REVIEW ARTICLE

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Silk Road studies have become an important part of the investigation of trade and cultural exchange in the ancient world. Glass, in addition to textiles, spices and other goods, formed an important part of that exchange bridging cultures from the Greek and Roman world to China, Korea and Japan. Two books on Silk Road glass, both based on conferences, have been published in the past few years. This review will report on both volumes, describing their contents along with some of their advantages and disadvantages.

The first volume, published in 2009, is Ancient Glass Research along the Silk Road, edited by Gan Fuxi, Robert Brill and Tian Shouyun. The two senior editors have been driving forces in glass study in general, and the study of Silk Road glass in particular. The book is based on papers from three conferences: the 2004 Urumqi Symposium on Ancient Glasses in Northern China, the 2005 Shanghai International Workshop of Archaeology of Glass and the 2004 International Congress of Glass, Kyoto. Proceedings from the first two meetings had previously been published in Chinese as Study on Ancient Glass along the Silk Road, Gan Fuxi (ed.), Fudan University Press, Shanghai, 2007. The 2009 book considered here contains 24 chapters in 475 pages, each slightly larger than one-half of an A4 sheet, with a total of 35 contributors. There are 80 color photographs, 10 maps and 50 data tables of varying length. One great strength of the book is that partial or complete glass compositions (usually major elements only) are given for a total of 636 glass objects. In addition to the 515 Chinese glasses, there are 87 from Uzbekistan, 12 from Afghanistan, and others from Tajikistan, Turkmenistan, Japan and Korea. However, this strength comes with an important caveat in that the actual analytical technique is often omitted, and many of the analyses have been done on the unpolished
surface of excavated glass, making these analyses difficult to interpret and compare with analyses using more quantitative techniques. Nevertheless, this is certainly the largest number of published compositions, and sometimes the only available, for glass from many of the areas considered, making *Ancient Glass Research along the Silk Road* an essential reference for any further investigation.

The first two chapters are by senior editor Gan Fuxi, writing first on the ‘Origin and Evolution of Ancient Chinese Glass,’ and then more specifically on ‘The Silk Road and Ancient Chinese Glass.’ The first of these chapters provides an introduction to Chinese terms for glass and a brief history of glass study in China. Prof. Gan then presents an overview of chronological trends in chemical compositional groups in China, followed by a detailed discussion of glass at each stage. Chapter 2 reviews the formation and development of the ancient Silk Roads with an emphasis on the importance of glass exchange. After outlining the four main routes as identified by UNESCO: Northern (Steppe), Northwestern (Oasis), Southwestern (Buddhist) and Southern (Maritime), Prof. Gan highlights the pre-Qin and Qin-Han Dynasty periods, followed by a useful discussion summarizing the understanding ca 2004 of the rapidly changing picture of the early Silk Roads. Color photographs of some of the glass beads discovered in Chinese excavations are a particularly welcome contribution.

In Chapter 3, ‘Opening Remarks and Setting the Stage: Lecture at the 2005 Shanghai International Workshop on the Archaeology of Glass along the Silk Road,’ Robert Brill first reviews two techniques that have been helpful in previous research: chemical analysis and lead-isotope analysis, including remarks on how lead-isotope data might be interpreted, but also some of the factors that can make such interpretation difficult. What follows is an excellent summary of the current knowledge of glass chemical types found in Asia, illustrated during the oral presentation but not in the published volume. The remainder of the chapter presents the results, including full chemical compositions, of Dr. Brill’s study of 61 glass fragments originally excavated by early explorers of the Silk Road, including von Le Coq, Pelliot, Hedin, Koslov and Stein, with the division of these into six chemical families associated with particular source areas, including ‘Roman,’ ‘Sasanian-Islamic’ and four groups of Central Asian glass. Many of these samples were first published here, although all have since been re-published and discussed in Brill and Stapleton 2012.

Chapter 4, by Brill and Hitoshi Shirahata, is a written version of ‘The Second Kazuo Yamasaki TC-17 Lecture on Asian Glass: Recent Lead-Isotope Analyses of Some Asian Glasses with Remarks on Strontium-Isotope Analyses,’ from the 2004 International Congress of Glass, Kyoto. The chapter includes lead-isotope data for 48 samples of Asian glasses from China and Central Asia, along with an interpretation of the results. To my
knowledge, these data have not been published elsewhere. The chapter concludes with a brief discussion of the strontium-isotope analyses carried out by Dr. Paul D. Fullagar, University of North Carolina, in cooperation with Dr. Brill. Fortunately, all of the actual measurements as well as an extensive discussion, have since been published (Brill and Stapleton 2012).

The following Chapters 5 and 6, ‘Glass and Bead Trade on the Asian Sea’ and ‘Characteristics of Early Glasses in Ancient Korea with Respect to Asia’s Maritime Bead Trade,’ were written by Dr. Insook Lee, currently the Director of the Hanseong Baekje Museum in Seoul. The first of these focuses on the Southern Maritime routes, reviewing some of the evidence for early exchange of glass objects from West to East as well as the history of trade on the South China Sea. Dr. Lee suggests that by the fifth century AD, the northern steppe routes had become more important, with examples of western glass found at sites in northern China, Inner Mongolia and Korea. Chapter 6 includes a discussion of the chemical compositional types of some of the early glasses found in Korea as well as a more detailed consideration of several special types of glass beads, including coil, cornerless cube and gold-foil glass beads, illustrating Dr. Lee’s point that “Korea was not an isolated kingdom, but was closely connected by external trade and contacts with neighboring regions through Asia’s maritime routes.” (p. 188)

Chapter 7, ‘Ancient Lead-silicate Glasses and Glazes of Central Asia,’ by Abdugani A. Abdurazakov, includes results of the author’s analyses of Central Asian glazes, ranging in date from the second century BC to the seventeenth century AD. The chemical compositions, mainly major elements (present in levels greater than 1 weight percent), for 27 glaze samples, including eight from Old Nisa, Turkmenistan (second century BC), are an important addition to a relatively scant literature, and merit wide recognition. Abdurazakov identifies 13 different chemical compositional groups, with lead oxide contents from less than 1% up to 40%.

The next chapter, ‘Central Asian Glassmaking During the Ancient and Medieval Periods,’ also by Abdurazakov, is even more data-rich, with compositions for 79 glass samples found in Uzbekistan, covering the period from the Late Bronze Age to the Middle Ages (eighth to fourteenth centuries AD). Distribution by geographical area can help the reader make sense of the multiple compositional groups suggested. Most importantly, the data and interpretation given here provides a convenient introduction to the rich Russian tradition of chemical analysis.

The next two chapters report recent studies on early glass found in Japan. The first of these, ‘Scientific Study of the Glass Objects Found in Japan from the Third Century BC to the Third Century AD,’ by Takayasu Koezuka and Kazuo Yamasaki, explores the usefulness of two nondestructive techniques: autoradiography (AR) and computed radiography (CR),
for the study of ancient glass. Both of these techniques have proved useful in Japan, where sampling ancient glass relics has been tightly restricted, although neither technique appears to have found much favor elsewhere. The first technique relies on the ability of a very sensitive imaging plate to detect radiation released by $^{40}$K, a naturally occurring radioactive isotope of potassium, thus enabling the important distinction between potash and soda glass for a large group of samples at one time. The technique itself, involving several steps including photo-stimulated luminescence, is described in section 2 of chapter 9. CR is used to distinguish lead silica from alkali silica glasses, since samples with higher lead will absorb more of an incident X-ray beam. The two techniques have been used to characterize over 200 small glass beads found in Japan that otherwise might not have been studied at all.

Chapter 10, ‘Chemical Analysis of the Glass Vessel in Toshodaiji Temple Designated a National Treasure Through a Portable X-ray Fluorescence Spectrometer — Where did the Glass Vessel Come from?’, is a collaboration between Akiko Hokura, Takaaki Sawada and Izumi Nakai at the Tokyo University of Science, Yoko Shindo at the Middle Eastern Culture Center, Tokyo, and Takashi Taniichi at the Okayama Orient Museum. The authors describe their studies of an important glass vessel held at Toshodaiji temple in Nara, Japan. This bottle with a globular base is thought to contain ashes of the Buddha, brought to Japan by a Chinese monk in the ninth century AD. Using a portable XRF spectrometer developed by Nakai et al. (2001), they were able to determine that the vessel was made from plant-ash soda glass, and is similar in typology and chemical composition to glasses produced in the Islamic world of the ninth century or later. The presence of a somewhat similar glass vessel, also used to hold Buddha’s ashes, found in the remains of a reliquary tower in China, leads the authors to suggest that the Toshodaiji vessel came to Japan via China.

The remaining chapters 11 to 24 in Ancient Glass Research along the Silk Road prove a treasure-trove of information on early glass in China and the then-current state of Chinese glass research. Topics range from the relationship between incipient glassmaking and metallurgy (Chapter 11), to the chemical composition and microstructure of faience beads (Chapter 13) and early eye beads (Chapter 24) found in China. Many chapters contain analytical data for the glasses studied, although this reader would have preferred a more thorough description of the methods used for each dataset. With dates ranging from the mid-first century BC to the early second millennium AD, and a geographical spread from Yunnan to Inner Mongolia and Xinjiang to Guangxi, the authors for these chapters provide useful introductions to their works that taken together becomes a mosaic of glass traditions and studies. While many of the chapters focus on the chemical analysis of glass fragments excavated from particular areas in
China, others approach glass study through a stylistic or art-historical lens. In this case, the color photographs from Chapter 15, ‘Glass Artifacts Unearthed from the Tombs at the Zhagunluke and Sampula Cemeteries in Xinjiang,’ by Wang Bo and Lu Lipeng, and from Chapters 19 and 20, both by An Jiayao, on ‘Glasses of the Northern Wei Dynasty Found at Datong’ and ‘Glass Vessels of the Tang Dynasty and the Five Dynasties Found in Guangzhou’ are particularly welcome.

Overall, the production values of the book are very good, with the text easy to read and figures and tables pertinent. Many of the photographs and drawings are excellent, and others at least legible even if not to the standard of the best. With so many authors and so many native languages, it is a real tribute to the editors how well the book holds together stylistically, with very little repetition of the information presented. The English is excellent throughout, and presents no barrier to comprehension of the authors’ points of view. While many of the contributions were written over ten years ago, the archaeological questions have not changed, and the data reported here are in most cases still the best available.

Glass along the Silk Road from 200 BC to AD 1000, Bettina Zorn and Alexandra Hilgner (eds.), Verlag des Römisch-Germanischen Zentralmuseums, Mainz, 2010, is also based on a preceding conference, in this case sponsored by the Sino-German Project on Cultural Heritage Preservation of the RGZM (Römisch-Germanischen Zentralmuseum) and the Shaanxi Provincial Institute of Archaeology, in December 2008. The 21 papers are organized into three parts based on geography: Europe, including Germany, Switzerland and Serbia; Western and Central Asia, including the United Arab Emirates, Afghanistan, Uzbekistan and Iran; and East and Southeast Asia, including Cambodia, Vietnam, China, Korea and Japan. The 248 pages, A4 size (216 x 279mm), include 8 maps and at least 140 color photographs, all excellent and many the best available of objects well-known in the literature on early glass.

The five papers on glass in Europe (Part 1: Europe) may seem a curious way to begin a volume on glass along the Silk Road. One clue to the intentions of the meeting planners and editors is suggested by Sophie Wolf and Cordula Kessler in their article on ‘Early Mediaeval Window Glass from Switzerland and a Brief History of Glass Production in Europe in the First Millennium AD,’ where they emphasize that much of the glass used in West and Central Europe during this period had an ultimate origin in the Eastern Mediterranean, the same area that was the western terminus for the main route of the Silk Road. The same message is repeated, less explicitly, in the other chapters in this section, on ‘Celtic Glass,’ by Rupert Gebhard; ‘The Late Antique Glass from Mayen (Germany): First Results of Chemical and Archaeological Studies,’ by Sonngard Hartmann and Martin Grünewald; “Glass” workshop from Čaričin Grad (Iustiniana Prima),’ by
Vujadin Ivanišević and Sonja Stamenković; and ‘Early Byzantine Glass from Caričin Grad/Justiniana Prima (Serbia): First Results Concerning the Composition of Raw Glass Chunks,’ by Jörg Drauschke and Susanne Greiff.

Each of these chapters has its merits. Gebhard’s study of Celtic bracelets is a model of how to combine historical background, archaeology, and artefact typology and distribution with the results of scientific analysis in order to “help us reconstruct the details of glass production” in the Celtic world. In their article on Late Antique glass from Mayen, Hartmann and Grunewald find that the local production of vessels at Mayen during the fourth and fifth centuries reflected not only changes in vessel form but also raw glass source, as HIMT (High Iron Maganese Titanium) replaced the earlier ‘typical Roman’ glass composition. The study on Early Mediaeval window glass from Switzerland by Wolf and Kessler, mentioned above, is strong in its presentation of historical and archaeological data, and incorporates as well a summary of the chemical compositional data from 100 samples. As is the case with most of the contributions in Glass along the Silk Road, no actual data is included. The half-page summary of the production of glass found in Europe in the first millennium AD is certainly concise, and accompanied by a useful chart of the changing glass compositions. The remaining two chapters in this section present work by the Archaeological Institute of Belgrade, in cooperation with the RGZM, on the sixth to seventh century AD site of Caričin Grad, a city known as Justiniana Prima in Late Antiquity. The first of these, mentioned above, is a report of the excavation of the southeastern corner of the lower town. Among the finds, bricks with vitrified surfaces and a fragment of what might be a crucible, led the authors to investigate whether or not these remains might be from a glass production workshop. Their thorough investigation of these objects, and reluctance to make a final conclusion, provide an excellent case study of how difficult it can be to identify ancient glass productions sites, whether for primary or secondary glassmaking. The final chapter in this section, by Drauschke and Greiff, continues at Caričin Grad, this time with chemical analyses of 14 of the raw glass chunks found during the excavations, although not in the vicinity of the possible glass workshop mentioned above. Excellent color photographs of vessel fragments from the site are presented as well, although these samples had not yet been analyzed at the time of writing this report. The compositional studies revealed two samples that the authors interpret as evidence for the use of a plant ash flux, since both magnesia (MgO) and potassia (K₂O) are elevated, although both are still below 2 wt% and the ratio of potassia to magnesia remains unchanged.

Whatever the reasons for including the articles in Part 1, and regardless of the likelihood that most western scholars will already be familiar with the take-home lessons, if not the actual studies, I think these chapters on
western glass do present some value for non-western researchers on Silk Road glass. These studies, ranging in time from the last centuries BC to the first millennium AD, provide a quick survey of some of the important issues that occupy many European scholars, and a glimpse into their ways of working, particularly in terms of combining archaeology with scientific analysis. Perhaps the message here, even if subliminal, is that this is how you can work, when resources, both financial and scientific, are available. Of course, this message is important not just for non-western scholars, but is one that many western glass researchers might take to heart as well, whether their approach starts from archaeology and typology or from the laboratory.

The first chapter in Part 2: Western and Central Asia, ‘Functional and Economic Aspects of Late Sasanian and Early Islamic Glass from Kush, United Arab Emirates’ by Daniel Keller, breaks the mold of Part 1 by not including chemical analyses, an absence that may be applauded by some readers but mourned by others, including this one. Apparently, the studies are in progress, although not in time for this report, and it will be interesting to see to what extent they help to clarify the geographic sources of the Late Sasanian and Early Islamic glass reported here. Based on a detailed study of the types of vessels from the four time periods from Late Sasanian (fifth century) to Early Islamic (ninth to eleventh centuries), the author concludes that most, if not all, of the vessels, particularly from the earlier periods, were used as tableware rather than being objects of trade, and, in addition, there was a decrease during the ninth to eleventh centuries in the degree to which certain vessel types were deliberately selected. While what this actually means remains an open question, the ability to pose this question reflects the careful data analysis on which this study is based, and a desire to relate the data from Kush to what people were actually doing there.

In ‘The Begram Glasses from Afghanistan’ Pierre Cambon reviews the archaeological and art-historical evidence for the over 150 glass vessels found in two sealed rooms during excavations in Begram, Afghanistan. The remarkable diversity in form and technique, coupled with chemical compositional coherence, makes the Begram vessels not only the largest collection of glass found along the Silk Roads, but also the most important known group of Late Hellenistic glassware anywhere. While some controversy remains regarding the meaning and precise dating of the site, by placing the glass in a first century AD context, Cambon raises the question whether the remains from Begram and Tillya Tepe were contemporaneous, the first representing Hellenistic influence from Alexandria, and the second influence from the Black Sea area. Excellent photographs by Thierry Olivier, Guimet Museum, help make this article a particular pleasure.
‘Some Notes on Early Islamic Glass in Eastern Uzbekistan,’ by Thilo Rehren, Ana Osório and Abdulhamid Anarbaev, is one of the few articles in Glass along the Silk Road to include the actual data on which the author’s interpretation is based, while at the same time not neglecting the important historical and archaeological background for the study. Analyses of eleventh to twelfth centuries glass from the Ferghana Valley, including from a kiln site just outside the ancient city walls of Akhsiket, suggests a variety of sources for the vessels, not solely, if at all, from that particular glass kiln. The variability in the Ferghana Valley data makes it clear that although such compositional categories as ‘Central Asian,’ based on potassia levels, can be helpful for the big picture, at a smaller scale these distinctions may be less useful, and only more detailed observations from production or kiln sites, as presented here, can help to address this complexity.

The last two chapters in Part 2 both report on glass found in Iran. The first, ‘Glass along the Silk Road in the Near East from the Persian Empire to the Middle Ages,’ by Mohammadreza Riazi, is a general review of Persian glass from the Late Bronze Age and the Achaemenian, Parthian, Sasanian and Early Islamic periods. Of these, the author considers the Sasanian period to have been the ‘golden age’ of Iranian glass, although considerable emphasis, with some details, is provided for other periods as well. While the descriptions are understandably brief, this reader would have preferred a more focused discussion of examples of Iranian glass, such as those found in China, Korea and Japan, with specific Silk Road links. In a book with excellent maps, at least one here would have been most welcome.

‘Technical Diversity of Persian Glasses in the Early Islamic Period and the Probable Relations with China (Chemical Analysis of Glass Findings from Rayy),’ by Reza Vahidzadeh and Ghadir Afrund, continues the Iranian theme, this time with a more specific look at glass found during the authors’ 2006-2008 excavations in the citadel area of ancient Rayy. Of the many glass fragments, ten were selected for chemical analysis using SEM-EDX (scanning electron microscopy with energy-dispersive spectrometry). Both the photographs of the types of samples and the SEM images from groups 2 and 6 illustrate the challenges of studying such weathered material, and the authors were careful to select relatively unweathered areas for analysis. With the exception of sample 1, a mold-blown vessel, it is difficult to know which samples were actually studied, since the photographs labeled sample 9 and sample 7 each contain three fragments, and the other samples are not illustrated at all. The analytical results themselves are well presented and very interesting. While all samples were relatively high in soda (Na₂O), potassia (K₂O) was high as well in the majority of glasses: greater than 4 wt% in seven samples and greater than 7 wt% in two. The authors interpret this as evidence for “potassium oxide as a primary flux,” and go on to show that in contrast to the high-soda plant
ash obtained from Isfahan glaze makers, ashed sugarcane leaves were relatively soda-poor and potassia-rich. While there seem to be several missing steps, perhaps omitted due to space restrictions, in suggesting that some of the Rayy glass were made using sugarcane leaves, the authors’ demonstration of glazing ceramics with a 5:1 mixture of sugarcane ash and silica is certainly interesting. The question of ‘probable relations with China’ during the Early Islamic period raised by the title of the article receives less attention, but would be welcomed as the topic of a future report.

Part 3: East and Southeast Asia, with eleven chapters, is easily the longest of the three parts, and comes closest to covering some of the same ground as that explored in Ancient Glass Research along the Silk Road, discussed above. The articles in Part 3 range in geographic scope from Southeast Asia and China to Korea and Japan, and begin with Brigitte Borell’s discussion of ‘Trade and glass vessels along the maritime Silk Road’ during the late centuries BCE and early centuries CE. Borell begins with Roman ribbed bowls, the ‘most suitable examples for illustrating the extent of the long-distance trade at the time,’ since, although relatively rare, they are easily identified even when only small fragments remain. Particularly precious were mosaic ribbed bowls, with one example from a royal burial in the Yangzi Delta. In contrast to ribbed bowls that were exchanged from the eastern Mediterranean to India and China, are the small, molded, glass cups found almost exclusively with burials in Guangxi. While no production sites for these cups and related shallow dishes has been found, Borell suggests that it is likely that they were made in the area of Hepu, Guangxi, based on their non-westerner potash chemical composition and their circumscribed distribution. That one such cup was found in the excavation of Arikamedu on the southeast coast of India provides evidence for a possible Chinese import there, and would add weight to the argument that Chinese traders visited Arikamedu, perhaps at least in part to place orders for such ornaments as Han ear spools in glass or carnelian.

In ‘Southeast Asia: Platform of Early Glass Trade,’ Karsten Brabaender presents a synthesis of early glass in Southeast Asia, emphasizing not only the dual influence of India and China, but also the active role of Southeast Asians themselves in the networks of exchange for both culture and commodities. While Indian influence is clear in the small, monochrome, ‘Indo-Pacific’ beads found in Southeast Asia, Brabaender raises the question of whether the high lead levels found in some Southeast Asian beads might be a reflection of technology from China, where the use of lead as a flux had a long history. Glass beads excavated in Vietnam, some with lead levels from the mid-teens to 30 wt%, provide the evidence. Unfortunately, the SEM-EDS analyses appear to have been made on the unprepared surface of the beads, since most samples have very low alkali levels, the hallmark of weathered glass. As a result, the reported lead levels, however
interesting they seem, may not be reliable. In addition, the two beads with highest lead levels both contain tin as well, and, in this case, high lead is expected, since lead levels in yellow glass are usually well beyond what is required by the stoichiometry of the lead-tin colorant. The question of Chinese influence on Southeast Asian glass is certainly an interesting one, and high lead may be the missing link, but I would encourage the author to find better compositional evidence as he continues his research. Another interesting question posed by Brabaender was whether glass, particularly beads, was ‘really a trading item?’ Could glass beads have served a monetary function? This of course is the topic for a much more detailed study, one that this reader, for one, would be very interested to see.

In ‘Analyses of Some Ancient Cambodian Glass Finds from Krek Village 10.8’ Susanne Greiff begins with a useful overview of glass chemical compositional analysis, then moves to the specific with her study of four beads and one bangle fragment dated roughly to the last centuries BCE. The results highlight some of the advantages and disadvantages of the micro-XRF technique.

The next four articles report recent studies on glass found in China. The first of these, ‘On Glassware from Tombs of the Sui and Tang Dynasties,’ by Wang Xiaomeng, is a substantive presentation of glass found in Sui and Tang Dynasty tombs in Shaanxi Province. First, he introduces a collection of six glass vessels excavated from a probably late sixth century tomb in the Weiqu cemetery in Shaanxi, now housed in the Shaanxi Institute of Archaeology. The excellent photographs are the best I’ve seen of this important group, some of the earliest blown glass vessels thought to have been made in China. No chemical analysis results are given, but similar-appearing vessels were apparently made with either lead-silica glass or some type of soda-lime glass. Clearly, good quantitative analyses would be very useful to understand the production not only of the vessels but the glass itself. A seventh vessel, a Late Sui/Early Tang footed bowl (Fig. 7), thought to be made from low-lead glass based on its weight, may also have been made in China. The author then reviews some of the types of glass ornaments from the tombs, and presents a summary table of the glass finds from four Sui/Tang phases. Based on the results from Shaanxi, he suggests that glass vessels were more common in the Late Sui Dynasty during the late sixth to early seventh centuries, while ornaments, mostly beads, predominate during the Tang Dynasty, particularly after the first half of the seventh century. Glass itself became relatively rare during the Middle and Late Tang periods, perhaps as a consequence of the An-Shi rebellion in the mid-eighth century. Why local production of glass vessels should begin and end during such a short time will be an interesting question for further research.

An Jiayao’s paper on ‘Glass Vessels of the Tang and the Five Dynasties Found at Guangzhou’ highlights the important role of maritime trade in
Islamic period glassware. In addition to excellent illustrations, the article includes chemical analyses of many of the vessels. If the vertical-walled cup from Tang layers of the Nanyue King’s palace site is consistent with glassware from Nishapur, the compositions of the ten fragments excavated from Liu Yan’s tomb, dated 942 AD, are also soda-lime glass, but this time surprisingly low in both magnesia and potassia. Further study may resolve the question of the origins of this glass.

In 874 AD, twenty glass vessels, collected by eight Tang rulers, were sealed in the crypt of the Famen Temple. Jiang Jie reports on these in the next chapter: ‘Glass: Top Quality Works in the Silk Road Trade,’ dividing them into six typological groups of bottles, cups, scratch-decorated plates, stained glass plates, undecorated glassware and glassware of domestic production. Jiang suggests that all but the last category were imported into China, with Nishapur as a possible source. The quality and condition of the objects is superb, and even what Jiang considers to be domestic production—two teacups and two teacup holders—were beautifully blown from yellowish transparent glass, very different from the Sui Dynasty domestic production described by Wang Xiaomeng in his article on glassware from Sui and Tang Dynasty tombs. As for most in this volume, the color photographs are excellent, even if a bit small.

The next two chapters focus on glass found in Xinjiang—the first, ‘Some Thoughts on Glass Finds in the Tarim Oasis from the Past Ten Years,’ by Yu Zhiyong, and the second, ‘A Scientific Study of Glass Finds from the Niya Oasis,’ by Lin Yixian. Yu Zhiyong’s article is both a very useful site-by-site survey of glass found in Xinjiang, and a critique—‘rethinking’—of glass study in general. Yu makes the excellent point that glass was more than “simply a type of goods traded,” and that knowledge of the “social functions, underlying values, cultural meanings, and/or symbols” represented by the glass is necessary for a full understanding of the glass evidence. By suggesting that “traditional archaeologists expect too much from the results of scientific analysis, while scientific archaeologists put too much emphasis on analyzing trial data and do not explore the cultural background sufficiently,” Yu highlights the cultural divide between many ‘traditional’ archaeologists and those more interested in scientific analysis.

Lin Yixian’s study of glass from the Niya Oasis makes an excellent attempt to bridge this gap between ‘science’ and ‘archaeology,’ particularly when taken together with Yu’s descriptive survey mentioned above. Lin reviews the Niya glass in the Xinjiang Institute of Cultural Relics and Archaeology, listing the total amounts and types of objects, mostly beads but including at least one near-intact vessel. Among the ‘polychrome special’ beads are eye beads, both stratified and mosaic, and zone or wave beads similar to those illustrated by Yu (Fig. 5). Chemical analysis of 41 broken beads and fragments from the site revealed four glass types, each
from a different source area. Based on her results, Lin suggests that most of the samples had been made in Central Asia, while others were from such disparate areas as the Hellenistic/Roman world, western Asia east of the Euphrates, and northwest Pakistan.

The two chapters on Silk Road glass in Korea follow a similar format. The first, ‘Early Glass in Korean Tombs—Cultural Context’ by Insook Lee, provides an overview, while the second, ‘Silk Road Glass in Ancient Korea: The Contribution of Chemical Compositional Analysis,’ by James Lankton, Bernard Gratuze, Gyu-Ho Kim, Laure Dussubieux and Insook Lee, is a more in-depth look at glass vessels from one early tomb. For her contribution, Lee emphasizes the important message of glass objects found in Korea as evidence for long-distance trade routes, whether overland or maritime. While many of the glass beads found in Korea have links to South and Southeast Asia, the glass vessels from fourth to sixth centuries tombs show a northern link, possibly through the Eurasian steppe extending from the northern shore of the Black Sea through Mongolia, and finally into Liaoning and Jilin Provinces in northeastern China. Lee emphasizes that gold objects in Korea may follow a similar trail of influence. In any case, both “gold ornaments and glass objects of ancient Korea should be studied with the thought that they are the results of cultural trade between the East and West…”

In the next paper, following a brief review of glass beads found in Korea, this time based more on chemical compositional evidence, Lankton et al. turn to the glass vessels from Silla tombs of the late fourth to sixth centuries, primarily in the southeastern city of Gyeongju, the site of the ancient Silla capital. The fifth century south-mound burial in a large double-mounded tomb contained at least seven different vessels. All were highly fragmented, providing an opportunity for chemical analysis of small samples of six of the seven. The initial result that even though many of these vessels had typical Roman typologies, none had been produced from Roman glass, raised the question of where else they might have been made. Based on new analyses of trace elements in the glass, the authors support their earlier assertion that the production zone may have been the Bactrian area of northern Afghanistan, known during the fifth century as Tokharistan. The article also includes a rather long exposition of the methods of compositional analysis and the comparison of compositional data, followed by a detailed presentation of the results.

The final contribution to Glass along the Silk Road is by Takashi Taniichi, writing on ‘Sasanian and Post-Sasanian Plant Ash Glass Vessels Delivered to Japan.’ Taniichi examines six glass vessels from Japan, describing where they were found and approximate dates of deposit. These Sasanian vessels, particularly the late-sixth century examples from the Shoso-in and the Tokyo National Museum, are remarkable for their excellent preservation.
and detailed histories. The last vessel considered serves to link together the two Silk Road glass volumes, since it is the same eighth century spheroid bottle used as a reliquary reported by Hokura et al in Chapter 10 of *Ancient Glass Research along the Silk Road*.

Taken together, the two books provide the best available introduction to the study of Silk Road glass. Neither should be approached uncritically, but both attempt to integrate traditional ‘archaeological’ glass study with newer forms of scientific analysis. The studies with clearly defined archaeological questions and techniques of analysis chosen to answer these questions are by far the most successful, but all of the articles in these volumes have merit, if only to introduce the reader to some of the lesser known facets of ancient glass in Asia. By the time of writing this review, neither volume is ‘new,’ but both remain timely in their concerns, and, in many cases, in the wealth of data presented. At this moment, both books are still available on internet sites, and may be available directly from the publishers as well. Contact details for all of the authors, including email addresses for those from *Glass along the Silk Road*, are provided, and this may be useful for those interested to learn more about a specific topic. Both of these books should be available in university libraries, particularly those serving students and scholars in archaeology. Although neither book is inexpensive, where there are no library copies available, having both books would be a good investment for those actively interested in the fields of Silk Road studies in general and Silk Road glass in particular.

**References**
