

Abstract:

For the past two years, student employees at Bryn Mawr College have been taught to take digital photographs for our collections management database (EmbARK Collections Manager by Gallery Systems). Provided with object handling and photography training, fairly inexpensive equipment, Adobe Creative Suite 5 software, and detailed guidelines for file-naming and color correction, the students have produced amazing results. They have also created quick-time VR files of some pottery “in the round.” This outlines our digital photographic workflow in a detailed, step-by-step manner with the goal of making it replicable by other institutions.

Object Handling:

All students working with art and artifacts are first asked to watch the video “Basic Art Handling,” produced by the Gallery Association of New York, and available for purchase online at www.exhibitionalliance.org/documents/39.doc. Students are expected to follow all of the guidelines discussed in the video. Additional supervision of and training for the handling of art are provided as needed by the Curator and/or Collections Manager.

Photography Guidelines:

Students begin by learning to photograph 2-dimensional works of art using a copy stand. Once they have mastered the photography of flat works, they then progress to photographing 3-dimensional pieces. Printed copies of the following guidelines are made available for reference purposes, but collections staff members work closely with the students until they are comfortable with all steps in the process, including adjusting the camera settings, taking gray scale meter readings and adjusting the lighting to eliminate most shadows and highlights.

The following guidelines are based on information found in *The AIC Guide to Digital Photography and Conservation Documentation*, edited by Jeffrey Warda, published by the American Institute for Conservation of Historic and Artistic Works (AIC), Washington, DC, 2008. (Note: at the time of this writing, a second edition is Scheduled for release later in 2011)

Guide to shooting in the studio

1. Gather the necessary supplies:
 - a. Backdrop (cloth sweep or tent), if 3-dimensional object
 - b. Copy stand, if flat object
 - c. Camera (We are using the Olympus E-520)

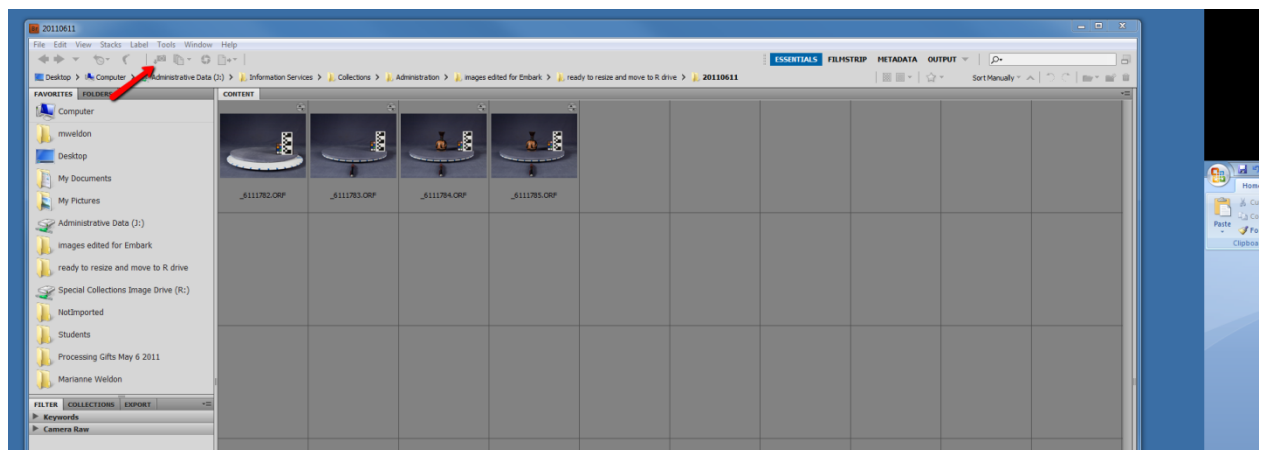
Link to the manual:

http://www.olympusamerica.com/files/E-520_Instruction_Manual_EN.pdf

- d. Tripod

- e. Lights (Tungsten [hot] lights)
 - f. Gray card
 - g. Color scale
 - h. List of objects to be photographed
 - i. Pencil and small scraps of paper on which to write accession numbers
 - j. Gloves and any other equipment necessary to ensure safe handling of the objects
2. Set up studio area:
- a. Make sure the backdrop or copy stand is clean and free of
 - i. lint
 - ii. wrinkles
 - iii. random objects and other items NOT intended to be photographed
 - b. Make sure the surface on which objects will be placed is STABLE (i.e. no wrinkles in fabric or anything sitting under the fabric)
 - c. Position the light(s) to illuminate the object without strong shadows or highlights. If necessary, the object can be placed in a tent to further diffuse the light.
 - d. Secure the camera to the copy stand or tripod.
3. Prepare the camera:
- a. Turn the camera on.
 - b. Check the camera to see if there are any images remaining on the memory card. If there are, download them to a folder before deleting them from the memory card. Name the folder something descriptive, like “Images downloaded from camera on (date).”
 - c. Select the appropriate lens and put it on the camera.
 - d. Adjust camera settings to the following:
 - i. Color space: Adobe RGB
 - ii. File Format: RAW
 - iii. ISO: 100 (lower if possible)
 - iv. Aperture priority mode:
 - a. Aperture at f8 for 2-d works on copystand
 - b. Aperture at f11 for 3-d works on phototable
 - v. Shutter speeds: as required based on light meter reading; speeds will be slow, so use the tripod
 - vi. Metering: 18% gray card – meter gray card
 - vii. White balance: Custom white balance setting
 - a. Setting may change based on lighting situation (guidelines will be provided)
 - b. Use a piece of white copy paper in frame to gauge appropriate balance setting.

4. Photograph objects:
 - a. Make sure to include scale and x-rite color checker in image
 - b. Take a variety of photographs of each object. If the object is flat, then at least one photograph of each side of the object with a gray scale and color card in the image is required. If the object is 3-dimensional, photos are generally taken from 6 different angles, including all 4 sides, top and bottom. In all cases, detail photographs of any signatures, marks, or imagery that may not be clear in the overall photos are required. (A guide, which includes examples of properly photographed prints, photographs, pottery sherds, and 3-dimensional pottery and sculpture, is available for student use.)
 - c. When multiple objects are photographed at the same time, a “disposable” image of each object is also taken. This photo includes the accession number written on a small piece of paper within the image area and helps to identify each piece during the subsequent creation of appropriate file names.
5. Download Images:
 - a. Download images from the camera using Adobe Bridge. Select to place the images in a folder by date in your student folder on the server from the download menu. In Adobe Bridge click on the camera icon at the top left of the screen and the program will walk you through the download process (image below shows this screen).
 - b. Once images are downloaded, delete them from the camera card.





Hollister Pritchett photographing pottery sherds



Laura Kelly-Bowditch photographing a vase

6. Name Files

- a. Once the images are downloaded from the camera, they are named using the following file naming protocol:

Image filenames consist of an **accession number** + **organization code** + **image type identifier** + **number**, if multiple images exist of same view.

For example: **2001.1.54_BMC_d_2.tif** is an image of an object with the accession number 2001.1.54 which belongs to Bryn Mawr College. The image is a detail view, and it is the second detail view. Finally the photo is a .tif file

If the accession number is alpha numeric, such as P.87, the filename will have a period between the letter and the numbers: **P.87_BMC_d.jpg**. If there are letters after the number, they should be separated from the number with a period: P.87.a becomes: **P.87.a_BMC_d.jpg**

Our image file naming protocol uses an underscore to separate the accession number from the rest of the filename, because this makes importing the images into our collections management database simple. During the import, the image is automatically linked to the accession number before the first underscore in the filename.

Image Type Identifier:

The image type identifier describes the type or format of the image, which can include front, detail, label, etc. Below are some of the identifiers we commonly use:

Front, full view = f **Rear view = r** **Proper left = pl** **Proper right = pr** **Side view = s**
Top = t **Bottom = b**

Edited Image = ed (edited to remove damage or flaws)

Sample Testing Area = st (an image of an area where samples are taken or analysis done)

Detail = d (a close up image and/or an image of a specific detail)

Label = l (a close up image of a label, signature, mark, or inscription)

Conservation = c (an image related to conservation work, either before, during, or after treatment)

Exhibition = e (an image of the object on exhibit or installed on campus)

Frame = fr (a image of a framed object including the frame in the image)

Historical = h (an historical or archival image of the object)

Interior = i (an image of the interior of the object)

Publication = p (an image of the object scanned from a publication)

Rotating Image = spin (used to identify both the 360 degree .mov file and the .jpg files used to make it)

Associated Image = a (an image of an object or artifact that is associated with a Bryn Mawr collections object, e.g. a preliminary drawing, an additional panel of a diptych or triptych, a copy by another artist, etc. These associated objects may not be in the Bryn Mawr collection.)

Other = o (an image that does not fall into any of the above categories)

For Comparanda: Use COMP as the institutional identifier, and use the custodial institutions accession number.

7. Color Correct and Crop Images

- a. Once the images have been re-named, they are color corrected and cropped while still in a raw format. All of this work is done using Adobe Bridge CS5 and Camera Raw. (See sections 10 e and f below for detailed instructions).

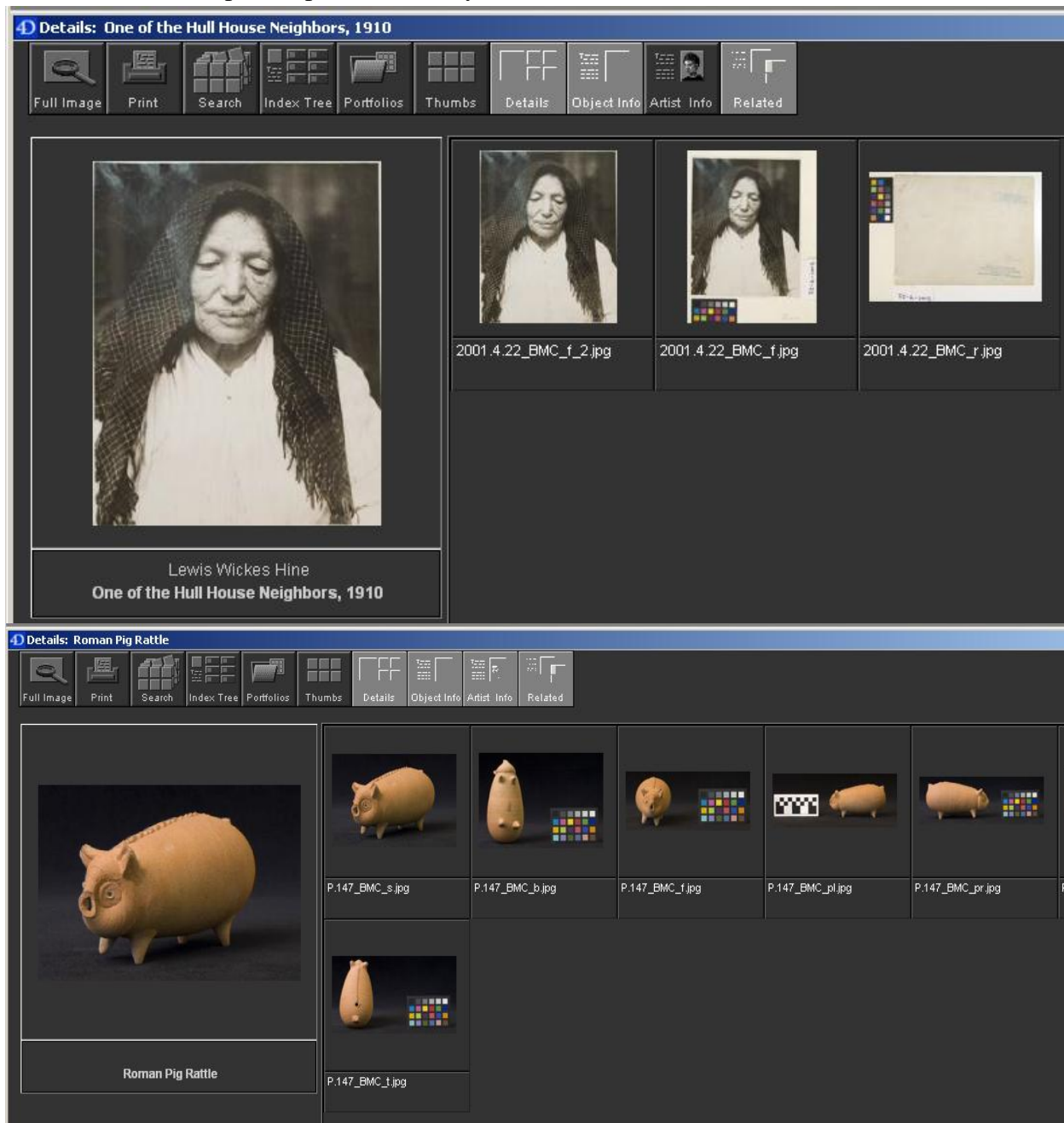
8. Create .jpgs

- a. When editing is complete, .jpgs of the files are created using Adobe Bridge CS5.
 - i. Select the image(s) to be saved in the .jpg format and then use the Ctrl R command (commands given are for PC's only). This will open the image(s) in Camera Raw.
 - ii. Select the "Select All" tab if you have multiple image and then select the "Save Image" tab. For one image, select the "Save Image" tab directly.
 - iii. Select the destination where the file is to be saved.
 - iv. Select "Document Name" under File Naming to give the .jpg file the same name as the corresponding Raw file.
 - v. Select lower case .jpg under "File Extension".
 - vi. Select Maximum under "Quality".
 - vii. Select "Save" and the .jpg files will be created.
- b. Scanned images are processed in the same way, except that the original image is a .tif rather than a raw file.
- c. At this point the student has completed their part of the image making process and the Collections Manager takes over.

9. Storage of Image Files by Collections Manager

- a. The Raw files are stored on our server as the preservation copy of the image. The .jpg files are resized to 1024 pixels in the largest dimension using Adobe Photoshop CS5.
- b. Jpg files are attached to the appropriate records in our collections management database.

Here are some examples of photos taken by students:



10. Rotating Images

For some 3-dimensional objects, particularly pottery with decoration that continues all the way around the object, we have also been creating 360 degree images. This is accomplished by taking 36 still images at 10-degree intervals and stitching them together using the software Object2VR by Garden Gnome Software. Rotating images can also be created using Adobe Photoshop, however

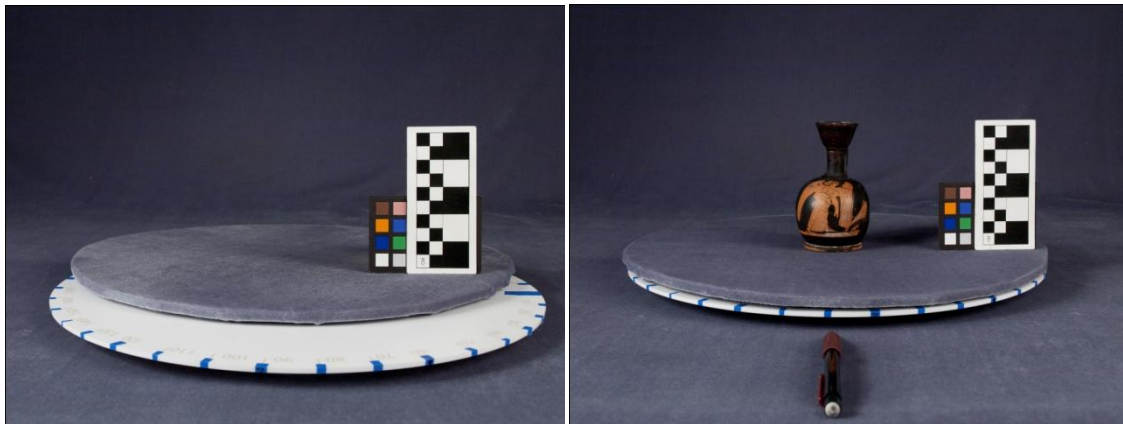
the output file types available with Photoshop are not compatible with our collections management software which required a QuickTime VR file (.mov).

An example of a rotating image can be viewed on our blog:

<http://artandartifacts.blogs.brynmawr.edu/category/imaging/>

a. Set-Up:

- i. To create 360 degree images, begin by placing a velvet covered foam-core circle on a turntable of the same size (14 inch diameter). The color of the velvet circle should match the background fabric. Typically, black velvet is used unless the object is too dark for a black background, in which case a medium gray velvet is used.



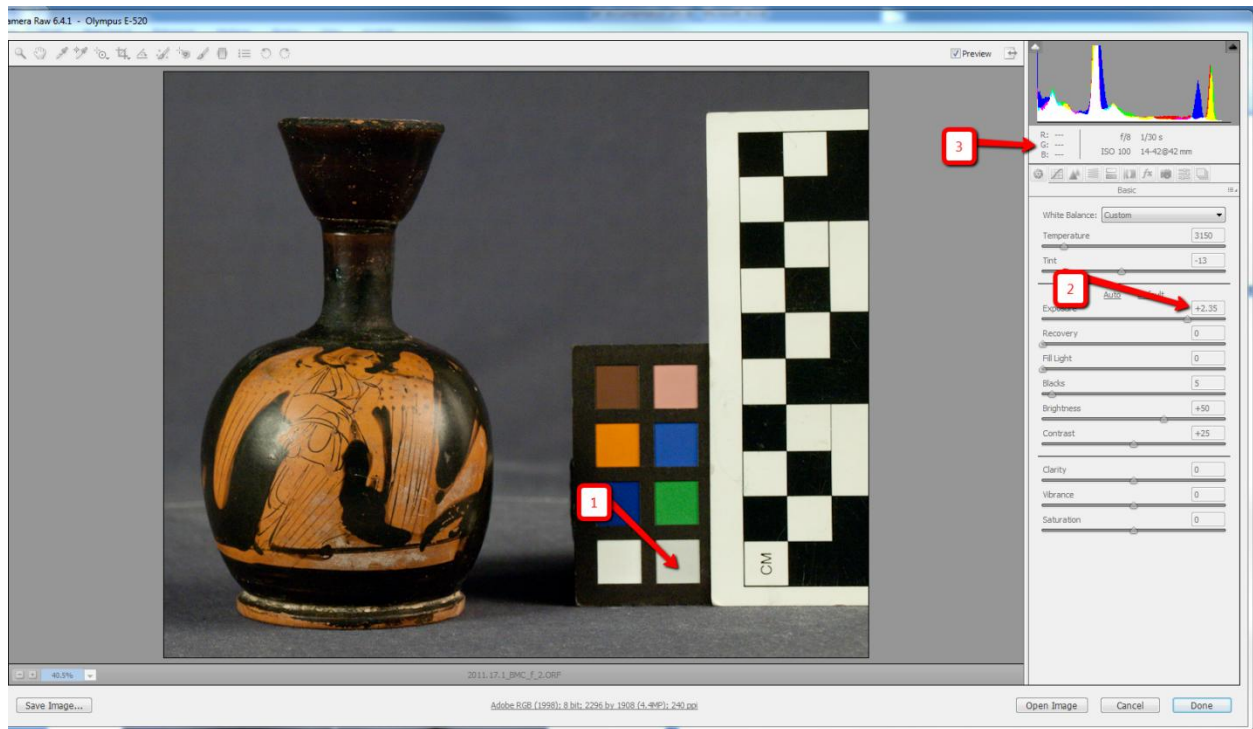
- ii. Mark off ten degree intervals along the side edges of the turntable using small pieces of Scotch Blue Painters Tape by 3M.
- iii. Place a pencil or small pointer in front of the turntable to indicate the point with which the turntable should be aligned for each photograph.
- iv. Place the object to be photographed on the turntable. Take time to center the object front to back and side to side so that the object is always in focus in the camera lens (focus on a point 1/3 of the way into the depth of the object for the best depth of field in the final photograph). Do not move the camera once you begin photographing. Ideally, it should be possible to focus the camera once and keep that same setting for the entire series of 36+ photographs (If the focus must be adjusted during the series, be careful not move the camera).

b. Photography:

- i. Begin by taking one photograph with an x-rite color checker and scale in the image. This photograph will be used to color-correct the rest of the images in the group. Alternatively, the color checker and scale can be placed off to the side in each image, but be very careful when re-positioning them not to bump the camera or change the position of the object. Shifting of the object or the camera will result in a “jump” in the rotating image. Additionally, if the lights are repositioned, or the object is not evenly lit, there will be a noticeable shift in the highlights and shadows of the rotating object. Sometimes this is difficult to avoid as objects are not always perfectly symmetrical and the direction of the weave of the fabric on the turntable may reflect light differently in different positions. If possible, use a remote controller for the camera in order to avoid touching the camera while photographing.
 - ii. Take 36 photographs of the object at 10 degree intervals without changing or moving anything. It does not matter whether the turn table is rotated clockwise or counter-clockwise, but moving it consistently in the same direction will save time later when the images are being stitched together.
- c. File naming:

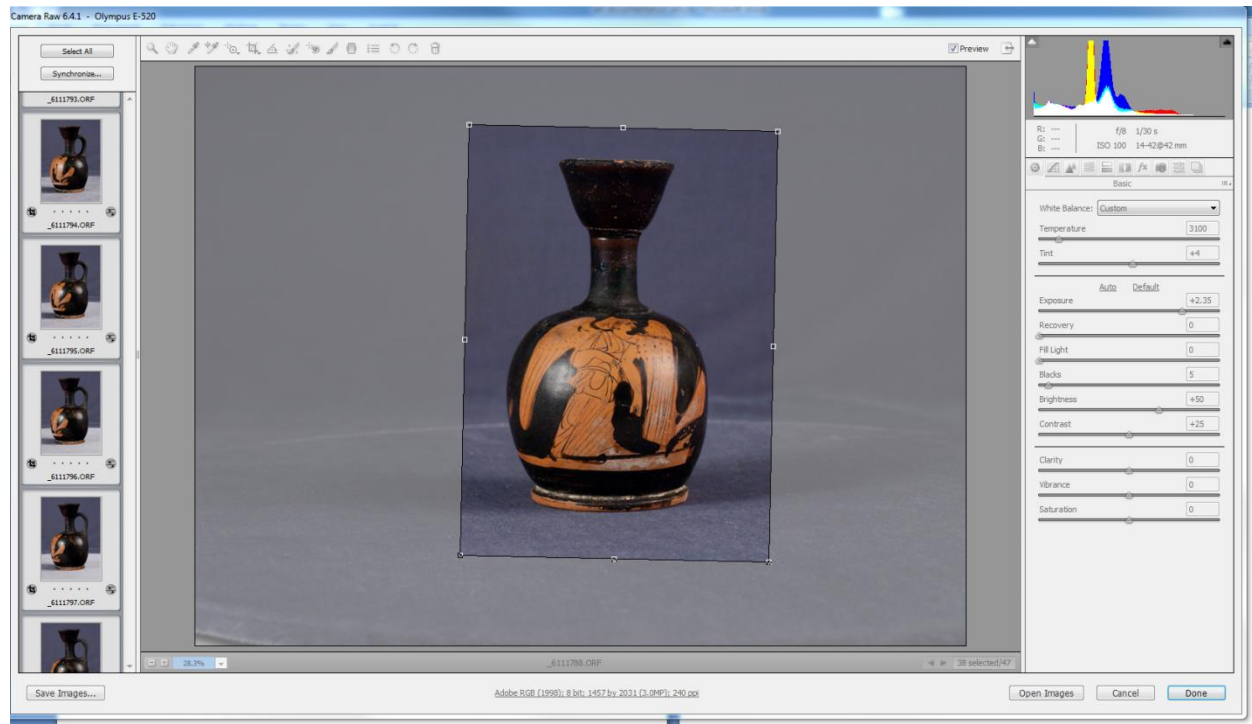
Once the photos are taken and downloaded, name according to the file naming protocol described above. It is important to keep the images in order. Selecting view, sort and filename in the pull-down menus in Adobe Bridge will insure that the images always sort by filename. Add the appropriate number after the image type identifier in the filename, beginning with the second image in the series. (eg 2011.17.1_BMC_spin.ORF [ORF stands for Olympus Raw Format. The file extension will depend on your camera and the settings]; 2011.17.1_BMC_spin_2.ORF ; 2011.17.1_BMC_spin_3.ORF; and so on through to 2011.17.1_BMC_spin_36.ORF)
- d. Color Correcting
 - i. Adobe Bridge and Adobe Camera Raw CS5 will be used to simultaneously open the group of images by highlighting them and using the Ctrl R command (commands given are for PC's only). Do not double click on the images, doing so will open them into Adobe Photoshop rather than Adobe Camera Raw.
 - ii. Once open in Camera Raw, select the image with the color scale first then select the rest (the image with the color scale will be displayed on the screen). Color correct by selecting the dropper tool on the left (the white balance tool) and dragging it to the lightest gray square on the x-rite color checker (beside the white square as indicated by the arrow marked 1). Press “tab” 4 times to reach the exposure tab (indicated by arrow 2) and then use the up and down arrow keys to set the red, green and blue values

as close to 200 as possible (see arrow 3). Instructions for color correcting can also be found in *The AIC Guide to Digital Photography and Conservation Documentation*, edited by Jeffrey Warda, published by the American Institute for Conservation of Historic and Artistic Works (AIC), Washington, DC, 2008. Adjustments will be made to all of the images simultaneously since they all were selected at the same time in Camera Raw.



e. Cropping

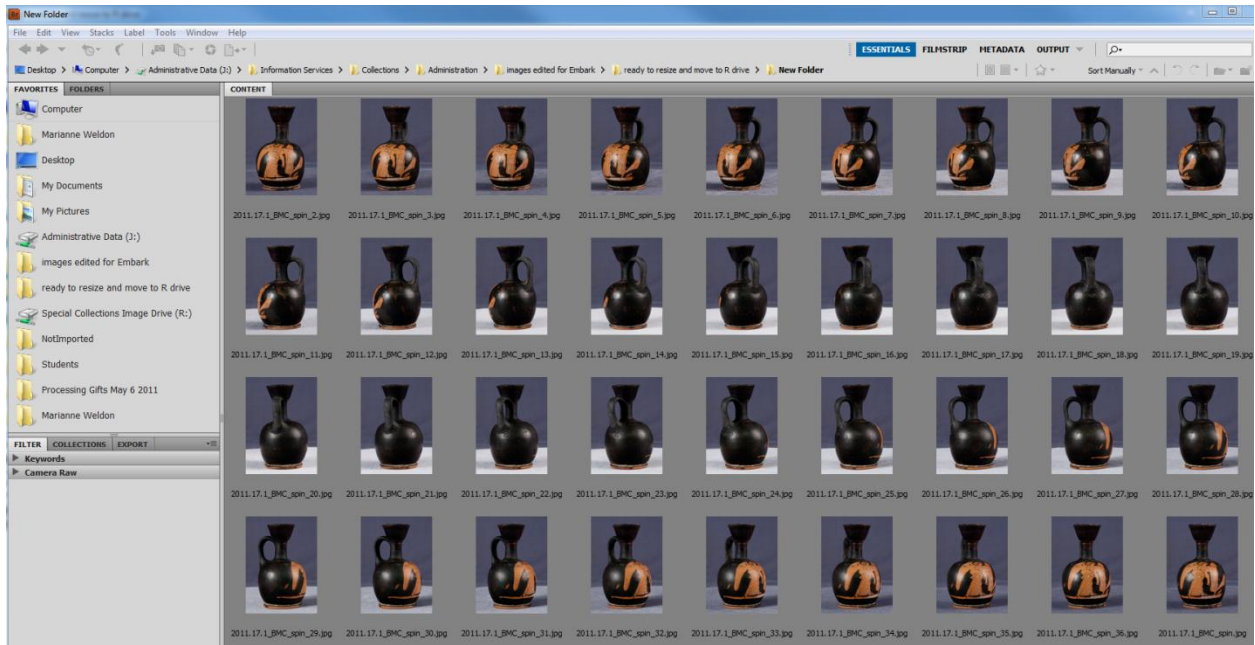
The images can also be simultaneously cropped in order to remove any evidence of markings on the turntable as well as excess negative space around the object. Selecting “Done” after color correcting and cropping will save changes to raw files in Adobe Bridge.



Above, 36 images being cropped at the same time (Red-Figure Lekythos 2011.17.1).

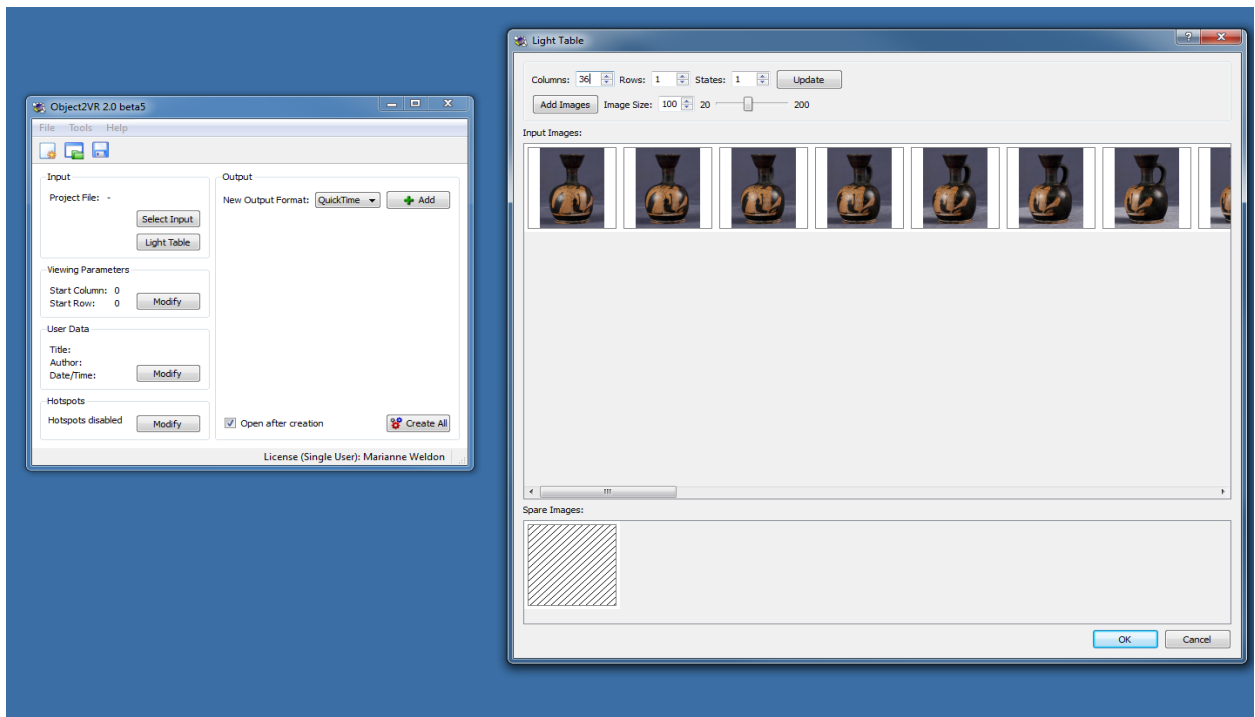
f. Saving Files

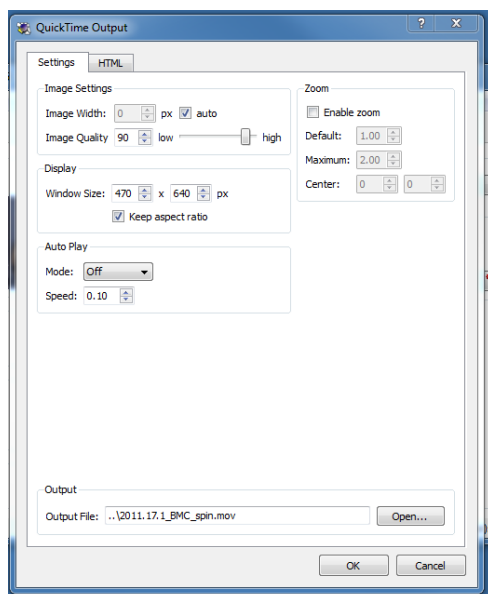
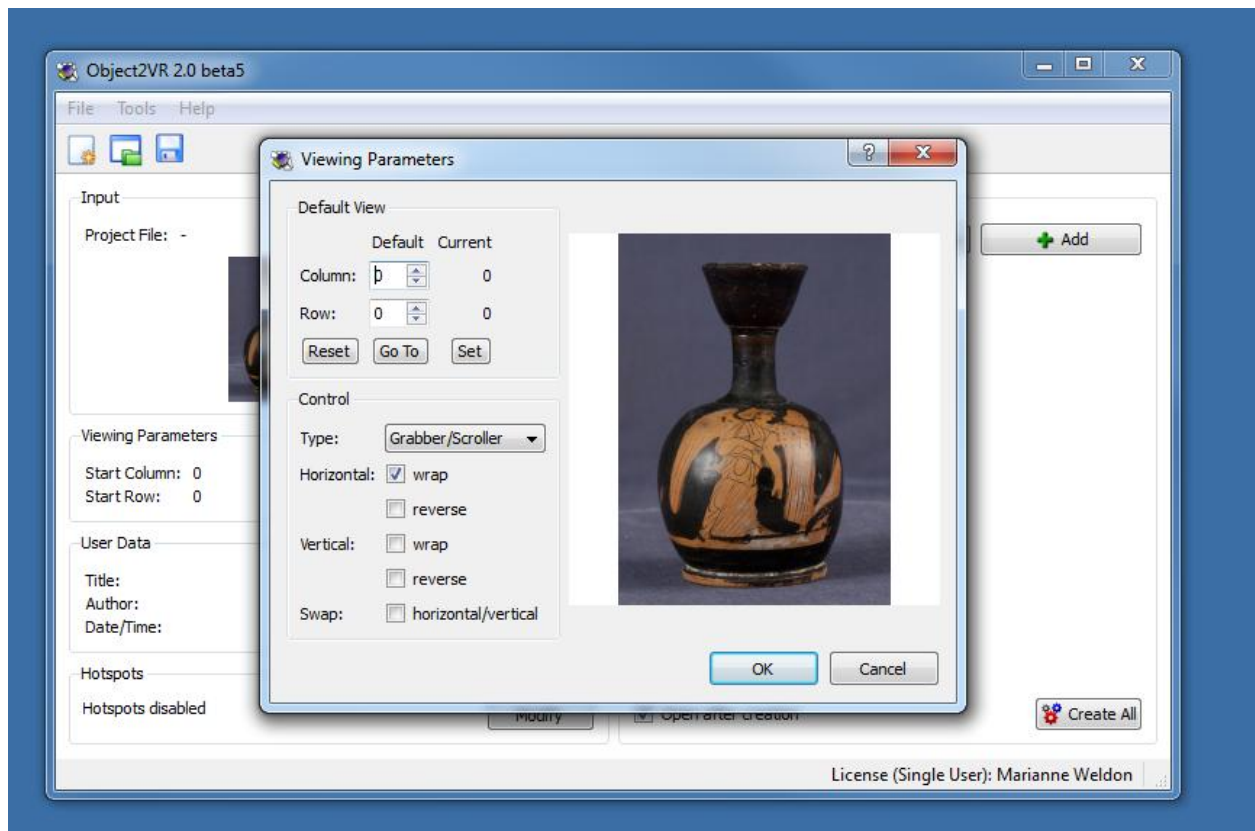
- i. Images are shot in Raw format, however, .jpg files are needed to create the 360 degree .mov files. The Raw format is a lossless compressed format which creates files that are smaller than .tif files and that can be easily returned to their original state (i.e. any changes can be “undone,” if necessary).
- ii. Save all edited files as .jpg files (see section 8 above)
- iii. Note, if raw files and .jpgs are saved in the same location, any attempt to move the Raw files will carry the .jpg files along with them. It is possible, however, to move the .jpg files without the Raw files going along with them. Below is an example of the way images look in Adobe Bridge after having been cropped and saved as .jpg files.



g. Creating .mov file

Object2VR by Garden Gnome Software is used to create .mov files. Load the 36 images into the “light table”; select wrap or reverse (depending on the direction in which the object was rotated during photography); and determine the name and destination of the .mov file to be created. It’s that easy!





Note: For pottery with unstable round bottoms, photography may be done with the vessel upside down. Images can then be flipped right-side up in Adobe Bridge CS5 before making the .mov files.

11. Panoramic Images

- a. Attempts have been made to create flat panoramic views of the imagery on pottery using the 36 images taken at 10 degree intervals and the photomerge feature in Adobe Photoshop. Unfortunately, results have not been consistently useful. The technique seems to work best when the vessel is perfectly symmetrical and has relatively flat cylindrical sides. Below is an example of a panoramic composite image of a Nasca Bowl (69.1.392).



12. Digital Asset Management

- a. Initially Adobe Bridge was used to find and navigate through the image files. As the number of image files grew however, it became cumbersome to find files by filename using only Adobe Bridge, sometimes taking longer than 15 minutes to get a single search result. It was therefore necessary to add Portfolio 9.5 by Extensis for digital asset management, which is able to give results for the same type of search in seconds.

Equipment used for photography:

Many items were inherited from the previous 35mm photography set-up and continue to be used, including copy stands, photography lights, and tripods. Equipment newly purchased is listed below with the approximate price.

Olympus Evolt E-520 Digital SLR Camera (purchased for approximately \$600.00)

Olympus Essentials Kit, case, extended warranty (purchased for approximately \$99.00)

Olympus Zuiko Digital ED 50mm f2.0 Macro Lens (purchased for approximately \$499.00)

Pro 52mm MC UV (purchased for approximately \$17.00)

Pro 58mm MC UV (purchased for approximately \$20.00)

Interfit 2LT tungsten Light Kit with Stands (purchased for approximately \$299.00)

18% R-27 Gray Card (purchased for approximately \$15.00)

X-rite mini color checker (purchased for approximately \$55.00)

Velvet in several colors purchased in local fabric stores (prices vary \$10/yd and up)

Turntable from <http://store.tabletopstudio-store.com> (purchased for approximately \$45.00)

Cubes or tents to filter light can be purchased at <http://store.tabletopstudio-store.com>

Object 2VR can be purchased from <http://gardengnomesoftware.com/>

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