

4) 絵図の安定化処理および保存修理

状態調査

被災した絵図の安定化処理および修理は、岩手県立博物館と東京国立博物館が連携して行いました。岩手県立博物館で安定化処理が施され、9群に分類された絵図の本紙全51紙が、2012年2月20日に東京国立博物館に搬入されました。本紙の継ぎ合わせなど安定化処理後の修理を、東京国立博物館が引き継いで行うことになりました。

まず本紙の状態と継ぎ合わせの調査を行いました。本来の形態は数枚の本紙が継がれた広い面積の絵図で、その本紙を折り畳んで小さくして保管し、運搬移動して使用されていたものと考えられます。

しかし、被災によってこれらの本紙の多くは継ぎ合わせ部分で外れ、別々になった状態で救出されました。また、料紙には被災による汚損や海水損の痕が残されていて、折れや皺などの損傷がいたるところにみられました。本紙の中には、料紙の表裏に墨書や描線がみられるものが複数確認されました。

元の継ぎ合わせ状況を確認するために、料紙および筆跡、元の形態の際の折り癖痕や継ぎ合わせの痕跡などについて、本紙表裏から目視観察しました。また、図中にある地名などについても確認しました。加えて、調査および処置作業時に透過光台を用いて料紙の状態を確認し、作業を進めました。特に料紙の亀裂部分や継ぎ合わせ箇所をよく観察し、調整してから補修し、裏打ち作業を行いました。透過光を用いて観察することで紙の質の目や

本紙の厚さの違いや斑な様子、料紙の重なりや裏打紙の状態など、墨や筆跡、亀裂箇所の状態に関する詳細な情報を得ることができます。

処置方針

今回の修理では、関連するすべての本紙が揃わないため、本来の姿にまでは戻すことは不可能です。そこで将来、欠失部を補填する修理が行われる可能性を考慮し、修理を行うことにしました。

本紙の継ぎ合わせ

本紙表裏面の塵埃や付着物を柔らかな白い筆や刷毛などを用いて払い落としました。次に、本紙の耐水性について再点検しました。必要な箇所に剥落止めを行うことを考えましたが、安定化処理を実施した際に多量の水が使用されたにもかかわらず、剥離しそうな部位がみられなかったことをふまえ、今回の処置では膠による接着力の補強までは取って行わないこととしました。本紙全体を精製水で加湿し、折れ癖などを調整して平滑な面になるように加圧乾燥、あるいは仮張り乾燥させました。加湿時における排液の状態を観察し、本紙に残る汚損状態などについて再点検しました。

事前調査で継ぎ合わせが確認できた部分は、元の重なり方と同じになるよう、小麦粉澱粉で継ぎ合わせました。継ぎ合わせの糊代は一般的な寸法で3mm（1分）程度のものでした。それに対し、継がれていたことを示す根拠

4) Stabilization and Repair of Pictorial Maps

Survey of pictorial maps

Stabilization and repair of disaster-damaged pictorial maps were collaboratively performed by the IPMM and the Tokyo National Museum. The stabilization was performed at the IPMM. Then, 51 sections of pictorial maps, divided into 9 groups, were brought to the Tokyo National Museum on February 20, 2012. After that, repair efforts, such as joining together pictorial map sections, were carried out by the Tokyo National Museum.

Survey of pictorial map sections

First, a survey on the condition of the pictorial map sections was undertaken. In the original form, a few sections were joined together as one pictorial map. The assembled pictorial maps had a large surface area, and it is assumed that they were folded into a smaller sizes for storage and were carried around.

However, many of these assembled pictorial maps disassembled because of damage from the disaster, and were salvaged in a separated state. In addition, stains from contaminants and seawater caused by the disaster were observed on the paper, and damage such as folded and wrinkled paper was observed all over the pictorial map sections. Writings in ink and pictorial strokes were observed on the front and back of the paper of many of the items.

In order to confirm the original joined state, pictorial map sections were observed visually from the front and the back to check the paper, brushstrokes, creases from the original folded state, and signs of the original joining areas. Geographical names written on the drawings were also confirmed. In

addition, the condition of the paper was confirmed using a light table while conducting the survey and performing treatments. In particular, subsequent to careful observation, split parts and joined areas were mended after making the necessary adjustments, and then lined. By observing with items transmitted light using the light table, detailed information on the condition of ink, brushstrokes, and split parts was obtained. For example, the paper-making screen slits on the paper, differences in the thickness and unevenness of the pictorial map sections, the state of overlapping paper, and condition of the lining paper.

Treatment strategy

Since some of the pictorial map sections were missing, it was impossible to restore the items to their original state by this treatment process. Thus, the possibility of lost parts being replaced in the future was taken into account when planning and performing this repair work.

Joining pictorial map sections

Dirt, dust and attached substances on the front and the back of the pictorial map sections were brushed off using a soft white brush, a large brush and other similar tools. Next, the water-resistance capacity of the items was re-examined. Though we evaluated the possibility of giving an anti-peeling treatment to areas of presumed damage, taking into consideration that no sign of possible peeling was observed in any area despite the fact that large amounts of water had been used during the stabilization treatment, it was decided not to perform any strengthening of the adhesive property by using

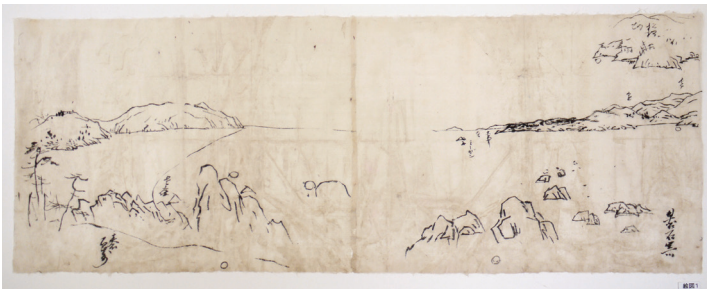


図1 絵図No.1-1(2紙) 紙本墨画 (処置後画像)
Fig. 1 Pictorial map No.1-1 (two sections) / Ink drawing on paper (post-treatment)

法量：No.1-1本紙 縦 830mm×横 313mm
法量：No.1-2本紙 縦 499mm×横 699mm
法量：No.1-3本紙 縦 405mm×横 310mm
法量：No.1-4本紙 縦 367mm×横 287mm
9件の内の1件「NO.1」の本紙は6紙あった。その内、継ぎ合わせが確認できたものを継ぎ合わせた(絵図No.1-1、No.1-2)。残りの2紙については、まとめて保管するようにした。

Size of assembled pictorial map sections
No.1-1 (height × width): 830mm × 313mm
Size of assembled pictorial map sections
No.1-2 (height × width): 499mm × 699mm
Size of pictorial map sections
No.1-3 (height × width): 405mm × 310mm
Size of pictorial map sections
No.1-4 (height × width): 367mm × 287mm
Out of the 9 salvaged sectioned pictorial maps, "No.1" had 6 sections. Among them, the sections in which adjoining areas had been confirmed were joined together (pictorial maps No. 1-1 and No. 1-2). The remaining unassembled two pictorial map sections were stored together with the other sections.

図2 絵図No.1-2(2紙) 紙本墨画 (処置後画像)
Fig. 2 Pictorial map No.1-2 (two sections) / Ink drawing on paper (post-treatment)



図3 絵図No.1-3(1紙) 紙本墨画 (処置後画像)
Fig. 3 Pictorial map No. 1-3 (one section) / Ink drawing on paper (post-treatment)

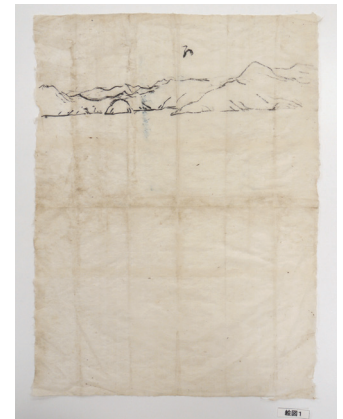


図4 絵図No.1-4(1紙) 紙本墨画 (処置後画像)
Fig. 4 Pictorial map No. 1-4 (one section) / Ink drawing on paper (post-treatment)



図5 絵図No.2(2紙) 紙本着色 (処置後画像)
法量：No.2本紙 縦 499mm×横 699mm
2紙を継ぎ合わせた。
Fig. 5 Pictorial map No. 2 (two sections) / Color ink drawing on paper (post-treatment)
Size of pictorial map No.2 (height × width): 499mm × 699mm
The sections were joined together.



図6 絵図No.3(2紙) 紙本墨画 (処置後画像)
法量：No.3本紙 縦 830mm×横 313mm
2紙を継ぎ合わせた。
Fig. 6 Pictorial map No. 3 (two sections) / Ink drawing on paper (post-treatment)
Size of Pictorial map No.3 (height × width): 830mm × 313mm

が得られなかった場合継ぎ合わせず、それらをまとめて保管することにしました。

また、本紙の損傷状態や継がれた状態の本紙の大きさなどを調べ、必要に応じて部分的補修あるいは全体的に裏打ちを施して本紙を強化しました。元は折り畳まれて使用する形態であったことと折り畳み痕からも、元の姿も支持体は然程厚くなかったと推測することができました。

処置後の本紙は、中性紙にはさみ次の処置まで安全に取り扱えるようにしました。継ぎ合わせた結果、法量が大きくなった本紙は中性紙製紙管に巻いて保管することとし、その他の本紙と共に中性紙製保存箱にまとめて収めました。

また、接着剤や補修紙など修理材料は、次期修理を考慮して可逆性の高い伝統材料を用い、後に外す、剥がすといった作業が安全に行うことができるようにしました。集められた本紙のみを継ぎ合わせてあることで、今後新たに本紙の一部が発見された際に、確認しやすい状態に還元されたと思います。欠失した本紙が全て揃うことを願いながら作業を進めました。

修理材料として有効な機能紙の特性

本紙の保護や補強のためにポリエステル紙、レーヨン紙、サンモア紙の機能紙3種を、各々の特性を活かして使用しました。ポリエステル紙で本紙表裏をはさむようにすることで本紙全体を保護しました。一時的に補強が

glue in this treatment project. The entire area of the pictorial map sections was dampened using purified water. Then, after adjusting the creases, the items were press dried or stretched out and temporarily fixed and subsequently dried to make the surface smooth. The condition of the discharged liquid from the dampening process was observed, and the presence of residual damage from contaminants was re-examined.

The places in which joining areas were confirmed from the preliminary survey were joined together using flour starch to return them into a state identical to that of their original overlapped state. The joining area glue margin had a typical size of approximately 3 mm. In contrast to those joined places, it was decided not to join places in which proof of joining could not be confirmed, and un-joined sections were collectively stored.

After confirming the damage to the pictorial map sections, and the size of the assembled sections, the sections were enhanced, as needed, by partial mending or full-scale lining. Since the pictorial maps had been carried around in a folded state, and also judging from the condition of the creases, it was assumed that the original supporting medium had been relatively narrow.

The treated pictorial map sections were placed between sheets of acid-free paper to enable their safe handling until the next treatment. Following the joining treatment, the resulting larger-sized assemblies of pictorial map sections were wrapped around tubes made of acid-free paper for storage, and were stored together with other pictorial map sections in preservation boxes made with acid-free paper.

Taking into consideration the subsequent treatments, traditional materials with high reversibility were used for

必要な箇所には、レーヨン紙を部分的に使用しました。水を用いた作業において本紙全体の保湿維持を図るとともに、取り扱いの安全性を高めるため主にサンモア紙を用いました。最後に使用した機能紙の組成や特性などについて説明します。

ポリエステル紙 (12g/m²) : 廣瀬製紙株式会社製

耐熱性、弾性回復性に優れたポリエステル繊維100%から成る機能紙で、熱融着繊維による繊維結合させたシートです。耐水性が高く、吸湿性や伸縮性がとても低い紙です。注意点としては、静電気を帯びることが挙げられます。

レーヨン紙 (12g/m²・18g/m²) : 五十川製紙株式会社製

木材パルプを溶解したセルロース繊維75%、セルロース繊維15%、ビニロンバインダー10%程度(PVA繊維)からなる機能紙で、ビニロンバインダーを混合して繊維間を結合させたシートです。構成成分の大半が天然繊維であるため、耐熱性に限りがあります。親水性、延伸性が高い紙です。

サンモア紙 (20g/m²) : 三和製紙株式会社製

レーヨン紙と同様の木材パルプを溶解したセルロース繊維30%、ポリオレフィン系芯鞘型熱融着繊維(ポリプロピレン・ポリエチレン繊維)70%から成る機能紙で、セルロース繊維の水素結合と芯鞘型熱融着繊維による織

this repair project so that future removal or peeling of the repair material, such as adhesives and mending paper, can be performed safely. Since only the salvaged pictorial map sections were joined together, the pictorial maps have been restored into a condition that enables straightforward confirmation of missing parts when the currently missing sections are discovered in the future. We performed the repair work and hoped that all missing sections would be discovered.

Properties of high-performance paper useful as repair material

Comparing the properties of different kinds of paper, the following three types of high-performance paper were selected for the protection and reinforcement of pictorial map sections: polyester paper, rayon paper and *Sanmoa* paper. The pictorial map sections were thoroughly protected by sandwiching the back and front of them with polyester paper. Rayon paper was occasionally used for areas requiring temporary reinforcement. *Sanmoa* paper was used as the main material to increase handling safety and to maintain the moisture of the entire pictorial map section in processes using water. Before finishing this section, I will explain the composition and properties of the high-performance paper we used in this treatment project.

Polyester paper (12g/m²): product of Hirose Paper MFG. Co., Ltd.

Made from 100% polyester fiber with excellent heat resistant properties and elastic recovery, the sheets consist of fibers bound together by thermal binding fiber. This paper has a high waterproofing capacity and extremely low hygroscopicity and retractility. One point of caution is that the paper generates static electricity.

維結合させたシートです。伸縮性が無く、親水性、吸湿性、耐熱性が低い紙です。

鈴木晴彦（東京藝術大学非常勤講師、
東洋絵画書跡保存修復士）

Rayon paper (12g/m² and 18g/m²): product of Isokawa Paper Mill Co., Ltd.

Made with 75% cellulose fiber with wood pulp dissolved in it, 15% cellulose fiber and approximately 10% vinylon binder (PVA fiber), the sheets consist of fibers bound together by mixing in vinylon binder. Since most of the components are natural fibers, this paper has a low resistance to heat. It has high elasticity and hydrophilic properties.

Sanmoa paper (20g/m²): product of SANWA SEISHI Co., Ltd.

Similar to the rayon paper, these high-performance paper sheets are made of 30% cellulose fiber with wood pulp dissolved in it and 70% polyolefin-based core-in-sheath thermal binding fiber (polypropylene and polyethylene fiber). The sheets consist of fibers bound by core-in-sheath thermal binding fiber and hydrogen bonding with cellulose fiber. This paper has low hygroscopicity and hydrophilic properties, low resistance to heat, and no retractility.

Haruhiko Suzuki (Tokyo University of the Arts part-time teacher /
Conservator of oriental painting and calligraphy)

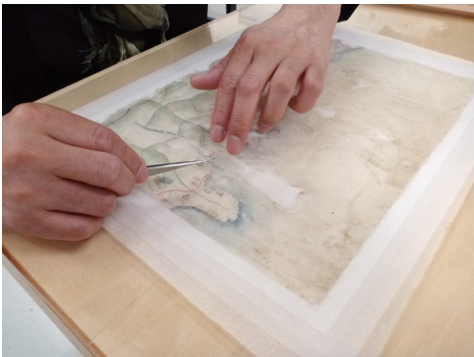


図7 絵図No.7 本紙部分の作業工程写真
本紙左上部分を調整し補修した。
Fig. 7 Pictorial map No. 7, section treatment process
The left upper part of the section was adjusted and repaired.



図8 絵図No.7(6紙) 紙本着色(処置後画像)
法量: No.7本紙 縦 885mm×横 542mm
補修し継ぎ合わせて中性紙製紙管に巻いて保存した。
Fig. 8 Pictorial map No. 7 (six sections) / Color ink drawing on paper (post-treatment)
Size of pictorial map No.7 (height × width): 885mm × 542mm
The sections were repaired, joined together, wrapped around a paper tube made of acid-free paper, and stored.

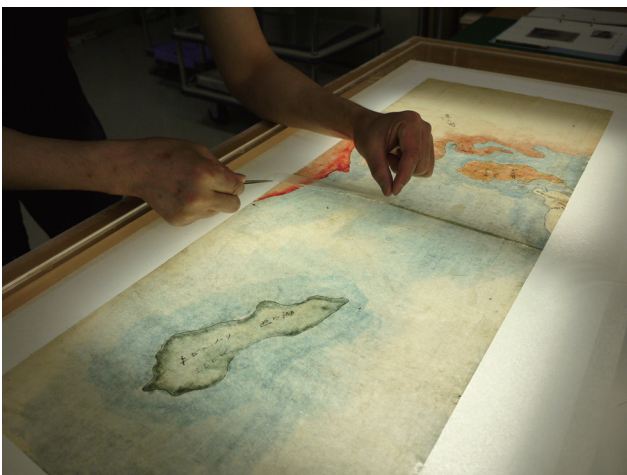


図9 絵図No.9本紙部分の作業工程写真
透過光台にて継ぎ合わせや亀裂箇所を調整し補修を施した。
Fig. 9 Pictorial map No. 9, treatment process on the section
The sections were joined using a light table, and the split parts were adjusted and mended.

図10 絵図No.9(12紙) 紙本着色(処置後画像)
法量: No.9本紙 縦 1221mm×横 1244mm
補修し継ぎ合わせて中性紙製紙管に巻いて保存した。
Fig. 10 Pictorial map No. 9 (twelve sections) / Color ink drawing on paper (post-treatment)
Size of pictorial map No.9 (height × width): 1,221mm × 1,244mm
The sections were repaired, joined, wrapped around a paper tube made of acid-free paper, and stored.

