) are covered with gold leaf rather than pigment. Extant painted examples of the mandala do not depict multicolored versions of the Five Wisdom Buddhas either: the Saiin mandala mentioned above depicts the deities' skin with a pinkish hue rather than multicolored.

Does a multicolored Five Wisdom Buddha pentad exist? It does, but in Japan only in textual sources. One such source is a ritual manual entitled *Sanshu shitchi hajigoku tengosshō shutsusangai himitsu darani hō* (C. *Sanzhong xidi podiyu zhuanyezhang chusanjie mimi tuoluoni fa*),[43] hereafter *Hell-conquering incantations*. Although traditional scholarship attributes a seventh-century Chinese origin to this text, recent scholarship has tacitly argued for a ninth- or early-tenth-century Japanese authorship.[44] In this text, each of the Five Wisdom Buddhas presides over a certain cardinal direction, and is associated with a color and with one of the five "families" noted in the Adamantine Peak sutra. The color iconography of the Five Wisdom Buddhas in this text (diagram 2) resonates with that of the Five Kokūzō Bosatsu. However, the central deity, Dainichi Nyorai, is associated with yellow, unlike the central deity of the Five Kokūzō Bosatsu, which is white.

I believe this discrepancy is the result of different ways in which Japanese clerics interpreted these pentads in relation to their elemental connections.

The incantation used in this ritual includes aspects of the Chinese five phases, examined below, and was likely used in conjunction with divination techniques related to rainmaking and national protection.[45] This ritual manual thus illustrates a connection between the Five Wisdom Buddhas' colors, Chinese-based belief elements, and Buddhist practices that were implemented for national protection.

Elemental Schemes

Now that I have described the early and medieval color schemes of both the Five Wisdom Buddhas and Five Kokūzō Bosatsu, I will explore possible sources for the specific color choices of these deities and images. The colors resonate with elemental schemes that were utilized in early India and China for divination or explications of the philosophical or natural world. These color schemes were sometimes used separately and sometimes combined with each other in various ways. One scheme, called *pañca mahā bhūtā* (five great elements) and utilized in Indian Esoteric Buddhism, comprises the five elements of earth, water,

42. For an image see Uehara Mahito, *Kōtaigō no yamadera*, fig. 9-1.

43. T18:905, 909b14–912b2.

44. Chen Jinhua, *Legend and Legitimation: The Formation of Tendai Esoteric Buddhism in Japan* (Brussels: Institut Belge des Hautes Études Chinoises, 2009), 12–13.

45. Ono Genmyō, and Maruyama Takao, eds., *Bussho kaisetsu daijiten* [Dictionary of Buddhist text commentaries], vol. 9 (Tokyo: Daitō Shuppansha, 1964–88), 322.

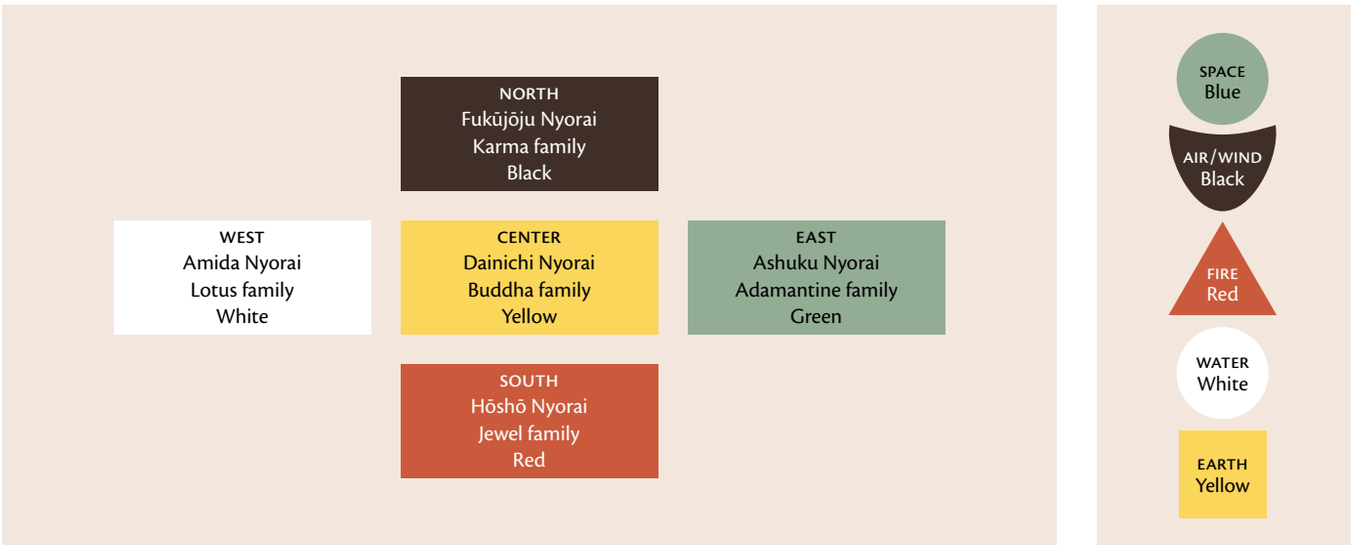


DIAGRAM 2
Five Wisdom Buddhas and associated attributes, according to *Hell-conquering incantations*.

DIAGRAM 3
Indian five-elemental scheme (*pañca mahābhūta*).

fire, air/wind, and space.[46] These five are represented by various shapes and colors: earth is square and yellow, water is round and white, fire is triangular and red, wind/air is semilunar and black, and space is spherical and blue (diagram 3).[47]

In Japan, these elements are often made manifest in the ubiquitous *gorintō* (five-element pagoda), comprising different shapes, each corresponding to one of these elements.[48] Grave markers, reliquaries, and other objects related to Buddhist material culture often take this form. Kūkai, patriarch of the Shingon Buddhist tradition, utilized this Indian-element-based scheme, one that he undoubtedly encountered during his period of study in China. For example, his *Shōji jissōgi* (The meanings of sound, word, and reality) lists different groupings of colors significant in Shingon teachings.[49] One of these color groupings includes the "five colors" (*goshiki*), which, in the Indian Esoteric Buddhist five-element scheme, correspond to the "five great (elements)" of earth/yellow, water/white, fire/red, wind/black, space/blue.[50] The Tendai tradition of Esoteric Buddhism utilized this scheme as well, as indicated in the writings of the patriarch Enchin (814–891).[51]

Japanese Buddhists also utilized the Chinese elemental scheme known as the five phases (C. *wuxing*, J. *gogyō*). The five phases (water, fire, wood, metal, and earth) are part of a system of "correlative cosmology"[52] based on a cycle of creation and destruction.[53] For example, fire melts metal, but wood generates fire; metal destroys wood (chopping with a metal axe), but water feeds wood. Each of the five is associated with a specific natural phenomenon such as color, direction, and planet (diagram 4), as well as numbers, seasons, plants, and viscera.[54]

46. The Sanskrit term for space is *ākaśā*, which appears in the Sanskrit name for Kokūzō Bosatsu, Ākāśagarbha.

47. Muller, "Godai," http://www.buddhism-dict.net/cgi-bin/xpr-ddb.pl?q=%E4%BA%94%E5%A4%A7, accessed May 2, 2011.

48. Richard Bowring, *The Religious Traditions of Japan: 500–1600* (Cambridge: Cambridge University Press, 2005), 236–37.

49. Katsumata Shunkyō, ed., *Kōbō Daishi chosaku zenshū* [Complete works by Kōbō Daishi], 6th ed. (Tokyo: Sankibō Busshōrin, 1968–1973), 1:68–69. A translation of this text is found in Hakeda, *Kūkai: Major Works*, 234–46.

50. MD3:1154.

51. Chen, *Legend and Legitimation*, 220.

52. This term is used by modern scholars of Daoist and *yinyang wuxing* systems. See Wang Aihe, "Yinyang wuxing," in *Encyclopedia of Religion*, ed. Lindsay Jones, 2nd ed. (Detroit: Macmillan Reference USA, 2005), 14:9887. On its use in Japan, see Hayashi On, "Myōken bosatsu to hoshi mandara" [Myōken Bosatsu and star mandalas], *Nihon no bijutsu* [Japanese art] 377 (October 1997): 23.

53. For a concise explanation of the five phases relationships and its history in early China, see Robert Sharf, *Coming to Terms with Chinese Buddhism: A Reading of the Treasure Store Treatise* (Honolulu: University of Hawai'i Press, 2002), 77–82.

54. Edward H. Schafer, *Pacing the Void: T'ang Approaches to the Stars* (Berkeley: University of California Press, 1977), 212; Senda Minoru, "Nihon ni okeru Chūgoku dōkyō" [Chinese Daoism in Japan], in *Nihon ni okeru Chūgoku dentō bunka* [Traditional Chinese culture in Japan], ed. Sai Ki (Tokyo: Bensei Shuppan, 2002), 60; Wang Aihe, "Yinyang wuxing," 9890, table 2.

DIAGRAM 4
Five Phases in China and their directional, planetary, and color associations.[55]

For the purposes of this discussion, I wish to draw particular attention to the colors white (representing Venus, metal, and the western direction) and yellow (representing Earth, soil, and the central direction).

This system of correlative cosmology was used in the legitimization of authority in China as early as the second or first century BCE. Within this system, each ruler's reign was represented by an element, and the succession of reigns was likened to the destruction of the previous reign's element in the natural cycle.[56] Relationships between and movements of celestial bodies mimicked the structure of government in the earthly realm; thus, changes in heavenly bodies were correlated with seasonal changes, the rise and fall of dynasties, and success or defeat in war.[57] The system was also an indispensable cosmological device used to predict such phenomena as lucky or unlucky days, governmental actions, personal affairs, or health diagnoses, and was also used in divination practices.

In Japan, the colors associated with the Chinese five phases and the five Buddhist colors derived from Indian prototypes (blue/green, yellow, red, white, black/purple) are the same, although they carry somewhat different meanings in the two contexts. The five colors are seen in ritual implements that adorn Esoteric Buddhist altars and on the flags hung from the eaves of Buddhist buildings of many sects.[58] Such examples appear in ritual manuals from the early and medieval periods, as well as in modern-day Esoteric Buddhist practice.

While there is an abundance of scholarship regarding the relationship between the use of the five colors and Indian or Chinese authority, the use of elemental schemes in the legitimization of authority in early and medieval Japan is a more recent area of inquiry. Japanese theories related to the Chinese-based five phases were incorporated into Japanese divination and religious practices as early as the sixth century, and by the eighth and ninth centuries were a vital part of the legitimization of authority.[59] For example, ninth-century rituals conducted at the Shingon'in, a ritual chapel within the Japanese Imperial Palace, incorporated the deities that controlled fire, wind, and other natural forces,[60] showing resonances with

55. Adapted from Wang Aihe, "Yinyang wuxing," table 2, 9890.

56. David Bialock, *Narrative, Ritual and Royal Authority from "The Chronicles of Japan" to "The Tale of Heike"* (Stanford: Stanford University Press, 2007), 41; Howard Weschler, *Offerings of Jade and Silk: Ritual and Symbol in the Legitimation of the Tang Dynasty* (New Haven: Yale University Press, 1985), 14.

57. Sharf, *Coming to Terms*, 78.

58. Miyasaka Yūshō, Kanaoka Shūyū, and Manabe Shunshō, *Mikkyō zuten* [Illustrated Dictionary of Esoteric Buddhism] (Tokyo: Chikuma Shobō, 1980), 94; MD2:630.

59. Bialock, *Narrative*, 48–64.

60. Bogel, *With a Single Glance*, 262.

Indian and Chinese belief systems. The reign of Emperor Ninmyō in the mid-ninth century was especially rich in divination practices,[61] since, as explained above, his was a time of repeated famine and natural disaster. This indicates that when multicolored deity configurations (as noted in texts or as manifested as images) appeared in Japan in the ninth century, Chinese- and Indian-based elemental schemes were a prominent and indispensable part of the politico-religious environment.

In addition to the Chinese five phases, the Indian five elements were also known in China. Attempts to explain the two systems in terms of each other appear very early on.[62] One of the first such references appears in *Mohe zhiguan* (J. *aka shikan*, Stopping and seeing),[63] a meditation treatise composed by the Chinese monk Zhiyi (538–587). The author retains the associations of earth-yellow and fire-red found in the Indian five phases, as well as the element of water, although he seems to change the color from white to black in the Chinese scheme. In addition, he seems to have changed space (blue) and wind (black) in the Indian scheme to wood (green/blue) and metal (white). The creative and destructive qualities of Chinese five phases are then superimposed onto the five Indian elements.[64] *Hell-conquering incantations*, which, as noted above, was likely composed by Japanese priests in the late-ninth or early-tenth century, draws upon the synthesized schemes seen in Zhiyi's and later texts, and applies them to the iconography of the Five Wisdom Buddhas. Most relevant to this discussion is the fact that the directional placement and color associations found in the iconography of the Five Wisdom Buddhas and the Five Kokūzō Bosatsu resonate with parts of both the Chinese and Indian systems: the element of space (*ākāśa*) is seen in the Indian scheme (although not in the Chinese) and the same colors are seen in both. I believe that in determining the iconography of the Five Kokūzō and certain Five Wisdom Buddha pentads, clerics referred to sources that did not use one single fivefold schema to determine the iconography of the Five Kokūzō and Five Wisdom Buddhas, but rather conflations of various schemes in order to increase the efficacy of these images. These deities not only embodied the numinous powers of Buddhism through their role as Buddhist deities but through their associations with colors, and they were also imbued with the power of nature inherent in each of these color-bound phenomena. This is especially true when considering the issue of central image placement in light of the Indian five elements and Chinese five phases schemes.

Color Schemes and Image Placement

How might the directional association of the deities within the Five Wisdom Buddha and Five Kokūzō Bosatsu configurations relate to the two color schemes explored above? Both of these pentads are placed in a concentric arrangement, with four deities surrounding a central one. Since Dainichi Nyorai is consistently placed in the center in Shingon practice and imagery (the other four can be moved or associated with a different color depending on the type of ritual performed), I will limit myself to a discussion of the central deities. In the case of the Five Wisdom Buddhas (according to *Hell-conquering incantations*), Dainichi Nyorai is placed in the center, and is associated with yellow.[65] This accords both with the Chinese concept of the five phases that posits the most prominent category in the center, affiliated with yellow, soil, and the planet Earth, and the Indian scheme that posits yellow in relation to earth/soil.

In the case of the Five Kokūzō Bosatsu, Hōkai Kokūzō Bosatsu is in the center and is associated with white. As noted above, the Chinese five phases concept situates white in

61. Bialock, *Narrative*, 108. See also Murayama Shūichi, "Kodai Nihon no onmyōdō" [Yinyang divination in ancient Japan], in *Onmyōdō sōsho* [The compendium of yinyang divination], vol. 1, *Kodai* [The ancient period], ed. Murayama Shūichi (Tokyo: Meicho Shuppan, 1991), 27–28.

62. Chen, *Legend and Legitimation*, 198–201.

63. T46:1911.

64. As noted in Chen, *Legend and Legitimation*, 198.

65. Chen, *Legend and Legitimation*, 225.

the western direction, along with the planet Venus and the element of metal. The Indian five elements relate white to the element of water. How are we to tease out the meaning of these colors, planets, and elements in relation to the placement of the white Kokūzō Bosatsu in the central position in the Japanese pentads? The inclusion of *ākaśā* (space, void) within the Indian five elements scheme makes direct reference to Ākaśāgarbha, the Sanskrit name of Kokūzō Bosatsu meaning "space repository," and associates this element with green. However, the central deity in Japanese Five Kokūzō Bosatsu pentads is never green. Rather, it is white, a color that, within the Chinese five phases scheme, is associated with the planet Venus. I believe that clerics within the Esoteric tradition deliberately placed the white Hōkai Kokūzō Bosatsu in the center of this pentad because, in its independent form, the deity has a close association with Venus. As described above, this planet is involved in *gumonjihō*, the ritual for memory retention that focuses on Kokūzō Bosatsu. While I do not believe that the Five Kokūzō Bosatsu pentad was utilized in the ritual for memory retention, the association between the independent form of Kokūzō Bosatsu with the planet Venus (and by extension, the color white) was so intertwined that it was also integrated into the pentad by way of the prominent placement of the white-pigmented deity in the pentad.

In addition, at the moment of Śākyamuni's "great awakening," or enlightenment, the planet Venus is said to have appeared in the sky.[66] This planet was subsequently associated with merit and virtue, two elements essential for the attainment of Buddhist enlightenment. As noted above, Kokūzō Bosatsu is not only inextricably linked to Venus through the *gumonjihō*, but is also the manifestation of merit and virtue as noted in the *fukutokuhō* rite. This elucidates the doctrinally based reasoning behind the central positioning of the white-pigmented Hōkai Kokūzō Bosatsu, as well as influences from both the Indian and Chinese schemes of natural elements and their associated colors.

Conclusion

I have illustrated the color schemes of two major pentad configurations within the Japanese Esoteric Buddhist tradition and their significance within the larger religious milieu of the early and medieval periods. Considering the conflations of elemental schemes that formed throughout different regions and periods, it is evident that there were combinations of accrued systems in play when the iconographies of the Five Kokūzō Bosatsu and Five Wisdom Buddhas were created.

The alteration of imported belief systems is seen in Buddhist visual and textual sources in the early and medieval periods. Japanese priests who needed to create images with maximal efficacy took advantage of the multifaceted religious environment of early Japan that incorporated colors and created visual programs that served their patrons' needs. In this case, the patrons were emperors who needed to protect their realms from natural disasters.

The precise method by which the iconography of these two pentads came to be is unclear, but from the above analysis it is likely that Buddhist clerics used elemental schema that were significant both within the Esoteric tradition, as well as the larger religious episteme at that point. It is this iconography, with color at its core, that was carried into later visual depictions of the deities.

The compounding of iconography from a variety of sources may have helped strengthen the efficacy of the images in their ritual contexts. The usage of various five-part schema in Buddhist iconography references the building blocks that were believed to comprise all phenomena, thus illustrating the place of various deities within the Buddhist cosmos. It also calls upon these natural forces in an effort to control them and prevent disasters from wreaking havoc on the nation.

66. MD5:2118.

FIGURES 1, 2, AND 3

Zenmyō's True Colors

Demonstrating Non-Duality of Form and Emptiness in the *Kegon Scroll*

IKUMI KAMINISHI

Introduction

The Japanese word for color, *iro*, signifies more than hues and pigments. It also includes two deceptively unrelated meanings: physical form and sexual desire. Chroma, sexuality, and form—these extraneous significations reveal a particular cultural interest in different aspects of color that extend beyond the property of the optical senses to include sensual responses aroused by visual excitement to the phenomenon of light. In folk etymology, the Chinese character for color is said to have derived from a picture of a woman engaged in sexual intercourse with the man on top. The association of color with sexuality may also colloquially relate to the heightened color of physiognomic complexion in amorous affairs. The term *irohon* (color books) refers to erotic picture books. Form, another signification of color, refers to the Mahayana Buddhist concept of the formal existence of material things. In its Buddhist context the word is pronounced *shiki*.

This paper explores the associated meanings of color—sexuality and form—in the contexts of Japanese Buddhist art and literature. The main pictorial work of focus here is a Japanese illustrated handscroll (*emakimono*) from the temple of Kōzanji in northern Kyoto, the *Kegonshū soshi eden* (Illustrated history of the founders of the Kegon sect, 1224–25), hereafter the *Kegon Scroll*.[1] The scroll was originally known as the "Tales of Gishō and Gangyō," as it told the separate stories of two protagonists, the seventh-century Korean monks Gishō (K. Uisang, 625–702) and Gangyō (K. Wonhyo, 602–668), from Silla.[2] The abbot of Kōzanji, the eminent Myōe Kōben (1173–1232), was responsible for the production of the *Kegon Scroll* by choosing the biographical accounts of these Korean monks from the 988 Chinese anthology *Song Gaoseng zhuan* (Song biographies of eminent monks) (J. *Sō kōsōden*).[3] Myōe's selection of these monks reveals more than his interest in the Kegon School (Sk. Avatamsaka, C. Huayan). He sought in the stories opportunities to illustrate the fundamental Buddhist concepts of non-duality and transience in the world of *samsara* (continuous rebirths in the world of suffering) and *karma* (the law of moral causation). These ideas suggest what the Buddhist significations of color elucidate, namely, how the two levels of sensory responses to color—optical and sexual—relate to the gendered signification of enlightenment.

1. For the English translation of the scroll title, I referred to Tokyo National Museum information, http://www.tnm.jp/modules/r_exhibition/index.php?controller=item&id=2011&lang=en.

2. Karen Brock, "The Case of the Missing Scroll: A History and Reconstruction of the 'Tales of Gishō and Gangyō,'" *Archives of Asian Art* 41 (1988): 6–31.

3. The scriptural source, *Sō Kōsōden*, written by the Buddhist historian Zanning (919–1001), is compiled in the *Taisho Shinshu Daizokyo* [Taishō Tripitaka], 2061:50.0729, which is now online in *The SAT Daizokyo Text Database*, version 2012 (SAT 2012), http://21dzk.l.u-tokyo.ac.jp/SAT/index_en.html. The story of Gangyō is also compiled in the Korean source *Sangoku iji* (K. *Samguk yusa*) [Past events of the Three Kingdoms], which was written by the Korean Buddhist monk, Iryeon (1206–1289), but obviously this source dates later than the *Kegon Scroll*. Both must use the same Chinese source.

Gishō's Tale: Zenmyō's 'Color Desire'

Today, the *Kegon Scroll* consists of two parts—three scrolls for the Gangyō chapter and three for the Gishō chapter. At the time of its production, however, four scrolls were dedicated to the Gishō tale and only two to the story of Gangyō.[4] In 1547 the scrolls were looted by foot soldiers of the powerful feudal lord Hosokawa Harumoto (1519–1563). The scrolls were recovered, but in their subsequent conservation the original order and some sections of the scrolls were lost.[5] Nevertheless, both chapters begin with the same episode of their joint departure to study abroad at Chang'an, the capital of the Chinese Tang dynasty (618–907), to further their Buddhist education. They split up, however, at the harbor. Gangyō decided to remain and return to his home temple, and Gishō followed the initial plan alone.

The tale of Gishō, illustrated in the second half of the *Kegon Scroll*, focuses not on his study in China but rather on his encounter on his way to Chang'an with a beautiful young Chinese maiden named Zenmyō (C. Shanmiao) (fig. 1). This episode reveals Gishō's attitude toward sexuality, which also illuminates Myōe's own. The critical scene appears in the fifth scroll, which opens with a scene depicting Gishō disembarking from the ship from Silla. The narrative explanation, which appears at the end of the fifth scroll, describes the scene:

> Upon arriving at a Tang port, Gishō begins begging in a village that is the home of the famous beauty Zenmyō. Zenmyō eyes the handsome monk as, with dignity and resolve, he goes from door to door begging for alms. She approaches him with her exquisitely high-arched eyebrows and seductive voice, saying, "You, Dharma-teacher who have renounced the world of desire, benefit by being in the realm of the Buddha's teachings [*dharma*]. I honor the purity of your virtues, but my attachment to color desire [*shiki-yoku*] is difficult to end. No sooner did I gaze on your attractive appearance than my heart trembled. I implore you to be so compassionate as to satisfy my passion." However, Zenmyō's alluring countenance does not move Gishō's heart, which remains as steady as a rock. He replies with compassion, "I follow the Buddha's precepts and my physical needs and life are secondary. I teach the law of purity to save people. I have left the impure world of *color desire* long ago. If you trust my teaching, believe the Buddha's tenets and do not resent me." Zenmyō immediately understands him and experiences a sudden spiritual awakening.[6] [Emphasis added.]

Enlightened, Zenmyō becomes a model lay Buddhist. She confesses to Gishō in tears that she regrets her seductive advance, and pledges to follow Gishō to the Buddha world to save others, and to provide protection and material and financial support for him.

The rest of the scroll continues the story of Zenmyō a few years later, when Gishō finishes his study at the capital and returns to Silla. Zenmyō, learning that he took a different route to the harbor, hurries to the harbor, but is too late to meet him. A dramatic sequence of illustrations unfolds. Zenmyō is beside herself as she sees that Gishō's ship has sailed. She drops the offering box, which contains vestments she has prepared for Gishō, and throws herself on the ground in a paroxysm of grief (fig. 2). Her attendants too shed tears. This scene solicits heartbreaking compassion for Zenmyō. Her enlightenment may have relieved her from sexual desire, as though the color has faded,

4. Komatsu Shigemi, ed., *Kegonshū soshi eden* [Illustrated history of the founders of the Kegon sect], *Nihon emaki taisei* [Collection of Japanese illustrated handscrolls] 17 (Tokyo: Chūōkōronsha, 1978).

5. Kanazawa Hiroshi, "'Kegon shoshi eden' seiritsu no haikei to gafū [The historical background of the *Kegon Scroll*]," in *Kegonshū soshi eden* [Illustrated history of the founders of the Kegon sect], ed. Komatsu Shigemi, *Nihon emaki taisei* [Collection of Japanese illustrated handscrolls] 17 (Tokyo: Chūōkōronsha, 1978), 78–81.

6. *Kegonshū soshi eden*. Transcribed in *Kegonshū soshi eden* [Illustrated history of the founders of the Kegon sect], ed. Komatsu Shigemi, *Nihon emaki taisei* [Collection of Japanese illustrated handscrolls] 17 (Tokyo: Chūōkōronsha, 1978), 112. The translation is mine.

FIGURE 1
"Zenmyō confesses her love to Gishō," detail, *Kegonshū soshi eden* (Illustrated history of the founders of the Kegon sect), sixth scroll. Length 1595.5 cm, height 31.7 cm. Set of six handscrolls, ink and colors on paper. Kamakura period, ca. 1224–25. Kōzanji, Kyoto.

FIGURE 2
"Zenmyō cries on the ground after finding out that she missed Gishō's departure," detail, *Kegonshū soshi eden*, sixth scroll.

but clearly it never abated her attachment, however chaste, to Gishō.

The phrase 'color desire,' which appears twice in the text, refers to the Buddhist teaching of worldly desire, including sexual/color desire. Zenmyō, unable to control her own amorous affection, seeks relief and entreats Gishō to be compassionate and satisfy her desire. But Gishō is color-blind, so to speak, a result of his unyielding commitment to the Buddhist vow of abdication from the world of 'color desire.' His steadfast commitment to the Buddhist precepts and teachings leads Zenmyō to her spiritual awakening. Gishō calls the world of color impure, and the source of her suffering. Zenmyō understands that sexual satisfaction is only temporary and illusory. She also must become color-blind.

Fading Color and Sexuality: Ono no Komachi

The word 'color' works as an effective metaphor for the idea of sexuality in part because of color's propensity to fade. The conflated ideas of color as discoloration and sexual beauty gave poetic license to the ninth-century lady Ono no Komachi, a famous court beauty and one of the Six Immortal Poets (*Rokkasen*) of Heian Japan (794–1185). One of her poems included in the poetic anthology *Kokin wakashū* (*Kokinshū* for short, ca. 920) uses color as a metaphor for feminine beauty:

hana no iro wa
  The color [*iro*] of the flowers
utsuri ni keri na
  has faded indeed:
itazura ni
  in vain
waga mi yo ni furu
  have I passed through the world
nagame seshi ma ni
  while gazing at the falling rains.[7]

Komachi's expressed grief over the fading color of the flowers alludes to her own waning youth and beauty. Medieval literary critics, however, took the word 'color' as a double-entendre, relating it not only to the Buddhist concept of physical form but also to the idea of sexual appeal associated with Komachi's feminine beauty.

Historical accounts of Komachi scarcely exist, but her reputation, though not always flattering, was established by the end of the Heian period. Various late Heian and early Kamakura myths surrounding Komachi recount her poetic

7. Ono no Komachi, poem 113, in *Kokin wakashū* [A collection of Japanese poems past and present]. English translation in Joshua Mostow, *Pictures of the Heart: The* Hyakunin isshu *in Word and Image* (Honolulu: University of Hawai'i Press, 1996), 59.

brilliance, stunning looks, and her proud yet flirtatious nature. Such strong female imagery has led her to become one of the most popular leading characters of theatrical plays: at least seven Noh plays feature Komachi. Sara Strong points out that medieval Noh playwrights did not base their portrayals of Komachi on their readings of classical literature, but on biased literary commentaries.[8] The author of one of these commentaries, a courtier-scholar named Fujiwara no Kiyosuke (1104–1177) contributed to the establishment of Komachi as a promiscuous *femme fatale* in commentaries in his *Ōgisho* (Collection of poetry secrets).[9] Komachi's imagery as a haughty flirt induced Kiyosuke to interpret her 'color of the flowers' poem as a confession that she had dallied away her youth and beauty only to lose her ability to attract male suitors in her old age.

Medieval commentators on classical literature go so far as to name Komachi as the unidentified lady who exchanges love poems with the protagonist (Ariwara no Narihira, 825–880) in the *Tales of Ise* (author unknown, Heian period). This woman is labeled *iro-gonomi*, which Sara Strong translates as "coquettish."[10] Yet a woman described as *iro-gonomi*, literally 'having a penchant for color,' implies that she is more than coquettish and flirtatious. It suggests that she possesses a wanton nature. The medieval view of Komachi as 'having a penchant for color' implied that she was sexually insatiable.

Buddhist practitioners appropriated Komachi's image in their teachings regarding transience. Her beauty, that is, her exquisite color in the sense of external form, offered a site to present the concept of beauty as illusion. Even the famed beauty ages and loses sexual appeal. Komachi thus represents an ideal referent to illustrate the concept of transience, the essential tenet of Buddhist thought. To help realize this tenet in practice, Buddhist monks sometimes meditate on images of a beautiful woman's putrefying corpse. Komachi's name is thus sometimes attached to the set of nine visual images that depict a corpse in the process of decaying.

The chilling imagery of decaying cadavers is derived from a poem called "Nine aspects" (*Kusōshi*). Two versions of the same poetry subject exist; one is attributed to the ninth-century Japanese monk Kūkai (774–835, known posthumously as Kōbō Daishi) and the other to the eleventh-century Chinese literatus Su Shi (a.k.a. Su Dongpo, 1036–1101).[11] Both versions consist of a set of nine long verses that describe the process of corporeal decay in nine sequential stages. Significantly, when the "Nine aspects" poems became the source of paintings in Japan during the Kamakura (1185–1333) and Muromachi (1336–1573) periods, the depicted subject is consistently female although the poems do not specify the corpse's gender. The pictorial genre of this subject matter is known as *kusōzu*, or "pictures of the nine stages of a decaying corpse."

One of the oldest extant paintings of this visual topic is the fourteenth-century illustrated handscroll in the collection of Kyushu National Museum, which contains ten horizontally arranged sequential images. The scroll opens with the picture of an aristocratic young woman with long, lustrous black hair, dressed in a red kimono with a black outer robe. She represents a 'before' picture for the subsequent nine cadaver images. The first of the nine shows the same woman, now dead, lying on a green mat under a white robe with one of her breasts revealed. In the second and third stages of decay the woman's skin has darkened, her hair is disheveled, and her abdomen distended. The fourth and fifth stages of decay show her bloated body gradually deflating as maggots devour her flesh. In the sixth picture, we see her emaciated cadaver. In the seventh picture,

8. Sara M. Strong, "The Making of a Femme Fatale. Ono no Komachi in the Early Medieval Commentaries," *Monumenta Nipponica* 49, no. 4 (Winter 1994): 391–92.

9. Miyoshi Teiji, *Ono no Komachi kōkyū* [Study of Ono no Komachi] (Tokyo: Shintensha, 1992), 223–32.

10. Strong, "Femme Fatale," 398.

11. The Tendai priest and scholar Genshin (942–1017) also emphasized the visualization of a decomposing body in nine stages in his *Ōjōyōshū* [Essentials of salvation] as a method for quelling greed.

FIGURE 3
"Zenmyō turns into a dragon," detail, *Kegonshū soshi eden*, sixth scroll.

she incongruously has more flesh again, upon which dogs and crows feast. The eighth picture shows the skeleton, and the ninth shows her bones broken apart and scattered.

The *Kusōzu* in Kyushu National Museum does not identify the woman, but paintings of the same subject at the temples of Mandaraji in Aichi Prefecture and Anrakuji in Kyoto name the painted subject as the decaying body of Ono no Komachi. These paintings are hanging scrolls and are still used today as visual aids during pictorial preaching called *etoki* or 'picture explanation' performances.[12] Unlike the Kyushu National Museum painting, which arranges images from right to left on a horizontal handscroll, the set of three hanging scrolls at Anrakuji uses the vertical plane, and the images of decomposition appear in a natural landscape (fig. 4). These images are used to edify viewers regarding ideas of illusion, including the reality that sexual beauty is only skin-deep.

Non-dualism of Emptiness and Color

The practice of meditating on images of once-beautiful decomposing women was designed to help curb monks' sexual desire, a subject I have examined elsewhere.[13] Here, I am interested in exploring the idea of non-duality between physicality and emptiness by examining the concept of the impermanence of corporeal forms. Kūkai is said to have written that whenever he met a beautiful woman, he imagined her as a skeleton, lying in a grave.[14] His statement reflects an ancient Indian ascetic practice of meditation in front of female corpses in charnel fields. One of the earliest written recommendations of this meditation practice appears in the *Mahayanavimsaka* (Adoration of the Three Treasures), attributed to Nagarjuna in the second century CE. The fifth-century Sri Lankan monk Buddhagosa later advocates meditation on decaying corpses as a means to the path of purification.[15] The state of 'purified body' includes the Buddhist teaching of detachment from sexual desire that Gishō represents in the *Kegon Scroll*.

By the end of the Heian period, the allusion to fading colors had become a familiar trope that referred to the concept of impermanence. The idea is even canonized as basic knowledge as demonstrated by a mnemonic device for the Japanese alphabet, or the four-line *i-ro-ha* poem, which opens with the line that literally translates, "The color trails its scent even after

12. Ikumi Kaminishi, *Explaining Pictures: Buddhist Propaganda and Etoki Storytelling in Japan* (Honolulu: University of Hawai'i Press, 2006).

13. Ikumi Kaminishi, "Dead Beautiful: Visualizing the Decaying Corpse in Nine Stages as Skillful Means of Buddhism," in *A Companion to Asian Art and Architecture*, ed. Rebecca Brown and Deborah Hutton, Blackwell Companions to Art History 3 (Malden, MA: Wiley-Blackwell, 2011), 513–36.

14. Kūkai, *Hizō hōyaku to kaisetsu* [Secret treasury key and explanation], in *Gendaigo no Hizō hōyaku to kaisetsu* [Modern translation of Kūkai's *Hizō hōyaku*], trans. and ed. Shoun Toganoo (Kōya-chō, Wakayama: Koyasan Shuppansha, 1949).

15. Buddhagosa Bhadantacariya, *Visuddhimagga* [Path of purification] (fifth century), trans. Bhikkhu Nyanamoli, vol. 1 (Berkeley: Shambhala, 1976). See Elizabeth Wilson, "The Female Body as a Source of Horror and Insight in Post-Ashokan Indian Buddhism," in *Religious Reflection on the Human Body*, ed. Jane Marie Law (Bloomington: Indiana University Press, 1995), 76–99.

scattering." The poem, a remarkable composition that uses each of the forty-seven syllables of the Japanese syllabary exactly once, is a reminder that nothing remains in this evanescent world. The Buddhist scholar Ryūichi Abé gives it a more nuanced translation:

> Although its scent still lingers on, the form [color] of a flower has scattered away.
> For whom will the glory of this world remain unchanged?
> Arriving today at the yonder side of the deep mountains of evanescent existence,
> We shall never allow ourselves to drift away intoxicated, in the world of shallow dreams.[16]

Abé translated the word *iro* or 'color' into English as 'form.' His translation conveys the Buddhist meaning of the word *iro* as both form and the beauty associated with flowers. The association of color as form is a particularly Buddhist notion; it is rooted in the Mahayana teaching of non-dualism between the physical materiality of form and emptiness. The seminal scripture *Prajna Paramita Hridaya Sutra* (ca. first century CE?), better known by its English title, the *Heart Sutra*, puts the idea simply in a phrase, "Form is emptiness, emptiness is also form." The Chinese version of the *Heart Sutra* by the Tang monk Xuanzang (600–664) translates the phrase, "Color is emptiness, emptiness is also color." In other words, Xuanzang understood the meaning of form to be color. This is not a mistranslation, but rather reflects a fascinating interpretation.[17] The word for form in the Sanskrit version is *rupam* (Pali, *rupa*). *Rupam* is associated with the idea of solid, material bodies and defined forms, with its root *rup* (to form). Color, an optical phenomenon, acts as the agent that defines the contour and surface of physical objects.[18] Therefore Xuanzang applied the meaning of *rupam* as 'color' instead of translating *rupan* as 'body' or 'shape' or 'material' or 'form.' The Chinese translator saw the visual property two-dimensionally, rather than seeing three-dimensionally the corporeal aspects of material objects. He thus translated 'form' as the colored-in shapes of materials rather than concrete material things.

The *Heart Sutra* teaches the law of impermanence through a lecturelike setting with Avalokiteshvara Bodhisattva as a teacher of the crowd gathered by Shariputra, a Buddhist elder. Avalokiteshvara elucidates the profound course of the Perfection of Wisdom, according to Xuanzang's translation, by saying that "Color is emptiness, emptiness is also color." This phrase teaches the Buddhist truth and worldview of transience. Avalokiteshvara explains that 'color,' that is, 'form,' constitutes one of the six basic senses:

> Therefore, S[h]ariputra, in emptiness, there is no *form*, no feeling, no discrimination, no compositional factors, no consciousness, no eye, no ear, no nose, no tongue, no body, no mind, no *form*, no sound, no odor, no taste, no object of touch, no phenomenon.[19] [Emphasis added.]

Xuanzang translates *rupam* as 'color' every time the word appears, while English translations, such as that by Donald Lopez, quoted above, consistently translate it as 'form.' In the context of the *Heart Sutra*, the translation of *rupan* as 'color' helps to explain the universal truth that nothing exists permanently, including sensory organs such as the eye and ear. They, too, are not exempt from the law of impermanence. Every physical form is constantly in flux and in the process of transformation from one state to another. Xuanzang's translation of

16. Ryūichi Abé, *The Weaving of Mantra: Kūkai and the Construction of Esoteric Buddhist Discourse* (New York: Columbia University Press, 1999), 392.

17. Professor William Johnston points out that it is not clear whether Xuanzang actually translated the sutra from Sanskrit or whether it was composed in Chinese and reverse-translated. William Johnston (professor at Wesleyan University, Connecticut), in discussion with the author, October 2012. See also Jan Nattier, "The *Heart Sutra*: A Chinese Apocryphal Text?" *Journal of the International Association of Buddhist Studies* 15, no. 2 (1992): 153–223.

18. Nakamura Hajime, "Shiki" [Color], in *Bukkyō-go dai jiten* [Dictionary of Buddhist terms] (Tokyo: Tokyo Shoseki, 1975), 574.

19. Donald S. Lopez, Jr., *The Heart Sutra Explained: Indian and Tibetan Commentaries* (Albany: State University of New York Press, 1988), 19.

rupam as 'color' is revealing because all color fades with the passage of time. The temporal component of color's corporeality aptly illustrates the concept of transience.

The *Heart Sutra* repeats that there is no permanent form, and every form is no different from 'emptiness' or 'no-thing.' Here, the idea of emptiness or void is conceived as though it were an identifiable phenomenon, but since there is no such thing as an abstract idea existing as a concrete object, even emptiness does not exist. Within the teaching of non-dualism, both 'form' and 'void' are illusions. The following section explores the concept of non-dualism in representations of Zenmyō.

Many Colors of Zenmyō

The non-duality of form and emptiness is an important lesson, but how can one visually present such a paradox? In the case of the *Kegon Scroll*, the concept is revealed, quite literally, through the transformations of Zenmyō. After she discovers that Gishō's boat has left harbor, she tosses the offering box into the sea, hurries to the edge of the land, and dives into the surging water, to her servants' astonishment. The pictorial sequence is set in the same location, which appears twice as though it were two frames of a film. The next scene is one of the most fantastic of all Japanese handscroll illustrations. Zenmyō has transformed into a gigantic, serpentine Chinese dragon, a mythical creature that has deer horns, a fish-scaled body, spiky red fins, and four legs with hawk's claws (fig. 3). Floating on a black cloud and discharging lightning bolts, the Zenmyō/dragon stares ahead as it chases the boat, while men stand on the deck pointing at the pursuing creature. The offering box miraculously reaches the boat. Ultimately, the Zenmyō/dragon dives under the boat to secure its safe passage to Silla. By showing her power to safeguard Gishō, Zenmyō demonstrates that a woman who has renounced sexual color is able to become a protector of Buddhism.

The *Kegon Scroll* ends in this visually spectacular fashion, with the enormous dragon in a blue sea, but this is not the end of the story; the real final scene was mistakenly mounted on the fourth scroll during the conservation of 1546.[20] Were the dragon scene the actual finale, Gishō's story would appear simply as one of a number of strange Buddhist tales and give little credit to his doctrinal contribution to his native state of Silla, where he established the Kegon School of Buddhism. Under the royal patronage of King Munmu (r. 661–681), Gishō founded the first Kegon temple in Silla and became one of the most eminent monks in the state. Zenmyō is critically involved in his success by securing the temple that Gishō made into the Kegon Buddhist center. The true final vignette of the *Kegon Scroll* captures Gishō, in his formal robes, inside a temple in front of several student monks as well-dressed lay followers bring him gifts. The scene depicts him giving a lecture to his disciples at the temple called Fusekiji (K. Buseoksa), literally the mountain "temple of the floating rock" in Yeongju City. Gishō founded the temple in 676, and it is now known as Korea's oldest extant wooden structure.[21] Several legends explain the origin of the temple's name, one of which refers to the western hall that appears as though it were floating above a large rock.[22] The *Kegon Scroll* relates the origin of the name. It is narrated in the *Sō kōsōden* as follows:

> Upon returning from China, Gishō traveled around the country to find a suitable location for a Kegon center. He came across an old temple on a sacred mountain. Unfortunately, the resident monks, who had never heard of Kegon Buddhism, would not accommodate him. To help Gishō, Zenmyō/dragon lifted herself in the air and transformed herself

20. Kanazawa Hiroshi, "'Kegon shoshi eden' seiritsu no haikei to gafū," 78–81.

21. Soeck Jae Yim, *Roofs and Lines: A Study of Korean Architecture*, trans. Lee Jean Young (Seoul: Ewha Womans University Press, 2005), 5.

22. Francis Ching, Mark Jarzombek, and Vikramaditya Prakash, *A Global History of Architecture*, 2nd ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2010), 300.

FIGURE 4
Ono no Komachi's Decaying Corpse. Set of three hanging scrolls, ink and colors on paper. Edo period, seventeenth to eighteenth century. Anrakuji, Kyoto.

into a gigantic rock and hovered above the temple.[23]

Astonished by such an awe-inspiring sight, the terrified resident monks fled, allowing Gishō to put the temple to his intended use. Hence the temple is named the "temple of the floating rock" after Zenmyō in the form of a rock. The illustration of Zenmyō as a floating rock is not found in the current *Kegon Scroll*; it may have been destroyed or misplaced during the 1546 looting. Nevertheless Myōe's interest in women's involvement in Buddhism is evident in his selection of the Gishō/Zenmyō story for the illustrated scroll. By manifesting her power to safeguard Gishō, Zenmyō again demonstrates that a woman may become a protector of Buddhism, an ability she gained after she had renounced sexuality.

Zenmyō thus has multiple 'colors,' that is, 'forms': She is a beautiful maiden, a gigantic dragon, and a floating rock. She changes not only from a human to a mythical creature but also from an animate being to an inanimate one. Zenmyō's transformations beg the question of her true color. Does she indeed have one? The suggestion of being without a lasting form aligns with the Buddhist teaching that all forms are illusion, which, in turn, directly relates to the other concept of color, discussed above in the context of the *Heart Sutra*. By the Buddhist account, all color is illusion, thus all three of Zenmyō's forms are illusion. As the *Heart Sutra* teaches non-dualism verbally, the *Kegon Scroll* illustrates the same idea through a visual spectacle.

The other protagonist of the *Kegon Scroll*, Gangyō, articulates further the concept of non-dualism. Gangyō set off together with Gishō but terminated his original plan to study in China after experiencing a strange dream as they journeyed to the harbor. Gishō and Gangyō took shelter in a cave one night. The next morning they realized that they had slept in a burial cave. Heavy rain prevented them from going further all day, and they had no choice but to spend another night in the cave. While Gishō slept soundly, Gangyō suffered a nightmare in which he saw a monstrous *oni* (demon or ghost). Upon awakening, Gangyō realized that his knowledge of the cave's true identity had disturbed him. His nightmare originated from his preconception that there were dead spirits in physical forms (*oni*) in the cave, but he then realized that these demons were real only in his mind. With this awakening, he understood that the idea of a master in a distant land (China) was also an illusion, and that a teacher was already present within himself. For this reason, he abandoned his journey to China with Gishō.

Myōe must have realized the importance of Gangyō's dream: the same episode appears twice in the *Kegon Scroll*, at or near the beginning of both chapters, confirming the critical role of the episode. The demons in each chapter have wild and untamed appearances, although they are not identical. The landscape composition surrounding the cave as well as the number of sleeping men in each case are different, but both scenes depict an aggressive and horrifying demon. The demons convey an irate intensity through the red-hued tones of their muscles, bulging eyes, and fanged teeth. Gangyō attains enlightenment immediately after this episode, a scene that is reminiscent of the moment of Siddhartha Gautama's enlightenment after his encounter with Mara, the personified representation of earthly existence who tries to prevent Siddhartha from attaining his spiritual awakening.[24] Buddha's life story describes Mara's disruptive forces, including his seductive daughters and his powerful army. Mara thus signifies attachment to aspects of color. In visual art, such as the sculptural frieze from the Great Stupa at Sanchi in India (first century BCE), Mara is depicted sometimes as a handsome king

23. Zanning, *Sō Kōsōden* [Chinese: Da Song gao seng zhuan; English: Hagiographies of famous monks], 2061:50.0729b11–12. The translation is mine.

24. This observation was made by Joshi Cohen-Hausman, a graduate student in a course on Japanese narrative scrolls that I taught at Tufts University in 2007.

surrounded by beautiful daughters and sometimes as a warmongering king with a hideous physical appearance. Gangyō is like Siddhartha who "defeats" Mara's army. Indeed, Karen Brock writes, "Upon awakening [Gangyō] realizes the essential Mahayana truth that nothing exists apart from the mind . . . he knows that neither the tomb nor the demon in his dream truly exist."[25] The *Kegon Scroll* is consistent with the teaching of non-duality.

The idea that all forms are illusion means that there is no such thing as a concrete or permanent form. Zenmyō's transformations therefore have no intrinsic value, so to speak, but they are expedient tokens that take appropriate shapes for specific circumstances. In other words there is no inherent goodness or evil in her various forms (colors). For example, in order to protect Gishō Zenmyō took the form of a dragon. She needed to become a large water creature capable of carrying a ship. A dragon, a large, powerful creature traditionally associated with water, rivers, and rainclouds, was a natural choice. There was no reason for Zenmyō to take a dragon form as opposed to any other. In this case, the dragon was benevolent and a protector of Buddhism and its doctrines. In a different context, however, a dragon could have malicious intentions, as Myōe illustrates by contrasting the story of Zenmyō's dragon form with a famous legend of a woman who became a gigantic and malevolent she-serpent.

Poisonous Colors

Myōe alludes to a famous old folktale from his native province, Kii (present-day Wakayama Prefecture), which tells the story of a woman who turned into a gigantic and malevolent serpent as a result of her excessive lust.[26] At the beginning, the narrative structure resembles the Gishō tale, but, because of the man's false promises, the outcome is the opposite. A young monk, on a spiritual pilgrimage to the sacred mountains of Kumano in the Kii Peninsula, seeks to stay at an inn in a nearby town. Kiyohime, the innkeeper's daughter (or the inn's mistress, depending on the source) falls in love with this handsome monk and propositions him. He tells her that he must stay pure from temptation to sexual (color) desire during his religious pilgrimage, and falsely promises to fulfill her wishes on his way back. Instead, he takes a different route when he returns from Kumano. Realizing that she has been deceived, the young woman sprints across the town in pursuit of the escaped monk. She is described as *iro-kichigai* (literally 'color crazed'), which has overtones of nymphomania. Her intense rage begins to turn her into a fire-spitting dragonlike serpent. The she-serpent crosses the Hidaka River to reach the temple of Dōjōji where the monk has retreated, and during the crossing the change is completed. Again, water signifies a liminal area of metamorphosis;[27] the human-to-dragon transformation in both tales takes place in water. Fleeing the Kiyohime-serpent, the frightened monk takes refuge under the temple bell, but in vain; the enraged serpent wraps herself around the bell and melts them both with the heat of her wrath.

This is a durable tale whose adaptations have been translated into a wide variety of genres and media, including Buddhist sermons, Noh and Kabuki plays, literary novels, and pictorial arts.[28] One of the most famous renditions is the illustrated handscroll, *Dōjōji engi emaki* (Illustrated origins of Dōjōji), a temple treasure belonging to Dōjōji, a well-known Tendai temple in Wakayama Prefecture. The painting is attributed to Tosa Mitsushige (act. late fourteenth–early fifteenth century). The

25. Karen Brock, "Chinese Maiden, Silla Monk: Zenmyō and Her Thirteenth-Century Japanese Audience," in *Flowering in the Shadows: Women in the History of Chinese and Japanese Painting*, ed. Marsha Weidner (Honolulu: University of Hawai'i Press, 1990), 187.

26. Komatsu Shigemi, *Kegonshū soshi eden*, 111.

27. Susan Klein, "When the Moon Strikes the Bell: Desire and Enlightenment in the Noh Play *Dōjōji*," *The Journal of Japanese Studies* 17, no. 2 (1998): 309.

28. Virginia Skord Waters, "Sex, Lies, and the Illustrated Scroll: The *Dōjōji Engi Emaki*," *Monumenta Nipponica* 52, no. 1 (1997): 59.

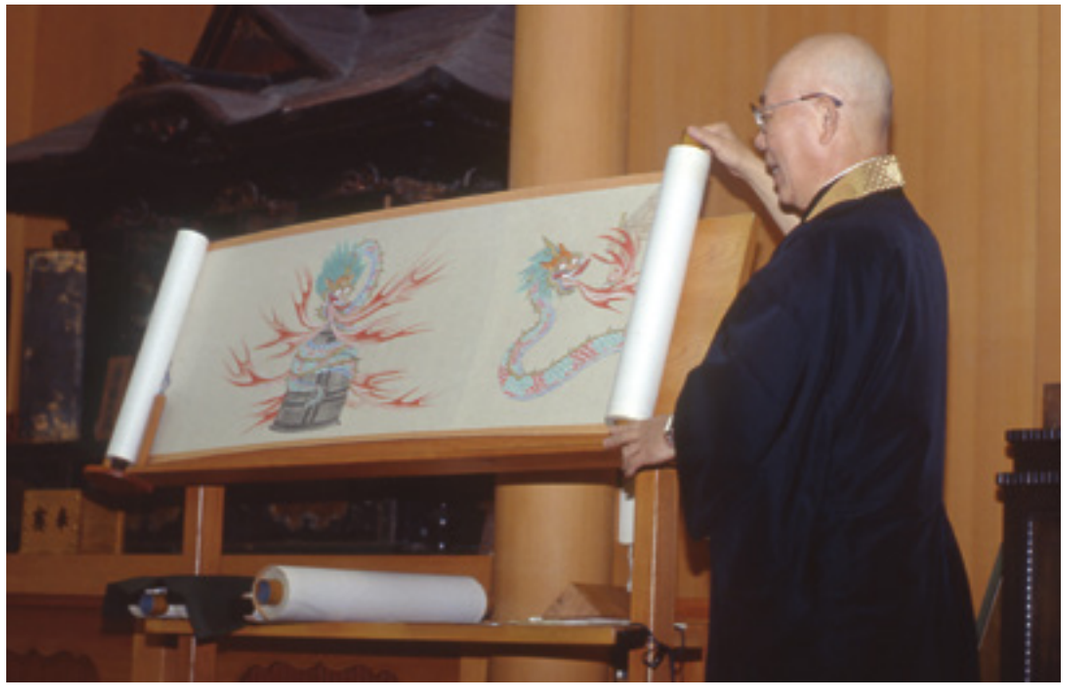


FIGURE 5
Abbot Ono no Jokan performing *etoki* on the *Dōjōji engi emaki* (The illustrated origin of Dōjōji). Handscroll, ink, and colors on paper. Dōjōji, Wakayama Prefecture.

woman is unidentified in the earliest literary sources, the Heian-period anthologies called *Dai Nihon-koku Hokkekyō genki* (Miracles of the Lotus, mid-eleventh century) and *Konjaku monogatari-shū* (Tales of times now past, twelfth century).[29] However, today, monks at Dōjōji identify the monk as Anchin and the woman as Kiyohime in their *etoki* sermon, "The love tragedy of Anchin-Kiyohime," using a modern replica of the illustrated Dōjōji scroll as an indispensable visual aid (fig. 5).[30] The illustration shows Kiyohime slowly transforming into a dragon. This is in contrast to Zenmyō, whose transformation into a dragon was instantaneous. At first Kiyohime's face looks reptilian, then her body above the neck becomes a scaled snake while the rest of her body and her limbs are still human. Finally, as she crosses the Hidaka River, her body is transformed completely into a serpent with the head of a single-horned dragon.

In a dramatic visual spectacle, Zenmyō and Kiyohime both transform into serpent-like beings before the viewer's eyes, but there the likeness ends. The dragon and the serpent exhibit contrasting values, indicating that dragon-serpents are not inherently good or evil in themselves. Buddhist stories of a protagonist who assumes different forms, or 'colors,' is a narrative strategy that occurs throughout the Buddha Shakyamuni's many *jataka* tales, the moralizing stories of his previous lives. *Jatakas* convey the compassion of Shakyamuni in previous existences, including those of a monkey or a deer. The Buddha has gone through many births, or colors; he has no single form. His death, or *parinirvana*, is often explained as his release from this physical realm and the cycle of rebirth. To examine the life of the Buddha in light of the teaching of the *Heart Sutra*, the Buddha's *parinirvana* is the emptiness and his *jataka* births are the colors. Buddha's life

29. Two of the oldest extant literary works are the Heian-period anthologies titled *Dai Nihon-koku Hokkekyō genki* (a.k.a. *Hokke kenki* [Miracles of the lotus] (mid-eleventh century) by a monk named Chingen (dates unknown), and the *Konjaku monogatari-shū* [Tales of times now past] (twelfth century). The name Anchin is first found in the medieval history text, *Genkō shakusho* (1322), written by the Rinzai Zen monk Kokan Shiren (1278–1346); Kiyohime is first found in the much later Muromachi-period text *Kengaku no Soshi* [Tale of the wise and learned]. See Waters, "Illustrated Scroll," 64. Waters dates the publication of *Genkō shakusho* to 1332, but its inscription states Genkyo 2 (1322).

30. Kaminishi, *Explaining Pictures*, 119.

story proves the doctrine that there is no difference between emptiness and form/color. By the same token, Zenmyō and Kiyohime have no single 'color,' but their actions have consequences, just as the Buddha's previous births did.

Buddhist tales teach the concept of *karma*, a belief that people's actions in this present world affect their future lives positively or negatively. In the case of *jataka* stories, the future Buddha demonstrates kind acts through many births (colors), which accumulate benevolent *karma*. The enlightened Zenmyō and passion-driven Kiyohime accumulate opposite *karma*. Indeed, Kiyohime's passions affect Anchin as well as herself, by causing him to lie. As a consequence, they are intertwined: in the *Dōjōji emaki*, they appear to the abbot of Dōjōji in a dream as two entwined little snakes. These snakes appeal to the priest to perform a salvation ritual on their behalf by copying and reciting the *Lotus Sutra* (Sk. *Saddarma pundarīka sutra*).[31] Awakening from the dream, the abbot led monks in the pacification ritual. The effect of the *Lotus Sutra* is immediate: Anchin and Kiyohime, regaining human forms, ascend to the realm of heaven. This is a clear case of aggrandizing the power of the sutra. Virginia Waters reiterates Michael Kelsey's analysis that many Buddhist tales relate stories of human-snakes too closely intertwined to distinguish between victim and aggressor.[32] This is yet one more instance of the precept that forms are illusions.

Conclusion

In this essay I have focused on the corporeal aspects of the term 'color' in Buddhist contexts, which include sexuality and form. It is not a coincidence that Buddhists coined the words *shiki-yoku*, literally 'color desire,' to denote sexual desire, and adopted female images to represent color, or sexual, desire in many paradigmatic stories. An unchaste woman, described as a 'color-crazed' woman, is juxtaposed with an austere man, like Gishō, who has the ability to withstand the temptation of 'color desire.'

Since women represent sexuality in medieval Japanese texts, the female body offers a preeminent site for teaching the Buddhist tenets of non-duality, *karma*, and impermanence. Zenmyō and Kiyohime are convenient protagonists who manifest a specific Buddhist agenda. Zenmyō's story adds a didactic moral and dramatic interest to the otherwise rather ordinary story of Gishō. Indeed, Zenmyō performs a large role in the story, not only playing a critical part in Gishō's establishment of the Kegon School in Silla, but also acting as an edifying model for the Japanese female audience. The monk Myōe, the founder of Kōzanji, also founded a nunnery in Hiraoka as a subtemple of Kōzanji, to harbor female patrons who had lost their husbands and sons in the 1221 rebellion of Emperor Gotoba (r. 1183–1198) against the Kamakura shogunate (the Jōkyū Disturbance).[33] He named the convent Zenmyōji, the temple of Zenmyō. The scrolls, intended for the comfort and instruction of the Zenmyōji nuns, taught that an awakening of faith or enlightenment and the cessation of suffering are as available to women as they are to men.[34] This belief was not uncontroversial at the time.

Skepticism regarding the ability of women to attain religious awakening is a discourse that appears throughout the history of Buddhism. More often than not, Buddhist attitudes toward women express misogynistic condemnation, and much Buddhist literature and visual imagery seem to support this view. Female sexuality—but somehow not so much male sexuality—hinders both men and women from attaining enlightenment. A practical approach to Buddhism promoted the practice of contemplating a female cadaver as a way

31. Waters, "Illustrated Scroll," 73.

32. Ibid.

33. Bernard Faure, "Kegon and Dragons: A Mythological Approach to Huayan Doctrine," in *Reflecting Mirrors: Perspectives on Huayan Buddhism*, ed. Imre Hamar (Wiesbaden: Otto Harrassowitz Verlag, 2007), 304.

34. Myōe's effort to help women is documented, as detailed in Brock, "Chinese Maiden," 185–218.

to substitute revulsion for desire. A woman's position in Buddhism has been secondary; her voice is often misunderstood and her body violated, as in the case of Ono no Komachi. Interpreting these images as evidence of Buddhist misogyny is certainly possible. A negative view toward women echoes the negative attitude toward the human body in general found in many Buddhist texts. However, Sue Hamilton points out through her examination of Theravada texts that the Buddha's attitude toward the body is neither positive nor negative, as the body is not the karmic source of consequences.[35] The body is merely a form.

Reading a woman and her body negatively may be colored by our own bias that supports the idea that the mind is superior to matter. As I have tried to show, Buddhist texts maintain a consistent gender assignment in concert with the dichotomous positions between form and emptiness, desire and enlightenment. Images of female transformation, whether in a series of images of a decaying corpse or metamorphosis into a dragon, vividly paint the nuanced meanings of color through physicality, sexuality, and femininity.

Feminine association with physicality, or 'color,' makes this transformation possible. Transformation as a form of reproduction or rebirth is women's property. Gender assignment is consistent in these stories. The female body as a site of transformation apprehends the fundamental Buddhist belief in reincarnation, or the continual chain of births and rebirths from one body to the next. In fact one does not have to go through rebirths: as Zenmyō shows in her transformations, one always has multiple forms of existence. Thus, there is no original form. Zenmyō's final message, in other words, is that there is ultimately no such thing as true 'color.'

35. Sue Hamilton, "From the Buddha to Buddhaghosa, Changing Attitudes Toward the Human Body in Theravada Buddhism," in *Religious Reflections on the Human Body*, ed. Jane Marie Law (Bloomington: Indiana University Press, 1995), 52.

FIGURE 6 (detail)

Daoist Uses of Color in Visualization and Ritual Practices

SHIH-SHAN SUSAN HUANG

This chapter explores the uses of color in the visual culture of early and medieval Daoism, China's indigenous religion. The main primary source for this investigation is the imperially sponsored *Daozang* (Daoist Canon) printed during the Zhengtong reign in 1445.[1] It contains a vast collection of illustrated material, including many texts that date from medieval times. The study will focus on two uses of color: first, in images used in private visualizations, and second, in objects and artifacts used in public ritual. Private images associated with an adept's visualization practices include illustrations of body gods—the divine and protective entities believed to reside in various parts of the body—and portrayals of mental journeys to the stars. Both are depicted in numerous meditative manuals dating from the Six Dynasties (420–589) and the Tang (618–907) and Song (960–1276) dynasties. The second part of this study examines Daoist liturgical manuals from the twelfth to thirteenth centuries to investigate the use of color in banners, paper, and written documents displayed in public Daoist rituals.

Color in Visualization of the Inner Body

Early and medieval Daoist visualization manuals that circulated internally among ordained Daoists contain rich information about color in Daoism. Literary sources predate visual documentation. One of the earliest Daoist texts on the subject is the *Taiping jing* (Scripture of the great peace).[2] The text, in which the earliest surviving layers date to the second century, advocates the use of painted images of body gods as meditation aids to prevent sickness. The text states that the images should be painted in full color and displayed in an empty and sunlit meditation room. The adept should face the painting in solitude and visualize the body gods appropriately.[3] According to the *Xuanxiang huanshen fa* (Method of hanging images to call back the [body] gods), different body gods depicted in the painting should appear in different colors that correspond to their associated seasons and organs in the five phases paradigm. Hence, those associated with spring are in blue (*qing*), those associated with summer are in red (*chi*), those associated with fall are in

1. The *Daozang*, Daoist Canon, contains a vast collection of material, including illustrations for visualization, body charts, ritual diagrams, cosmological maps, talismans, and magical scripts. Of the nearly 1500 texts, many date from medieval times and were preserved in the now-lost twelfth-century canon compiled under Emperor Huizong (r. 1110–1125); over half of the manuscripts come from liturgical texts written between the tenth century and the 1445 printing. For an introduction to the Daoist Canon, see Shih-shan Susan Huang, *Picturing the True Form: Daoist Visual Culture in Traditional China* (Cambridge, MA: Harvard University Asia Center, 2012), 18–21. In this article, Daoist texts from the Daoist Canon are numbered according to Kristofer Schipper and Franciscus Verellen, eds., *The Taoist Canon: A Historical Companion to the Daozang* (Chicago: University of Chicago Press, 2004), and follow the *Sanjia ben* edition in thirty-six volumes of *Daozang* (Beijing: Wenwu chubanshe, Shanghai: Shanghai shudian, and Tianjin: Guji chubanshe, 1988).

2. Wang Ming, *Taiping jing hejiao* [Annotation of the *Scripture of the Great Peace*] (Beijing: Zhonghua shuju, 1960).

3. Lin Fushi, "Shilun 'Taiping jing' de jibing guannian" [A study of the concept of disease in the *Scripture of the Great Peace*], *Zhongyang yanjiuyuan lishi yuyan yanjiusuo jikan* 62, no. 2 (1993): 236–38; Lin Fushi, *Jibing zhongjie zhe: Zhongguo zaoqi de daojiao yixue* [The disease terminator: Daoist medicine in early China] (Taipei: Sanmin shuju, 2001); Barbara Hendrischke, *The Scripture on Great Peace: The Taiping jing and the Beginnings of Daoism* (Berkeley: University of California Press, 2006); Shih-shan Susan Huang, "Daoist Imagery of Body and Cosmos, Part 1: Body Gods and Starry Travel," *Journal of Daoist Studies* 3 (2010): 61–62; Lennert Gesterkamp, *The Heavenly Court: Daoist Temple Painting in China, 1200–1400* (Leiden: Brill, 2011), 186–87.

Phases	Direction	Color	Season	Organ 1	Organ 2
wood	east	blue	spring	liver	gall
fire	south	red	summer	heart	small intestine
earth	center	yellow		spleen	stomach
metal	west	white	fall	lungs	large intestine
water	north	black	winter	kidneys	bladder

TABLE 1

white (*bai*), those associated with winter are in black (*hei*), and those associated with all four seasons are in yellow (*huang*).[4] Elsewhere in the same text, the *Zhaijie sishen jiusi jue* (Method of fasting and meditating on the spirits to rescue oneself from death) advises the adept to use painted images of the body gods of the five organs and corresponding cosmic divinities as visual meditation aids to attain eternal life.[5] Depicted on plain silk, these deities wear garments whose colors correspond to the five phases. Their matching cosmic divinities, who appear as twenty-five anthropomorphic gods mounted on celestial steeds, are divided into five groups corresponding to the five directions: north, south, east, west, and center. They wear bonnet-caps and are equipped with a variety of weapons, including arrows, crossbows, axes, gilded shields, and swords.[6] While the text does not specify the color–organ correspondence, the following table of cosmic correspondence, based on Livia Kohn's summary, charts the corresponding relationships of the five phases, cosmic directions, colors, seasons, and body organs (table 1).[7]

As indicated in table 1, the five inner organs marked as 'organ 1' are heart, liver, lungs, kidneys, and spleen. These organs are particularly crucial to Daoist visualization practices, and are associated with the colors red, blue, white, black, and yellow, respectively. Indeed, in numerous Daoist meditation texts, these five organs are simply described metaphorically as colorful architectonic symbols. For example, the heart is represented by the Scarlet Palace (*Jianggong*) and the spleen by the Yellow Court (*Huangting*). Although it is not one of the five primary colors of the five phases, purple (*zi*) is often evoked as a superior color as well. For example, in the *Laozi zhong jing* (Central scripture of Laozi), dating arguably to the Later Han (25–220) dynasty,[8] the gallbladder, the residence of the Lord of the Dao (*Daojun*), is referred to as the Purple Chamber (*Zifang*), a term rooted in early alchemy.

One of the most popular visual conventions in picturing Daoist body gods is to highlight their physical appearances as bureaucrats reporting to the stars. A good example is the Highest Clarity document on visualization, the *Dadong zhenjing* (Perfect scripture of the Great Cavern), collated on Mount Mao (*Maoshan*) by the Southern Song (1127–1279) patriarch Jiang Zongying (d. 1281).[9] Composed of stanzas, the

4. The English translation is mine. For the punctuated Chinese text, see Wang Ming, *Taiping jing hejiao*, 21–22.

5. Ibid., 292–93.

6. Ibid., 293.

7. Cf. Livia Kohn, *Introducing Daoism* (New York: Routledge, 2008), 84.

8. Zhang Junfang (ca. early eleventh century), *Yunji qiqian* [The bookcase of the clouds with seven labels], ed. Li Yongsheng, *Dao jiao dian ji xuan kan* [Selected compilation of Daoist texts] (Beijing: Zhonghua shuju, 2003), juan 18–19. For a slightly different version, see *Taishang laojun zhongjing* [Central scripture of the Supreme Lord Lao], DZ 1168, *Daozang* 27:141–56. For a study, see Kristofer Schipper, *The Taoist Body*, trans. Norman Girardot (Berkeley: University of California Press, 1993), 108–12; Schipper, "The Inner World of the Lao-tzu chung-ching," in *Time and Space in Chinese Culture*, eds. Chun-chieh Huang and Erik Zürcher (Leiden: E.J. Brill, 1995), 114–131; Sara Elaine Neswald, "Internal Landscapes," in *Internal Alchemy: Self, Society, and the Quest for Immortality*, eds. Livia Kohn and Robin R. Wang (Magdalena, NM: Three Pines Press, 2009), 30–33.

9. *Dadong zhenjing* [Perfect scripture of the Great Cavern], DZ 6, *Daozang* 1:513b–555c. For selected studies, see Isabelle Robinet, "Le Ta-tung chen-ching: Son authenticité et sa place dans les textes du Shang-ch'ing ching" [*The Perfect Scripture of the Great Cavern*: its authenticity and its place in the scriptural texts of the Highest Clarity Daoism], in *Tantric and Taoist Studies in Honour of R.A. Stein*, ed. Michel Strickmann (Brussels: Institut Belge des Hautes Études Chinoises, 1983), 2:394–433; Robinet, *Taoist Meditation: The Mao-Shan Tradition of Great Purity*, trans. Julian F. Pas and Norman J. Girardot (Albany: State University of New York Press, 1993), 97–117.

FIGURE 1
The twelve kingly figures associated with Mercury wear imperial robes in yellow and descend to the spleen, an organ that is associated with yellow. *Dadong zhenjing* (Perfect scripture of the great cavern), DZ 6, *Daozang* 1:517a.

FIGURE 2
Shangqing qionggong lingfei liujia zuoyou shangfu (Six *Jia* talismans for summoning the *lingfei* [Maidens] of the Qionggong Palace), DZ 84, *Daozang* 2:175a.

scripture is intended to be recited as the adept visualizes body gods and cosmic divinities. It emphasizes the relationship between the divinities residing in the body and those in the heavenly sphere, encouraging the adept to embark on ecstatic journeys, soaring into the sky, absorbing cosmic energies, and merging with the Dao. By concentrating the mind, meditating, and breathing consciously, the adept can visualize his saliva condensing into various forms of body gods.

A common template shared by most of the fifty illustrations in the *Dadong zhenjing* shows a seated adept positioned frontally or with his back to the viewer, visualizing a group of body gods floating on a cloud mass emanating from his head. These body gods are the bodily presences of the planetary divinities of Venus, Mercury, Mars, Jupiter, Saturn, the Sun, and the Moon.[10] Their dress varies in style and color according to their rank and body location. For example, the twelve kingly figures (fig. 1) associated with Mercury wear imperial robes in yellow and descend to the spleen, which is also associated with yellow,[11] and the eight officials associated with Mars are dressed in red (*chi*) as they enter the scarlet (*jiang*) palace of the heart.[12] There are many more body gods illustrated in Daoist visualization manuals, of which most include detailed textual descriptions of the specific colors of their garments, caps, shoes, and tablets (fig. 2).[13] The stereotypical representations of the body gods not only correspond to the imagery of divinities summoned in ritual but also resemble the typical devotional images depicted in Daoist grottoes and temples, such as those depicted in the fourteenth-century

10. The numbers of planetary deities from each star vary: Jupiter has nine, Mars eight, Venus seven, Mercury five, and Saturn twelve; see *Dadong zhenjing*, DZ 6, *Daozang* 1:516–18. For more study of this illustrated text, see Huang, "Daoist Imagery of Body and Cosmos, Part 1," 64–67.

11. *Dadong zhenjing*, DZ 6, *Daozang* 1:517a.

12. *Dadong zhenjing*, DZ 6, *Daozang* 1:518a.

13. *Shangqing qionggong lingfei liujia zuoyou shangfu* [Six *Jia* talismans for summoning the *lingfei* (Maidens) of the Qionggong palace], DZ 84, *Daozang* 2:175a.

FIGURE 3
Illustrations of the nine worms. Rearranged by this author from *Taishang chu sanshi jiuchong baosheng jing* (Scripture of the most high for the protection of life through the elimination of the three corpses and the nine worms), DZ 871, *Daozang* 18:700–701.

mural in the Temple of Eternal Joy (*Yongle gong*) in southern Shanxi.[14] The colors, however, are not necessarily the same.

Similar attention to color is also applicable to the visualization of the grotesque-looking body worms residing in the human body that can cause sickness or death.[15] The illustrations of the nine worms (*jiuchong*) (fig. 3),[16] for example, include inscriptions that denote their individual colors of blue-green, black, white, or red. Visualizing such bodily spirits in their concrete form and color allowed the adept to control or expel them, a feature that led to the creation and proliferation of images of such body entities.

The purpose of stressing colors in visualization practice is perhaps to help the adept visualize the imagined image in a more concrete fashion. A comparison of a black-ink printed depiction of a visualized image called *choutian* (adding and taking away), illustrated in the thirteenth-century inner alchemy manual preserved in the fifteenth-century Daoist Canon (fig. 4),[17] and a colored version of a similar image, depicted in an eighteenth- or nineteenth-century handscroll in the White Cloud Temple Collection,[18] illustrates the point. Both images depict the same episode from the same illustrated text of internal alchemy. The image features a cauldron on a three-tiered altar, a symbolic reference to the body transformed in internal alchemy. A round shape at the center of the cauldron symbolizes liquefied gold—the end product of inner alchemy. Two harmful body spirits, depicted as hybrid one-legged creatures, flee the boiling cauldron. The colored version of this episode is clearly more effective in articulating the blue and white dragons swirling around the alchemical cauldron, as well as the exiting body spirits shown inside the cloudlike enclosure emanating from the red elixir forming in the cauldron.

One finds the most elaborate color instructions in Daoist visualization texts dealing with the adept's imaginary journey to the stars, such as the *Wudou sanyi tujue* (Illustrated instructions for visualizing the Three Ones in the Five Phases of the Northern Dipper), a Highest Clarity document from the Six Dynasties

14. See, for example, Xiao Jun, *Yonglegong bihua* [The murals of the temple of eternal joy] (Beijing: Wenwu chubanshe, 2008), 135.

15. For more study of the body souls and body worms, see Shih-shan Susan Huang, "Daoist Imagery of Body and Cosmos, Part 2: Body Worms and Internal Alchemy," *Journal of Daoist Studies* 4 (2011): 32–41; also Huang, *Picturing the True Form*, 52–65.

16. *Taishang chu sanshi jiuchong baosheng jing* [Scripture of the most high for the protection of life through the elimination of the three corpses and the nine worms], DZ 871, *Daozang* 18:700–701.

17. *Jinye huandan yinzheng tu* [Illustrations of the return of the liquefied gold to the cinnabar field], DZ 151, *Daozang* 3:103c–110a.

18. Huang, *Picturing the True Form*, 65; Stephen Little and Shawn Eichman, eds., *Taoism and the Art of China* (Chicago: Art Institute of Chicago, 2000), 344–47.

FIGURE 4
Episode of "Adding and Taking Away," detail from *Jinye huandan yinzheng tu* (Illustrations of the return of the liquefied gold to the cinnabar field), DZ 151, *Daozang* 3:107a.

(fig. 5).[19] Owing to its position as the bridge between the sun and the moon, the Northern Dipper played an important role in medieval Daoist visualization. This illustrated text thus focuses on the adept's ecstatic journey to and beyond the Northern Dipper at the Eight Nodes of the year, that is, at the beginning of each of the four seasons plus the four solstices and equinoxes. One of the accompanying illustrations (fig. 5) depicts the springtime journey to the first star of the Northern Dipper, *Yangming* (Yang Brightness), and shows the adept seated at the right of the picture, facing the Northern Dipper at the upper left. The Northern Dipper is represented as a graphic configuration of seven dots lined up like a scoop with a handle. A young lady standing below the Dipper may represent the celestial attendant of the first star.[20] Between the adept and the Dipper are two groups of seven figures seated on clouds and moving in opposite directions, one ascending and one descending. The groupings of seven echo the seven visible stars of the Northern Dipper.[21] The figures in each group wear bureaucratic robes and hold audience tablets. The explanatory notes above the illustration designate the adept at the center as a 'perfected being' (*zhenren*), with clothing different from that of the others.[22] The group at the bottom ascending to the Northern Dipper represents the adept and includes the body gods called the Three Ones (*Sanyi*), as well as other internal divinities. The group on top descending from the Northern Dipper may indicate the adept's journey back to earth.

The explanatory notes accompanying this Six Dynasties illustration provide valuable information about the idea and function of color in the art of Daoist illustrations. According to the inscriptions, which may have functioned as color guides for illustrators, the adept depicted in larger size to the right of the picture plane wears a robe of light red (*qianhong*) with black (*zao*) trim and purple (*zi*) strips along the waist with a bluish-green (*bi*) cap. In the round-trip journeys appearing at the center of the illustration, however, he is depicted slightly differently, with a bluish-green (*bi*) cap, a jade (*yu*) tablet, a bluish-green upper garment trimmed in blue-green (*qing*), and a scarlet (*jiang*) skirt. The six body gods traveling with him are divided into two groups differentiated by different dress codes. The Three Officials (*Sanguan*), perhaps the three depicted in front of the adept in both the departing and returning trips, wear golden (*jin*) caps, light red (*qianhong*) upper garments with blue-green (*qing*) borders, and scarlet (*jiang*) skirts, and hold jade (*yu*) tablets. The Three Chancellors (*Sanqing*), perhaps referring to the three seated figures behind the adept in the two clusters of clouds, wear bluish-green caps decorated in gold, light red upper garments with black (*zao*) trim, and

19. *Wudou sanyi tujue* [Illustrated instructions for visualizing the Three Ones in the Five Phases of the Northern Dipper], DZ 765, *Daozang* 17:218a–224b; for the illustration featured here, see 219a. Cf. *Shangqing tianguan santu jing* [Three Limits Scriptures on the Passes of Heaven], DZ 1366, *Daozang* 33:808b–818c. For selected studies, see Isabelle Robinet, "Visualization and Ecstatic Flight in Shangqing Taoism," in *Taoist Meditation and Longevity Techniques*, ed. Livia Kohn and Sakade Yoshinobu (Ann Arbor: Center for Chinese Studies, University of Michigan, 1989), 178; Livia Kohn, *The Taoist Experience: An Anthology* (Albany: State University of New York Press, 1993), 257–67. Scholars have suggested that the *Tianguan santu jing* was added to the *Daozang* from a now-lost Song-dynasty Daoist canon; see Schipper and Verellen, *Taoist Canon*, 4, 32.

20. The Northern Dipper consists of seven visible stars and two invisible ones. For a diagram, see Kohn, *Taoist Experience*, 213.

21. *Wudou sanyi tujue*, DZ 765, *Daozang* 17:218a.

22. Robinet, *Taoist Meditation*, 124–27.

scarlet (*jiang*) skirts; they also hold jade tablets. As for the standing young lady who may represent the celestial attendant associated with the Northern Dipper, her garments are a mixture of blue-green (*qing*), scarlet (*jiang*), and light red (*qianhong*) fabrics, and she wears orange-red (*zhu*) shoes. Following these textual instructions and based on figure 5, Andrew Taylor, associate curator of visual resources at Rice University, worked with me to reconstruct a multicolored version (fig. 6), which sheds light on the colorful world of Daoist visualization. One can even infer that the original illustrations accompanying this medieval text may have been hand-colored drawings—the dominant form of religious illustrations produced before the age of printing.

Beyond Daoism, there exist comparable printed and hand-drawn illustrations with short coloring notations in eleventh- to twelfth-century China and Japan. The oft-cited architecture manual *Yingzao fashi* (Building standard), commissioned by the Northern Song (960–1127) government and first printed in 1103, is a good example.[23] Though the manual was printed in black ink, it contains many illustrations of detailed images of architectural parts, all of which bear coloring notations. For example, the illustration of a bracketing system and the lintels adjacent to it is entitled "five-colored decoration on a plain white background" (*wucai zhuang jingdi jin*) and contains small characters on individual parts of the architectural unit to indicate specific colors for each detail.[24] The five primary colors are red (*hong*), vermilion (*zhu*), blue-green (*qing*), green (*lü*), and white (*bai*). A comparable example is a twelfth-century Japanese drawing known as *Tōhon hokuto mandara* (Northern Dipper mandala based on a Tang model).[25] Short notes specifying "yellow," "white," and "red," as well as the coded number "six," were written on the drawn areas of the lotus petals, clouds, draperies, arms of a guardian, and so on to provide coloring instructions for the final production. The only number used in this drawing to refer to a color code is number six. It is likely that this number is a coded reference to the color green due to the harmony of the sounds of "six" (*liu*) and "green" (*lü*) in Chinese.[26] In Japan the word for green malachite is *rokusho*, with *roku* written using the character for "six."

An eighth-century manual of Daoist ritual robes, *Sandong fafu kejie wen* (Treatise on the code of ritual vestments for the entire liturgy), sheds light on the vestment colors of Daoist gods of the nine celestial ranks.[27] As Livia Kohn noted, the highest-ranking god wears a headdress "of one hundred transformations and five colors," a "misty skirt of yellow brocade," and "jasper slippers of spontaneity and transformations of the five colors."[28] The coloring system of Daoist ritual vestments imitated the clothing of the gods and was used to indicate the rank and relative power of their wearer. The skirts were usually yellow, but the robe changed from scarlet to yellow to green to purple as the rank of the wearer increased. It is interesting to note that the greater the number of colors in Daoist vestments, the higher the rank of the wearer. The highest-ranking priest of the Three Caverns wore a nine-colored cape over his other vestments. This association of a multitude of colors with high rank may reflect the Daoist notion of true form as constant, spontaneous, transformation.[29]

Color in Daoist Ritual Objects

Daoist liturgical manuals from the twelfth to thirteenth century are amply illustrated with depictions of objects used in public rituals,

FIGURE 5
Imaginary journey to the first star of the Northern Dipper in the spring, from *Wudou sanyi tujue* (Illustrated instructions for visualizing the Three Ones in the Five Phases of the Northern Dipper), DZ 765, *Daozang* 17: 219a.

FIGURE 6
Reconstruction based on the inscription on figure 5. Colored by Andrew Taylor, associate curator of visual resources at Rice University.

23. See Li Jie (?–1110), *Yingzao fashi* [Building standard], in *Li Mingchong Yingzao fashi sanshiliu juan* [36 chapters of the building standard] (Beijing: Beijing tushu chubanshe, 2003), vols. 7–8.

24. Li Jie, *Yingzao fashi*, 34:12a, in *Li Mingchong Yingzao fashi sanshiliu juan*, 8:12. I would like to thank Shuishan Yu for his valuable input.

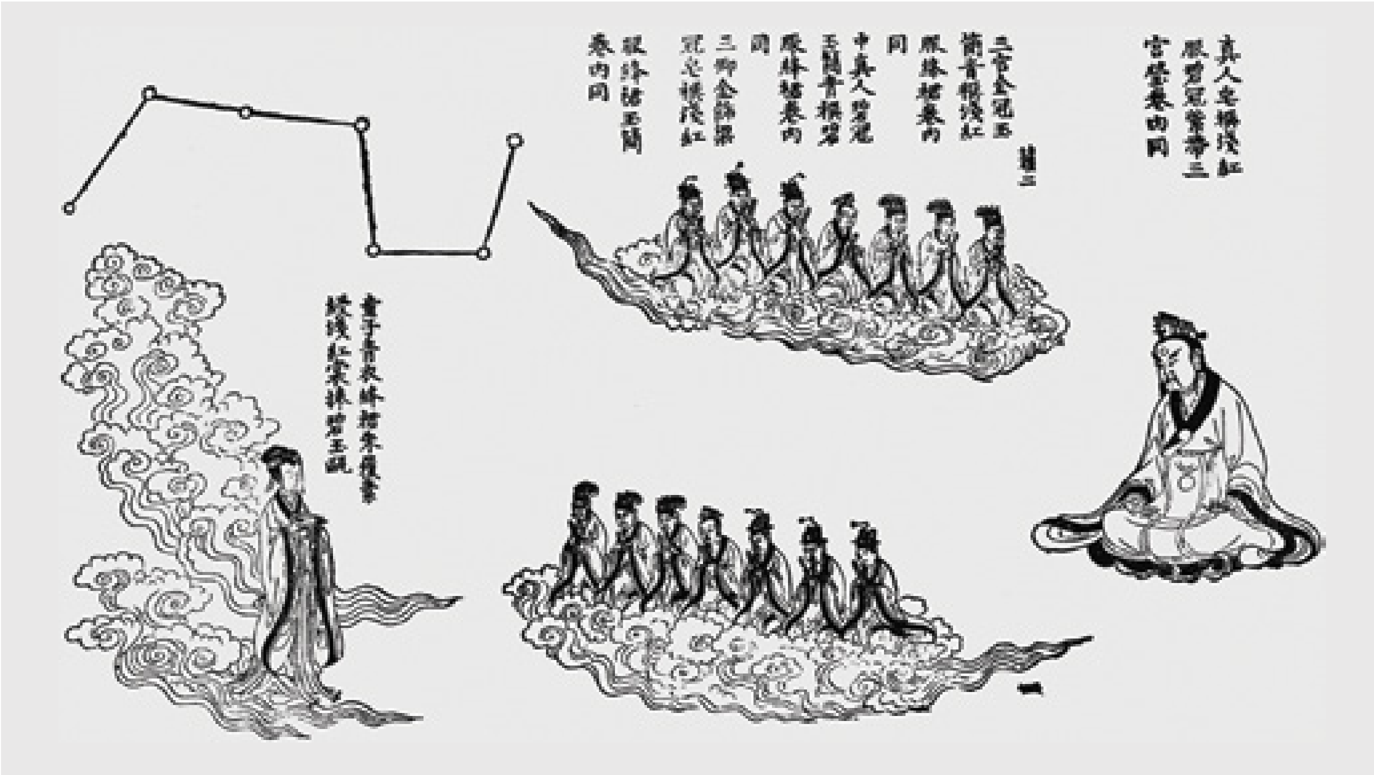
25. For an illustration, see Huang, *Picturing the True Form*, 287.

26. Some modern Chinese painters still use the number six as a color code for green. I would like to thank Phoenix Chen (PhD student at Stanford University) for his input.

27. Livia Kohn, *Monastic Life in Medieval Daoism: A Cross-Cultural Perspective* (Honolulu: University of Hawai'i Press, 2003), 149–51.

28. Ibid., 149–50.

29. Huang, *Picturing the True Form*, 150–51.


真人皂幞綫紅
服碧冠紫帶三
宮紫裳內同
三官金冠玉
簡青綬綫紅
服絳裙裳內
同
中真人紫冠
玉簡青綬綠
服絳裙裳內
同
三卿金飾梁
冠瓜綬綫紅
服絳裙玉簡
裳內同
童子青衣絳裙朱履紫
綬綫紅紫袜碧玉硯

including the colors of banners, paper, and ritual documents.[30] These ritual paraphernalia and objects may be hidden or mobile, be present only temporarily, or be minute in size. Far from being merely static objects displayed in the ritual space, they form an active part of the material ritual performed by the priests, and are touched, moved around, or carried by the ritual participants. It is through the participants' use of the objects that their liturgical power is activated.

Ritual banners were often made of silk or other textiles.[31] Banners used to signify cosmic directions were colored in accordance with the appropriate directional color of the five phases paradigm—east: blue-green; south: red; north: black; and west: white.[32] Banners for salvation rituals—rites designed to rescue suffering souls from the underworld and send them to their proper resting places—were mostly yellow, although blue-green, vermilion, and white banners were used on occasion.[33] The Spirit-Moving Banner (*Qianshen fan*), for example, is made of vermilion (or scarlet) silk (fig. 7).[34] At forty-nine *qi* in length, or about ten to fifteen meters, it is the largest standard size recorded.[35] In the salvation ritual, this colossal banner is erected in the east division of the nonary hell compound, a compound based on a three-by-three scheme.[36] The 'arms' and 'belly' of the banner are suspended from the triangular 'head.' The belly of the banner is almost the same length as the legs, but the arms reach from the bottom of the triangular head to the bottom of the legs, framing the banner. Because its main function is to summon deceased souls, the inscriptions on the banner all evoke soul-saving deities. The belly bears the name of the Great One, *Taiyi jiuku tianzun* (Heavenly Worthy Who Rescues from Suffering). On the two arms are the names of additional soul-saving Heavenly Worthies of the Ten Directions Who Save from Suffering (*Shifang jiuku tianzun*). On the legs are the names of two perfected beings who serve as their attendants (see fig. 7).[37]

FIGURE 7
The forty-nine *qi* long Spirit-Moving Banner, *Lingbao lingjiao jidu jinshu* (Golden book of salvation according to the numinous treasure tradition), DZ 466, *Daozang* 8:577c.

Paper is another important material used in Daoist rituals since it serves as a symbolic

30. This study cites primarily from the following sources: *Lingbao lingjiao jidu jinshu* [Golden book of salvation according to the numinous treasure tradition], DZ 466, *Daozang* 7:1–831; 8:1–825; *Wushang huanglu dazhai licheng yi* [Standardized rituals of the supreme yellow register retreat], DZ 508, *Daozang* 9:378a–729c.

31. The banners displayed in the Nine Hells compound in the salvation ritual space are sometimes made of paper with the intention of burning at the end of the rite; see *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:603c–604c.

32. *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:605b.

33. Cf. examples of ritual banners illustrated in *Lingbao lingjiao jidu jinshu*, DZ 466, *Daozang* 8:577b–78b; *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:602c–605c.

34. *Lingbao lingjiao jidu jinshu*, DZ 466, *Daozang* 8:577c. For two illustrations of a banner bearing the same title but with slightly different writing on the banner, see *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:602c–603a; *Lingbao yujian* [Jade mirror of the numinous treasure], DZ 547, *Daozang* 10:163a; Lin Sheng-chih, "Nansō no dōkyō ni okeru jigoku kyūsai no zuzōgaku—denryō Ryōkai 'ōteikeizukan' kō" [The iconography of rescuing souls from hell and its association with Southern Song Daoism: a case study of the "Yellow Court Scripture Handscroll" attributed to Liang Kai], *Bukkyō geijutsu* 268 (2003): 101, fig. 13.

35. While the *Fengdao kejie* mentions that the banners can be as long as one thousand *zhang*, the longest banners illustrated in Song Daoist texts are forty-nine *chi* long. See Li Yuanguo, "Shilun lingfan yu baochuang de wenhua neihan" [A study of the cultural meanings of Daoist banners and canopies], *Zongjiao xue yanjiu* 1 (2002): 13.

36. *Lingbao wuliang duren shangjing dafa* [Great rites of the book of universal salvation], DZ 219, *Daozang* 3:895b.

37. *Lingbao lingjiao jidu jinshu*, DZ 466, *Daozang* 8:577c. For the diagram of the lighting lamps for the nine hells shown here, see *Lingbao lingjiao jidu jinshu*, DZ 466, *Daozang* 7:29b.

medium on which all communications with the gods—ranging from legible writings to purely magical signs—are to be recorded.[38] In the early seventh century, a monastery would often have a papermaking workshop attached to its scriptorium.[39] Although the paper produced in the monastic studios was mainly for copying scripture, it probably also answered the demand for paper offerings in rituals. Song-dynasty Daoist rituals demanded even more paper than those in earlier times. Such increased demand reflects, in part, the growing scale of Daoist rituals and the sophistication of papermaking during the Song.

The Southern Song *Wushang huanglu dazhai licheng yi* (Standardized rituals of the supreme yellow register retreat) lists a variety of papers for the Yellow Register Purgation,[40] some with clear reference to its color. For example, the yellow scripture paper (*huang jing zhi*), popular among Song art collectors for labeling paintings and calligraphic pieces, is here employed in the making of *Shengtian baolu* (Nine-dragons talismans and registers of rebirth in heaven).[41] Other miscellaneous kinds of paper include yellow paper (*huangzhi*) and white paper (*bai shouzhi*).[42] According to Matsumoto Kōichi, the frequent use of yellow paper for talisman writing may be due to a general perception that the color yellow is efficacious in communicating with the spirits and that it is a sacred color evoking earth.[43] The most popular Daoist paper is perhaps the blue-green paper (*qingzhi*) used for inscribing all kinds of talismans, including the True Writs in Five Tablets, and contracts for ascending to heaven (*shengtian juan*).[44] A special entry that refers to *Fuzhou qingzhi sanshiba fu* (Thirty-eight sets of blue-green paper made in Fuzhou) may reflect a local specialty.[45] All this carefully selected paper is intended to be burned at the end of the service.

Daoists used paper or wooden written documents to communicate with the gods and the spirits.[46] These documents also came in different colors. Thirteenth-century liturgical manuals contained detailed guidelines for the preparation and packing of ritual documents. The written documents, once completed, were sealed in envelopes and placed in textile pouches or wooden boxes. The Southern Song *Lingbao yujian* (Jade mirror of the numinous treasure) illustrates some samples (fig. 8).[47] The packing materials for a written memorial include the innermost "perfect envelope" (*yuanfeng*), three inner containers, and the outermost box.[48] The inner containers come in three colors—the innermost container is green, the middle yellow, and the outermost white—and their format is similar to that of the envelopes. By the thirteenth century, a standard set of such written prayers comprised a mountain tablet (*shanjian*), an earth

38. Paper was invented in China in the late first century. For the history of Chinese paper, see Joseph Needham and Gwei-Djen Lu, *Science and Civilization in China*, vol. 5, part 2 (Cambridge: Cambridge University Press, 1974); Jonathan M. Bloom, *Paper before Printing: The History and Impact of Paper in the Islamic World* (New Haven: Yale University Press, 2001), 32–45, 230–31.

39. *Dongxuan lingbao sandong fengdao kejie yingshi* [Regulations for the practice of Daoism in accordance with the scriptures of the Three Caverns, a Dongxuan Lingbao canon], DZ 1125, *Daozang* 24:745c–746a.

40. *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:661b–662c.

41. For visual examples of the Nine-Dragons Talismans, see *Shangqing lingbao dafa* [Great *lingbao* method of the Shangqing heaven], DZ 1221, *Daozang* 31:111b; *Lingbao lingjiao jidu jinshu*, DZ 466, *Daozang* 8: 295b, 301b, 350c, 428c, 480b–c; *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9: 6–9b. For visual examples of the register or coupon of rebirth in heaven, see *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:661b; *Lingbao lingjiao jidu jinshu*, DZ 466, *Daozang* 8:481a.

42. *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:661b–c, 662b–c; for an example of a talisman for attacking hell written on yellow paper, see 631b.

43. Matsumoto Kōichi, *Chūgoku no jujutsu* [Chinese spells] (Tokyo: Taishūkan Shoten), 181.

44. *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:661b; *Lingbao lingjiao jidu jinshu*, DZ 466, *Daozang* 8:480c. The term "green paper" here is different from the so-called green-verses paper (*qingci zhi*, used for writing memorials to the gods), although, according to Poul Andersen's fieldwork in Taiwan, green-verses seen in modern Daoist rituals are mostly written on green paper.

45. *Wushang huanglu dazhai licheng yi*, DZ 508, *Daozang* 9:662b.

46. For a study of Daoist written documents, envelopes, and containers, see Ren Zongquan, *Daojiao zhangbiao fuyin wenhua yanjiu* [A study of the culture of Daoist memorials, documents, talismans, and seals] (Beijing: Zongjiao wenhua chubanshe, 2006), 274–335.

47. *Lingbao yujian*, DZ 547, *Daozang* 10:281b–c. Also, see Ren Zongquan, *Daojiao zhangbiao fuyin wenhua yanjiu*, 281–82, figs. 146.1, 146.2, 147.1.

48. As John Lagerwey observes from contemporary Daoist ritual in Taiwan, the gods who receive the documents in boxes are of a higher rank than those who receive the documents in flat rectangular envelopes. See John Lagerwey, *Taoist Ritual in Chinese Society and History* (New York: Macmillan, 1987), 67.

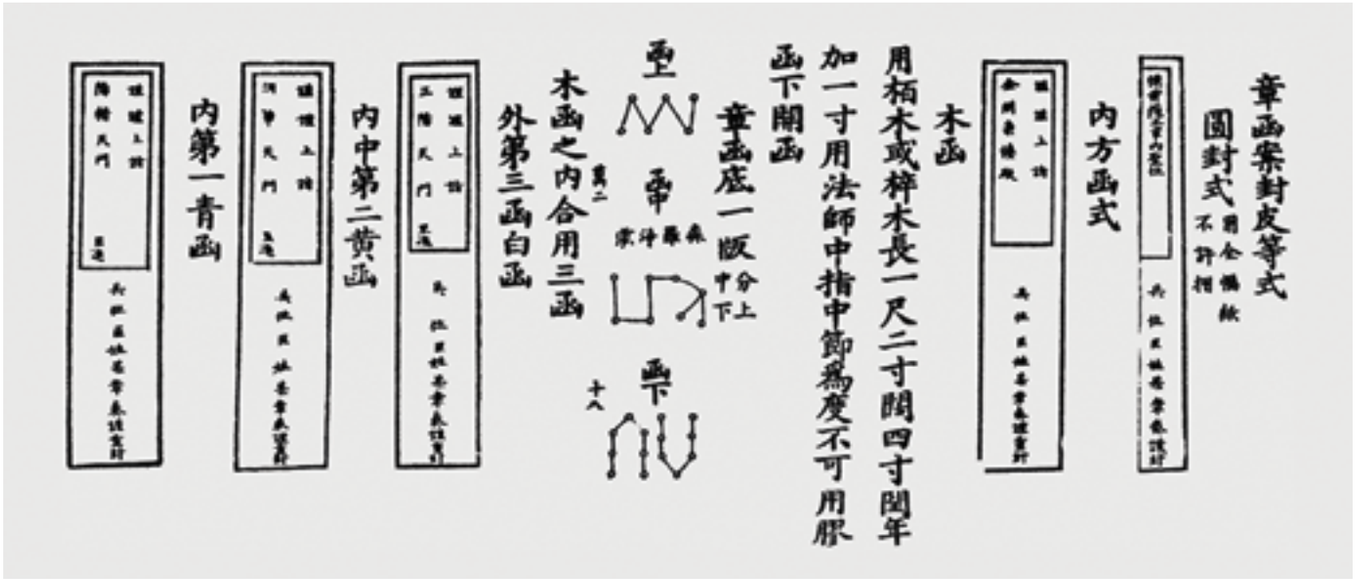


FIGURE 8
Lingbao yujian (Jade mirror of the numinous treasure), DZ 547, *Daozang* 10:334c.

tablet (*tujian*), and a water tablet (*shuijian*); their writing conventions ranged from regular script to talismanic writs.[49] In some cases, the tablets are packed inside layers of other materials for increased protection. First, they are sealed in three rectangular cloth pouches (*dai*) with designs that are comparable to those of the paper envelopes.[50] Second, golden rings (*jinniu*) and jade *bi* disks of different shapes (fig. 9) are placed on the outer pouch and secured there with wrappings of blue-green silk thread.[51] The golden rings and jade *bi* disks replace the blood and human hair given when making vows to form a covenant (*meng*) and when undergoing Daoist initiation. The mountain tablet is bundled with a green jade disk, whose round shape echoes Heaven; the earth tablet is bundled with a yellow jade disk, whose square shape represents Earth; and the water tablet is bundled with a black jade disk that is either hexagonal or octagonal. Like the aforementioned talismanic papers, the written documents are ephemeral objects; they are meant to be burned, buried in earth, or thrown into a river or lake to symbolize their delivery to the gods and spirits.

Conclusion

This study explores the uses of color in private visualization practices and public rituals, two crucial components that constitute the inner and outer facets of Daoist experience. Drawing from primary sources compiled in the fifteenth-century Daoist Canon, this chapter has examined different media used in Daoist visual culture, ranging from illustrations that serve as visual aids for the adept's mental exercises, to colored banners, paper, and written documents used in ritual performance. The Daoist world seen through descriptions of color in the Daoist Canon and other texts appears much more colorful than what one might expect to see based on the colorless, black-ink images preserved in the printed Daoist Canon.

Notations about color for the illustrations accompanying Daoist meditation manuals from the fifth to the thirteenth century highlight the prominent roles of red, blue, white, black, and yellow because these five colors correspond to the five phases paradigm both in microcosmic and macrocosmic schemes. Indirect evidence, such as the color notations

49. *Lingbao yujian*, DZ 547, *Daozang* 10:333a–b. For a variety of designs, see *Lingbao yujian*, DZ 547, *Daozang* 10:316a–c; *Lingbao wuliang duren shangjing dafa*, DZ 219, *Daozang* 3:939a–941a.

50. *Lingbao yujian*, DZ 547, *Daozang* 10:316b–317a; for more samples of the envelopes for other Daoist documents to other deities, including the underworld officers and jailers, see 317b–321c.

51. *Lingbao yujian*, DZ 547, *Daozang* 10:334c.

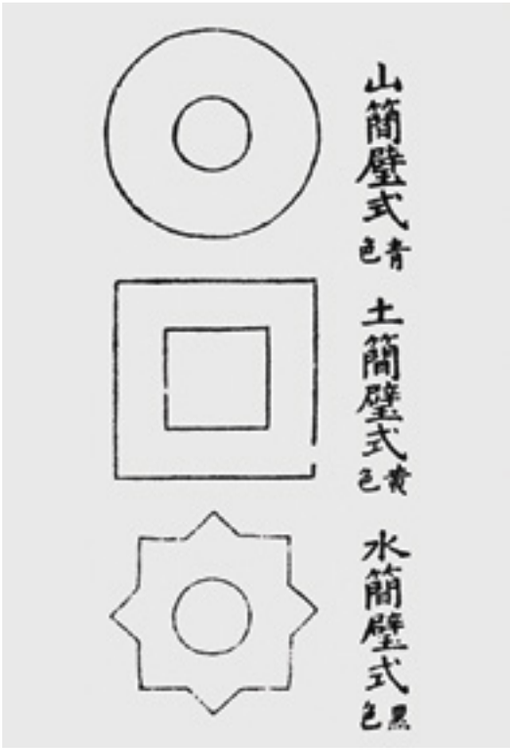


FIGURE 9
Jade *bi* disks of different shapes. *Lingbao yujian* (Jade mirror of the numinous treasure), DZ 547, *Daozang* 10:334c.

accompanying selected illustrations and the related texts advising the adept to visualize images in concrete colored forms, suggests that many of the illustrations used by Daoists were originally colored by hand. Multicolored illustrations, in comparison to monochromatic ones, produce a stronger visual impression on the adept, and were hence more efficient in helping him to generate his own mental images in the process of visualization.

Artifacts used in Daoist salvation rituals are equally colorful. The colors of the banners marking cosmic directions accord with the colors assigned to the five phases paradigm, while banners associated with soul-saving were mostly yellow. Paper used for talisman writing was usually either yellow or blue-and-green. Miscellaneous packing materials for written documents for gods and spirits, including paper envelopes, wooden boxes, textile pouches, and silk threads, came in multiple colors. Among them, green-blue, yellow, and black, the three primary colors associated with the tripartite universe of heaven, earth, and water, respectively, color the tablets to heaven, earth, and water. It requires further study to determine if there is an organic coloring program underlining the other packing materials that is directly connected to Daoist cosmic symbolism.

This focused study of the fundamental role of color in Daoist visualization practices and public rituals underscores the importance of color within Daoist practice. More broadly, it indicates that color can be an integral and active part of religious systems.

APPENDIX

The Substance of Color

Blooming gromwell, Kamafu fields, near Lake Biwa, Shiga Prefecture.

Section 1
Introduction

MMD[1]

This appendix introduces the plants that produced the major dye materials used to color luxury textiles in ancient and medieval East Asia.[2] These were the dye materials for which we have documentary records in China, Korea, and Japan and that turn up in analyses of the high-quality aristocratic and sacred textiles that have been preserved in tombs and temples over the centuries.[3]

The plants included in this appendix are listed in a tenth-century Japanese text, the *Kusagusa no some yōdo* (Miscellaneous dyeing supplies), fascicle XIV of the *Engishiki* (Regulations of the Engi era: 901–923).[4] This document provides us with a great deal of information. However, since it uses a generic name for each plant, it is impossible to determine which variety of plant was used, or even if several species were used interchangeably.[5] The *Kusagusa no some yōdo* was written for commissaries, not dyers, in the imperial dye workshop at the Heian court in the city that is now Kyoto. Therefore, it lists the ingredients necessary to produce a specific shade or tone of color, even including the amount of firewood, but it gives no indication of procedure. As it has not proved possible to retrieve dye processes from the Heian period or from other early times in Japan, Korea, or China, this appendix will introduce basic principles of dyeing based on contemporary practices of the most skilled dyers in Japan today, many of whom regard the Heian period as a golden age of dyeing and have studied the *Kusagusa no some yōdo*.

1. Monica Bethe, Dominique Cardon, and Richard Laursen provided substantial help with this appendix. Richard Laursen provided the diagrams of chemical structures. Chika Mouri provided much of the information about the medicinal use of dye plants.

2. It is virtually impossible to trace the use of dye materials used for ordinary, everyday, textiles and clothing. They were generally unrecorded and the textiles themselves have long since disintegrated. Undoubtedly many of the plants listed in this appendix were used also by ordinary folk, especially plants that grew wild or were easy to cultivate and did not require substantial resources to process. Undoubtedly also, as Laursen's essay indicates and Mouri's suggests, a great variety of local, indigenous plants were used to color textiles for which we have no written or archaeological records.

3.This appendix focuses on dye materials derived from plants. Recent dye analyses of archaeological textiles in northwest China and Dunhuang have revealed the presence of scale-insect dyes, but the research is in its infancy and cannot be included here. Generally it is thought that the use of scale-insect dyes reached East Asia considerably later than the periods discussed in this volume.

4. For a discussion and annotated translation of the *Kusagusa no some yōdo*, see Mary McClintock Dusenbury, "Court Colors: the *Kusagusa no some yōdo* in Fascicle XIV of the *Engishiki*," in "Radiance and Darkness: Color at the Heian Court" (PhD diss., University of Kansas, 1999), 145–210. An annotated transcription may be found in Maeda Ujō, *Nihon kodai no saishiki to some* [Colors and dyeing in ancient Japan], (Tokyo: Kawade Shobōshinsha, 1975), 173–85. Maeda was a dyer/scholar with an appointment to the Imperial Court.

5. For a comprehensive treatment of these and other dye plants, see Dominique Cardon, *Natural Dyes: Sources, Tradition, Technology and Science* (London: Archetype Publications, 2007), and Dominique Cardon, *Le Monde des Teintures Naturelles* [The world of natural dyes], new edition (Paris: Belin, 2014).

Section 2
Dye Materials and Principles of Dyeing

It has not proved possible to retrieve the practices of dyers of a thousand and more years ago. The principles and dye processes described briefly here are based on the practices of skilled dyers and dyer/scholars in Japan today. Although there are considerable differences in the practices of contemporary Japanese dyers, they share basic practices and several overarching principles.

Japanese dyers work with nine main elements: the fiber to be dyed and the dye material, acid and alkali substances to adjust and balance the pH of the extraction and dye baths, mordants (metallic salts used to bind the dye to the fiber), water, heat, time, and air. Each element is considered carefully, and we can presume that Heian dyers did the same. The tenth-century *Kusagusa no some yōdo* gives different proportions of each ingredient, including the firewood used, depending on the material to be dyed. For example, to dye *asaki murasaki* (a light purple), the ingredients specified are roots of the gromwell plant (the dye material), vinegar (an acid), ash lye (an alkali and, depending on the content of the ash, a mordant), and firewood. The materials listed for dyeing seven kinds of cloth and thread are the same, with only the amounts and proportions of vinegar and ash lye, and even firewood, differing, but these vary considerably.[1]

Japanese dyers regard air and time as important elements in the dyeing process. Dye baths are comparatively weak and the intensity of color is obtained by the number of immersions in the dye bath rather than by its strength. The material (cloth or thread) is wrung out and thoroughly aired between immersions. It might, for example, be dipped and aired several times one day and then aired and dried and left to rest for a week before a subsequent series of immersions and airings. It is not uncommon for the dyeing of one length of cloth or set of skeins of thread to continue over a series of days or even weeks. On the importance of time and air, the dyer Yamazaki Seijū has said that dyeing is a type of drinking up of color, drinking to saturation point. If one re-immerses the thread or cloth in the dye bath immediately, there is nothing in the fiber for the dye to attach to. If the fiber is left to rest, it readjusts and again is capable of absorbing color.[2] In some materials the chemical reaction continues over a long period of time. Indigo may be active for a year following the final dyeing; some indigo dyers put their

1. To dye *asaki murasaki* the *Kusagusa no some yōdo* lists the different proportions and quantities of ingredients needed to dye silk damask, plain woven silk cloth, resist-tied silk gauze, resist-tied plain woven silk, reeled silk thread, ramie cloth, and kudzu-fiber cloth. All silk cloth was made approximately the same length (1 *hiki*, about 20 meters), and all required the same amount of dye material (5 *kin*, about 1.2 kilograms of gromwell roots) and the same quantity of firewood (60 *kin*, or about 14.5 kilograms). However, the amounts and proportions of vinegar and ash lye varied considerably, from 1.08 liters for resist-tied silk gauze to 3.6 liters for silk damask. The resist-tied silk gauze required 45 liters of ash lye, silk damask required 90 liters. Only half as much firewood is needed for silk thread as for cloth. See Mary M Dusenbury, *Radiance and Darkness*, 172–73.

2. Yamazaki Seijū, personal communication, February 1988.

dyed skeins or bolts away to cure for a year before they considered them to be finished.[3]

Dyes come from the heartwood, inner bark, nuts, grass stems, flower petals, and roots of a wide variety of trees, shrubs, grasses, and flowering plants. These are generally chopped or crushed and then simmered or sometimes fermented to extract the coloring. Some dyes are best extracted in a heated alkali bath, others in a slightly acidic one. Most plant dyes require a mordant (a metallic salt such as alum, copper, or iron) to forge a bond between the dye and fiber molecules. Today, many dyers use commercially available metallic salts such as alum, copper, tin, and iron. The only material that might have served the function of a mordant in the *Kusagusa no some yōdo* is ash lye. Predominantly used for its alkalinity, ash lye also contains trace minerals from the wood that was burned to make the ash. Two plants in Japan have traditionally been burned for the high aluminum content of their wood. Both camellia and *sawafutagi* are aluminum-accumulating plants, and the alkali bath made from their ashes is an effective mordant.

3. Chiba Ayano, a Living National Treasure, spoke of the increasing depth and beauty of indigo-dyed hemp cloth when it was cured for three or even six years. See Barbara Adachi, *The Living Treasures of Japan* (Tokyo, New York, and San Francisco: Kodansha International, 1973), 16.

Section 3
Purple

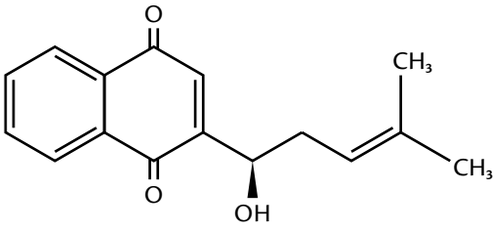
Gromwell *Lithospermum oficinale,* roots 紫草
Lithospermum erythrorhizon

MAIN DYE COMPOUND: shikonin

A tall perennial growing wild in mountains and plains throughout East Asia, *murasaki* (purple grass) bears small white flowers. Its long purple roots thicken and spread over the years, yielding both dye and medicine.

Gromwell is difficult to dye successfully. The roots yield their color reluctantly, the extraction and dye baths are sensitive to pH and to temperature (a temperature that is too low has little impact; too high turns the purple gray), and the dye bath sediments easily. In Japan today, to achieve proper bonding between dye and fiber, the thread or cloth is soaked in an alkali solution that contains alum, such as a lye bath made from the ash obtained from burning camellia twigs and stalks (*Camellia japonica*). At the end of a series of immersions in the dye vat, vinegar is used to neutralize the pH. Washing, airing, and time allow the color to mature. This process is repeated multiple times to achieve a deep color. Skill and experience are required to achieve a range of pale to deep purples with perfect balance between red and blue overtones.

MEDICINAL USES: Dried gromwell root has traditionally been used topically for burns and frostbite, and internally for its antiviral activity.



Shikonin (*Lithospermum erythrorhizon* = *murasaki* = gromwell)

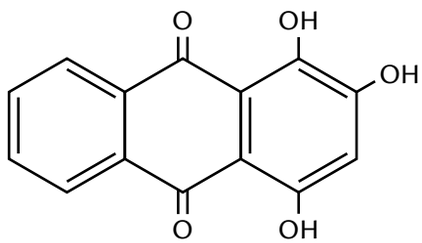
Section 4
Red: Madder, Safflower, and Sappanwood

Madder, *Rubia cordifolia* L. (roots: red) 茜
Rubia akane [*Rubia argyi* (H. Lév. & Vaniot) Hara ex Lauener] (roots: red)[1]

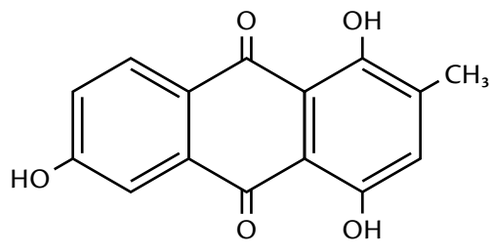
MAIN DYE COMPOUNDS: Most species of madder contain purpurin and alizarin. *Rubia cordifolia* L. contains predominantly purpurin; *Rubia akane* (Japanese madder) is unusual in that its characteristic compound is 6-hydroxyrubiadin.

Various species of madder grow throughout moderate regions of East Asia. The two above are vinelike perennials with whorls of four leaves, small white flowers, and long red roots.

MEDICINAL USES: An infusion of madder roots has traditionally been used to treat jaundice, rheumatism, and bleeding.

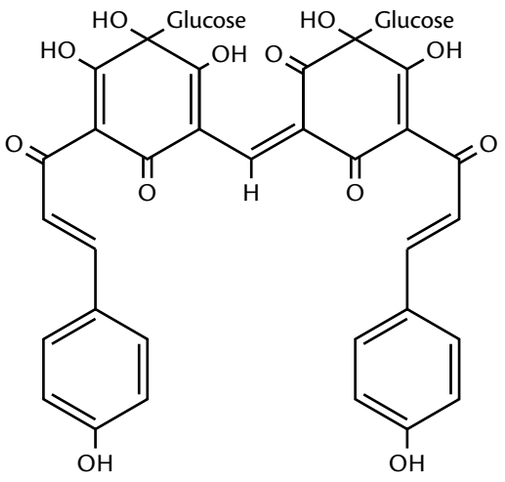


Purpurin (*Rubia* spp. = Madder species)



6-Hydroxyrubiadin (*Rubia akane* = Japanese madder)

1. This is a new botanical name. See Cardon, *Le Monde des Teintres Naturelles*, 150, and www.theplantlist.org. The Plant List is a joint project of Kew Gardens and the Missouri Botanical Garden. It is a reliable source for the most recent botanical nomenclature.



Carthamin (*Carthamus tinctorius* = safflower)

Safflower, *Carthamus tinctorius* L.
(florets; dyes pink to scarlet but the color is light sensitive and fades quickly) 紅花

MAIN DYE COMPOUND: carthamin

Safflower is a tall annual thistle with sharply pointed leaves and pom-pomlike blooms of spiky thin yellow petals that eventually turn red from the base up. Safflower was cultivated in the eastern Mediterranean, especially Egypt, since earliest antiquity. It is mentioned in documents dating from the eighteenth dynasty (1543–1292 BCE), and linen cloth dyed with safflower has been found in an Egyptian tomb dating from the twenty-first dynasty (c. 1050 BCE).[2] In the early years of the Common era, safflower traveled east. Its name in Japanese, *kurenai*, suggests that it reached Japan from the Chinese State of Wu (J. Kure). Safflower pollen has been found at the mid-third-century Makimuku archaeological site in Nara Prefecture, Japan, in a context that suggested medicinal use,[3] but there is no evidence that it was cultivated and used as a dye material in Japan before the seventh century when it appears as a rank color.[4]

In Japan today, in July, as soon as a hint of red shows in the flowers, the petals are picked without the calyx, an extremely labor-intensive method of harvesting. To extract scarlet, the dried petals are soaked in successive baths of water until the yellow is leached out. They are then soaked and kneaded in ash lye to release a muddy bath that clears to red with the addition of plum vinegar. Intense colors require repeated baths with the thread or cloth aired well between baths. The deep scarlet of safflower was highly prized but faded quickly.

MEDICINAL USES: An infusion of safflower petals was used traditionally to alleviate pain, increase circulation, and treat high blood pressure.

2. Cardon, *Natural Dyes*, 58.

3. Matsui Akira, Masaaki Kanehara, and Masako Kanehara, "Palaeoparasitology in Japan—Discovery of Toilet Features," *Memórias do Instituto Oswaldo Cruz* 98, suppl. 1 (January 2003): 127–36.

4. Safflower scarlet was used to indicate the top rank in an imperial edict of 685. *Nihonshoki* II [Chronicles of Japan II], eds. Sakamoto Tarō, Ienaga Saburō, Inoue Mitsusata, and Ōno Susumu, NKBT 68 (Tokyo: Iwanami Shoten, 1967), 470–71; W.G. Aston, trans. *Nihongi: Chronicles of Japan from the Earliest Times to A.D. 697* (first published 1896; London: George Allen & Unwin, 1956), 370; Maeda Ujō, *Nihon kodai no shikisai to some*, 52.

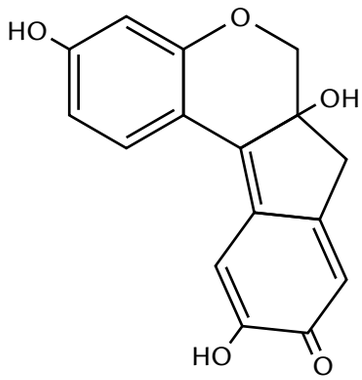
Sappanwood, *Caesalpinia sappan* L.
(heartwood: red) 蘇枋

MAIN DYE COMPOUND: brazilein

Sappanwood is a small, shrubby flowering tree with legume fruits and thorny bark that is thought to be native to southern India, Southeast Asia, and southern China. It appears as a dye material in the *Shoku nihongi* (Chronicles of Japan continued) of 797, and was probably imported to Japan for dyeing purposes during the Nara period (710–794).[5] Simmered wood chips produce a deep red when mordanted with aluminum salts (e.g., from camellia ash) and a reddish purple with an iron mordant.

MEDICINAL USES: An infusion of sappanwood has been used traditionally for blood-related ailments, including menstruation, and to reduce pain and swelling.

5. Yamazaki Seijū, *Kusakizome: senryō shokubutsu zukan* [Illustrated book of dye plants] (Tokyo: Bijutsu Shuppansha, 1985), vol. 1, 130.



Brazilein (*Caesalpinia* spp. = sappanwood)

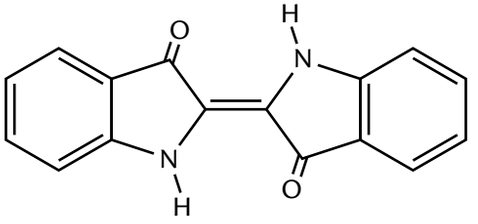
Section 5
Blue

Indigo, *Polygonum tinctorium* or *Persicaria tinctoria* (Aiton) H. Gross;[1]
(leaves and stems: blue)

MAIN DYE COMPOUND: indigotin

Mercurialis leiocarpa
(*yama ai*: mountain indigo)

MAIN DYE COMPOUND: cyanohermidin



Indigotin (indigo) (*Isatis* spp., *Indigofera* spp., *Polygonum* spp. etc.)

There are many plants that can produce a blue dye, but the fastest blue dye is indigo, extracted from different species of plants belonging to a wide range of botanical families. The botanical source of an indigo dye fixed onto a textile cannot be distinguished by dye analysis since all contain indigotin as the main compound. A species native to Japan, *Mercurialis leiocarpa* (*yama ai* or mountain indigo) produces a lovely sky-blue color but is not fast. As early as the seventh century, it was probably supplanted for the finest textiles by an imported species of indigo, probably *Polygonum tinctorium*.[2] In the north and south of Japan, other indigo plants were and are still used: *Isatis* spp. in the north and *Strobilanthes* spp. (*Ryukyu ai*) in the south. *Polygonum tinctorium* is a leafy annual with small red or white flowers that grows to about twenty-eight inches tall. Poems in the early-eighth-century *Man'yōshū* suggest that in the Asuka (538–710) and Nara (710–794) periods fresh leaves were simply rubbed into the cloth. Fresh leaves can also be chopped and crushed in water to produce sky-blue, but the most colorfast method and the one that can yield the deepest color requires immersing fresh or composted leaves in a fermentation vat. In Korea today, fresh leaves are fermented directly in the dye vat; in Japan, beginning in the Muromachi period (1333–1568), the leaves have been dried and composted. In this compact and long-lasting form, they quickly became an important market commodity.

MEDICINAL USES: Indigo has been used traditionally for stomach disorders, to lower fevers, and treat snakebites.

1. Botanists have recently renamed *Polygonum tinctorium* but kept the old name as a synonym. See Dominique Cardon, *Le Monde des Teintures Naturelles*, 370, and www.theplantlist.org.

2. See Yamazaki Seijū, *Kusakizome: senryō shokubutsu zukan* [Illustrated book of dye plants], vol. 1, 16–17, 230–31.

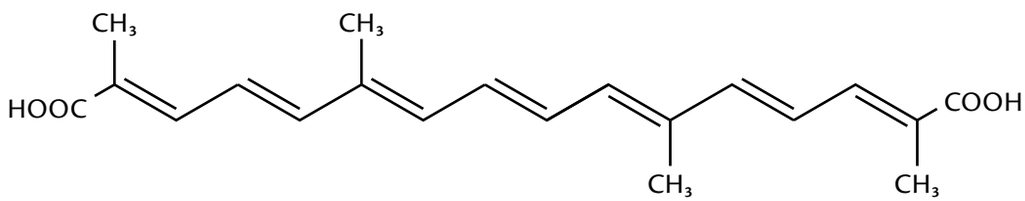
Section 6
Yellow

Gardenia, *Gardenia jasminoides*
(hulls: yellow) 栀子

MAIN DYE COMPOUND: crocetin

Gardenia is an evergreen shrub with fleshy oval leaves and fragrant white flowers. The dye is contained in the orange-colored star-shaped crowns of the fruit. When heated in water, gardenia hulls produce a warm yellow dye that does not require a mordant to bond with thread or cloth.

MEDICINAL USE: An infusion of the hulls has been used traditionally to treat fever, inflammation, and bleeding.

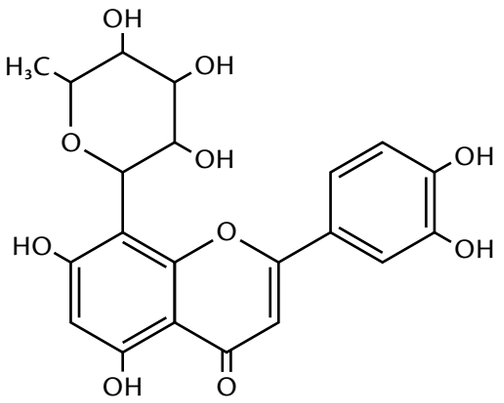


Crocetin (*Gardenia jasminoides*)

Eulalia or Chinese silver grass (J. *kariyasu*), *Miscanthus tinctorius* (Sieb. & Steud.) (stalks and leaves: yellow) 刈安
[Eulalia or Chinese silver grass (J. *susuki*), *Miscanthus sinensis* (stalks and leaves: yellow)]
Anthraxon hispidus (stalks and leaves: yellow) 小鮒草

MAIN DYE COMPOUNDS: luteolin and luteolin 7-glucoside[1]

Miscanthus tinctorius (pictured) is a tall, tufted grass with head tassels that open in early autumn. Simmered stalks and leaves yield a slightly transparent yellow dye with a green tinge. It is one of several grasses traditionally used in Japan to dye yellow. In the *Engishiki* it appears as a court color both by itself and in conjunction with other dyes. Its name in Japanese, *kariyasu*, might also have referred to another grass dye, *Anthraxon hispidus*, as Chika Mouri suggests in her essay.



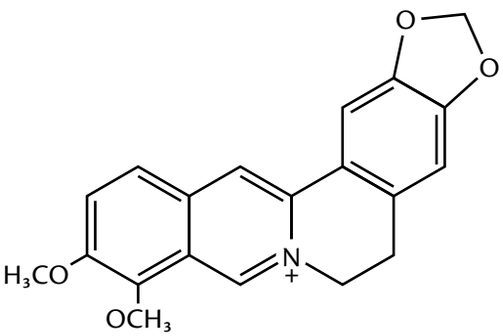
Luteolin 8-C-Rhamnoside (*Miscanthus tinctorius* = *kariyasu*)

1. Cardon, *Natural Dyes*, 204.

Amur cork tree, *Phellodendron amurense* Rupr. and Japanese cork tree, *Phellodendron Japonicum* Maxim (inner bark: yellow) 黄檗

MAIN DYE COMPOUND: berberine

The Amur cork tree is a tall deciduous tree with small paired pointed leaves and yellowish green flowers that bear black berries. Simmering the inner bark releases a bright yellow. The inner bark of the Amur cork tree does not require a mordant to bond with the fiber.[2] Its use as an insecticide was well known at least by the seventh century. In 675 a Chinese official decreed that government documents should be treated with *huangbo* (*Phellodendron*) extracts to prevent insect damage.[3] References to the use of yellow paper dyed with *Phellodendron* in the *Izumo Fudoki* (History and customs of the Izumo region), composed 713–773, and in eighth-century documents from the Shōsōin Repository in Nara suggest that its use as an insecticide was well known in Japan at least by the eighth century. Yellow papers are common among Buddhist sutra manuscripts of this period. *Phellodendron* is mentioned frequently in the *Engishiki* in connection with indigo to produce green.



Berberine (*Phellodendron amurense* = Amur cork tree)

MEDICINAL USE: *Phellodendron* was used in traditional medicine as a cure for stomachache.

2. The inner bark of *Phellodendron* is ionic. It has a positive charge. For this reason it does not need a mordant to bond with the fiber. Richard Laursen, manuscript comment, July 24, 2014.

3. See T.H. Tsien, *Science and Civilization in China*, vol. 5, part I, ed. Joseph Needham (Cambridge: Cambridge University Press, 1985), 74–76, as quoted in Cardon, *Natural Dyes*, 326.

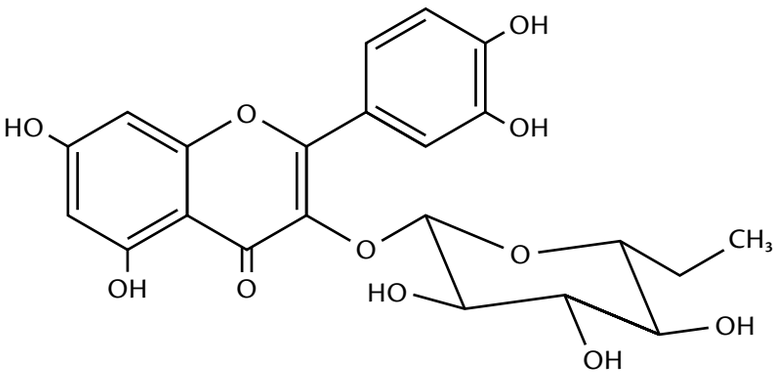
Section 7
Brown, Gray, Black

Oak, *Quercus acutissima*
(acorns: gray, tan-brown, black) 楢

MAIN DYE COMPOUND: tannin

As in the case of the grass *kariyasu*, the Japanese term *tsurubami* probably covered several species of oak and possibly other native trees that yielded a range of browns, grays, and blacks.

Quercus acutissima, native to Japan and East Asia, is a tall, spreading, broadleaf tree with a thick, gray trunk and long oval serrated leaves that drop off only in spring. The slim, cylindrical flower clusters produce small, round acorns. Although many parts of the oak contain tannin, a basic source for brown dyes, traditionally acorns have been used as the primary dye material. The use of an ash-lye mordant in the dyeing process yields shades of tan, brown, and gray; an iron mordant yields black. Acorns were plentiful and a natural choice for commoner garments. The tenth-century *Engishiki* specifies acorns and madder with an ash-lye mordant as the ingredients to dye gray or black for court use. The addition of madder would have yielded a quality of color distinct from the commoner's straight acorn-dyed garb, although not a true black. The character for black, read *kuro* today, was sometimes read *fukaki* (deep or dark) in the Heian period and referred to a highly saturated color, so dark as to appear almost black.[1]



Quercitrin (*Quercus* spp. = Oak tree species)
Quercetin 3-*O*-rhamnoside

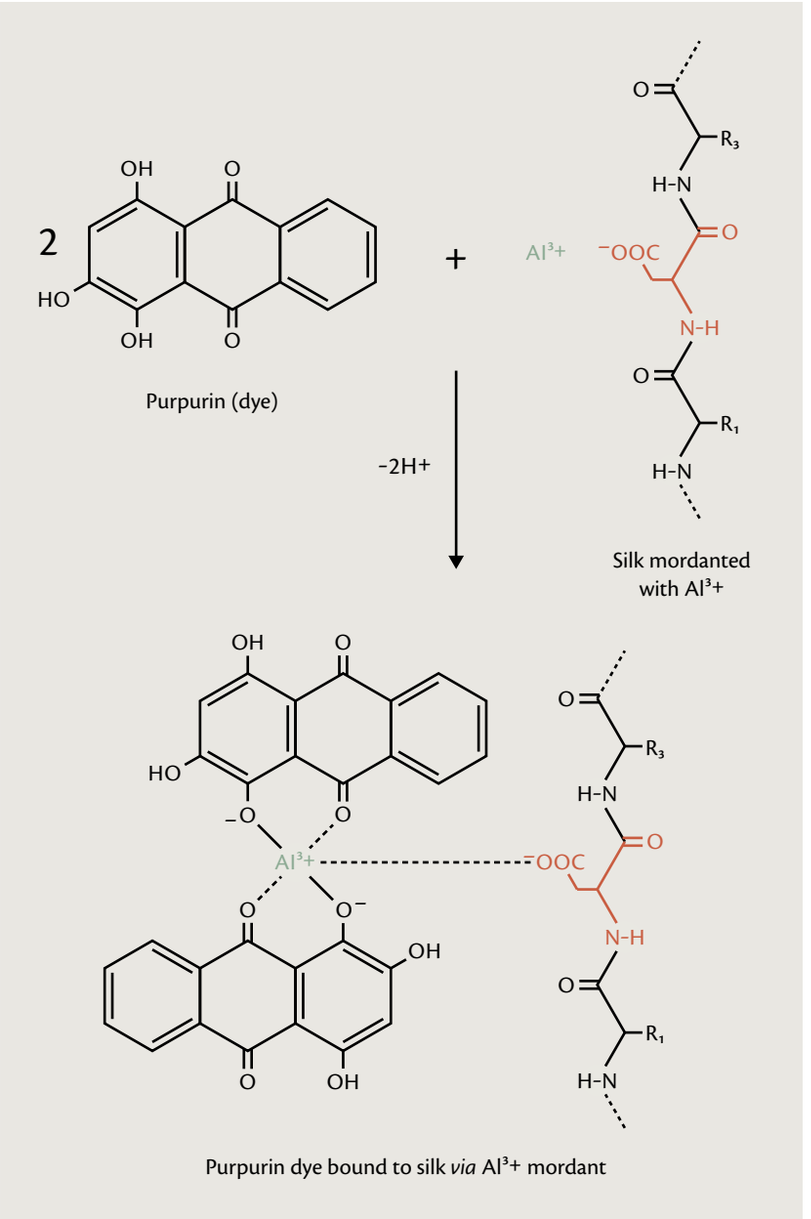
1. See Maeda Ujō, *Nihon kodai no shikisai to some*, 92.

Section 8
Mordants

A mordant is a substance that forms a bridge between a dye molecule and a fiber molecule, forging a chemical bond between dye and fiber. The word comes from the Latin *mordere* and means 'to bite'. Most mordants are metallic salts.

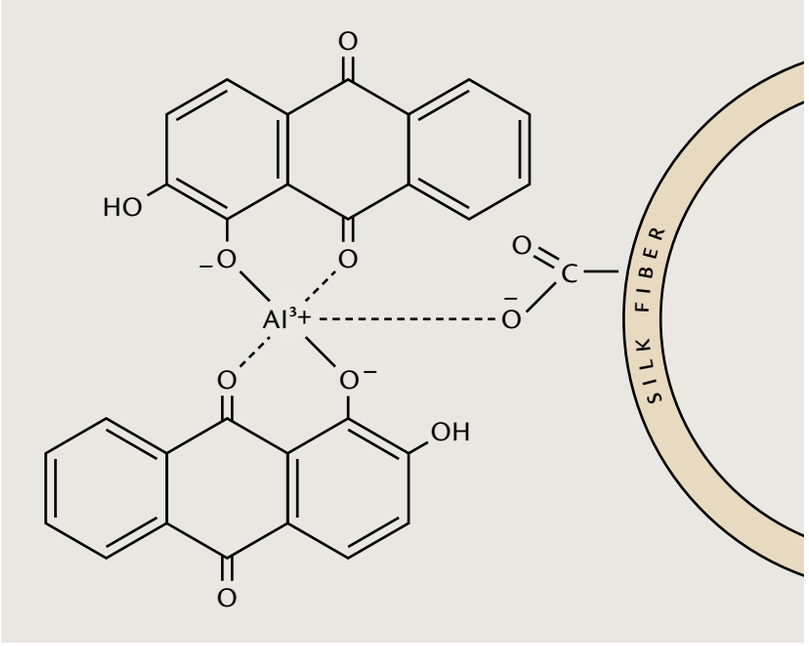
Ash lye with high aluminum content was one of the oldest mordants used in Japan, made by burning aluminum-accumulating plants such as camellia (*Camellia japonica* L.)[1] and leaching the ashes in water to make an alkali bath with high aluminum content. Iron—sometimes in the form of iron-rich mud—was another common mordant used by dyers around the world, but iron does not appear in the ingredient list for any color in the *Kusagusa no some yōdo*. The tannins occurring in trees and woody shrubs act as mordants, and the dyes from these plants are generally robust and stable.

The chemical diagrams in this section show the bonding of a dye molecule (purpurin, one of the dye compounds in most madder plants) to silk fiber through the agency of an aluminum mordant. Richard Laursen supplied the diagrams and technical description of the process.



Purpurin dye bound to silk *via* Al^{3+} mordant

1. In the north of Japan, *sawafutagi* was (and is) used as a mordant. The plant does not yet have an accepted botanical name. It appears on www.theplantlist.org as *Symplocos sawafutagi* Nagam. with a note that the name is unresolved.



Technical Description

Hypothetical representation of alizarin bound to a mordant (aluminum ion) and bound to silk. Most mordants are at least trivalent (three + charges), which can complex with dye molecules as shown. This leaves a single + charge that can bind to negatively charged carboxyl groups (shown) found in protein fibers, such as silk and wool. Cotton has very few carboxyl groups and is more difficult to dye.

Author Biographies

Monica Bethe is Director of the Medieval Japanese Studies Institute, Kyoto. After earning her Bachelor's and Master's (in East Asian Regional Studies) degrees from Harvard University, she spent over forty years teaching at Japanese universities. A weaver, dyer, and Noh practioner, she has published widely on Japanese Noh drama and historical textiles. She has collaborated on many exhibition projects in Japan and America, including co-editing, writing, and translating portions of *Miracles and Mischief: Noh and Kyōgen Theater in Japan* (with Sharon Sadako Takeda, Los Angeles County Museum of Art, 2002); *Amamonzeki, A Hidden Heritage: Treasures of the Japanese Imperial Convents* (with Patricia Fister, Tokyo University of Arts and Sankei Shimbun, 2009); and *Transmitting Robes, Linking Minds: The World of Buddhist Kasaya* (with Aki Yamakawa, Kyoto National Museum, 2010). Her essays specifically on color include "Color and Dye" for the *Encyclopedia of Japan* (with Mary Dusenbury, Tokyo: Kodansha International, 1983); "Color: dyes and pigments," in Amanda Stinchecum, *Kosode: 16th to 19th Century Textiles from the Nomura Collection* (New York and Tokyo: Japan Society and Kodansha International, 1984); and "Reflections on Beni: Red as a Key to Edo-Period Fashion," in Gluckman and Takeda, *When Art Became Fashion: Kosode in Edo-Period Japan* (Los Angeles: Los Angeles County Museum of Art, 1992). Her translations cover numerous areas; those relating to the Shōsōin include *The Treasures of the Shōsō-in: Buddhist and Ritual Implements* (Masashi Mitsumori, ed., Kyoto: Shikosha, 1993) and *Textiles in the Shōsō-in* (Office of the Shōsō-in, Tokyo: Asashi Shimbun, 2000 (vol. 1), 2001 (vol. 2), besides catalogues for the Annual Exhibition of Shōsō-in Treasures (Nara National Museum: 2000–2013).

Mary M Dusenbury is Research Curator at the Spencer Museum of Art and editor of *Color in Ancient and Medieval East Asia*. After earning her Bachelor's degree at Harvard University, Dusenbury spent several years in Japan studying textiles. With a grant from the Japanese Ministry of Education, she began her study of color in East Asia with color historian Nagasaki Seiki at Kyoto University of Arts. She took Master's and PhD degrees at the University of Kansas, with a dissertation centered on color at the Heian court. Dusenbury's focus on Asian textiles and the dyes that colored them has combined a study of archaeological and historical textiles with fieldwork in East and Central Asia. Her recent invited lectures and symposium papers include: "Layering Color at the Heian Court of Japan (794–1185): Empress Shōshi and her Salon," for *Costume Colloquium IV: Colors in Fashion*, Florence, 2014; "Radiant Light: Aureoles Surrounding Heian-period Buddhist Icons," for the Midwest and Southwest Conferences of the Association for Asian Studies, Lawrence, Kansas, 2014; "Color Matters: The Significance and Materiality of Color in Ancient East Asia" for The Getty Research Institute *Color Colloquium*, 2013; "Ikat Weaving in Central Asia: History and Contemporary Production," for the Oxford Asian Textile Group, 2010; and "Languages of Color in Ancient Japan," for *Colours*, Early Textiles Study

Group, London, 2010. Her publications include: *Flowers, Dragons, and Pine Trees: Asian Textiles in the Spencer Museum of Art* (New York and Manchester: Hudson Hills Press, 2004); "Binding Clouds in the Twenty-first Century: Central Asian Ikat Today," in Sumru Krody, ed., *Colors of the Oasis: Central Asian Ikats* (Washington, D.C.: The Textile Museum, 2010); "The *Kusagusa no some yōdo*: A Tenth Century Manual for Court Dyers in Japan," in *Bulletin du CIETA* #80, Lyon, France: Centre International d'Étude des Textiles Anciens, 2004; and "The Art of Color," in *Beyond the Tanabata Bridge: Traditional Japanese Textiles*, William Jay Rathbun, ed. (New York: Thames and Hudson, and Seattle: Seattle Art Museum, 1993). She is a frequent contributor to reference works, including: "Textiles and Clothing in Pre-Modern Japan," in *Encyclopedia of Asian Design*, Christine Guth, ed. (London: Bloomsbury Publishing, forthcoming); "Archaeological Evidence: Japan," in *East Asia*, vol. 3 of *Berg Encyclopedia of World Dress and Fashion*, John Vollmer, ed. (Oxford: Berg Publishers, 2010); "Textiles" (with Carol Bier), in *Encyclopedia of Archaeology*, Deborah M. Pearsall, ed. (Oxford: Elsevier, 2007); and the main "Textiles" entry for both *Japan: An Illustrated Encyclopedia* (Tokyo and New York: Kodansha International, 1993) and its more extensive predecessor, *Encyclopedia of Japan* (Tokyo and New York: Kodansha International, 1983), for which she also coauthored the entry, "Color and Dye," with Monica Bethe. Dusenbury has served on the international editorial board of the Textile Museum in Washington, D.C. She is a past president of the Textile Society of America and a member of the *Centre Internationale d'Études des Textiles Anciens* (CIETA).

Shih-shan Susan Huang is Associate Professor in the Department of Art History, Rice University. She received her MA in Chinese art history at the National Taiwan University, and her PhD in the history of art at Yale University. Her research focuses on the Daoist and Buddhist visual culture of Middle Period China. Huang's first book, *Picturing the True Form: Daoist Visual Culture in Traditional China* (Harvard Asia Center, 2012), investigates the long-neglected visual culture of Daoism, China's primary indigenous religion, from the tenth through the thirteenth century, with references to both earlier and later times. Huang has contributed articles on Daoist visual culture, Buddhist illustrated woodcuts, and landscape paintings to *Artibus Asiae*, *Ars Orientalis*, *Orientations*, *Journal of Daoist Studies*, and *National Palace Museum Research Quarterly*. Huang is working on a book titled *First Impressions: Chinese Religious Woodcuts before Gutenberg, 850–1450*, in which she uses visual analysis of extensive materials drawn from archaeological finds and makes comparisons to Korean and Japanese art.

Ikumi Kaminishi is an Associate Professor in the Department of Art and Art History at Tufts University. She received BA, MA, and PhD degrees at the University of Chicago. Kaminishi is the author of *Explaining Pictures: Buddhist Propaganda and Etoki Storytelling in Japan* (Honolulu: University of Hawai'i Press, 2006). Her scholarly articles include "Dead Beautiful: Visualizing the Decaying Corpse in Nine Stages as Skillful Means of Buddhism," in *A Companion to Asian Art and Architecture: Blackwell Companions to Art History*, Rebecca Brown and Deborah Hutton, eds. (Malden, MA: Wiley-Blackwell, 2011). She is currently expanding her study of the political culture of medieval scrolls into a book.

Guolong Lai is a 2014–2015 member of the School of Historical Studies, Institute for Advanced Study at Princeton, and associate professor of Chinese art and archaeology at the University of Florida. He earned a BA in International Law at Jilin University, an MA in Chinese archaeology and paleography at Beijing University, and a PhD in Chinese art and archaeology from the Department of Art History at the University of California, Los Angeles. He has worked at the National Museum of Chinese History (now the National Museum) in Beijing, at the Freer and Sackler

Galleries of Art in Washington, D.C., and has served as Consultant to the China projects at The Getty Conservation Institute in Los Angeles. His awards and fellowships include a Postdoctoral Fellowship in East and Southeast Asian Archaeology and Early History from the American Council of Learned Societies, sponsored by the Henry Luce Foundation, the Jack Wessel Excellence Award for Assistant Professor (2009), International Educator of the Year Award at the University of Florida (2009), and a Mellon Postdoctoral Fellowship at the Society of Fellows at Columbia University (2002–2004). Lai recently contributed to and co-edited *Collectors, Collections & Collecting the Arts of China: Histories and Challenges* (2014), a volume based on a symposium he organized at the University of Florida. He has recently been awarded a Comparative Perspectives on Chinese Culture and Society Grant from the American Council of Learned Societies/Chiang Ching-Kuo Foundation for the workshop "Unmasking Ideology: The Vocabulary and Symbols of Colonial Archaeology" at the University of Florida. His book *Excavating the Afterlife: The Archaeology of Early Chinese Religion* is forthcoming from University of Washington Press. He is founding editor of the new Chinese-English bilingual *Zhejiang University Journal of Art and Archaeology*. He participated in the 2003 CAA panel, *Languages of Color in East Asian Visual Culture*, and in the 2010 colloquium, *The Power of Color in Ancient and Medieval East Asia*, with a paper on "Colors and Color Symbolism in Early Chinese Ritual Art."

Richard Laursen is Emeritus Professor of Chemistry at Boston University where he taught for forty-three years and is now devoted solely to research. He obtained his BS degree in chemistry at the University of California, Berkeley, and his PhD in organic chemistry at the University of Illinois, Urbana/Champaign, and did postdoctoral work in protein chemistry at Harvard University. For thirty-five years he worked in the field of protein chemistry, developing and utilizing new methods for studying protein structures; some thirty-five of his graduate students have been awarded PhD degrees. After a sabbatical semester in 1999 in the Conservation Department of The Metropolitan Museum of Art in New York, he turned his attention to the analysis of artists' materials. He and his graduate student Xian Zhang introduced new tools and methods for the analysis of dyes in textiles of cultural interest (cf. Zhang and Laursen, *Analytical Chemistry* 77, 2022–2025 [2005]). These techniques have been applied to textile samples as old as three thousand years from burial sites in Xinjiang, China, besides sites in Japan, the Peruvian Andes, and an ancient salt mine in Iran. Because of his own interests and those of co-workers Xian Zhang and Chika Mouri, there has been some focus on Asian archaeological textiles. A focus on Asian dyes is reinforced by the fact that relatively little is known about their sources, as most prior research in this area has centered on Europe and the Middle East. Since all the ancient dyes were obtained from natural sources—mostly plants, but also a few animals—Laursen has devoted much effort to analyzing the dye components of several hundred plants with the aim of creating a database to aid in identifying the plant sources of dyes (cf. Mouri and Laursen, *Microchimica Acta* 179, 105–13 [2012]; *Dyes and Pigments* 100, 135–41 [2014]). The bulk of these have been plants producing yellow dyes, as yellow dyes are the most numerous of the colors and the least characterized chemically. Botanists, taxonomists, and dyers throughout the world have been generous in providing plant material for these studies. Richard Laursen is the author or coauthor of some 125 articles on protein chemistry and dye analysis. Recently he was appointed to the Academic Advisory Committee, China National Silk Museum, Research Base for Textile Conservation, Hangzhou, China, for 2013 to 2015. He participated in the 2010 colloquium, *The Power of Color in Ancient and Medieval East Asia*, with a paper titled: "What can we learn from the analysis of dyes in textiles?".

Lee Seonyong is a researcher at the Institute of Traditional Fabric Restoration at the Korea National University of Cultural Heritage. She received her PhD degree in art history from the Graduate School of Dongguk University, writing her dissertation on *A Study on the Objects and Textiles of Buddhist Statue Enshrinements* (Dongguk University, 2005). She previously worked as a researcher at the Tongdosa and Sudeoksa Museums. She has contributed two articles to the *Journal of Korean Art History*: "Relics and Votive Objects Installed inside Buddhist Statues," in *Journal of Korean Art History* 261 (Art History Association of Korea, March 2009), and "A Study of Sanskrit Scripts and Mantras in Buddhist Paintings," in *Journal of Korean Art History* 278 (Art History Association of Korea, June 2013).

Liu Jian holds a BS and MS in applied chemistry from Zhejiang Sci-Tech University, Hangzhou, China. His graduate research focused on ancient dyes and fibers, including silk, wool, cotton, and ramie. Since 2004 Jian has worked as a research scientist at the China National Silk Museum, during which time he has published on the identification of ancient dyes from Yingpan burial site, Xinjiang; the ageing of unearthed silk fibers; and processing techniques for traditional indigo dyes. He has contributed to the following publications: "Identification and light-fastness evaluation of vegetable dyes using miniature spectrometer with fiber optics," in *Journal of Textile Research* 35 (6), 2014 (in Chinese); "Characterization of dyes in ancient textiles from Yingpan, Xinjiang," in *Journal of Archaeological Science* 40 (12), 2013; "Identification of ancient textiles from Yingpan, Xinjiang, by multiple analytical techniques," in *Journal of Archaeological Science* 38 (7), 2011; "The processing technique of traditional indigo dyes," in *Silk Monthly* 11, 2009 (in Chinese).

Long Bo is a research scientist at the China National Silk Museum in Hangzhou, China. He holds a Bachelor's degree in textile engineering from Wuhan Textile University, Wuhan, China, and a Master's of engineering in textile materials and textile design from Zhejiang Sci-Tech University, Hangzhou, Chinese. His graduate research focused on traditional weaving techniques from ancient to modern times. He has contributed to the following publications: "Investigation of a Spinning Wheel of the Neolithic Age in Zhejiang Province," in *Journal of Silk* 50 (8), 2013 (in Chinese); "Investigation on the technique and artistry of Dai brocade in Yunnan Province," *Journal of Silk* 48 (12), 2011 (in Chinese).

Chika Mouri is currently working in the Department of Scientific Research at The Metropolitan Museum of Art as an Andrew W. Mellon Fellow. She earned her Bachelor's, Master's, and PhD degrees in pharmaceutical sciences from Kanazawa University, Japan, studying medicinal compounds in Asian species of *Berberis* plants, with a particular focus on environmental factors affecting those compounds. With the realization that many medicinal plants can also be used for dyeing, she became interested in dye plants. She worked as a visiting scholar in the Department of Chemistry at Boston University, where she learned dye-analysis techniques using high-performance liquid chromatography and mass spectrometry under the guidance of Richard Laursen. This work stimulated a more general interest in conservation science. Subsequently, while working as a research fellow at the Department of Scientific Research, Freer and Sackler Galleries of the Smithsonian Institution, she studied the pigments in Chinese lacquer objects and in the paintings of James A.M. Whistler, as well as dyes in textiles. She hopes her studies with Richard Laursen on dye-marker compounds will contribute not only to the identification of dyes in textiles but also to a better understanding of cultural details, such as lost dyeing

techniques, trade history, changes in political power, and others. The following are her recent publications related to dye analysis: *Characterization of Flavonols in Plants used for Textile Dyeing and the Significance of Flavonol Conjugates, Dye and Pigments* 100 (2014) 135–41 [DOI: 10.1016/j.dyepig.2013.08.025]; coauthored with Richard Laursen: "Decomposition and Analysis of Carthamins in Safflower-dyed Textiles," in *e-Preservation Science* 10, 35–37 (2013); "Identification of anthraquinone markers for distinguishing *Rubia* species in madder-dyed textiles by HPLC," in *Microchimica Acta* 179, 1–2, 105–13 (2012); "Characterization of *C*-Glycosylflavone Markers in Asian Plant Dyes Using Liquid Chromatography-Tandem Mass Spectrometry," in *Journal of Chromatography* A, 1218 (2011) 7325–7330. She also coauthored the following publications: "Preliminary Studies toward Identification of Sources of Protoberberine Alkaloids used as Yellow Dyes in Asian Objects of Historical Interest," in *Studies in Conservation* 55, 177–85 (2010); "Characterization of dyes in ancient textiles from Yingpan, Xinjiang," in *Journal of Archaeological Science* 40, 12, 4444–4449 (2013) [DOI 10.1016/j.jas.2013.06.034].

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Abbreviations

DZ–*Daozang* [Daoist canon]. 36 vols. Beijing: Wenwu chubanshe; Shanghai: Shanghai shudian; and Tianjin: Guji chubanshe, 1988.

KNK–*Kan'yaku nihon no koten* [Concise series of classical Japanese literature]. Tokyo: Shōgakkan, 1984.

NKBT–*Nihon koten bungaku taikei* [Compendium of classical Japanese literature]. Tokyo: Iwanami Shoten, 1958.

NKBZ–*Nihon koten bungaku zenshū* [Collected works of classical Japanese literature]. Tokyo: Chikuma Shobō, 1961.

NKZ–*Nihon koten zensho* [Compilation of classical Japanese literature]. Tokyo: Asahi Shimbunsha, 1956.

SNBT–*Shin nihon koten bungaku taikei* [New compendium of classical Japanese literature]. Tokyo: Iwanami Shoten, 1989–1998.

SZKT–*Shintei zōho kokushi taikei* [Newly revised compendium of Japanese history]. Tokyo: Yoshikawa Kōbunkan, 1965.

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Front cover: Diagram of the mourning system from Mawangdui Tomb 3. 48.4 × 26.2 cm. Silk, ink, and pigments. Ca. 168 BCE. Hunan Provincial Museum, Changsha, Hunan, China (see plate 6, page 38).

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