学会誌 No.	年月 year	名前 author(s)	題目 title	ページ page(s)	英文要約 abstract	キーワード英語 key words (English)	キーワード(日本語) key word (Japanese)	メモ
No.51	2006	KUSUNOKI, Kyoko; KATO, Hiroshi; KAWANOBE, Wataru; HAYAKAWA, Noriko	Physical Property of Animal Glue as Restoration Material	1–13	Animal glue is one of the traditional restoration materials used as adhesive for the conservation of paintings. It is made of the skin of animals, such as cows, pigs and rabbits, and is obtained from hydrolysis of collagen. In a restoration studio, glue is used appropriately, according to the materials and degree of deterioration of the object to be restored. In this paper, some physical properties of eight kinds of animal glue – e.g., molecular weight distribution, viscosity, compressive strength and modulus elasticity – were investigated. Animal glue has both high molecular weight fraction, such as 30–140 thousands molecular weight, and a low molecular weight fraction, such as 100–1,000 molecular weight. The physical properties of animal glue made from different animals are characterized by the difference in the value and ratio of molecular weight. Viscosity and compressive strength are correlated with the value of higher molecular weight fraction. Modulus elasticity changes largely with relative humidity: the higher the ratio of lower molecular weight fraction, the lower the modulus elasticity, especially in a humid condition. This is due to the hygroscopicity of lower molecular weight fraction.	animal glue, GPC, molecular weight, modulus elasticity, relative humidity	膠, ゲルろ過クロマトグラフィー, 分子量, 弾性率, 相対湿度	
No.51	2006	ISHII, Mie; SAITO, Masako	Fading Behavior of Natural Yellow Dyes and the Maintenance of Japanese Yellow *Kosode*	14–37	This study examines the fading behavior of nine yellow dyes historically used in Japanese and Chinese textiles: kariyasu (Miscanthus tinctorius L.), ukon (Curcuma longa L.), kuchinashi (Gardinia jasminoides Ellis), zakuro (Punica granatum L.), enju (Sophora japonica L.), kihada (Phellodendron amurense Rupr.), yamamomo (Myrica rubra Sieb.), kobunagusa (Arthraxon hispidus L.) and fukugi (Garcinia subelliptica L.). Dyed silk and cotton fabrics were exposed to xenon-arc lamp and the fading rate was measured against Japanese Standard (JIS) blue scale and fluorescence scale. Reflectance spectrum, CIELAB and color difference (⊿E) were gained and evaluated. Samples were photographed under day light and UV light for record. The bluescale grade of samples were: ukon I; kihada 1–2; kuchinashi, enju, fukugi 2–3; kariyasu, zakuro, yamamomo, kobunagusa 3–4. Noticeable fading (⊿E＝1.6) of all dyes commenced at around 90 kJ/m^2 and the fading slowed down at around 2,500 kJ/m^2 of light exposure. Although all dyes showed characteristic reflectance spectrum and CIELAB points before light exposure, some whitened (ukon, kuchinashi, enju, kobunagusa, fukugi) and others darkened (kihada, kariyasu, zakuro, yamamomo). As some reflectance spectrum and CIELAB points were similar, they were indistinguishable from each other. All dyes showed yellow fluorescence before exposure; among them, ukon and kihada fluoresced the strongest. Synchronously with color change, fluorescence declined, and by 4,100–4,500 kJ/m^2 of light exposure, all but kihada showed weak fluorescence. Quantitative information of the fading behavior of dyes was used against five kosode (kimono) fragments dyed with ukon and kihada already analysed by HPLC and XRF. Fading characteristics of yellow areas of kosode matched that of reference gained by the experiment. Such indicative information is indispensable in understanding historical textile dyed with natural dyes and in setting up a relevant environment for their preservation.	fading behavior, yellow dye, xenon-arc lamp, color measurement, *kosode*	変退色挙動, 黄色染色, キセノン光, 測色, 小袖	
No.51	2006	FUKUOKA, Yuko; SAITO, Masako	Colors, Dyes and Mordants on Imported Red Woolen Fabrics Applied for *Jinbaori* from Eda Period	38–50	A military campaign coat, *jinbaori*, was worn over armors by Japanese warriors since the 16th century and was continually used until the middle of the 19th century. For making *jinbaori*, various types of fabrics imported from foreign countries were used. Among them, red woolen fabrics imported from Europe were especially favored by military commanders. In this study, colors, dyes and mordants of red woolen fabrics used for 38 *jinbaori* of the Edo period (1603–1867) were analyzed and interpreted in historical contexts. The colors were measured by spectrophotometer and the results were plotted on the L*a*b* chromatic system, the dyes were analyzed by high performance liquid chromatography with photo-diode array detector, and mordants on fabrics were detected by X-ray fluorescence spectroscopy. Cochineal dye with aluminum mordant was detected from bluish-red *jinbaori* of l 7th and 18th centuries. Cochineal, lac, and a combination of cochineal and lac dyed with aluminum and tin mordants were identified in yellowish-red *jinbaori* of the 17th through 19th centuries.	military campaign coats, impoeted textiles, red dyes, scarlet, HPLC-PDA	陣羽織, 舶載染織裂, 赤色染料, 猩々緋, 高速液体クロマトグラフィー・フォトダイオードアレイ検出法	

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No.51	2006	KAMIYA, Yoshimi; KATO, Hiroshi	Assessment of the Surface of Lacquer Films Deteriorated by Ultraviolet Irradiation	51–58	Japanese lacquer, *urushi*, is a natural polymer that has been used as adhesive or paint from ancient times. Recent studies have made it clear that Japanese lacquer films are weak against ultraviolet irradiation and that exposure to ultraviolet rays could cause lacquer films to deteriorate (e.g. Flaking off of films, loss in gloss, or cracking might possibly occur.). There are many research data on the effect of ultraviolet irradiation on *urushi* by using samples on which a single layer of lacquer coating film has been applied on a glass board. However, there are few research data about the relation between gloss, color and surface condition of *urushi* on objects that have been coated with several layers of lacquer, which is done in actual lacquer cultural property. Therefore, in this research samples similar to what may be found on indoor lacquer-coated objects were used to study the influence of ultraviolet ray. After irradiating ultraviolet rays, changes in appearance on the polished lacquer coating film that had four-layer structures were verified. Results of gloss measurement and color measurement provided close agreement with the result obtained by visual observation method. The rate of change in the gloss in the first stage of ultraviolet irradiation time on black lacquer coating samples was large. On the other hand, although deterioration could not be observed so clearly by visual observation in the case of samples coated with *sugurome* lacquer, examination under a microscope showed that deterioration had gradually but surely occurred on the surface of lacquer films. Thus it was confirmed that there was an enormous difference in the progress of deterioration depending on the kind of final coating lacquer applied. For deteriorated lacquer coating films, then, this study made it clear that there was a difference between the impression received from visual observation and the actual condition occurring on the surface of films.	urushi film, ultraviolet irradiation, sueface, color difference, gloss	漆塗膜, 紫外線照射, 表面, 色差, 光沢	
No.51	2006	YOSHIDA, Kazunari; WATANABE, Yuko; SANO, Chie	Comparison of Methods for Measuring Acidity of Paper	59–68	Measuring pH of paper is important in the evaluation of the condition and life time of paper materials. There are several standardized methods for measuring pH. However, since there are limitations to the amount and size of samples that may be used in the case of cultural properties, pH measurement is done not always by a fixed method but by several methods according to their appropriateness. Yet there are few reports that provide a comparison of these testing methods. In this study, three pH testing methods, i.e. cold extraction method, surface pH method and method using small pieces, were compared. The effect of water on pH values was also examined by changing the amount of water used in measuring pH. The pH value thus obtained was compared to a theoretically calculated pH value. As a result, it was found that the amount of water and the weight of paper clearly affect the measured value and that it is possible to calculate the required amount of water and weight of paper that would meet the standardized method for pH measurement.	paper, acidity, cold extraction method	紙, 酸性度, 冷水抽出法	
No.51	2006	MABUCHI, Hajime; SANO, Chie	Influence of Methyl Bromide Fumigant Remaining on Paper	69–78	Methyl bromide has been repeatedly used for fumigation on cultural properties at museums in Japan and it has been assumed that there was very little influence on materials (except blue prints, fur, leather, rubber, photographs and specific mineral pigments containing sulfur). However, some current researches suggest that remaining bromine was detected on polychrome sculptures, paintings, photographs (printed on paper), color slide films, unbleached cotton cloths and some paper samples, which had been previously fumigated repeatedly. In this research, the amount of Br−, extracted from fumigated paper samples, by water was measured by ion chromatography as remaining bromide on paper. It was found that bromine remains on fumigated paper even 2 years after fumigation, especially on Japanese papers, which contains a great amount of non-cellulosic components, rather than on filter paper. Concentration of Br − extracted from papers increased when fumigation was repeated and when sheets of paper were bound into a brochure. Accelerated aging treatment (TAPPI T 573 pm-03) was done to study the effect of methyl bromide fumigation on the deterioration of paper. As a result, it was found that acidification and discoloration of paper were remarkably expedited when methyl bromide remained on paper. Therefore, against our estimation, deterioration of papers or books stored in museums and libraries, with history of methyl bromide fumigation, may be advanced.	methy bromide, fumigation, paper, deterioration	臭化メチル, 燻蒸, 紙, 劣化	

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No.51	2006	MASUZAWA, Fumitake; KITANO, Nobuhiko; SUGIMOTO, Keisuke; UEDA, Naomi; SAWADA, Masaaki; MIYAGISHI, Shigeyoshi	Cluster Analysis of Dimensional Changes of a Waterlogged Sleigh during Its Conservation with Polyethylene Glycol	79-92	Dimensional variation of a waterlogged wooden sleigh, *shura*, was followed at 108 points on its surface during 11 years of a polyethylene glycol impregnation treatment and subsequent 7 years of its preservation, Data were statistically treated with cluster analysis method. The *shura*, a two-forked sleigh of Japanese evergreen oak, was one of the largest waterlogged objects made of one wood in the world. Cluster analysis was performed under the condition of auto-scaling, Euclidean distance and Ward method, and its precision was more than 80%. Data points could be grouped into several clusters, and the clusters showed characteristic behaviors respectively and differed from each other in shrinkage, expansion and crack. Mapping of the data for each cluster on the *shura* enabled visualization of the cluster distribution.	waterlogged ork, impregnation with PRG, cluster analysus, dimensional stability, Y-shaped limb	水浸出土カシ材, ポリエチレングリコール含侵処理, クラスター分析, 寸法安定法, 二股の木取り	
No.52	2007	INUZUKA, Masahide; KIGAWA, Rika FUTAMATA, Satoshi; KIMURA, Hiroshi; TORIGOE, Toshiyuki; IMAZU, Setsuo; HONDA, Mitsuko; SANO, Chie; ISHIZAKI, Takeshi	Study of Various Methods of Humidity Control for Wooden Objects in Carbon Dioxide Treatment for Eradication of Museum Insect Pests	1-12	As an alternative to fumigation with methyl bromide, carbon dioxide treatment is one of the candidate methods for eradication of museum insect pests, and it has recently become popular in Japan. Folk cultural objects have been commonly treated with this method, but now, the application of the carbon dioxide treatment is being gradually extended. So far, it has not been reported that cultural objects were physically damaged due to rapid changes of humidity of the surrounding space when dry carbon dioxide (CO_2) gas was introduced. However, it is anticipated that some objects that are sensitive to rapid changes of humidity might be physically damaged if the volume of the treatment space is extremely large compared with the volume of the target objects. In this study, various conditions for carbon dioxide treatment were examined using a bag for eradication, which is commercially available and widely utilized in museums. The examinations were conducted by measuring strain on thin cypress boards settled in the bag. It was verified that the shrinkage of the cypress boards was sufficiently suppressed if CO_2 gas was humidified using silica-gel based sorbents (60% RH) before flushing into the bag. This method has already been practically adopted in the Kyushu National Museum. It was also verified that the shrinkage of cypress boards was moderated by simply enclosing additional wooden pieces, which functioned as a humidity buffer in the bag when dry CO_2 gas was introduced. This method is convenient compared with the above one requiring a special humidifier. Moreover, the method enclosing silica-gel based sorbents instead of wooden pieces was also examined. The moderation of the strain was also observed. However, more quantitative studies are necessary, taking into account the difference of equilibrium moisture content between target objects and sorbents.	carbon dioxide treatment, insect eradication, strain, wood, humidification	二酸化炭素処理, 殺虫, ひずみ, 木材, 加湿	

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№52	2007	ICHIKAWA, Saari; MATSUI, Toshiya; SAWADA, Masaaki; NARUSE, Masakazu; MATSUDA, Yasunori	Distinction of Raw Materials (Shells and Limestone) for Calcium Carbonate Based on the Shape of Their Particles II -- An Attempt at Making a Chart for Distinction --	13-21	Investigation into raw materials of calcium carbonate used for pigments, lime plaster and wall painting bases is important for the conservation and restoration of cultural properties. Shells and limestone are known as raw materials for calcium carbonate. The type of shells used were discriminated by observing their crushed shape with an optical microscope and a scanning electron microscope. We have managed to create an indentification chart, focusing on the differences in the biomineral growth of shells. This chart shows the procedure for observing an unknown sample. If it is recognised to resemble one of the shapes listed, the raw material of the cultural properties can be identified. For example, it is understood that the material is *Crassostrea* (*kaki*) if an unknown sample has long and slender irregular polygons, plate-like crystals descends from "foliated structure" on this feature and spherical particles. But in addition to ref erring to the chart, it is necessary to refer to literature and information abut traditional materials in order to identify the type of shells. FT-IR analysis has revealed that aragonite and calcite have different spectrum patterns. An aragonite spectrum has a peak of 1446～1470 cm^{-1},854cm^{-1}, 1080$cm^{-1}$and 699cm^{-1}, and a calcite spectrum has a peak of 1410cm^{-1}, 874cm^{-1} It is possible to treat the identification of the combined states of calcium carbonate as an information that supports the observation result. This chart is yet incomplete because as a more detailed observation of shapes is necessary to clarify the identification items. However, assuming this chart is a prototype, more information will be added to improve the quality of the chart.	calcium carbonate, shells, limestone, shape, identification chart	炭酸カルシウム, 貝殻, 石灰岩, 形状, 識別チャート	
№52	2007	SASAKI, Yoshiko; KOIKE, Tomio; YANO, Toshiaki; SASAKI, Ken	Scientific Analysis for the Reconstruction of "*Haori* with Design of *Aoi* Crests and Rabbits Jumping through Waves" from "*Album of Textile Fragments of Tsujigahana Garment*" Stored in The Tokugawa Art Museum	22-36	Wadded haori with the design of "rabbits jumping through waves" in "*Album of Textile Fragments of Tsujigahana Garment*" stored in The Tokugawa Art Museum, inherited from Tokugawa Ieyasu, the first *shogun* of the Edo government, was reconstructed based on the results of material and dyestuff analysis. The outer material was *nerinuki* that consisted of raw twine-less silk warp and degummed twine-less silk weft. The raw silk warp was dark-brown and heavily degraded. The weft was also damaged but the color was yellow. A part of the white pattern was pale blue. These observations suggested that the *haori* was originally dyed with indigo followed by tie-dyeing with a yellow dyestuff. Polarized infrared microscopy for the wad, weft, and warp indicated that the differences of the spectra with polarization, parallel and perpendicular to the fiber axis, which reflect the orientation of silk fibroin, were almost the same as those of modern silk fiber. The mordant for the dark-brown outer material was identified by X-ray fluorescence analysis as iron. The second derivative of the reflectance visible spectra showed the presence of three peaks in the region of 400 to 500 nm, indicating the use of *kuchinashi* (gardenia). It was clarified that the original color of the haori was not brown as observed, but greenish yellow by iron-mordanted gardenia dye. "*Haori* with Design of *Aoi* Crests and Rabbits Jumping through Waves" was reconstructed based on these analytical results. For reconstruction, as the original color hue could not be determined by these analyses, the color was selected from fifteen gradations of greenish yellow color samples, which were prepared by iron mordanted gardenia dye. In addition, the arrangement of forty fragments of the original was newly decided based on the crests, seams, and shape of sleeves as previously proposed. Actual dying in the reconstruction was carried out by using synthetic dyes, upon consideration of the heavy damage incurred in a short-time (only 150 years) of the original haori due to iron mordanted dying.	natural dye, silk, textile fragments of *tsujigahana* scopy, reconstruction, polarized infrared microscopy, reflectance visible spectrum	天然染料, 絹, 辻ヶ花染め裂地, 復元, 顕微鏡偏光赤外分光, 反射可視スペクトル	

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No.52	2007	ISHII, Mie; SAITO, Masako	HPLC Analysis of Natural Yellow Dyes in 18th Century French Silk Textiles	37-52	Identification of natural yellow dyes used in historic textiles provides us with information about their historical interpretations and suggests how they should be preserved. Four natural yellow dyes described in European dye manuals from the 18th to 19th centuries, weld (*Reseda luteola*), dyer's broom (*Genista tinctoria*), old fustic (*Chlorophora tinctoria*) and quercitron (*Cuercus tinctoria*), were analyzed by photodiode array high-performance liquid chromatography (HPLC), and a data base was compiled for the purpose of identifying historic textiles. From five French silk textiles dating from the 18th century, four yellow and four green silk warp and weft threads were sampled. Dyes were extracted from the threads with 0.5mol/l HCl: MeOH=1: 1 (v:v) and DMF for blues in an ultrasonic vibrator (40℃) and analysed. Mordants were analysed by X-ray fluorescence analysis. All four yellow threads were dyed with weld and alum. Among four green threads, three were dyed with weld, indigo and alum, but one lacked distinction between weld and dyer's bloom since both contained luteolin but other decisive colorants were not distinguished due to their break-down from ageing. Weld is frequently mentioned in dye manuals of the period and favored for dyeing high quality silks because of its 'true yellow' color and color fastness compared with dyer' broom which is a drab yellow. The scientific result of this study complies with historic documents. Textiles dyed with weld are recommended by the CIE to be displayed at 15000 lx/y, using UV-cut museum lighting.	HPLC, XRF, Natural yellow dye, moedant, 18th century French silk textiles	高速液体クロマトグラフィー, 蛍光X線, 黄色天然染料, 媒染剤, 18世紀フランス絹織物	
No.52	2007	YAMAGUCHI, Kana; KATSUMATA, Saito Kyoko; KIRINO, Fumiyoshi; INABA, Masamitsu	Insertion-accelerated Ageing Test of Paper (III): Effect of Migration of Aluminum Sulfate Components on Discolouration	53-60	In our previous paper, we reported that lesser discolouration of acidic paper contacted with alkaline paper was observed under the condition of 80℃, 95%RH with pressure than that under the conditions of lower relative humidity and/or without pressure. This phenomenon is caused by the neutralization of acidic paper. To study the migration of aluminum sulfate components from paper to paper, acidic papers were inserted into three types of booklets: alkaline paper (H: higher content of calcium carbonate), alkaline paper (L: lower content of calcium carbonate), and filter paper. Moist heat treatment was carried out under 80℃, 65 to 95%RH, with pressure ranging from Oto 39 kPa (0 to 10 kgf / 25 cm^2). After accelerated ageing at 80cC and 95%RH with pressure, it was found that SO4 and Al components from the sheets of acidic paper moved to the sheets of three types of booklets. The acidity and the rate of discolouration of the acidic paper treated under 80℃ and 95%RH were lower than those of the papers aged at 65 and 80%RH with or without pressure. Additionally, when acidic paper was inserted into an alkaline paper (H) booklet, Ca was also transferred from the alkaline paper (H) as we already reported. These migrations resulted in neutralizing the inserted acidic paper. When the acidic paper contacted with filter papers, SO4 and Al components moved from the acidic papers into the filter papers even at 80℃ and 80%RH with pressure. The faster migration of these components were observed under higher pressure. The migration of SO4 and Al components from acidic paper contributes to the pH increase of the acidic paper and reduces the degree of discolouration of acidic paper during moist heat ageing.	Discolourationm, Acidic paper, aluminium sulfate, Migration, Insertion method	変色, 酸性紙, 硫酸アルミニウム, 移行, 挿入法	

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No.53	2008	HAYAKAWA, Noriko; NAKAU, Erika; KIGAWA, Rika; OKIMOTO, Akiko; KAWANOBE, Wataru	Basic Research of Conservation Materials for Painting Surface	1–19	In the case of conservation for paintings, especially on the surface treatments, the selections of materials ways of their use is very important. In Japan, *nikawa* glue is commonly used for consolidation, and *funori* (seaweed paste) for facing and as thickener. However, these materials are very susceptible to molds in high humidity conditions. There are a few underground stucco paintings in Japan that are in need of conservation in high humidity. We examined some kinds of conservation materials for selecting appropriate treatments of underground stucco paintings. Funari, nikawa glue, Paraloid B 72, acrylic emulsion adhesive (AC 3444), hydroxy propyl cellulose, methyl cellulose, and ethyl cellulose were evaluated for compressive strength, depth of penetration, degree of lightness, and susceptibility against molds. It was made clear that all samples, especially *funori* and HPC, were sensitive to humidity not only when measuring but also when using them. It was said in restoration studios that cellulose with low molecular weight either penetrated deeper than cellulose with high molecular weight, but the samples showed different tendency in that cellulose with high molecular weight penetrated deeper than others. However, they showed different tendency when the samples were spreading on the wall at conservation sites. Change in the degree of lightness was minus in all pigments except pine soot. It was also made clear that Paraloid B 72 did not cause extreme change in the lightness of pigments. It is considered that the reason that the pigments look dark at conservation sites was caused by transparent backing dark color of paintings. Traditional materials such as glue,*funori*, and Paraloid B 72 allowed significant growth of molds in mold susceptibility tests. The Paraloid B 72 samples, which were sprayed with mold strains isolated from underground tumulus where Paraloid B 72 had been used for conservation, showed significant mold growth.	conservation materials, strength, lightness, mold, penetration	修復材料, 強度, 明るさ, カビ, 浸透性	
No.53	2008	FUKATSU, Yuko; KASASAKU, Nana; SAITO, Masako	Scientific Analysis of Materials and Techniques in Purple Woolen Fabrics Used for Japanese Campaign Coats from the Late Edo Period	20–34	Materials and techniques of purple woolen fabrics used for military campaign coats or swatches from the late Eda period (1800–1868) were analyzed in order to explore manufacturing techniques and their historical contexts. The weave structure, yarns, surface treatment and thickness were documented. Fibers were observed by Scanning Electron Microscope. Colors were measured by spectrophotometer. Dyes were analyzed by high performance liquid chromatography with photo-diode array detector. Mordants on fabrics were detected by energy dispersive X-ray microanalyzer. The fibers were identified as wool. Woolen yarns woven in plain weave or twill weave were napped on the surface and worsted yarns were woven in plain weave. Alum mordant with lichen, cochineal and indigo or woad, and logwood were detected. Those results reflect textile manufacturing and dyeing technology used in Europe during the 19th century. Therefore, purple woolen fabrics used for Japanese costumes such as campaign coats or preserved as swatches were produced in European textile industry, exported to Japan by trade with the Dutch.	Historic textiles, woolen textiles, Pueple dyes, HPLC-PDA,EDX	染織文化財, 毛織物, 紫色染料, 高速液体クロマトグラフィー・フォトダイオードアレイ検出器法, エネルギー分散型X線分析法	
No.53	2008	SASAKI, Yoshiko; FUJII, Kenzo; SASAKI, Ken	Non-destructive Analysis for 17th Century Traditional Japanese Textile, "White Ground Satin with Design of Snow, Crests, and Chrysanthemums"	35–53	Non-destructive methods using visible and fluorescent spectra were adopted for identification of red, yellow and blue dyestuffs of embroidery threads and square patterns in a 17th century traditional textile "*uchishiki*" (kimono fragment with print and embroidery). ATR-infrared analysis was also carried out for determing binding material in the blue and red stencil bound dot. Information of dyestuffs used for multi-dyeing was easily obtained by combining fluorescence emission and excitation spectra. Amur cork tree was observed as a minor component together with safflower in the red embroidery thread by excitation spectra. Yellow dyestuffs could be easily discriminated by the excitation spectra of turmeric, amur cork tree, and Eulalia. Bound dots were made by stencil dying into red and blue with brazilwood and indigo, respectively. Binding materials in the stencil dyeing were determined by ATR-IR spectra. In the blue dot, the spectrum was almost identical with that of typical dextrin, indicating usage of starch glue. In the red dot, the spectrum was slightly different from that of starch glue, but almost identical with the spectra of glucomannose glues. Thus, it was found that binding materials were changed by the color in the stencil dots.	*kanbun-kosode*, Non-destructive dye analysis, UV-Vis spectroscopy, Fluorescence spectroscopy, ATR infrared spevtroscopy	寛文小袖, 非破壊染料分析, 紫外可視分光, 蛍光分光, ATR赤外分光	

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No.53	2008	YASUE, Akio	Living Philosophy of Book Restoration: Remarks on the IFLA Principles of 1979	54-66	IFLA (International Federation of Library Associations and Institutions) framed "Principles on Conservation and Restoration in Libraries" in 1979. The document indicates the essential philosophy and practical guidelines for both conservation (preventive measures) and restoration (remedial measures) of library materials. In order to meet broader themes of preservation in libraries, the Principles were revised in 1986 and were replaced by new principles. Therefore, relatively speaking, the impact of the 1979 Principles was limited to a short period of time. Although the Principles of 1986 has received high recognition for providing a new framework of library preservation, it omitted restoration theme from its scope. Authors of the new .Principles probably thought restoration work belong not to librarians but to technical experts of conservation. It is natural that restoration process is carried out by conservators, but librarians, in particular curators who care for rare books and documents, ought to understand restoration work as well: what restoration is and what it does, what should be considered when planning restoration etc. The 1979 Principles responds to such needs and obligations of library curators and, in this regard, there are no other international documents which exceed it. The 1979 Principles, or its thought on book and document restoration, still provides essential guidelines and has continual importance in our time.	conservation and restoration, rare books, IFLA Principles, history	保存修復, 貴重書, 国際図書館連盟の原則, 歴史	
No.53	2008	KIGAWA, Rika	Effects of Various Fumigants and Other Pest Controlling Treatments on DNA Extraction and Amplification from Natural Specimens	67-75	Much emphasis has been placed on visible damage to collections, such as mechanical damage or color changes, caused by some pest controlling treatments. But in light of the increasing use of DNA methodologies, invisible damage to macromolecules such as DNA is also critical especially to the preservation of natural history collections. In this report, the effects of several treatments for pest eradication on natural specimen DNA are outlined, mainly from the results of our experiments using freezedried mushroom and freezedried muscle (Kigawa et al., 2003). From the data, it was clearly showed that the fumigants — methyl bromide, methyl bromide/ethylene oxide mixed gas, ethylene oxide, propylene oxide and methyl iodide — all caused significant degradation of specimen DNA, even with a single fumigation. Subsequent steps at amplification of certain DNA fragments by PCR (polymerase chain reaction) were difficult in these samples. There were more problems in amplifying larger DNA fragments than smaller fragments. The main cause for the decreased efficiency of PCR was thought to be the degradation of template DNA. On the other hand, thermal methods (heating and low temperature), 60% carbon dioxide treatment and fumigation by sulfuryl fluoride seemed scarcely to affect the DNA molecules of the specimens, allowing subsequent PCR to be successfully performed. Direct sequencing of the PCR products was also performed to check for the possibility of modifications to the DNA sequences. As a result, it was found that when the PCR products were amplified to the sufficient amount for direct sequencing, the DNA sequences were normal in our examination of a few gene regions. From the results of other papers, the levels of effects by treatments can vary by conditions, such as with kinds of specimens, or with different concentrations of chemicals, or with different extraction methodologies of DNA from specimens. But at least it is possible to consider how damaging to collections it would be to perform repeated fumigation by chemicals which cause obvious degradation of extracted DNA molecules even after a single treatment.	DNA analysis, Natural specimens, Fumigants, Pest control	DNA解析, 自然誌標本, 燻蒸剤, ペストコントロール	

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No.54	2009	SONODA, Naoko	Collection Management for Ethnological Artifacts	1-21	The National Museum of Ethnology has a collection that includes not only ethnological and folklore artifacts, but also materials much like those currently used in everyday life. Many materials that the Museum has collected or will add to the collection were not originally intended to be conserved for a long period of time, but to be used as ordinary items in everyday life or in special ceremonies or festivals, for only a limited time. In other words, unless they are deliberately conserved somewhere, it is unlikely that they would exist for very long. Some materials are highly valued as rare items; but on the other hand, scholarly information learned from analysis of numbers and quantities of materials is also very important. It is therefore necessary for the Museum to deal with a huge trove of materials as a whole, instead of treating them as individual pieces. In addition, many items are composed of organic materials. Dirt, perspiration stains and other signs of use shown in individual materials are also very important clues for understanding how they were used, and therefore such signs must not be removed without due care and consideration. Moreover, it is not unusual that the environment in which these materials are usually used is significantly different from that in which they are stored at the Museum. For these reasons, our collection materials are very susceptible to bio-deterioration, even in comparison with other museum collections. In conserving collection items, we at the National Museum of Ethnology are required to fully consider the above-mentioned peculiarities. In the field of conservation science, the principle of "preventive conservation" has been main stream since the 1990s. The practice of this principle is integral to the "people-friendly, collections-friendly and environmentally friendly" management of the Museum. This article describes preventive conservation and collection management at the Museum, referring to measures which have been taken to implement Integrated Pest Management (IPM) and improve the environment of the collection (in terms of temperature/humidity management, and improvement of storage methods). We believe that many of the ideas underlying those measures can be shared with other museums dealing with folklore materials. The Museum's collection management staff mainly consists of three-year contract employees. Therefore, in our efforts to enhance our collection management system, special consideration is given to how to collect and record homogeneous data for a long time while maintaining a specified standard in collection manage-ment work.	museum of ethnology, preventive conservation, Integrated Pest management, museum environment, storage	民族学博物館, 予防保存, 総合的有害生物管理, 保存環境, 収蔵	
No.54	2009	CHEN, Gang; SU, Junjie	The Performance of Chinese Bamboo Paper -Changes in Physical Properties by Accelerated Ageing-	22-29	Five kinds of traditional Chinese bamboo paper – old lianshi paper, new lianshi paper, maobian paper, small yuanshu paper and fine yuanshu paper, were selected as samples for investigateing their strength and durability after accelerated ageing (105℃) for up to 40 days. Changes in brightness, tensile strength, folding endurance and tear index of these samples were measured for evaluation of their permanence. Lianshi, which is bleached paper, has higher pH. Old lianshi paper with sunlight bleaching shows lower deterioration rate of its strength and discoloration than new lianshi paper and jingpi xuan Paper, a kind of Chinese paper made from bast and straw, with chlorine bleaching. Maobian paper and yuanshu paper, both without bleaching, show lower pH and whiteness. But the deterioration of their strength is not so quick, and the use of strong cooking agent caustic soda in manufacturing fine yuanshu paper do not affect its permanance markedly.	bamboo paper,permanence, physical property, deterioration	竹紙, 保存性, 物理的物質, 劣化	

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No.54	2009	YOSHIDA, Miyo; HAYAKAWA, Yasuhiro; OKADA, Nobuyo	The Materials Investigation of the Tapestries on "Dashi" Floats: Tapestries at the Festival in Handa City, Aichi	30–40	During traditional festivals in Japan "dashi" floats or wooden carriages are paraded throughout the city. These floats are usually covered with tapestries among other decorations. Tapestries used for the floats are made using various techniques of dyeing, weaving and embroidery. In Japan, the techniques of the embroidery used in tapestries were completed in the latter part of the Edo period. In this study, production techniques and materials analyses were performed on the tapestries that were used in "dashi" floats of Banda City, Aichi during the Taisho period (1921). The following tools were used for the analyses: a digital microscope for substance observation; X-ray fluorescence analyzer (XRF) for elemental analysis; Fourier transform infrared spetrophotometry (FT-IR) for adhesive identification; and scanning electron microscopy (SEM) for fiber identification. Analyses revealed that two types of gold-colored threads were used for the patterns found on the tapestries: a twisted Type and a flat type. The flat gold-colored thread found on the brocade are gold foils, a mixture of either gold or silver or copper pasted on one side of a Japanese paper, which were then cut into thin strips and inserted into the warp of every other row. On the other hand, the twisted gold colored thread serves to coil the flat colored thread around a core thread that varies in thickness. Upon examination of the reverse of the tapestries, cotton threads were found, while cotton and rayon were used for the core thread of the gold-colored thread. The metal ornament found on the tapestry is a gold-plated copper.	tapestory, embroidery, X-ray fluorescence analysis,gold-colored thread, Kinran	水引幕, 刺繍, 蛍光X線分, 金糸, 金襴	
No.54	2009	FUJISAWA, Akira; KITADA, Masahiro; CHUJO, Kouichirou; KIRINO, Fumiyoshi	Composition of Materials and Production Techniques of Japanese Sword Guard Fabricated in the Late Edo Period	41–51	Composition of materials and production techniques of Japanese Sword Guard fabricated in the late Edo period have been investigated. Microstructure of metals were observed by an optical microscope, a scanning type electron microscope (SEM). Elemental analyses were carried out using an energy dispersive X-ray spectrometer (EDS) and a wavelength dispersive X-ray spectrometer (WDS). Crystal structures were examined by an X-ray diffract meter (XRD). As a result of observation of the metallurgical microstructure, it was found that the low-carbon steel con-taining less than 0.2 mass% carbon is used for base metal and that it was forged by hot hammering or annealed. Copper, Cu-Au-Ag alloy, Cu-Zn alloy, Ag-Cu-Au alloy and low-carbon steel are used for decoration. The non-ferrous metals are inlaid with takanikuzogan technique. The low-carbon steel inlaid with hamegane technique for decoration is the same material as the base metal and the boundary between both steels is indistinct from the surface. Undistorted blowholes are observed at the section of Ag-Cu-Au alloy. It is estimated that the Ag-Cu-Au alloy parts were casted, or casted and cut. Distorted blowholes are observed at the section of Ag-Cu-Au alloy. The Cu-Au-Ag alloy parts are estimated to have been casted and plastic worked. A layer of enriched gold that was made by amalgam exists on the surface of copper.	sword guard, inlay, iron, gilding	鐔, 象嵌, 鉄, 金銷	
No.54	2009	SUZUKI, Haruhiko; HONTA, Satoshi; YONEKURA, Otoyo; KAMBA, Nobuyuki; TSUCHIYA, Yuko; ATSUDA, Marni	An Application of a New Roller Clamp for Scrolls Toward an Approach to Symptomatic Treatment in Conservation	52–65	Roller clamps or futomaki are used as a protective measure for storing objects such as hanging scrolls, hand scrolls, and tapestries. Traditionally made of wood, their wide diameter helps reduce creases and wears inherent in objects that are repeatedly rolled and unrolled. This paper introduces an "all-purpose conservation roller clamp" developed by the authors as part of the Tokyo National Museum's primary care. This model caters to a majority of protection problems in museum objects that are stored in a rolled state. One of its versatile characteristics is its ability to accommodate deformed rods which otherwise would require conservation treatment. Incorporating materials available in conservation practice into traditional methods, the device is easily processed with little practice, saving both time and money. It is hoped that this clamp will serve as an efficient and accessible tool for museums worldwide dealing with the preservation of their diverse collections.	Roller Clamp, Symptomatic Treatment, Preventive Conservation, Remedial Conservation, Primary Care, Hanging Scroll	太巻添軸, 対症修理, 予防保存, 修理保存, 包括的保存, 掛軸	

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No.54	2009	TAKEDA, Eri	Report on UV-fluorescence Reaction and Ageing of Natural Resin Varnish used for Oil Paintings	66-83	This study reports on observations and analysis of varnishes for oil paintings based on UV fluorescence and three-dimensional fluorescence emission spectrum as well as on changes in such varnishes due to the passage of time. Since varnishes fluoresce when UV is applied, investigation using UV rays is used mainly to examine surface layers of paintings. This is method is widely used at restoration sites because it is an easy method. However, because of limitations in materials and information, judgment depended much on experience. Investigations were made frequently to confirm damage or retouchings and comments on fluorescent colors tended to be limited to "synthetic resins fluoresce blue while natural resins fluoresce yellow." The reason for this is that fluorescence itself if dark and unclear and influence of lower layers and ageing bring about changes in appearance, making judgment difficult. In this study, UV fluorescent colors of 13 types of natural resins were observed and analyzed with three-dimensional fluorescence emission spectrum for compari-son. As a result it was confirmed that with regard to UV fluorescent colors there are characteristics particular to each type of resin. Terpene resin types fluoresced blue to greenish, while shellac fluoresced yellow to reddish color. Dammar showed the most blueish while Madagascar copal was greenish. The same samples were re-examined 11 years later using the same methods. With regard to terpene resin types, the blue was stronger in newer varnishes and the color tended to become more greenish with time. There was no change in shellacs. These findings were supported by spectrum analysis using three-dimensional fluorescence Resins showed clear peaks particular to each type. With regard to ageing, although peak wavelengths moved toward high wavelengths in excitation light/EX while wavelengths in fluorescence/EM moved toward low, the range of movement in most resins were not large, it being between ±0 to 15 nm., with elemi and amber showing +60 for EX and +30 nm for EM, respectively. Elemi showed that one of the two low wavelength peaks seen before passage of time had disap-peared after the passage of time. More than two peaks were also confirmed with shellac, but there was not much change. The high wavelength peaks of shellac are thought to indicate components of dyes, In this investigation Dammar showed the least change due to ageing while elemi showed the greatest change.	natural resin, oil painting, varnish, ultravioret fluorescence, 3-D fluorescence spectrum	天然樹脂, 油画,ワニス, 紫外線蛍光, 三次元励起蛍光スペクトル法	
No.55	2010	MIURA, Sadatoshi	On Code of Ethics	1-6	文化財保護に関する国際章としてもっとも古いものは、1904年にマドリッドで開催された第6回国際建築家会議で採択された「記念建造物の保存と修復」で、その後、1931年の「歴史的記念建造物の修復のためのアテネ憲章」。1964年の「記念建造物および遺跡の保全と修復のための国際憲章(ベニス室)」と続いていく"。しかしこれらの憲章は広く文化財の保護を目的としているとはいえ、その表題にもある通り建造物や遺跡など不動産文化財の保護・保存・修復を念頭に置いて制定されたものであった。 美術工芸品や発資料の保存に関する最初の理規程"は、1967年に国際文化財保存学会アメリカ支部 (IIC American Group, 現AIC)が制定した「美術修復家のための倫理規程」である。AICはこれより先の1963年に「修復家のための実務と専門性の基準」を制定している。その後。カナダではAICにならって、国際保存学会カナダ支部 (IIC Canadian Group, 現CAC)が理規程と実務指針を1985年に制定し。その頃から色々な国や団体で倫理規程が制定されるようになる。また 1984年に国際博物館会議保存委員会(ICOM-CC)が「保存修復者:職業の定義」を採択している。 ここでは、2008年7月8日に制定された"本学会の倫理規程「文化財の保存にたずさわる人のための行動規範」も含めて、それらの命理規程でどのようなことが述べられているか考察して、倫理規程の果たす役割と今後の課題について考える。			

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No.55	2010	TAKASHIMA, Miho	Technical Study of Venus and Amour by Alessandro Bedoli Mazzola (16th century, Italian oil painting)	7-24	Venus and Amour (oil on canvas, 104 X 62 cm, ca. 1560~70), attributed to Alessandro Bedoli Mazzola, was examined using X-ray radiography, IR-photography, microscopes, SEM-EDX, FT-IR and staining tests in order to diagnose the painting materials and methods. Alessandro Bedoli Mazzola was an Italian painter of the Parmesan school of painting and active in the later Mannerist style. X-ray radiograph showed that there were few changes in the work from his underdrawings except for the right side handle of a basket. Cross-sections of the samples revealed that the work has a grayish ground comprised of lead white, calcium carbonate white, charcoal black and a small amount of earth pigments. The layer of calcium carbonate white in this painting contains numerous dolomite and silicate particles, which would indicate that the origin of this pigment was dolomitic limestone. Powdered dolomitic limestone was also employed as a substrate for the yellow lake pigments. The abundant use of this dolomitic mineral in this work would indicate that it was produced in Italy. Although the areas of green grass in the painting consist of more than two paint layers containing verdigris (copper acetate) and lead white, the majority of the composition is made up of only a single paint layer over the ground. The colors used in this work seem to consist of a rather limited number of pigments, such as lead white, azurite, red lake, yellow lake, red lead, hard red crystalline hematite, earth pigments and verdigris. These characteristics are distinct from the Venetian school techniques of the same period: Venetians often applied several layers of transparent glaze and used brilliant colors such as lead-tin yellow, orpiment and realgar. The use here of hard red crystalline hematite, which was rarely used in oil paintings but frequently in fresco paintings, along with the use of powder of dolomitic limestone, suggest that the painter of this work was familiar with frescoes and their techniques.	Alessandro Bedoli Mazzola, Par-mesan school of painting, Materials and methods of oil painting, Dolomite, Hematite	アレッサンドロ・ベドリ・マッツォーラ, パルマ派, 油絵技法, ドロマイト, ヘマタイト	
No.55	2010	TSUBOKURA, Sachiko; KONDO, Aya; TOYOTAKE, Yukie; YAMAGUCHI, Kana; INABA, Masamitsu	Insertion-accelerated Ageing Test of Paper (IV): Effect of Aluminium Sulfate Components on Paper Deterioration	25-37	Alkaline and neutral papers are called "chusei-shi" in Japan and are now used generally. It has been reported that some kinds of chusei-shi prepared with aluminium sulfate discolour more than chusei-shi that was not. Because chusei-shi is preferably used in the conservation field, it is important to examine the deterioration of chusei-shi prepared with aluminium sulfate. Handsheets were prepared with various amounts of aluminium sulfate and/or calcium carbonate were made by using bleached, soft wood, sulphite pulp. The samples were treated at 80℃ and 65%rh by insertion-accelerated ageing test and suspension-accelerated ageing test (normal accelerated ageing test). The papers prepared with aluminium sulfate seemed to discolour more than aluminium sulfate-free ones by insertion-accelerated ageing test. Almost all samples showed nearly equal deterioration rates by suspension-accelerated ageing test, while the same samples showed various and heigher deterioration rates by insertion-ageing test. Deterioration rates by insertion-ageing test seemed to increase with the decrease of pH of the sheets. These results show that the use of aluminium sulfate-free chusei-shi is recom-mended in preservation.	Aluminium Sulfate, Neutralized Paper, Inser-tion-accelerated Ageing Test	硫酸アルミニウム, 中性紙, 挿入法,	

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No.55	2010	SASAKI, Yoshiko; FUJII, Kenzo; SASAKI, Ken	Research on the Textile Fragment (AN. 106) Stored in Kyoto Institute of Technology, "Fragment with Design of Tie-dye Dots (hitta shibori) and Embroidered Chrysanthemums, Pines, Bamboo, Plums, and Good-luck Treasures"	38-66	Detailed research on a 17th century traditional textile fragment, "Fragment with Design of Tie-dye Dots (hitta shibori) and Embroidered Chrysanthemums, Pines, Bamboo, and Plums" stored in Kyoto Institute of Technology (AN. 106) was carried out by observation of the techniques for dyeing and embroidery, and by non-destructive spectroscopic methods for dye-stuff analyses. The textile was found separated from "Koshimaki Fragment in Black Background Style with Chrysanthemums and Good-luck Treasures Motifs in Diagonal Cross Stripes" on a folding screen, one of the items in the Nomura collection, stored in the National Museum of Japanese History (H-35-16), which is believed to have belonged to the empress Tofukumon-in (1607-1678). Characteristic features of the textile based on our observations were: a) use of different techniques for the embroideries on the right and left sides of the fragments; and b) systematic arrangement of the chrysanthemum flowers on the tie-dye dot stripes and design of the background. Multiple dye-stuffs were easily determined by combining the fluorescence emission and excitation spectra for red bound dots and red embroidery thread. For the scarlet color, strong fluorescence emission at 510 nm (ilEx=360 and 450 nm), which is attributed to kihada (Amur cork-tree), one of the typical yellow dyes in ancient Japan, used as a minor component, was observed, together with that of beni (safflower) (λ_{BX}=540nm/ λ_{EM}= 580nm). Our observations indicated the use of yellow dye in the pre-dyeing process for red dying by using beni. Yellow and purple colored embroidery threads are also characteristic in this textile. The yellow chrysanthemum embroidery on the left side of the fragment was determined to have been achieved by using kihada. This was determined to be the case by means of fluorescence spectra. However, the dyestuff used for the faded yellow colors on the right side of the fragment was ukon (turmeric). This fact was determined by using the same method. Similarly, we discovered by using visible spectra, that the purple was achieved by the use of shikon (gromwell) for the right side of the fragment, and that multi-dying of shikon and indigo was used to achieve the color on the left side of the fragment. Thus, it was found that same colors of the embroidery were achieved by using different techniques and materials for different fragments of the textile; they were dyed with different kinds of dyes. We discussed the reconstruction of the original image of the kosode, based on the systematic arrangement of the flowers and design of the background, and compared it with the fragment stored in the National Museum of Japanese History.	Kosode fragment, Non-destructive dye analysis, UV-Vis spectroscopy, Fluorescence spectroscopy, Reconstruction of design	小袖裂, 非破壊染料分析, 紫外線可視分光, 蛍光分光, 文様復元	
No.55	2010	HOSHI, Eriko; INABA, Masamitsu; KITADA, Masahiro	Effects of Chelating Agents to Control Degradation of Japanese Paper Due to Cu Ion	67-75	The effects of chelating agents on the degradation of Japanese paper due to copper ion have been investigated. Koza paper was treated with chelating agents: sodium ethylenediaminetetraacetate (EDTA・3Na), sodium diethylenetriaminepentaacetate (DTPA・3Na) or sodium hydroxyethylidenediphosphonate (HEDP・2Na) and/or calcium carbonate (CaCO3). These kozo papers were pasted to gampi paper coated with powdered malachite respectively. Specimens were aged in an environment of S0°C and 65%rh Deterioration of the kozo paper was investigated by colour, surface pH and degree of cellulose viscosity (η). The following results were obtained. When Cu ions do not exist in kozo paper, EDTA・3Na causes discolouration and acidification of kozo paper. DTPA・3Na and HEDP・2Na do not promote the acidification of kozo paper, whereas they cause noticeable discolouration. When there is a possibility for deterioration of kozo paper by the presence of Cu ions, treatment with each chelating agent together with CaCO3 is effective in reducing the acidification, discolouration and depolymerization caused by Cu ions. The effect of DTP A is better than that of the others. (187)	chelating agent, Cu ion, discolouration, Japanese paper	キレート剤, 銅イオン, 変色, 和紙	

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No.55	2010	Committee of Ethics (MIURA, Sadatoshi; INABA, Masamitsu; IMAZU, Setsuo; KANBA, Nobuyuki; KIJIMA, Takayasu; SANO, Chie; MASUDA, Katsuhiko; YAMARYO, Mari	Foreign Codes of Ethics	76-88	これは学会の倫理領検討委員会が、学会の「文化財の保存にたずさわる人のための行動規範」の案を作成するに当たって参考とした、外国の倫理規程の日本語訳である。参考とした倫理規程は、AIC(アメリカ文化財保存学会)、CAC(カナダ文化財保存学会)& CAPC(カナダ保存専門家協会)、ECCO(欧州保存修復団体連盟)の倫理と、それに関する ICOM-CC(国際博物館会議保存委員会)の職業の定義である。最初の翻訳は外部に依頼したが、その後改訂された箇所の翻訳も含め、全体の手直しは委員長である三浦か行ったので、文責は三浦にある。の英語を示した方がよいと思われるいくつかの単語については、原文の英語を付記した。また。2008年9月のICOM-CCニューデリー大会で、動産文化財の保存に関する用部の決議が採択されたが。それも三浦が訳出して併せて掲載した。規程の日本語への訳と保存修復学会議への掲載を許可していただいた。各団体に厚くお礼申し上げる。			
No.55	2010	AKITSU, Takashiro; NISHIZURU, Hitoe; ITOH, Harumi	Color Changes and UV Effects in Cadmium Pigment and Copper Containing Organic Dyes in Model Organic Solvent Systems	89-97	As a model system of pictures painted with metal containing organic dye in oil, we prepared CdSe, one of the predominant components of cadmium red pigment, and two new chiral Schiff base Cu (II) complexes, brown colored dyes, in octadecene ($CH_3((CH_2)_{15}CH=CH_2$) solvent. Two chiral Schiff base Cu(II) complexes were prepared according to common procedures by using different chiral amine precursors and were characterized by elemental analysis, IR, CD and UV-vis spectra. Spectral shifts of CD and UV-vis spectra in π－π＊ bands (around 400 nm) of organic ligand moieties as well as d-d bands (around 650 nm) of Cu(II) ions, in other words model dyes, were caused by substituent groups of amine moieties and different organic solvents, acetone, methanol, chloroform, and octadecene. Accompanying gradual changes size of CdSe nanoparticles in the range of 2.0 and 3.5nm controlled by reaction time, CdSe exhibits gradual color changes observed by both visible absorption bands (about 470-570nm, yellow-orange-red) and fluorescence bands (about 500-540nm) in octadecene solvent. However, size effects of CdSe nanoparticles could not be observed by microscope IR spectra. Obviously, we could examine intermolecula interactions resulting in color changes due to mixing (adsorption on surface) of CdSe pigment and Cu(II) dyes by means of induced CD bands from chiral Cu(II) complexes to the surface of achiral CdSe nanoparticles. The induced CD bands in UV region (π－π＊ band) as well as microscope-IR spectra around 1720cm^{-1} shift by the size of CdSe nanoparticles, which is proof of intermolecular interactions between CdSe pigment and Cu(II) dyes. In addition, we also investigated effects of UV light irradiation expecting photo-induced electron transfer from photo-responsible semi-conductor CdSe and photochemical reduction of Cu(II) dyes. However, we could not observe significant spectral changes due to the reduction of Cu(II) dyes by CdSe nanoparticles.	cadmium red, dye, metal complex, UV-visible absorption spectroscopy, fluorescence spectroscopy	カドミウムレッド, 色素, 金属錯体, 紫外可視吸収分光法, 蛍光分光法	

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No.56	2013	NAKAMURA, Rikiya; NARUSE, Masakazu	Adhesive Analysis of the Wooden Artworks Treasured in Shosoin	1–14	Shosoin, a famous treasure repository in Nara, Japan, stores varieties of precious wooden artworks such as furmishings, boxes, musical instruments, playthings desks and Buddhist alter fittings, which were made in the 8th century. Analysis of adhesives used on Shosoin wooden artworks was conducted by using attenuated total reflectance–Fourier transform infrared (ATR–FTIR) spectrometric technique. ATR–FTIR allowed the identification of animal skin glue for the adhesives used on the bottom plate, box–shaped leg, base frame, inner flange and the upright rim from the following five boxes: eight–lobed box of white sandalwood, wooden box covered with betel palm and decorated with marquetry, the box of boxwood decorated with gold and silver painting, lacquered wooden box and sutra case coated with powdered aloeswood. Animal skin glue was also found on the fragment of the box–shaped leg from the sugoroku game board covered with red sandalwood and decorated with marquetry. This result indicates that animal skin glue was used for the assembly of wooden artworks made not only in the 8th century Japan but also in classic periods in China, i.e. Tang dynasty. Common usage of animal skin glue for wooden artifacts in the 8th century Japan is seen in assembling parts to make the offering table, the wagon zither and the gigaku mask. Detection of amide I band at higher wavenumber in the FTIR spectra of some artworks, compared with modern references, may reflect on the age–deterioration of animal skin glue that was applied about 1250 years ago. This successful experiment for the identification of animal skin glue was on the Shosoin treasures will lead to more advanced elucidation of organic materials used on these treasures.	Shosoin treasures, wooden artwork, adhesive, attenuated total reflectance–Fourier transform infrared spectrometry, animal skin glue, soy bean glue	正倉院宝物, 木工品, 接着剤, 全反射吸収フーリエ変換赤外分光, ニカワ, ダイズ糊	
No.56	2013	ISHII, Mie; FUKATSU, Yuko; NAITO, Sachie; OKADA, Nobuyo	Dye and Mordant Analysis of Coptic Textiles in the Collection of Joshibi University of Art and Design Art Museum	15–26	Dye analysis with HPLC–PDA and mordant analysis with XRF were conducted on 13 sarno1Ies obtained from 6 tunics and 1 sprang head–dress from 4–7th century Egypt. All expect 1 tunic fragment had been radio–carbon dated. As a result, madder (alizarin, purpurin pseudopurpurin), weld (luteolin, apigenin) and indigo (indigotin) was detected as dyes. Elemental analysis found Al, S, Fe and Na in some samples. which may suggest a possible use of a mordant such as alum. However, further comparative analysis is necessary.	Coptic textile, Dye analysis, HPLC, Mordant analysis, XRF	コプト染織品, 染料分析, 高速液体クロマトグラフィー, 媒染剤分析, 蛍光X線	
No.56	2013	HAYAKAWA Noriko; SAKAI, Kiyofumi; KIDA, Keiko; TSUBOKURA Sachiko; OHKAWARA, Noriko; OKADA Yusuke; FUJIMATSU, Hitoshi; KAWANOBE, Wataru	Effectiveness of PVA–Fegrading Enzyme Against Deteriorated Polyvinyl Alcohol (PVA) in the Conservation of Japanese Paintings	27–36	Polyvinyl alcohol (PVA) is a common commercial water–soluble polymer that is used as an adhesive, a coating material and a starting material in the chemical industry. This polymer has been used as a consolidant in many painting conservation projects. However, in several cases, the degradation of PVA causes whitening and flaking in paintings, so it is necessary to remove degraded PVA. Although when conservators try to remove PVA from paintings, PVA is not only insoluble in mild solvents but also hard to dissolve in water on the practical treatments. In this study, an attempt was mask to an enzyme that degrades PVA for the conservation of paintings. Viscosity of PVA solution dropped within five minutes of adding the enzyme to it. Molecular weight of PVA reduced to approximately tens of thousand despite ditterent the molecular weight and degree of saponification resulting from the addition of the enzyme. Clark stiffness of paper coated with PVA also declined after it was soaked in the enzyme solution. In addition, the PVA coating on Japanese paintings was removed mildly by dripping the enzyme solution gently on the painting, in a manner similar to dripping with water.	Enzyme, Polyvinyl alcohol, Consolidation, Removing, Molecular weight	酵素, ポリビニルアルコール, 剥落止め, 除去, 分子量	

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No.56	2013	SASAKI, Yoshiko; FUKAE, Ryohei; SASAKI, Ken	Chemical Analysis of Red Dyestuffs Used for Enji-wata (Rouge-cotton)	37-50	Enji-wata (Rouge Cotton) was a traditional colored material to be made by soaking sheet of cotton in red dyestuffs and had been used for many centuries in China. It was also widely used in Japan for Japanese style painting and Yuzen-dyeing in Edo period (1603-1868). However, their actual ingredients used including red dyestuff was unclear after end of 19thC. Six Enji-wata (Rouge Cottons) were provided for chemical analysis using visible reflection spectra, HPLC, SEM-EDS, and ESI-MS to understand precisely how they were made. HPLC analyses of two samples (I and V) showed that two natural dyes (Lac and/or Cochineal), had been used. This was confirmed by ESI MS. The remaining samples were different from other typical natural dyes in east Asia such as safflower, Japanese madder and sappanwood, These observations suggested that red synthetic dyes might have been used. SEM-EDS revealed that Na and Cl were detected as major inorganic elements, except for sample I and V. These results were explained by the existence of inorganic chemicals in red synthetic dyes.	Rouge-cotton, dye analysis, HPLC, Mass spectrometry, X-ray fluorescence analysis	臙脂綿, 染料分析, 高速液体クロマトグラフ, 質量分析, 蛍光X線分析	
No.56	2013	TAGUCHI, Kaori	Function of Patina in the Modern Italian Restoration of Painting: Focusing on the methodology of Cesare Brandi and his Theory of Restoration	51-62	Cesare Brandi (1906-1988) published The Theory of Restoration in 1966 as an integral part of his general conception of art. There he explained the true purpose of restoration, which had not been fully developed in the previous centuries. His theory focuses on his specific idea of patina and clarifies his characteristic definition of its properties. Since the previous centuries, the ethics of intervention on patina has been extremely confused because of its multiple interpretations and the difficulty of distinguishing among them. In the present paper, patina is classified into three types according to different characteristics. One is the original patina, which was probably applied by the artist himself. while another is that caused by time-related physical deterioration. The third one is the artificial patina applied by classic restorers in order to add the appearance of natural antiquity to the work of art. Under the influence of the controversy on cleaning techniquess, quite a few restorers tended to eliminate patina as a blunder of the old days or a simple deterioration which could damage the original painting. Brandi, however, objects to the removal of patina not only for its authenticity and historical value but also for its peculiar effect on paintings. In his theory, patina is identified as an ″imperceptible damper on the material″ and so Brandi and his followers insiste on conserving it rather than taking it away. In his opinion, patina has been applied from ancient times in order to moderate vivid colours on the surface of the painting and functions as a kind of ″negotiator″ between material and image of the art. This paper treats the issues of patina as an embodiment of Brandi's idea on respecting ″image and material″, and tries to verify how Brandi's theory corresponds to his peculiar interpretation of patina.	Patina, Cesare Brandi, Restoration of Italian modern painting, Cleaning of painting, Theory of restoration	古色(パティナ), チェーザレ・ブランディ, 近代イタリアの絵画修復, 画面洗浄, 修復理論	

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No.56	2013	KITAGAWA, Miho; BALLARDIE, Margaret	Oil Gold Sizes and Gum Anime as Described in English Technical Books Published from the 17th to 20th Centuries	63–72	Oil gold sizes are adhesives that have been used since the 17th century to attach metal leaf or powder to various objects. As part of a course in reproducing traditional English Japanned decorations, using "A Treatise of Japanning and Varnishing," by John Stalker and George Parker published in 1688, the authors made gold size following the treatise's original formula. Although today, oil gold sizes are marketed under the same term, the ingredients differ from the old formulas. For example, asphaltum is no longer used in current oil gold sizes. This paper gives some examples of formulas from technical books from the 17th through the early 20th centuries and from current mass-produced gold sizes on the market. Though most European gold sizes are now made of synthetic resins to better control drying times, even conservators are using them without noticing the ingredients. Conservators should have an understanding of period differences in the composition of these materials when treating gilded objects. Gum Anime, referred to in the treatise is an ingredient of oil gold sizes, is no longer available in Europe as an artist material or paint component. After research and experimentation, it was decided that Gum Anime is South American Jatoba resin. The authors also examined why Gum Anime was used in gold sizes; comparing it with copal and amber and examining what constitutes a good gold size. It was found that jatoba resin has more adhesion than the other two. Heating the oil first and then adding the powdered resin made for a darker and more glutinous liquid. Jatoba resin is a clear resin with a pleasant smell, which is used in Brazil as a medicinal substance. It has potential to become a component of safer, non-toxic paints in the future.	gold size, gum anime, jatoba, asphaltum, copal	ゴールド・サイズ, アニメ樹脂, ジャトバ, 瀝青, コーパル	
No.56	2013	LEE, Kang; KURI, Motoaki; INABA, Masamitsu	Evaluation of Washing Seawater-Damaged Paper and Its Effect on Durability of Washed Paper	73–80	A large quantity of paper was damaged from the tsunami that followed the Great East Japan Earthquake, 2011. When conservators wash such damaged paper, they wish to know what effect remaining seawater has on the extent of washing and deterioration. To solve this question, paper from a book soaked in seawater by tsunami and paper of the same book bought at a second-hand bookstore, which was not soaked in seawater, were tested. A sheet of the paper is put between plastic nets, then washed twice in 21 of reverse osmosis membrane water, successively. Each washing period is about 1 minute. Water is absorbed by a towel, then dried by air streaming method. We measured chloride ion concentration of water extract of the two kinds of paper before and after washing by using capillary electrophoresis. After washing, chloride ion concentration of the paper soaked in sea water became almost similar to that of unsoaked paper. Thus, washing was found to be sufficiently effective. Physical properties such as colour, tear strength, burst strength and degree of polymerization were measured to evaluate the effect of paper having been soaked in seawater. Although wetting caused some change in physical properties such as a slight increase in the burst index of wetted (soaked in seawater and/or washed) paper, there was little influence of seawater on the paper. In addition, we conducted moist heat accelerated ageing (80° C, 65%rh) test for 4 weeks to evaluate the degradation behavior of seawater-soaked paper samples. Those results indicate that there is little difference in change of physical properties between paper samples.	Sea water, Tsunami, Damaged paper, Washing, Chloride ion	海水, 津波, 被災した紙, 洗浄, 塩素イオン	

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No.57	2014	INABA,Masamitsu;YAMAGUCHI,Kana;TAKAGI,Akiko;TSUBOKURA,Sachiko	Insertion-accelerated Ageing Test of Paper (V) :Test of Commercial Alkaline Paper for Conservation	1-5	Some types of acidic paper and alkaline paper were found to be severely discoloured by insertion those into books of different types of paper. In previous our studies, the same alkaline conservation paper, which passed the Photographic Activity Test was used. However, since several types of commercial alkaline and neutral papers are predominantly used in conservation field, the effect of these papers on discolouration of acidic paper was examined in this study. Three types of commercial alkaline paper (surface pH 7.6-8.3), two types of commercial neutral paper (surface pH 5.9-6.4) and one type of filter paper (pH 6.3) were compared on the degree of discolouration of acidic paper by insertion method (80℃, 65%rh, 39kPa, 28days). It is said that even good quality alkaline paper for preservation of paper objects causes greater discolouration of acidic paper inserted in a paper stack (book). In order to suppress discolouration of acidic paper, it is recommended that neutral paper, rather than alkaline paper, be used as direct contact paper to objects. However, this recommendation does not restrict the use of alkaline paper for packaging materials not in direct contact to acidic paper objects.	Paper, Insertion method, Discolouration, Wrapping materials	紙, 挿入法, 変色, 包材	
No.57	2014	FUKAGAWA,Hiromi;	Report on the Identification of Insects and Fungi sticking to Adhesive Tape on Cardboard Box	6-11	The idea of Integrated Pest Management (IPM) to protect and conserve cultural properties originated from the review on abuse of fumigation gas to control pests, and the IPM has been so far carried out at some museum and art museum. However, information on the practical method itself to control pests is not yet enough. Then, as a practical method to control pests at museum, I focused on adhesive tape that is used for sealing cardboard boxes of museum collection, and examined insects attached to the tape under microscope. As a result, I have identified several species of insect pests and also museum insects and fungi that feed on the dead bodies of the insect pests. This circumstance is similar to the left sticky insect trap used for monitoring pests, and thus is unfavorable for the museum where pest controlling is being carried out. Physical cleaning and air conditioning managements are effective to prevent proliferation of insects such as psocids and fungi at museum, but seem not to work deep inside the cardboard boxes. Furthermore, museum and art museum use a lot of cardboard boxes for preservation and transportation of documents and museum resources, and they tend to be left in places where humans could not keep their eyes on. Under such circumstance, adhesive tape used for sealing the cardboard boxes gives fungi and psocids a rare chance to survive and proliferate at museum. For such a reason, I recommend not to use the sealing tape but a stapler or use a cardboard box with no sealing particularly at museum resource conservation and document preservation.	preventive conservation, cardboard box, adhesive tape, dead bodies of insects, fungi	予防保存, ダンボール箱, 粘着テープ, 昆虫死体, カビ類	
No.57	2014	SASAKI,Fuyumi;INABA,Masamitsu	Paper in a Naturally Aged Book:Relationship between the Amount of Organic Acid and Physical Property	12-20	*Journal of the Chemical Society* (JCS, 1878-1901) was obtained from the university library in Tokyo for analysis of the natural ageing behavior of paper. In this report, the amount of organic acid and physical properties of naturally aged paper in 37 volumes of JCS are compared. Samples were taken from the middle pages, avoiding 200 pages from the front and back covers of a volume, and from the central part of a page, leaving a 2cm margin all around. Paper used in JCS were classified into three fibre compositions: esparto plus a minor amount of cotton and linen (E+C,L), esparto and soft wood (E+N), and soft wood (N). Organic acids such as oxalic, glycolic, acetic, lactic, malic and succinic acid were detected, but it was found that the total amount of these acids is not correlated to fibre composition or the year of publication. The amount of organic acids was correlated to paper strength (TEA index and Tear index), pH and colour (L*, a*) of paper. Since organic acids are produced by the decomposition of cellulose and hemicellulose, it is supposed that the amount of organic acids could be a deterioration index of naturally aged paper.	paper, aged book, organic acid, physucal property	紙, 経年図書, 有機酸, 物性	

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No.57	2014	SASAKI,Fuyumi;LEE,Kang;INABA,Masamitsu	Distribution of pH, Sulphuric Acid and Organic Acid Ions in a Page and in a Volume of Naturally Aged Book	21-30	This research was planned to clarify naturally aged paper. To determine sampling method, it is measured that distribution of pH, sulphuric acid and organic acid ions in a page and in a volume of naturally aged book. *journal of Chemical Society* (JCS, 1878-1901) was obtained from a university library in Tokyo for analysis of the natural ageing behaviour of paper. To determine the pages of each bound volume and the places in these pages from where samples are to be taken, differences in the distribution of pH and the amount of sulphuric and organic acids in different pages of a volume as well as in different parts of a given page were measured. For analysis discussed in this study, four volumes of the Journal (published 1892, 1897, 1919 and 1921) were used. For comparison, a Chinese book using bamboo paper (published around 1850) was also analysed. The middle 10 cm of the sheets of paper taken from selected pages of the JCS (12.9 X 20.0 cm) and the Chinese book (12.3 x 21.1 cm) were cut vertically from edge to gutter into strips 5 mm wide. In the case of 1892 and 1921 volumes of JCS, samples of same size were also taken horizontally from the central part of the remaining head and tail. With regard to the distribution of pH, it was found that in the case of JCS, pH in the central part of a sheet was lower than in the surrounding areas while in the case of the Chinese book it was lower in the surrounding areas. Difference of measured sulphuric acid in a sheet was around 10 μmol/g for ICS and around 80 μmol/g for the Chinese book. This big difference in the amount of sulphuric acid in a sheet of the Chinese book caused a different pH distribution in the sheet. Probably, the Chinese book absorbed more sulphuric acid from air pollutants, while in the case of JCS the amount of sulphuric acid was less than the sum amount of organic acids. In the case of 1892 (928 pages) and 1921 (916 pages) volumes of ICS, the samples were taken from every 50 pages, in the central part of each page. The first or the last 50 or 100 pages shifwed lower organic acid content than the middle pages and the organic acid content of the middle pages was about equal. For further study, samples to be used will be taken from the middle pages, avoiding 200 pages from the front and back cover of a volume, and from the central part of a page, leaving 2 cm margin all around.	Paper, aged paper, Organic acid, pH, sulphuric acid	紙, 経年図書, 有機酸, pH, 硫酸	
No.58	2015	TAGUCHI,Satoko;OHNO,Naoshi;KIRINO,Fumiyoshi	Reproduction of Iroage Treatment Performed on Mameitaginand Chogin-coin from the Edo Period	1-8	*Mameitagin* and *chogin* coins composed of silver and copper alloys were cast throughout the Edo period. The nominal silver content of the coins, as specified by the Edo shogunate, decreased with time. Therefore, a surface treatment called *iroage*, which helps form an Ag-rich surface layer, was applied to the coins. In this study, *iroage* treatment used on these Ag-Cu alloy coins was reproduced to study the changes in color and structure due to the treatment. The beginning silver content of the Ag-Cu alloy samples used in the study were 75%, 45%, and 15%. First, *iroage* was performed on the three Ag-Cu alloys using *umezu* (plum vinegar) in accordance with the traditional method. After treatment, the surface color of the Ag-Cu alloys containing 75% and 45% Ag became silver. Reflectance spectra of these treated samples were similar to that of Ag. Energy dispersive X-ray spectrometry (EDS) indicated an increase in the silver concentration of all the samples after treatment. Scanning electron microscope (SEM) observation showed holes in the surfaces, suggesting that copper eluted in *umezu*. Second, *iroage* using separate aqueous solutions of citric acid, malic acid, and sodium chloride, which are the main constituents of *umezu*, was performed. After treatment using citric acid and malic acid solutions, the surface color of the Ag-Cu alloys containing 75% and 45% silver became silver. When treated with sodium chloride solution, only the sample containing 75% Ag became silver after treatment. For all samples, EDS analysis showed that the surface Ag concentration increased, and SEM observation revealed copper elution. These results suggest that elution of copper into the treatment liquid could occur by using citric acid, malic acid, and sodium chloride solutions.	iroage treatment, mameitagin, chogin, reproduction, surface structure	色上げ処理, 豆板銀, 丁銀, 復元, 表面構造	

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№58	2015	HASHIMOTO,Mari;INABA,Masamitsu	Effect of Heat Treatment on the Prevention of the Rotting of Animal Glue Solution for Japanese Paintings	9-16	Animal glue is mainly used in nihonga (Japanese paintings) as a sizing agent and medium. It is said that since boiling of animal glue solution causes it to lose its adhesiveness, it should generally be dissolved at around 60℃ for 10 minutes. However, some books on Japanese painting techniques written before the Showa period say that animal glue solution should be boiled. Based on these writings, Fukuda used tensile shear test and showed that boiling of animal glue solution prolonged the usage period of a solution up to three days at 30℃. The present authors tried to confirm this effect of heat treatment on preventing animal glue from rotting. Solutions (Asahi Gelatine Industrial Co. Ltd. Sanzenbon-nikawa Asuka, 12.5 wt%) were heated at 60℃ for 10 minutes, at 80℃ for 60 minutes, boiled for 60 minutes or autoclaved (121 ℃) for 60 minutes and were preserved in a container free from germs from outside at 30℃. Test solutions were measured in viscosity and amount of microorganism using ATP (Adenosine triphosphate) bioluminescence. The amount of ATP was measured using ATP swab test with a portable illuminometre (Sumitomo-3M Ltd. ATP Water Test kit AQT 200 and illuminometer UNG-3). Viscosity changes by heat treatment up to boiling were small but the viscosity of animal glue solution by autoclave (121 ℃, 60 min) changed from ca.9 mPa・s to 2 mPa・s. However, the amount of ATP and viscosity of this solution did not change after 10 days in a germ free condition. In the case of solutions heat treated at 60℃ for 10 min or 80℃ for 60 minutes, their viscosity dropped rapidly after two days and their amount of ATP increased from one day, showing its peak at two days. However, in the case of the solution boiled for 60 min, the amount of ATP showed lower value at one day and a peak at around two and a half days. The viscosity of this sample did not change up to two days. Solutions which were heat treated, including boiling, smelled stuffy after two days, but some which were similarly heat treated did not and their viscosity changed slowly. Of the latter, some samples showed ATP peaks at two to four days. Repeated testing showed that these two patterns of rotting occurred randomly.		膠溶液, 加熱, 微生物, 腐敗, ATP法	

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No.58	2015	SANO,Chie;KITANO,Nobuhiko;HAYAKAWA,Noriko;SUGIZAKI,Sahoe;MATSUDA,Takatsugu;ITO,Kyo;HIGAKI,Shogo;KUBO,Kenya,ISHIZAKI;Takeshi	Research Survey and Decontamination Tests to Remove against Radioactive Contaminants Originating from Fukushima Daiichi Nuclear Power Plant Deposited on Cultural Property	17-37	On 11 March, 2011, the northeast coast of Japan was inundated by a tsunami caused by earthquakes which occurred on the seafloor near Japan's Tohoku and northern Kanta regions. Power was lost at the Fukushima Daiichi Nuclear Power Plant in Okuma town and Futaba town, Fukushima Prefecture, resulting in a meltdown of the nuclear reactor and the release of large amounts of radioactive substances into the atmosphere, which contaminated cultural objects located outdoors. To deal with contaminated objects, specialists from museums, universities and research institutions all over Japan gathered to discuss the situation and to decide how to manage the contaminated objects and decontaminate them. Firstly, a nationwide survey of rules for treating radioactive substances was conducted and research reports on the dynamic movement and local behavior of radioactive cesium were reviewed. The results of the survey indicated that radioactive cesium deposited on surfaces if they were dry. Measurement methods and instruments were clarified following some guidelines that were drawn up by the government. Through these studies we defined that objects were evaluated as being contaminated with radioactive substances if the density of radioactive nuclides exceeded the surface contamination density limit, as specified in the Act on Prevention of Radiation Disease Due to Radioisotopes. The relevant radioactive elements in this case are cesium-134 and cesium-137. Both are nuclides that emit β^- electron particles and r rays, and their surface contamination density limit is 40 Bq/cm^2 As a result of experiments using vacuum cleaning in the dry state to remove dust adhering to the surfaces of objects transported out of the restricted area, it was found that the surface contamination could be reduced by vacuuming. Thus, it was decided to remove dust in this way first, and then to manage the objects while waiting for the radioactive elements to decay if the objects still exceeded the criterion radioactivity value. This procedure was applied in a project to rescue cultural objects stored in three museums located in the restricted area in Fukushima Prefecture. When the surface contamination density of each cultural object was measured, it was found that most objects in the museums were not contaminated and showed radioactivity counts similar to the background count. In the period between August 2012 and March 2014, about 98% of all the objects were transported out of the restricted area. The total quantity, expressed in terms of standard containers with dimensions of 60 x 44 X 15 cm, was 2,935 boxes. After cleaning at the Shirakawa Branch of the Fukushima Cultural Property Center in southern Fukushima Prefecture, these objects have been periodically displayed in public.	tsunami, Fukushima Daiichi Nuclear Power Plant, radioactive contaminant, countermeasure, de-contamination	津波, 福島第一原子力発電所, 放射性物質による汚染, 対策, 除染	
No.59	2016	OHASHI,Yuka;OBAYASHI,Kentaro;INABA,Masamitsu	Soybean Glue for Ancient and Medieval Manuscripts: Documents Survey and Trial Manufacture of Powdered Soybean Glue	1-8	For joining pieces of paper to make a hand scroll, soybean glue was used in ancient and medieval Japan. In previous studies, soybean glue was made by boiling down soymilk based on accounts found in Shosoin documents (around 8 C) and Engishiki (AD 927). In a survey of documents of later ages down to the Kamakura period (-14 C), three more documents referring to soybean glue were found. In two of those documents, powdered soybean was mentioned as having been used for glue. So two kinds of soybean glue were made, one from powdered soybean and the other from soymilk. These were treated by moist accelerated ageing (80℃, 65%rh, 8 weeks) and their IR spectra were measured. Ester peaks (oil) of these glue decreased with longer accelerated period. The IR spectrum of powdered soybean glue resembled that of medieval soybean glue reported by Hayakawa more than those of soymilk glue.	soybean glue,FT-IR,adhesive,powdered soybean	大豆糊, 赤外分光法, 接着剤, 大豆粉	

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No.59	2016	OKA,Yasuhiro;TAKAI,Yuka;GOTO,Akihiko;OKA, Kozo	Analysis of Process and Eye Movement during Subsidiary Lining Procedure	9–18	In the present study, focus will be placed on the traditional techniques used in the creation of Japanese hanging scrolls. When fabricating hanging scrolls, a traditional method called "subsidiary lining beating" is used. Hanging scrolls are generally lined with four layers of Japanese paper, which are respectively called the first, subsidiary, subsidiary overall, and final linings. This study focuses on the technique used for adhering the subsidiary layer, referred to as "subsidiary lining beating". For this process, very soft Japanese paper called "*misu* paper" is used. For the adhesion of the subsidiary layer and beyond, a traditional adhesive agent called "aged paste" is used. This adhesive is a kind of wheat starch paste that is fermented for 10 years. It does not stiffen like new paste, even after it has dried. In order for hanging scrolls to be rolled up and unrolled smoothly, using this aged paste for the lining is essential. However, the adhesive strength of diluted aged paste with water is insufficient on its own. Thus, traditionally the adhered parts are beaten with a brush, enhancing the adhesive strength of paper. In this study, an expert and a non-expert were assigned as test subjects, and the lining procedure and the time each subject required for the process were analyzed. Moreover, through eye movement measurement, the focal points of each test subject and their movement during the work were observed in order to comparatively verify the differences in work content between the expert and non-expert. Similar to other artisan works, "watch and learn" is the primary way these techniques are passed to successive generations. Through this study the present author aim to deepen understanding of how expert workers perform and find valuable hints for acquiring these traditional work techniques, while comparing the movements of two workers from the stand point of a data analysis.	subsidiary lining,process analysi, eye movement analysis, brush	増裏打ち, 工程分析, 眼球運動解析, 刷毛	
No.59	2016		Report on JSCCP Symposium "Cultural Heritage, Succession to Posterity; Saving Ancient Egyptian Antiquities/ GEM-CC Project"	19–83				
No.59	2016		Obituary	84–86				
No.59	2016		A Ceremony of A warding an Honor	87–89				
No.59	2016		A General meeting of Bunkazai Hozon-Syuhuku Gakkai 2015	90				
No.60	2017	OKA, Yasuhiro; TAKAI, Yuka; GOTO, Akihiko; OKA, Kozo	Three Dimensional Motion of the Beating Brush Contents in the Beating Procedure	1–9	Hanging scrolls are a traditional form of Japanese ornamental art used to display paintings and calligraphy. When displayed, scrolls are unrolled and hung straight, without rippling or warping, on a wall or in an alcove. When stored, they are rolled up smoothly and tightly from the bottom. To make the effective performance of these two functions of rolling out and rolling up the scrolls possible, paintings and calligraphy depicted on pieces of silk fabric or paper were typically lined with several layers of traditional Japanese paper affixed through the use of paste made from wheat starch. This paste was diluted glue that would not harden after drying, employed for the purpose of maintaining flexibility. However, inasmuch as its adhesive strength was insufficient, scroll makers came to use a technique of lightly beating the surface of each layer of lining paper with a special "beating brush" in order to provide better adhesion. Nevertheless, beating entails the risk of damaging the paper or the work underneath if it is done too strongly; on the other hand, if it is done too weakly, it cannot enhance the strength of the adhesion. Accordingly, although this beating work appears to be a simple process of merely rapping the brush up and down, in fact it requires a high level of technical ability. Due to its being one continuous set of movements, no clear elucidation of the manner in which a worker grasps and operates his/her brush has ever been undertaken to date. In the present study, an expert and a non-expert were designated as test subjects. Both participants were asked to wear infrared reflection markers so that the authors may see, by means of three-dimensional analysis, the differences in their movements when operating their brushes. Beating an adhesion surface efficiently and evenly requires accurate reproducibility in the consecutive motions used to tamp. By providing a clear breakdown of the differences in the motions of the expert and the non-expert, the authors make a significant contribution toward delivering a useful tool for non-experts to acquire more advanced techniques in this area.	three dimensional motion, infrared reflection marker, beating brush, beating, subsidiary lining paper	3次元挙動, 赤外線反射マーカー, 打刷毛, 叩打, 増裏紙	

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No.60	2017	KURITA, Katsumi; SATO, Yuki; AOKI, Shigeru; KANAZAWA, Mitsuo	The Small Simple Seismic Isolation System for Displayed Cultural Properties in the Museum: Evaluation and Experimental Study of this Device by Excitation Experiment	10–21	In order to introduce a seismic isolation system in museums that would prevent overturning of a displayed cultural property by seismic ground motion, a simple, small seismic isolation device was developed consisting of two metal plates placed on top of each other. In the present study, the vibration characteristics of this device were investigated by excitation experiment and evaluated by numerical analysis. Dynamic behavior of the system was also investigated by installing a vase on the device. First, the vibration characteristic of the device was investigated. From the result of excitation experiment, it was found that when friction coefficient was μ =0.12 the response acceleration amplitude on the device was sufficiently reduced if the maximum peak acceleration amplitude was over 400 Gal. From the result of numerical analysis, it was found that the effect of the system to reduce the response depended on the friction coefficient and that the effect was higher when friction coefficient was lower. However, the relation between peak acceleration amplitude and peak relative displacement indicated a trade-off. If focus were to be placed only on the reduction of peak acceleration amplitude, the risk of the upper plate hitting the wall would increase since peak relative displacement would become larger. Next, the effectiveness of the system to prevent overturning of displayed cultural property was investigated by examining the overturn limited acceleration of a vase, used as an example of a cultural property, in the excitation experiment. It was found to be about 400 Gal. Based on this result, the vase was installed on thedevice. As a result the device indicated good performance to reduce seismic response against sine wave and the four seismic ground motions that may cause immense damage, thus preventing the overturning of the vase.	seismic isolation, friction, pberturning limit acceleration, overturning prevention, cultural property	免震, 摩擦, 転倒限界加速度, 転倒防止, 文化財	
No.60	2017	SAKAI, Kiyofumi; HAYAKAWA, Noriko; KUSUNOKI, Kyoko; YAMANAKA, Hayato; KAWANOBE, Wataru.	Application of Poly(vinyl alcohol)-degrading Enzyme for the Removal of Deteriorated Poly(vinyl alcohol): Interaction between the Enzyme and Adhesives or Pigments	22–35	Poly(vinyl alcohol) (PVA) was previously used as a consolidant of pigments on paintings, but deterioration due to passage of time has caused cloudiness and contraction of the PVA coating. As a means for solving these problems, a study was conducted on the use of PVA-degrading enzyme in the removal of deteriorated PVA in the conservation of paintings. The stability of the enzyme and the interaction of the enzyme protein, adhesives and pigments were examined. It was found that the enzyme was relatively stable at room temperature without contamination of microorganisms. The enzyme activity was increased by 10% when mixed with cowhide glue, and slightly decreased by mixing with funori or furunori-like polysaccharide (shin-furunori). The enzyme activity was decreased by the addition of pigments to each enzyme solution. This was found to be so because the enzyme protein was adsorbed to the pigments. Adsorption of the enzyme protein to the pigments was suppressed by the addition of adhesives to the enzyme solution. Although this inhibitory effect was observed in cowhide glue and funori, it was not so clear in Shin-furunori. It was suggested that the effect was due to the charge and the solubility of the adhesives. The enzyme did not affect the peel strength of the adhesives nor the color difference of the pigments. From these results, it was found that the enzyme solution containing an adhesive such as glue andfunori effectively degraded the deteriorated PVA on paintings.	enzymes, poly(vinyl alcohol), consolidation, removal, adhesives, pigments	酵素, ポリビニルアルコール, 剥落止め, 除去, 接着剤, 色材	

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No.60	2017	LEE, Kang; INABA, Masamitsu	Distribution of Relative Peak Intensity of Levoglucosenone to Levoglucosan in Naturally Aged Books Measured by Pyrolysis-Gas Chromatography	36-45	Shosoin is a treasure repository in Nara, Japan which has stored varieties of the precious cultural properties since the mid-eighth century. In Shosoin, decorative papers dyed, painted, or sputtered with colorants have been handed down. The aim of the present study is to elucidate the colorants used in the decorative papers stored in Shosoin by scientific instrumental analysis, which will lead to conservation of the papers in the future. Visible and fluorescence reflectance spectrometry, X-ray diffractometry and X-ray fluorescence spectrometry were carried out for the identification of the organic and inorganic colorants in the decorative papers. For the dyed paper, the visible and/or fluorescence spectra of blue, red and pink areas were identified with those of knotweed, madder and safflower references, respectively. The spectrometry of the dyed paper also indicates the overdyeing with knotweed, madder and gromwell for purple. In the analysis of the paper painted with colorants, visible spectrometry and X-ray analysis respectively verified sappanwood in reddish brown and lead white in white. For the papers sputtered with colorants, visible spectrometry and X-ray analysis led to the identification of indigo, malachite, sappanwood, and lac as colorants. X-ray fluorescence analysis for colorants in light red sputtered in a folding screen panel indicated the addition of a Pb-based white pigment to lac. This analytical study shows that a variety of colorants were used for the decorative papers stored in Shosoin.	acisic paper, levoglucosenone, pyrolysis-gas chromatography, thermal decomposition materials, natural ageing	酸性紙, レボグルコセノン, 熱分解ガスクロマトグラフィー, 熱分解生物, 経年劣化	
No.60	2017		Report on JSCCP Symposium "Succession of Cultural Heritage to Posterity; Considering the Cultural Heritage Affected by the Great East Japan Earthquake"	46-87				
No.61	2018	TAGUCHI,Satoko;,MUROSE,Tasuku;KOIKE,Tomio;KIRINO,Fumiyoshi	Effect of Compounds Comprising Treatment Solution of Namarigin no Sahi Described in Ogata Karin Archives of the Konishi Family on Lead	1-11	Urushi works made by Rimpa, represented by Ogata Kōrin often used lead-plate decorations. *Namarigin no Sahi* described in Ogata Kōrin archives of the Konishi family seems to be a surface treatment technique to create black-colored layers. There is a possibility that *Namarigin no Sahi* was applied to the lead decorations made by Rimpa. According to Ogata Kōrin archives of the Konishi fmily, the treatment solution comprises *enshau*, *iwau*, *tanhan*, *shiho*, and *su*, corresponding to KNO_3, S, $CuSO_4$, · $5H_2O$, NaCl, and acetic acid or plum vinegar called *umezu*, respectively. In this study, a treatment solution comprising a single compound of *Namarigin no Sahi* was applied on the lead surface to understand the effect of the compounds. In addi-lion, surface treatment using *umezu* as a solvent instead of water was performed on the lead sample. The samples were examined through color measurements using CIEL*a*b*, scanning electron microscopy (SEM), electron dispersive X-ray analysis (EDS), and X-ray diffraction (XRD). From the results of the color measurements, *tanhan* and *su* caused a change in the color of the lead samples. The color change and corrosion products of the lead samples that were treated with solutions using *umezu* as a solvent were different from those of the samples that underwent aqueous treatment with single solute. XRD analysis results indicated that PbO_2, was formed on the surface of the sample treated with a solution mixture of KNO_3 and *umezu*, and PbO_2, and PbS were formed on the surface of the sample treated with a solution mixture of S and *umezu*. On the basis of these results, *Namari gin no sahi* treatment can be considered to cause the formation of black-colored layers on lead, suggesting that it may have contributed to the formation of blackish surfaces in the lead decorations of Rimpa's urushi works.	Ogata Kōrin Archives of the Konishi Family,surface treatment, craft technique, lead-plate decoration, lead compounds	小西家旧蔵・緒方光琳関係資料, 表面処理, 工芸技法, 鉛装飾, 鉛化合物	

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No.61	2018	TAKASHIMA,Miho	Using Enzyme-Linked Immunosorbent Assay (ELISA) to Identify Proteinaceous Materials and Plant Gums in Artworks	12-37	An immunological technique, Enzyme-Linked Immunosorbent Assay (ELISA) was used to simultaneously identify proteinaceous materials (animal glues, fish glues, egg white, yolk and milk casein) and plant gums in binding media and adhesives on works of art. In the present study, although the method was based on the ELISA protocol used by the Getty Conservation Institute (GCI), the washing process, evaluation method for positive or negative results, and the waiting time needed to measure appropriate absorbance were improved. The antibodies used in this study are specific to the target protein and plant gums, and the detection limit of this improved assay is extremely low at about 0.1-50 ng/100 μL for the reagent of the proteinaceous materials and plant gums. Many glue and gelatin products made from mammals and sturgeons were also tested for antibodies and showed that all of them were detectable by adopting only two anti-collagen type I antibodies which are developed by using collagen I from human as immunogen, raised in goat or rabbit. Furthermore, samples from naturally aged easel and mural replica paintings were tested and confirmed that, with some exceptions, this assay can identify individual proteinaceous material and plant gum even when the samples contain different types of binding media in each paint layer. The exceptions are pigmented egg yolk samples and pigmented sanzenbon glue samples. These problems seem to have occurred due to increased insolubility of aged samples in the elution buffer. Though future work must be done on improving elution buffer and elution method, and on examining the effects of pigmentation and/or aging, this study indicates that ELISA is one of the effective analytical methods for identifying the proteinaceous materials and plant gums present in minute samples taken from artworks.	ELISA, antibody, binding medium, proteinaceous material, plant gum	エライザ, 抗体, 膠着剤, 蛋白質, 植物ガム	
No.61	2018	NAKAMURA,Rikiya;TSURU,Mami;NARUSE,Masakazu	Colorant Analysis of Papers Treasured in the Shosoin Treasure Repository	38-54	Shosoin is a treasure repository in Nara, Japan which has stored varieties of the precious cultural properties since the mid-eighth century. In Shosoin, decorative papers dyed, painted, or sputtered with colorants have been handed down. The aim of the present study is to elucidate the colorants used in the decorative papers stored in Shosoin by scientific instrumental analysis, which will lead to onservation of the papers in the future. Visible and fluorescence reflectance spectrometry, X-ray diffractometry and X-ray fluorescence spectrometry were carried out for the identification of the organic and inorganic colorants in the decorative papers. For the dyed paper, the visible and/or fluorescence spectra of blue, red and pink areas were identified with those of knotweed, madder and safflower references, respectively. The spectrometry of the dyed paper also indicates the overdyeing with knotweed, madder and gromwell for purple. In the analysis of the paper painted with colorants, visible spectrometry and X-ray analysis respectively verified sappanwood in reddish brown and lead white in white. For the papers sputtered with colorants, visible spectrometry and X-ray analysis led to the identification of indigo, malachite, sappanwood, and lac as colorants. X-ray fluorescence analysis for colorants in light red sputtered in a folding screen panel indicated the addition of a Pb-based white pigment to lac. This analytical study shows that a variety of colorants were used for the decorative papers stored in Shosoin.	Shosoin treasure, paper, colorant, reflectance spectrometry, X-ray analysis	正倉院宝物, 紙, 色料, 反射分光, X線分析	

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No.61	2018	KIJIMA,Takayasu;SUZUKAMO,Fujiko;KIM,Jongwook	Restoration of Wall Paintings, *Yusen* and *Saika* by KOSUGI Misei at the Main Hall of The University of Tokyo, Yasuda Auditorium	55-68	During the repair work on Yasuda Auditorium, The University of Tokyo, restoration of the wall paintings inside the auditorium was conducted between March 2013 and December 2014. The wall paintings are a pair of oil paintings on canvas clothes: the one to the left entitled Yusen (*Spring Water*) and the one to the right *Saika* (*Fruit Picking*), as the viewer faces them. They are the works of the painter Kosugi Misei (1881-1964) and were painted in 1925. Although they had received remedial treatment during the large-scale repair work of Yasuda Auditorium, which was carried out between 1989 and 1990, remedial treatments had been conducted since their crea-tion. The present restoration consisted mainly of the repair of damage due to the passage of years and the damage they had incurred at the time of the campus dispute between 1968 and 1969. To preserve the wall paintings, which are a part of the interior decoration of the building, in a stable condition and to provide structural improvement so that they may be removed easily at the time of a future restoration were also considered to be major aims. Research was also conducted from the point of view of art history as well as techniques and materials employed in order to acknowledge once again the historical value of the paintings in the Yasuda Auditorium that had been registered as a "registered tangible cultural property" in 1996. The restoration having been completed, the paintings revived their originalbeauty. By placing them on new panels and thereby improving their structure, keeping in mind their handling, it became possible to maintain the paintings in a more stable condition. Mutual understanding and cooperation of experts in architecture and restoration made this project possible. It is hoped that this project will serve to re-acknowledge the historical and cultural values of the wall paintings in Yasuda Auditorium by Kosugi and that they will be preserved and transmitted in a good condition for years to come.	conservation of wall paintings, mounting method of wall paintings, oil painting restoration, painting technique and material, KOSUGI Misei	壁画の保存, 壁画の設置方法, 油彩画修復, 絵画技法材料, 小杉未醒	
No.62	2019	UCHIDA,Yuka;HAYAKAWA,Noriko	Methods for Removing Natural-Rubber Pressure-Sensitive Tapes from Paper Using Organic Solvents	1-13	One of the major issues associated with conservation of historical documents and artifacts is the treatment of aged pressure-sensitive tapes that cannot be removed from paper. These tapes reduce the paper flexibility due to the adhesive permeating into the paper and hardening, which also degrades the appearance of artworks by discoloration. It was demonstrated in the present study that artificial samples similar to natural aged tapes on paper could be acquired by conducting accelerated aging test on a natural rubber adhesive tape. In addition, a comparative study of effective organic solvents for removing tapes, in three stages of degradation, from paper was performed using the artificial aged samples. It is very difficult to separate and precisely categorize the three stages of degradation of the tapes because there are various factors governing the degradation of tapes, including composition of tapes, surrounding environment. and objects that the tapes were put on. However, after a rough assumption of the degree of tape degradation through touch and visual observation, the above findings can be applied to select the appropriate solvents for removing the tapes.	conservation, pressure-sensitive tape, paper, accelerated aging test, organic solvent	保存修復, 粘着テープ, 紙, 加速劣化試験, 有機溶媒	

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No.62	2019	TANAKA,Naoko;OHBAYASHI,Kentaro;SASAKI,Yoshiko	Studies on Colorants Used for the Colors on *Nehan-zu* at Daigoji Temple	14-27	The original colors of the Kamakura period *Nehan-zu*, a picture of Buddha entering Nirvana, stored at Daigoji temple had been difficult to identify due to previous restoration work during which some parts had been painted over and also to aging. Buddhist paintings symbolically represent the sacred teachings, and therefore, the colors used are symbolic as well. For further reproduction of the painting, in the present study the original colors used in the Nehan-zu were investigated through instrumental analysis of the colors and research into their corresponding symbolism. The study focused on the colors of the substratum of silk, the blue colors, and the colors in the details of the face of Jikoku-ten. Regarding the colors of the substratum of silk, no specific pigment was observed, and instrumental analysis suggests the possibility that tannin was used in the dyeing. Tannin dye when used on silk can produce the effect of turning silk yellow with an alum mordant used on the sizing silk Moreover, lotus is symbolically and deeply related to Buddhism. References to the lotus-leaf dye are found in the Shosoin documents dating to the time of the enshrinement of the Buddha at Todaiji. The lotus-leaf dye showed up as soft yellow-ocher color on a standard color sample prepared for this study and appeared suitable as the color of the substrate of silk. Furthermore, when exposure experiments were conducted, it was found that the fastness of the lotus-leaf dye color was maintained longer than that of the sizing silk. Also, during the exposure experiment period, as mold was growing on the sizing silk, the antimicrobial effect of the lotus-leaf dying was indicated. Both indigo and azurite pigments expressed blue, but they were used distinctively, indicating a symbolic meaning. In regard to the colors of the face of Jikoku-ten, if they should follow the colors which symbolize the directions of the compass based on Yin and Yang, this study concludes that the current colors are not the original but the result of previous resto-rations. Combining symbolism with instrumental analysis has brought us closer to determining the original colors.	*Nehan-zu*, colorants, instrumenta analysis, symbolism, reproduction	仏涅槃図, 色料, 機器分析, 象徴性, 復元模写	
No.62	2019	YOKOYAMA,Tomonori;AKIYAMA,Yasunobu;YAMAHANA,Kyoko;ASAKA,Takashi;HIGUCHI,Masashi;SATO ,Masashi	Study of Ancient Egyptian Beads Made of Sulfur	28-42	In the present paper, the authors discuss how sulfur bead necklaces in the Ancient Egyptian and Near Eastern Collection at Tokai University (AENET) were manufactured. The parallels of those sulfur beads were reported only from four institutions in the world, and none was studied due to their extreme rarity. The present authors therefore studied the morphology of those beads and estimated the possible period of manufacture. They also assumed that the reason of utilizing sulfur despite its stinging odor is because of its yellow color, which substitutes for the color gold. The authors then conducted chemical analyses and determined that the beads were made of pure sulfur. After confirming the original material, the authors tried to replicate the beads by using terracotta molds and olive oil that must have existed in ancient times. In this experiment, the authors not only succeeded in replicating ancient Egyptian technique but also in collaborating science and history. By such interdisciplinary collaboration, the authors are convinced that it is possible to enhance human technological development. Reproducing tangible artifacts with precision also enables people to 'feel' the artifacts with their own hands, thus providing an alternative way of exhibition.	Ancient Egypt, Sulfur Bead, Casting, Grave goods, 3-D data	古代エジプト, 硫黄ビーズ, 鋳造, 副葬品, 3次元データ	
No.62	2019		Report on JSCCP Symposium "Succession of Cultural Heritage Reproduction and Reconstruction at present and in the future	43				

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No.63	2020	IWATA,Yasuyuki	Lethal Conditions in Heat Treatment of Cultural Property Pests, *Gibbium aequinoctiale* (Coleoptera, Ptinidae) Adult and *Attagenus unicolor* (Coleoptera, Dermestidae) Larva	1-8	*Gibbium equinoctiale* and *Attagenus unicolor* are cultural property pests that inhabit Japan. To know the lethal conditions of both insects in heat treatment, 30 individuals of *Gibbium aequinoctiale* ault or *Attagenus unicolor* larva were prepared and were incubated under 30, 40, 45 and 50 degree Celsius for 1, 2, 4, 6 and 8 hours. Adults were tested because the larvae of the Gibbium aquinoctiale are a nest-forming organ-ism, and it is difficult to confirm the mortality of the larvae before and after treatment. The larvae of the *Attagenus unicolor* were tested because previous studies showed that adult was more susceptible to high temperatures than larvae. The results are as follows: 1) G. *acquinoctiale* adult are killed by heat treatment at 15 degrees Celsius for 8 hours or 50 degrees Celsius for 2 hours; 2) A. unicolor larva are killed by heat treatment at 45 degrees Celsius for 4 hours or 50 degrees Celsius for 1 hour; and 3) both species hardly die after heat treatment at 40 degrees Celsius for 8 hours. It was suggested that many species of pests survive when the temperature of the central part of the object rises only up to the level of 40 degrees Celsius by heat treatment.	museum pest, beetle, insecticidal effect, heat treatment experiment, lethal condition	文化財害虫, 甲虫, 殺虫効果, 高温処理実験, 致死条件	
No.63	2020	ISHII,Mie;KOSAKA,Satoko	Learner-centered Heritage Education: ICCROM Summer School 2019 Communication and Teaching Skills in Conservation and Science Organized at Saga University Arita Campus	9-16	ICCROM *Summer School 2019 Communication and Teaching Skills in Conservation and Science*, September 9-20, 2019, held at the historic ceramic town of Arita, provided an opportunity to rethink our way of teaching and to explore the potential of new didactic approaches to learn about conservation and science. Conservation education programmes are, without exception, facing a paradigm shift from one directional teaching to interactive learner-centered approach. Successful interdisciplinary collaboration is essential for meaningful conservation actions. A shared understanding of core principles of the diverse fields involved is the basis on which such collaboration is built and learn-er-centered approach is the key. This was the first ICCROM course to take on the Zero Waste policy and the event was planned, conducted and evaluated through a shared guideline.	ICCROM, learner-centered, active learning, heritage, conservation	イクロム, 学習者中心, アクティブラーニング, 遺産, 保存	
No.63	2020	KANSHA,Hiroo;YOKOYAMA,Midori,ISHII;Mie	International Cooperation in the Conservation of Textile Heritage in Armenia	17-25	International cooperation in textile heritage conservation between the Republic of Armenia and the Tokyo National Research Institute for Cultural Properties was conducted in September 2017, June 2018 and October 2019. Every year, a workshop was organized for the duration of about ten days. The subjects covered were the basics to identify textile materials and structures, documentation, condition assessment and various treatment methods and storage. Practice of microscopic analysis of fiber, chemical identification of natural dyes, analysis of fabric structures, conservation dyeing, support stitching, wet cleaning, documentation and storage were covered. Furthermore, a historic textile was analyzed to identify its dyes, as a part of a practical work. This cooperation project was beneficial since one of the effects can be seen in the fact that a textile heritage was exhibited at the Metropolitan Museum of Art, New York. after restoration by using techniques introduced in the workshop.	Armenia, textile, conservation, cultural heritage, international cooperation	アルメニア, 染織品, 保存修復, 文化財遺産, 国際協力	
No.64	2021		Report on JSCCP Symposium "Succession of Cultural Heritage Application and Management of Digital Information					

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No.64	2021	KIGAWA Rika; TOMIKAWA Atsuko; KUBO Kenji; ARIYOSHI Masaaki; AKIYAMA Junko; HAYAKAWA Noriko	Conservation of Flood-damaged Adhered Documents Using Lye of Wood Ashes: Evaluation of Active Ingredients of the Lye Solutions and Effects on Soaked Acid Paper and Traditional Japanese Paper (washi)	1-20	Lye, an alkaline solution historically prepared from plant and wood ashes, has been used for various traditional methods related to produce textiles and paper. Especially, in the past. it was used to cook plant fibers to make traditional Japanese paper (washi). In previous studies by Tomikawa et al., lye of pH 10 to 11 was applied to restore looddamaged, entirely adhered documents, and had remarkable effects to open the adhered pages, clean the soiled paper and remove insect feces. In the present study, the ingredients of the wood-ash lye solutions used for conservation were investigated by HPLC and ICP, and consequently potassium carbonate was detected as a major ingredient together with small amounts of sulfate and sodium ions. Solutions of potassium carbonate showed similar effects to the original lye solutions for the conservation of adhered documents. This indicates potassium carbonate solutions can replace wood-ash lye for the conservation of water-damaged adhered documents. The effects of lye on the soaked acid paper and Japanese paper, both from actual documents, were evaluated by zero-span tensile strength tests, before and after an accelerated deterioration process in 100℃ for 120 hours. In the case of acid paper of pH 3-4, from documents published in 1936, 1941 and 1957, the tensile strength after accelerated deterioration improved by soaking into all of water, lye and potassium carbonate solutions. Lye and potassium carbonate solutions were more effective in increasing the tensile strength than water. Regarding traditional Japanese paper, which had substantial initial strength, the tensile strength was not significantly affected by soaking in either water or lye solutions. To investigate for residual potassium on treated paper, XRF analysis was performed. The process of rinsing with water just after soaking paper in lye removed potassium substantially from the paper. Therefore, rinsing with water after treating in lye can be used to remove residual potassium if that is preferable. Though there are reports about possibility of alkali degradation of oxidized cellulose, adverse effects have not been observed so far using lye of pH 10 to 11 on either acid or Japanese type of paper samples from actual documents in the present study. However, since not all types of papervarieties of different sizing and components have been tested, further evaluation and cautions would be necessary when the method is to be applied to variety of documents.	lye, disaster-damaged documents, conservation, restoration, acid paper, Japanese paper, *washi*	灰汁, 被災文章, 修復, 酸性紙, 和紙	
No.64	2021	UCHIDA, Yuki	Quality Assurance Culture Facilitates Preservation of Cultural Property – Disaster Management in the UK's Libraries and Archives –	21-31	Disaster management in UK libraries and archives is holistically connected to their own management activities and services. This is not merely the result of a strong sense of professional accountability in protecting our heritage but, it might be argued, also driven by rather political motives. Here in the UK, there are numerous guidelines intending to lead the cultural sector to best practice and ensure continuous development of services such as standards, guidance, recommendations, code of practice, policy and principle. All these factors are inter-connected and influence one another to integrate the service. With the culture of 'quality assurance' being prominent in the culture, there is pressure to demonstrate compliance with relevant guidelines as a gauge of competence and to survive, as an institution and as custodians of cultural collections. The system of Archive Service Accreditation, the UK standard for archive services, typifies this assessment culture. However, the author recognises that this comprehensive mechanism ultimately contributes to ensure cultural collections are physically secure and accessible with disaster recovery planning and procedures playing a significant part of the whole. As an overview of this theory, the present paper reviews the current approach to disaster management and procedures in place at the author' s institution which have origins in a major fire event of 1994 and, on this basis, offers a broader solution to effective planning for similar occurrences.	disaster management, quality assurance culture, best practice, archive service accreditation, British standards	防災マネージメント, クオリティーアシュアランス文化, ベスト・プラクティス, アーカイブ業務認定, ブリティッシュ・スタンダード	

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No.64	2021	HIOKI, Kazuko	Disaster Preparedness for American Cultural Institutions – Training and Partnership	32–42	Disaster preparedness for cultural collections encompasses a wide range of activities including identifying risks, creating emergency procedures, gathering information about people and services, providing training, and developing partnership with cultural heritage and emergency professionals. Regional conservation centers in the United States have contributed to raising awareness of disaster preparedness and response among cultural institutions by providing training and education. Heritage Emergency National Task Force (HENTF) was founded in 1995, co-sponsored by Federal Emergency Management Agency (FEMA) and Heritage Preservation (later Smithsonian Institution), to protect cultural heritage in the United States from the damaging effects of disasters. HENTF exemplifies the best in public-private partnership as well as collaboration between cultural and emergency communities. It provides framework to enhance coordination among cultural stewards and emergency managers to ensure effective response to collections damage in large-scale disasters. To bring together cultural heritage and emergency management professionals, HENTF provides training called Heritage Emergency and Response Training (HEART) which offers realistic, hands-on training in damage assessment, emergency evacuation and salvage of museum objects, crisis communication, leadership, and team building.	U.S.A., disaster preparedness, training, partnership, cultural heritage	アメリカ, 防災, 訓練, 協力, 文化財	
No.65	2022	NISHISAKA, Akiko; OKADA, Yasushi; ISHII, Mie; TANIGUCHI, Yoko; NAKAMURA, Mikio; GAMAL, Gilan; AYAD, Mohamed; SHERATA, Mostafa; ZIDAN, Eissa; KAMAL, Hussein	JICA Grand Egyptian Museum Joint Conservation Project	1–18	International cooperation in human capacity development in the field of conservation at the Grand Egyptian Museum Conservation Center initiated by JICA won the 27th Yomiuri International Cooperation A ward (2020. 11). Egypt and Japan started their cooperation in 2008. After a decade of training with replicas, in 2016, the two countries launched a joint conservation project (GEM-JC) targeting 72 groups of objects that include textiles, the chariots and ritual beds of King Tutankhamen (18th Dynasty, New Kingdom), and wall painting pieces from the tomb of Ini-Sneferu-Ishetef (5-6th Dynasty, Old Kingdom). The case study exemplifies Japan's overseas cooperation through education to support the counterpart to establish a conservation and research hub with an internationally recognizable standard.	Egypt, International Cooperation,Wood, Textile, Wall paintings, Conservation	エジプト, 国際協力, 木製品, 染織品, 壁画, 保存修復	
No.65	2022	AIKAWA, Yu; WADA, Hiroshi	A Case Report on Ventilation Measures and Maintenance of Restoration Work Environment in Historical Buildings from the Perspective of Infection Prevention against COVID-19	19–35	The Tokyo National Museum was temporarily closed between February and June 2020 due to the spread of COVID-19. The reopening of the museum was based on "Guidelines for Controlling the Spread of Novel Coronavirus (COVID-19) Infections in Museums" prepared by the Japanese Association of Museums. On the other hand, it 'was also necessary the Tokyo National Museum to formulate operational standards for its internal works. Especially at a site of restoration of cultural properties, it is common that several conservators to work in the same space for a certain period of time. However, in old facilities such as the main building (Honkan) of the Tokyo National Museum, ventilation and air-conditioning systems are not sufficient. Moreover, there were concerns regarding how to achieve both the safety of the working environment for conservators and the maintenance of the conservation environment of cultural properties. Therefore, we focused on the ventilation conditions in our restoration rooms and conducted a survey of CO2 concentration, the number of people in the rooms, and temperature and humidity from June to October 2020. As a result, the CO2 concentration of the restoration rooms without the central air conditioning system exceeded 1,000 ppm under the conditions where the doors were plosed and the ventilation fans were stopped. However, CO2 concentration could becontrolled by increasing the ventilation rate by opening the doors (about 10 cm wide) and operating the ventilation fans or air circulators. In contrast. there was also a concern that an increase in the ventilation rate and the door opening frequency may change temperature and humidity. The standard deviation of the temperature in each restoration room was around 1 ℃, although, when the doors were opened to their full width, the standard deviation of the humidity was 8.46%. Future issues to be considered include the control of pests, airtightness, and humidity when the doors are kept open. As seen above, in the limited environment of a historic building, we attempted to take ventilation measures against COVID-19 and at the same time maintain the conservation environment for our cultural properties and, as a result. were able to improve the environment to some extent.	COVID-19, historical buildings, ventilation rate, restoration work environment, carbon dioxide concentration	新型コロナウイルス感染症, 歴史的建造物, 換気回数, 処理作業環境, 二酸化炭素濃度	

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No.65	2022	TORIUMI, Hidemi	Considerations on the Reintegration of Paint Loss: History and Ethics in the Conservation of Paintings	36–49	Retouching can be categorized into two types: "visible retouching" and "imitative retouching." While "imitative retouching" has been empirically executed for a long history, the theory for "visible retouching" was established by Cesare Brandi and Umberto Baldini in Italy after the mid-1900s. The prominent examples of ethical thoughts on retouching observed before the modern period are overviewed, and the first reintegration cases by "visible retouching" and their backgrounds are described in detail. The ground color retouching method used to restore Japanese traditional paintings on paper or silk has some similarities to Brandi's theory. This suggests there might be common ideas among painting restoration methodologies in keeping the balance paintings' historical originality and artistic value, regardless of the difference of geographical areas and materials. Also, technical exchange between Japanese conservators and Italian mural painting conservators Paolo and Laura Mora, who visited Japan for the conservation project of the mural painting of Takamatsuzuka Tumulus and following training of Japanese experts in Rome, possibly might have influenced to the development of the conservation ethics in Japan. They were the conservators from the Istituto Centrale de! Restauro, whose first director had been Cesare Brandi. In western countries, right after the invention of "visible retouching," conservators trictly followed the method. however they eventually to adapt retouching techniques for individual case restoration cases. Today they are developing solutions which enable us to respect the historicity of the painting and to appreciate the painting as an integrate art work, in which the original and restored parts coexist in harmony.	visible retouching, imitative retouching, tratteggio, neutral tone, Cesare Brandi	裸眼で識別可能な補彩, オリジナルを模倣した補彩, トラッテッジオ, 中間色, チェーザレ・ブランディ	
No.65	2022	KUCHITSU,Nobuaki	How Should a Paper Be Written?	51–60				
No.65	2022	TSUCHIYA Yuko	How to Write a Paper: A Guide for Conservators	61–71				
No.65	2022		Reflections on Salvage Activities in the Great East Japan Earthqua	72				
No.66	2023	KURITA, Katsumi; AOKI, Shigeru; INAMURA, Eijiro	Prevention of Overturning by Seismic Ground Motion of Small Exhibits in Museums Fixed by Nylon Guts and Its Effects – Behavior Analysis of Small Exhibits in a Vibration Test –	1–10	In the museums, small exhibits are generally fixed on the boards using nylon guts for the prevention of overturning. The same method is also used for the prevention of seismic overturning. However, some exhibits protected by the method have been overturned and damaged by seismic ground motion. In this study, the behavior of a small exhibit while the ground is shaking was investigated in a test using specimen as a small exhibit and using observed seismic ground motion as input waves. Although the specimen is fixed on the board by nylon guts, it has generated rocking vibration by strong ground motion. In the case where the static friction coefficient between the specimen bottom and the board is small, the specimen bottom was slid on the board and overturned. However, when increasing the static friction on the board was increased with the setting of a cork sheet, sliding was suppressed, and the effectiveness of the prevention of overturning was improved. The increase in the tension force of nylon guts to fix the specimen on the board is also effective. In terms of the effects of the prevention of overturning, increasing the static friction coefficient is more effective than increasing the tension force of nylon guts.	Nylon gut, Exhibit, Sliding, Friction, Seismic ground motion	ナイロンテグス, 展示品, 滑動, 摩擦, 地震動	

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No.66	2023	YAMATO, Asuka	Usage and Distribution of Natural and Artificial Arsenic Sulfide Pigments in Ukiyo-e Prints	11-29	Orpiment (arsenic sulfide) is one of the representative yellow pigments used for ukiyo-e prints. Crystalline orpiment pigment (diarsenic trisulfide) is derived from minerals, whereas amorphous orpiment (arsenic sulfide glass) is produced via modern dry or wet processes. Therefore, there is a large difference in crystal structure between natural and artificial orpiment, and Raman spectroscopy is effective for distinguishing between them. This study examined 84 ukiyo-e prints and stenciled covers from Edo-period texts (14 from the National Museum of Japanese History and 70 from private collections) produced between the Horeki (1751-1764) and Bunkyu (1861-1864) eras whose year of production is clear. We conducted our investigation by first using Raman spectroscopy in the areas colored with orpiment in yellow, green, and orange, then identifying and classifying natural and artificial orpiment used in the surveyed materials. As a result, we discovered that the natural orpiment circulating in Japan was replaced by artificial orpiment sometime between 1847 (Koka 4) and 1851 (Kaei 4). One of the major reasons for this change was the beginning of artificial orpiment production, triggered by the mining of raw materials for orpiment pigments in Aizu.	orpiment, diarsenic trisulfide, arsenic sulfide glass, raman spectroscopy, ukiyo-e print	石黄, 三硫化ヒ素, 硫化ヒ素ガラス, ラマン分光法, 浮世絵版画	
No.66	2023	CAO, Zhijian; TSUKADA, Masahiko	Lac Dye Paints Used in Works of Art along the Silk Road – Effect of Additives in Paint Manufacturing on Coloration	30-45	Kerria lacca (referred to as lac) is a native insect of India, Southeast Asia, South China, etc. and traces of the usage of paints prepared from lac have been widely found in India, China and Japan in East Asia, and Rome and Portugal in Europe. The purpose of this study is to investigate the coloration of lac paint by different additives and extraction conditions in the manufacturing process, focusing on three methods of lac paint recipe from India, Tibet, and China, where many lac paints have been found to be used along the Silk Load. Based on a literature survey of pharmacological and medical texts, the additives used in each manufacturing method were estimated and classified into two types: aluminum ion sources and pH control agents. The effects of these additives on the coloration of lac paint was evaluated by UV-Vis spectrometry. The addition of an aluminum ion source gave Laccaic acid a constant and stable coloration at pH 5.8 to 9.0. The results showed that the types of the colorants depended on the aluminum ion source, as aluminum oxalate complex maintains the dyestuff in water solution, while alum produces the lac lake pigment precipitation. On the other hand, borax, an additive material that can be classified as a pH control agent in the Indian and Tibetan manufacturing methods, was found to change the coloration of Laccaic acid to be orange, regardless of the pH of the solution. This indicates that lac paint may exhibit different coloration depending on the manufacturing method.	Conservation science, Water-soluble lac paint, Paint manufacturing method, coloration, additives	保存科学, 水溶性ラック絵具, 絵具製造法, 呈色, 添加物	
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