

A Dionysian Dilemma: The Conservation and Display of Oversized Pompeian Watercolors at the Kelsey Museum of Archaeology

ABSTRACT

Long-term display of works of art on paper is problematic, and installation of oversize works of art can be challenging. However, a joint project between the Kelsey Museum of Archaeology and the Intermuseum Conservation Association successfully achieved both. This paper describes the treatment of twenty one oversize watercolors, and their subsequent installation in a setting that can function as both display venue and long-term storage.

The watercolors, the largest of which measures nearly twenty feet long, presented challenges not only because of their extraordinary size, but also because of their hybrid nature; they were painted on paper backed with canvas. Because of their large size, many of the works were stored rolled, and were thus inaccessible to students and visitors. The treatment involved surface cleaning, humidification, flattening, and hinging of the watercolors to aluminum honeycomb panels. Although much of the treatment drew on techniques commonly used in paper conservation, it successfully combined methodology and materials from both paintings and paper conservation. Micro-fading tests of the watercolor pigments were used to design display lighting, and a simple cleat system was used to hang the panels.

The project was funded in part by a Conservation Project Support Grant from the Institute of Museum and Library Services.

INTRODUCTION

The Kelsey Museum of Archaeology at the University of Michigan, Ann Arbor, houses a collection of over 100,000 objects from the civilizations of the ancient Mediterranean. The Museum's collection was begun in 1893 by Professor Francis W. Kelsey, for whom the Museum is named. Although the majority of the objects come from University

of Michigan excavations conducted in the first half of the 20th century, Professor Kelsey supplemented the collection with objects purchased during his travels in Italy, North Africa, and the Near East.

The twenty one watercolors that were the focus of this project were an artist's illustration of the famous fresco cycle in Room 5 of the Villa of the Mysteries in Pompeii, Italy. The watercolors were commissioned by Kelsey and painted by Maria Barosso, a highly regarded Italian artist and archaeological illustrator. Painted at nearly life-size (5/6ths scale), the watercolors were intended to recreate the experience of visiting the room at the Villa. Kelsey, who was present at the Villa's discovery in 1909, wished to document accurately the condition of the frescoes and the technical details of their creation. He hoped the paintings would be a research and teaching tool for the University (de Grummond 2000). Painted on-site in Pompeii between 1925 and 1927, the watercolors were the only large-scale pictorial record of the fresco cycle that was roughly contemporaneous with its discovery.

A temporary exhibit of the watercolors in the year 2000 focused attention on their condition. Due to their great size, the paintings had been rolled and stored in various locations, including the attic, in the Museum's 1890s building. The paintings had to be unrolled to be viewed, and the combination of rolled storage, dirty and dusty conditions, a wildly fluctuating climate, and poor handling created a number of condition issues. The paintings, which were watercolor and gouache on heavy-weight paper lined with linen or cotton, had become creased, warped, and distorted, with numerous tears and small losses along the edges.

Sadly, despite Professor Kelsey's desire for the watercolors to be available for research and study, the paintings' large size precluded their display at the Kelsey Museum. The sole temporary exhibit in 2000 had to be hosted by another campus museum. When the Museum received a generous private donation to build new gallery and collections facilities, there was finally an opportunity to house and display the Barosso watercolors properly.

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In 2007, Kelsey Museum conservators applied to the Institute of Museum and Library Services (IMLS) for a Conservation Project Support Grant to assist with funding for the treatment and mounting of the watercolors. The conservation department at the Kelsey Museum specializes in the conservation of archaeological objects, and the conservators knew that the watercolors would require assessment and treatment by both paintings and paper conservators. The oversized paintings would also require a large, open-plan lab to accommodate treatment. The Intermuseum Conservation Association (ICA) in Cleveland, Ohio met all these requirements. In addition to performing the treatment, ICA conservators also assisted with the successful grant application, writing an initial condition report as well as providing a treatment plan and cost estimate for the watercolors.

This paper will describe the condition of the watercolors at the inception of the project. It will also provide a detailed description of the treatment and mounting process, which successfully combined methodology and materials from paintings and paper conservation. The results of the microfade tests of the watercolor pigments will be discussed along with the design of the gallery/open-storage area created to house the watercolors, which included innovative lighting and design elements to protect light-sensitive pigments.

DESCRIPTION AND CONDITION BEFORE TREATMENT

The watercolors are faithful renderings of the frescoes in Room 5 at the Villa of the Mysteries in Pompeii, Italy. Eighteen of the twenty one watercolors were painted at 5/6ths scale; the three additional watercolors are 1:1 copies of the original frescoes. Maria Barosso and Francis Kelsey originally intended to produce all the watercolors at a 1:1 scale, but the local Soprintendenza official charged with the care of the Villa of the Mysteries would not allow a complete set of paintings at 1:1 scale (de Grummond 2000).

Each wall of the original fresco cycle was divided into three sections: a central figural panel with decorative borders above and beneath. Barosso divided her paintings in the same way, so that each wall was broken into three horizontal sections. The watercolor panels range in size from 25" high by 33 ½" wide, to 59 ¼" high by 237" wide.

Barosso carefully drew and painted her images to reflect accurately the condition of the wall paintings, including cracks and losses (de Grummond 2000). In this way, the watercolors function as a condition map of the frescoes as they appeared in the late 1920s as well as works of art in their own right. Because the original frescoes have deteriorated further since Barosso's renderings were completed, the watercolors are considered key documents of the condition of the frescoes at the time of excavation.

Much of Barosso's work was carried out on-site in the Villa, under working conditions she described in her regular

letters to Kelsey as oppressive and lonely. The images were first sketched in pencil, and then painted using Winsor and Newton watercolors (de Grummond 2000). The support is heavy-weight wove paper variously lined with linen or cotton cloth, or thick wove paper. The artist's name and notes are written on the lining cloth/paper in multiple places.

This primary paper support came from two sources: Superior II, and Canson and Mongolfier Paper (Baird 1986). To form the lengths of paper needed for the longest set, Barosso joined two shorter papers with strips of paper or fabric attached with thick hide glue. Outlines of figures or motifs in the design were used to hide the joins, meaning the lines along which the two pieces of paper met were not straight, but instead followed elements in the paintings. The edges of each watercolor were irregularly trimmed, and Barosso included additional borders on the top and bottom edge of each painted panel. These borders were unfinished and contain notes and light sketches in pencil and watercolor. Perhaps Barosso was planning to use them as guides for joining the sections, or perhaps they were meant to be cut. Because the artist's intent is unknown, the edges remain as she left them and are exposed in the final installation.

Overall the watercolors were in fairly good condition. Because they have rarely been on display, the pigments are in excellent condition with no obvious fading, and the only damage is a slight darkening of small areas of white. The majority of the condition issues were related to storage and handling. The edges of many of the paintings were tattered, from both handling and the pins used by the artist along the edges of the paper at regular intervals to hold the support flat while she painted. There were numerous scratches, abraded areas, creases, and handling dents from where the paintings had been rolled and rerolled over the years for display and storage.

While the majority of the backings were stable, one fabric-lined watercolor panel had some rippling and detachment of the backing. The upper and lower panels of the full-sized set of paintings had had their fabric backings removed at some point, leaving grainy adhesive on the verso. There were several lengthy tears in these two panels as well, which had been mended with Japanese paper and wheat starch paste. The three segments of the longest set were created by joining two pieces of backed paper. These joins were rippled and significantly less flexible due to the stiffness of the adhesive and paper/fabric used as a bridge. The upper panel had been split at the join, leaving a small end piece separate from the rest of the watercolor.

For the exhibition in 2000, all the watercolors had been humidified, flattened, and mounted to Gatorboard support panels with Japanese paper T-hinges adhered with wheat starch paste. Following the exhibit, the six longest watercolors were removed from their mounts and re-rolled around six inch diameter, paper-wrapped, plastic tubes, leaving the hinges attached to the verso. The smaller watercolors had been stored upright on their mounts but were beginning to

curl away from the Gatorboard in the spaces between the hinges. In addition, because the edges of the watercolors were uneven, both the hinges and the dark brown color of the Gatorboard were visible in many areas. Seeing both the positive and negative aspects of the mounting system used for the 2000 exhibition gave the team a wealth of information for designing a new system that would be both stable over time and aesthetically pleasing in the galleries.

CONSERVATION TREATMENT

The basic course of treatment was to remove the smaller watercolors from their mounts, unroll the larger watercolors, and prepare everything for humidification and flattening. An extensive condition report was written for the watercolors in 1986 (Baird 1986), and it seemed that little had changed overall. Therefore, the team decided to create a binder of annotated photographs in lieu of a written condition report as a visual reference for tears, folds, abrasions, scratches, and pin holes (fig. 1). The idea was that the photographs could also be used for future gallery condition checks. Following the completion of condition notations, the Japanese paper hinges were removed from the verso with a light application of moisture. The verso was then gently vacuumed with a brush attachment while the recto was brushed with a soft brush. Each watercolor was humidified for a few hours in a chamber constructed of Gore-Tex or Tyvek covered with damp toweling and finally plastic sheeting. Following humidification, the watercolors were moved to a stack of dry blotters, and weighted under boards for two weeks.

Working with twenty one oversized watercolors turned what is normally a fairly straightforward treatment into an enormous task, both literally and figuratively. A great deal of time was spent simply planning how the watercolors would shift through the labs during the six months it took to flatten all the individual pieces. In addition, the irregular edges meant that inevitably some hinge paper would show outside the image area. To make the hinges less noticeable, a neutral tone, common along many of the edges, was chosen, and all the Japanese paper was dyed with acrylics to match.

In the first two cycles, the hinges were attached to fully humidified watercolors with wheat starch paste prior to flattening. However, because of the composite structure of the pieces, the wet hinging process caused excessive warping to both the watercolors and the hinge paper. Adjustments were made to the amount of moisture in the hinge paper during the attachment step to reduce the severity of the distortions. In one instance the hinges were placed in a humidification chamber, and in another they were sprayed out fully prior to pasting. Unfortunately, even after weeks under weight, the watercolors were still not flat enough to be mounted, and it quickly became apparent that a dry method would be a more viable hinging option.

Because the paper was backed with canvas, the watercolors had properties not only particular to works on paper, but also to paintings, leading to further investigation of techniques and adhesives used in paintings conservation. After considering options for an adhesive that would provide a strong, reversible attachment, BEVA 371 film was chosen. This flexible, heat activated, synthetic adhesive could be used both to attach the hinges to the watercolors and to mount the watercolors to the panels, in the style of a strip lining. Another advantage was that the film could be custom cut to follow the irregular edges of the watercolors. This technique allowed the watercolors to be fully flattened and the hinges attached dry using a tacking iron. Because the largest watercolors were to be mounted to their panels in the gallery at the Kelsey Museum, this method also served to alleviate the problem of reintroducing moisture to the watercolors in a less controllable setting.

Once the treatment protocol had been established for humidification and flattening, it became clear that the joined



Fig. 1. Creation of annotated photographs for the condition binder (Photo by John T. Seyfried)



Fig. 2. Filling the joins in the large objects while partially rolled on Tyvek covered Sonotubes for storage and transport (Photo by Nicole Hayes)

pieces of the longest set would need to be separated. There was concern that the stiffness of the joins would prevent expansion during humidification and cause even further distortion. Therefore, the joins were split and the fabric/paper lining and adhesive removed from the verso with a poultice of methylcellulose. Following humidification and flattening, the joins were reconstructed from the verso using bridges of Japanese paper adhered with BEVA film cut to follow the irregular shapes of the joins. Gaps were filled from the recto as necessary with small pieces of the hinge paper pushed into the spaces and compacted with wheat starch paste (fig. 2). The fills, along with other obvious losses in the media, were toned with watercolor, both at the ICA and after the watercolors were mounted in the galleries at the Kelsey Museum.

MOUNTING TO RIGID SUPPORT PANELS

Once the watercolors had been flattened, they were carefully measured for the fabrication of custom aluminum honeycomb panels made by the Small Corp company in Greenfield, MA. Aluminum honeycomb panels were chosen over paper honeycomb panels (Tycore) because they could be manufactured in continuous pieces creating more solid panels in the sizes needed for these watercolors. Each panel had a frame of sealed poplar exposed on the verso. On the recto, the manufacturer lined the aluminum skin with 2-ply conservation mat board.

Due to the size of the watercolors, it was not surprising that the widths of the panels within each set were not uniform. In fact, the top section of the longest set was eight inches shorter than the central panel just below it. For the exhibition in 2000, the Gatorboard panels were cut exactly to the size of each individual watercolor. This created a stair step horizontal edge when each set was hung on the wall.

For the current installation, the decision was made that it would be less visually distracting to have all the mounting panels within a set be the same width, especially since all the hinge paper had been toned to the same neutral hue. The height of each panel was sized to the individual watercolors. In addition, as previously discussed, all of the edges were uneven and out of square. To ensure that the irregularities of the watercolors would not impact the ability to align them properly on the wall, a buffer of half an inch on all sides was built into the measurements sent to Small Corp. With this bit of wiggle room, painted elements such as cracks that continued from one panel to the next could be more closely aligned to improve visual cohesion. The exposed neutral hinge paper around the edges—in most cases about an inch—was almost unnoticeable when viewed on such a large scale (fig. 3).

As was noted in the treatment section, BEVA film was used to both attach the hinges to the watercolors as well as to the exposed poplar on the backs of the panels. After the watercolors had been measured, custom strips of BEVA film were cut



Fig. 3. Left, before treatment with T-hinges mounted to Gatorboard. Right, after treatment with toned strip hinges attached to aluminum honeycomb panels (Photo by John T. Seyfried)

to follow the irregular edges and tacked to the canvas or paper backings on the verso of the watercolors. Half-inch strips were used for the fifteen smaller watercolors, and three-quarter-inch strips were used for the six larger watercolors. The hinge paper was given a feathered edge and laid out along the edges of the watercolor over the BEVA film. The film was activated by applying light pressure with a tacking iron set at 76°C for fifteen seconds. To mount the watercolors to the panels, a strip of BEVA film was lightly adhered to the exposed poplar on the verso of the panels. The placement of the watercolors was determined from the front, and then the watercolors were laid face down with the aluminum panels on top. The panels were weighted and the hinge paper wrapped to the back and attached to the poplar strips with the tacking iron.

MICRO-FADE TESTING

With the knowledge that the watercolors could be on display indefinitely, the team had to devise a way to measure if and when the pieces might need to be rested from exhibit. To this end, the IMLS grant was written to include non-destructive micro-fade testing of the pigments. In January 2009, Dr. Paul Whitmore, conservation scientist and director of the Art Conservation Research Center at Carnegie Mellon University in Pittsburgh, PA brought his equipment to the ICA in Cleveland and performed micro-fade testing of the pigments in the watercolors chosen for study.

One minute of micro-fade testing approximates one year of gallery conditions, or eight hours/day of exposure to light at 50 lux with ultra violet and infrared filtered out. The test results showed that most of the pigments in these watercolors were fairly stable. The greens, blues, yellows, and purples were slightly affected by light, roughly equivalent to blue wool three on the standard scale. The reds were somewhat more sensitive, with most of the reds roughly equivalent to blue wool two or three. Two of the reds tested in some of the smaller watercolors were very unstable, roughly equivalent to blue wool one or two. Tests on unpainted paper indicated that the paper was also slightly sensitive to light in the range of blue wool three (Whitmore 2009).

Even though the test is called a micro-fade test, Dr. Whitmore is measuring *any* change in the tonality of a pigment, based on color shift comparisons with the blue wool samples used to calibrate the machine at the beginning of each day. In some instances, as was the case with the reds in these watercolors, pigments may shift to a darker tone, contrary to what the term “fading” might suggest. It is well known that some reds darken with exposure to light, specifically pigments containing red lead and vermillion. According to Barosso’s letters, she used Winsor and Newton watercolors imported from England. Phil Jones, Group Research and Development Director for ColArt Fine Art and Graphics in London, the owner of Winsor and Newton, checked the archives and found that watercolors from the mid-1920s would have contained various grades of vermillion (Jones 2010), supporting the findings of the micro-fade tests. In contrast, the paper did not darken with exposure to light as many papers do, but rather became lighter during testing, indicating the possibility that the paper could bleach out with excessive exposure to light.

LIGHTING AND GALLERY DESIGN

Even before micro-fade testing was carried out, Kelsey Museum staff members were concerned about the long-term effects of light on the watercolors. Planning for the Barosso watercolor room began as long ago as 2003, when the Kelsey Museum received a generous donation from longtime patrons Ed and Mary Meador to construct a new gallery and collections facility. From the very beginning, the Museum focused on proper display and housing for the watercolors when designing the new building, the William E. Upjohn Exhibit Wing (named for Mary Meador’s father). An area of the second floor, near exhibit galleries on Roman Italy, was set aside to house the watercolors. Curators at the Museum wanted to remain true to Kelsey’s vision of giving viewers the experience of visiting Room 5 at the Villa of the Mysteries, so a rotating display of selected watercolors was rejected. Given the size of the watercolors, repeated temporary exhibitions of the entire set, followed by long rest periods, did not seem like a practical solution either.

In the galleries, open-storage was planned to make more of the Museum’s collection available to visitors. Many display cases were designed to have study drawers beneath the vitrine. Visitors could pull out the Plexiglas-topped drawers to view, for example, a large selection of brightly-painted mummy masks, or sandals from ancient Egypt. For the so-called Barosso Room, the Museum decided to take a similar hybrid approach to the question of display versus storage; they elected to do both simultaneously. The result is a room which can be open to the surrounding galleries and function as part of the permanent exhibition, or it can be closed with the watercolors installed on the walls, but still accessible to visiting scholars and students.

Lighting in the room is provided by light emitting diode (LED) lamps, which do not produce light in the ultraviolet spectrum, as well as by MR16 floods with ultraviolet filters. To further protect the watercolors from light, all lighting for the room is motion-activated. Visitors activate the room lights by crossing through the threshold of the door, and the lights remain on only as long as the motion-detector senses movement. Two other sources of light, a backlit photograph in the room’s “window” (the photograph is of a Roman-style garden) and a display case which faces the room’s door, are also motion-activated. The window light is activated along with the rest of the room lights, while the case light turns on only as long as a visitor remains in front of the case; a motion detector is located in the case’s base. The room is lit to a mere 3 foot candles, or 30 lux, but due to careful control of ambient lighting in the surrounding galleries this low light level appears surprisingly bright. So bright, in fact, that several of the Museum’s curators expressed concern about the high light level!

The Museum’s closed-circuit television system records when the room’s lights turn on and off. Examination of the recordings reveals that the lights are on for an average of 55 minutes per day and a total of 6.5 hours per week. Thanks to the findings of Dr. Paul Whitmore, Kelsey Museum conservators will be able to correlate any changes to blue wool cards, placed discretely in the room, with actual changes to the watercolors.

INSTALLATION

The Barosso Room was designed and built to replicate Room 5 of the Villa of the Mysteries, with a large door and window built in, as they were in the Villa. The room was carefully scaled to the watercolors, a design feature which contributes to the feeling of being present at the Villa in Pompeii. Of course, this also made installation of the mounted watercolors a challenge, since there was very little room to maneuver in this tight space.

The fifteen smaller watercolors were mounted to their panels at the ICA. Because the six larger watercolors were too long to be transported safely on the panels, they were rolled around two foot diameter, Tyvek covered Sonotubes

for transport and mounted on-site at the Kelsey Museum. Prior to ordering the panels, the team met in the new galleries for a walk-through to determine the best way to allow for both the alignment and attachment of the sixteen and twenty foot long panels in the space. Because the Barosso Room is on the second floor, there were questions about the feasibility of moving twenty foot panels through the loading dock, around a tight corner, up the stairs, and ultimately into the gallery. Initially the idea was to order the longest panels in two sections and join them in the gallery prior to mounting. Fortunately, during the initial walk through, the team discovered that it would be possible to maneuver a twenty foot panel through the space allowing Small Corp to manufacture them as continuous panels.

To permit the ICA team to complete the mounting and installation of the watercolors in-situ, the Kelsey Museum left several walls in the adjacent gallery unconstructed. This allowed for the use of the floor space in that gallery and provided an unobstructed path into the room. To mount the six largest panels on-site, a table capable of accommodating the panels was constructed from plywood mounted on saw horses and covered with thick blotters. The panels were aligned on the floor in one gallery, mounted on the table in another, and finally installed in the Barosso Room (figs. 4–5).

It was during the mounting and installation that additional advantages of BEVA film were revealed. During the mounting, the hinge on the longest top panel had to be replaced to accommodate the eight inch difference between it and the adjacent panel. Because there was no place large enough at the ICA to lay the panels next to each other, it had not been possible to determine where the space would fall prior to the alignment at the Kelsey Museum. Once the two panels were properly aligned, the gap fell entirely to the left edge, requiring the five inch hinge attached two months prior at the ICA be replaced. With a moderate application of heat, the hinge was easily removed. Because there was no moisture involved, a new hinge was attached and ready in less than an hour.

Another advantage was that the ICA team could attach the film to the poplar edges of the largest panels before arriving at the Kelsey Museum, significantly reducing the time needed on-site. In addition, after allowing the watercolors to acclimatize to the conditions at the Museum, adjustments could be made to the tension of the watercolors on the panels where necessary. With the watercolors weighted face down, any slack could be taken in by warming the BEVA film and gently pulling the hinges tighter. While it was never the intention to have the watercolors drum tight, it was also undesirable to have the watercolors sag on their mounts.

While some members of the team mounted the larger panels, the smaller panels that had already been mounted at the ICA could be installed by the remainder of the team. A simple wooden cleat system was used to attach the watercolors to the wall, and an eighth inch gap was left between the



Fig. 4. Aligning the twenty foot watercolors on the floor in the Kelsey Museum galleries (Photo by Chris Pelrine)



Fig. 5. Mounting one of the sixteen foot watercolors to an aluminum honeycomb panel in the Kelsey Museum galleries



Fig. 6. Installation of the twenty foot panels in the Barosso Gallery



Fig. 7. The Barosso Gallery at the Kelsey Museum of Archaeology

panels in each set so they would not be resting directly on each other (fig. 6). This meant that the panels had to be installed from the bottom up and there needed to be enough room left at the top to lift the last panel up and over the cleat without bumping into the ceiling. The cleat system also allowed for the smaller watercolors to be easily removed from the wall and the tension adjusted where necessary.

CONCLUSION

From the time the watercolors were loaded onto the truck in Cleveland following treatment to the time they were on the wall in Ann Arbor, five people spent four days working normal business hours. The short time frame was made possible by the amount of planning and preparation that was done prior to arriving at the Kelsey Museum. Several aspects of the project were altered during the initial walk-through of the space, including the areas of the galleries that were to be left unfinished and the discovery that the largest panels could be fabricated in full by Small Corp. The close coordination between the conservation and installation staff at the ICA and the conservators and design team at the Kelsey Museum was integral to the success of this project.

In addition, this project highlights the advantages of BEVA film in mounting oversized objects to panels, reducing the chances of distortion and allowing large works to be mounted in-situ. The open nature of the labs at the ICA allows for cross pollination of techniques and collaboration between textile, objects, paintings, and paper conservators. BEVA film is not often used in paper conservation, and, while it may not be appropriate in many cases for hinge to object attachment, it is a great option for hinge to panel attachment. The use of BEVA film as a hinging adhesive was not only a more stable choice for these watercolors, but also considerably less difficult to manage on such a large scale than a wet process.

These watercolors are a significant part of the Kelsey Museum's collection and to have them displayed in the new galleries, finally bringing the dream of Francis Kelsey to fruition, was a wonderful opportunity that could not be missed (fig. 7). Overall, this project was a great success despite, or perhaps because of, the unwieldy and sensitive nature of the watercolors which were its focus. It highlighted the benefits of cross-disciplinary collaboration not only between conservators, but also exhibit designers and technicians, as well as curatorial and public programs staff members. The responsibility of all involved was to display these watercolors in such a way that honored the Museum's mission to be good stewards

of cultural heritage while providing access to these incredible works of art for many years to come.

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- The Kelsey Museum of Archaeology and the University of Michigan.

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SOURCES OF MATERIALS

Japanese paper for hinges—Yukyu-Shi Medium
Hiromi Paper
2525 Michigan Avenue
Santa Monica, CA 90404–4091
(310) 998–0098
<http://store.hiromipaper.com>

BEVA 371 film
Conservators Products Company
PO Box 601
Flanders, NJ 07836
(973) 927–4855
<http://www.conservators-products.com>

Aluminum honeycomb panels faced
with 2-ply conservation mat board
Small Corp
P.O. Box 948
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