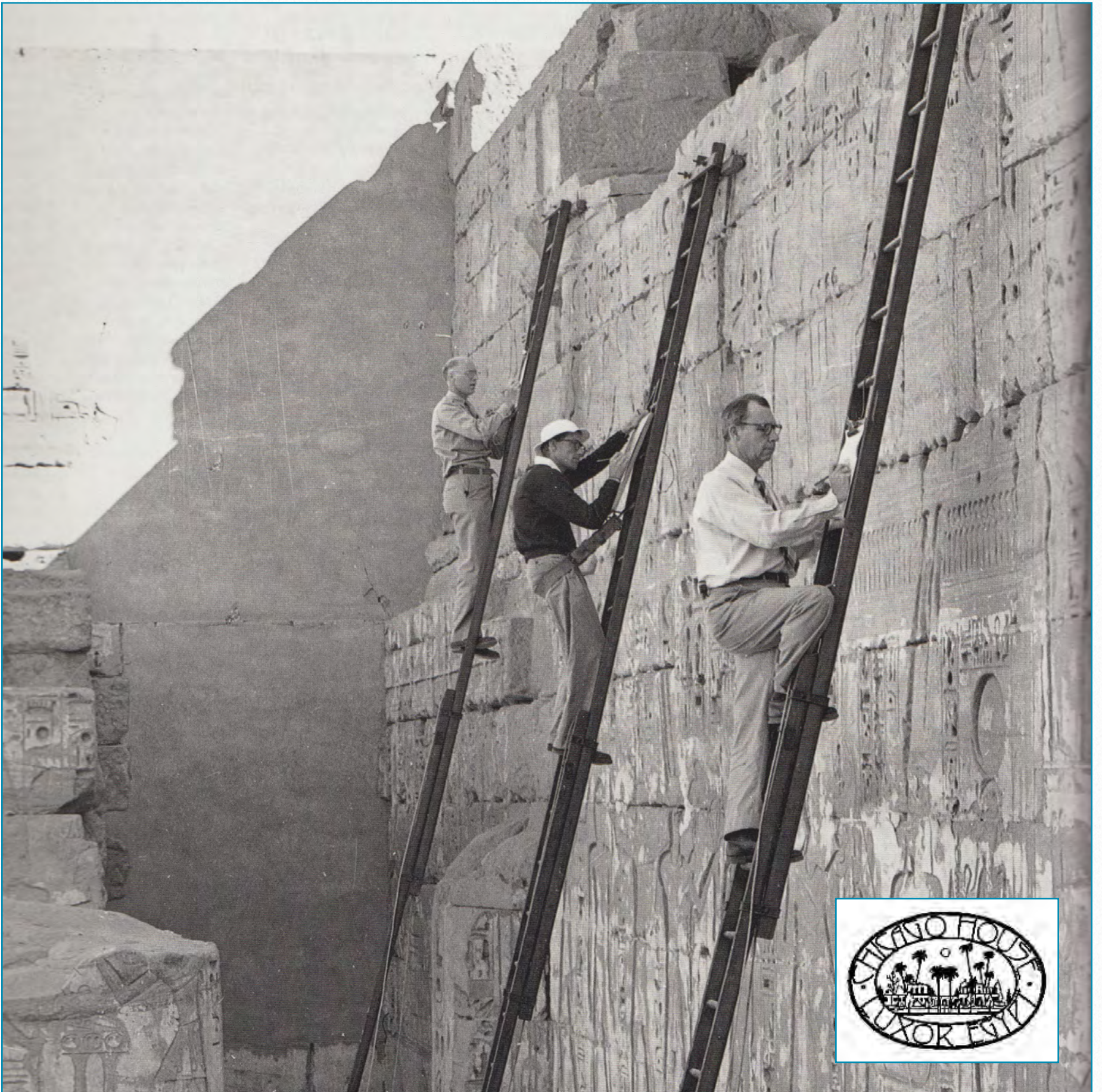


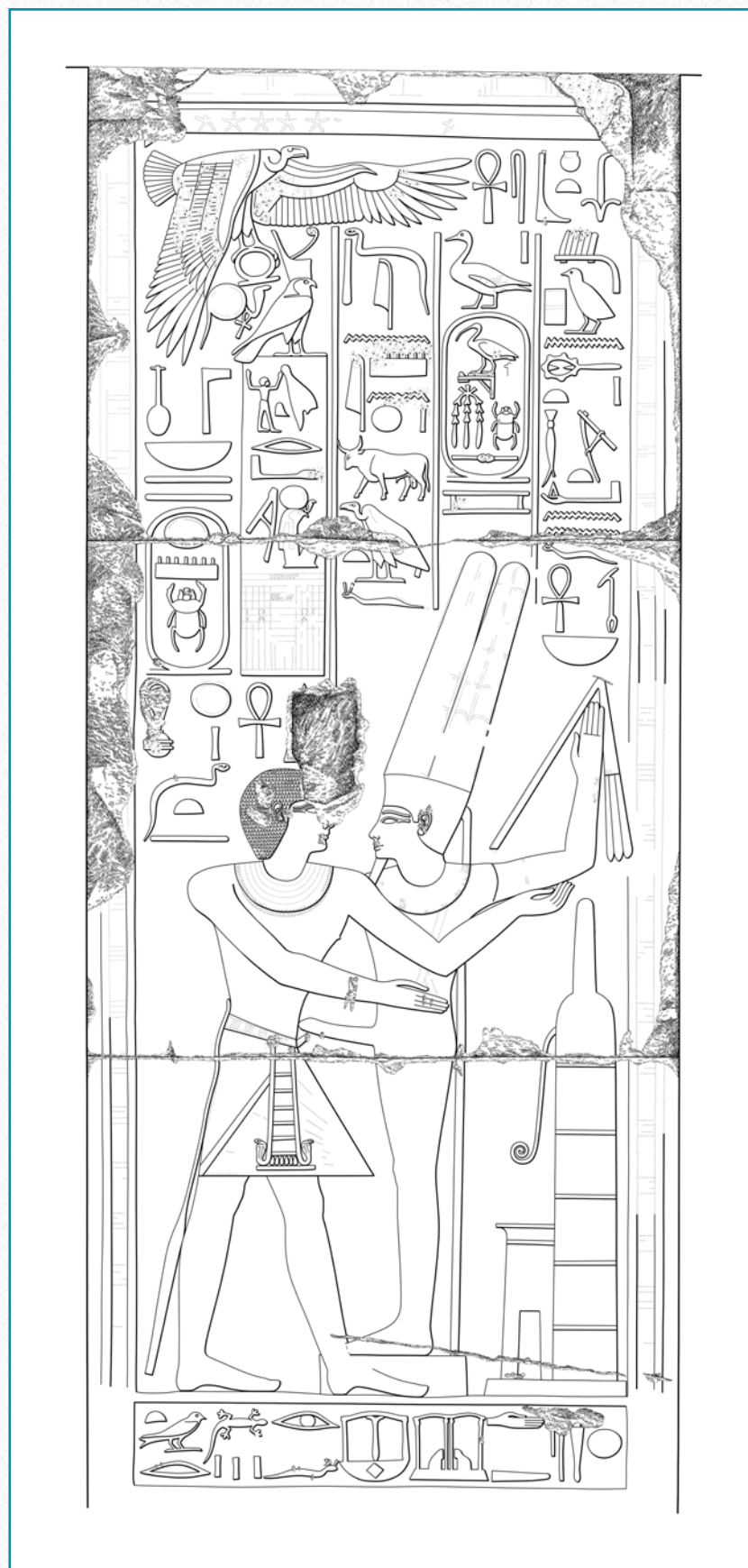
Digital Epigraphy

Written and designed by Krisztián Vértés



**The Epigraphic Survey of the Oriental Institute,
University of Chicago**

Digital Epigraphy



MHB 91 - The Survey's very first digitally inked drawing

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Written and designed by Krisztián Vértés.

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All the drawings appearing in this book are created by the author except where indicated.

On the cover: C. F. Nims, D. A. Champion, and G. R. Hughes of the Epigraphic Survey checking and correcting copies of text and reliefs at Medinet Habu in 1951-52 (In: Thomas ed.: *The American Discovery of Ancient Egypt - Essays*, ARCE, 1996 p. 96)

For Ray Johnson
who made the digital revolution
at Chicago House
a reality

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Foreword

This long-awaited manual represents an extraordinary new chapter in the history of the Epigraphic Survey, Oriental Institute, University of Chicago. In the pages that follow, a century of tradition joins with modern technological innovation for an exciting glimpse into the future of our epigraphic recording. The very form of this manual, an eBook, is a new medium never before utilized by the Epigraphic Survey, or the Oriental Institute, and is yet another new tool in an arsenal of groundbreaking new tools now at our disposal.

During the past several decades the Epigraphic Survey has refined its conventions and recording methodologies to fit with the wildly divergent nature of the inscribed surfaces we record and the changing conditions in Egypt that are resulting in the accelerating decay of those inscribed surfaces. For the past two years we have been experimenting with new digital tools, software, and equipment that have allowed us to streamline our recording process while still achieving the highest degree of accuracy, the bottom line of any scientific documentation. It has always been our aim to

share these conventions and methodologies with our friends and colleagues, and it is my great pleasure to present the initial results here now. We have chosen the form of the ebook and PDF as the best ways to communicate this data, as they are formats that can be updated and changed regularly, since the manual will always be a work in progress. The possibilities are limitless.

The contents of this book are based on the cumulative experience and input of the entire Epigraphic Survey staff over the last several decades. The composition of the manual itself in ebook and PDF formats, and the new digital methodologies presented in it are largely the product of Epigraphic Survey egyptologist/draftsman/digital drawing guru *Krisztián Vértés*. It is thanks to Krisztián's drafting expertise and bold experimentation with the new digital drawing tools that this manual is appearing now, and not much later. Senior epigrapher *J. Brett McClain* was responsible for proofreading and helping to gather the material utilized in the manual, while senior artists *Margaret De Jong* and *Susan Osgood* were

responsible for compiling the drawing convention material. Special thanks must go to *Tina Di Cerbo*, who introduced the Wacom drawing tablets to Chicago House and has pioneered the digital drawing of the Medinet Habu graffiti over the years. Additional thanks must go to epigrapher *Jen Kimpton*, photographer *Yarko Kobylecky*, artist *Keli Alberts*, and artist/architect *James B. Heidel* for their contributions, and to all of the previous Chicago House artists and epigraphers whose drawings appear in this book. Special thanks must be extended to our friends and colleagues in the Egyptian Ministry of State for Antiquities with whom we have worked in fruitful collaboration for 90 years. And finally, we gratefully acknowledge here that the entire digital epigraphy program was launched with grants from the University of Chicago Women's Board and Marjorie M. Fisher in 2013 and 2014. This manual is the happy culmination of their help and friendship, and we owe them an enormous debt of thanks.

What you have before you represents the past, the present, and the future of the Epigraphic Survey's epigraphic recording processes for your reference and use. Our convention sheets are downloadable for easier access. The tools that we describe and utilize - old and new - are available for every-

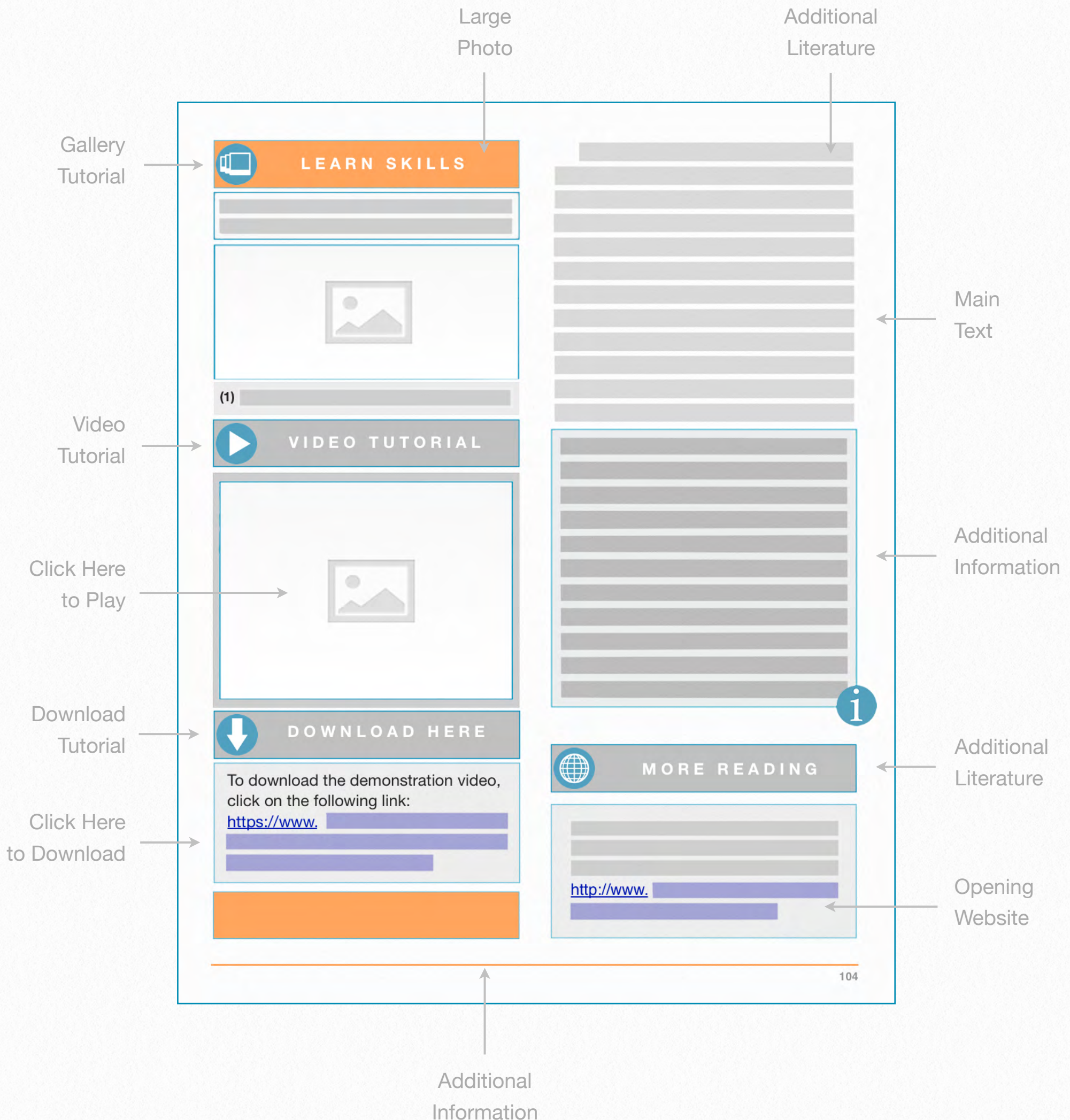
one to use. We welcome and encourage your questions and feedback, since we will always be refining and improving these processes. We look forward to hearing from you. Enjoy!

W. Raymond Johnson, PhD
Director, Epigraphic Survey
Oriental Institute, University of Chicago
Chicago House, Luxor, Egypt
July 22, 2014



Cintiq 22HD Digitizer Pen - Image credit:
<http://www2.pcmag.com/media/images/>

Manual Icons and Book Navigation



The Epigraphic Survey

A brief history of the Epigraphic Survey with an overview of the Chicago House Method of epigraphic documentation

Written by W. R. Johnson



Photo courtesy of the Oriental Institute

Epigraphic Survey staff working on the wall at Medinet Habu in 1928

In 1923 Oriental Institute founder James Henry Breasted conceived the idea of a permanent field headquarters of the Oriental Institute, based in Luxor, for a long-term epigraphic and architectural survey of all the ancient temples of the Nile Valley. This project would start with the extensive monuments of ancient Luxor itself, beginning with the great mortuary temple com-

plex of Ramesses III at Medinet Habu in western Thebes. Breasted sent a draft of his vision to Dr. Harold H. Nelson, head of the Department of History at the American University of Beirut, and convinced him to be the first director of what came to be known as the Epigraphic Survey of the Oriental Institute, University of Chicago.

Establishing the Survey

Photo courtesy of the Oriental Institute



Chicago House as seen from the air in 1933

Breasted himself designed the first expedition field house on the west bank to the north of Medinet Habu, and the construction of the first “Chicago House” was supervised by A. R. Callender, who had been an assistant to Howard Carter. The field house was completed by the summer of 1924, and in October 1924 the expedition members moved in. On November 17th work began at the great mortuary temple of Ramesses III; the Epigraphic Survey was launched and continues to this day. In 1926 the Architectural Survey was also es-

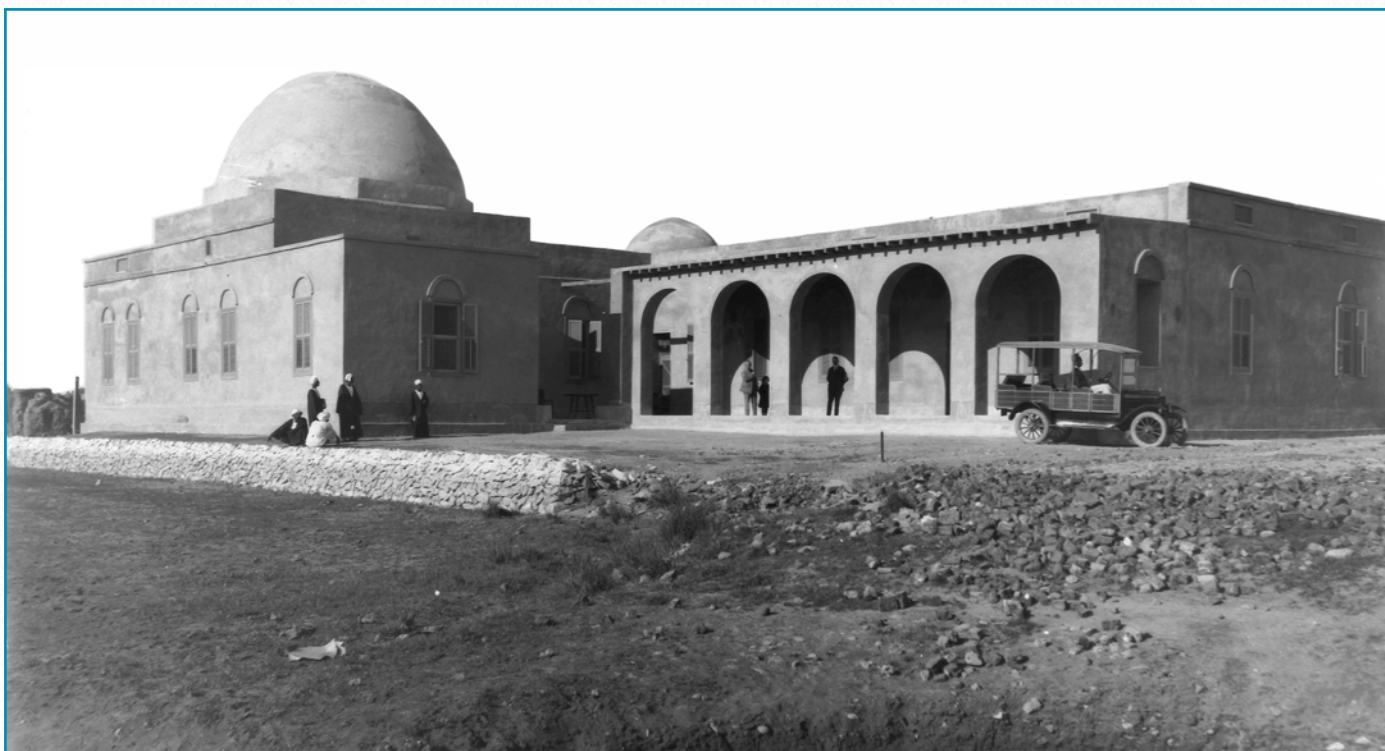
tablished at Chicago House under the directorship of Professor Uvo Hölscher of Hannover, Germany. In addition to documenting and analyzing the considerable architectural remains at Medinet Habu, Hölscher also directed excavations at the site (already started in the nineteenth century by John Beasley Greene, Georges Daressy, etc.), at the Ramesseum, and the mortuary temple complex of Ay and Horemheb immediately to the north of Medinet Habu. His drawings, plans, and reconstructions of the Medinet Habu com-

plex and environs are among the best ever done of any site in Egypt.

In 1930, the original mudbrick and wood Chicago House facility, despite numerous additions, was clearly insufficient for the needs of the growing expedition. Thanks to a generous gift from John D. Rockefeller, Jr., three and a half acres of land for the present facility were acquired on the east bank of Luxor in 1929, north of Luxor proper and just south of Karnak, on the Nile. Two young University of Pennsylvania architects, L. LeGrande Hunter and L. C. Woolman, drew up plans in close consultation with Breasted, and construction of the present-day Chicago House began in 1930. The complex, consisting of a main residence wing, a large library and office wing, art studios, photography studio with three darkrooms, and back garage and support area, was constructed of permanent materials (stone, baked brick, and reinforced concrete) and was completed in 1931. The professional staff took up residence in 1932. The old facility on the west bank was kept as a rest house for the

Medinet Habu epigraphic staff and archaeologists, but was later demolished in 1940. (Architectural elements from the original house, as well as the land, were sold to Sheikh Ali Abdul Rasool, who used them to construct the Marsam Hotel and rest house on the original site, still in operation today.)

Breasted's dream was to record with precision all the monuments of Egypt, starting in the south. In 1930–1931 that vision was extended northward to the site of the ancient political and administrative capital of Egypt, great Memphis, established by Menes/Narmer at the beginning of the First Dynasty. Here was constructed, again with the support of John D. Rockefeller, Jr., an expedition field house that would house a second, northern epigraphic expedition, whose purpose was to record the ancient Old Kingdom monuments of Saqqara.



Old Chicago House on the West Bank in 1924

Photo courtesy of the Oriental Institute

Epigraphic Recording



Photo by W. R. Johnson

Margaret De Jong drawing on photo enlargement at Medinet Habu

The fact that anything from Egypt's remote antiquity survives to the present day is nothing short of miraculous. Yet over the thousands of years since the eclipse of pharaonic civilization, Egypt's dry climate, and low population allowed the preservation of much of the ancient landscape, particularly in the south, where the majority of the best-preserved temple sites is to be found. Temples, mortuary complexes, and even cities, an astonishing array of cultural

heritage sites, with literally miles of inscribed walls, offer us today a wealth of information about these deep roots of Western civilization. Unfortunately, the conditions that allowed their preservation are now rapidly changing as weather patterns shift and Egypt's population grows. Even in Breasted's day he could see beautifully inscribed wall surfaces slowly fading and vanishing in front of his eyes, as wind and rain and the depredations of man scoured

the fragile, ancient stone. Higher air humidity, growing cities, and agricultural expansion are now causing that decay to accelerate alarmingly. In recent years the Epigraphic Survey has added conservation and restoration to its programs, in addition to its core documentation work, in an effort to help keep up with Egypt's rapidly changing environment.

The Recording Process

The point of epigraphic recording, and the primary task of the Epigraphic Survey even today, is to create precise facsimile copies of the carved and painted wall surfaces of Egypt's ancient temples and tombs in order to preserve for all time the information found on them as part of the scientific record. Breasted believed that this documentation should be so precise it could stand in for the original. The documentation program of the Epigraphic Survey was designed accordingly, and today the drawings and photographs produced by Chicago House are so exact that they are even used by conservators in the physical consolidation and reconstruction of those walls as a fixed reference to their condition at the time of recording.

Large Format Photography - Archival large-format black-and-white (and color)

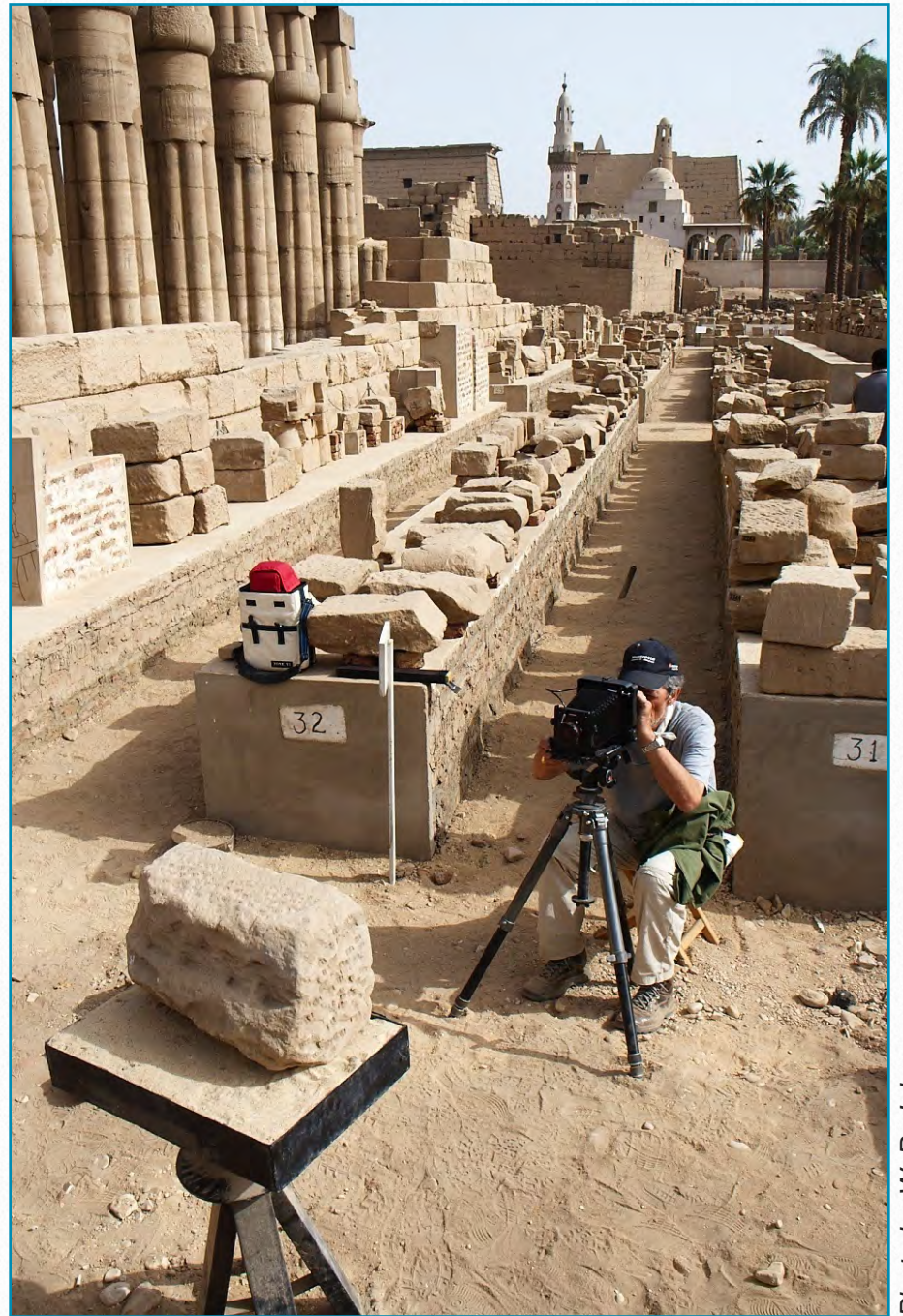


Photo by W. R. Johnson

Yarko Kobylecky photographing Luxor Temple blocks

film photography (8 x 10, 5 x 7, and 4 x 5 inches) was, and still is, the first step in the recording program of the Epigraphic Survey. In recent years this has been supplemented with digital color photography, and in all cases, large-format negatives are now also digitally scanned. Hard copy contact prints are made directly from the black-and-white negatives, and these form the core of the Chicago House Photographic Archives, which presently houses over 20,000 negatives and 21,000 prints.

Our digital image archive is considerably larger and is growing rapidly. Intact carved wall surfaces and well-preserved painted plaster walls can be recorded quite well with photography alone. Many of the walls and inscribed columns in the mortuary temple of Ramesses III, for instance, do not require drawings, and so they are published in clear, crisp black-and-white photographs that show most, if not all, of the inscribed details. More recent digital photography can now capture and reproduce color and painted details on wall surfaces in a way that is quite extraordinary. Three-dimensional imaging can capture a tremendous amount of information as well.



Photo by W. R. Johnson

Keli Alberts penciling at Medinet Habu

The Photographic Method

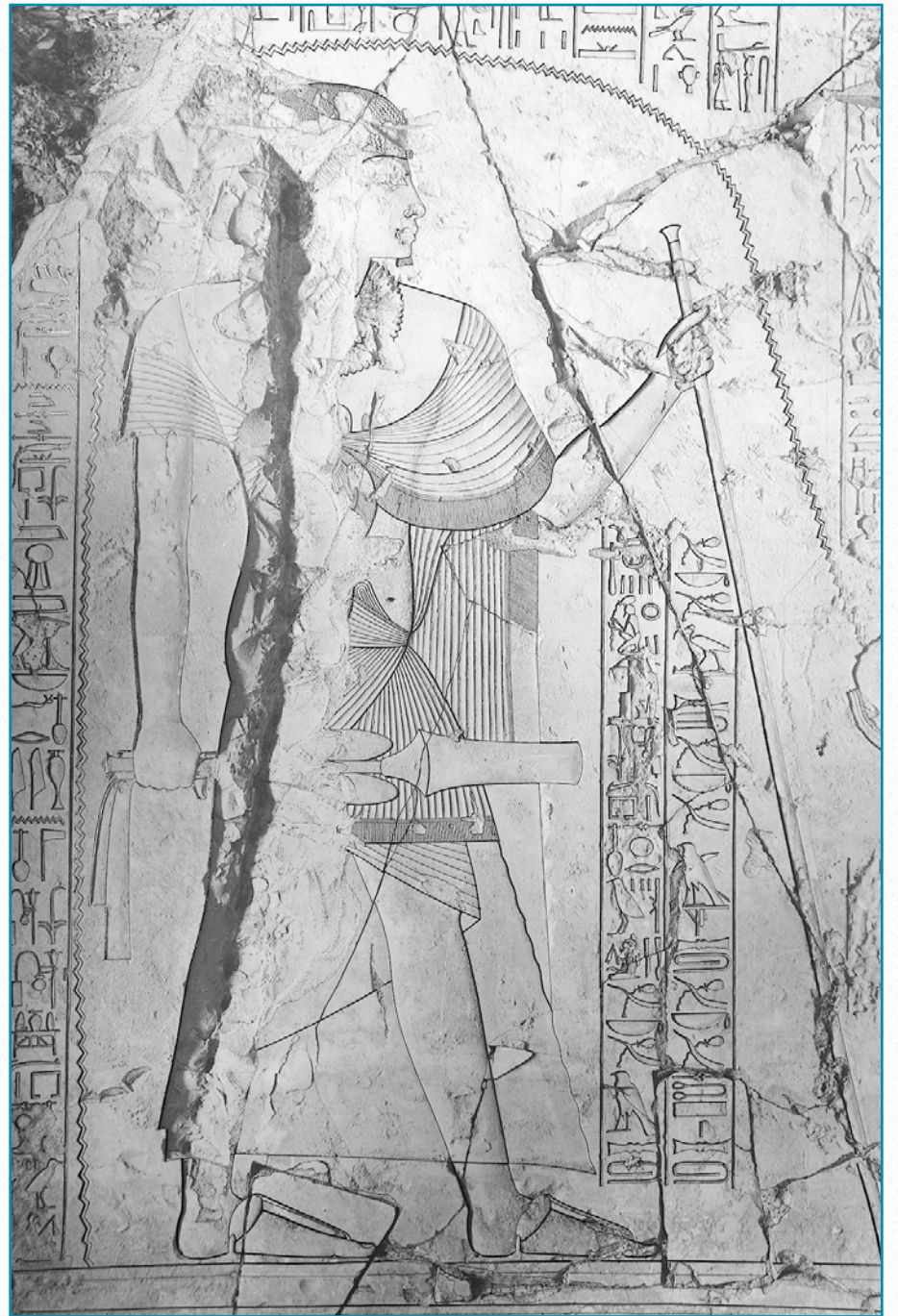
Although an avid photographer himself, Breasted quickly learned through experience that unless an ancient inscribed wall surface is in a pristine state, photography alone often cannot capture all the details that are preserved on it. In the case of a wall surface that is damaged or has been modified through recarving, many details that are visible to the naked eye are often invisible to the camera lens. In cases like these, to supplement and clarify the photographic record, precise line drawings are produced at Chicago House that clearly present the carved details and combine the talents of the photographer, artist, and Egyptologist.

Photography is still the first step. First, the wall surface is carefully photographed with a large-format camera whose lens is positioned exactly parallel to the wall to eliminate distortion. A series of photographic film negatives is taken along the length of the wall, each the same distance from the wall, taking care to make sure that the edges of each overlap slightly for joining of scenes later. From these negatives, when necessary, photographic enlargements up to 20 x 24 inches are produced, printed on a special matte-surface paper with an emulsion coating that can take pencil and ink lines.

All hard-copy negatives and duplicates are archived at Chicago House and the Oriental Institute, and all negatives are scanned at high resolution for digital archiving in both locations as well.

Penciling on Enlargement - An artist takes the enlarged photographic print mounted on a drawing board to the wall itself and pencils all the carved details that are visible on the wall surface directly onto the photograph, adding those that are not visible or clear on the photograph. This non-invasive system, where no tracing paper or plastic is ever pressed against the wall, is particularly well suited to fragile, decayed wall surfaces that should not be touched.

Inking - Back at the Chicago House studio, or at home during the summer, the penciled lines are carefully inked by the artist with a series of thin and thick black lines to show the three dimensions of the relief (thin where the hypothetical sun, always from the upper left, strikes the reliefs, and a thicker line where a shadow is cast).



Inked drawing enlargement from TT 107

Drawing by Osgood

During the 2012–2013 archaeological field season the Epigraphic Survey launched an exciting new digital inking program, where the penciled photographic enlargements are scanned, and the inking is done digitally in layers on Wacom drawing tablets using Adobe Photoshop, with wonderful effect. This technique now supplements and will eventually replace most of the physical inking with India ink. The techniques utilized in this program are discussed at great length in the chapters that follow.



Damage that interrupts the carving is rendered with very thin, broken lines that imitate the nature of the break. With care, a skilled artist can indicate with the inked line alone whether the stone is limestone or sandstone, and even differentiate between natural damage and deliberate defacement.

Bleaching and Blueprinting - Traditionally, when the India inking has been com-

pleted, the entire inked photograph is immersed in an iodine bath that dissolves the photographic image containing all the “background noise” that obscures the carved information, leaving just the ink drawing of the carved details and any damage that interrupts the carved line showing very clearly on the white photographic paper. In the case of digital inking, the photographic “layer” is simply turned off and the grayscale background disappears, leaving just the inked lines against a white background. The drawing is then blueprinted, scanned, or in the case of the digital drawing, printed out.

Collation Process - The blueprint or print is cut into sections, and each is mounted on a sheet of stiff white paper. These “collation sheets” are taken back to the wall where the inked details are thoroughly examined by two Egyptologist epigraphers, one after the other (the “first epigrapher” and the “second epigrapher”). The collation step of the process is a crucial component in all epigraphic recording and allows several sets of additional eyes to extract from the carved wall surface additional information that otherwise might be missed. The epigraphers pencil corrections and refinements onto the blueprint itself with explanations and instructions to the artist written in the margins. When the epigraphers have met and consolidated their cor-

rections, the collation sheets are then returned to the artist, who in turn takes them back to the wall and carefully checks each correction or refinement, one by one. When the review is finished, the artist and epigraphers iron out any questions at the wall. When everyone is in agreement, the artist adds the corrections to the inked drawing back in the studio using the collation sheets as a guide, the transferred corrections are checked for accuracy by the epigraphers, and the drawing receives a final review by the field director back at the wall itself. During the course of the collation process, the first epigrapher is also responsible for translations and preliminary



Photo by W. R. Johnson

Jennifer Kimpton collating at Medinet Habu

analysis of the texts being documented, which are later compiled and synthesized by the senior epigrapher.

Recording Color

Ancient Egyptian inscribed wall reliefs were usually intended to be plastered with whitewash and painted with bright mineral-based pigments. Sadly, most painted details are now missing from the ancient Egyptian monuments, scoured away by time and the elements. But not all monuments are lacking paint. Because many more details were painted than carved, traces of painted details often sur-

vive within carved outlines. The convention for paint boundaries in the Chicago House black-and-white line drawings is a row of small consecutive dots. The eye sees the dots as a thin gray line, differentiated from the carved lines that are rendered with unbroken ink lines. In some rare and wonderful cases when the painted surface is well preserved, full-color reproduction is necessary. Today, color photography, both film and digital, can be utilized to capture and reproduce true color and is now standard in documentation and publication. At the time the Epigraphic Survey and Saqqara Expedition started work, color photography was not adequate for the task of color reproduction. Instead, a number of talented epigraphic artists mixed colors at the wall and, instead of penciling photographs, painted directly on the photographic enlargements, matching the colors by eye as they saw them. Printed in Austria and Germany, the published results are sensational and form an exciting component of the early published record of both expeditions. Chief among the extraordinary artists who perfected this technique were Alfred Bollacher and Virgilio Canziani, whose work can be seen throughout the Epigraphic Survey Medinet Habu volumes. Saqqara Expedition field director Prentice Duell himself was responsible for many of



Photo by W. R. Johnson

Krisztián Vértés drawing in color at Medinet Habu

the color paintings in the Mereruka volumes.

Recording Invisible Surfaces - While photography and the Chicago House photographic drawing method are very well suited for certain types of inscribed wall surfaces, they are not perfect for all situations. Each inscribed area has its own set of conditions and challenges, and the Chicago House epigraphic team uses whatever methodology is appropriate to record it. Wall areas that are partly obscured behind later walls or are behind columns cannot be photographed, for instance. In such cases tracing (using paper or transparent tracing film) is the only way to document them, and those tracings can be reduced digitally and integrated with the photographs and/or drawings. Reused blocks in floors, foundations, and walls where inscribed surfaces are barely visible present another situation in which photography is impossible. The reused material in the walls and floors of Khonsu temple, Karnak, which the Epigraphic Survey is currently documenting, is a perfect example. In many instances this material cannot even be traced, and can barely even be seen in the spaces between the floor-blocks. But with care, aluminum foil can be slipped in the gaps between the blocks, and rubbings made of the invisible surfaces (utiliz-



Krisztián Vértés using rubbings at Karnak

Photos by J. Schmied

ing long sticks with cotton tips), with extraordinary results. These rubbings can then be traced, reduced digitally, and used to make scale drawings, which are then inked according to our normal weighted line conventions. The possibilities are endless; the present author has used the aluminum foil technique quite successfully in ancient Memphis to record blocks that were actually underwater!

The Graffiti Project - Facsimile drawings of graffiti throughout the Medinet Habu

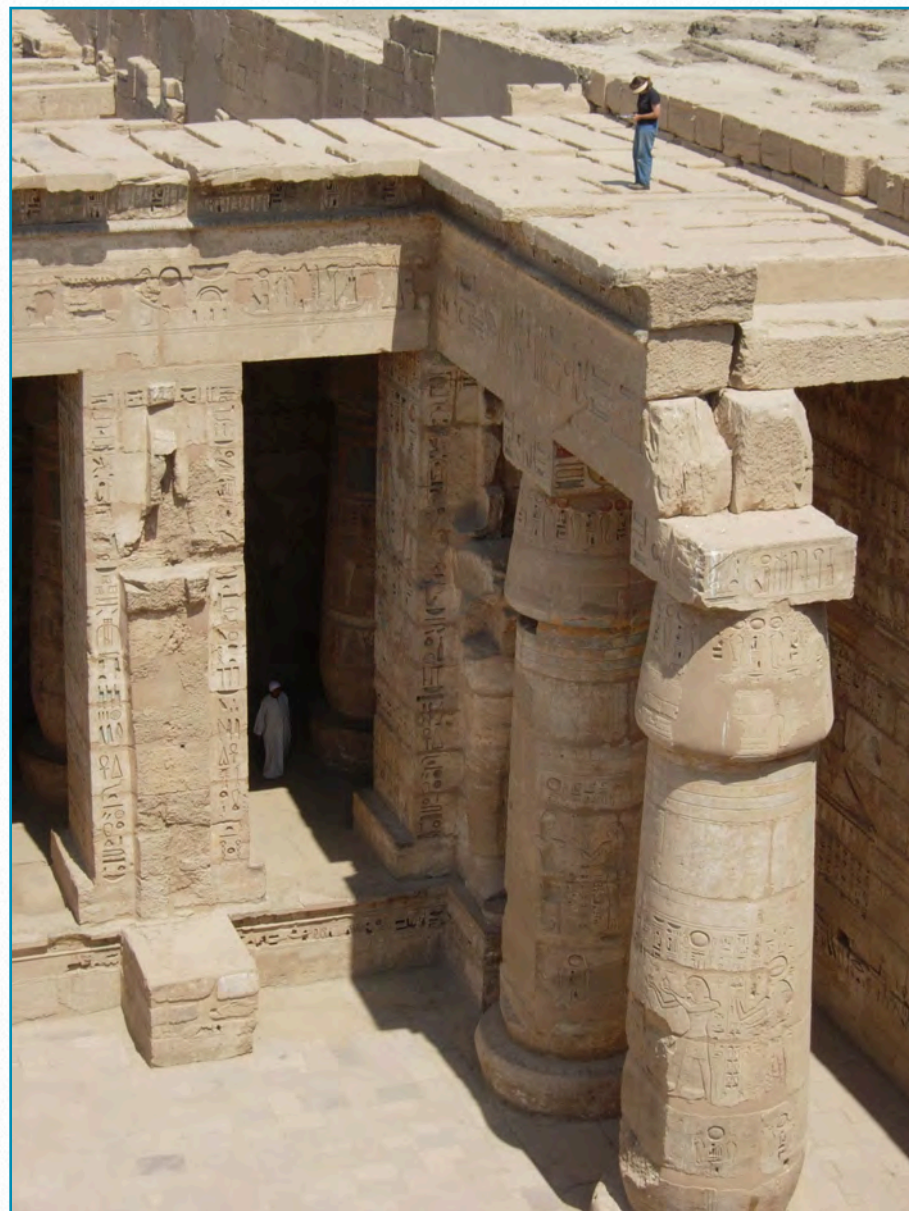


Photo by W. R. Johnson

Christina di Cerbo recording graffiti at Medinet Habu

complex are now also made digitally, utilizing a modified form of the Chicago House method. Scanned or digital photographs are the basis for digital tracing using Photoshop and Illustrator software on drawing tablets. Preliminary drawings are done in the studio as a layer over the digital photograph, which is then printed and taken to the wall or roof area for collation. Corrections are added back in the studio and checked again at the wall or roof area. It is quite possible that a time will come when large-format negative film and photographic paper are no longer available, and



Photo by W. R. Johnson

Christina di Cerbo modifying digital tracings

all our drawings will have to be done digitally. We will be ready! We are also looking forward to experimenting with three-dimensional imaging as a future methodology in our Luxor program. Whatever the method of recording, be it drawing on photographs, tracing with paper or transparent film, doing aluminum foil rubbings, or digital drawings, consultations between the artist, epigraphers, and field director (the consensus of all talents combined) ensure a scientific facsimile drawing that is faithful to every detail preserved on the wall. This is the new definition of what is generally referred to as the Chicago House method. Our goal is to continue improving, refining, and broadening it.

Once the facsimile drawing has received its final review and is cleared for publication by the director, it is archived at Chicago House until the whole monument being recorded is finished, after which all drawings are taken back as a group to Chicago where the publications are organized and printed. The hard-copy drawings are scanned in high resolution for plate production (after which they are permanently archived at the Oriental Institute), the digital drawings are integrated, and the whole publication is designed electronically. All of the Epigraphic Survey's publications are now printed digitally, allowing accessibility in electronic as well as in hard copy. And

now, in an exciting new program inaugurated by the Oriental Institute, all past Epigraphic Survey publications have been scanned as well and are available without charge in PDF format for free electronic download from the Oriental Institute Publications website.



MORE READING

Additional reading material about the *Oriental Institute* and the *Epigraphic Survey*:

- To reach the Oriental Institute on the web: <http://oi.uchicago.edu>
- To read the Oriental Institute Annual Reports:
<http://oi.uchicago.edu/about/annual-reports/oriental-institute-annual-reports>
- To read about the Epigraphic Survey's work:
<http://oi.uchicago.edu/research/projects/epigraphic-survey>
- To read the annual Chicago House Bulletins:
<http://oi.uchicago.edu/research/publications/chicago-house-bulletins>
- To download the Epigraphic Survey Publications for free in PDF format:
<http://oi.uchicago.edu/research/publications/epigraphic-survey>

2

Drawing Conventions







Written by W. R. Johnson, M. De Jong, S. Osgood, and K. Vértés

Ink-Line Weights, Sun-shadow Orientations, Translating Three-Dimensional Relief into Two-Dimensional Pencil/Ink Lines, Architectural Elements, Recut or Restored Figures and Inscriptions, Plaster, Additional Details



MHB 95 (Detail) - Inked by using the Epigraphic Survey drawing conventions

Basic Techniques

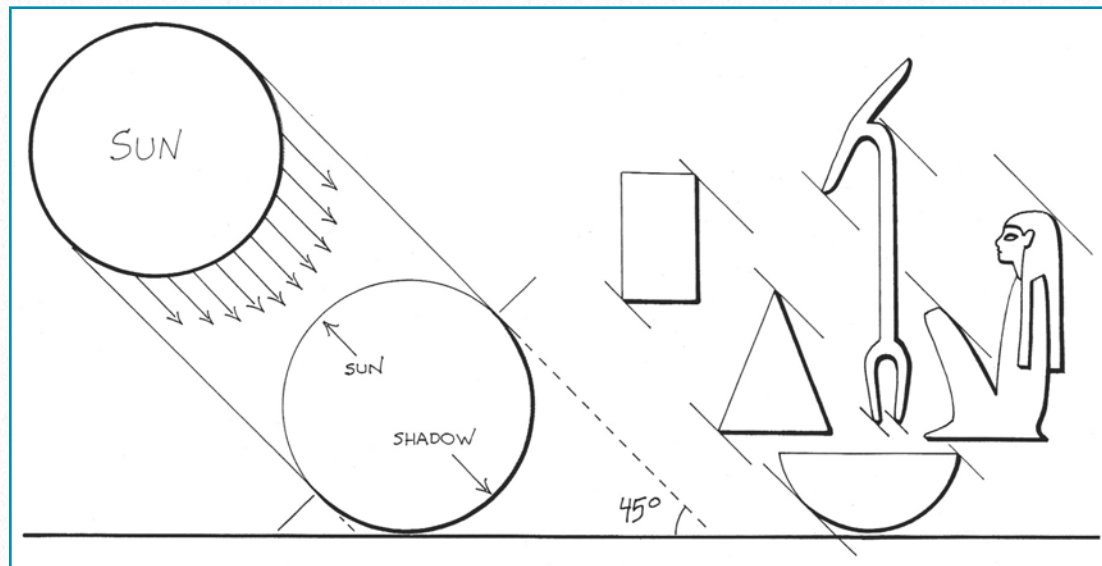
	6x0/.13 (teal)	Trace/Damage/Paint line
	4x0/.18 (pink)	Sun line
	0/.35 (gray)	Exterior (“full”) Shadow line (for small elements)
	1/.50 (brown)	Exterior (“full”) Shadow line (for larger elements)
	00/.30 (yellow)	Interior Shadow line “half”-shadow
	0/.35 (gray)	Interior Shadow line “three-quarter”-shadow

The Epigraphic Survey’s standard ink-line weights

Note: Shadow-line thicknesses will vary depending on the scale of the drawing; the above chart is intended to be a general guide only, and is flexible. For instance, some very small-scale hieroglyphs or other details often require an even thinner shadow line than a 0.35 (gray). Sun-line weight is always 4x0/.18, regardless of the scale of the drawing and trace/damage lines always done with a 6x0/.13 pen. Paint lines are most often 6x0/.13, but in usual cases can be 4x0/.18 when required for clarity.

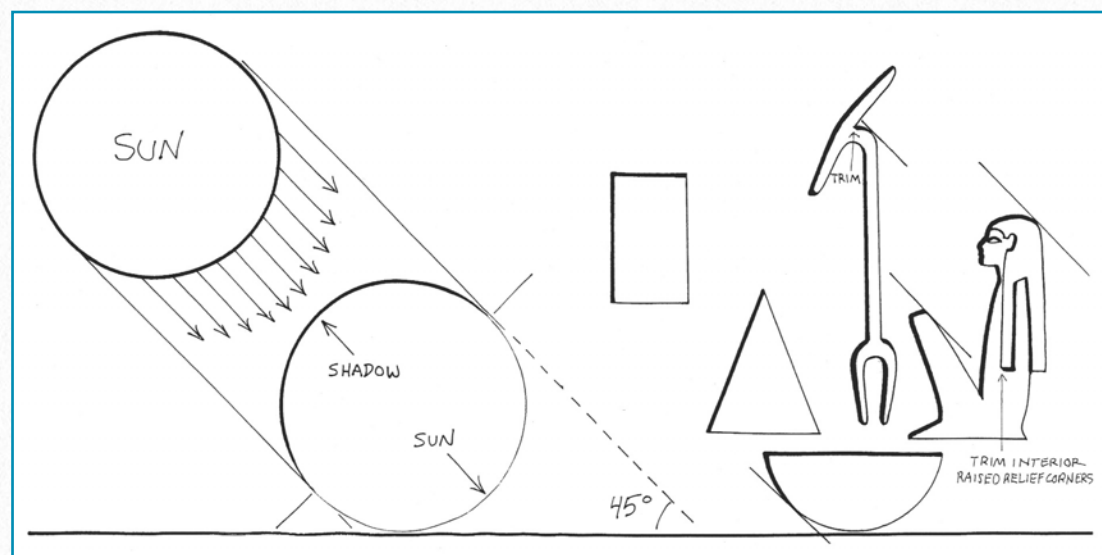
The mechanical pens of choice are *Koh-i-Noor Rapidograph pens*, and the ink that best survives the bleaching process is *Koh-i-Noor 3085-F Ultradraw Ink, Non-clogging Waterproof Ink for Paper*, that should be purchased fresh for the beginning of each season, at least one 3/4 fl. oz. (22 ml.) for each artist for each six-month increment of work. (Old, unfinished bottles should be thrown away.)

Note: When inking on Denril Multi-Media Vellum (used extensively for Colonnade Hall plates) use *Koh-i-Noor 3071-F Acetate Ink, Waterproof Drawing Ink for Acetate and Film*. Regular ink does not adhere to the vellum.



Raised Relief:

1. The hypothetical sun is always from the upper left
2. The transition between sun and shadow lines occurs at a 45-degree angle to the ground line (sun line = upper left, shadow line = lower right)
3. Outer corners of shadow lines should be nicked at a 45-degree angle
4. Interior shadow lines are generally 1/2 to 3/4 the diameter of exterior shadow lines



Sunk Relief:

1. The hypothetical sun is always from the upper left
2. Exterior shadow weights are the reverse of raised relief (shadow line = upper left, sun line = lower right); the transition between shadow and sun lines occurs at a 45-degree angle to the ground line
3. Interior details are rendered in the Raised-Relief Convention; Interior shadow lines are generally 1/2 to 3/4 the diameter of exterior shadow lines

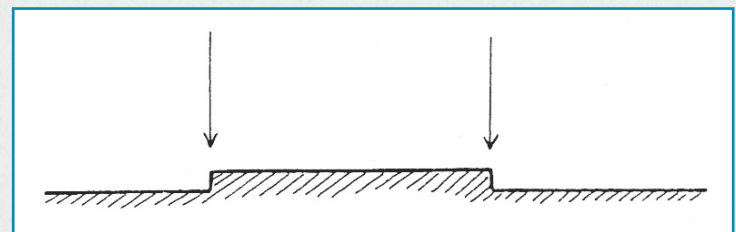
Translating Three-Dimensional Relief into Two-Dimensional Pencil/Ink Lines

In **Raised Relief** the background stone is removed, leaving the carved hieroglyph or figure projecting above the surface of the wall on a shallow platform stone. **Sunk Relief** is exactly the reverse, where the area within the outline of the carved hieroglyph or figure is removed, and the surrounding stone left intact; the effect is that the element has been pushed into the stone. In most cases, the outer edge of both raised and sunk relief are *perpendicular* to the plane of the wall, and the artist simply uses the *outer line* of the element as a guide for pencil and ink lines.

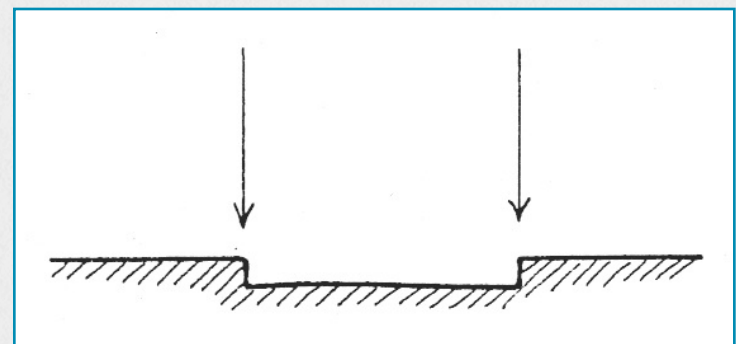
In *both* raised and sunk relief, the outer edges of carved hieroglyphs or figures are sometimes not perpendicular to the plane of the wall, but are carved on a bevel, or slanting edge, creating in effect two outer lines. Rather than attempt to draw both lines, which looks clumsy and distorts the original intent of the ancient artist, the Epigraphic Survey splits the difference between the two lines and draws a *single line* only.

Translating carved lines into inked lines:

Outer line used as a drawing guide:

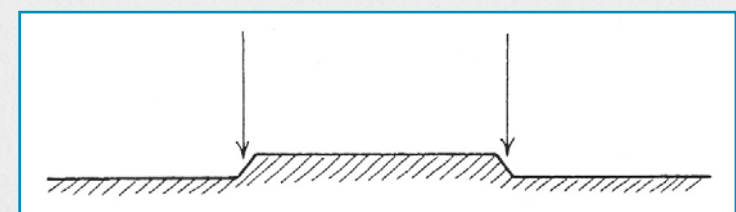


Raised Relief

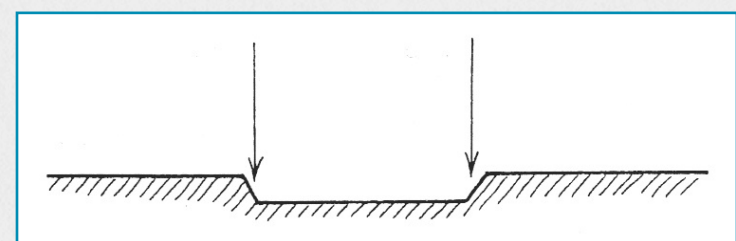


Sunk Relief

Splitting difference used as a drawing guide:

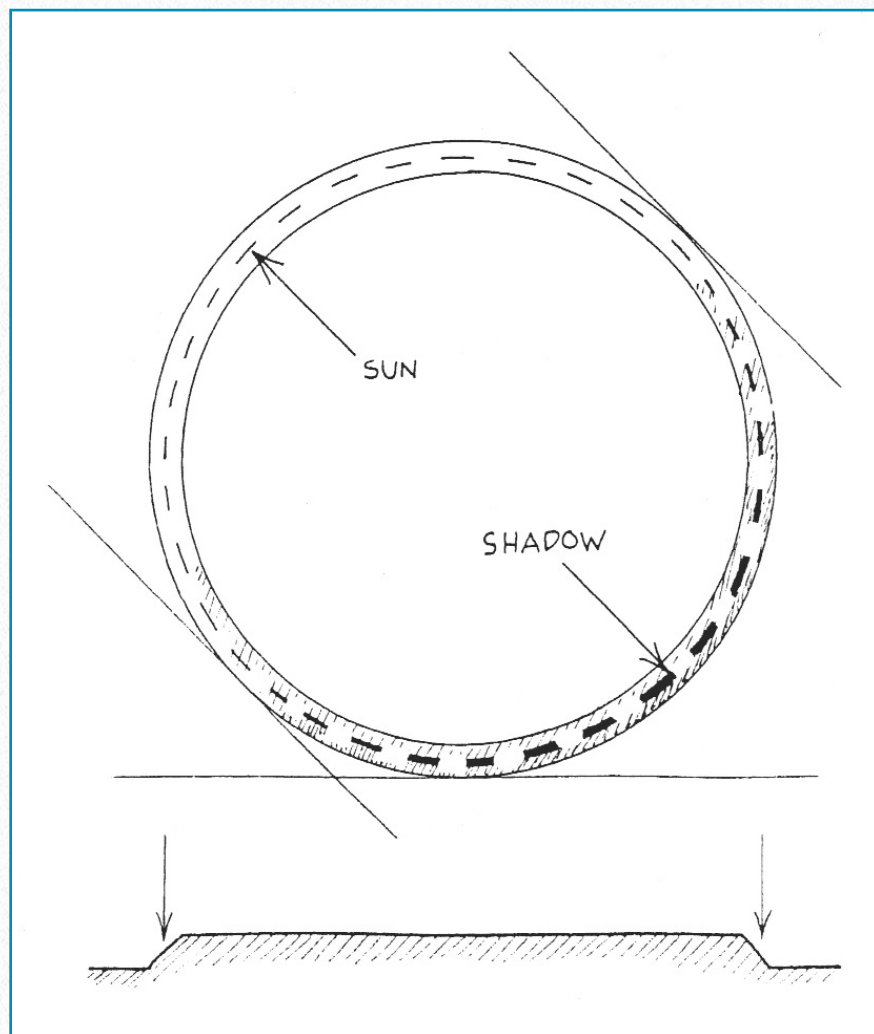


Raised Relief

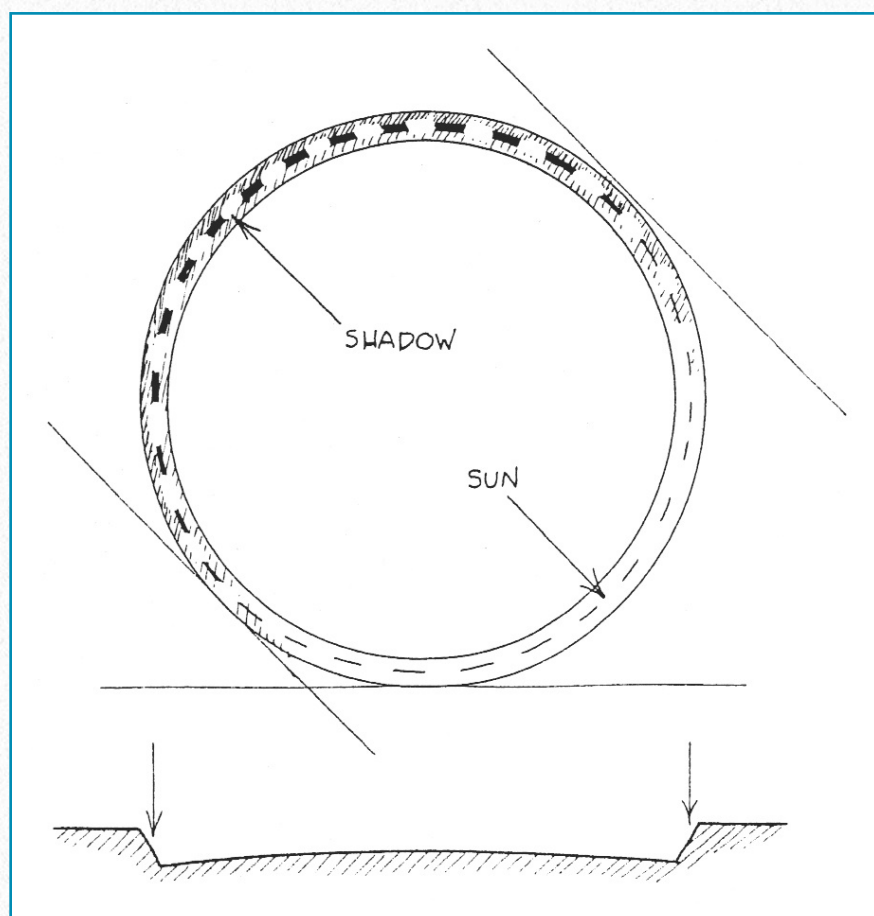


Sunk Relief

Indicating the line placement on both raised and sunk relief:



Raised Relief



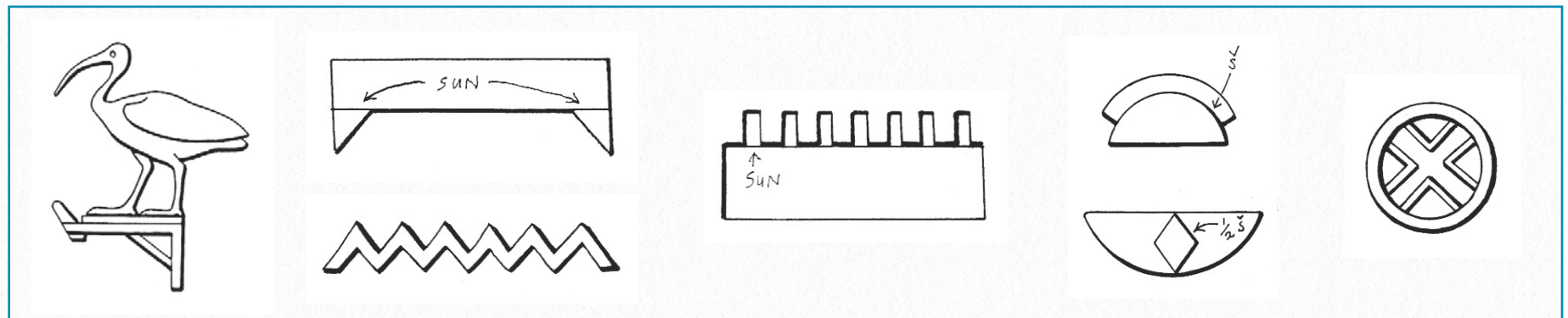
Sunk Relief



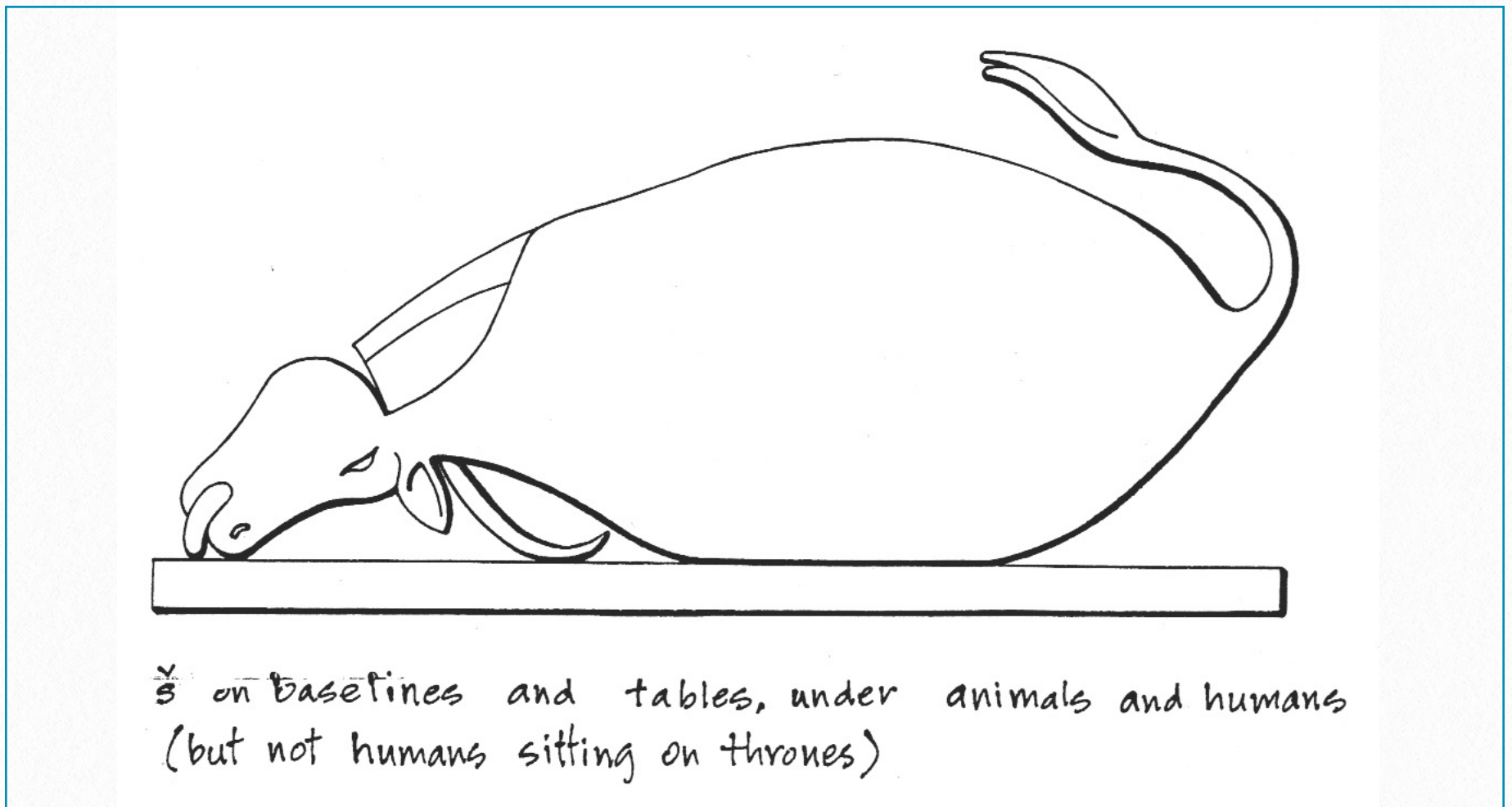
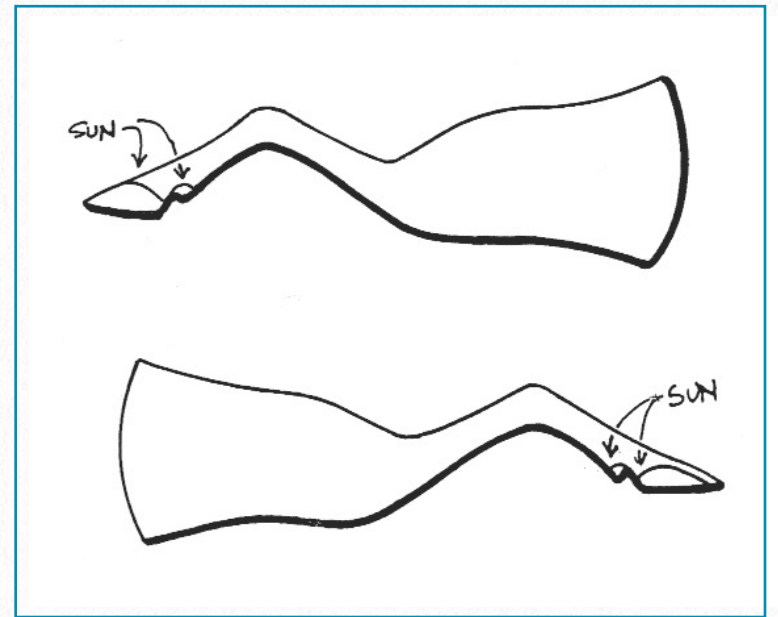
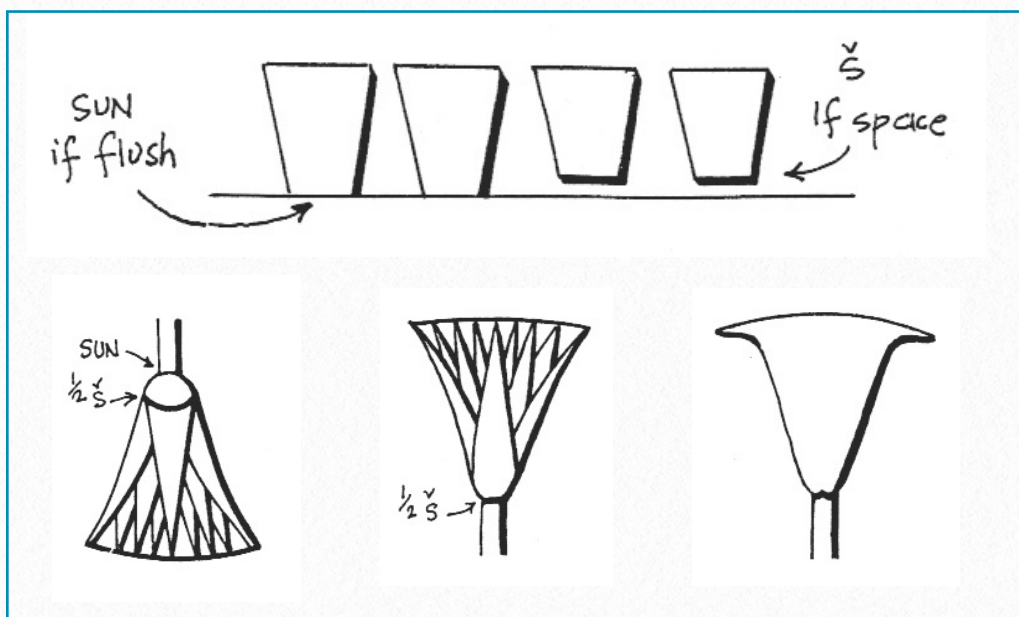
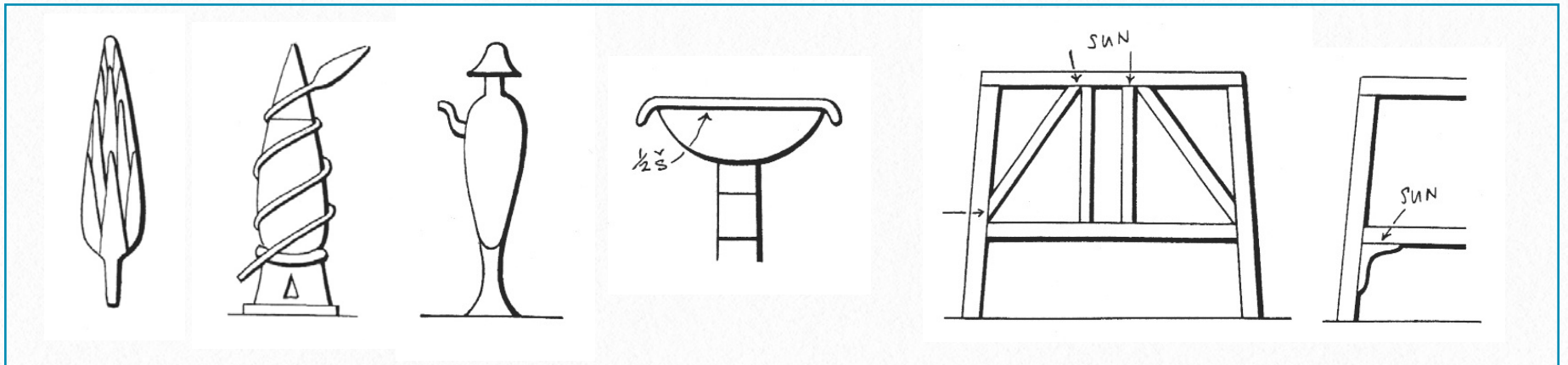
DOWNLOAD HERE

To **download** the demonstration materials for this and following Sections, click on the following links:

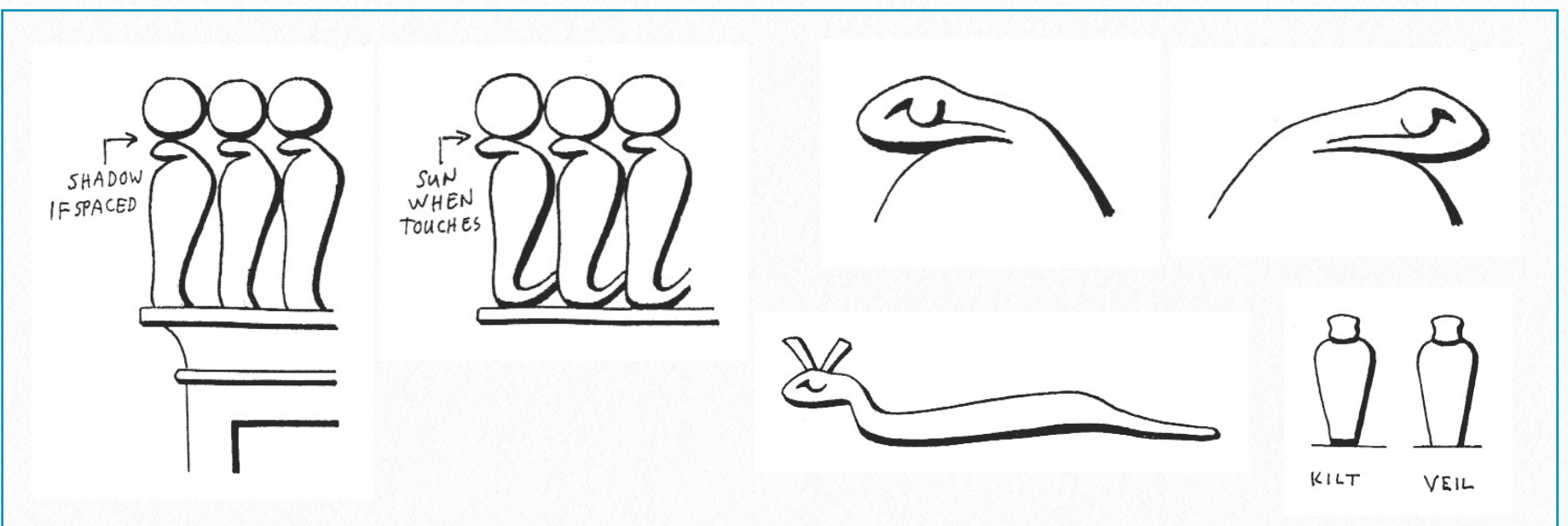
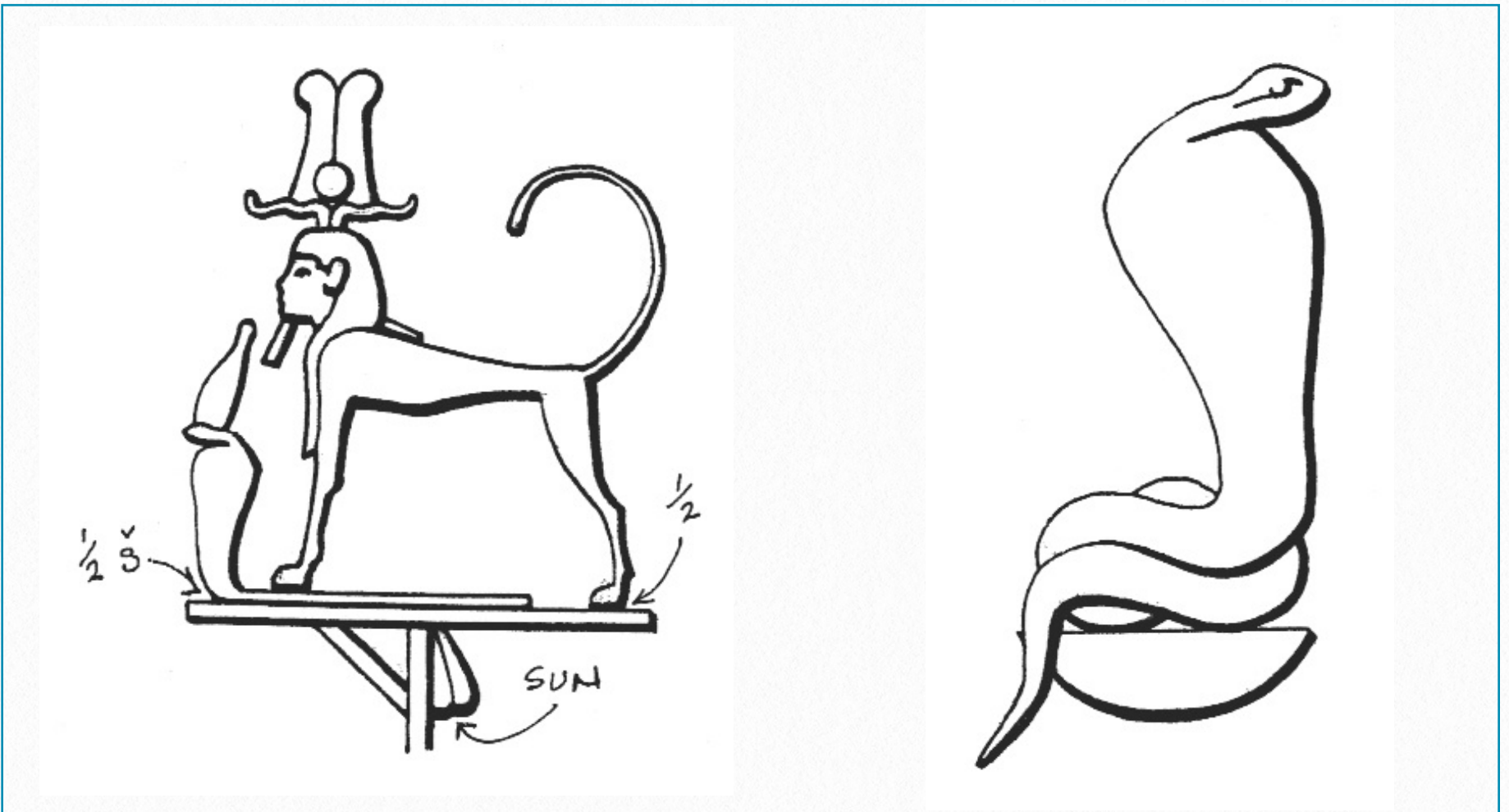
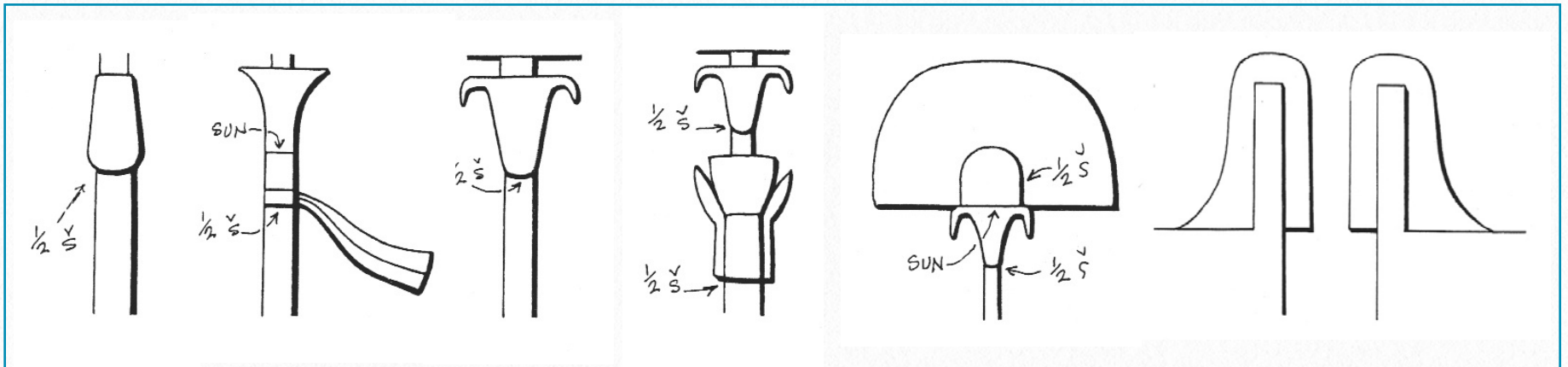
- Translating three-dimensional relief into two-dimensional pencil/ink lines:
<https://www.dropbox.com/sh/gphon4ti9xtsuxv/AABZwi0z5BOa68tGMEX1Unzxa>
- Translating carved lines into inked lines:
https://www.dropbox.com/sh/1085ulyvduzaup8/AAAxJg8i9M_99AEo115WITXa
- Ink line conventions for raised and sunk relief (*Hieroglyphs*):
https://www.dropbox.com/sh/wpwx2is2qrfsft/AAAE0_DCiEmhvd_4qvDX-wyJa
- Ink line conventions for raised relief (*Offerings, Offering Stands*):
https://www.dropbox.com/sh/kc31xrhy1gnbdjb/AAA_hp6TrUNF4OBgTYopKhpua
- Ink line conventions for raised relief (*Pillars, Fans, Thrones, Snakes*):
<https://www.dropbox.com/sh/66tnato8ganqc5q/AABRXyT9yE98RrbWqxK8VY0la>
- Ink line conventions for raised relief (*Birds*):
<https://www.dropbox.com/sh/sru543iwzk9rey5/AAARZ-i9cXS0qV-ykNWMnWn7a>
- Ink line conventions for raised and sunk relief (*Human Figures*):
<https://www.dropbox.com/sh/zmogc5fsog8tynx/AAAFQr4ABQaozCUkzeqENT9a>
- Ink line conventions for raised and sunk relief (*Sporrans, Sashes, Bull's Tail Intersection*):
<https://www.dropbox.com/sh/0nh8jaq3qmdwsqf/AABg5NIa-VF2KIRBN9lgI36pa>
- Ink line conventions for raised and sunk relief (*Heads, Eyes, Ears, Feet*):
<https://www.dropbox.com/sh/vcmtceaexiun40z/AADF16HSyLkWYbbuc5xQ6Jia>
- MHB raised and sunk relief samples:
<https://www.dropbox.com/sh/4zf2pveppy16b65/AACg1D1u3bzyEopeL1gltbQFa>



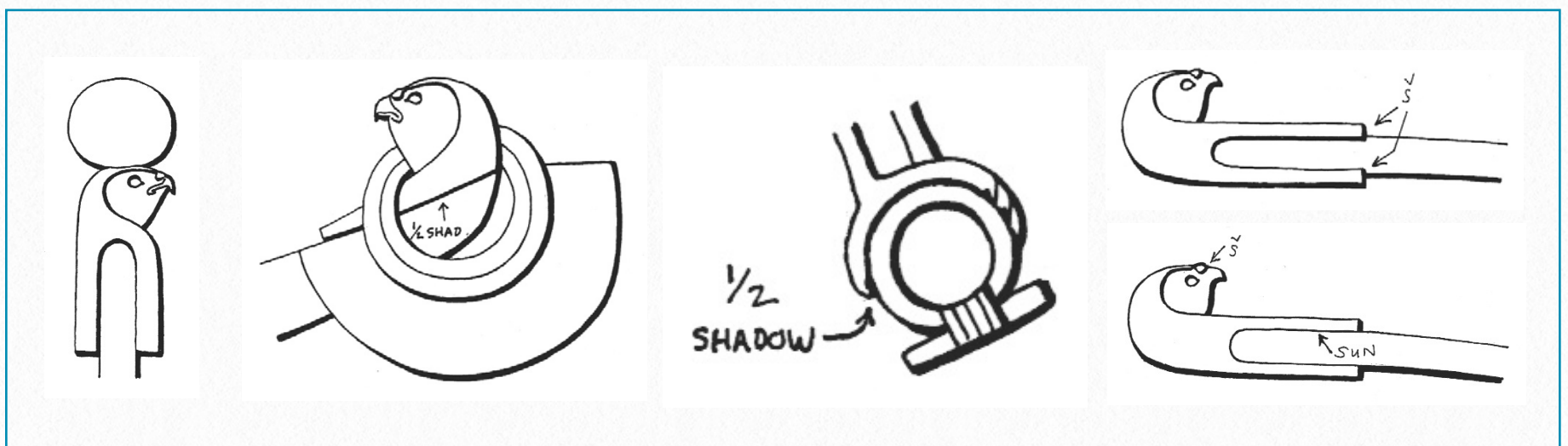
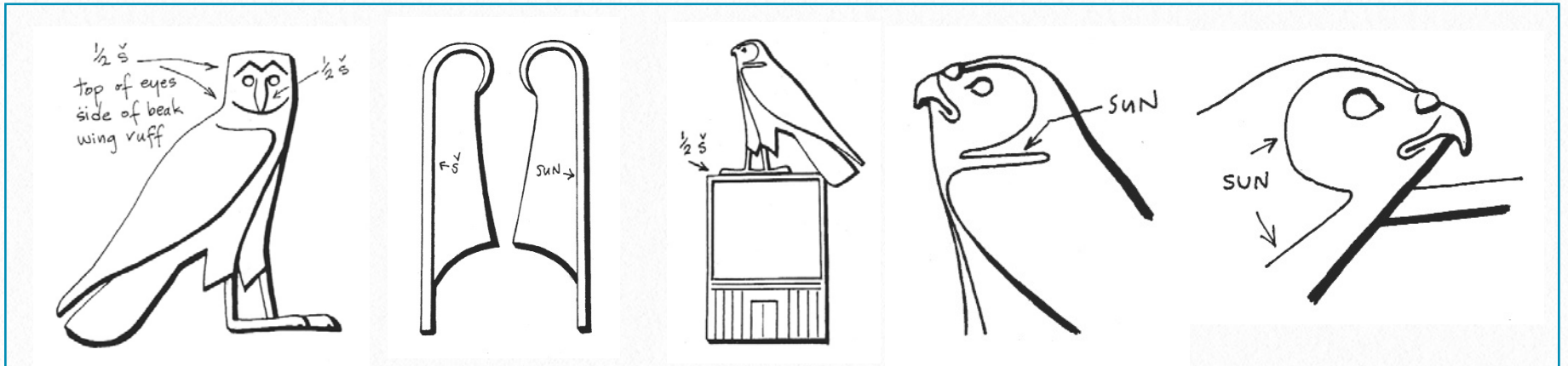
Ink line conventions for raised relief (*Offerings, Offering Stands*):



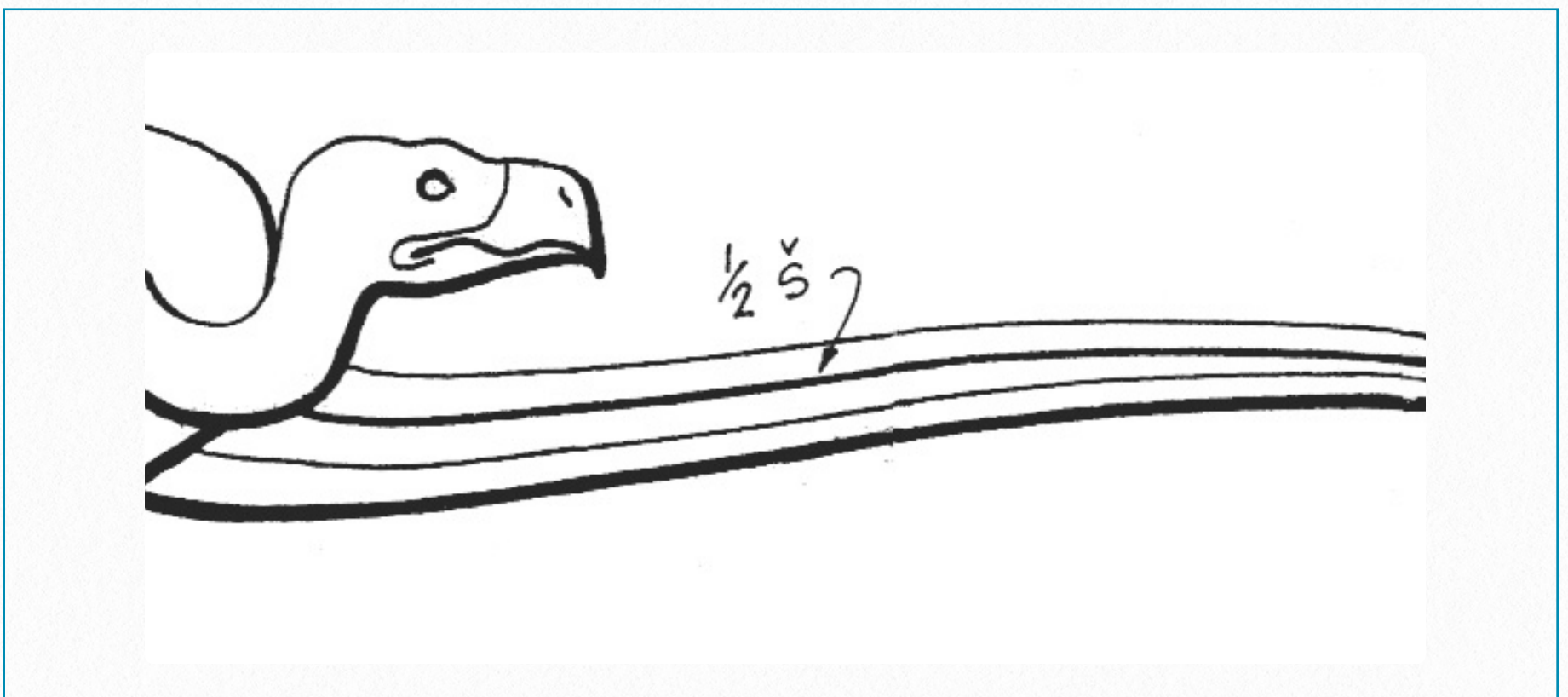
Ink line conventions for raised relief (*Pillars, Fans, Thrones, Snakes*):



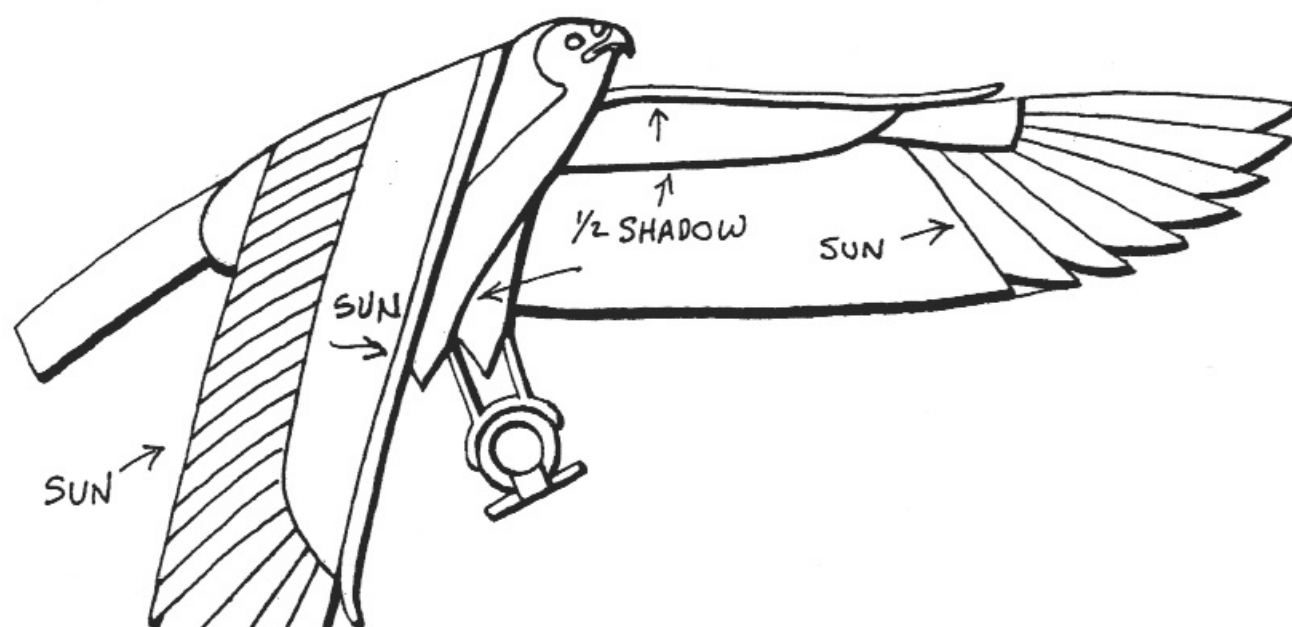
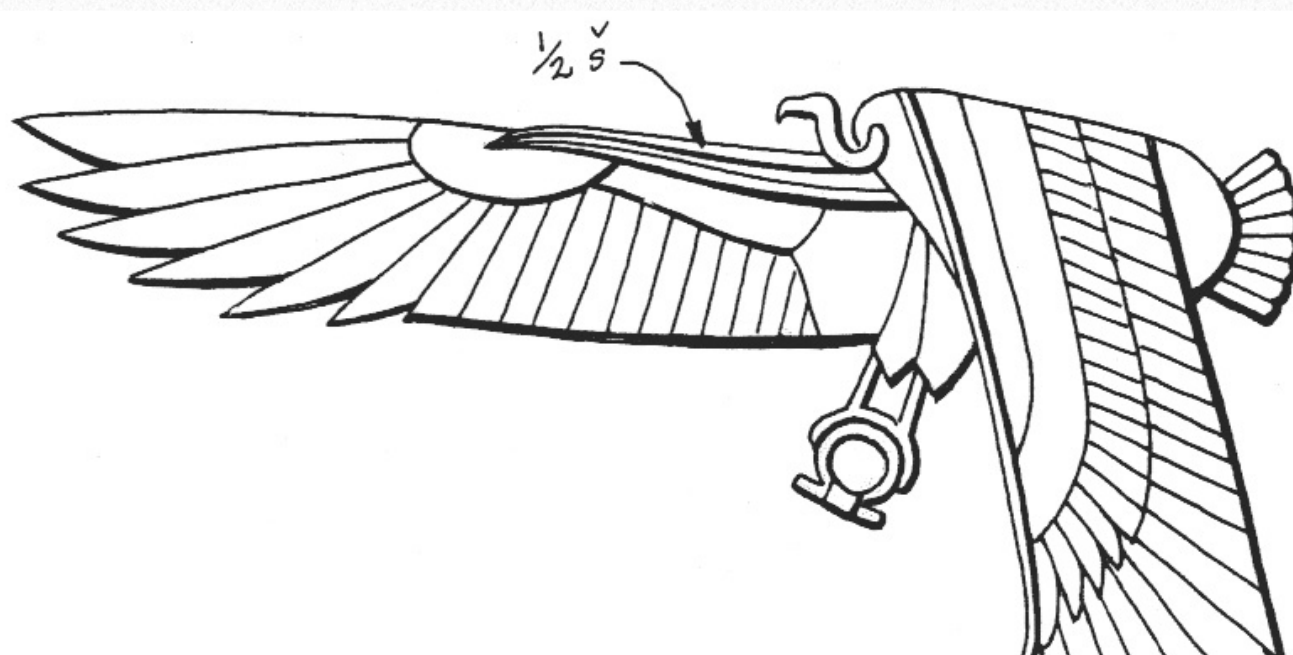
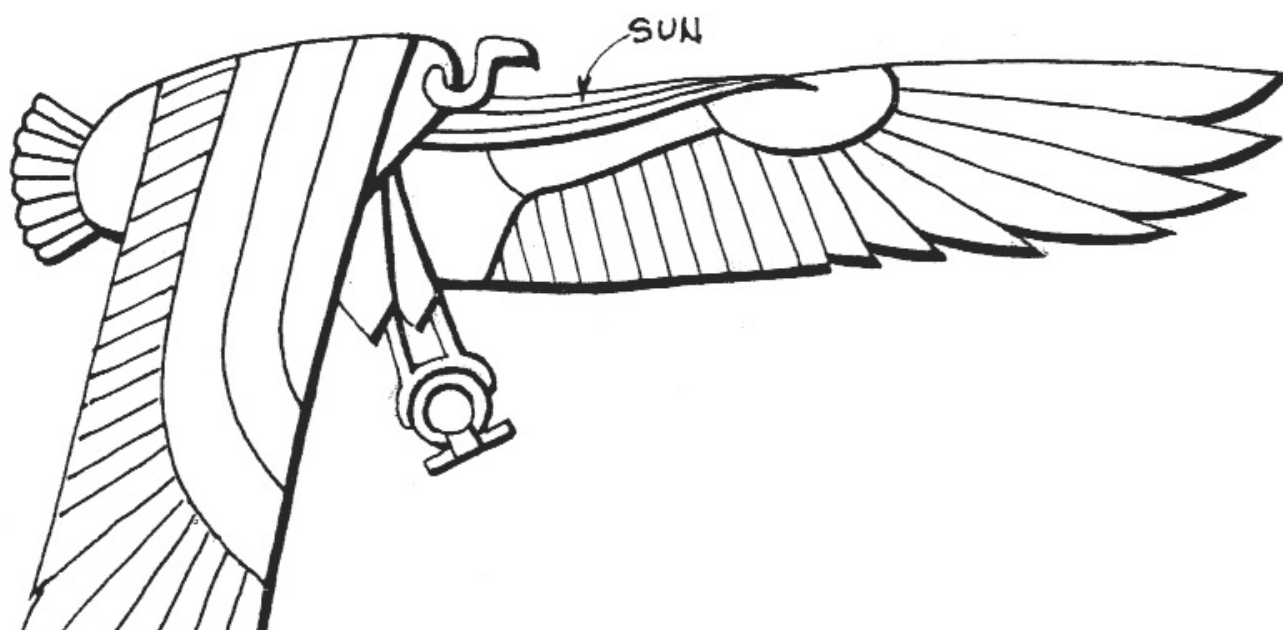
Ink line conventions for raised relief (*Birds*):



Protective birds Inking conventions (*Raised Relief*)



Protective birds Inking conventions (*Raised Relief*)



Ink line conventions for raised and sunk relief (*Human Figures*):

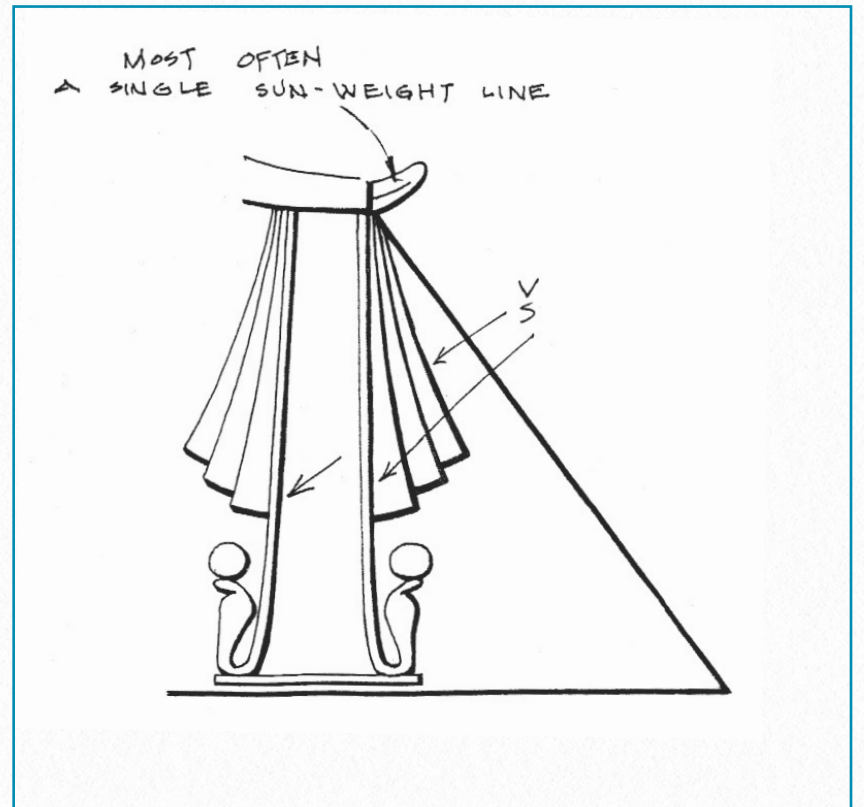
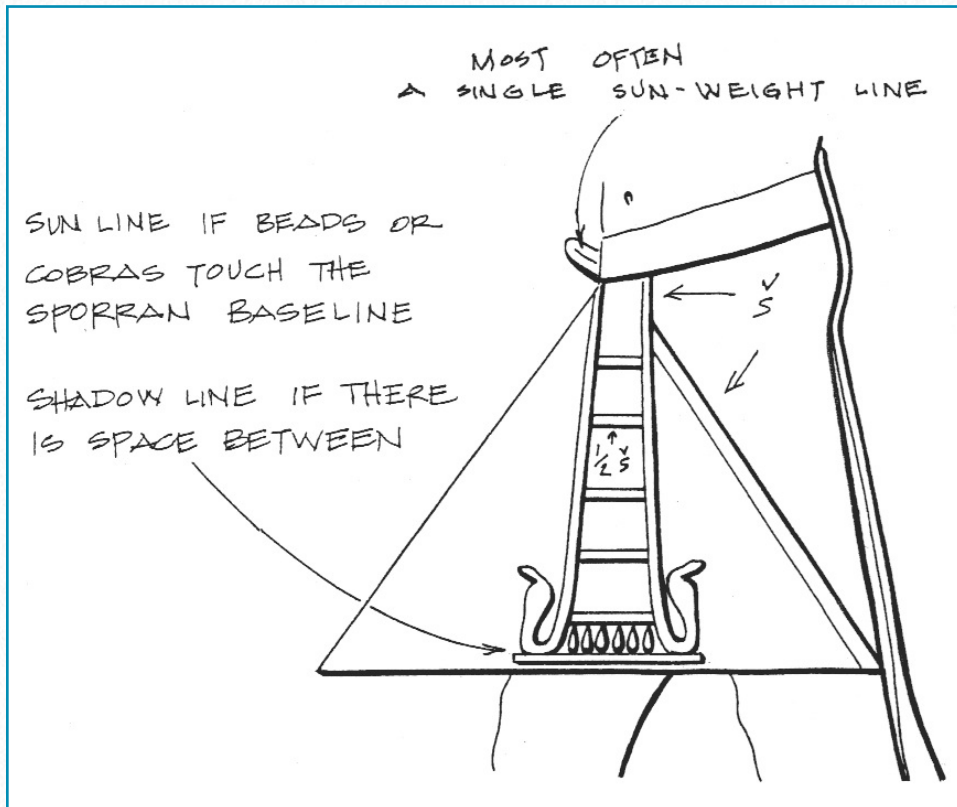


Raised Relief

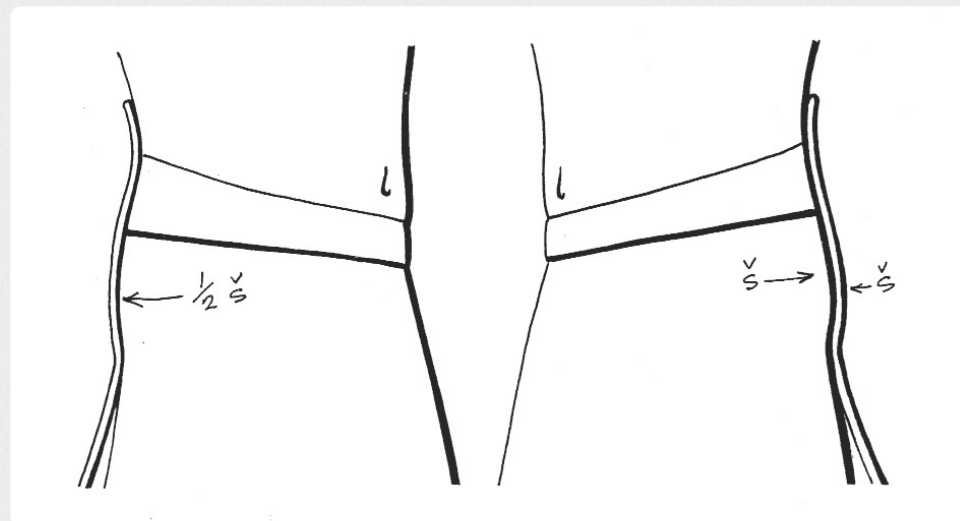


Sunk Relief

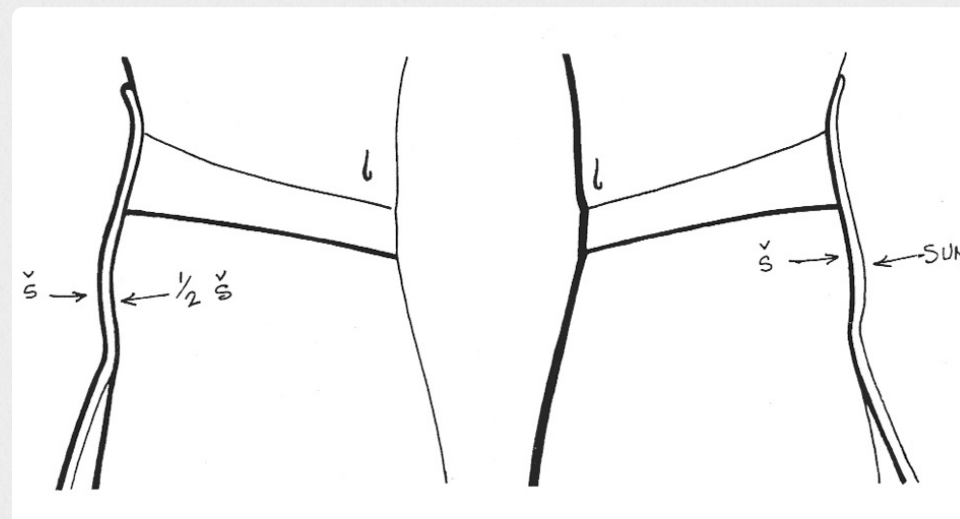
Ink line conventions for raised and sunk relief (Sporrans, Sashes, Bull's Tail Intersection):



The Bull's Tail - Thigh Intersection

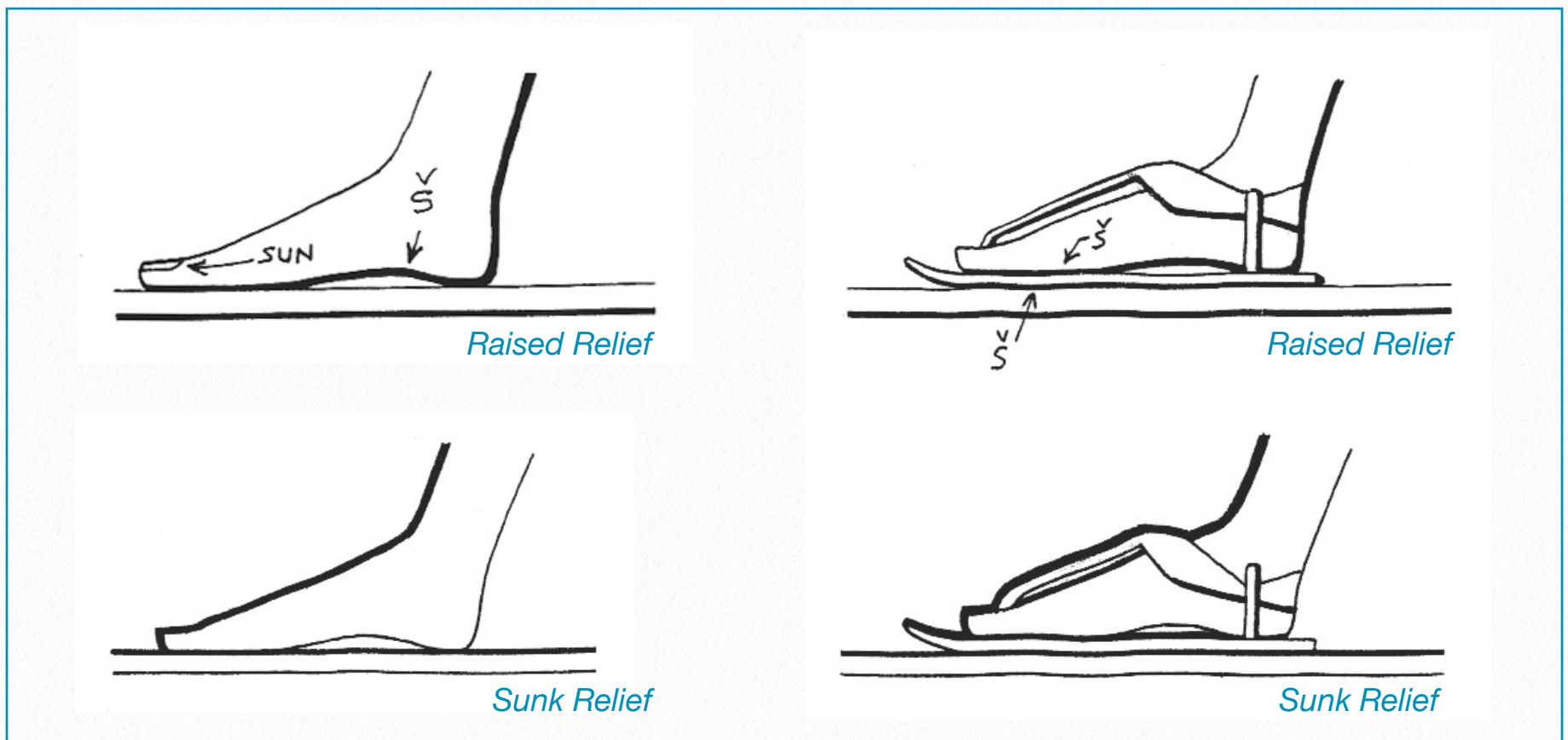
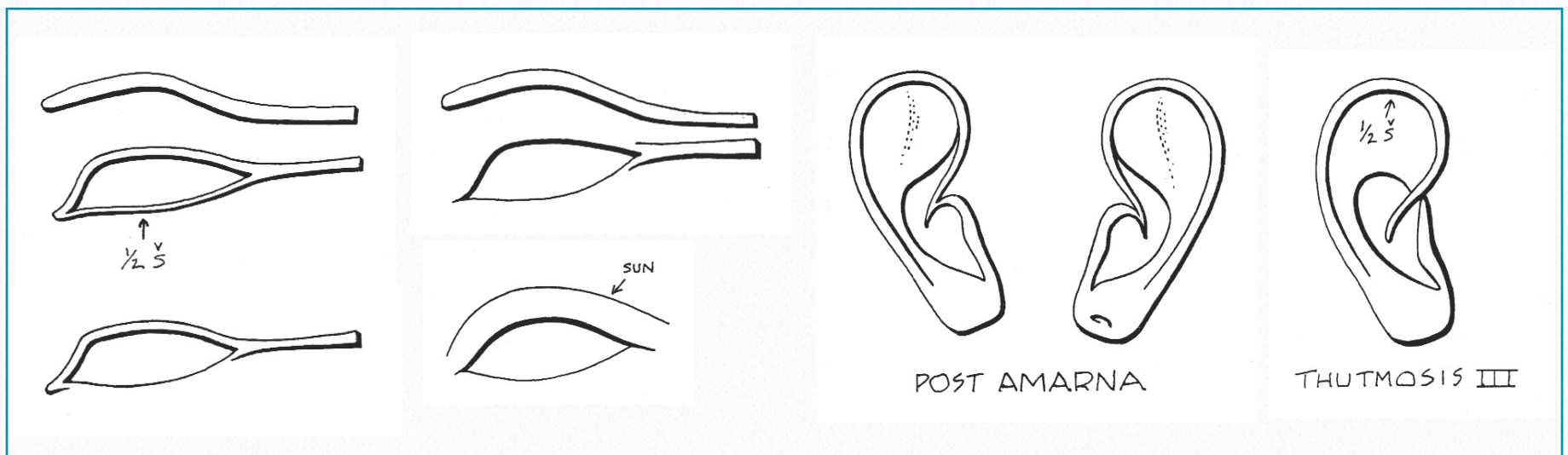
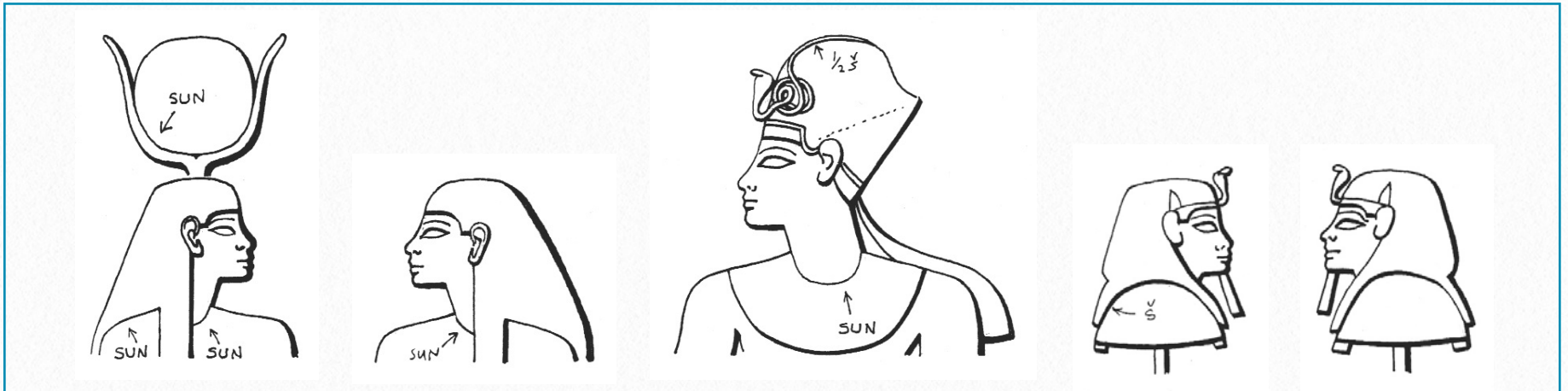


Raised Relief

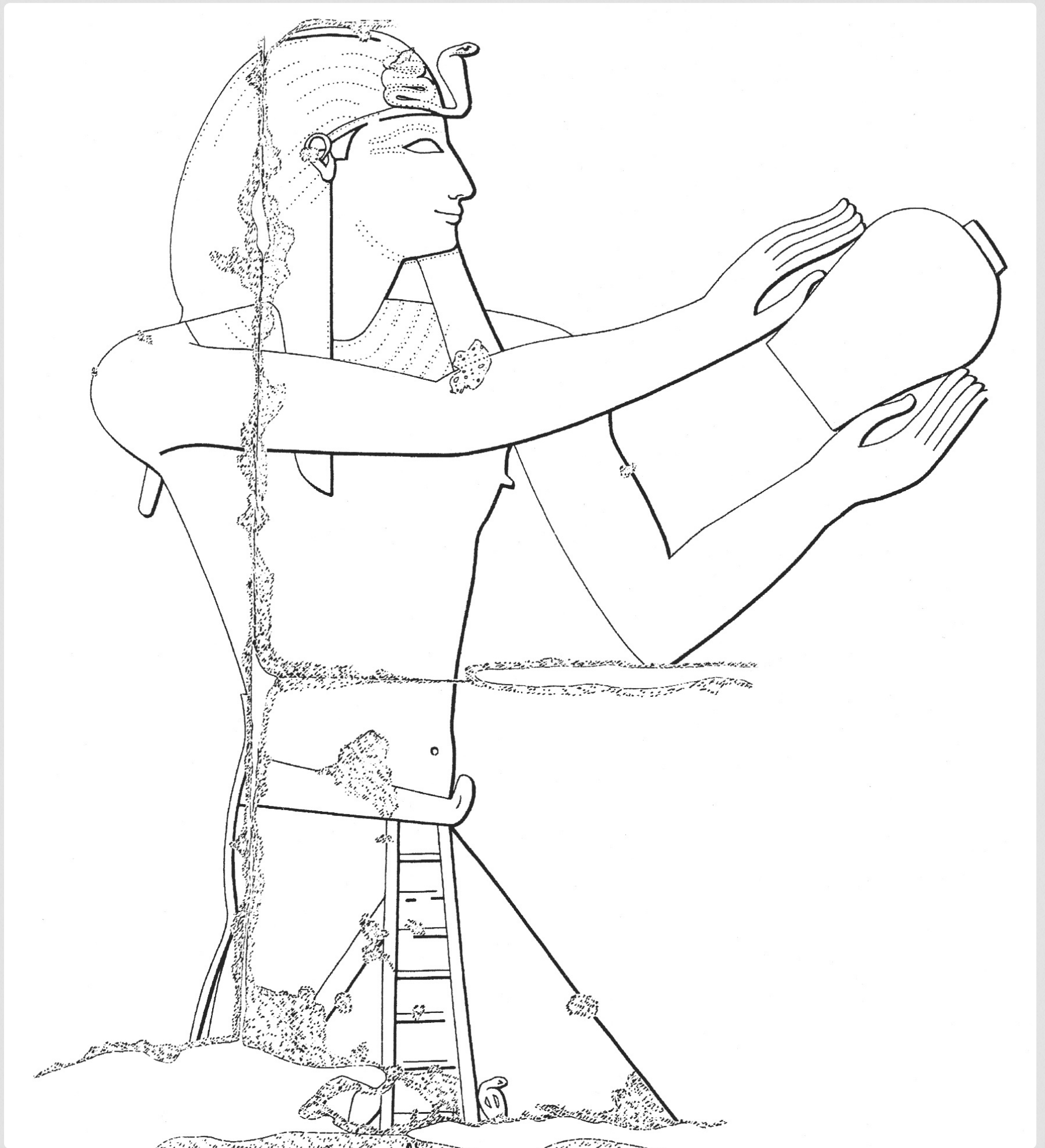


Sunk Relief

Ink line conventions for raised and sunk relief (*Heads, Eyes, Ears, Feet*):

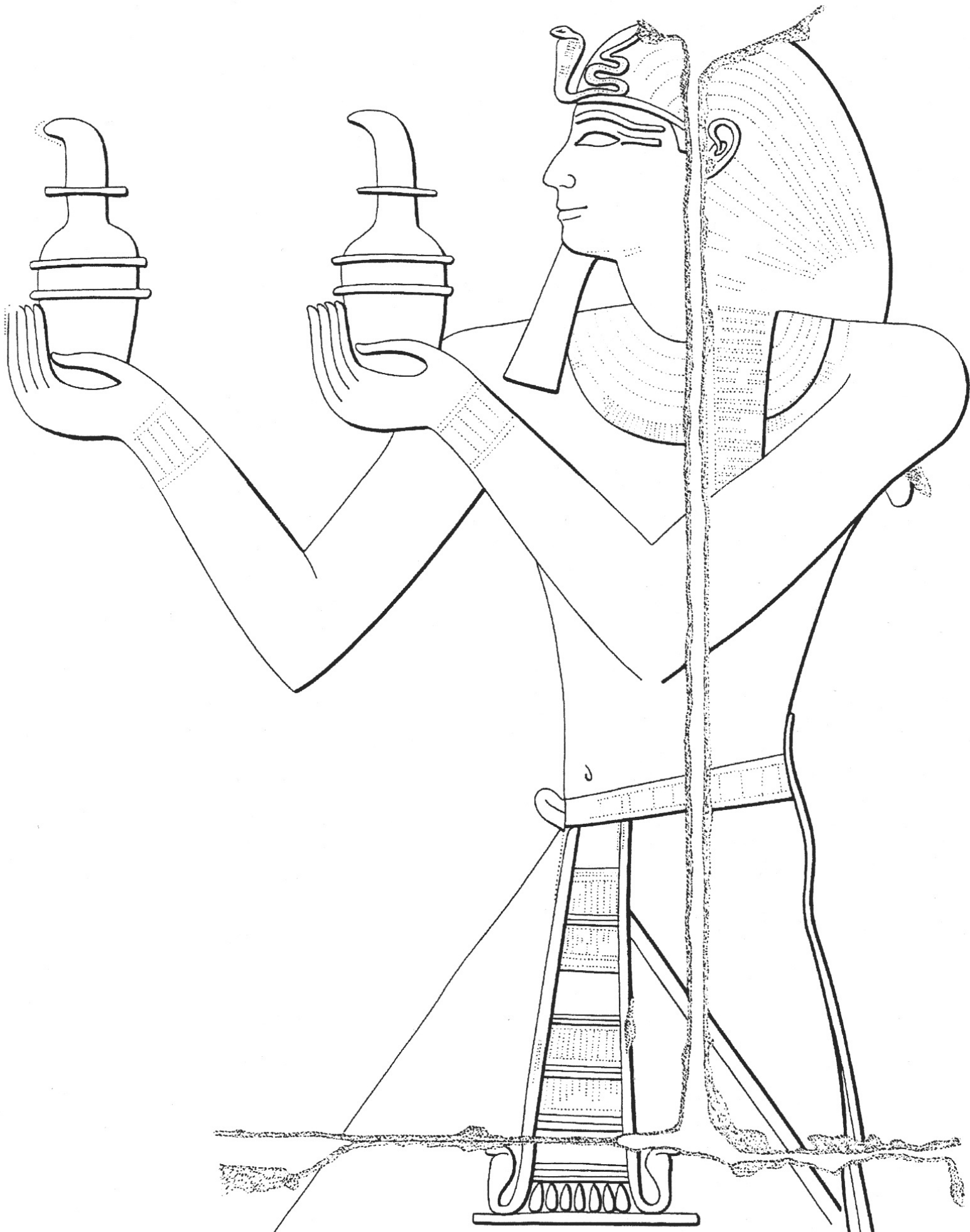


Raised Relief Illustration (*Medinet Habu - Small Amun Temple*)



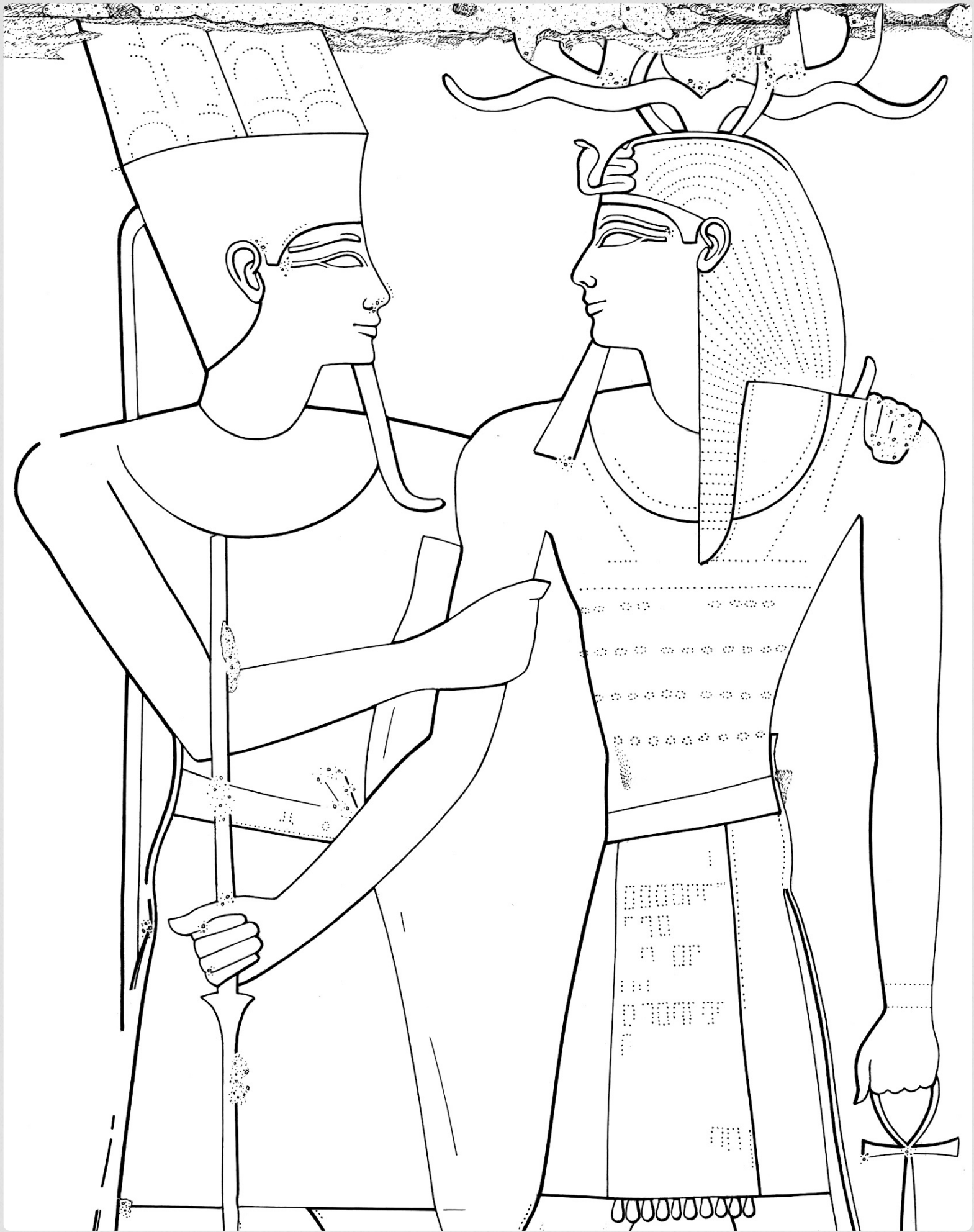
MHB 61 - detail (*Drawing by Heidel, Johnson, and Osgood*)

Raised Relief Illustration (*Medinet Habu - Small Amun Temple*)



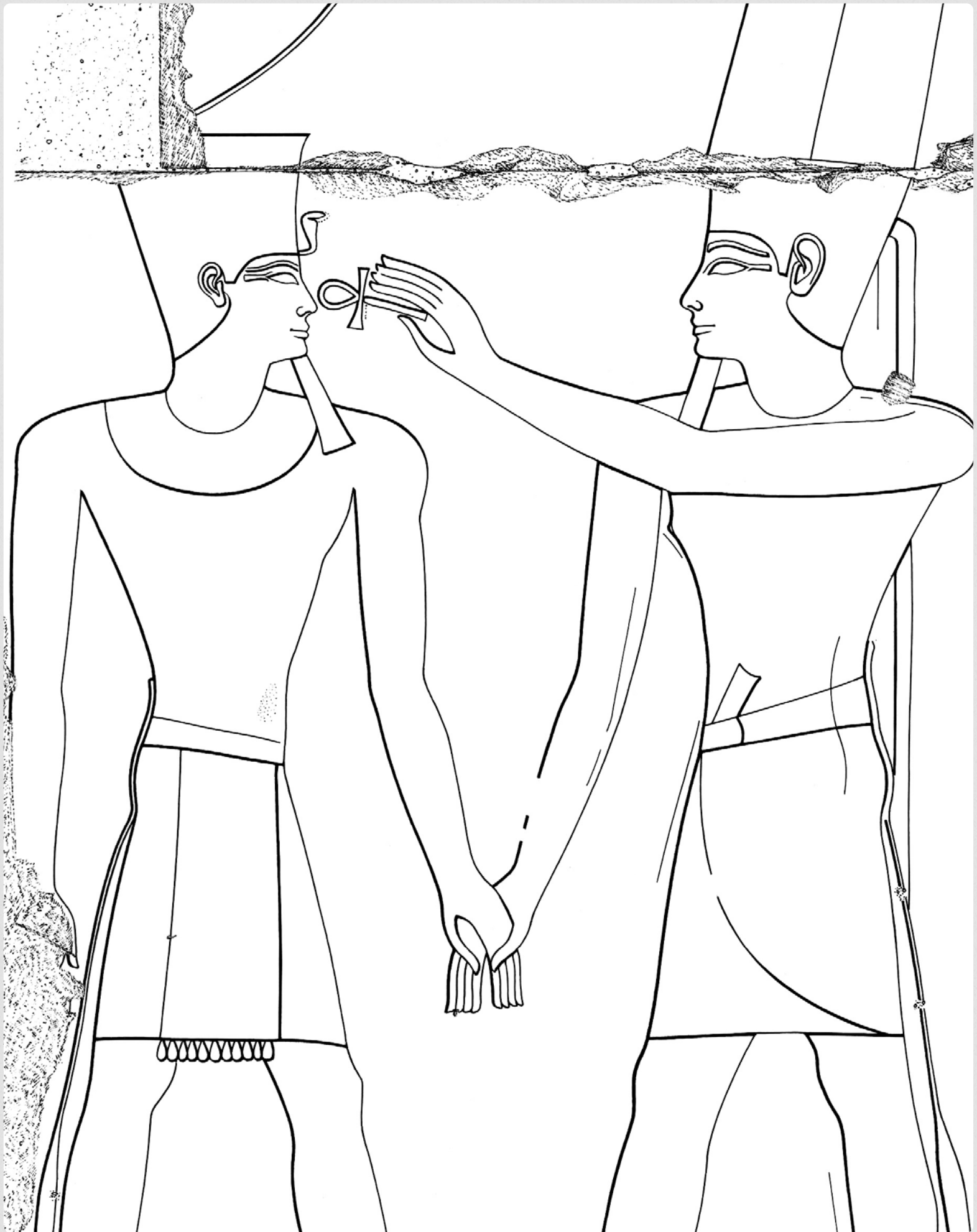
MHB 54 - detail (*Drawing by De Jong*)

Sunk Relief Illustration (*Medinet Habu - Small Amun Temple*)



MHB 118 - detail (*Drawing by Osgood*)

Sunk Relief Illustration (*Medinet Habu - Small Amun Temple*)



MHB 115 - detail (*Drawing by Osgood*)

Architectural Elements

The carved reliefs and inscriptions which are the focus of the Epigraphic Survey documentation efforts are usually found in an architectural setting (except in the case of decorated block fragments) on interior and exterior walls, portals, columns, four-sided pillars, architraves, and sometimes ceilings. The architectural “frame” or boundary of the relief decoration, when included, is rendered in the following ways:

Juncture of two walls (corner):

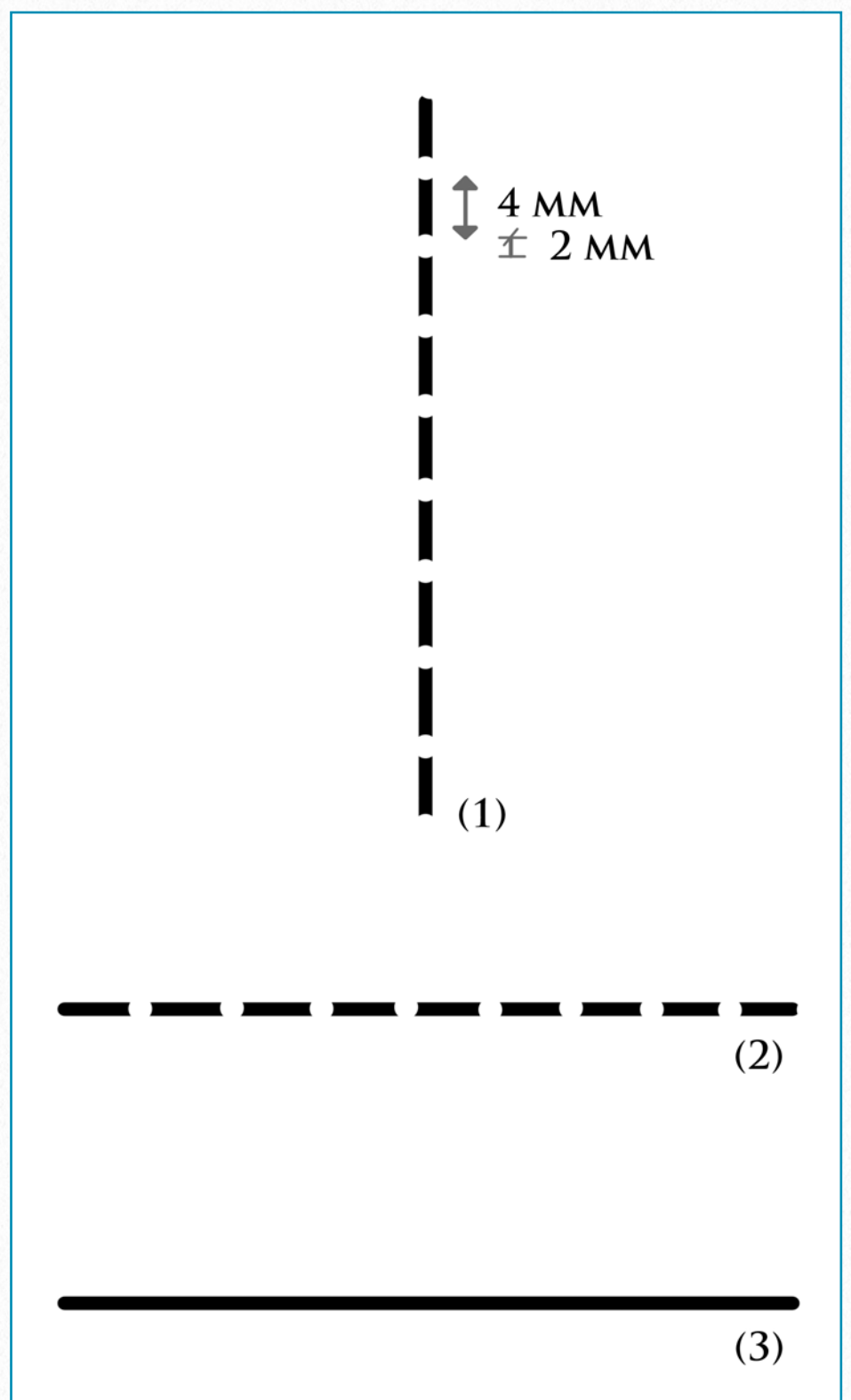
Basic dashed architectural line, shadow line weight (1/.50), rendered vertically. (1)

Juncture of wall and ceiling:

Basic dashed architectural line, full shadow line weight (1/.50), rendered horizontally. (2)

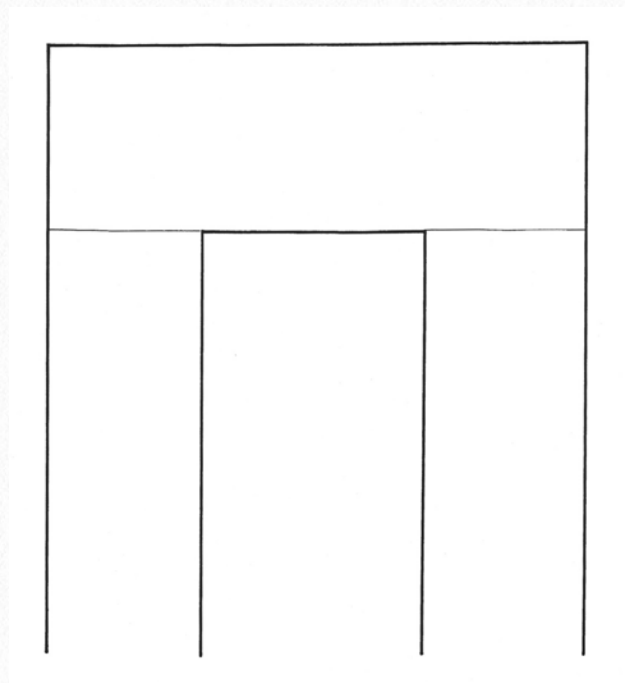
Juncture of wall and floor:

Most ancient Egyptian decorated walls feature an undecorated dado at the ground level (sometimes a meter and a half high) that is rarely, if ever, included in Epigraphic Survey facsimile drawings. The juncture of floor and wall is usually shown in schematic “key plan” drawings of entire walls, where it is indicated with a strong, solid line (1/.50). (3)

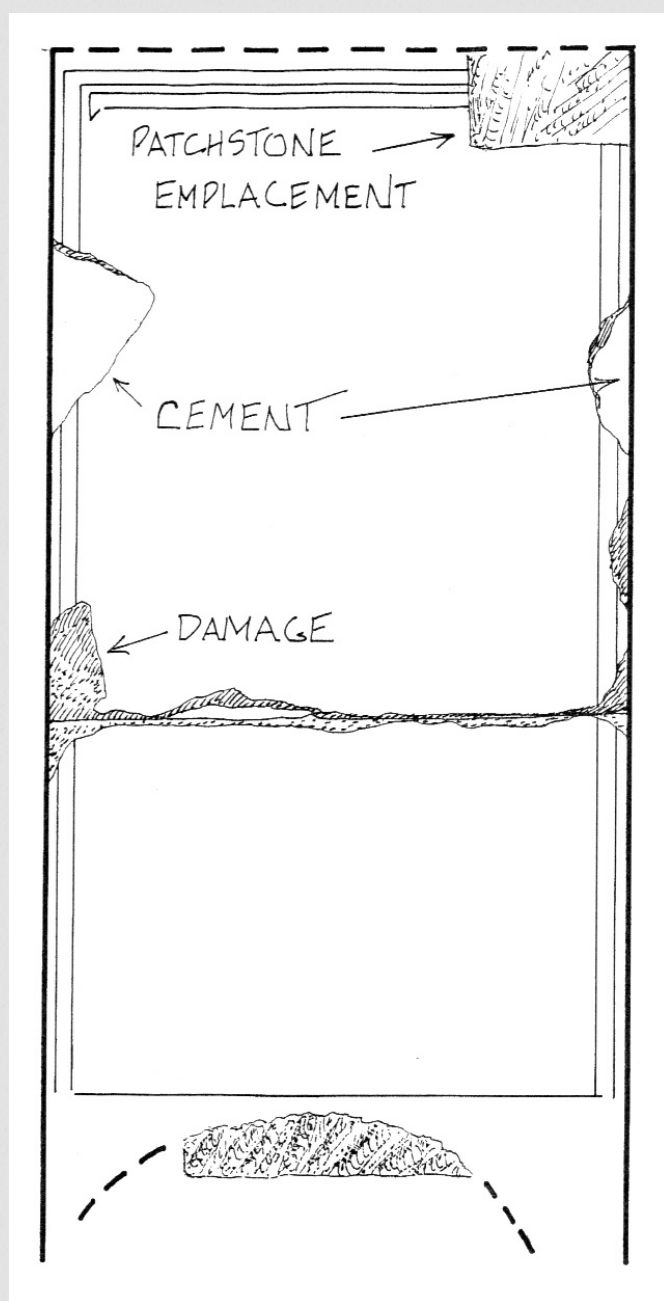


Doorframes:

Doorframes, which consist of *two vertical doorjambs* supporting a *horizontal lintel*, usually project a centimeter or two above the surface of the wall and form a distinct architectural unit unto themselves. All edges of the doorframes (interior, exterior, top) are rendered with a solid shadow line (usually 1/.50).



Flat-Faced Pillars:



The *left and right edges* of each pillar should be rendered in a solid shadow-weight line (1/.50) on all inscribed faces. *Damage* at the side limits of the pillar or cement should be drawn out to the edge to correct perspective.

The *junction of the side pillar faces* (in line with the balustrade) and the *architrave block* above it is indicated in a dashed shadow-weight architectural line (like a ceiling line).

The *balustrade* itself where it abuts the pillar should be rendered in the same dashed architectural line, and if there is a scar on the pillar face where the top of the balustrade was later cut back, the chisel marks of that modification should be indicated.

The chiseled cutting of any similar *late modifications* such as patchstone holes or shaved-down areas around patchstones should also be indicated by the artist.

Cylindrical Columns:

Decoration on curved column surfaces is always “*unfolded*” (usually by tracing) and drawn flat, with no reference to outer edges indicated on the facsimile drawing. Reduced-scale elevations provide the contextual information elsewhere on key plates.

Faceted Columns:

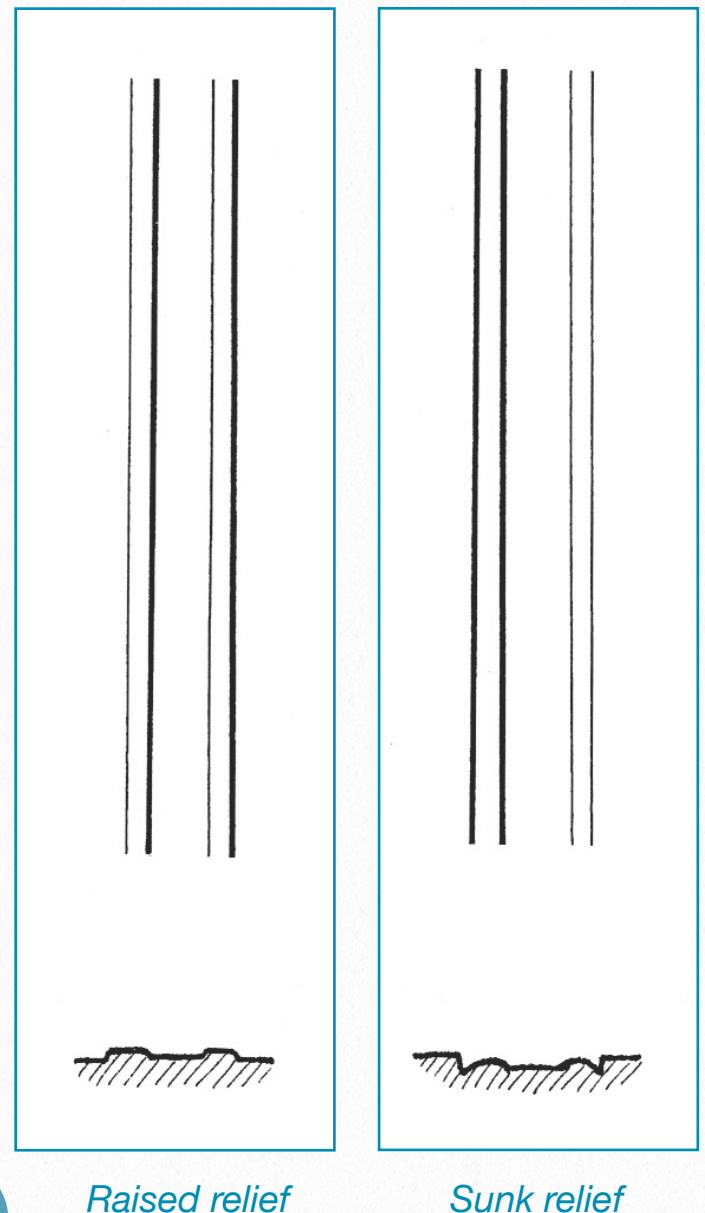
A separate, detailed study volume provides an accurate depiction of the architectural features of columns. For context, the general arrangement of architectural elements are illustrated on facsimile drawings of the decorated surfaces. Facets are drawn with sun lines (4x0/.18). Raised facets with inscriptions (such as *MHB 171* and *MHB 173*) are outlined with the *architectural line convention* (1/.50). Bases of the columns are shown resting on the *current* floor level.

Border Elements:

Wall and pillar scenes are often “framed” on all four sides by a double border element consisting of two parallel plastic bands that are connected with perpendicular crossbars spaced at regular intervals (often just painted).

At MHB and elsewhere, the border found beneath the carved ground line of the lowermost register is sometimes rendered only in paint, and does not survive. In our conventions for both raised and sunk relief, the two bands are treated as one element, (even if appearing with no more depth than a scratch) and represented as illustrated.

Sometimes, particularly on pillars, steel beams - or other types of modern structures - have been affixed so that they cover inscribed areas. In this case, the ink lines simply end where the carving is completely covered and the obscured area is left blank. In the publication, the reason for the blank area is explained in the commentary.



Balustrade:

The *top of the balustrade*, from a *front view*, is drawn with a solid architectural line (1/.50). It can be an irregular line. The juncture of the *front face* with the *receding bevel* is drawn with a sun line (4x0/.18).

Bevel:

On *pillar faces*, a *bevel* (resulting from the cutting back of the inscribed surface for architectural fitting) can be rendered three dimensionally by stippling.

Torus Molding:

- **Architectural features** - only the *existing* torus molding is drawn, using a solid architectural line (1/.50) for the outer edge and dashed architectural line (1/.50) for the advancing plane at the juncture with the wall. Modern architectural reconstruction of any kind is *omitted*. When the torus molding is *faceted*, it can be indicated with a sun line (4x0/.18). Depiction of architectural curvature by modeling or stippling is omitted. *Damage* is shown where the torus is broken off at its upper or lower limits. Existing plaster may be drawn within damaged areas to show the repaired area where there is an indication of a *torus emplacement* remaining. However, plaster on the surface of the existing torus molding is omitted.
- **Surface area** - any *carved relief* and/or incised decoration on the torus molding is drawn with a sun line (4x0/.18). Damage and paint are drawn with trace weight lines (6x0/.13).

Additional Architectural Information:

For context and alignment, it is helpful to pencil the architectural features adjacent to the scene being recorded. For instance, in the *MHB Kushite Portico* drawings the “screen” blocks are inked and the torus molding, column bases, and adjacent side columns are penciled only.

Patchstones, Holes:

Post-antique period architectural modifications to the inscribed walls in the form of chiseled patchstone, tether, and beam holes, etc. should be carefully indicated by the artist since they provide important archaeological information concerning the latest, pre-modern phases of the monument's use.

When a *patchstone* projects beyond the carved surface it is outlined with a shadow weight line (1/.50). If the patchstone is *flush* with the carved surface, that juncture is indicated with a trace weight line (6x0/.13).

Intact *inscribed patchstones* (reused blocks) are outlined similarly but the carved surface is inked in a single, sun weight line (4x0/.18). If decided, a detail of the reused block will be drawn separately with regular sun/shadow conventions.

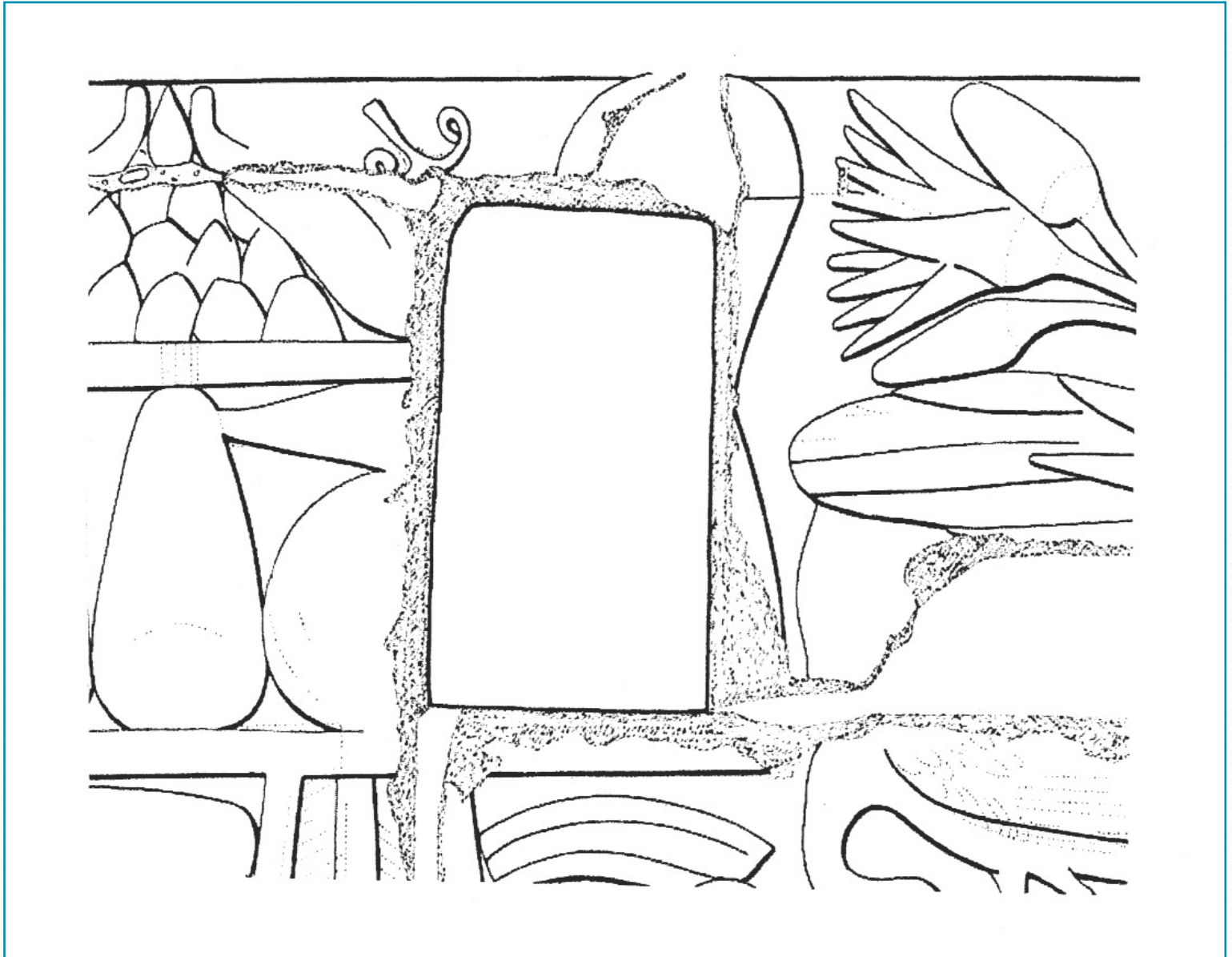
Patchstone emplacements, where patchstones have been removed or have fallen away, are treated as damage with the characteristic dimensional shape and chiseling clearly recorded.



MHB 84 (detail) - Drawing by di Cerbo and Vértés

Holes:

Holes piercing the full depth of the wall or pillar should be outlined in a solid shadow weight line (0/.35).



MHB 75 (detail) - Drawing by De Jong

Modern Modifications:

When steel beams or other types of *modern* structures or constructions have been affixed to walls or pillars so that they cover inscribed areas, *older photographs* can be used for reference, when available, to complete the facsimile drawings. In the event there is no reliable reference, the ink lines simply end where the carving is completely covered and the obscured area is left blank. In the publication, the reason for the blank area is explained in the commentary.



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To **download** the demonstration material for this Section, click on the following link:

https://www.dropbox.com/sh/4wzses27rssx1ew/AAB6DyiF0Gx0cv_6KVXUMAUsa

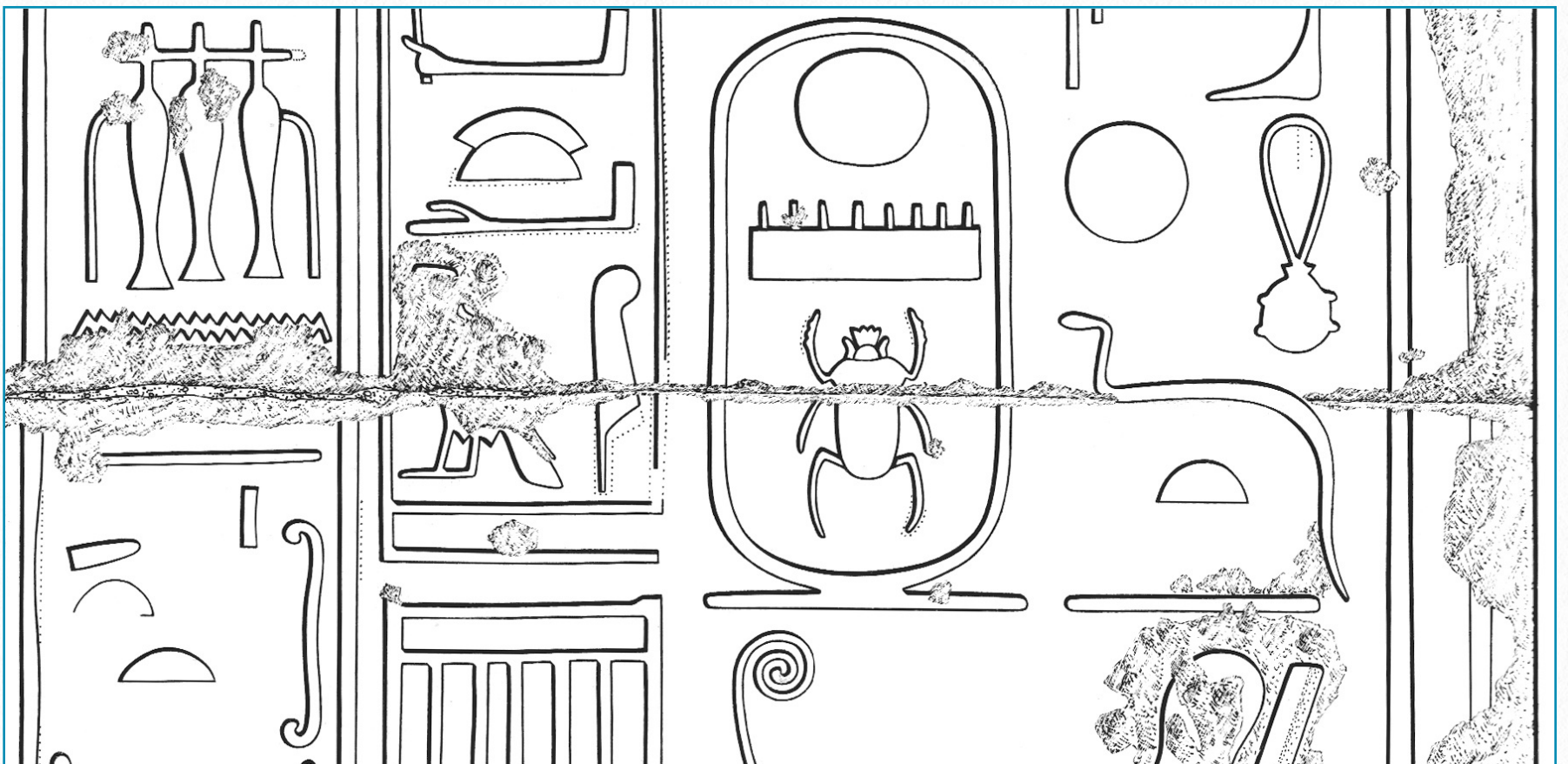
Architectural Obstructions

In the history of a monument, several stages of development can have occurred over time. When later buildings, walls, or other edifices have been added so as to nearly obscure earlier inscriptions, it might be possible to record those carvings by employing any number of resourceful methods.

In the case of an inscribed stone and a wall obscuring it but sitting only a few centimeters away, an artist might use a three-dimensional “rubbing” by placing panels of aluminum foil between. The rubbing might then be “traced” over, scaled down to the required size, and then transferred to enlargement paper to produce the obscured inscription. The obscuring blocks are drawn in a dashed trace weight line (6x0/.13) on the drawing.

Block Lines:

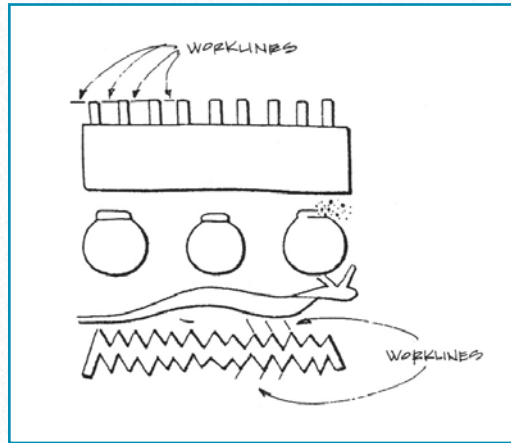
A block line is a trace weight line (6x0/.13) used to render the *interstices between block edges* when the area has been damaged and the edges can be seen. If the juncture is visible, the block line is shown and is cut when the surrounding damage is cut.



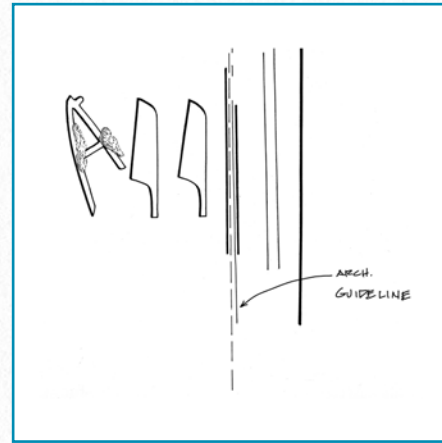
MHB 84 (detail) - Drawing by di Cerbo and Vértés

Work Lines and Guide Lines:

Work lines, which may extend beyond the actual carved line, are considered unintentional and are *not* rendered. *Incised architectural guidelines* are drawn with a single trace weight line (6x0/.13). An example of an incised guideline can be seen on the MHB facade.



Work lines

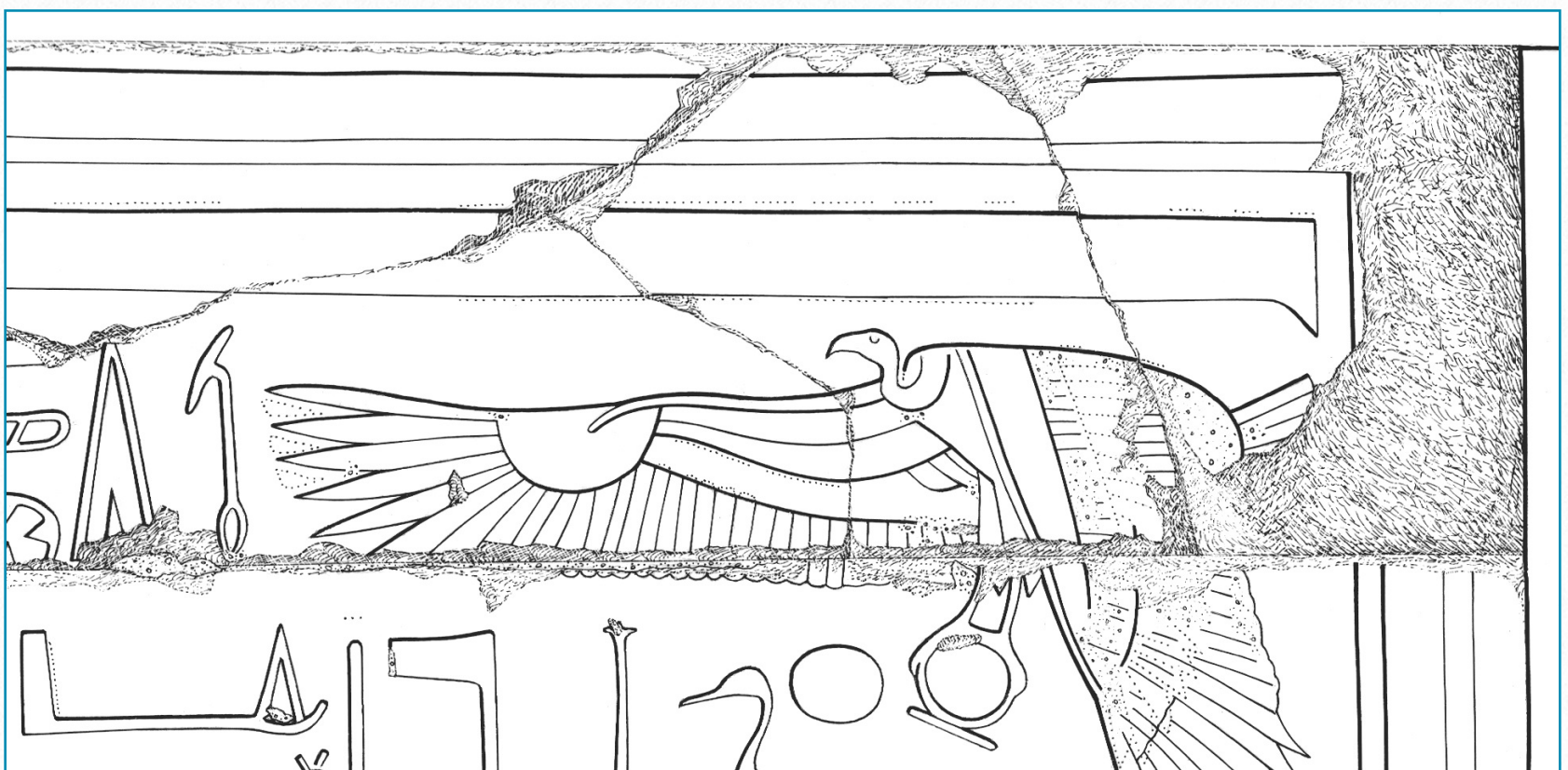


Architectural guideline

Damage:

In general, damage is only shown when the carved line has been interrupted. With some exceptions, damage shall not be shown in any damaged area which has never been carved.

Damage is rendered by a series of short trace weight lines which are subsequently broken (that is, cut with a scalpel) after the collation corrections have been completed. Deeper damage can be shown with more closely spaced lines and shallow damage with less spacing for a three-dimensional appearance.



MHB 118 (detail) - Drawing by Schenck and Osgood

Exceptions:

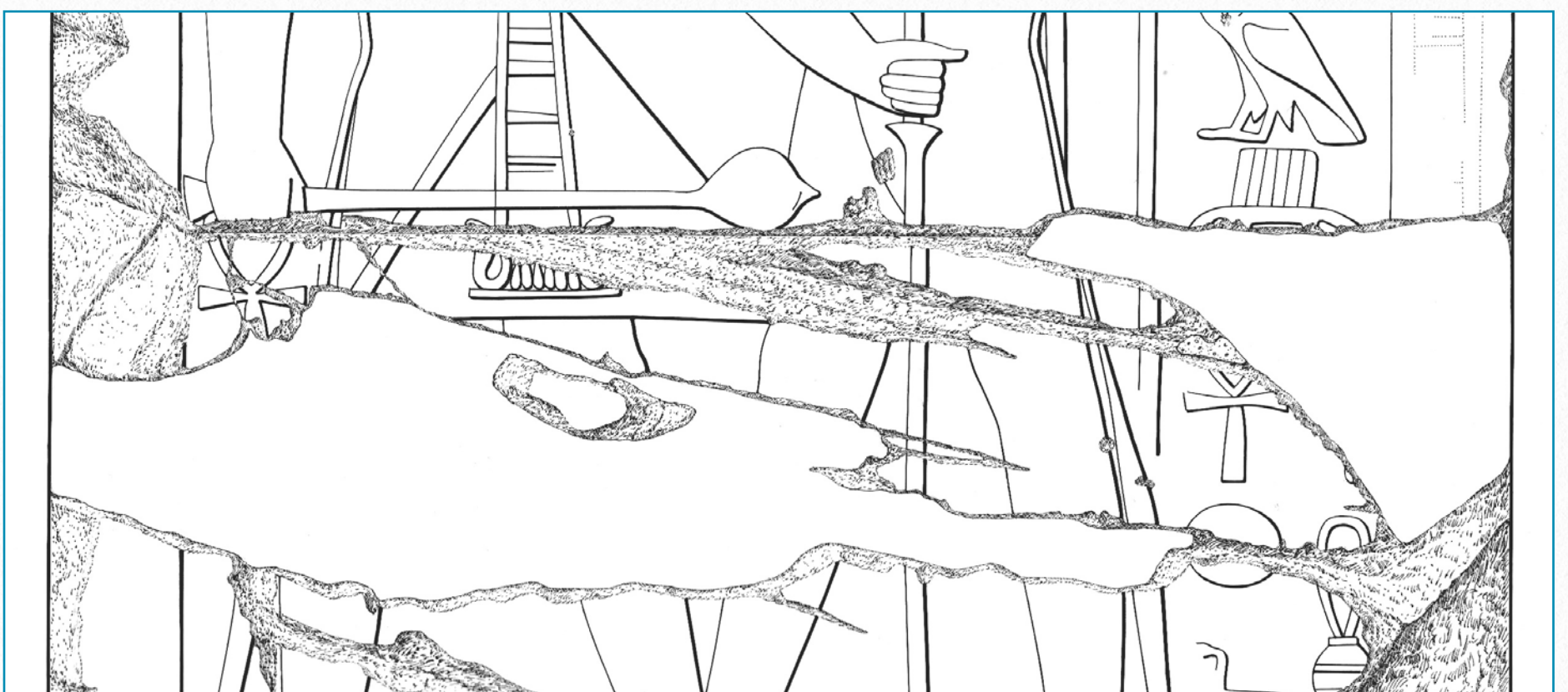
In summary, damage not interrupting carved lines can be shown on facsimile drawings when the walls show damage resulting from *deliberate mutilation*, usually medieval chisel blows. In very rare cases, after due examination and study, modern damage can also be shown if necessary to an historical understanding.

Damage is omitted when pebbles or other stone inclusions interrupt a carved line, in which case the interrupted line is left blank. When pebbles or other stone inclusions which have interrupted a carved line have fallen away, the remaining hole may be rendered as damage.

Cement:

Usually, *modern cement* filling the broken edges between block courses and other holes in the walls can be outlined with a trace weight line (6x0/.13) and left blank. Cement lines are broken or cut after collation corrections are completed, along with damage.

In many cases, however, photographic documentation exists either in Chicago House archives or other collections. Portions of the inscriptions, when existing, can be copied from these images, as can damaged edges and/or holes which are now mortared over, giving more complete information.



MHB 121 (detail) - Drawing by Johnson and Osgood

Plaster:

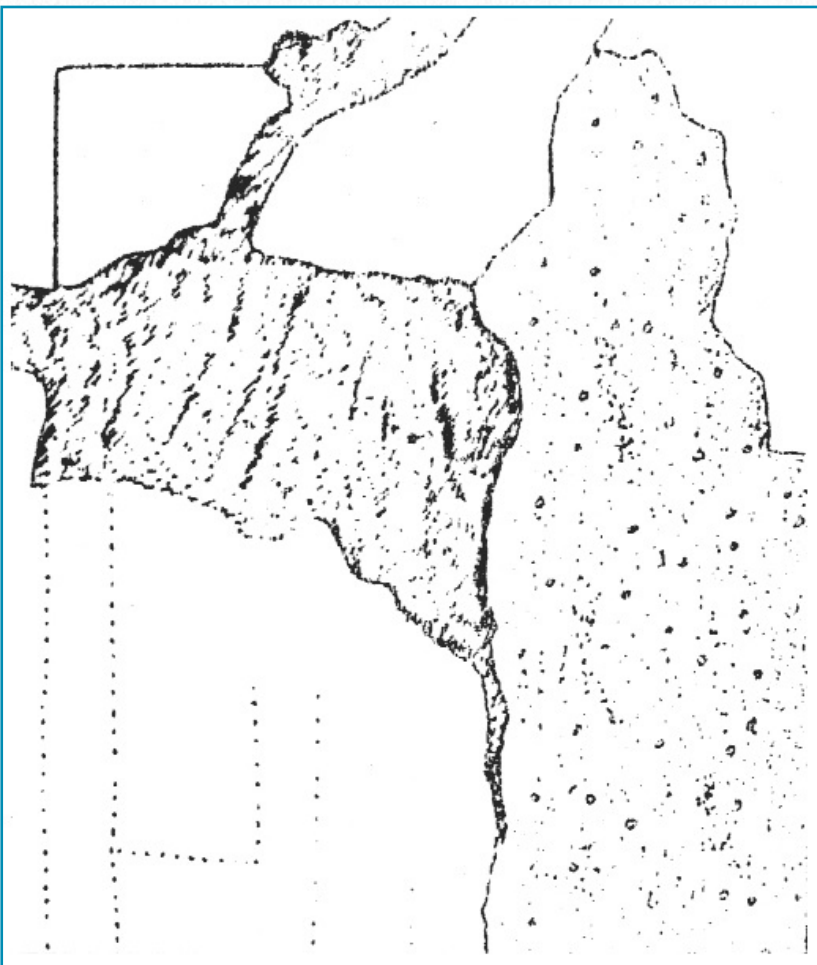
The plaster convention is rendered as widely spaced dots and small open circles placed at random using a trace weight pen (6x0/.13) in an outlined area (which has obscured the carved lines). Plaster is *not broken or cut* when damage is cut.

Usually, plaster is *not* indicated by the artist when it forms the *finished surface* of the wall.



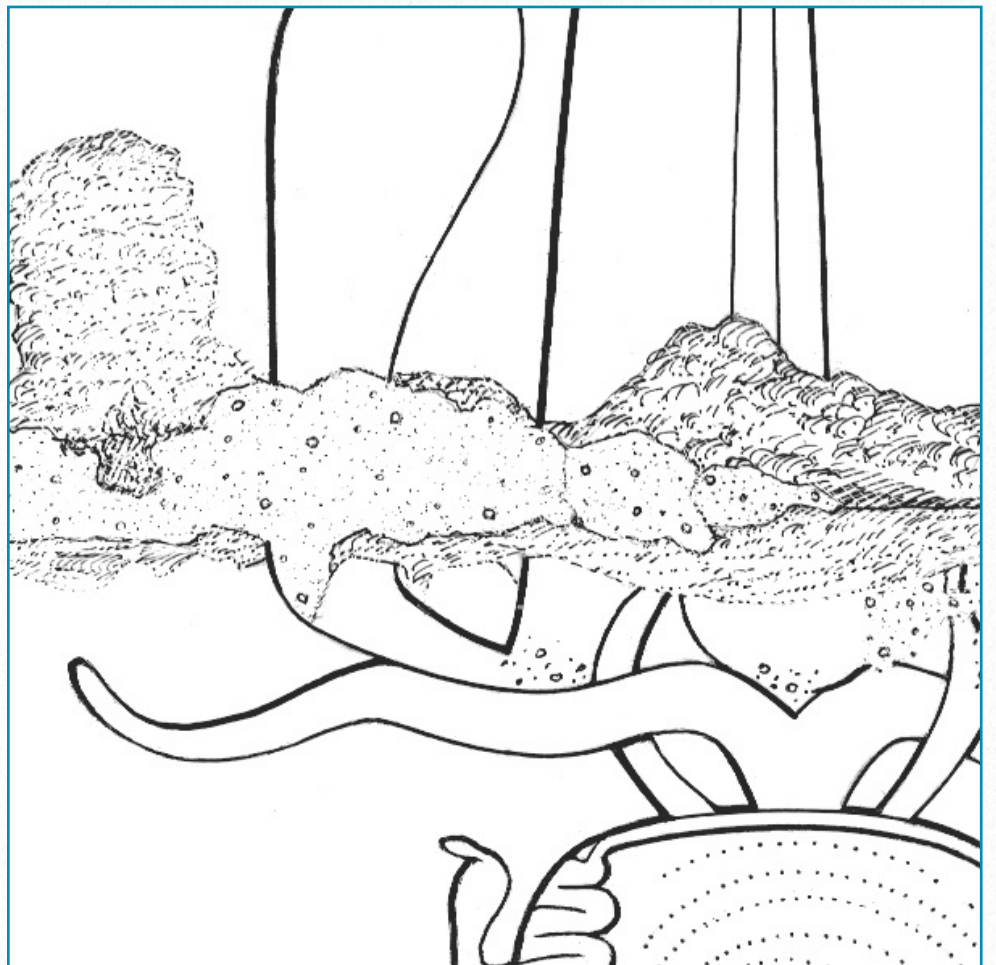
Plaster convention

Plaster Is Indicated:



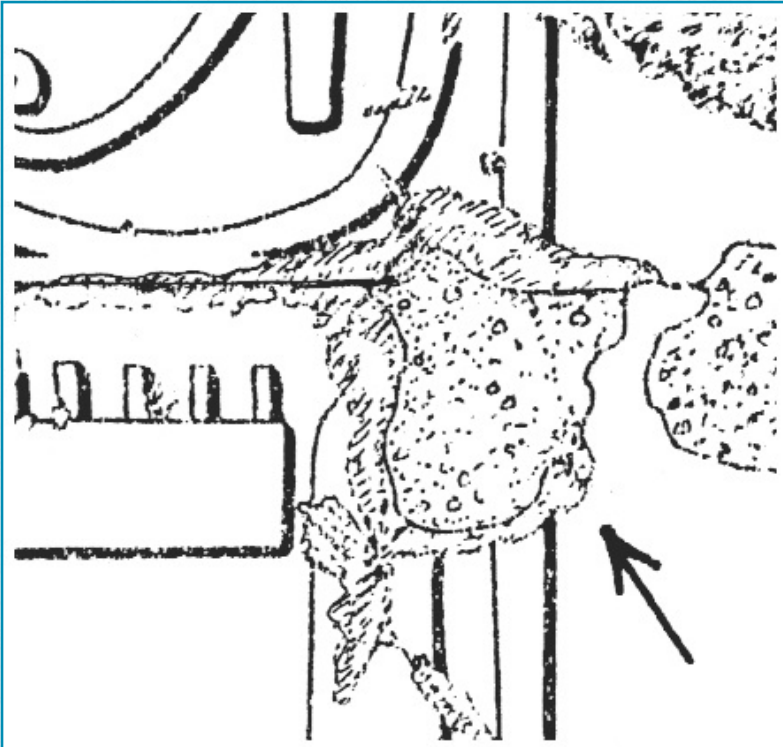
MHB 53 (detail) - Drawing by De Jong

...when it is Roman "filler" plaster as found in the back area of MHB.



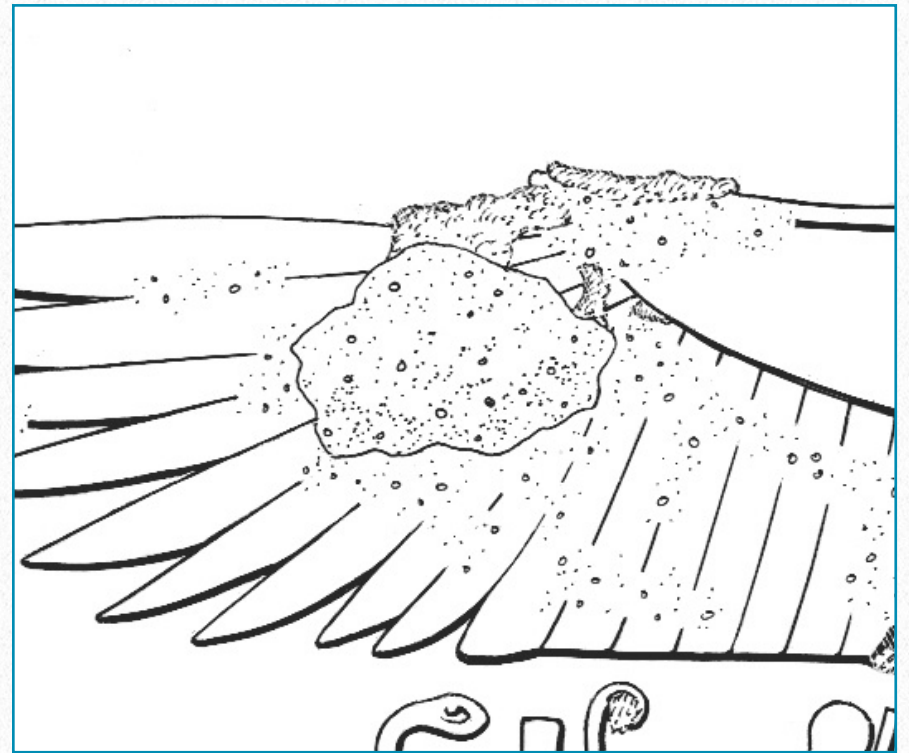
MHB 118 (detail) - Drawing by Schenck and Osgood

...when it is exposed in a damaged condition between block courses.



MHB 19 (detail) - Drawing by Osgood

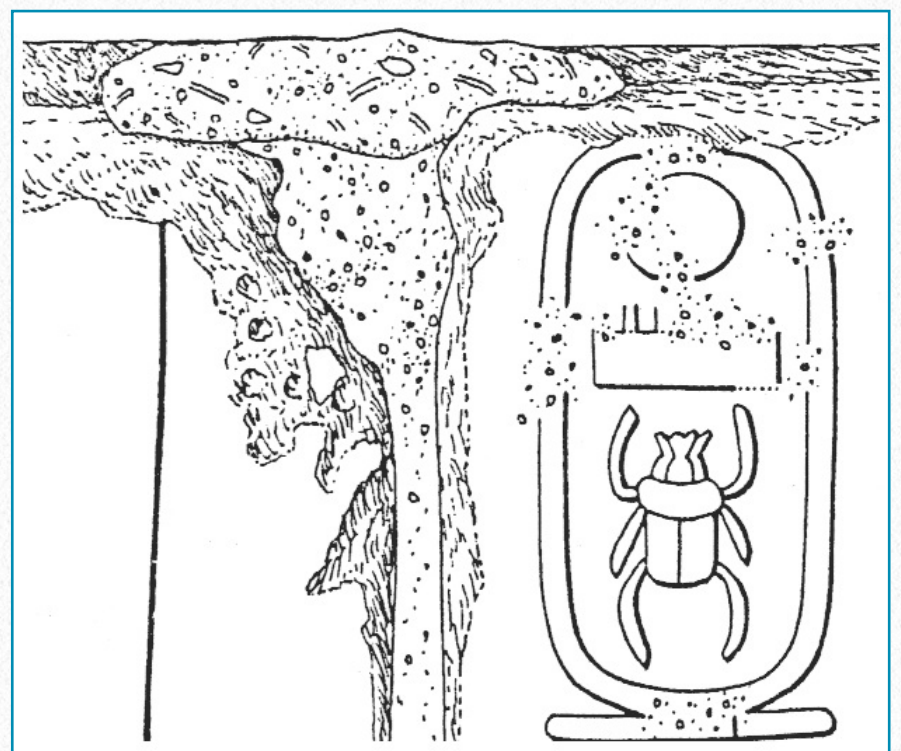
...when accidental or intentional chipping exposes underlying plaster and interrupts the carved line (plaster damage). The artist outlines the plaster area with a trace weight line (6x0/.13) and makes the plaster dots more dense on the upper edge to create the illusion of depth.



MHB 131 (detail) - Drawing by De Jong

...when a plaster "blob" obscures the carved line. The artist outlines the plaster area and makes the plaster dots more dense on the bottom of the "blob" to suggest the illusion of its three-dimensional "raised" nature. Note: small dots of plaster that occur on carved lines are largely ignored and not rendered.

"Mudbrick" plaster is rendered with randomly placed widely spaced dots, small open circles, larger open circles and random double lines (to represent straw).

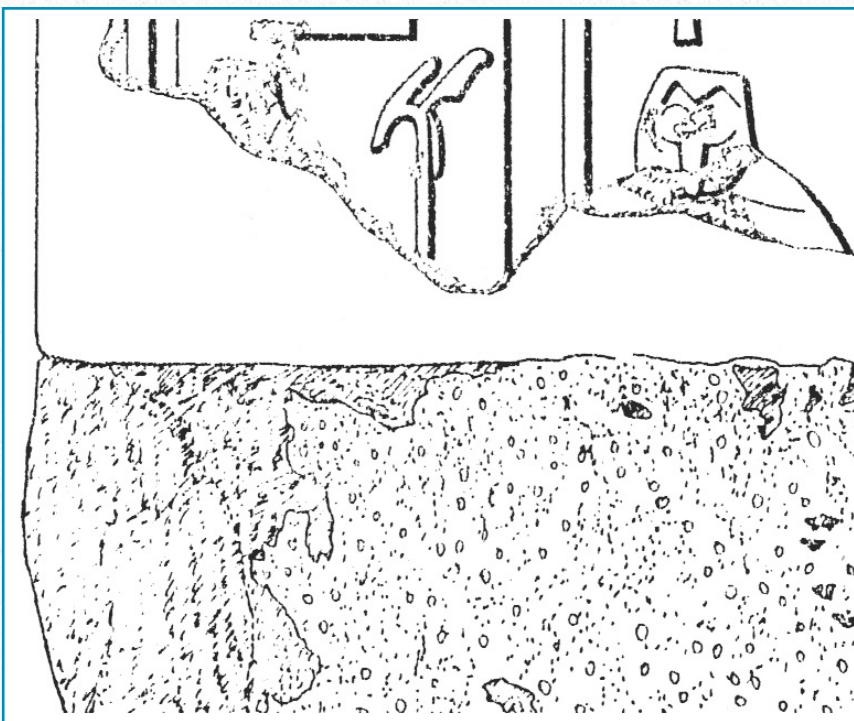


MHB 169 (detail) - Drawing by Osgood



MHB 109 (detail) - Drawing by Osgood

...when a later coating of thick plaster obscures carved lines (*open plaster* convention, not outlined). Because large areas of scenes at MHB are sometimes covered with a plaster wash which partially obscures lines, rather than delineate the entire area of plaster-covered surface with the open plaster convention, plaster shall be indicated only where the line is *obscured* and left not outlined. If one side of the obscuring plaster begins with a defined edge but extends into a larger area, it can be rendered as a combination; outlined and not outlined.



MHB 21/22 (detail) - Drawing by Osgood

...when a patchstone or block is missing and the interior plaster or mortar is exposed.



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To **download** the demonstration material for this Section, click on the following link:

<https://www.dropbox.com/sh/iem25q0tp1zyvc1/AABnTsVj0gPIJUHFL2QSy3ena>

Recut or Restored Figures and Inscriptions

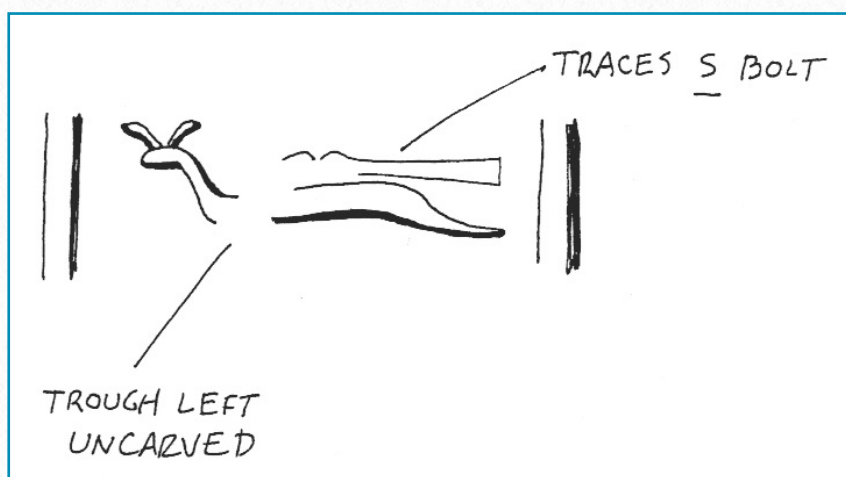
Hatshepsut figures, cartouches, and text, recut by Thutmose III, and deity figures hacked by Atenists and later restored:

At Medinet Habu there are areas recut by Thutmose III where signs and other elements are found inside scooped-out areas where Hatshepsut's original carvings were removed, and where Atenist-hacked deities and inscriptions were smoothed back and recarved within similar depressions.

The *final lines* are rendered as sun and shadow, while any *traces* of the original decoration are rendered in *trace weight line* (6x0/.13):

Uncarved Areas:

Any portion of the decoration which is absent because of chisel blows, smoothing, etc. made while taking back the stone for recarving is shown as uncarved.

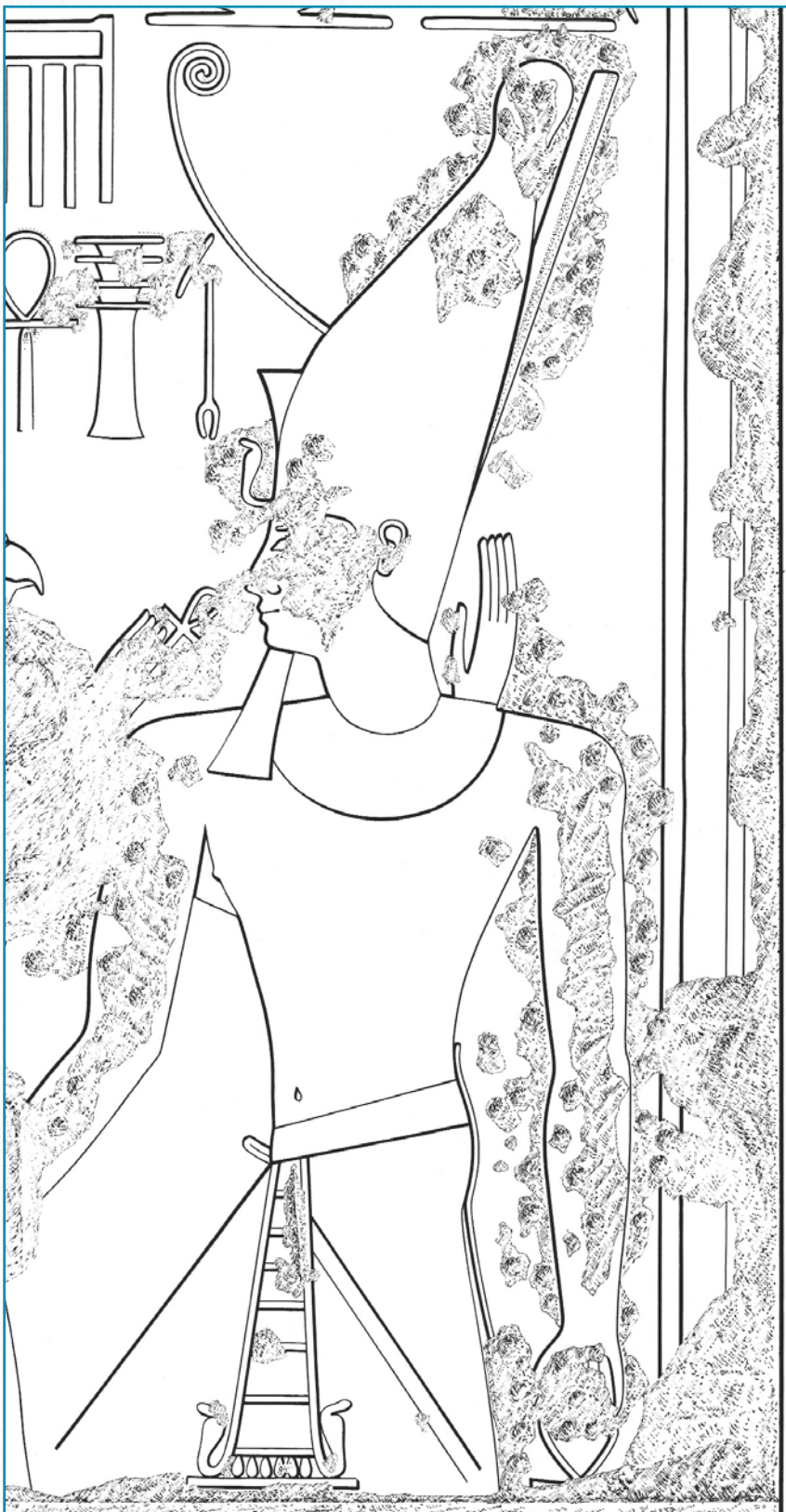


- when hieroglyphs have been erased and/or recarved
- when interior surfaces of cartouches have been taken back and the names recut
- when figures of Hatshepsut have been erased and recarved into offering piles
- when figures of deities have been hacked by the Atenists and subsequently restored

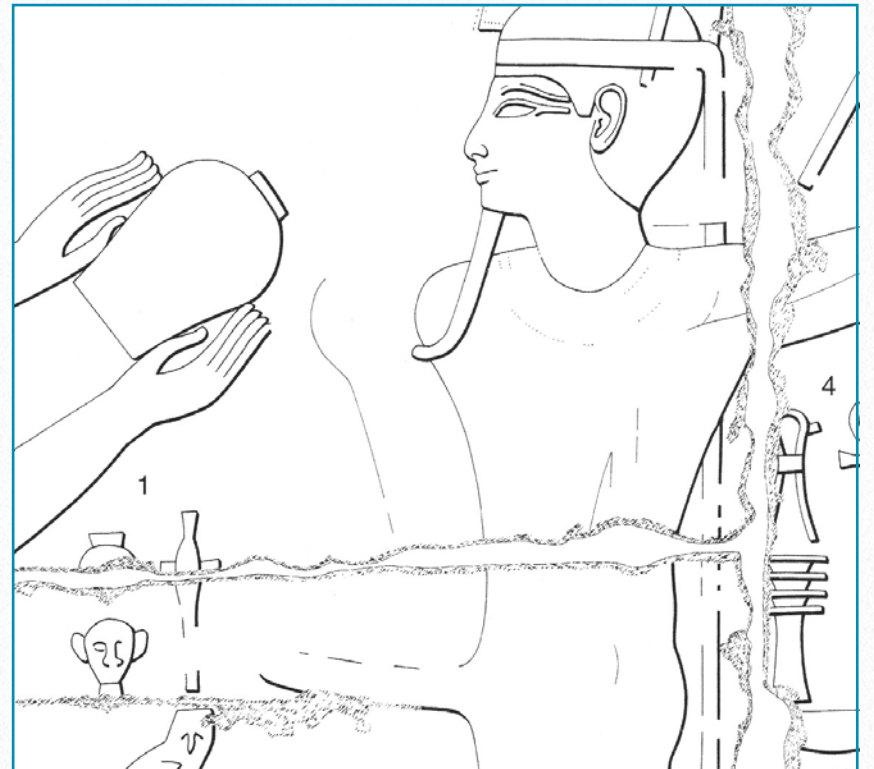
The depth of the final surface (the scooped-out area) should not be indicated on the drawings; it should be treated as the final surface or surface preparation and left blank.

For example, if Thutmose III erased a bolt “s” in an inscription, and replaced it with a viper “f”, and one of the chisel blows used to remove the “s” was very deep, and a portion of the viper skips over this area (probably having been added in plaster), the area of the trough of the deep chisel blow which contains no line of the final Thutmose III carving is shown in the drawing as an uncarved area.

Similarly, if the carved line of a restored deity is interrupted by a deep chisel mark that was originally filled with plaster and carved, but has subsequently fallen away, the area where the line is interrupted by the *Atenist chisel blows* should be left blank.



MHB 84 (detail) - Drawing by di Cerbo and Vértés



MHB 61 (detail) - Drawing by
Heidel, Johnson, and Osgood

Post-antique period hacking:

Post-antique period hacking of figures (particularly faces and limbs) should be indicated by the artist.

If chisel marks were made with a view towards intentionally destroying or mutilating a figure without the intent to rework that figure in any way, such chisel marks within figures should be drawn by the artist, even when they don't actually interrupt a carved line.



DOWNLOAD HERE

To **download** the demonstration material for this Section, click on the following link:

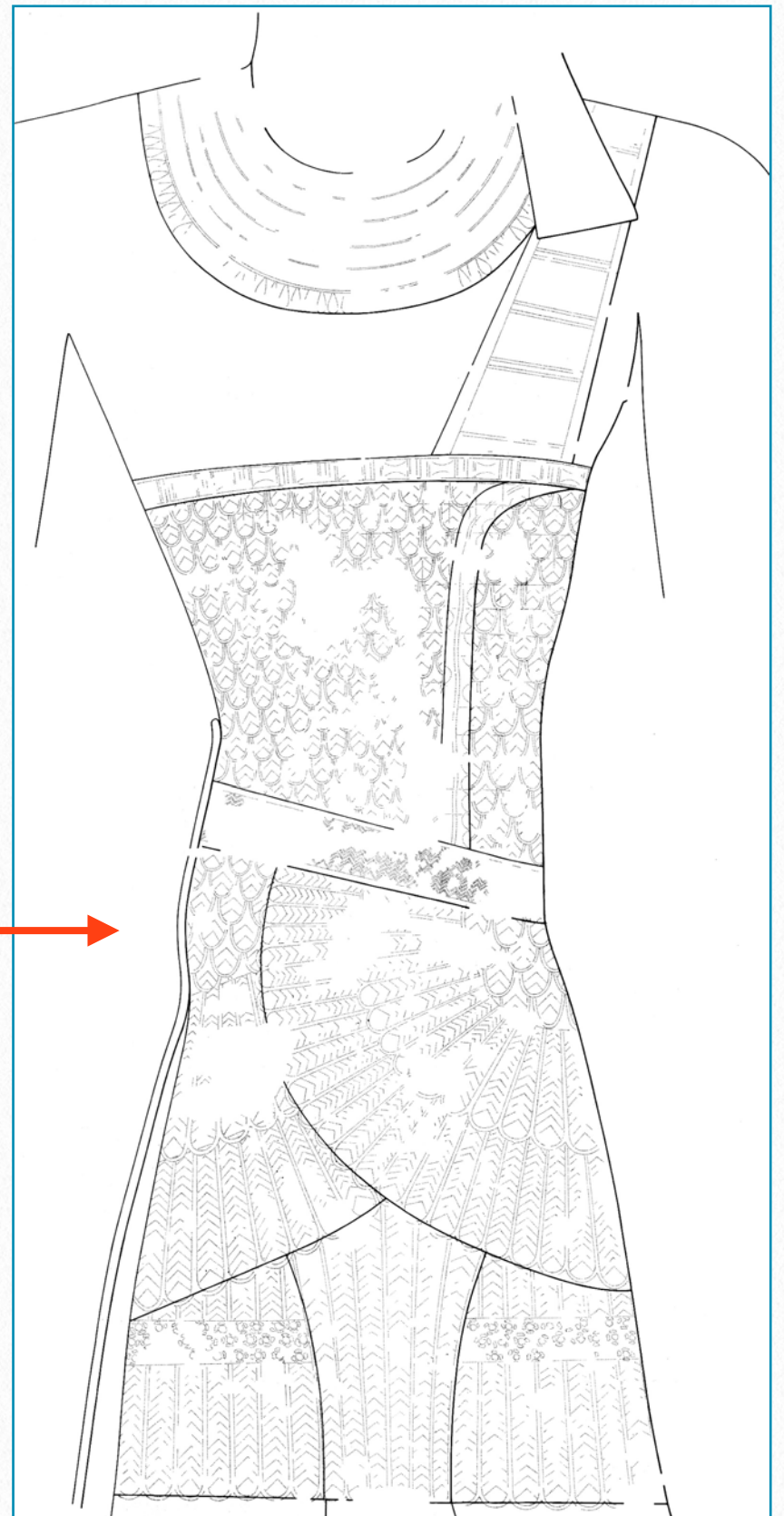
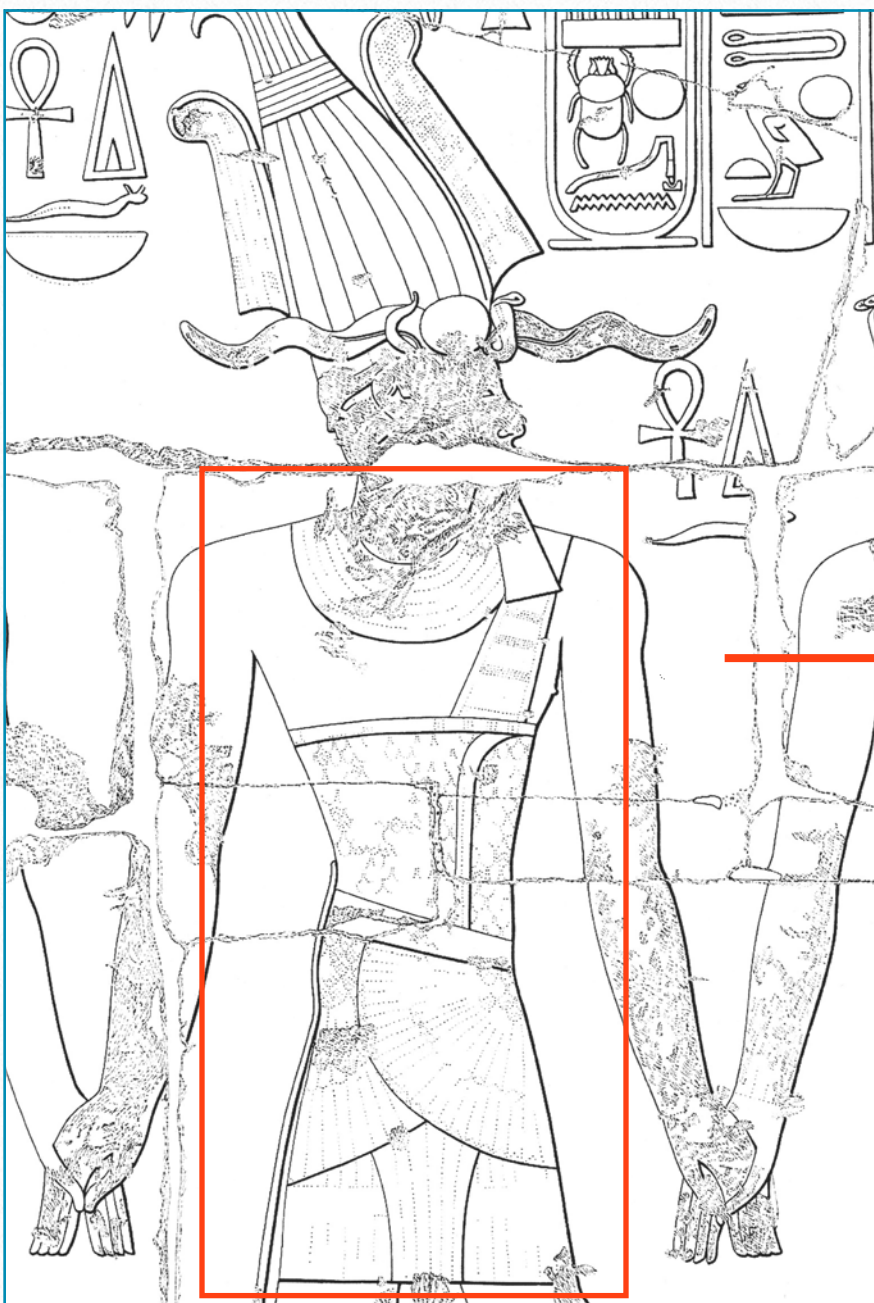
https://www.dropbox.com/sh/384ifx5zt29mc27/AADYCO-3k-80fsSgCOfR0W8_a

Additional Details and Restorations

Paint:

Painted details are rendered as *dotted lines* using a 6x0/.13 pen. Paint lines define actual edges of paint strokes or intentionally painted areas. *Paint flecks* or *spots* of any size remaining within a painted area after abrasion or erosion are *not rendered*.

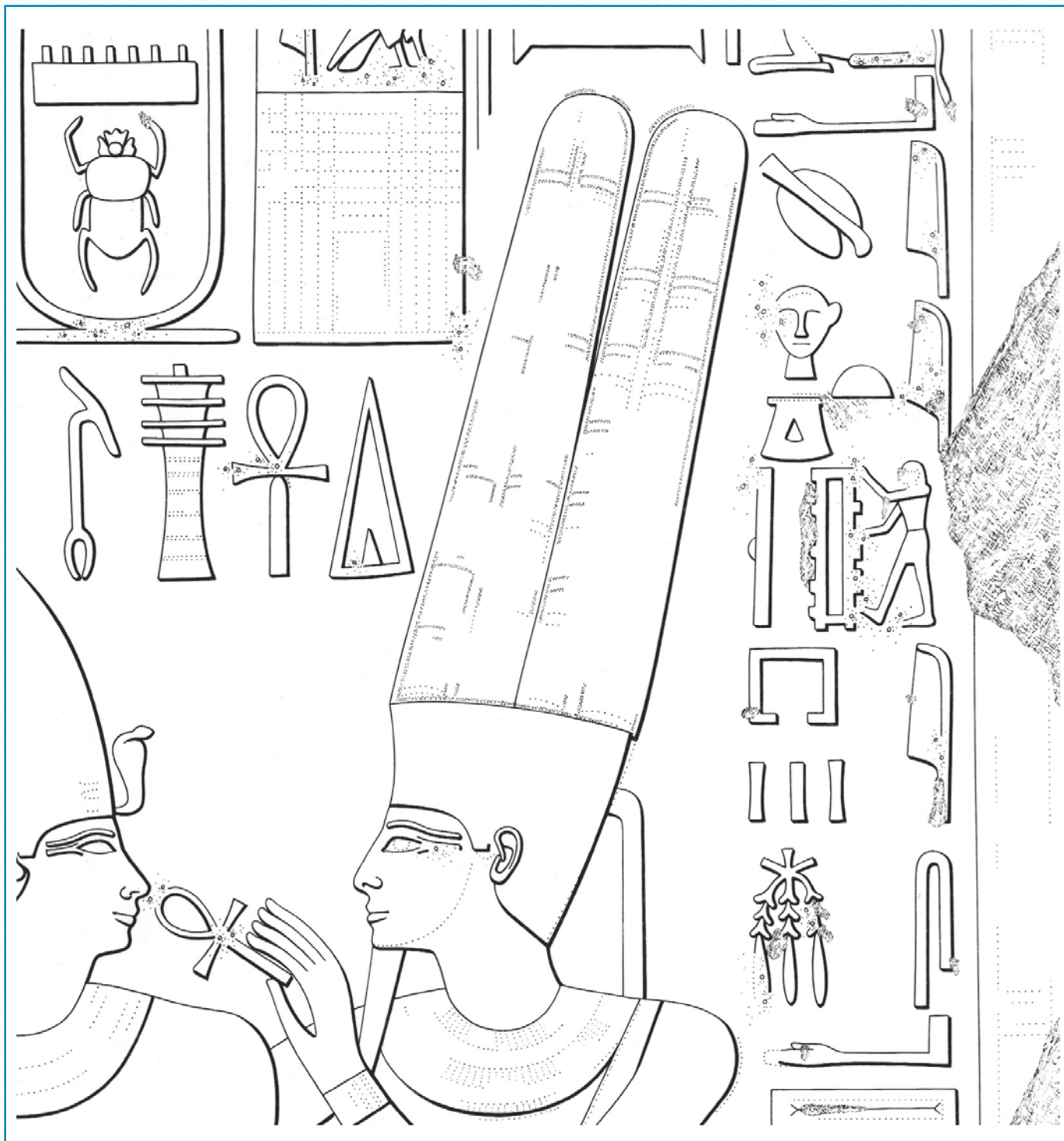
When a paint line and a carved line are in exact alignment, the carved line takes precedence and *no paint line is rendered*.



MHB 17 (detail) - Pre- and Post-conservation drawings by Osgood and Vértés

Multiple Paint Layers:

When there is more than one stage of paint, the latest stage will be drawn in a *more intense* series of dots in trace weight (6x0/.13). This can be a double-dotted line or a completely dotted area depending on the width of the painted detail. The earlier stage will be drawn as usual, as a single dotted line in trace weight (6x0/.13). There may be more than one earlier paint layer. For the present time, the final carved scene will dictate which is the primary paint detailing the case of more than one paint layer. However, multiple paint layers require a case-by-case discussion of the most effective, accurate, and clear way to render painted details. Generally, the treatment of paint will be consistent within a body of work or within a group of joined scenes.

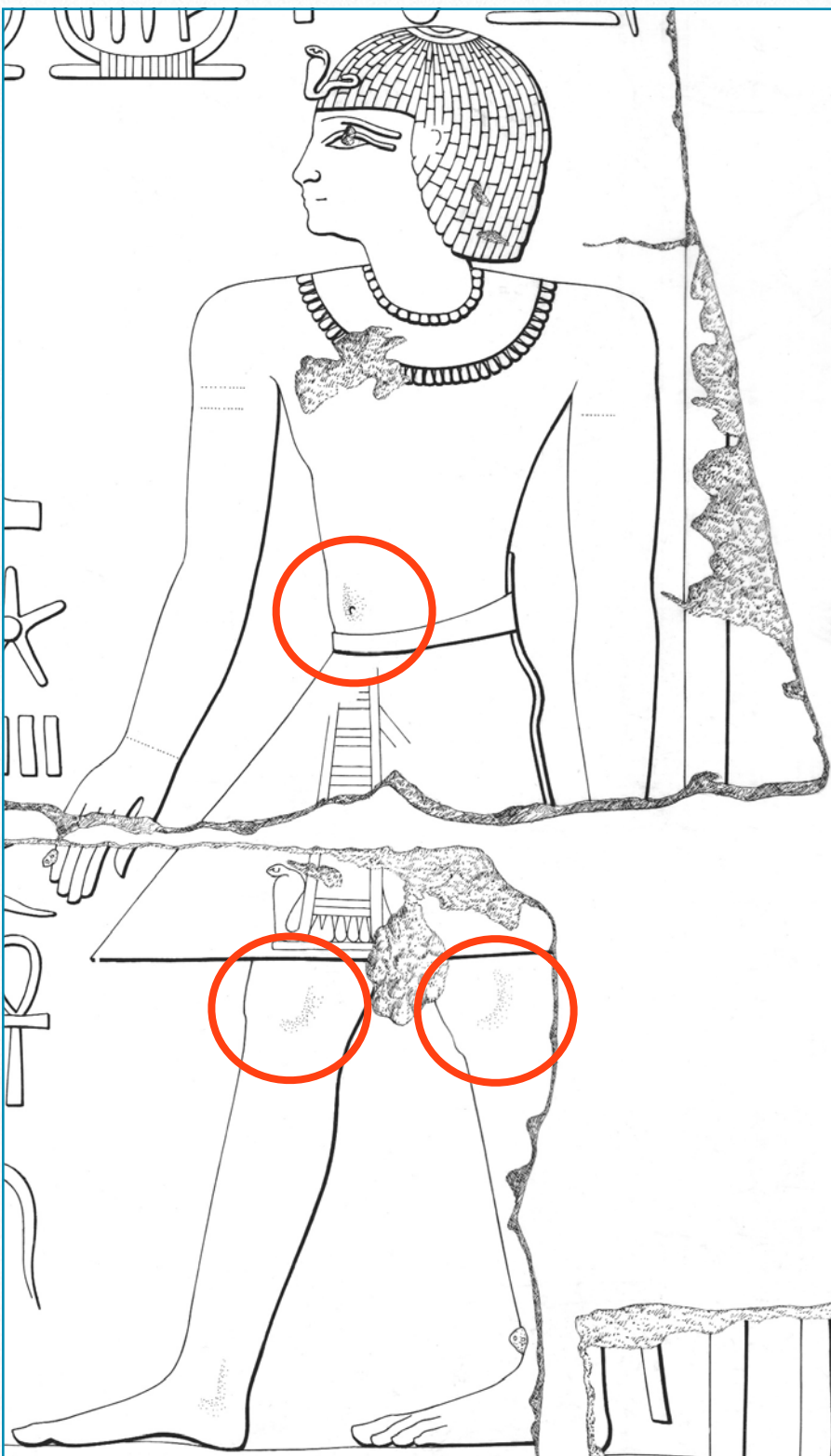


MHB 99 (detail) - Drawing by di Cerbo and Vértés

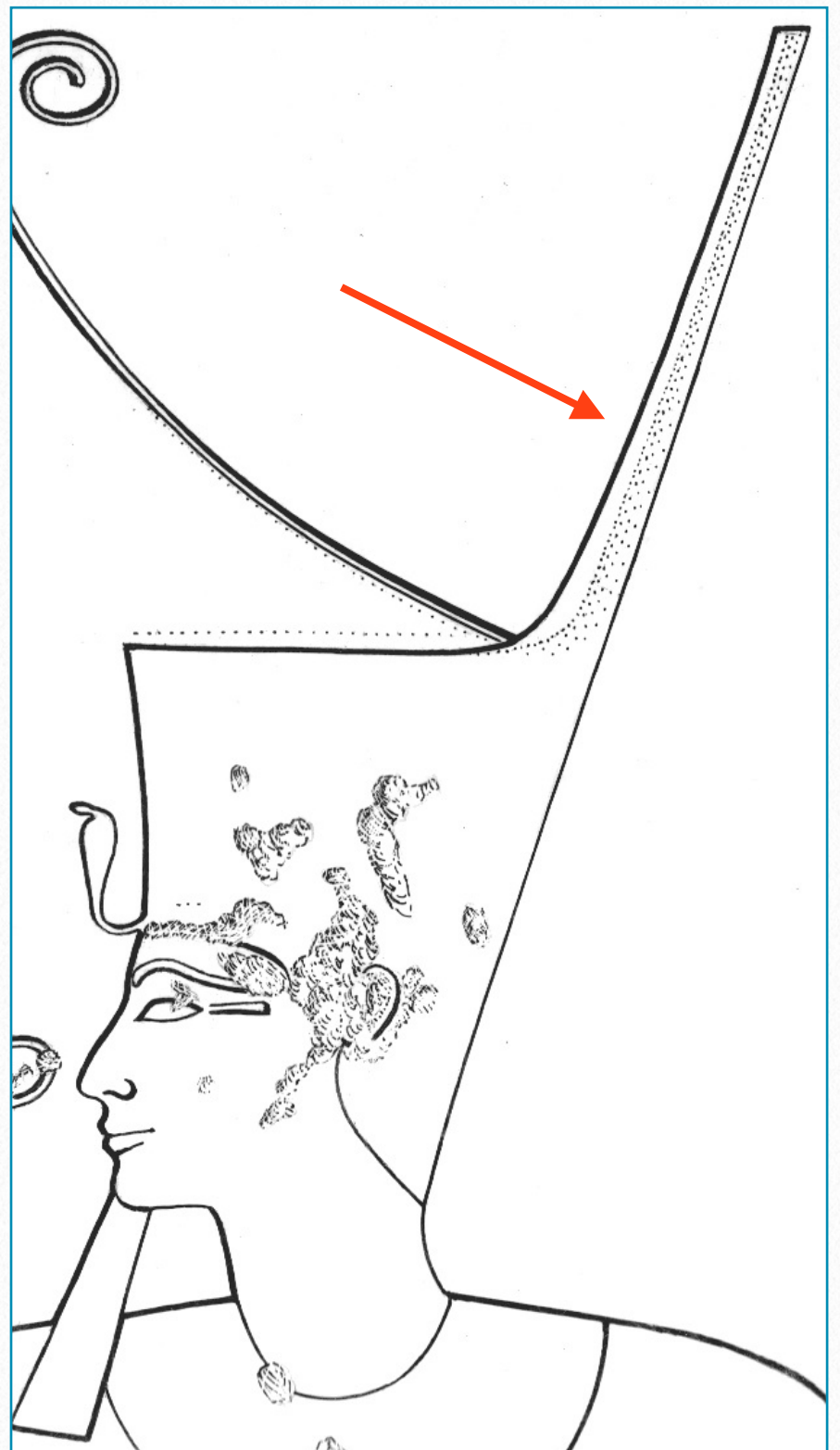
Modeling:

When a certain feature, such as an ankle or a navel, appears not as a carved line but as a sculptured area, it can be shown by *modeling*: that is, *stippling* with a trace weight (6x0/.13) pen. Modeling is used sparingly, usually on larger figures. This holds true in the case of Ptolemaic carving as well.

In some cases, particularly in the ambulatory at MHB, the long, vertical portion of the red crown has a beveled feature. Stippling can be used to render the three-dimensional portion.



MHB 180/181 (detail) - Drawing by De Jong



MHB 121 (detail) - Drawing by Johnson and Osgood

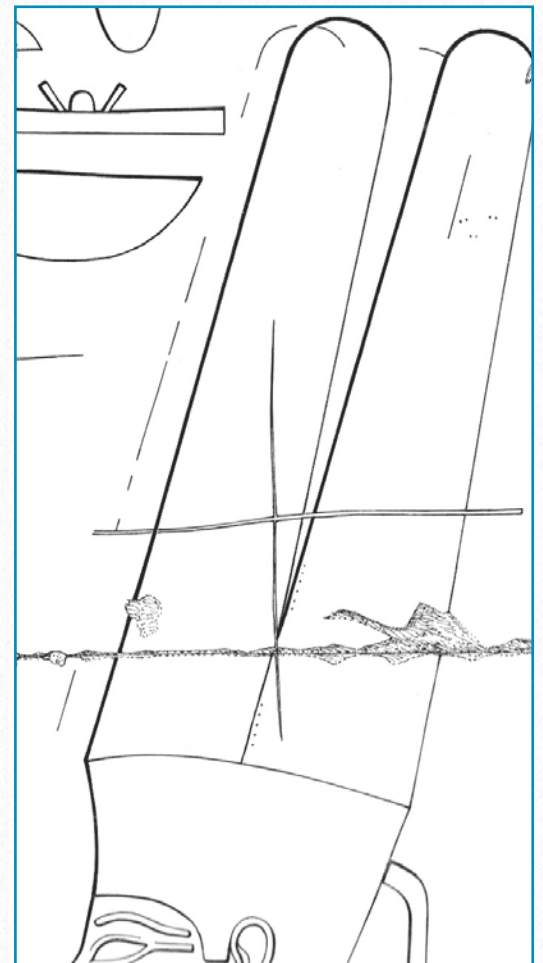
Graffiti:

Pre-modern graffiti (up to AD 600) can be included in the facsimile drawings of the wall decoration or may be recorded on separate plates.

Painted vs. Carved Graffiti



*MHB 92 (detail) - Drawing by
Johnson and De Jong*



*MHB 106 (detail) - Drawing by
Schenck and De Jong*

Guidelines:

Carved graffiti are usually depicted for context in the facsimile drawing using a single sun weight line (4x0/.18). A separate graffiti plate would be used to record the wall decoration in single lines and the graffiti in regular sun/shadow convention.

On graffiti plates, the following guidelines are used:

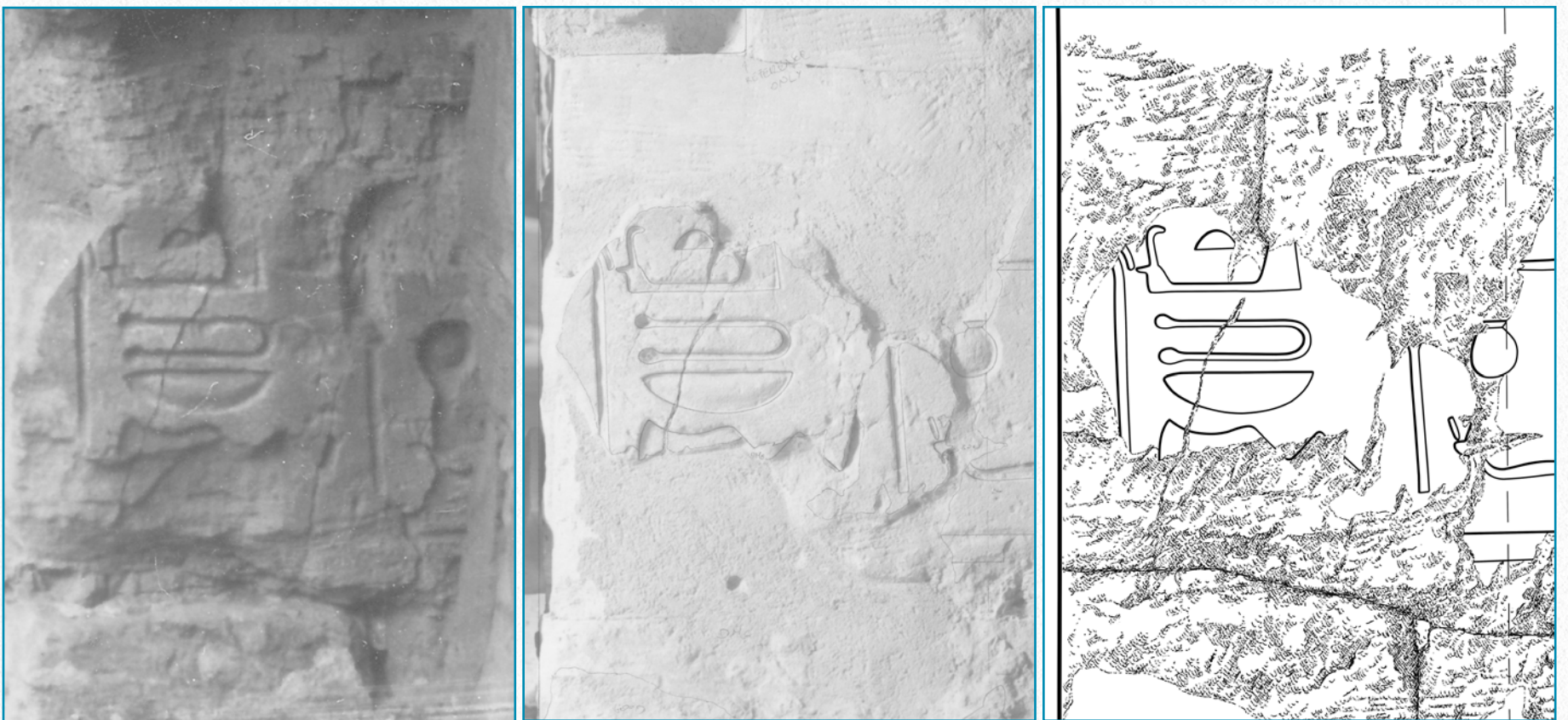
Ink graffiti, whether in red or black ink, are rendered in single lines which are broken or cut (using a scalpel). *Painted graffiti* are outlined with dotted lines, trace weight (6x0/.13).

Note: It is possible that a previously published graffiti, which appears in a scene currently being recorded by the Survey, may be chosen for incorporation in the final production stage of the facsimile drawing. In this instance only enough of the graffiti needs to be penciled for accurate alignment.

Restorations:

Inscribed elements or parts of signs now lost but appearing in earlier Chicago House photographs are rendered in regular sun/shadow convention. The artist will add a note in ink recommending the use of the alternate photograph for reference during collation. This note will include the negative number.

(In previous Survey publications, restorations from earlier Chicago House photographs have been recorded in dashed lines.)



*MHB 4s (detail) - Earlier photograph, recent photograph, and inked drawing
Drawing by Vértés*

Inscribed elements or parts of signs now lost and not appearing in earlier Chicago House photographs but appearing in other old photographs are rendered with a dashed line in regular sun/shadow convention.



DOWNLOAD HERE

To **download** the demonstration material for this Section, click on the following link:

https://www.dropbox.com/sh/0o2hn5fge0b3ogp/AAD_MLX7R9nhHs6s-W7RU-0Ea

3

Digital Drawing Tools

Introducing and customizing Photoshop, setting up the Wacom tablet and the digitizer pen, and exploring additional hardware options



Image credit:http://kellyfinan.files.wordpress.com/2010/05/dsc_0007.jpg

In this chapter we explore the digital environment in which the final Chicago House inked drawings are created. Although dealing with buttons and sliders while holding our pen might seem to be a bit alien at first, it will nevertheless be worth the effort

to learn to customize and to change the appearance of our artwork. We won't master Photoshop by the end of this chapter, but we'll get to know what kind of features can be useful for enhancing the Chicago House Method as we know it.

Introducing Photoshop

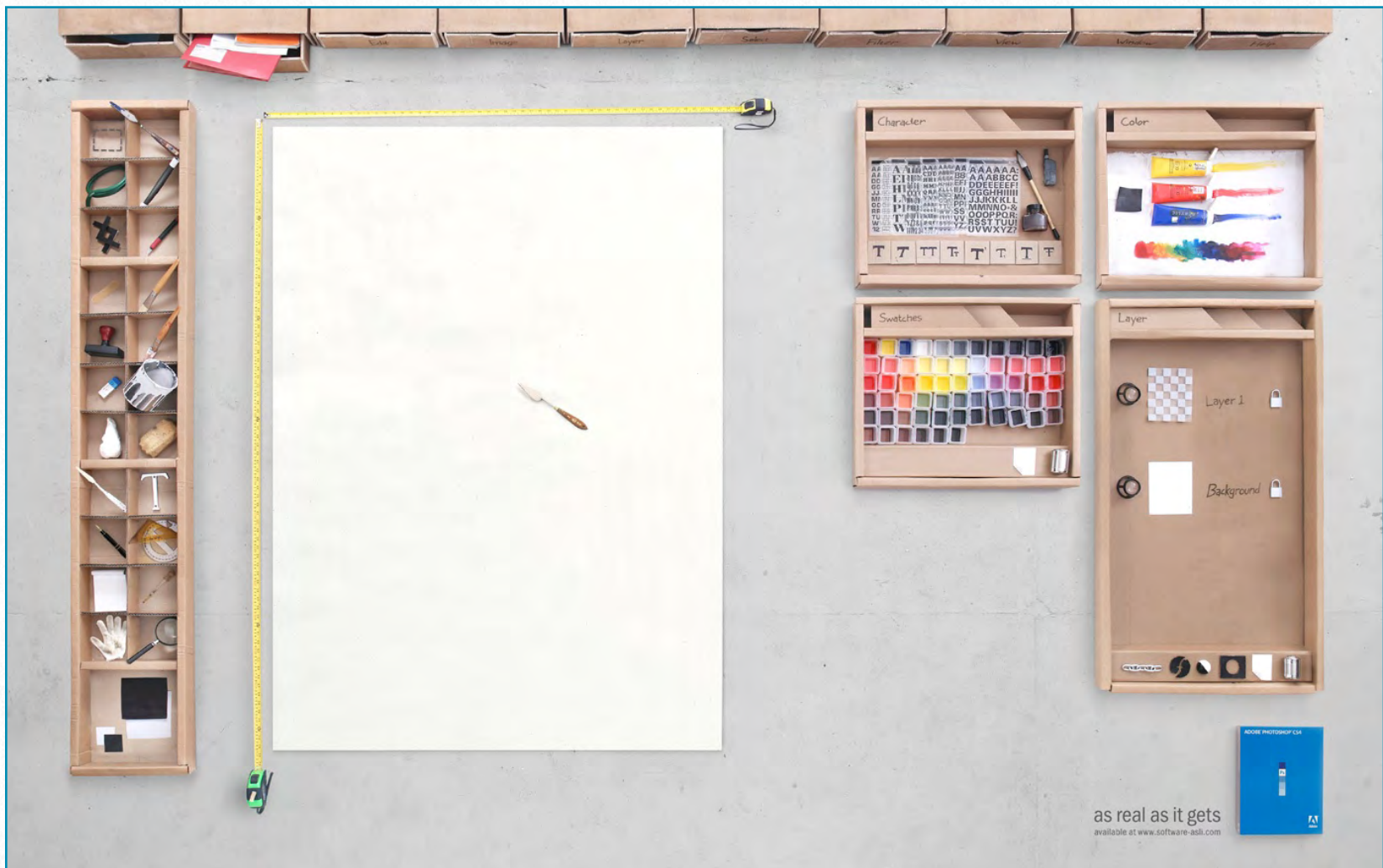


Image credit: <http://theinspirationroom.com/daily/2008/photoshop-as-real-as-it-gets/>

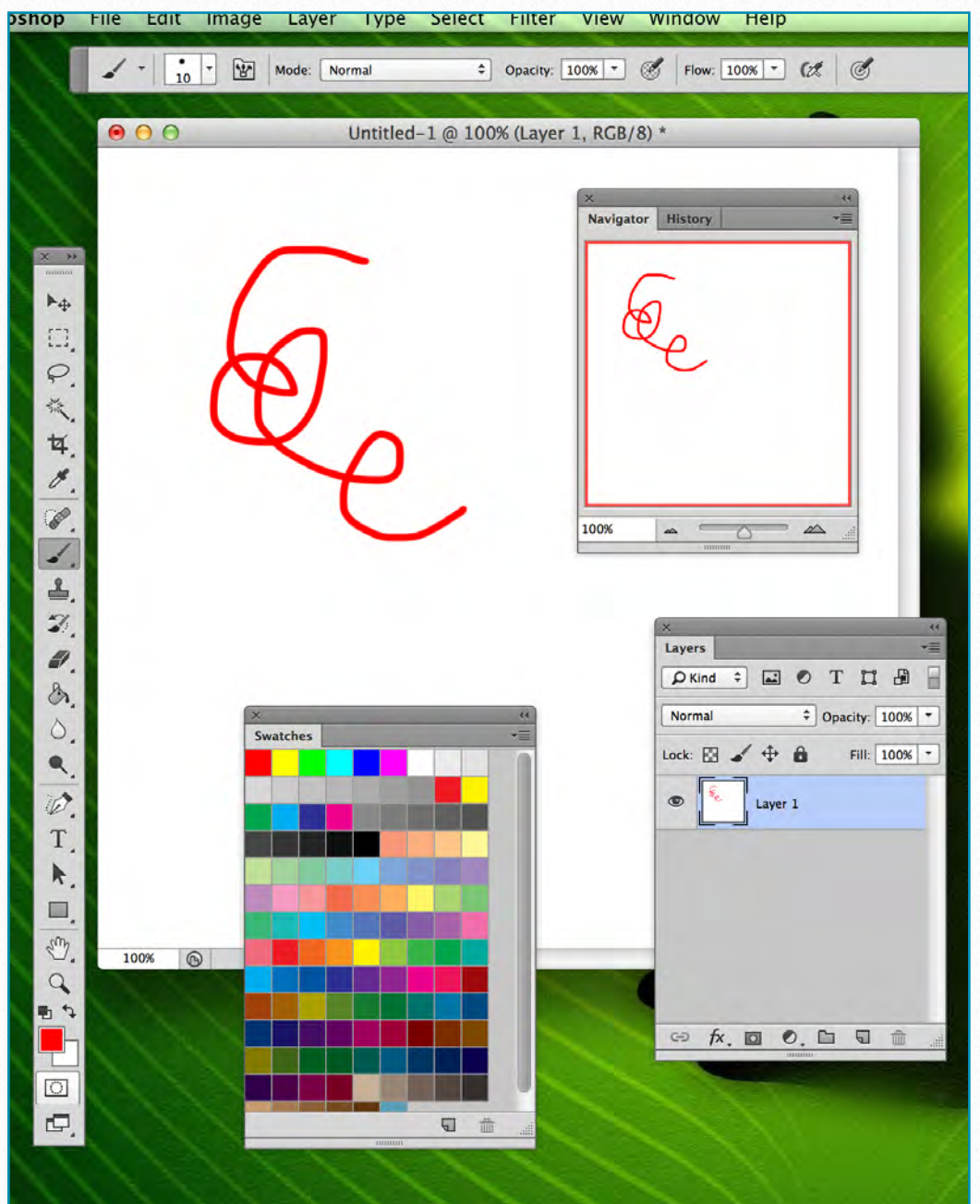
The reason we use Photoshop for our digital inking is simple: Photoshop lets us draw lines by freehand! This may not sound like an obvious advantage at first. One would think that drawing by computer means that the computer will accomplish the difficult task of drawing our straight lines and beautiful curves for us. In fact, one of Adobe's most popular software programs is Adobe Illustrator, which is used by many artists as a primary tool for digital inking. Adobe Illustrator's drawing engine

is vector-based, which means that the artist draws paths (guidelines) and the software creates curves based on the frequency and distance of the anchor points on this path. Because of the vectorized nature of the drawings made in Illustrator, these artworks can be rendered in any size, the line quality will stay the same at the same time keeping the file size relatively small. In theory, then, Adobe Illustrator would be a very appealing option for inking our field drawings, because the soft-

ware would correct our little mistakes. When the Epigraphic Survey, however, translated its sophisticated drawing method to the computer, in order to ink drawings digitally, its main goal was to capture the unique sculpted character of the ancient Egyptian wall scenes as much as possible. To be able to render the complicated interplay of different line thicknesses, irregularly carved shapes, and rich painted details on the multi-layered wall surfaces, Chicago House needed a more natural painting tool, and that tool is Adobe Photoshop.

Photoshop, as its name indicates, is primarily a photographic editing tool. In the past ten years, however, the software has been discovered by digital artists, and, as with other software such as Corel Painter, Photoshop has become an indispensable tool for digital painting. As we will see in the next few chapters, using Photoshop in conjunction with a drawing tablet gives the epigraphic artist an excellent tool to capture and depict the fine details that one encounters when documenting decorated wall surfaces in a line drawing format.

When we first open Photoshop, we see a rather complex on-screen environment,



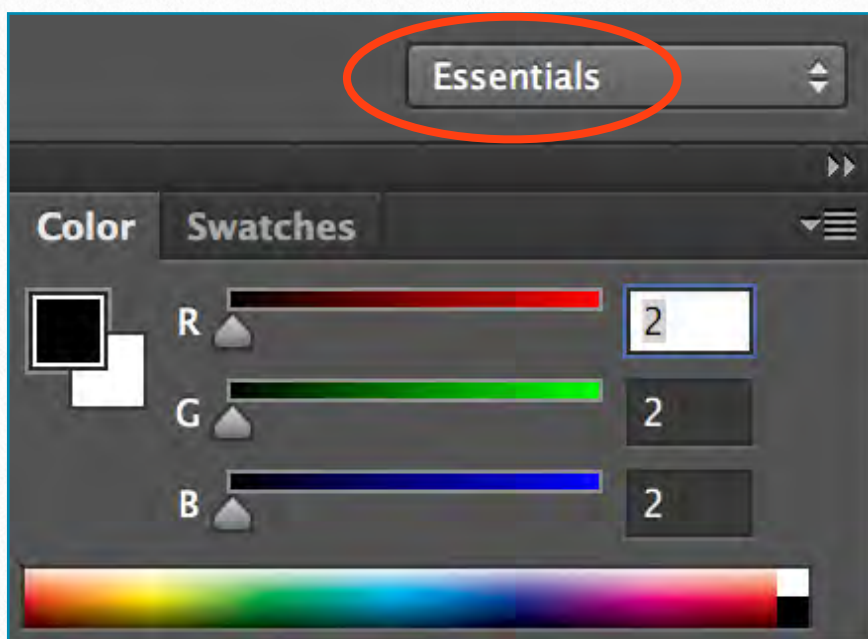
*Photoshop CS6 working environment
(menubar, toolbar, canvas, and panels)*

with horizontal and vertical rows of icons and text, plus a handful of little windows on the right. These windows are called panels, and much of the work that we do in Photoshop involves using them regularly. The layer panel, for example, is where we add, delete, select, and arrange our drawing's layers, and where we add layer masks and layer effects. For some drawings we'll also add adjustment layers using both the Adjustments and Properties panels. We can change the colors of our

brushes in the Color and Swatches panel, go back to previous steps in our workflow with the History panel, and so on. There are many panels to choose from, so it can be a bit overwhelming to the digital artist, especially at first sight. This is why it is very important from the beginning to know how to manage and arrange these panels on the computer screen.

Resetting the Essentials Workspace

First of all, let's make sure that we have our default Photoshop workspace in front of us. This default workspace is called Essentials, and it can be selected through the workspace selection box. Let's reset the

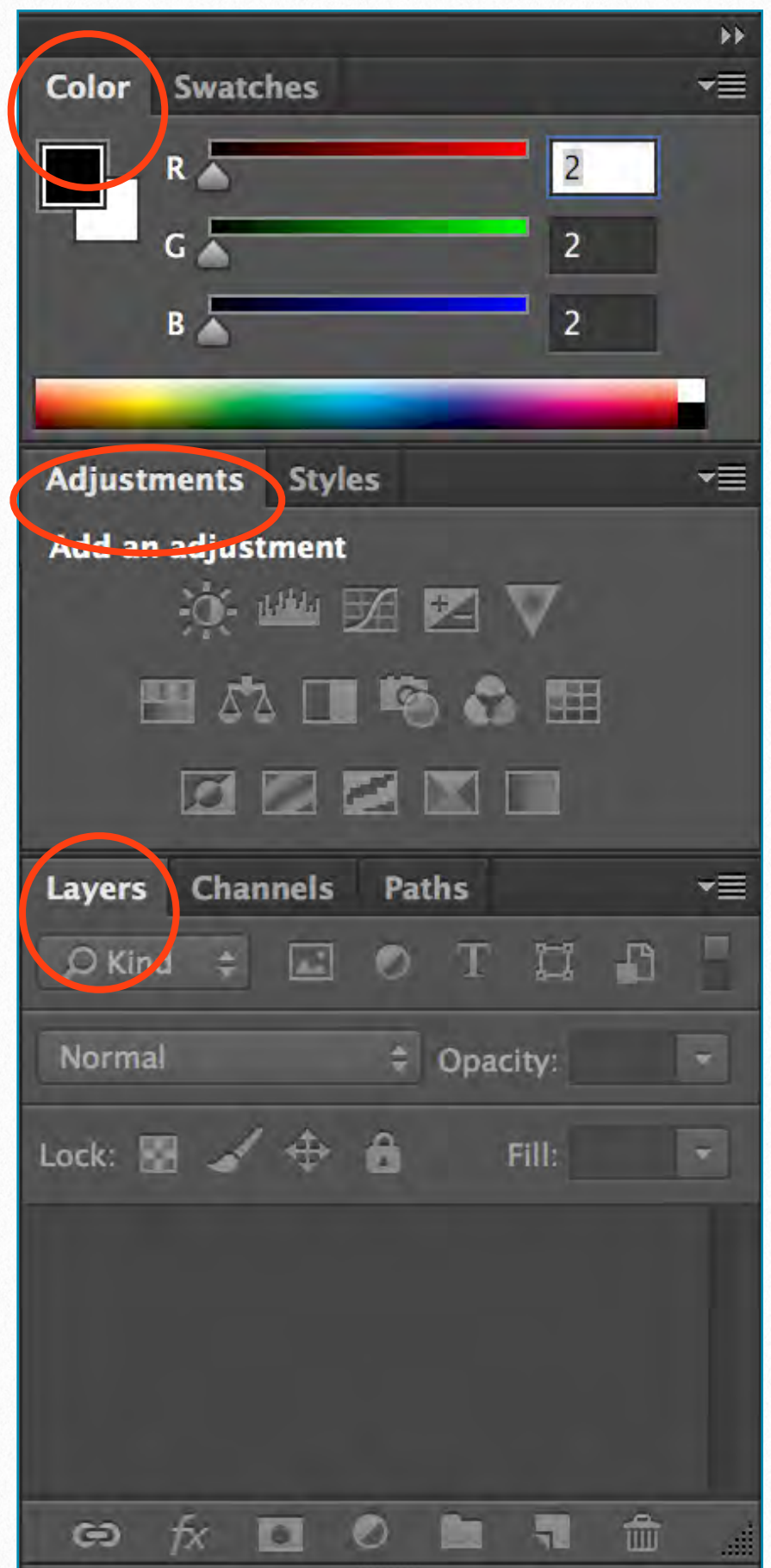


The Essentials workspace

Essentials workspace itself, so that all of the panels are placed back in their default location. (*Reset Essentials*)

Arranging the Main Panels

Photoshop's panels are located in *columns* on the right side of the screen. By default we see two columns: the wide main column and a much narrower secondary col-



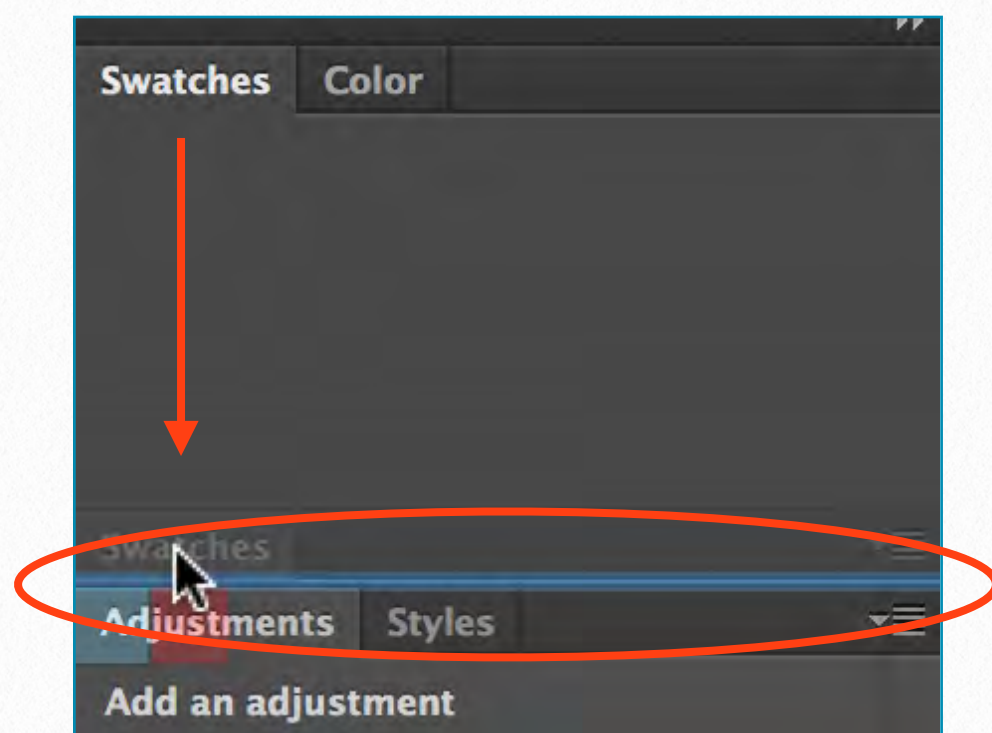
The main panels by default

umn beside it on the left. By default, Photoshop opens three panels for us: the *Color* panel at the top, the *Adjustments* panel in the middle, and the *Layers* panel at the bottom. Each panel has its name displayed in a tab at the top of the panel. Although there are only three panels open, there are more names listed in the main column. The *Color* panel at the top also has a *Swatches* tab to the right of it. The *Adjustments* panel in the middle has a *Styles* tab to its right, and the *Layers* panel actually has two other tabs - *Channels* and *Paths* - next to it. To prevent your workspace from being taken up by floating panels everywhere, Photoshop collects (*docks*) some panels in *panel groups*. Only one panel can be active at a time within each group, but we can switch in between them by clicking on their tabs.

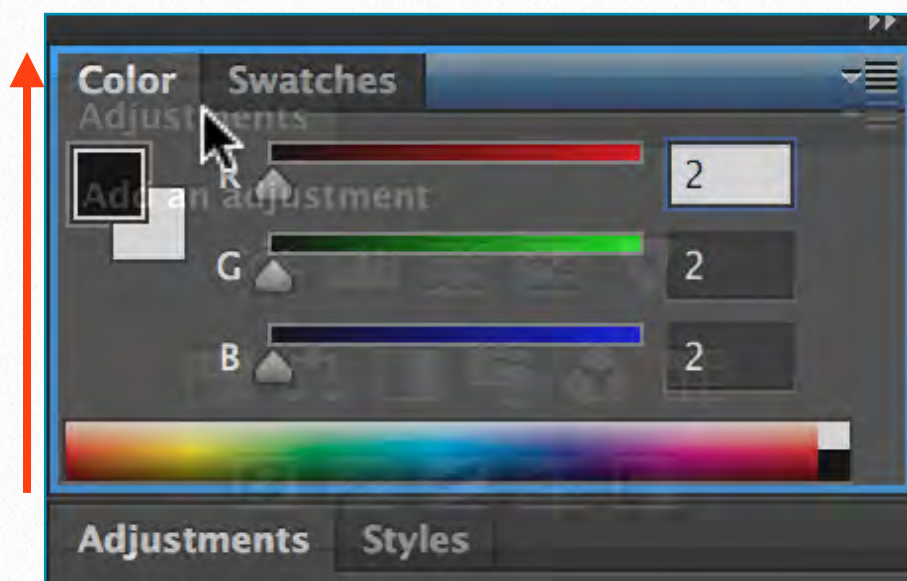
Changing the order of the panels within a group is easily done by clicking and holding (*dragging*) the tabs left and right. Mov-

ing an actual panel in between groups is also possible, by dragging the tab of the panel we wish to move over the destination group until a blue highlight border appears around the new group. This border lets us know that we can release the panel.

We can also make a new group from any docked panel by dragging a tab downward, towards the lower edge of the panel group, until a blue highlight bar (not a border!) appears between the two panel groups.



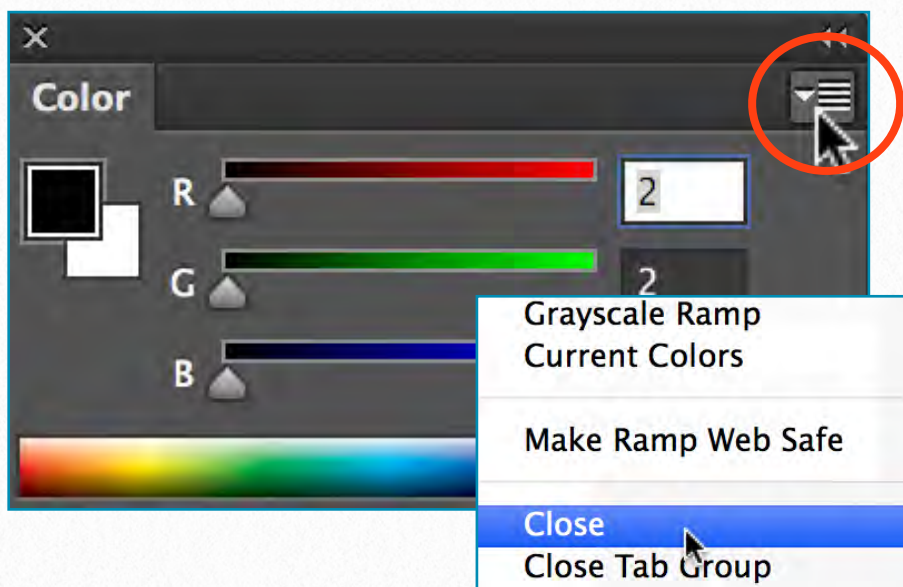
Making a new group from the Swatches panel



Moving the Adjustments panel between groups

We can temporarily minimize panel groups to free up more space by double-clicking on any tab in the group. To maximize a group again, just click once on a tab and it appears again as it was before. If we no longer need a single panel in a group, we can close it by clicking on the menu icon on the panel's upper right corner and

choose *Close*. We can close the entire group in the same way, by selecting *Close Tab Group* from the drop-down menu.



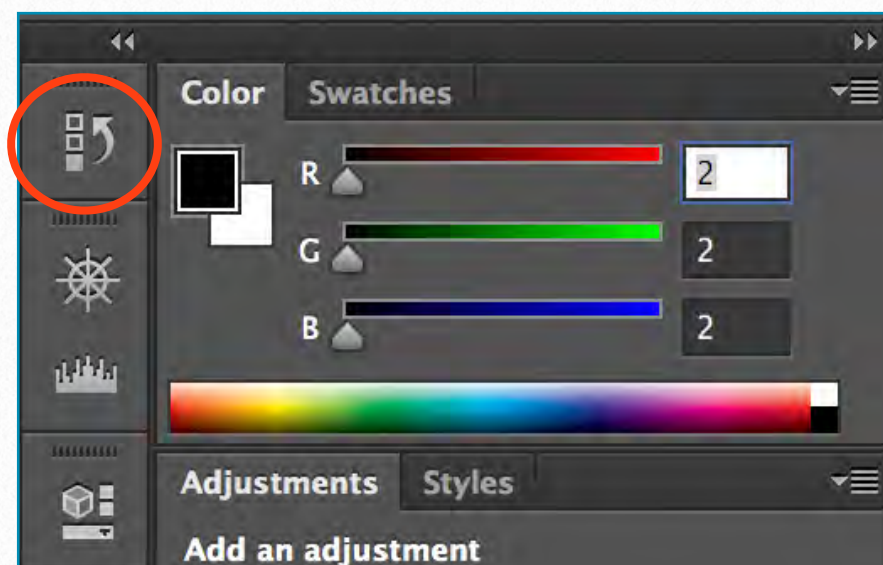
Closing panels and groups

To re-open a panel after we've closed it, or to open any of Photoshop's other panels, click on the Window menu in the Menu Bar along the top of the screen. Now, if we close the Color panel and re-open it through the Window menu, it shows up exactly where it was before. Notice that when we close an entire panel group, and later open any panel which was part of the group, we also re-open the other panels in the group with it. It is also important to point out that in the Windows menu only the active panels have a checkmark next to their names, meaning that although our Swatches panel is present on the workspace it's not active at the moment. Once we switch to the Swatches panel the checkmark appears right next to it. The checkmark means a panel is open and ac-

tive. No checkmark means the panel may be closed - appearing nowhere on the screen - or it may just be nested in behind a different active panel in its group.

The Secondary Panel Column

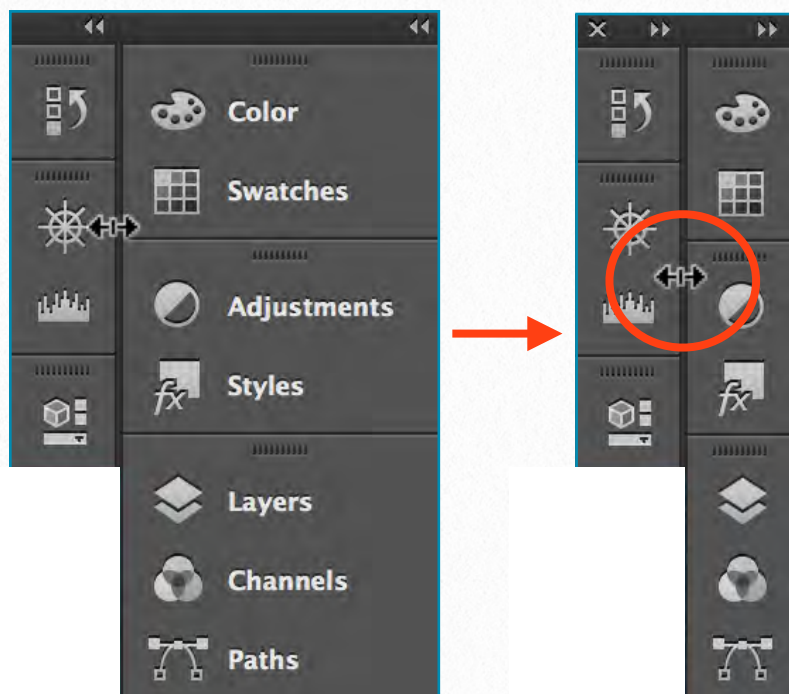
By default, the panels in this column appear only as icons:



Icons on the Secondary Panel Column

The two panels that initially appear in this second column are the History panel on top and the Properties panel below it. By dragging the left edges of these panels farther left, we can reveal enough space to display their names as well. A good use for this secondary column is to hold panels we'll need, but we don't want to see open all the time. If we click on the panel's icon (or its name), Photoshop will temporarily expand the panel to full size, so we can work with it. To collapse the panel back to icon view mode, we can either click on its name/icon again or hit the double arrow on

the panel's upper right corner. If the artist needs even more space on the screen, the main panel column works exactly the same way. Dragging the vertical divider to the right results in an even more compact view, where all the panels are represented by icons only.



Photoshop panels' icons view

Moving Panels Between Columns

It's possible to move panels from one column to another by dragging them over to their new place. We can release our panel as soon as the blue highlight panel/bar appears and our panel moves to its new place.

Hiding All the Panels

Finally, there are a couple of keyboard shortcuts for temporarily hiding all the panels on the screen. Pressing the Tab key on



Arranging panels



To **download** the demonstration video, click on the following link:

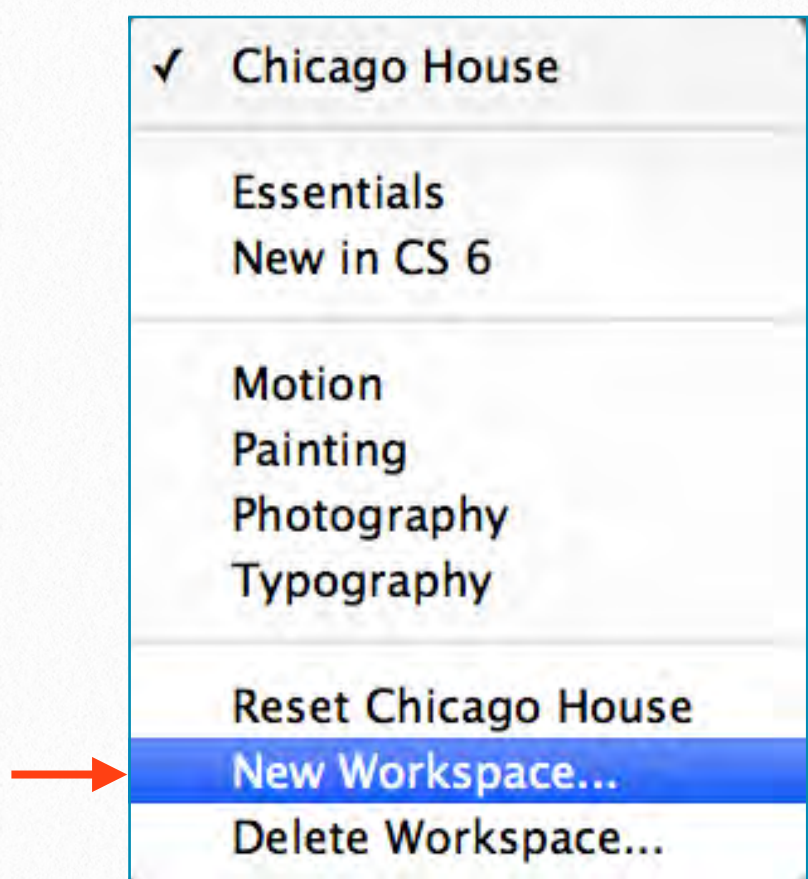
<https://www.dropbox.com/s/0fn6w2nyqe96b6r/Arranging%20Panels%20%28SD%29.m4v>

the keyboard hides all the panels along with the Tools and the Options Bar - basically it will hide everything except the Menu Bar. Pressing Tab again brings all the panels and bars back. To hide only the panels on the right, press Shift+Tab once. Pressing Shift+Tab again brings them back. Moving the cursor to the right edge of the screen while the panels are hidden results in the re-appearance of our panels so we can interact with them. But as soon

as we hover our cursor somewhere else the panels disappear again. These features are particularly useful when we are working with large drawings, and we need all the real estate our screen can offer.

Saving our Favorite Workspaces

Every artist has his/her own way to arrange the panels he/she favors during inking. It is also possible that different types of drawings will need different panel layouts. The best way to deal with these situations is to save our favorite panel layouts as templates for future use. We can click on the same Workspace Selection Box as we did when resetting the Essentials work-



Saving a new workspace

space, and in the drop-down menu we select *New Workspace*. Here we are able to











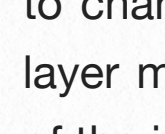
give our new workspace a name and decide if we want to save our keyboard shortcuts (if we reset any) or menu items as well. Once our workspace is saved, we can load it any time by selecting it in the *Workspace Selection Box*.

The Tools Bar

Now if we look at the left side of the Photoshop Workspace, we see a vertical bar called the *Tools Bar*. These buttons are the heart of the software's drawing/image manipulating management. Although most of the capabilities represented in the Tools Bar are used for image editing, the digital artist should know what each of these can do. To reveal the Tools Bar, check *Tools* in the Window Menu.

1. **Move** - moves selected layers around. Click and hold to adjust the positions of layer elements. Also used to set and move Guide Lines.
2. **Rectangular Marquee** - allows the user to select rectangular shaped areas within a drawing. These can be copied or cut and then pasted into new layers. Other marquee tools are available by clicking and holding the button.
3. **Lasso** - creates a freehand selection. There are other types of lassos avail-

able, including a Magnetic Lasso and Polygonal Lasso.

- 1  4. **Magic Wand** - creates selections based on the same color.
- 2  5. **Crop** - makes adjustments to the overall size of a drawing. Affects the size of the whole image, not just a layer.
- 3  6. **Color Selection** - lets the artist grab a color from an image and applies it to the brush or fill. Access by Alt+click while drawing.
- 4  7. **Healing** - removes dust marks and scratches from scans. The Patch tool is used to repair larger areas on a photo or scan.
- 5  8. **Brush** - the most frequently used tool for painting on a background with any selected color in any size (hold left click
- 6  to change while painting). Also used on layer masks for showing or hiding parts of the image.
- 7  9. **Clone Stamp** - similar to the healing brush, but it doesn't blend. Instead, it creates a direct copy of the information
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from the first selected area to the second.

10. **History Brush** - works similarly to the Brush tool, except that the information with which it paints is from the original state of the drawing. It paints with the information from whatever History state is selected on the History Panel.

11. **Eraser** - when on a layer, this tool will erase the information with a transparent effect. If one is on the background layer, it will erase with whichever secondary color you have selected.

12. **Paint Bucket** - fills areas with solid color using the foreground color set on the Tools Bar. The Gradient tool creates a blending of the foreground color and background color (click+drag).

13. **Blur** - makes part of the drawing blurred. The Sharpen tool does the exact opposite.

14. **Dodge** - lightens the area where it is used. It's useful on particularly dark en-

largement scans. We'll use it more in Section 2 of this chapter.

15. **Pen** - lets the artist draw a line by clicking one spot and then clicking elsewhere to add anchor points. In between these points, Photoshop places a line called path. It can be used to create complex selections and smooth curved brush strokes. With the Freeform Pen the artist can draw freehand paths with the limitations of starting and ending anchor points, but with the freedom to draw any line shape without stopping to add extra points along the way. The Add Anchor Point, Delete Anchor Point, and Convert Point tools are used to edit the paths drawn with the Pen.

16. **Type** - adds horizontal or vertical text to images/drawings. Size, color, and other attributes of the text can be specified and adjusted.

17. **Path Selection** - selects paths created with the Pen tool, shapes that were converted to paths, and even text.

18. **Shape** - draws all kinds of shapes that are made out of vectors, meaning they are made from points and paths instead of pixels.

19. **Hand** - moves the images/drawings around onscreen. The Rotate View tool is self-explanatory.

20. **Zoom** - zooms in up to 3200% or zooms out by holding down the Option button while clicking.

21. **Foreground and Background Color** - it is only possible to work with two colors at the same time, which can be set here by using different palettes. They can be switched by clicking the arrow above them.

22. **Quick Mask and Screen Mode** - in Quick Mask Mode the artist can paint to create or edit a selection. The Screen Mode lets the artist easily switch between Standard, Full with Menu Bar, and Full Screen Modes.

The Menu Bar

Because of the overwhelming number of menu options Photoshop has (nearly 300!), here we'll cover only the ones important to our digital drawing needs. Of course, different situations need different solutions, so the user might eventually want to know more about the available options.

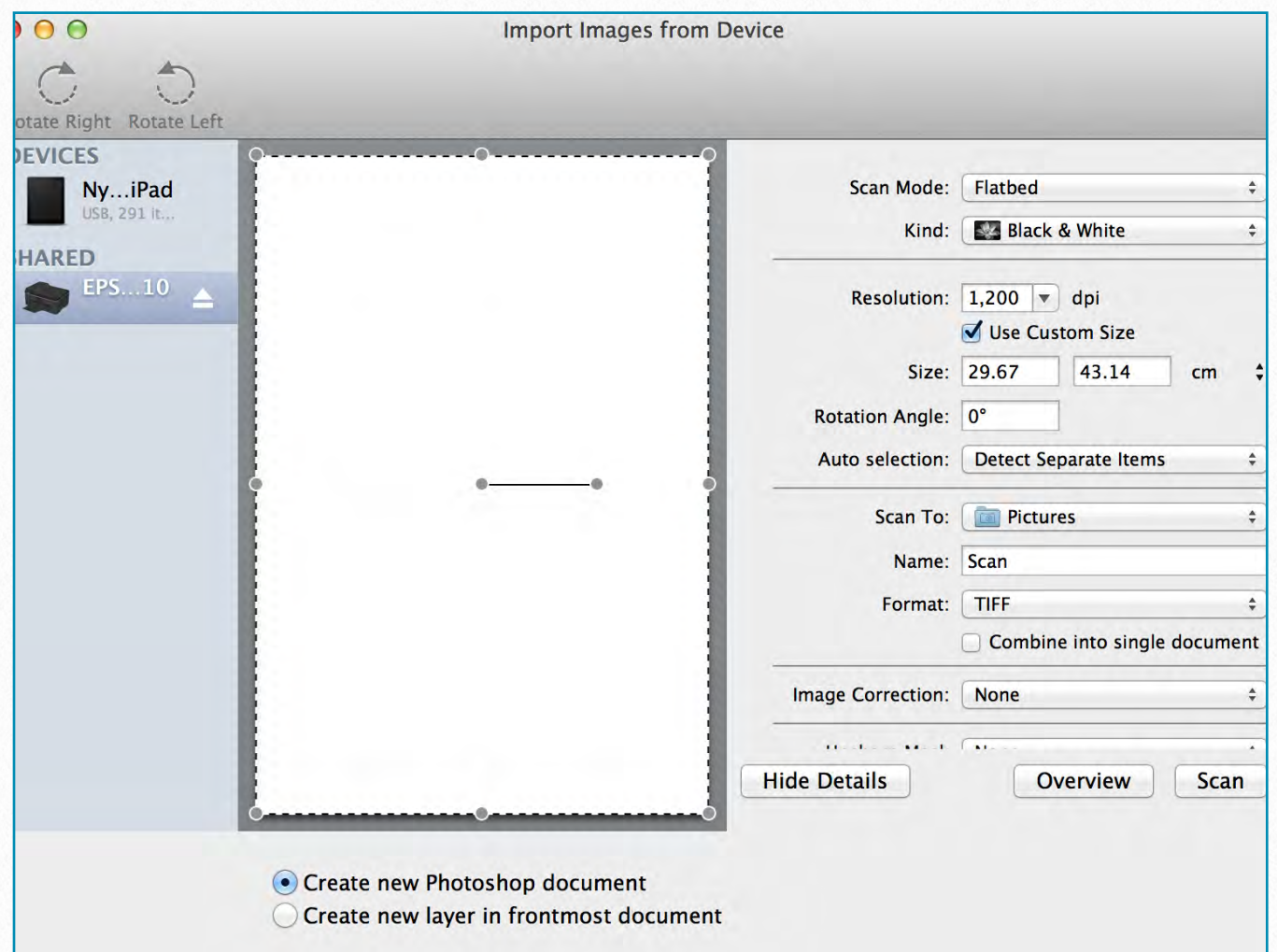
Photoshop

- **Hide Photoshop, Hide Others, Show All** - hides all of Photoshop's menus, panels, and windows so one can work in other programs, or hides every program running on the computer *except* for Photoshop. *Show All* reveals every program you may have hidden.

File

- **New, Open** - creates a new document or lets the artist pick an existing one to open. One can open any document as a linked *Smart Object* or browse the recently opened documents from the same menu as well.
- **Save** - saves the document as it is or changes it to another format (*Save As*). Although we almost exclusively use *.tiff* as our file extension, *.pdf* can be very useful for printing purposes.

- **Revert** - wipes out any changes we've made to the current document and returns it to its last saved state.
- **Place** - this option is used to place an image or other Photoshop-supported file format into the current document as a *Smart Object*. The artwork appears on its own layer, surrounded by a *bounding box* we can use to resize it.
- **Import Images from Device** - lets us use a scanner to get a picture, drawing, or anything else off paper and into Photoshop on a Mac. (WIA Support to import images from an attached digital camera,



The Import Images from Device panel is used for scanning documents

memory card, or scanner is only available on PCs running Windows.)

- **Export** - this menu item is used to export drawings as *paths* so they can be opened with Adobe Illustrator.
- **Automate, Scripts** - it is possible to automate tasks we do over and over in Photoshop by saving them as actions. There are some built-in actions that can be set here. *Scripts* also helps with changing file extensions or other features of files in batches, rather than individually.
- **File Info** - creates *metadata* about the current document, including when it was created, how big the image is, its name, copyright information, and so on. It is editable any time, and it is therefore very useful to label our drawings.
- **Print** - Choosing this item opens the Photoshop Print Settings dialog box and lets us adjust features like the number of copies, print quality, and which printer to use.

Edit

- **Undo, Step Forward/Backward** - allows us to correct our mistakes, either by erasing the last change we made or stepping

back and forth in the History Panel up to the number of steps previously selected.

- **Cut, Clear, and Copy** - deals with selected objects' movement on the drawing canvas. *Copy Merged* makes a merged copy of all the visible layers in a selected area. When we're editing a multi-layered document, this is a handy way quickly to consolidate and copy a certain part of the drawing - the area we've selected - onto a single layer without having to select that area on each layer.
- **Fill** - fills the selected area with the color of the artist's choice. If nothing is selected, it fills the whole layer instead.
- **Stroke** - adds a colored stroke, or outline, to the current selection.
- **Puppet Warp, (Free) Transform** - twists, turns, moves, or distorts pixels independently of other pixels in a drawing (*Puppet Warp*) or scales, stretches, warps, distorts, and rotates the selected objects. Free mode lets the user do a whole sequence of the above modifications before saving the changes.
- **Auto-Align and Auto-Blend Layers** - these can be used to compose selected layers into one based on the common elements, and therefore can be very helpful

during stitching scanned parts of enlargements.

- **Define Brush Preset** - converts the selected object into a custom brush.
- **Define Pattern** - makes a custom pattern out of the current selection.
- **Define Custom Shape** - turns the selected path or vector mask into a custom shape.
- **Adobe PDF Presets** - manages settings we can use when making PDF versions of drawings.
- **Keyboard Shortcuts** - customizes Photoshop's keyboard shortcuts, adds one's own, and saves these personalized menu commands.
- **Menus** - customizes which menu items are hidden or shown.

Image

- **Mode** - allows us to change the current document's color mode and bit mode.
- **Adjustments** - most of the options here are useful for changing our background photo's overall tonal quality, which can be very helpful working with bad scans.

- **Image/Canvas Size** - while *Image Size* lets one change the drawing's dimensions and resolution, *Canvas Size* changes the document's dimensions *without* affecting the resolution.
- **Image Rotation** - rotates the image by a preset or arbitrary degree.
- **Variables** - creates powerful document templates that we can use to generate several versions of the same basic design (with different images and/or text) automatically.

Layer

- **New/Duplicate/Delete/Rename** - interact with selected layers. The same actions can be managed directly from the *Layers Panel*.
- **New Fill** - creates a new layer and fills it with a solid color, gradient, or pattern. If the canvas size is enlarged, Photoshop fills the extra space as well.
- **New Adjustment** - adds a layer where nondestructive changes can be made to the drawing/image.
- **Layer Mask** - allows the artist to obscure an entire layer or layer set, or just a selected part of it. It is editable and it is a

grayscale image so what we paint in black will be hidden, what we paint in white will show, and what is painted in gray shades will show in various levels of transparency.

- **Group/Ungroup/Hide/Arrange** - interact with selected layers. The same actions can be managed directly from the Layers Panel.
- **Align/Distribute** - lets the artist align content that exists on different layers along the objects' edges or center points.
- **Link/Select/Merge** - interact with selected layers. The same actions can be managed directly from the Layers Panel.
- **Flatten Image** - merges all the drawing's layers into the Background layer.
- **Matting** - This option removes the extra pixels surrounding an object's edge after it has been isolated from its original background. After being applied, the item's edge should look cleaner and more natural.

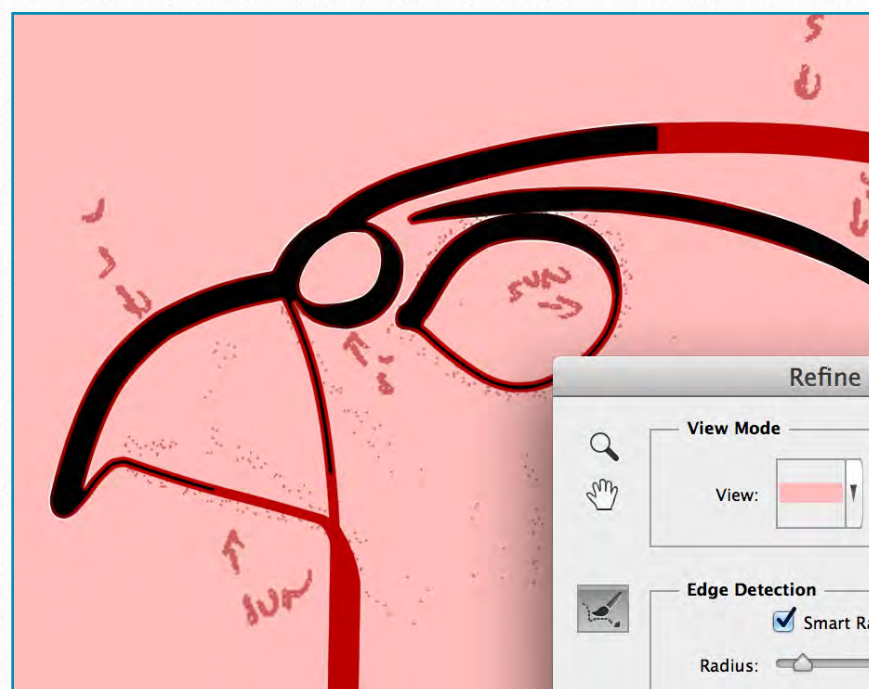
Type

New to Photoshop CS6, this menu has all the commands related to text that were previously sprinkled throughout Pho-

toshop's menus and preferences. Because we are working almost exclusively with drawings, adding and editing text will not be explained in detail in this tutorial.

Select

- **All/Deselect/Reselect** - places or deactivates "marching ants" around the perimeter or a particular area of the entire document.
- **Inverse** - selects the area that is *not* part of a selection.
- **Color Range** - opens a dialog box that lets the artist select areas in the drawing based on color.
- **Refine Edge** - opens a dialog box that



Refine Edge dialog box

lets the artist fine-tune the edges of a selection.

- **Modify** - lets the artist tweak the edge of a current selection by expanding, shrinking, feathering it, grabbing just its border, or smoothing it.
- **Grow/Similar** - finds and grabs pixels that match the colors just around the selected area or anywhere in the drawing.
- **Edit in Quick Mask Mode** - temporarily covers the drawing with a red overlay, or mask, letting us create or fine-tune a selection visually.
- **Save/Load** - lets the artist save and load a previously saved selection. This is particularly useful for complicated selections that have to be used repeatedly.

Filter

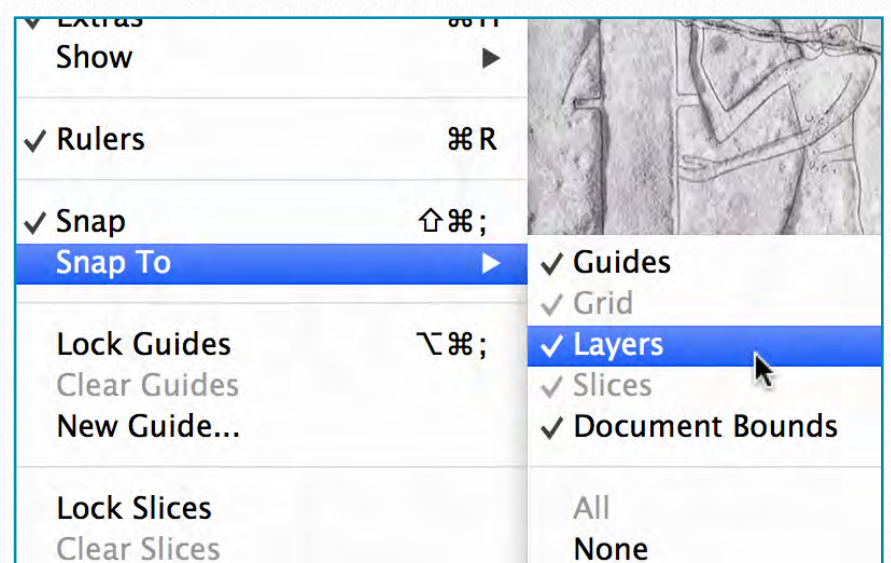
This menu is a collection of filters that can be used in modifying images. It groups filters by type: Artistic, Blur, Sharpen, etc. Because of the nature of our inking method, there is no particular use of filters in our process. Nonetheless the artist should know about them and experiment with them to be aware of their existence.

View

- **Proof Setup** - creates a proof, which is a sample version of the drawing that simulates what the finished artwork will look

like. It can simulate how the drawing's colors will look on a Mac or PC monitor, or in another color mode, or even how a color-blind person would see them. This preview process, called *soft proofing* can be turned on/off in the *Proof Colors* sub-menu.

- **Zoom In/Out, Fit on Screen, etc.** - self-explanatory command to view the entire artwork or its details on screen; the same actions can be managed directly from the *Tools Bar*.
- **Extras** - when this option turned on, the artist can add alignment helpers like guides and grids to the drawings.
- **Show** - lists the extra items (guides, layer edges, notes, etc.) we can display and use while drawing.
- **Snap/Snap To** - lets the artist align selected parts or objects with guides, grids, layers, etc.



Snapping objects to layers

- **New Guide** - adds vertical or horizontal guides to a drawing/image. *Lock Guide* prevents us from accidentally moving a guide we set up previously, while *Clear Guides* gets rid of all the guides we set up.

Window

Workspace - rearranges Photoshop's panels, menus, and tools as was discussed at the beginning of this section. A short description of the panels we'll use the most is appropriate here in the introductory chapter:

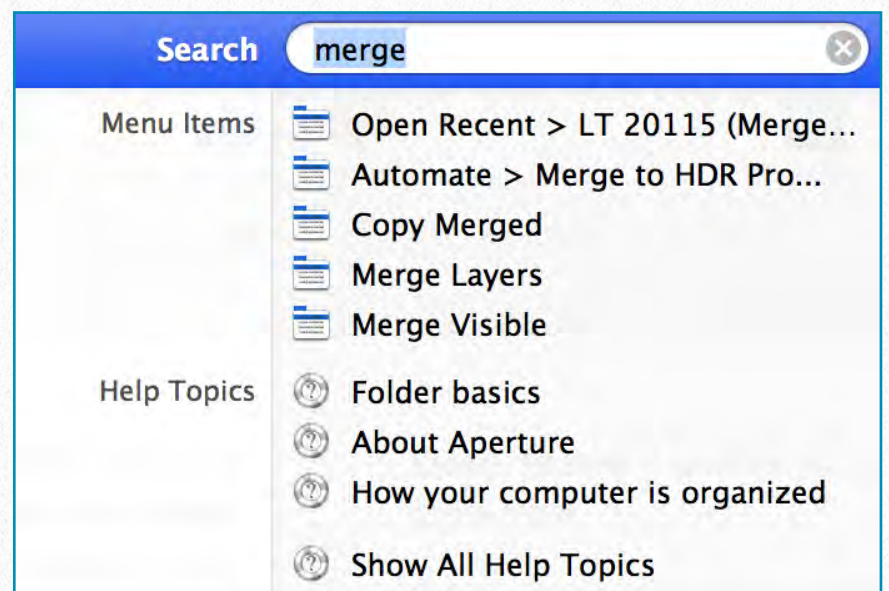
- **Adjustments** - lets us add *Adjustment layers* that we can use nondestructively to alter the color and lighting for a drawing or image.
- **Brush** - selects and edits Photoshop's built-in brushes, as well as brushes the artist has created.
- **Brush Presets** - lets us view a painting sample, as well as edit and store our own customized settings for brushes.
- **Channels** - shows the different color channels contained in the drawing/image.
- **Clone Source** - settings for using the *Clone tools*.
- **Color** - this panel can be used to view and change the foreground and background colors
- **Histogram** - includes a graph (called a histogram) that shows information about the pixels of the drawing.
- **History** - displays a timeline of the edits made to the current drawing. Also shows what the image looked like last time it was saved and lets the artist restore the drawing to any previous (last saved or last opened) state.
- **Info** - includes information about where the cursor is, the color of the pixels it's hovering over, and the size of the current selection.
- **Layers** - add, delete, and organize the document's layers from this panel.
- **Navigator** - lets us change how much we're zoomed in on an image and which part of the image we are viewing.
- **Notes** - notes can be viewed, edited, and deleted here.
- **Paths** - lets the user keep track, change stack of, add, or delete all the paths of the artwork in this panel.

- **Styles** - layer styles are a popular way to add effects, such as drop shadows and strokes, to layers in a non-destructive way. The artist can save combinations of effects, such as blueprint settings through this panel.
- **Swatches** - lets the user save, view, and pick colors from libraries of color panels.
- **Tool Presets** - if the artist regularly uses the same settings for a particular tool, this panel can be used to save them as a preset so they can be used again later.

Help

If one doesn't know how to do something in Photoshop, this menu is for finding the answer. Provides a direct link to Adobe's online help system, including lots of tutorials, and helps the user activate or deactivate a copy of Photoshop. One particular submenu can be very useful for our work:

- **Search** - this is a Mac only feature and helps the artist find any menu item by just typing in its name.



The Search window



MORE READING

Additional Reading:

A Short Introduction to Adobe Illustrator:

<http://design.creativefan.com/an-introduction-to-adobe-illustrator/>

Managing Panels in Photoshop CS6:

<http://www.photoshopessentials.com/basics/managing-panels-in-photoshop-cs6/>

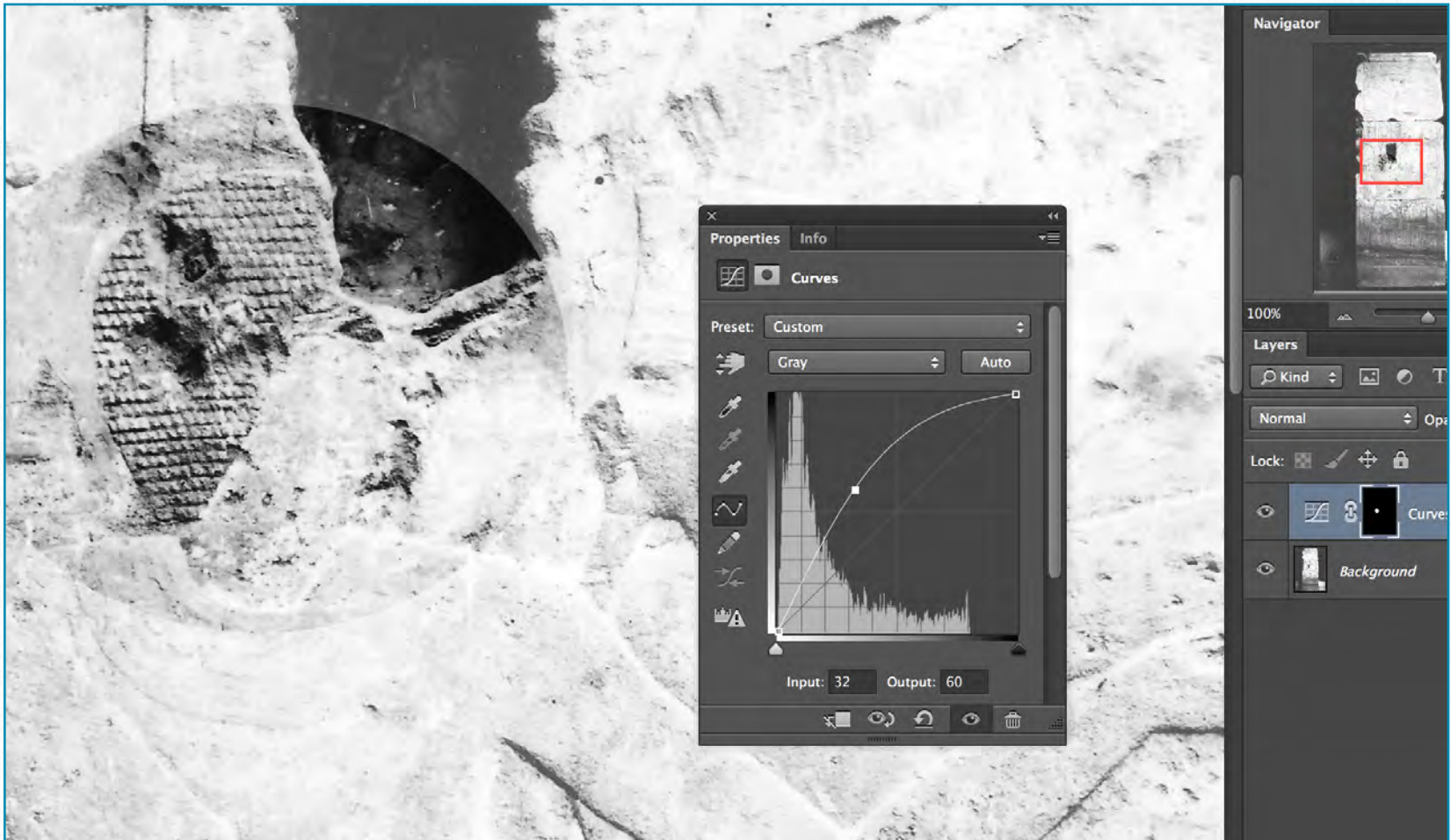
To Learn More About Photoshop's Tools Panel:

http://examples.oreilly.com/0636920022718/examples/pscs6_mm_appc.pdf

Additional Reading Material About Photoshop's Menu Bar:

http://examples.oreilly.com/0636920022718/examples/pscs6_mm_appd.pdf

Essential Photoshop Skills for the Artist



MHB 91 (detail) - Color enhancement using the Curves tool

For whatever purpose a digital artist uses Photoshop, there are a handful of fundamental features that form the basis of almost any task. As we'll learn later, working within the parameters of the Chicago House Method, we might be able to accomplish our goal without ever encountering some of these basic features. It is a good idea, however, to introduce some of these other common Photoshop features to the artist, if for no other reason than to

suggest a more complex way of thinking whenever we do an art project.

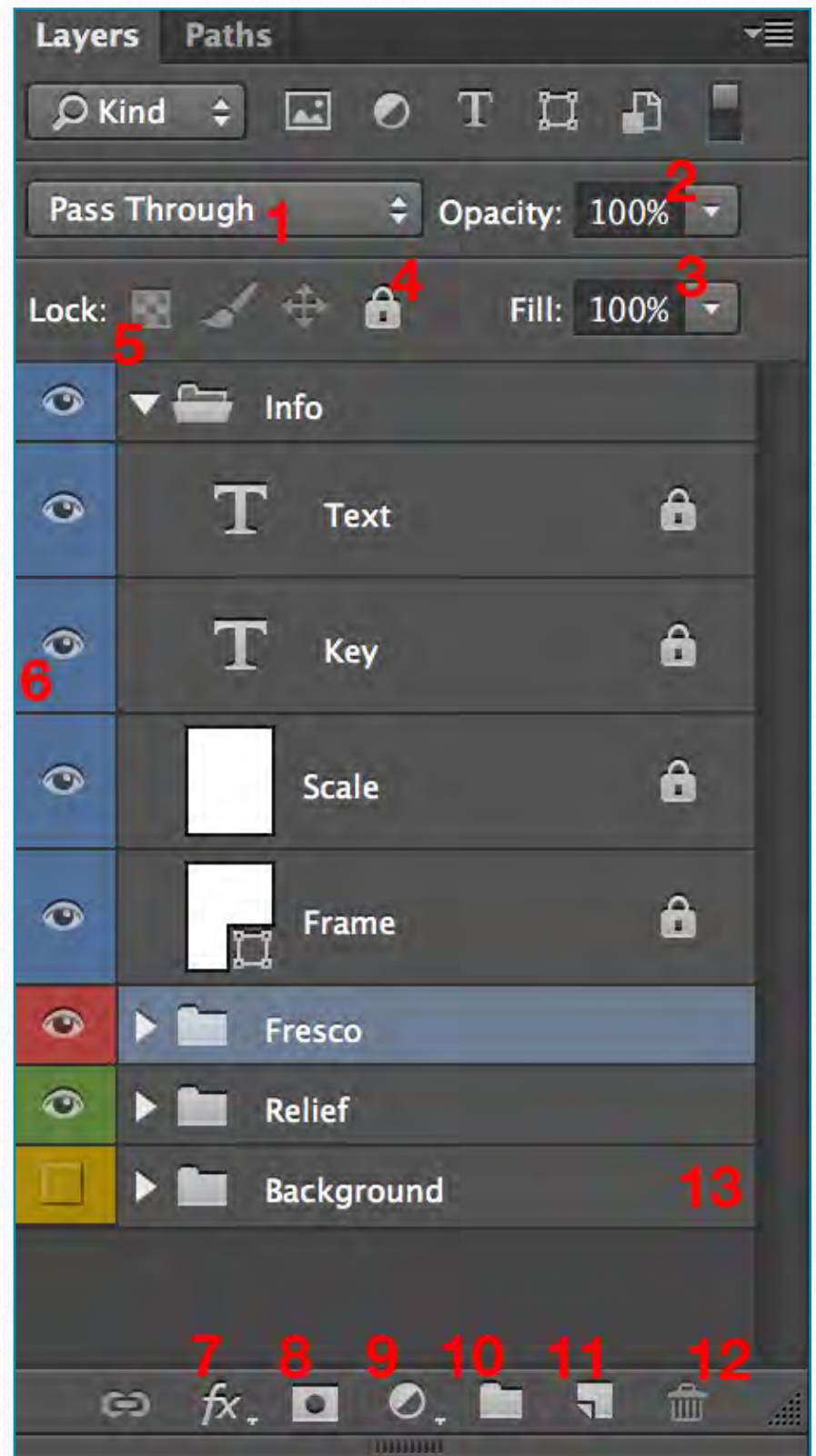
These basic groups of skills are **Layers**, **Masks**, **Selections**, **Curves**, and, last but not least, **Brushes**. All of these features have been essential components of Photoshop for the last 20 years, but they have constantly been refined and are still fundamental to the Photoshop environment, through many new versions, dominating our day-to-day Photoshop habits.

Layer Basics

Using layers in Photoshop lets us experiment with different effects without modifying the original image. Layers also allow us to stack images on top of each other in the same way that different transparent sheets of plastic could be stacked. Layers are simply images and effects that sit within a document, allowing for each to be edited, repositioned, or removed independently of all the other elements. As we will learn in the *Merging Scanned Images* section, any task that involves putting more than one image together will involve layers. But layers are not just useful for creating composites. They complement all types of image editing by enabling the artist to make duplicates and to try out different adjustments, knowing that anything can be changed back to its original state.

The Epigraphic Survey digital inking method is based on the fact that every distinguishable feature of a certain drawing is drawn on its own layer, and therefore can be modified independently. The use of layers makes these drawings a lot more flexible than their paper-based counterparts. Entire series of enhanced drawings can be printed based on a single layered digital drawing, emphasizing certain features while omitting others.

Therefore of all the panels and windows in Photoshop, the *Layers Panel* is the one that should always be close to hand. When the Layers Panel is open, the user can access the following important features:



The Layers panel

1. **Blending Modes:** changes how a layer interacts with all the layers below it. Each mode gives us a different look by blend-

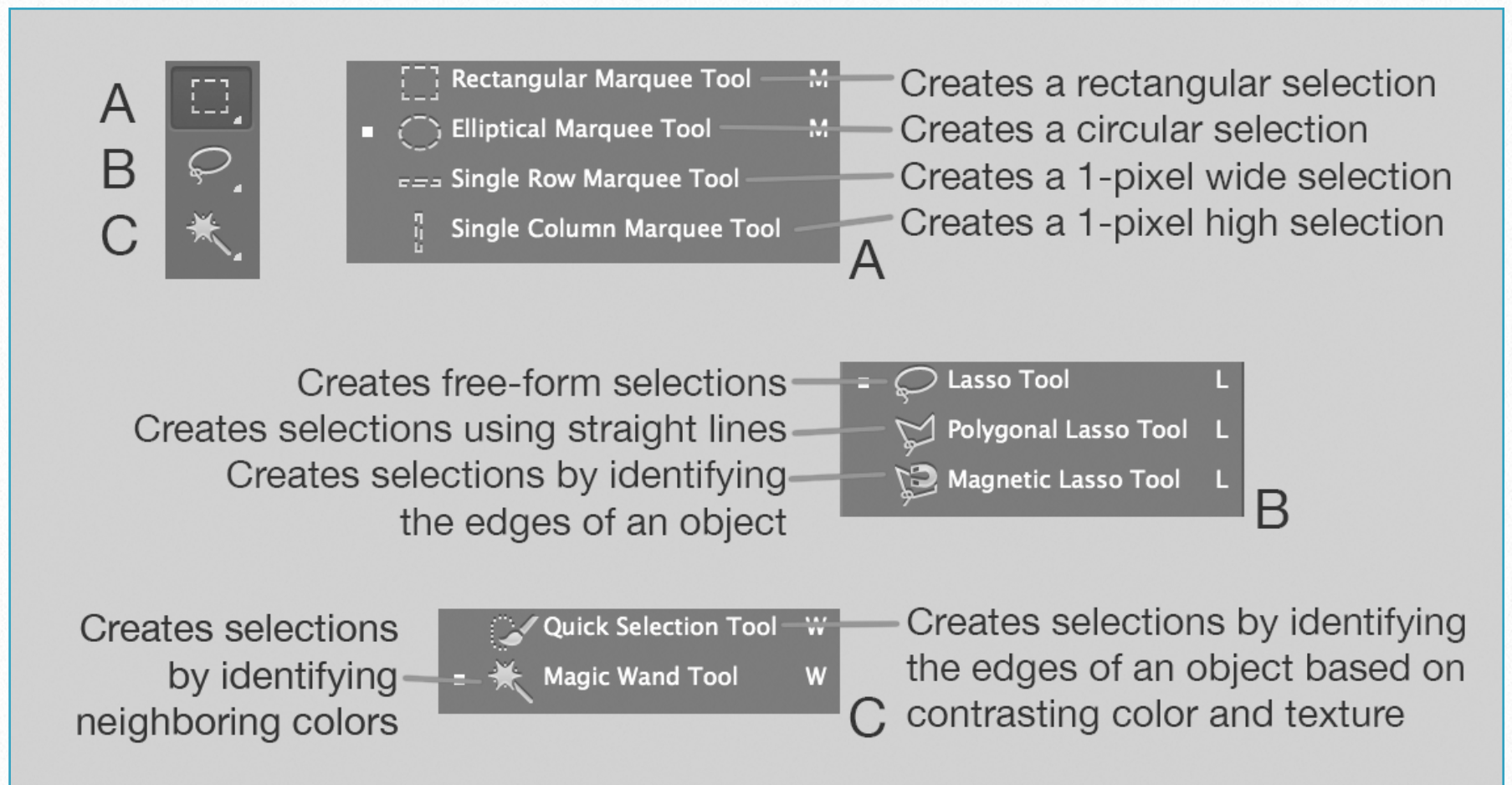
ing the pixels on the selected layer with those below. We use these to make backgrounds transparent, darken or lighten colors, etc.

2. **Opacity:** controls the transparency of the entire layer. We use this to make one layer show through beneath another layer and to paint transparent brush strokes. This could be especially useful when inking on a photo enlargement.
3. **Fill:** controls the opacity of the layer but *not* the layer effects outside of its fill.
4. **Lock Layer:** completely locks the layer so that we can't edit it. It prevents us from accidentally drawing certain features on the wrong layer.
5. **Lock Transparency:** this allows us to paint on a layer, but not on the transparent areas. For example this feature can be used for indicating scalpel effects on damage.
6. **Show/Hide icon:** clicking the eye icon turns the layer's visibility on and off. It's best used to try out different effects and see our drawing with or without the background image.
7. **Layer Style:** this is the special effects area of the layers palette. It can be used, for example, for thickening or thinning line weights. Layer Styles are *nondestructive*, so they can be changed or removed any time.

8. **Layer Mask:** layer masks allow us to paint on a portion of an image while protecting another portion. The artist can use them for merging scanned image parts or to make selections.
9. **Adjustment Layer:** allows color changes to any layer beneath it. It is also *nondestructive*, and it can be deleted later, so the Adjustment Layer and the layers beneath it will return to their previous state.
10. **Layer Group:** creates an entire group of layers, best used when the artist needs to distinguish between lots of layers.
11. **New Layer:** creates a new layer above our drawing's last used (therefore currently selected) layer.
12. **Delete Layer:** deletes the selected layer(s) or layer group(s).
13. The **Background Layer** remains locked unless we unlock it by double-clicking on it. We are able to paint on this layer even in its locked state, but it can't be moved onto the top of other layers unless it's unlocked.

Selections

Selections enable the artist to define an area of pixels on a drawing and help in making changes by isolating one area from another. Selections play a part in all kinds of Photoshop tasks. Sometimes this involves



Selection tools

using more than one selection tool or command, and during photo modification often the goal is to convert the selection to a mask.

Photoshop has several selection tools, but whether the artist uses selections for cutting out parts drawn on the wrong layer, erasing or adding precise details, filtering, or copying and pasting, one general rule is: the more accurate our selection the better. You can see the different types of selection tools above, but a few useful shortcuts should be pointed out here to be able to use them effectively:

With any selection tool, hold down *Shift* to add to an existing selection, or hold down *Alt* to subtract from it. Pressing *Shift+Alt* will intersect. When using the Marquee tools,

hold down *Alt* to start a selection from the centre and *Shift* for perfect circles or squares (*Shift+Alt* does both). Hold down *Space* while selecting to temporarily move the selection. Hold down *Cmd* and click on any layer thumbnail, Channel, or Path on its panel to load its shape as a selection.

Sometimes it's easier to select the opposite of what one would like to interact with, and then invert the selection. For example, selecting a complex artwork against a homogeneous background is difficult in terms of pixels (with all the details and different shades), and would take a lot of time. The background, however, would probably take a couple of clicks with the *Magic Wand*. Once the background is selected, going to

Select/Inverse or pressing *Cmd+Shift+I* will do the trick.

Among the most useful selection tools for the digital artist are the *Lasso* tool and the *Quick Selection* tool. While the *Lasso* tool “draws” the boundaries of our selection, the *Quick Selection* tool “paints” it in, and, since the latter works like a brush, its size can be adjusted. On occasion, it’s easier to paint a selection rather than use the regular selection tools. After roughly encircling the area we would like to modify, we can press *Q* to enter *Quick Mask* mode, and unselected areas will be covered by a pink overlay.



Unselected areas shown in pink

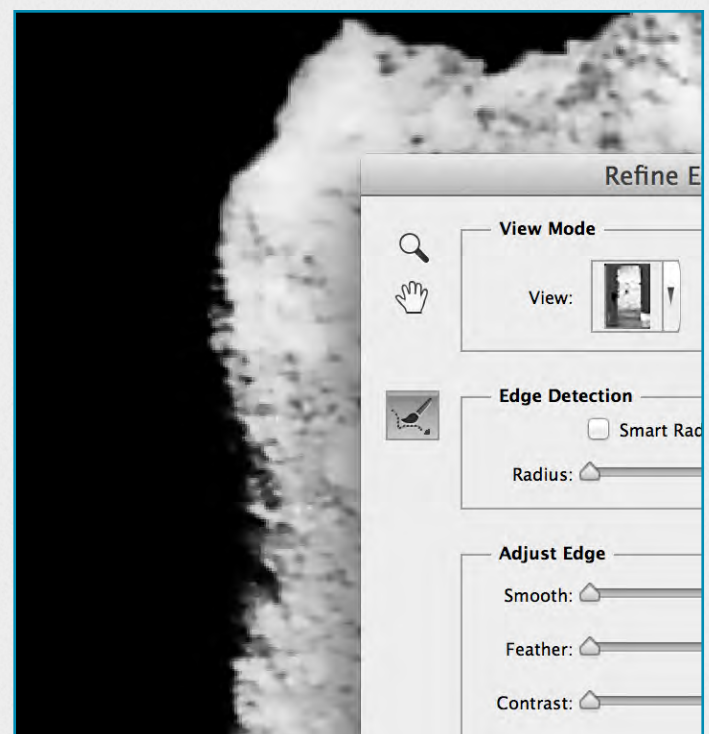
Now we can open the *Brush* tool and choose either a soft- or hard-edged brush

tip, then paint with white to add areas to a selection, or with black to subtract areas.

Further Useful Selection Tricks (1)

Refine Edge

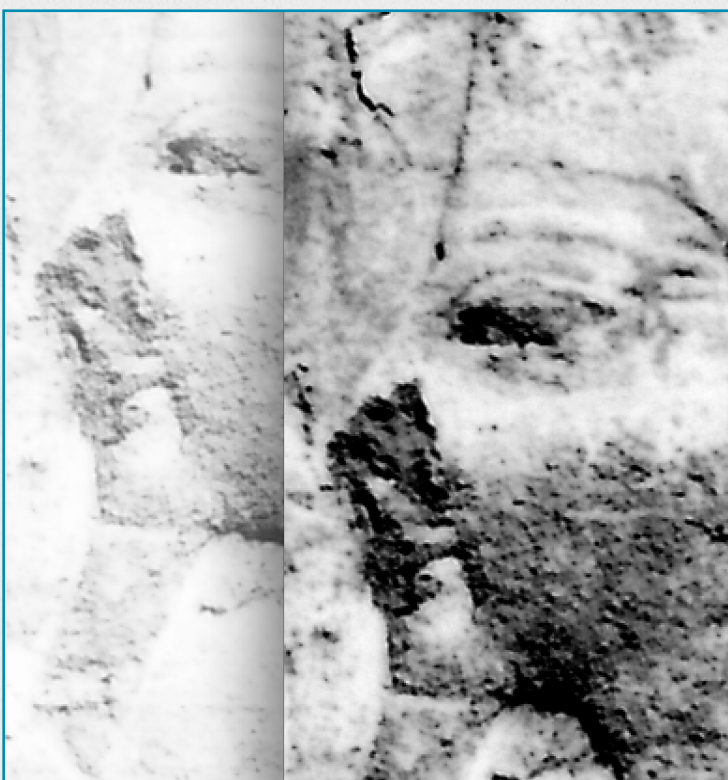
This tool comes in very handy when we have to create intricate selections of troublesome areas, such as the edge of a damaged block line. First, we have to make an initial selection with any tool, then click the *Refine Edge* button at the top. Now we can press the *F* key to cycle through all the different views to find one that gives the best contrast. The key to success here is getting the *Radius* right, because this controls the area of refinement around the edges of a selection. A larger radius is good for fuzzy edges. The artist can use the *Refine Radius* tool to increase the radius around large soft areas.



Further Useful Selection Tricks (2)

Temporarily Emphasize Edges

Most of the selection tools (Quick Selection tool, Magic Wand, etc.) work by seeking out edges or changes in contrast across an image. So if a given tool is struggling to latch on to the edges of a shape, we can help by emphasizing those edges with a temporary tonal tweak. The best tool to use for these enhancements is an *Adjustment Layer* such as Levels, which enables the artist to boost the contrast of the image to make the edges more visible. The good thing about the Adjustment Layers is that once the desired selection is made, we can delete the layer and go back to our task.



When done, Q must be pressed again to return to the “marching ants” view. (These marching ants don’t always display the full selection, so Quick Mask can also be useful for checking exactly where the selection is operating.) When making a selection it’s useful to keep the Anti-Alias box checked, which results in smoother transitions.

Layer Masks

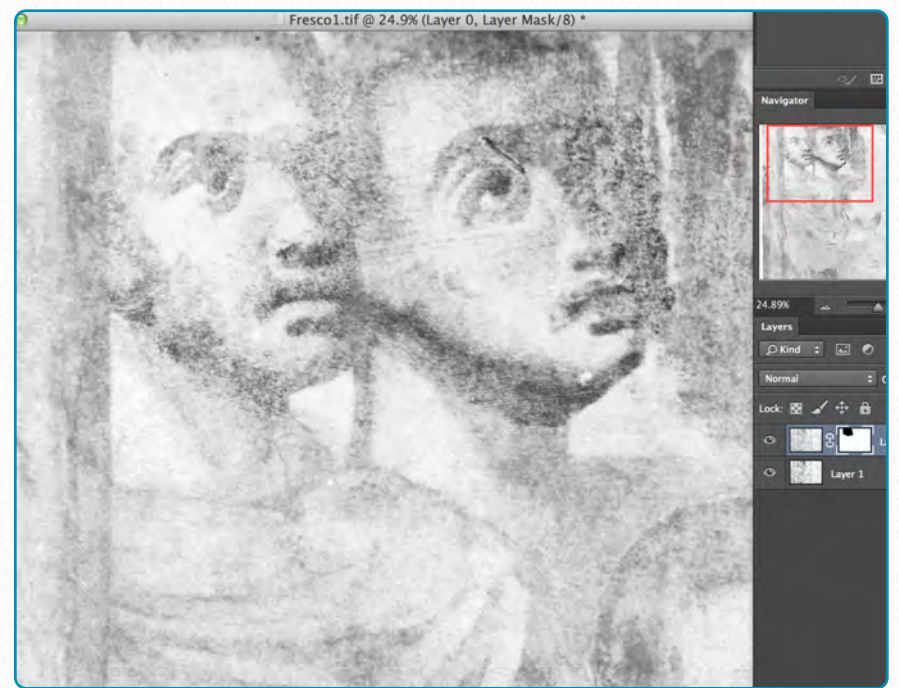
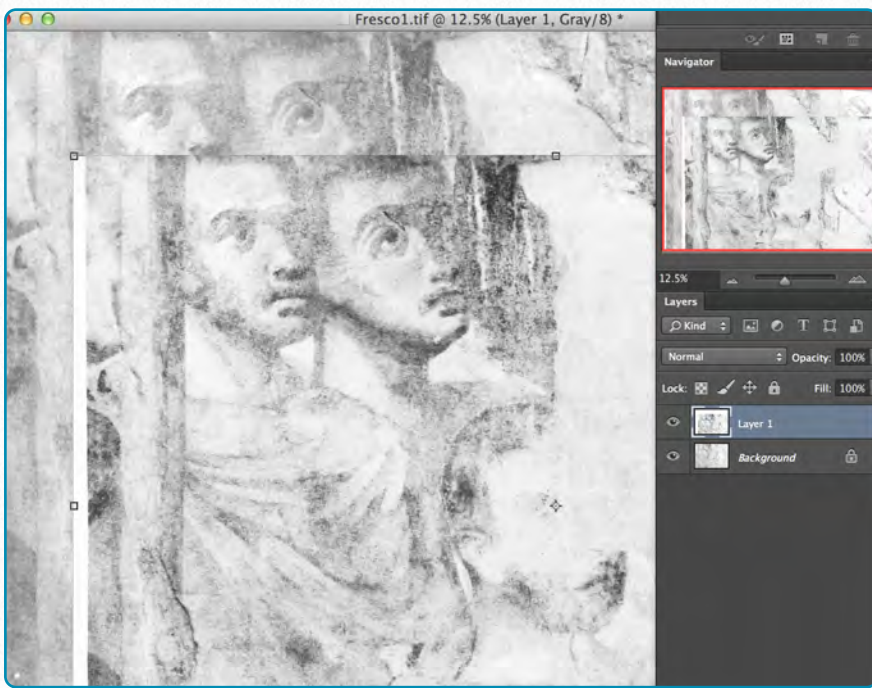
Layer Masks are one of those Photoshop features that beginners might find hard to work with, although the philosophy behind masks is very simple: masks enable the artist to hide or reveal parts of a layer.

To add a mask, we have to click on the icon at the bottom of the *Layers Panel*, which results in the appearance of a little box next to the layer. This is the mask thumbnail. While it is highlighted, one can paint with black or white over the image. Masks are always indicated in grayscale. The parts of the mask that are *black* hide the layer’s content, while the parts that are *white* keep the layer’s content visible. The parts of the mask that are *gray* make the content partially visible. Using masks is very similar to using the *Eraser* tool, but much more useful because one can bring parts back whenever needed. What’s more, masks can also



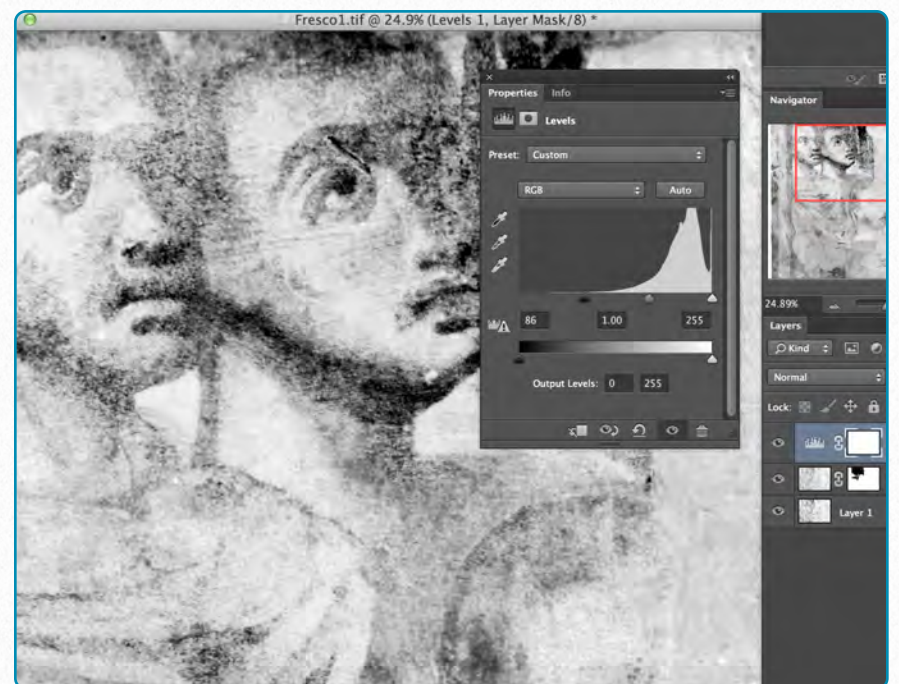
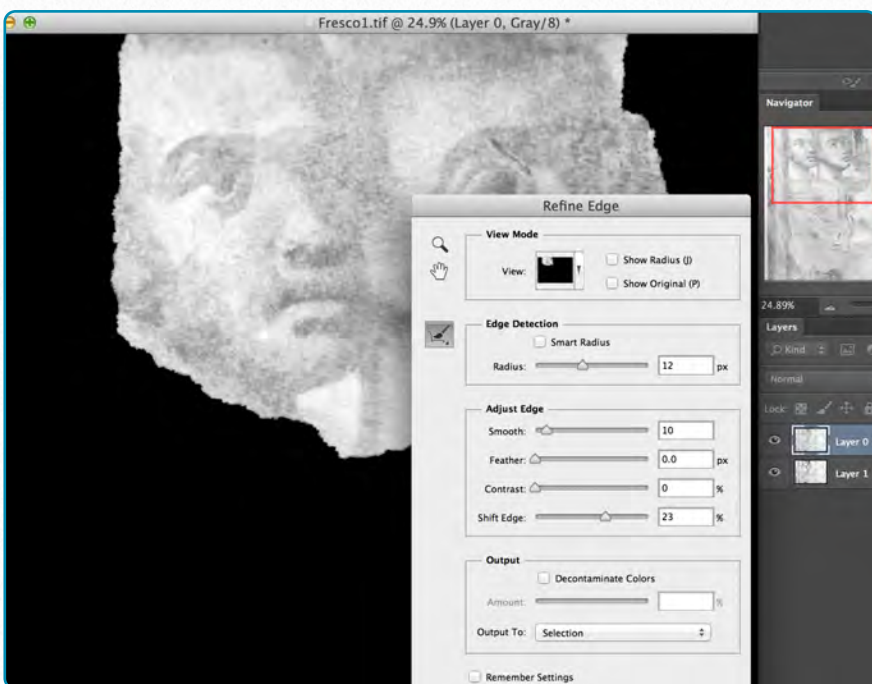
LEARN SKILLS

Using Layer Masks to Emphasize Details on a B/W Photo



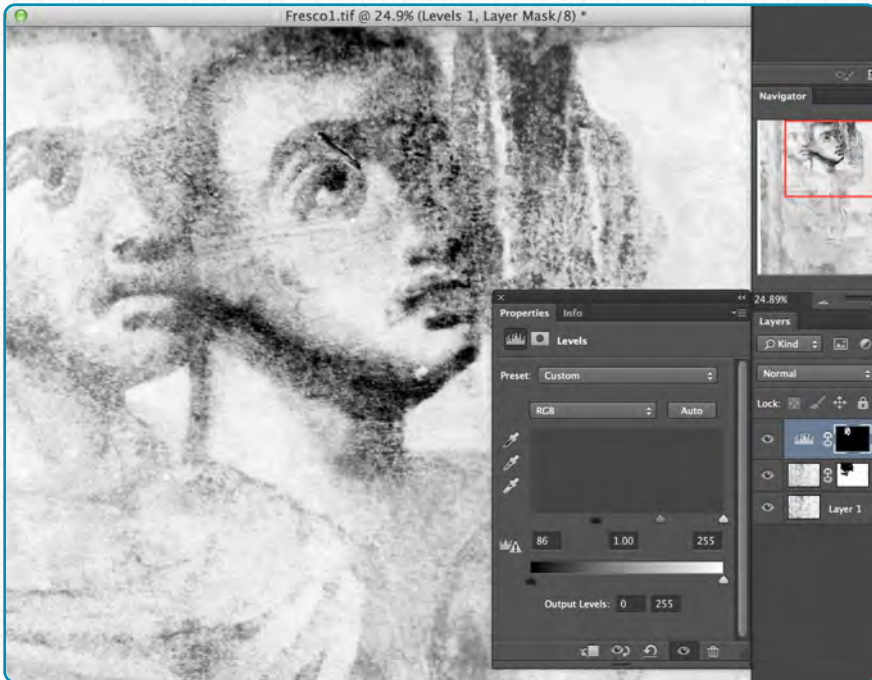
(1) Open the two photos, and go to the dark one. Select the *Move* tool, then drag the image over the light one. Press *Cmd/T* and resize and position it so that the details match. Press *Enter* to apply, then go to the Layers Panel, double-click the Background layer, and hit OK to make it editable.

(3) Hold down *Alt* and click the *Add Layer Mask* icon to add a mask that hides the selected area. Highlight the Layer Mask thumbnail in the Layers Panel, then select the *Brush* tool. Set the Foreground color to black (changing brush opacity makes the strokes gentler), and then paint over the faces to reveal some of the darker details from the Background layer.



(2) Drag the top layer below the bottom one. Highlight the top layer, then hit the *Quick Selection* tool and paint over the area you'd like to emphasize. Click *Refine Edge* and - depending on how accurate the selection has to be - set Radius, Smooth, Shift Edge, and Output as seen above.

(4) Finally, add some localized adjustments to the image. Make sure the top layer is highlighted, then click the *Create Adjustment Layer* icon in the Layers Panel and choose *Levels*. Adjust the levels according to your needs and see if you can reveal more details on your background image.



(5) Next, hit *Cmd/I* to invert the Layer Mask to black, and then paint with white to reveal the shade shift over the face and curtains. By using Layer Masks instead of manipulating the entire image, you should be able to do as many changes as you want, and to go back to the original in case you're not satisfied. It is also possible to use different effects on certain areas.



be used on *Adjustment Layers* to hide or reveal changes in color and tone.

The power of Layer Masks can be demonstrated with a simple project: we have two photo enlargements, one of which is light and reveals lots of details on dark areas, but is burnt out over lighter elements. The other one is the exact opposite. When we pencil on our photo in front of the wall, we want to see as many details as possible. Instead of being forced to choose in between these two imperfect enlargements, with a little modification we are able to enjoy the

benefits of both. (As an easy reminder, the artist should think of masks in terms of light: black blocks out all light; white lets light in, while gray lets varying levels of light in.) Just like any grayscale image, a mask can be created with a paintbrush, fill, or gradient, giving us control over their shape and most importantly their transparency.

Five Mask Essentials

Highlight the mask thumbnail - when we work on our mask, we always have to make sure the mask thumbnail is highlighted on the selected layer in the Layers Panel, rather than the image thumbnail, otherwise we might end up painting over the image instead of the mask.

Knowing the right shortcuts - *D* resets the foreground colors to black and white, and *X* swaps them. The *]* and *[* bracket keys resize the brush tip and *Shift +]* and *Shift + [* hardens or softens the brush (we'll talk about the brushes more later in this section).

Turn selections into masks - Often, the process of making a mask begins with a selection. Any active selection can be turned into a mask simply by clicking the *Add Mask* icon. This hides everything but the selected area. Holding down *Alt* while clicking does the exact opposite and hides just the selected area.

Adjustment Layer Masks - Conveniently, Adjustment Layers automatically come

with Layer Masks, which means that the artist can add - for example - a Levels or Curves Adjustment Layer to make a tonal change, then immediately pick the Brush tool and start painting to apply the change selectively over the image.

Invert from white to black - It's sometimes much easier to hide absolutely everything on a layer, then paint with white to bring back the parts we want. By holding down *Alt* and clicking the *Add Layer Mask* icon we can add a full black mask that hides everything, or simply highlight an existing white mask and hit *Cmd/I* to invert it.

i

Curves

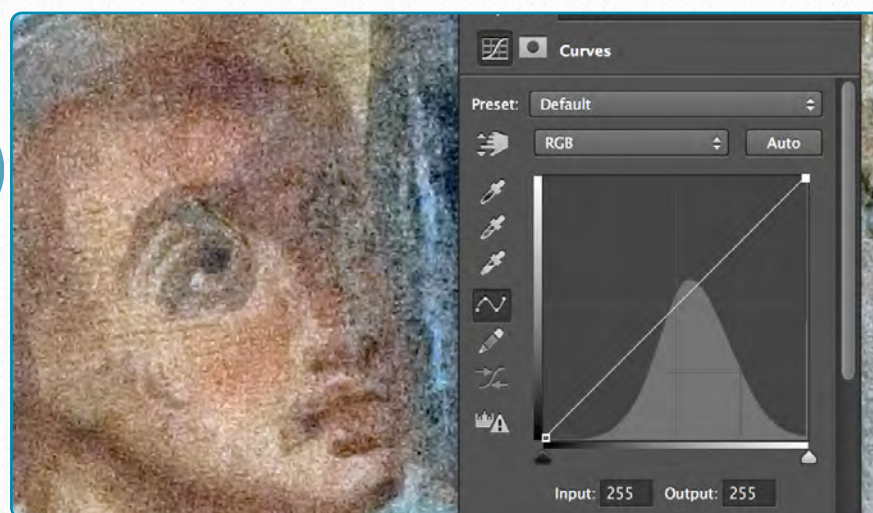
As an Epigraphic Survey artist who works almost exclusively with black-and-white images, one would think that learning about Photoshop's color management is rather pointless. However, some of the Survey's more recent documentation efforts (paint studies at Medinet Habu, Roman fresco project at Luxor temple) are strongly concerned with colors and tonal modifications. With one of Photoshop's most powerful and flexible tools, called Curves, the artist is able precisely to control tones throughout an image. With Curves one can not only adjust the brightness of different parts of the tonal range, but also change individual

color channels, correct color casts, and create a huge range of tonal effects. It's possible to apply Curves directly on an image layer (*Image/Adjustments/Curves*, or *Cmd+M*) or alternatively as an *Adjustment Layer*. In general it is recommended using Adjustment Layers, so that the changes are completely reversible.

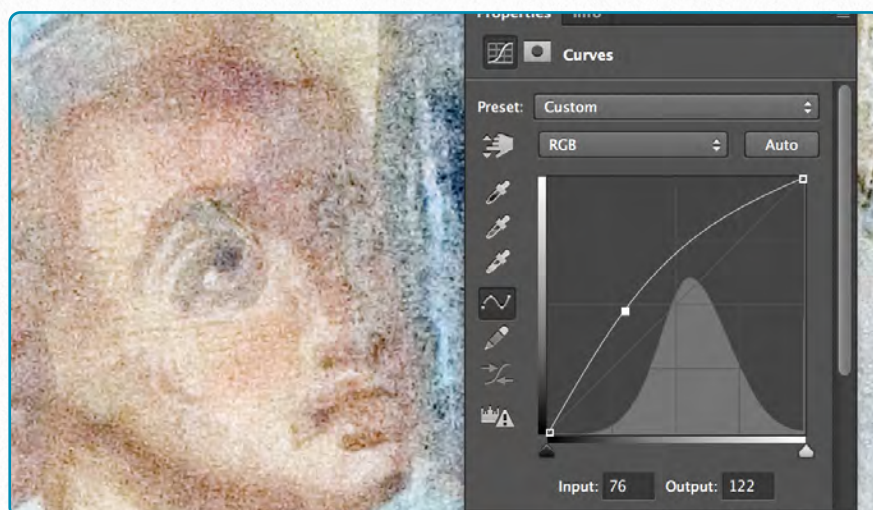


LEARN SKILLS

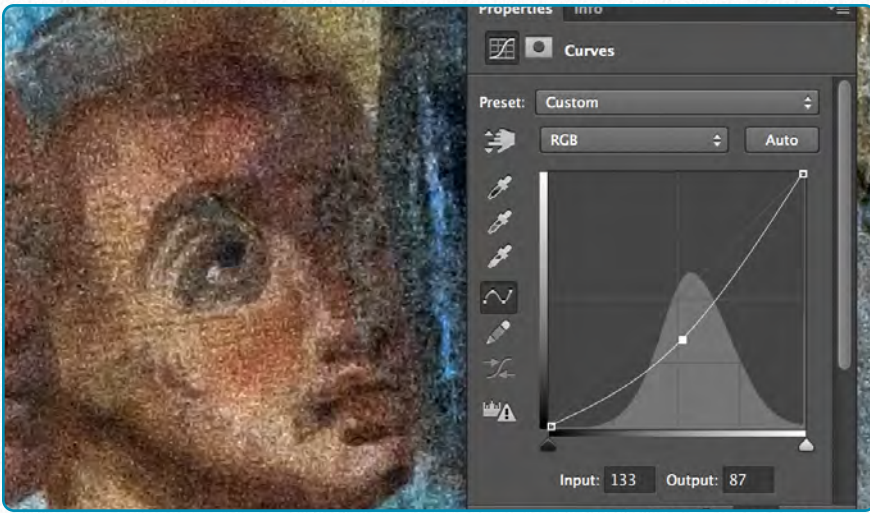
The Most Common Curves Adjustments



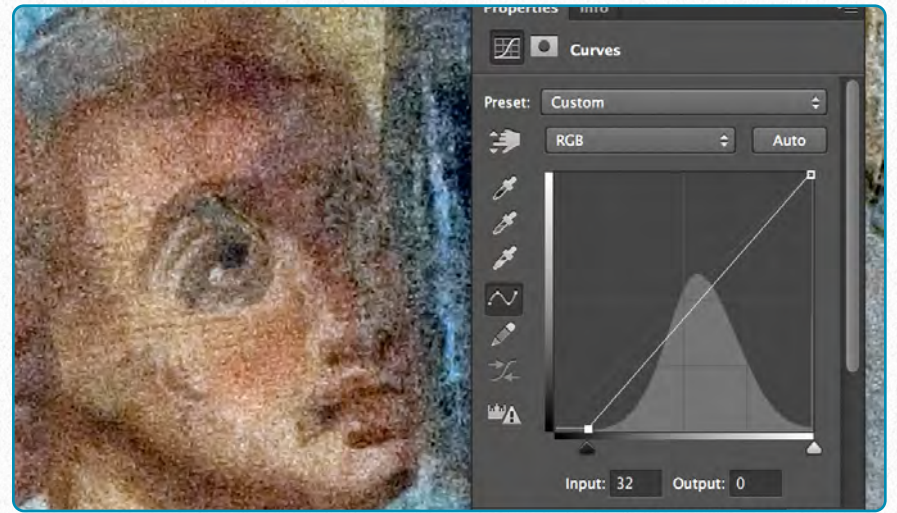
(1) The original color image shows part of a Roman fresco. It was already color-corrected by the photographer and is used here only for demonstration purposes.



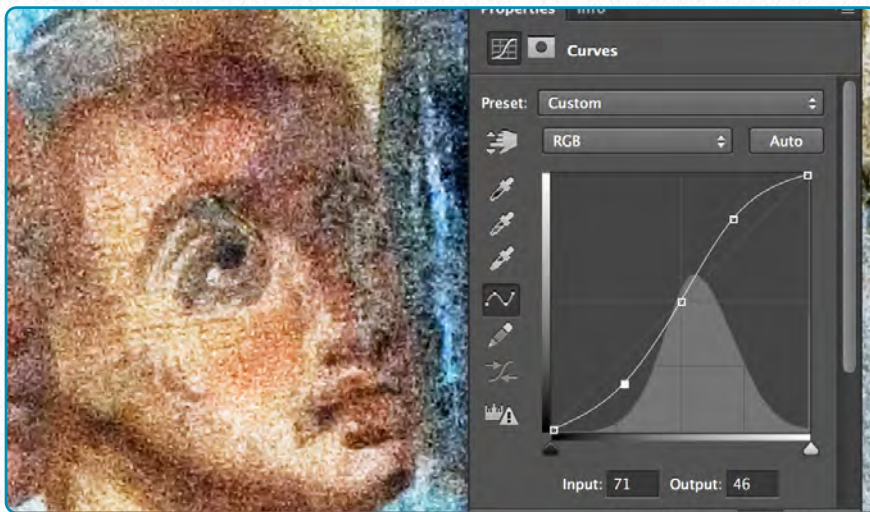
(2) **Lighten an image** - click and drag upwards on the line to brighten all the tones in the image



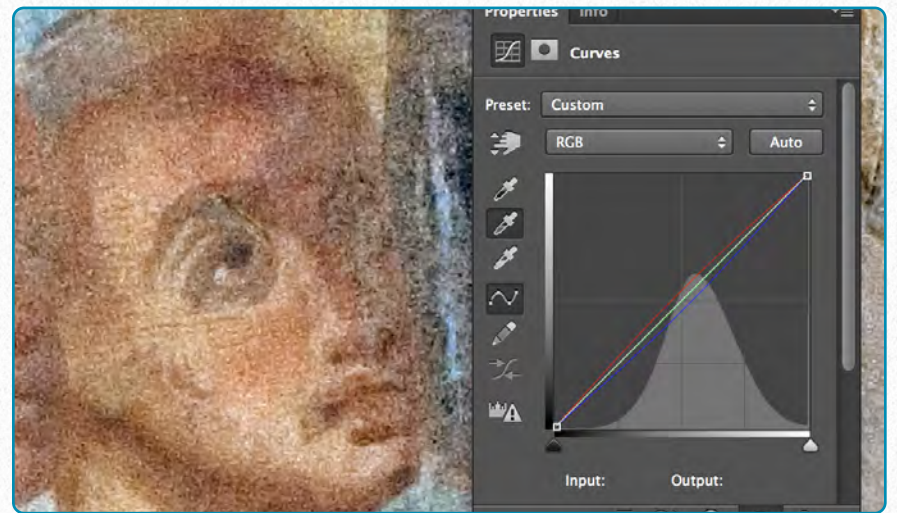
(3) Darken an image - click and drag downwards on the line to darken all the tones in the image.



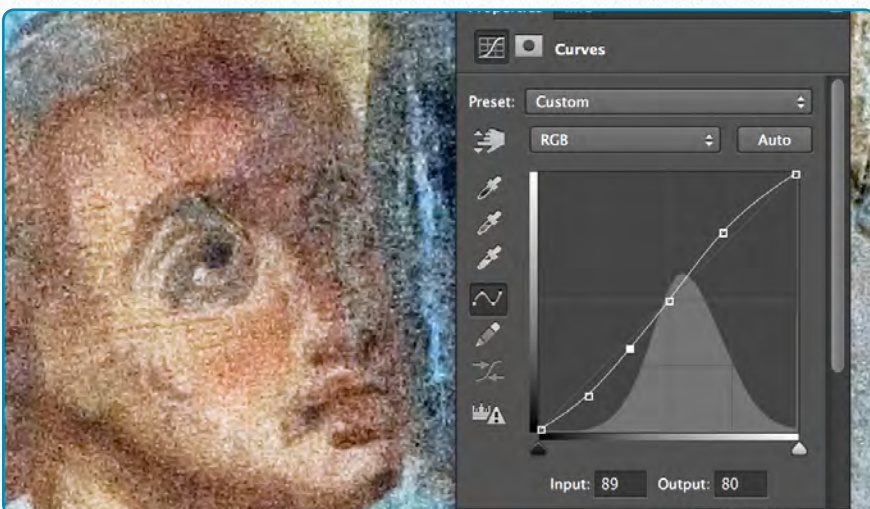
(6) Set black-and-white points - hold down *Alt* and drag the bottom sliders inwards until clipped pixels appear.



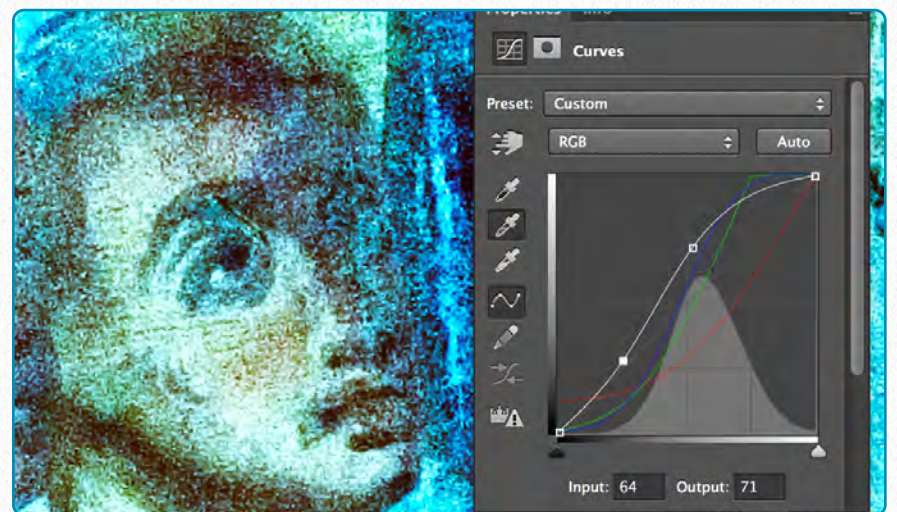
(4) Add contrast - make an S-shaped curve with two points, one dragged up, the other dragged down.



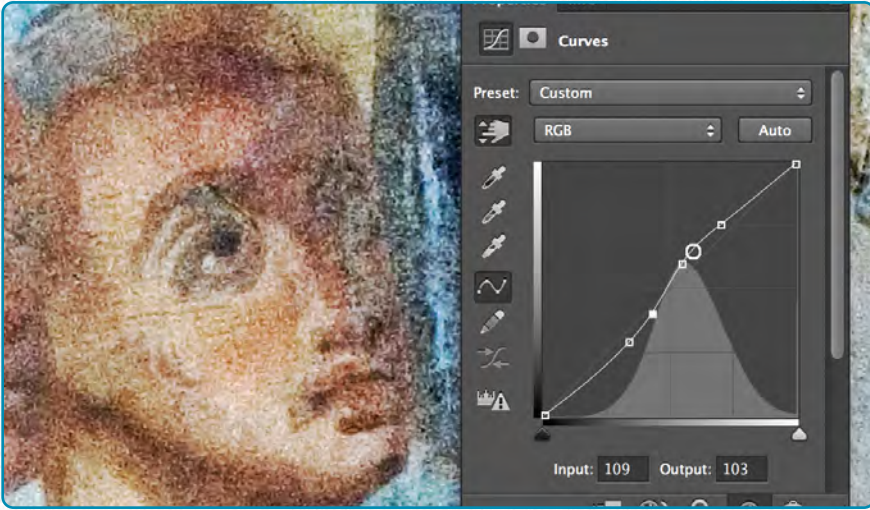
(7) Fix a color cast - click with the middle eyedropper on a part of the image that should be neutral gray.



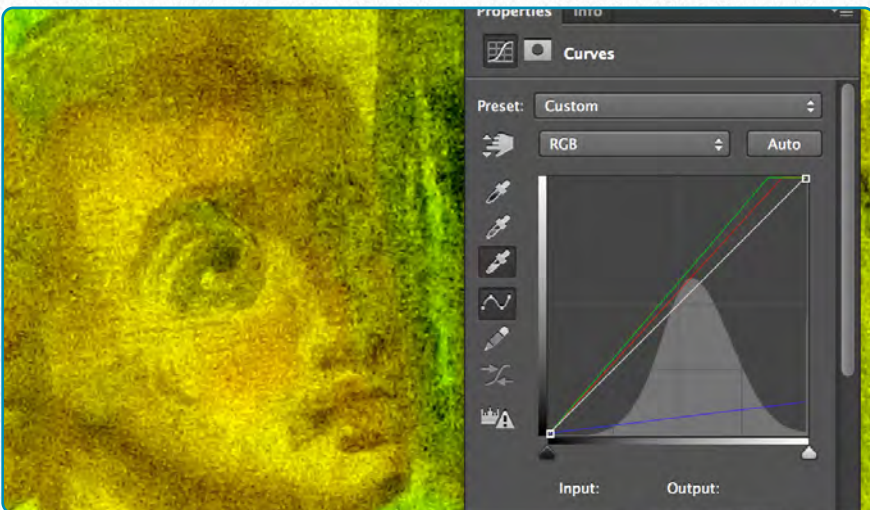
(5) Target specific tones - adjust one part of the line and pin the rest back along the diagonal with further points.



(8) Add color shifts - click on RGB, choose Red, green, or blue and adjust the lines by dragging them.



(9) Make interactive tweaks - click on the hand icon, then drag over the image to adjust the tones.



(10) Set colors - double-click the black or white eyedroppers, select a color on the *Color Picker*, click OK, then click on the image.



Modifications in curves happen by adjusting the shape of the so-called **Curve line**. The Curve line enables the artist to adjust brightness by altering different parts of the tonal range. The X-axis represents the tone before any change, and it is displayed on a scale from 0 (black) on the left to 255

(white) on the right. The Y-axis represents the changes we make. Dragging the line up past the initial straight diagonal lightens the tones, while dragging it down darkens them. It's also possible to add multiple points to fine-tune these changes.

Brushes

Brushes are one of the most powerful tools in Photoshop's creative arsenal. Certainly Brushes will be the *initial* painting tool for the Epigraphic Survey artist and will be explained in a lot more detail later on. When clicking on the *Brush tool* (*Shortcut: B*), we have a number of options to adjust at the *Options Bar*:

- **Tool presets** - access previously saved brush settings.
- **Brush picker** - accesses and manages preset and saved brushes, controls brush size and edge hardness, and saves settings as a preset.
- **Brush panel** - manages deeper customization of brushes as described in *Chapter 4, Section 4*.
- **Mode** - contains blend modes. A Blending mode is a way to mix the colors with the object(s) behind them using specific mathematical formulas working over the RGB values of each pixel.
- **Opacity** - controls how transparent the brushstrokes are.

The Brush Presets

Shape Dynamics

Allows the artist to adjust the shape of the brush tip, either randomly or with pressure controls. One can set randomness with the Size, Angle, and Roundness *Jitters* (jitter means randomness in Photoshop and is adjusted by using sliders). The Flip X and Y boxes can be used for extra randomness.

Scattering

Turns any brush into a random scatter. The Count settings in combination with the Spacing settings in Brush Tip Shape can be used to control the size and density of the scattered effect.

Texture

Adds a texture or pattern to the brush tip. This is useful for creating the look of paint on a textured surface. One can choose a pattern from the drop-down menu, then experiment with the Mode and Depth settings to control its appearance.

Dual Brush

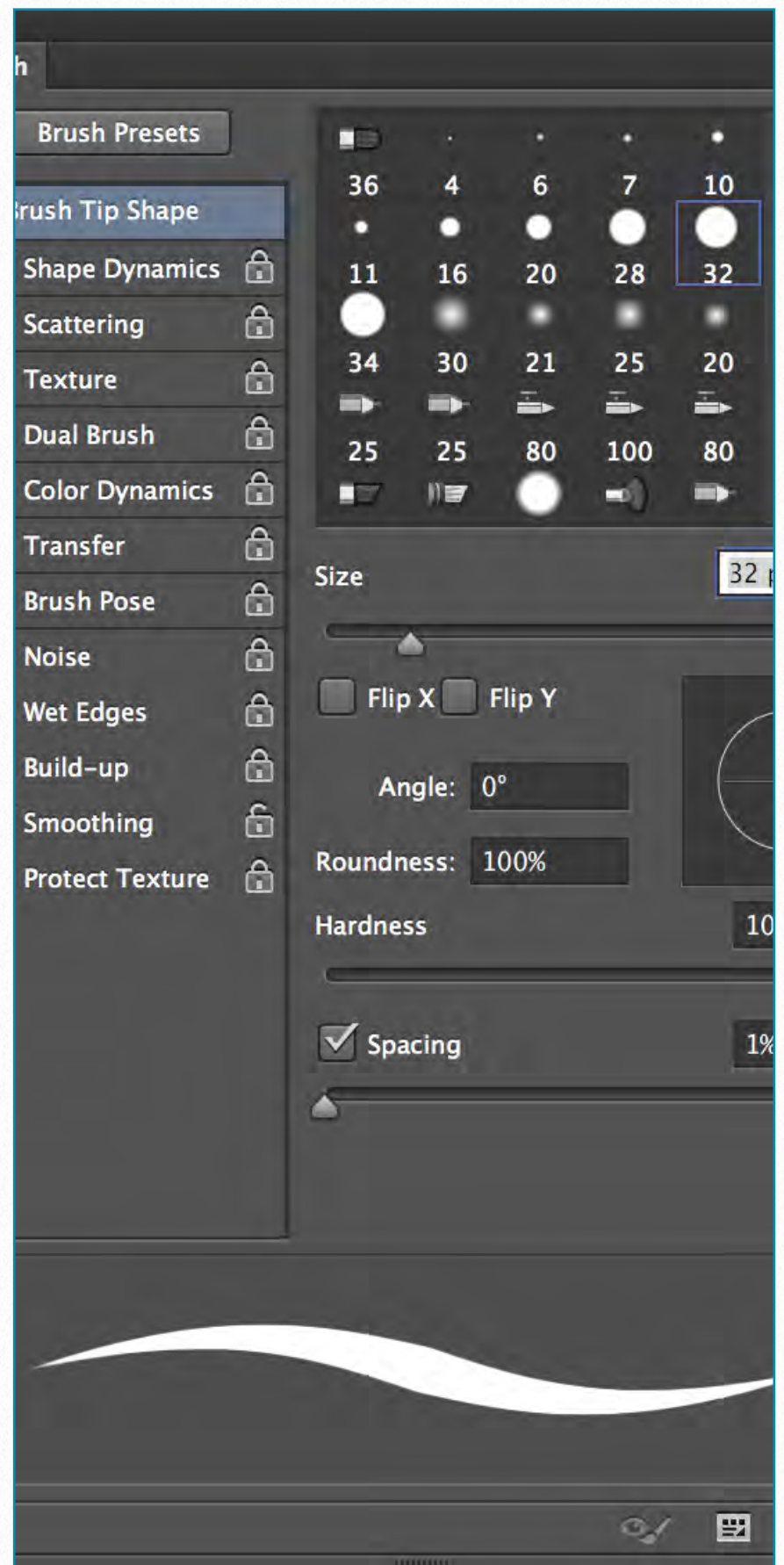
Selects a second brush tip that acts a little like a mask for the main brush tip, so that the first brush fits inside the shape of the second brush. One can experiment with Blend Mode and scattering for an array of effects.

Color Dynamics

Adds random shifts in color as we paint. The jitter sliders can be used to set Hue, Saturation, and Brightness. The Foreground/Background Jitter flicks between the two selected colors, and can be controlled by pen pressure. When *Apply per tip* is checked, it results randomly colorful strokes.

Transfer

Adds random Opacity and Flow settings that affect how the brush builds up paint. (When using



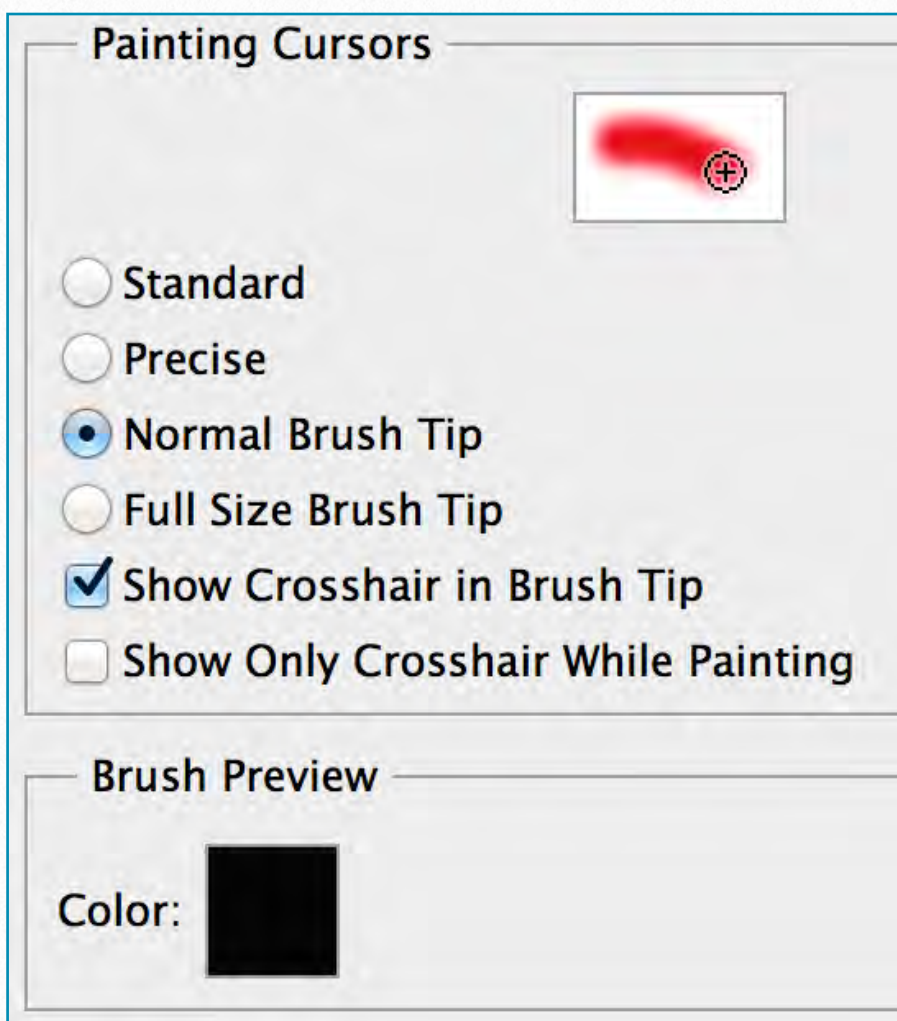
the mixer brush, we can set the Wetness and Mix the paint as well).

Brush Pose

This feature is only available for pressure-sensitive tablet users. It lets the artist set tilt values for the X and Y axis that control how the pen behaves.

- **Tablet pressure controls opacity** - the artist can make the opacity vary by changing the amount of pressure applied to the tablet.
- **Flow** - controls the rate at which the color is applied to the drawing. A lower number means less paint is applied.
- **Airbrush** - emulates a tool that sprays paint onto the canvas with compressed air.
- **Tablet pressure controls size** - controls the brush size by changing the amount of pressure applied to the tablet.

Brush Cursor's Appearance



Brush cursor options

As a factory setting, the brush cursor reflects the size and shape of the selected brush, but it can be changed (*Photoshop/Preferences/Cursor*). If the brush cursor suddenly turns into a dot inside crosshairs, it means that *Caps Lock* might be turned on, which lets the user switch between the currently used and the precise cursor. While inking, the artist should paint with either *Normal Brush Tip* (which makes the tip slightly smaller than the actual brush stroke) or *Full Size Brush Tip*.

Customizing Brushes

There are lots of options to customize a brush tip in Photoshop, as shown on the previous page. Although the artist might limit his/her brushstrokes to solid lines during inking, again, it is very useful to know how to interact with these settings in case we need them. The basic use of the *Brush Panel* involves picking a preset brush tip from the upper-right window of the Brush panel, then activating a category on the right and tweaking the settings of that category that appear on the right. The preview area at the bottom of the panel shows how those changes affect the brush. Once a particular setting is selected, it can be locked by activating the padlock next to its name. This newly created brush can be saved by clicking on the folded paper icon on the

lower right corner of the Brush Panel. Photoshop gives the artist endless choices to change brush behavior, far more than can be included in this manual. (We will talk more about setting up our custom brushes in *Chapter 4, Section 4.*)



MORE READING

The Master Guide to the Photoshop Layers Panel:

<http://designshack.net/articles/software/the-master-guide-to-the-photoshop-layers-panel/>

Modifying Selections:

<https://www.inkling.com/read/photoshop-cs6-missing-manual-lesa-snider-1st/chapter-4/modifying-selections>

Understanding Layer Masks In Photoshop:

<http://www.photoshopessentials.com/basics/layers/layer-masks/>

The Science Behind Using the Curves Tool:

<http://www.cambridgeincolour.com/tutorials/photoshop-curves.htm>

The Most Comprehensive Examination of the Brushes Tool:

<https://www.inkling.com/read/photoshop-cs6-missing-manual-lesa-snider-1st/chapter-12/reintroducing-the-brush-tool>

Setting Up the Wacom Tablet



To buy the Cintiq 22 HD visit: <http://eu.shop.wacom.eu/products/cintiq/cintiq-22hd/cintiq-22hd/503?c=70177>

To be able to create precise drawings in Photoshop, the artist must be able to emulate closely the feel of working on paper with a regular pen. Achieving the high standards of the Epigraphic Survey when inking digitally is certainly not possible by using the computer's touchpad or mouse. The need of finding a replacement for the regular pen and paper drew the Survey's attention towards *graphics tablets*. A graphics tablet (or *digitizer*) is a computer input device that enables the artist to hand-draw

images and graphics, similar to the way a person draws images using pencil and paper. This device consists of a flat surface (ideally a high-resolution screen) upon which the artist can draw using a *stylus*, which is a pen-like accessory. At the moment the Epigraphic Survey artists work on graphic tablets equipped with high-resolution screens (1920x1080 pixels in 22 inches) made by the Wacom company. These tablets are not stand-alone input de-

vices, but can be used only with an attached computer running Photoshop.

As of 2013, there is a brand new standalone Wacom tablet, called Wacom Cintiq Companion, which is currently going through some rigorous testing at Chicago House. The tablet has a 13-inch full HD screen merging all the benefits of a regular Wacom digitizer with a Windows PC environment. The main advantage of using such a tablet would be during fieldwork. Most of this Manual was designed for artists working with their initial version of documentation as a physical copy. But the benefit of learning about photo-editing techniques as we've seen in the previous section becomes obvious as soon as the entire documentation process is carried out *digitally*. For now, the digital inking method is explained through documentation techniques with which the Epigraphic Survey already has experience.

Hardware

The Wacom Cintiq 22HD - the Survey's standard tablet - is very easy to set up: the artist only needs to put up the stand, slide the screen into place, and it's ready to go. The screen can be laid down flat, which is a very important feature for our

inking purposes, as it helps the artist lean over the screen while drawing.

The button interface is particularly useful for providing hot keys to access such features as modifiers (Command, Option, or Shift), Photoshop Keyboard Shortcuts to certain features (such as Step Backward,



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The Wacom Cintiq 22 HD: Important features for the artist



(1) The tablet can be set up in various angles



(2) The tablet can be turned either left or right and can be rotated 180 degrees in both directions



(3) The tablet has 16 express buttons for action shortcuts, 8 on both sides



(4) The tablet is equipped with a touch strip on the back to perform more complicated tasks



(5) The tablet's screen is very bright (230cd/m²) and has a 178 degrees viewing angle

Deselect, Brush, or Pen) or mouse clicks (such as Right Click). The reason it's recommended to set up the shortcut buttons only on the left is because the artist tends to hit the right side of the screen by accident while leaning over the tablet. But one can use whatever layout works for him/her; there are more than enough combinations to fulfill anybody's needs.

The Touch Strip is a bit uncomfortable to use for Epigraphic Survey-type drawings because when scrolling it's necessary to slide one's finger up or down, lift it, bring it



VIDEO TUTORIAL

INSTALLING
CINTIQ22HD

Installing The Wacom Cintiq 22HD

back, and repeat until arriving at the desired result, which can be very distracting. However, the Touch Strips perform very well, and they are conveniently positioned on the back of the device (directly behind the toggle buttons that change their func-

tion), making it easy to switch function with the thumb while scrolling with the index finger. Again, it's recommended to try out all of the Wacom tablet's functions and to see what works in certain situations. This short introduction to the hardware set aside, let's see how to customize the interface.

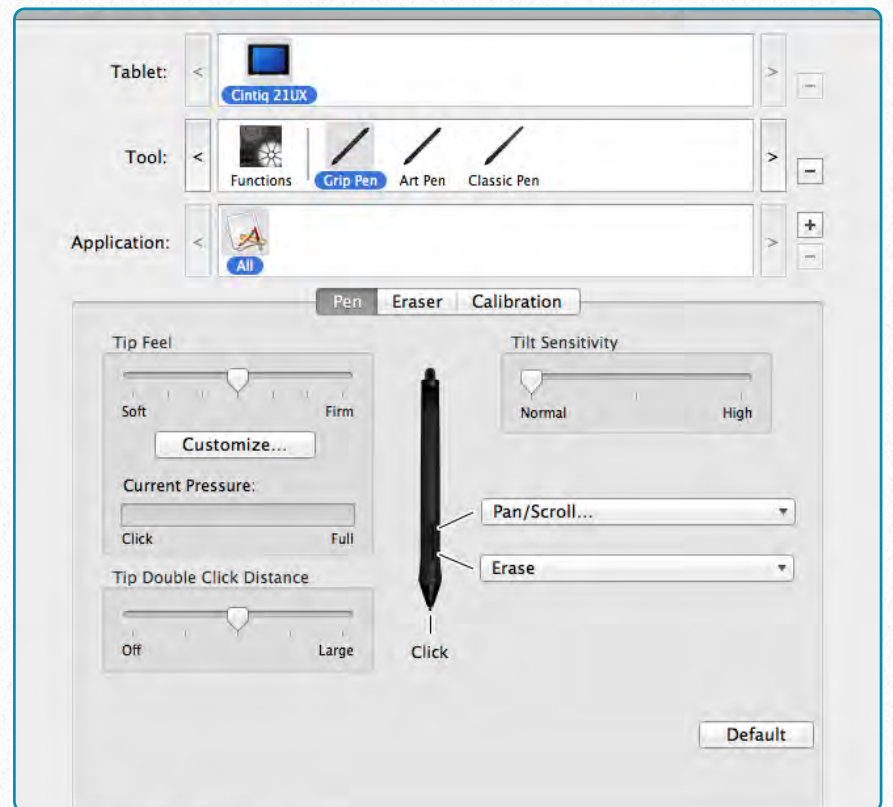
Software

The driver of the tablet is located in System Preferences on the Mac (System Preferences/Wacom Tablet). Once the Wacom driver is installed and the tablet is connected to the computer, we can open up the tablet setup window. The three horizontal windows show the name of the tablet associated with our computer, the tools we can use with our tablet, and the applications to which these settings can be applied. By default it is set to *All*, but the user is allowed to set up different attributes for certain applications like Photoshop or Illustrator.

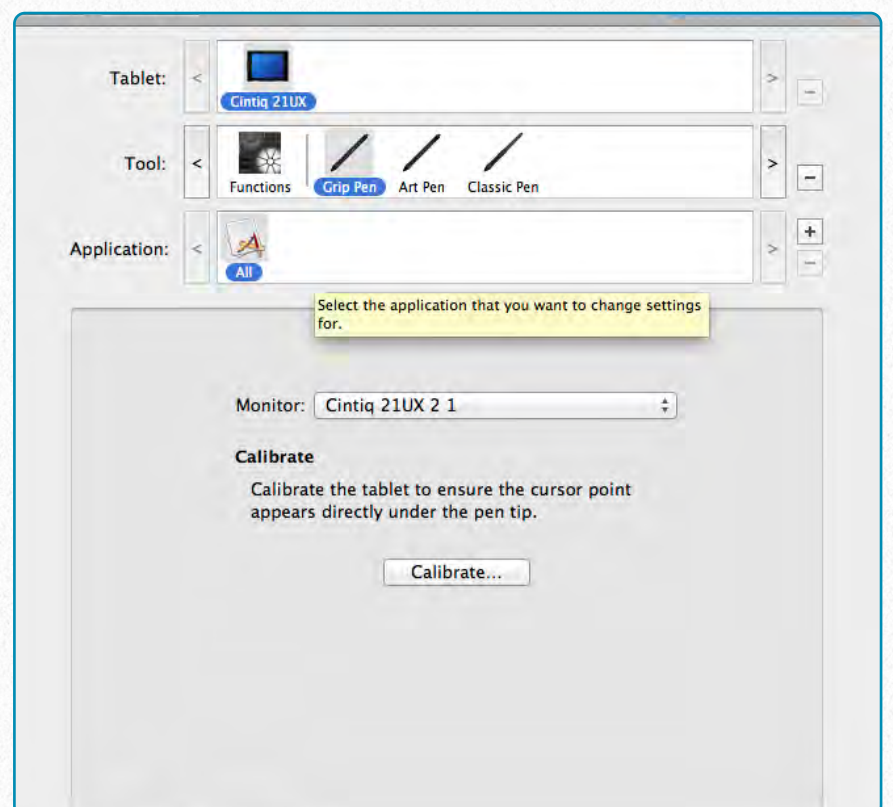
As can be seen on the above screenshots, this particular tablet has been associated with three different pens (*Grip*, *Art*, and *Classic Pen*). Each has its own settings, so the artist is able to use different pens to perform certain tasks. When one of the pens is selected there are the following features that can be customized:

LEARN SKILLS

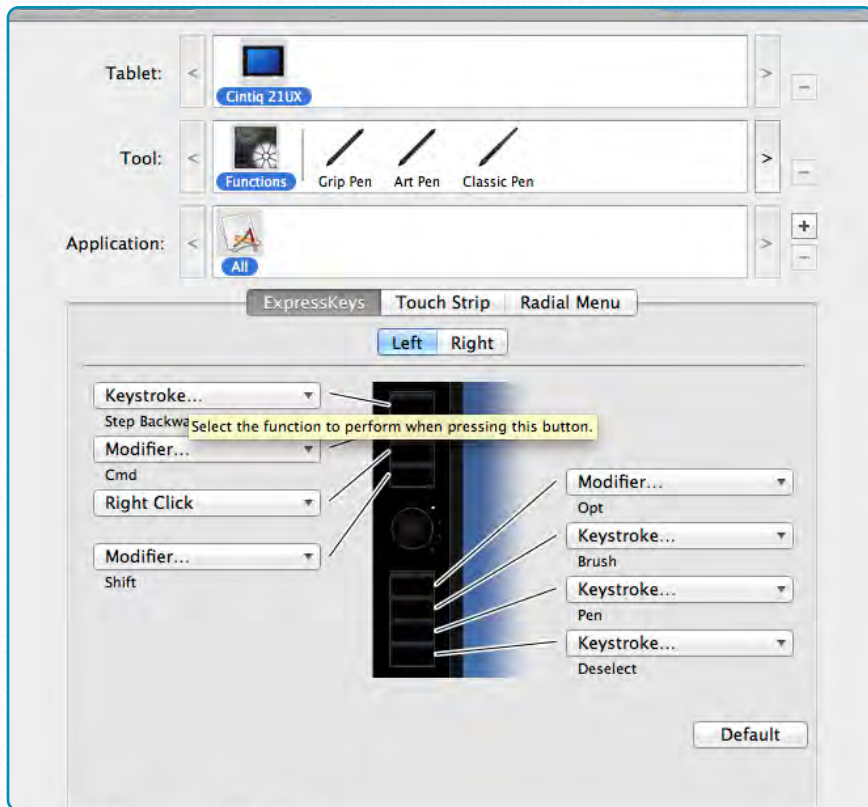
Assigning Certain Functions to the Pen and Hot Keys



(1) The Pen Setup Window



(2) The Screen Calibration Window



(3) The Hot Keys Setup Window

- **Tip Feel** - adjusts how much pressure one has to put on the tip to draw different line thicknesses. The Epigraphic Survey drawings are usually inked with preset line thicknesses, so pressure sensitivity is normally disabled when we draw in Photoshop.
- **Tip Double Click Distance** - can be set to “Large” if the artist feels that the buttons are too responsive when clicking.
- **Tilt Sensitivity** - a self-explanatory setting, once again not particularly useful for the the Survey’s traditional inking process.

- **Side Buttons** - there are two buttons on the side of our pens that function as hot keys to perform certain commands. This particular pen is set up to either Pan/Scroll the paper by hovering over the drawing area and holding down the button at the same time or to Erase whenever necessary (this is the same as using the pen’s end button, but it is faster and more precise).

Another action we have to perform with the pen during setup is *calibrating* our Wacom tablet’s screen as demonstrated in the *Installing Cintiq 22HD* video tutorial.

Finally, there should be some customization performed on the tablet’s button interface as well. When we click on the *Functions tool*, we see a picture of the left/right string of buttons with some commands already associated with them. These buttons are called Express Keys and can perform tasks associated with certain mouse clicks, Photoshop-specific action modifier buttons (*Shift, Control, Option, Command*). There are some other options that are either Wacom specific (such as *Pan/Scroll*), or associated with computer features (*Show Desktop, Switch Application, On Screen Keyboard, etc.*). Each and every Express Key can potentially be disabled as well. For our drawing purposes, I would



VIDEO TUTORIAL

SETTING UP EXPRESS KEYS AND TOUCH STRIPS

Wacom Cintiq button setup

like to recommend the following setup of these buttons (the order is equivalent to the vertical row of 8 regular-sized buttons on the left side of the Cintiq 22HD model):

- **Step Backward** (*keystroke Opt+Cmd+Z*) - the most commonly used Photoshop command which cancels not just our latest modification step on the drawing (*Undo*), but, by repeatedly clicking on it, lets us step backwards in Photoshop's History panel.
- **Command** (*modifier*) - every time a drawing path has to be modified, the action is executed by holding down the *Command* button.
- **Right Click** (*mouse clicks*) - every secondary option throughout the entire system is called up by clicking on the right

mouse button (also called *secondary click*), so it is one of the most-used shortcuts the artist will employ during drawing.

- **Shift** (*modifier*) - mostly used for drawing straight brush lines or proportion-aware editing of objects, images, or image parts.
- **Option** (*modifier*) - when using the Clone stamp or any other location-aware action, pressing the Option button selects the sample area from which the information is taken.
- **Brush** (*keystroke B*) - one of the two most-used tools for digital inking.
- **Pen** (*keystroke P*) - the other most commonly used tool for digital inking.
- **Deselect** (*keystroke CMD+D*) - in most of the cases specific selections can be very time consuming to achieve. Once we are done and want to go back to drawing, the easiest way to deselect the area is by hitting a single button.

All of the above-mentioned shortcuts can be executed from the regular computer keyboard as well, especially if the user takes the time to learn the combinations for specific tasks. When the artist is deeply involved with drawing, however, he/she

should always choose the least distracting way to interact with the software, and in our case that means dealing with Photoshop right from the tablet. Since all the buttons on the Cintiq 22HD look exactly the same, it is useful to have a sticky note reminder of each button's actions on the actual button. Otherwise, it's recommended to hit the Information (i) button on the tablet frame's upper right corner, which briefly highlights the actual setup of each button.



<http://www.smudgeguard.com/ordernow.htm>

transitions. One of the most recommended accessories is a drawing glove to keep hand movements on the surface continuous and smudge-free while drawing. The best drawing gloves are made by a company called Smudgeguard and come in different sizes, with either one or two fingers covered for more freedom of movement.



Information button

Additional Accessories

- **Gloves** - it is very hard to have a continuous movement of the hand while drawing on the tablet's glass surface. There are usually smudges, sweat, etc. on the screen preventing the artist from drawing elegant curves and executing smooth

- **Trackpad** - there are several companies producing Bluetooth-enabled wireless trackpads to increase the tracking area of one's laptop, but to date Apple makes the most useful gesture-based device to help the digital artist. When drawing, the usual arrangement is to have the Wacom tablet in front of us, and the laptop (or whatever computing device the user has) on our right (giving the best cable arrangement in between PC and tablet). Certainly this may vary depending on whether the artist is left- or right-handed,



Apple Magic Trackpad

<http://store.apple.com/us/product/MC380LL/A/magic-trackpad>

and otherwise for personal convenience. A separate trackpad provides better gesture-based control than using a mouse, and it can be placed anywhere on the table, so it



Apple Bluetooth Keyboard

<http://www.apple.com/keyboard/>

can be operated with the left hand while drawing with the right.

•**Bluetooth Keyboard** - As mentioned in the *Installing Cintiq 22HD* video, the Wacom digitizer, when connected to the computer, acts either as a main or secondary screen, splitting the information between the two devices or mirroring the computer screen itself. In case the artist wants to keep his/her focus on the drawing (assuming the screen has enough space to accommodate all the necessary information), it is recommended to mirror the computer screen and close the lid on our laptop (in this case the energy saving settings should be revised in *System Preferences/ Energy Saver/ Computer Sleep*). In this scenario, a separate Bluetooth keyboard can be used whenever key commands are needed. There are many options on the market, but Apple's Bluetooth Keyboard is the one recommended. It is light enough to carry around and can be put anywhere on our desk, making the drawing process more versatile.

•**Cooling Pad** - this is the last of the accessories recommended here for digital inking. Working with large drawing files requires not just a powerful computer, but also a sophisticated cooling system.

Laptop fans are usually not powerful enough to balance out all the heat generated by heavy data processing. There are hundreds of cooling pads on the market to choose from, but two attributes should be considered: the number and power of fans that it includes and the noise that it generates.



Thermaltake Massive23 LX Snow edition
http://www.thermaltake.com/products-model.aspx?id=C_00001932



MORE READING

A Very Thorough Review of the Wacom Cintiq 22HD:

<http://www.wexphotographic.com/blog/wacom-cintiq-22hd-interactive-monitor-review>

An Early Review of the Wacom Cintiq Companion Tablet:

<http://gizmodo.com/wacom-cintiq-companion-review-a-dream-for-drawing-oth-1458825039>

A Comprehensive Tutorial Using Wacom Tablets and Photoshop CS6:

http://www.photoshopcafe.com/video/products/CS6_Wacom.htm

A Comprehensive Tutorial Using Wacom Tablets and Photoshop CC:

http://www.photoshopcafe.com/video/products/CC_Wacom.htm

The Most Thorough Cooling Pad Comparison as of 2014:

<http://laptop-coolers-review.toptenreviews.com>

4

Digital Inking Method

Capturing Data, Setting up and using the Survey-specific drawing environment, Using digital inking on photo-enlargements - Theory and Practice



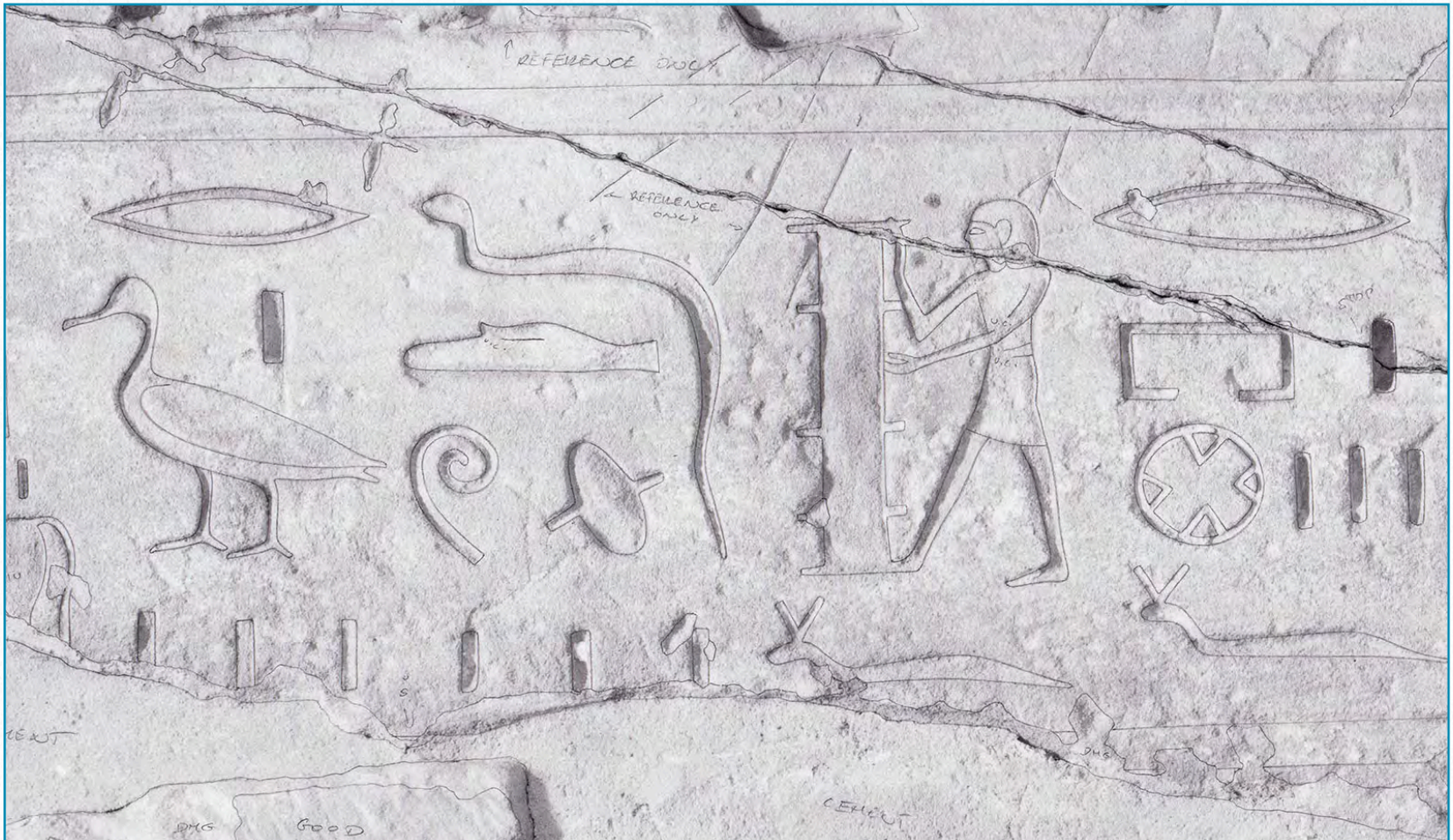
Photo by J. Kimpton

Epigraphic Survey members practicing on the Wacom tablet

In this chapter we'll give the artist detailed guidance for producing digitally inked final versions of his/her initial documentation. The method described in the following sections is not exclusive; one has to keep in mind that there is no uniform solution that

can be applied in every situation. The main aspect that makes documentation a very innovative and constantly changing phenomenon is the number and variety of material that needs to be recorded.

Capturing Data



MHB 4n (detail) - Initial pencil drawing on B/W photo enlargement

As we discussed earlier, the initial version of our digital documentation is prepared at the archaeological site, in front of the actual wall. This version contains all the important data of the original artwork. The artist prepares these facsimile drawings by applying the guidelines of the Chicago House Method regarding *in situ* copying. This means that we draw in pencil on a specific scaled-down photo enlargement of a given wall section. This drawing contains all the visual (carved and/or painted

details, traces of earlier decoration, damages of the wall surface, etc.) and verbal (artist's remarks on the relationship of surface elements, color preservation, etc.) data on which we'll rely heavily while inking in the studio. There is an important advantage of inking digitally which we can take advantage of right from the beginning: our pencil drawing made at the site will not be inked, but rather it serves as a scanned background, providing guidelines for the digital drawing. Therefore the artist

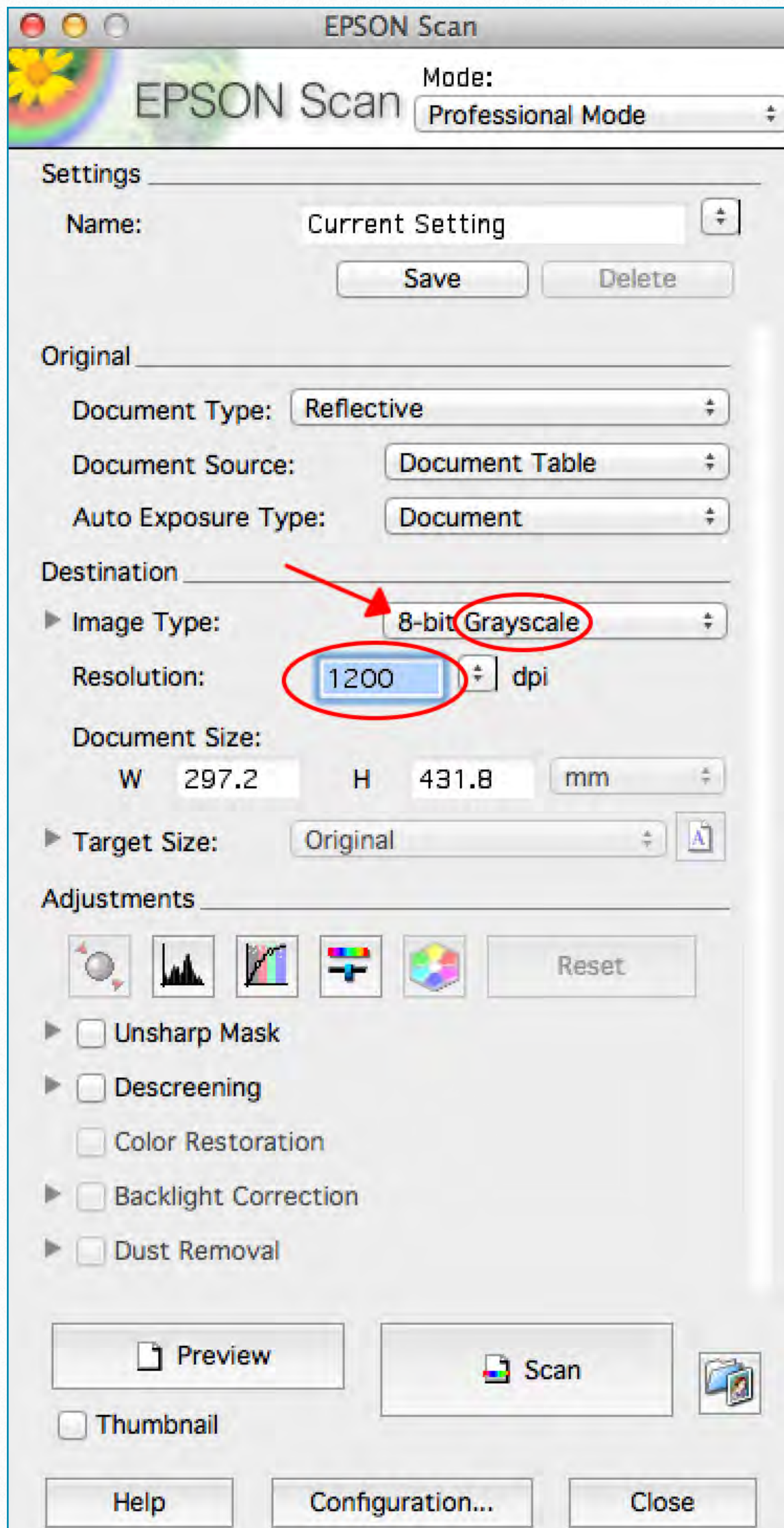
has a lot more freedom preparing this first sketch, adding more notes as well as trying out different solutions for certain problematic areas. Generally speaking, our photo enlargement can be treated a lot less circumspectly when we ink using a digital method.

The photo enlargement, or whatever physical media (film, transparent or acetate paper, etc.) is used to capture the initial artwork, has to be digitized so that it can be worked on in Photoshop. The most effective (i.e., the most accurate and most detailed) digitizing process is scanning.

During digitization our main goal is to capture the original photo's resolution (*dpi*) and detail to the greatest extent possible. Because the Oriental Institute traditionally publishes drawings in black and white, we get the most detailed image of a photo enlargement by scanning it in *grayscale*. Scanning in binary (black and white or line art) mode would provide us with the fastest processing. However, on most documents, grayscale leads to more accurate results, especially on degraded or shaded background photos. Color scanning is used only if one wants to retain color information and/or color graphics in the source material. The destination image resolution has to be set at 1200 dpi, which means

that there will be 1200 dots in one square inch (*dpi* - dots per inch) of canvas. This option yields rather large file sizes, but results in a sufficiently high level of detail and quality during printing. We have to make one more important choice during scanning that will affect the quality of our final product, and that is the bit mode of our scanned image. Some scanners offer 8-bit, 16-bit, 24-bit, and even 32-bit modes, indicating how many colors exist in an image. For example, scanning in 8-bit *RGB* (Red, Green, and Blue) means we have 256 shades of Red, 256 of Green, and 256 of Blue, which gives us $256 \times 256 \times 256$, exactly 16.8 million possible colors. On the other hand, scanning in 8-bit grayscale results only 256 shades of gray representing our entire image. Although scanning in 16-bit grayscale would mean much better image quality (256×256 , meaning 65,536 shades), it would result in much larger file sizes. Since our final inked documentation is represented by black outlines only, it is recommended to scan the background in 8-bit grayscale to keep the file sizes at a manageable level.

Once the scanning is done, the result has to be saved. We will talk a lot more about saving our files in *Chapter 5, Section 1*, but for now all we have to know is that we don't want our image data to be com-



Epson Workforce WF-7515 Scanner Interface

pressed during saving. Therefore we have to save our background image as uncompressed .tiff (Tagged Image File).

The regular flatbed scanner size is A4 (8.3x11.7 inches), but some scanners are able to capture A3+ images as well. If our source photo enlargement is larger than A3+ (13x19 inches) we have two options:

We can use a drum scanner (such as the HP Designjet HD Scanner), which is able to scan up to 42-inch wide images in infinite length but only provides 600 dpi optical resolution. An additional problem with this type of scanner is that the nature of this process (the image is “rolled” through between two drums) has a higher margin of inconsistency and distortion, and can damage the original drawing, especially if it is in a fragile state.



HP Designjet HD Scanner

<http://shopping1.hp.com/is-bin/INTERSHOP>

A better solution is scanning our large image in sections with some overlapping and then stitching the parts together in Photoshop. In the next Section we will have a look at the tools used for merging the various sections of scanned images and for modifying the results for our drawing needs.



MORE READING

Get Your Scanner to Work with Photoshop CS6:

http://www.macworld.com/article/1168305/get_your_scanner_to_work_with_photoshop_cs6.html

Image Resolution, Pixel Dimensions and Document Size Explained in Photoshop:

<http://www.photoshopessentials.com/essentials/image-resolution/>

Difference Between Image Resizing and Resampling in Photoshop:

<http://www.photoshopessentials.com/essentials/resizing-vs-resampling/>

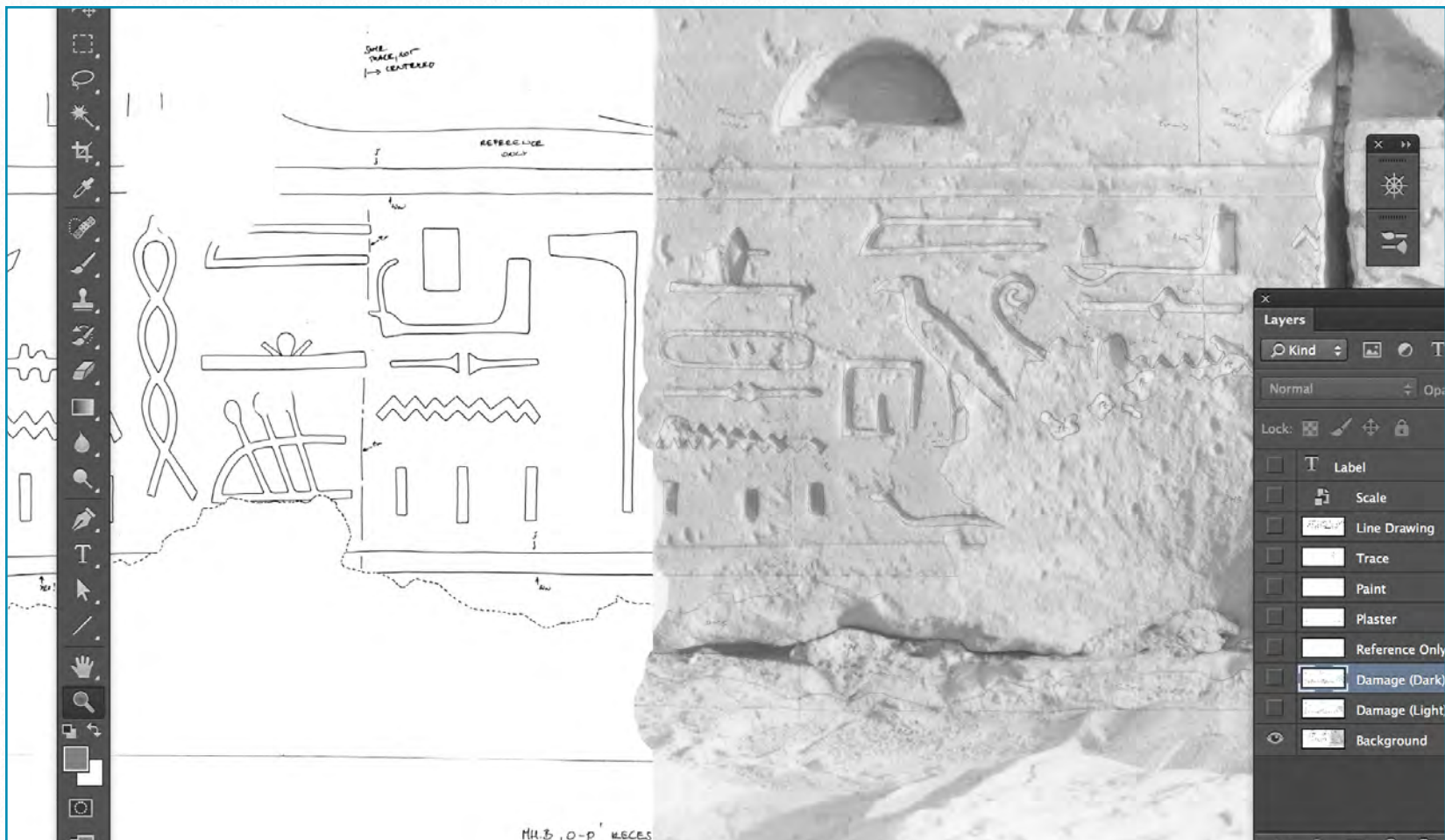
Printing on an Inkjet Printer in Photoshop CS6:

<https://www.inkling.com/read/photoshop-cs6-missing-manual-lesa-snider-1st/chapter-16/printing-on-an-inkjet-printer>

The Best A3+ Scanners as of 2014:

<http://large-format-scanner-review.top-tenreviews.com>

Merging Scanned Images



MHB 4o (detail) - 1:1 tracing (drawn on acetate by marker) merged with 1:4 B/W photo (drawn on paper by pencil)

Once the image is scanned, it should be ready to work with. Ideally the photo enlargement is small enough to be scanned as one piece, and our pencil lines are strong enough to be visible enough while inking. Unfortunately, this is rarely the case: most of the time the artist has to merge scanned sections of a primary source larger than A3 and to make the modifications necessary to enhance certain elements, such as pencil lines, darkened or burnt out areas, etc.

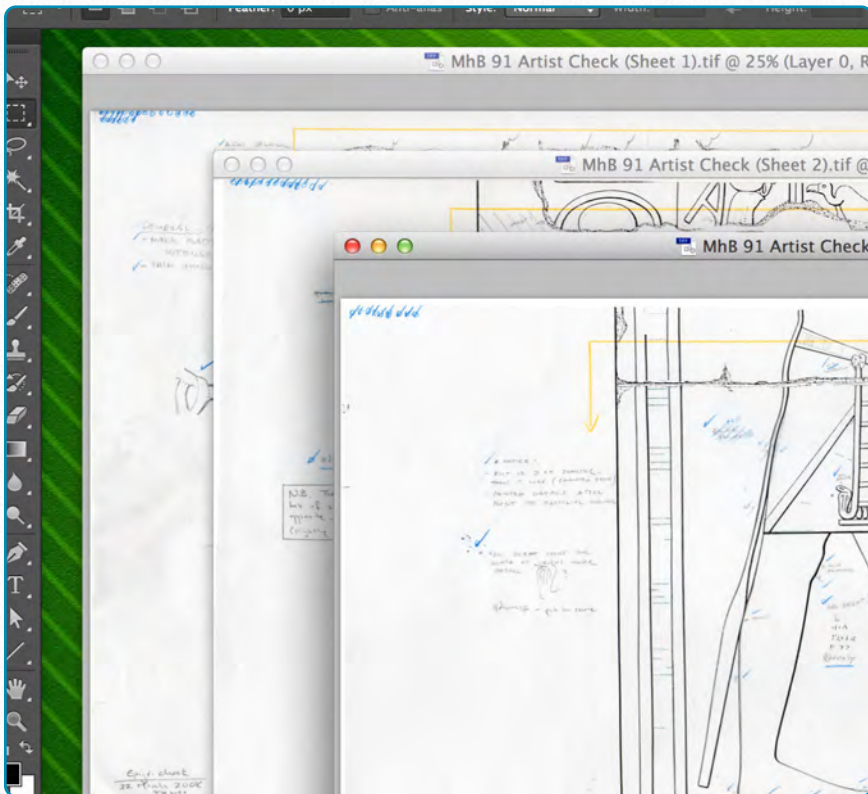
Merging Images Manually

The classic - and more time-consuming - way of merging scans of oversized images involves a lot of manual manipulation by the artist, but it gives a lot more control over the entire process. It should be used on images with very fine details. During scanning, the artist should find the least busy areas of his/her overlapping drawing sections to be merged so as to avoid over-complicating the stitching process:

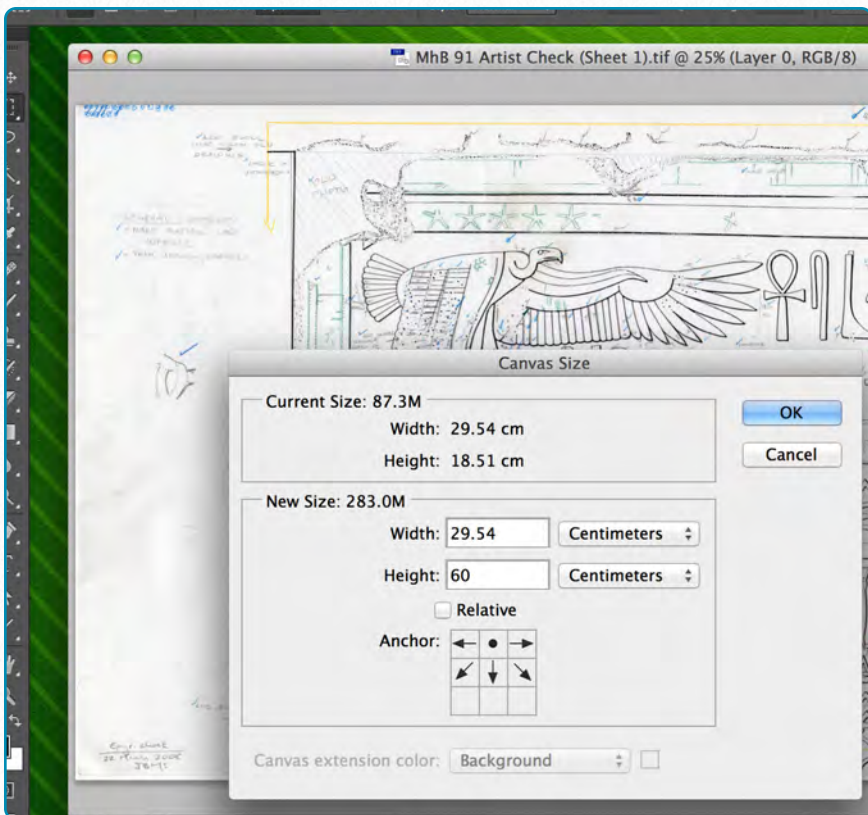


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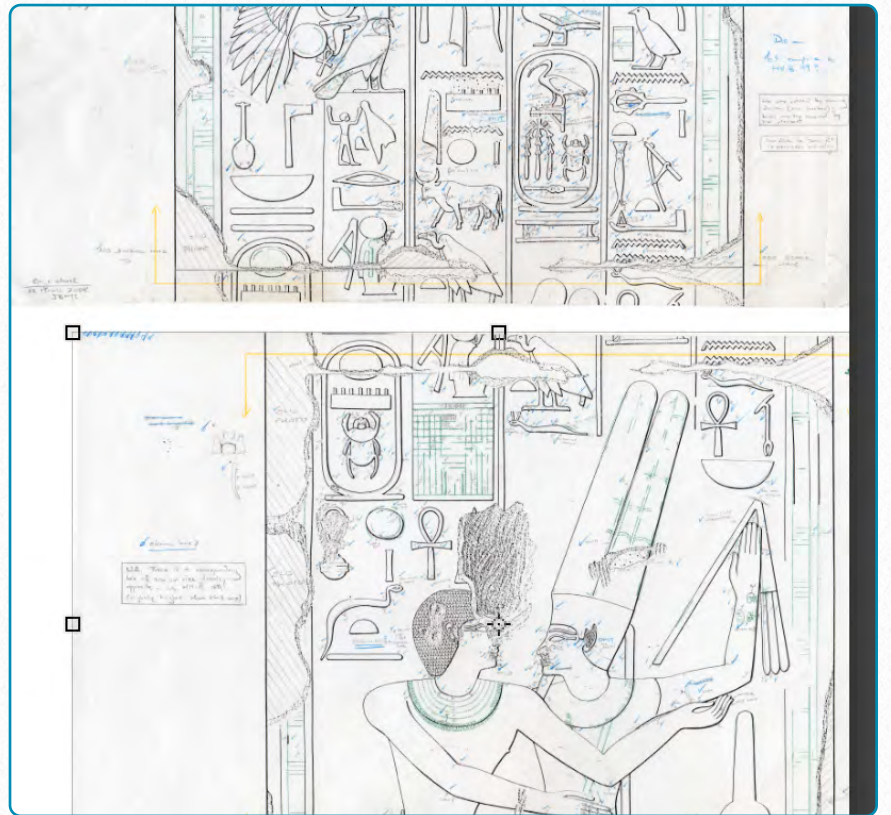
Merging Three Sections Manually into One Drawing



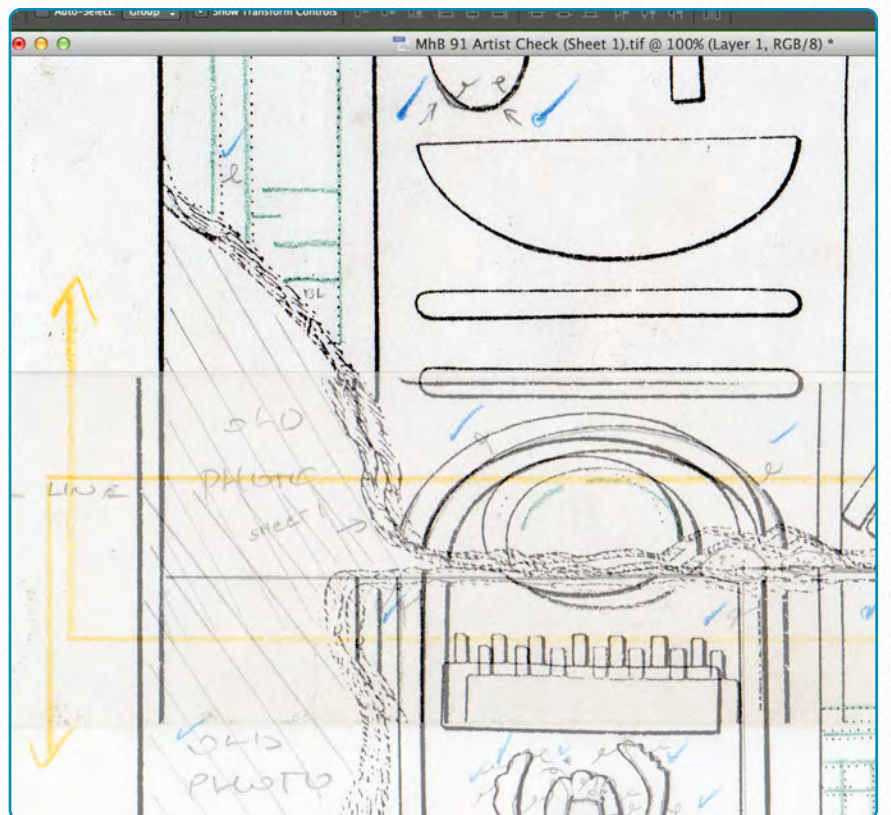
(1) Open all images at once in Photoshop



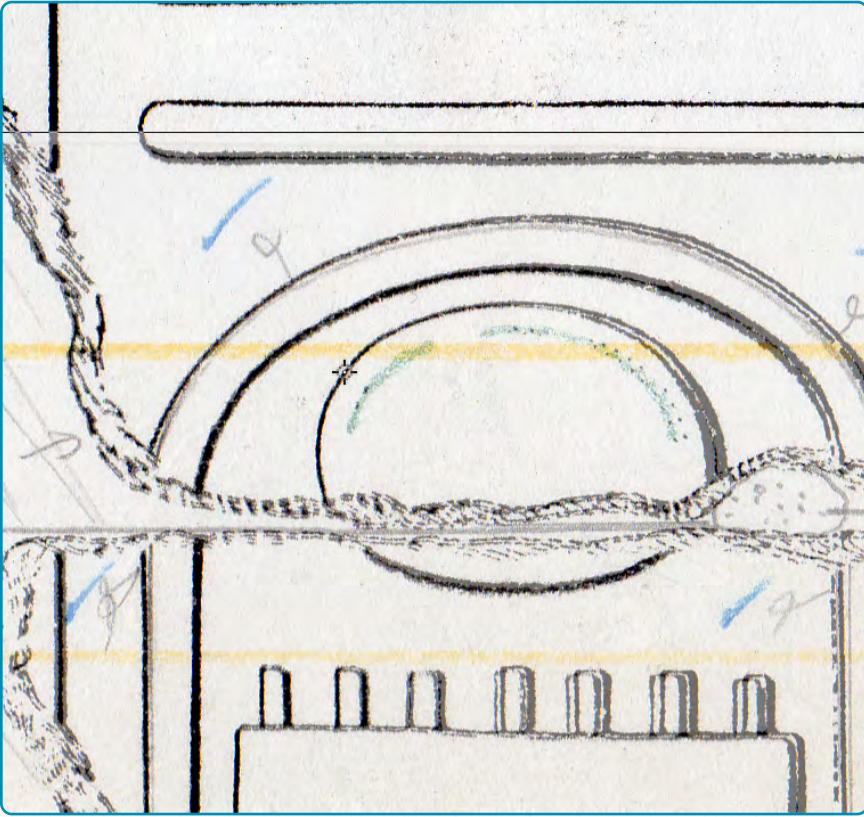
(2) Choose one of them as the base image; this will be the one with which you will merge the rest. Enlarge its canvas to its assumed final size and shape (Anchor - height in the sample case).



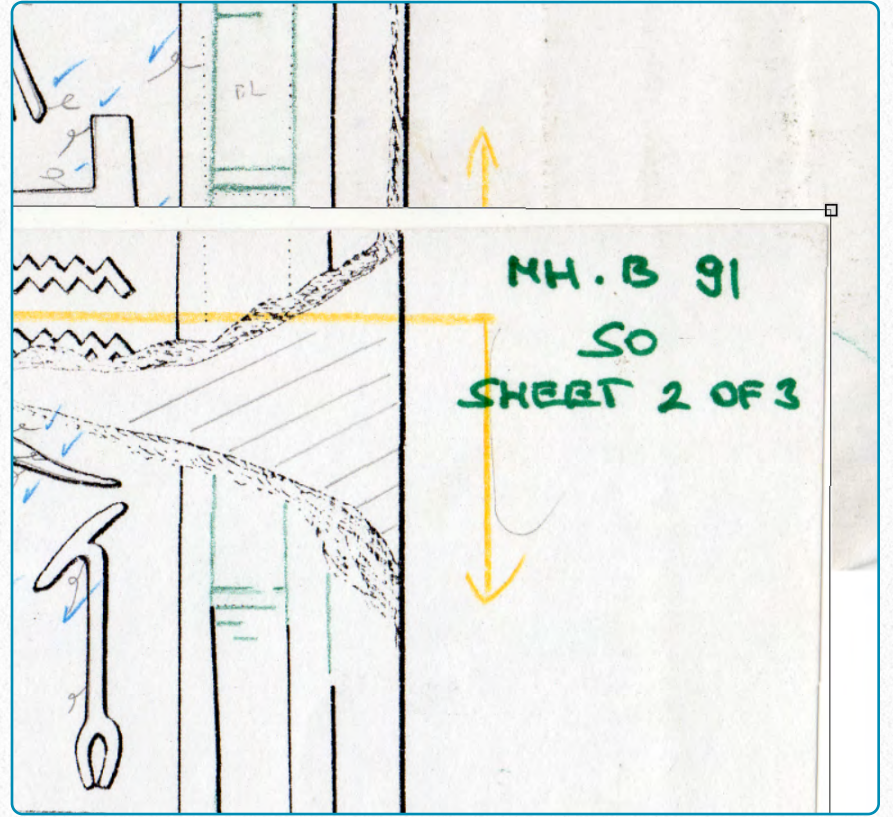
(3) Move the next section over the base image and navigate it to its approximate place. (Make sure all the sections are in the same file format, otherwise you can't merge them.)



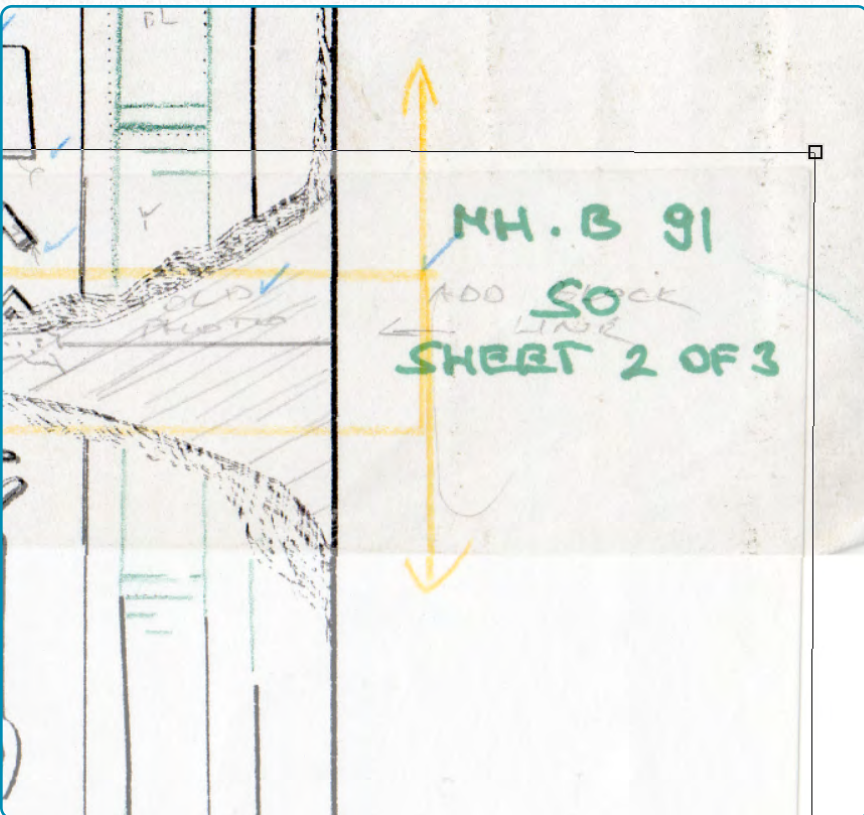
(4) Change the **opacity** of your to-be-merged sections' to 50% to be able to refine the two sections' alignments. (Note that every new section ends up on a new layer.)



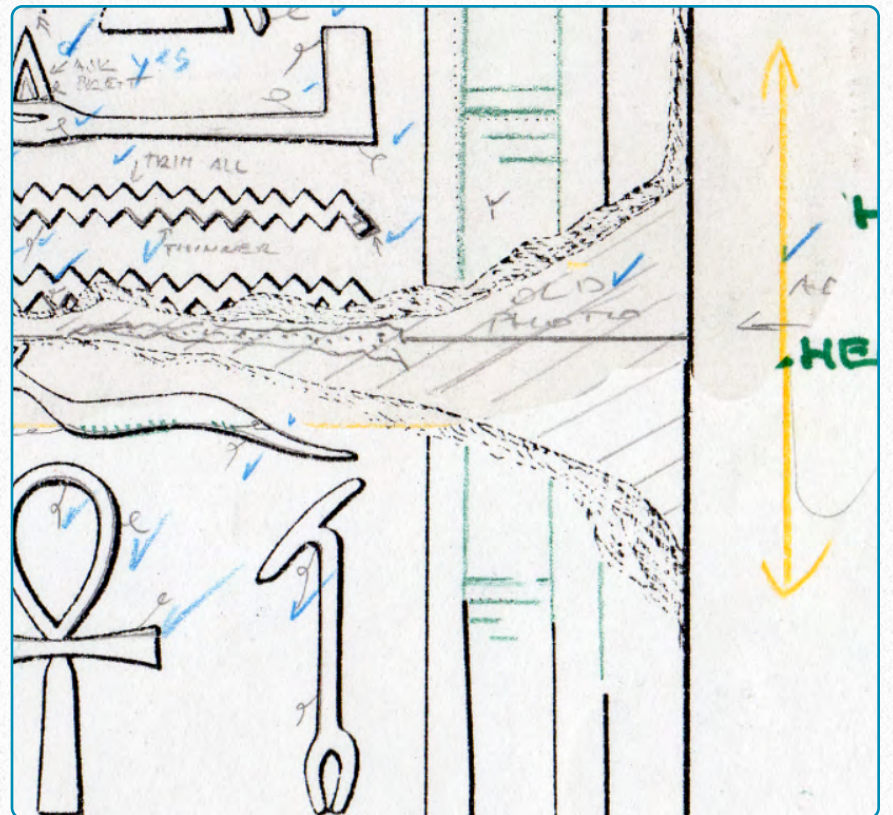
(5) Find an area where the base image and the new section align *accurately*, and move the new section's center point over this area.



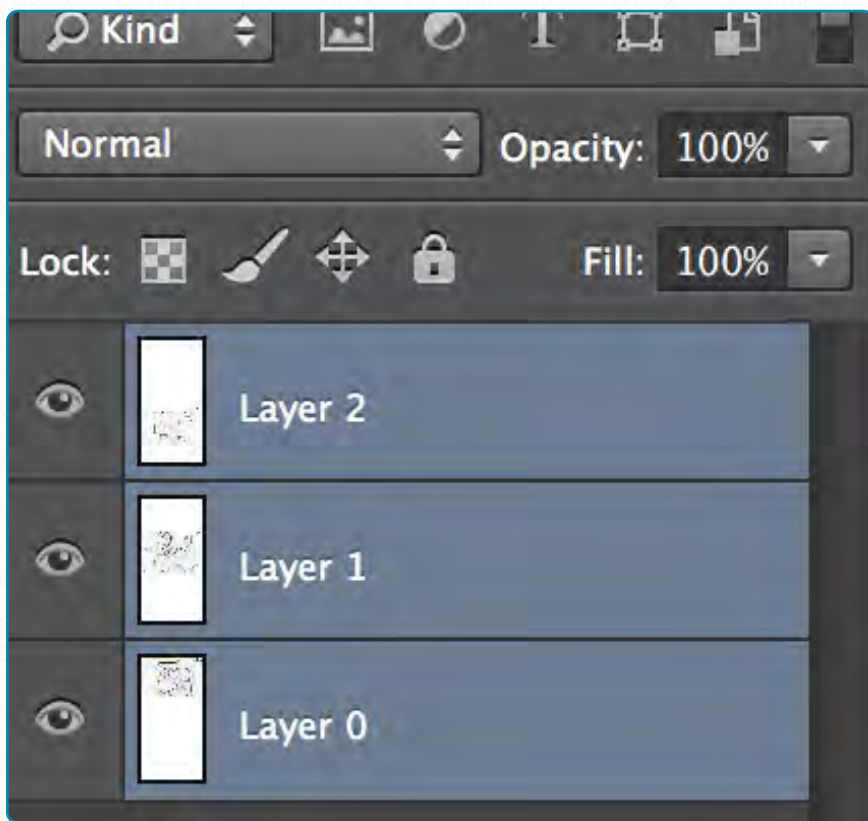
(7) Once the two layers are aligned, change the new section's opacity back to 100%. This action results in a white stripe covering some parts along the overlapping areas.



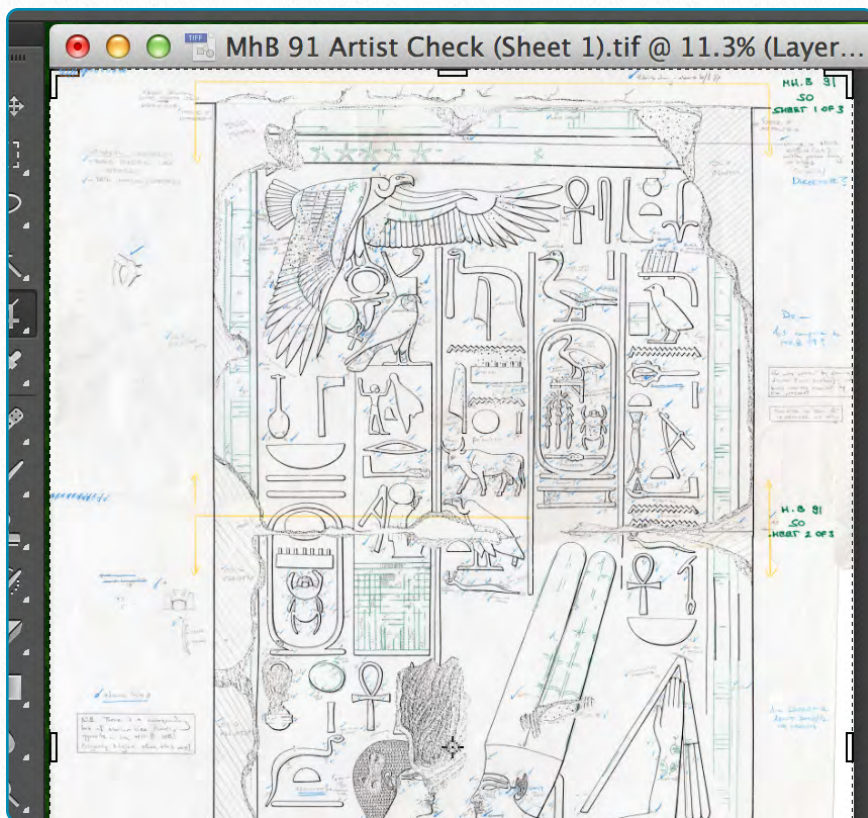
(6) Rotate, (distort, etc. if necessary) the new section around this point to align the two layers as much as possible. (*Edit/Transform/Rotate*)



(8) Erase the white areas of the to-be-merged new section and reveal the base image underneath. (Use a soft-edge eraser to achieve a more natural blending of the two layers, if necessary.)



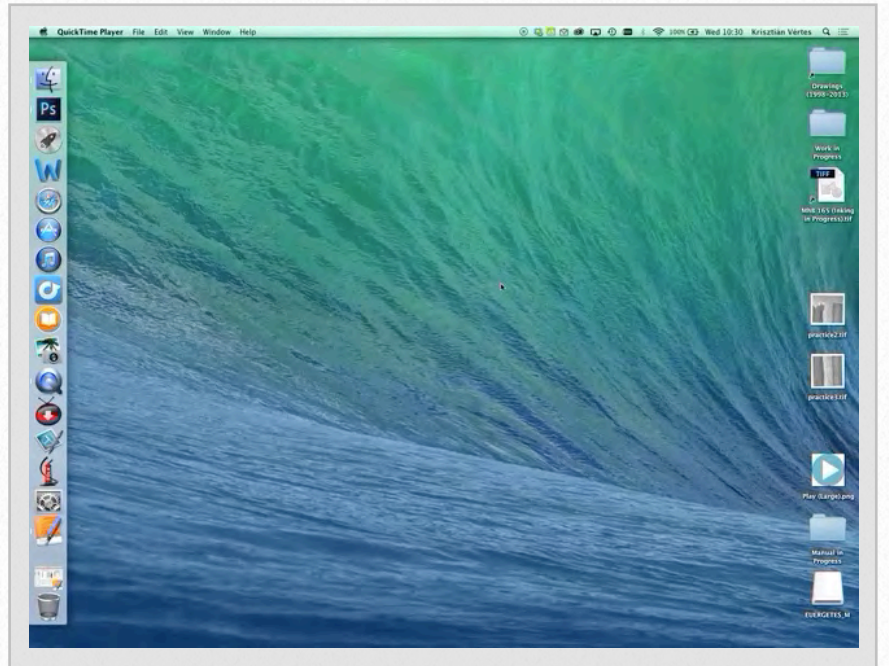
(9) Repeat the previous steps with all the sections you want to merge. Once all the sections are aligned, merge the layers into the base image. (Make sure opacities are 100% everywhere)



(10) Crop, rotate, etc. the final image (if necessary) and save the image as a non-compressed .tiff file. (Make sure to give it a different name and not to overwrite the base image file.)



VIDEO TUTORIAL



DOWNLOAD HERE

To download the demonstration video, click on the following link:

<https://www.dropbox.com/s/4tw7nbw3692oxb4/Merging%20Sections%20Manually%20%28SD%29.m4v>

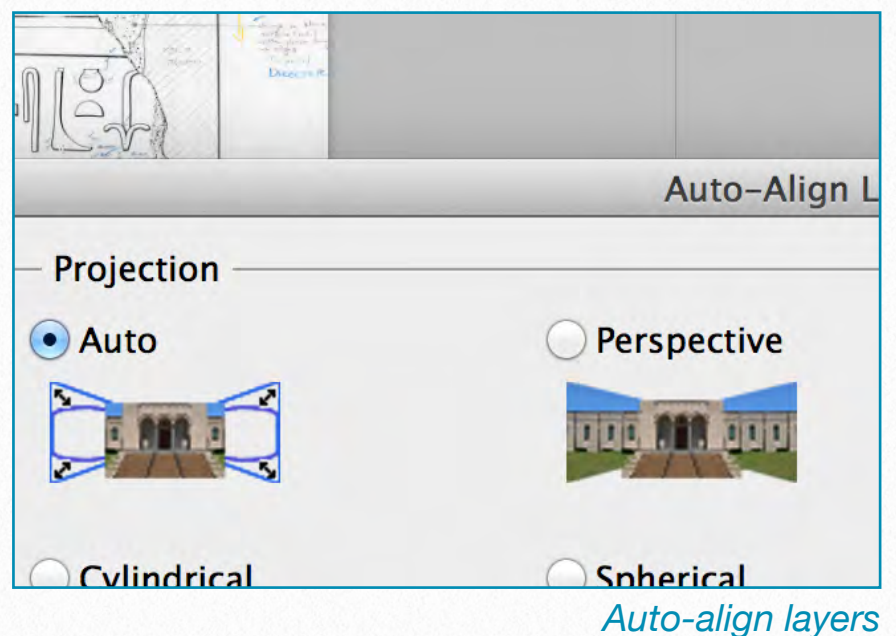
Auto-Align Layers

In Photoshop CS6 there is also a way to auto-align layers:

1. Create a new document with the same dimensions as your original source image (keep the same resolution and color mode as well.)

2. Open all the scanned section images. (Make sure you overlap each section by at least 40% during scanning, otherwise auto align won't work!). With the *Move tool*, drag and drop each image into the new document. Each image should now appear on a separate layer.
3. If you desire, you can choose a layer to use as a *reference*. Lock the reference layer. If you don't set a reference layer, Photoshop analyzes the layers and then selects the layer in the center of the final composite as the reference.
4. In the Layers panel, select all the layers you want to align and go to *Edit/Auto Align Layers*. Choose one of the projection methods:
 - **Auto:** Photoshop analyzes the layers, decides which method would create the best composite, and then applies the alignment.
 - **Perspective:** Photoshop designates one of the layers as the reference layer. The remaining layers are transformed so that content is aligned.
 - **Collage:** This option enables us to move, rotate, and scale our layers to get the desired layout.

- **Cylindrical:** Places the reference layer in the center and then places the remaining layers on an unfolded cylinder to minimize distortion.
- **Spherical:** This option also places the reference layer in the center and places the remaining layers on a sphere to correct distortion.
- **Reposition:** The best option when we need to stitch together oversized scanned images.



If necessary, the artist can check options to correct for scanning problems, such as Vignette Removal and Geometric Distortion. (Vignetting is caused when light at the edges of the images is reduced and the edges become darkened. Geometric Distortion refers to such problems as *barrel* (bulging out) and *pincushion* (pinching in) distortions).

Once we hit OK, Photoshop finds and aligns the common areas of the layers. If we're stitching together images, we're done. If the composite has visible seams or inconsistencies, the Auto-Blend Layers command can be applied as well.

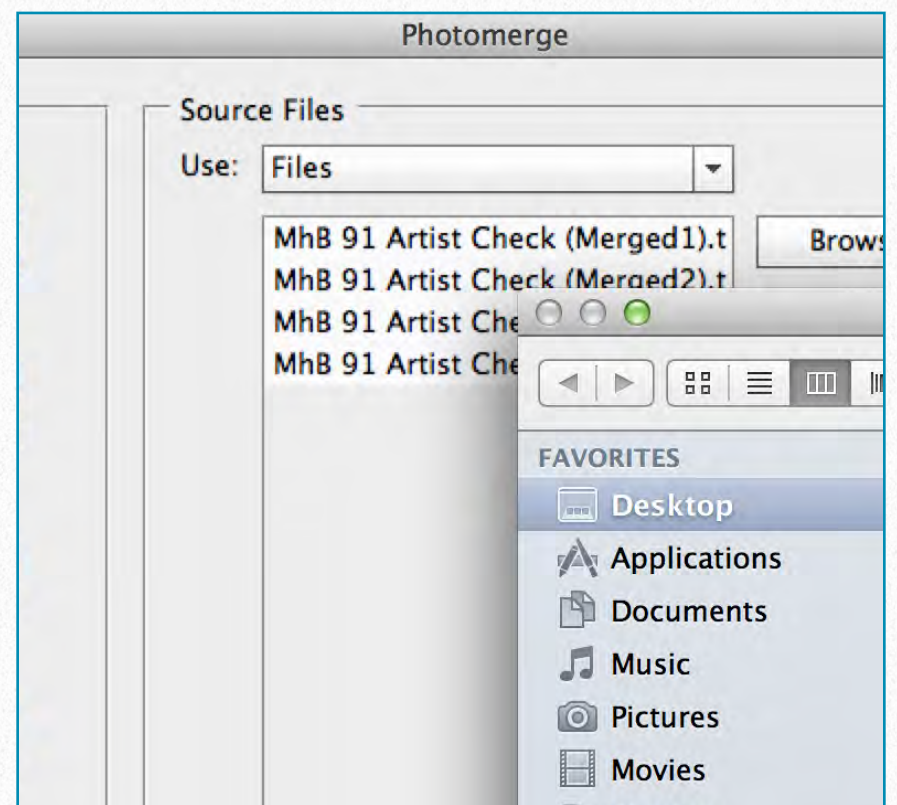
Photomerge

In Photoshop CS6 there is a **Photomerge** command that combines several photographs into one continuous image. The main difference between using Auto-Align Layers and Photomerge is that in the latter the artist has even *less* to do during the merging process. The Photomerge command can assemble scanned sections that are tiled horizontally as well as vertically, just like the previously described method. To try Photomerge, do one of the following:

1. Choose *File/Automate/Photomerge*.
2. Under Source Files in the Photomerge dialog box, choose one of the following from the *Use* menu: *Files* generates the Photomerge composition using individual files. *Folders* uses all the images stored in a folder to create the Photomerge composition.
3. Specify which images to use by doing one of the following: To select image

files or a folder of images, click the *Browse* button and navigate to the files or folder. To use the images currently open in Photoshop, click *Add Open Files*. To remove images from the Source File list, select the file and click the *Remove* button.

4. Select a *Layout* option: Auto, Perspective, Collage, Cylindrical, Spherical, or Reposition. These layout options behave the same way as described under *Auto-Align Layers*.



Selecting files in Photomerge

The digital artist must know about all three methods and must decide how much automation is necessary in the merging process. There will be cases when the

simplest/fastest method provides enough accuracy, while in other cases more deliberate actions must be taken. Needless to say, no matter what method is chosen, our scanned sections must be as accurate as possible with - preferably - at least *40% overlapping* from section to section.



MORE READING

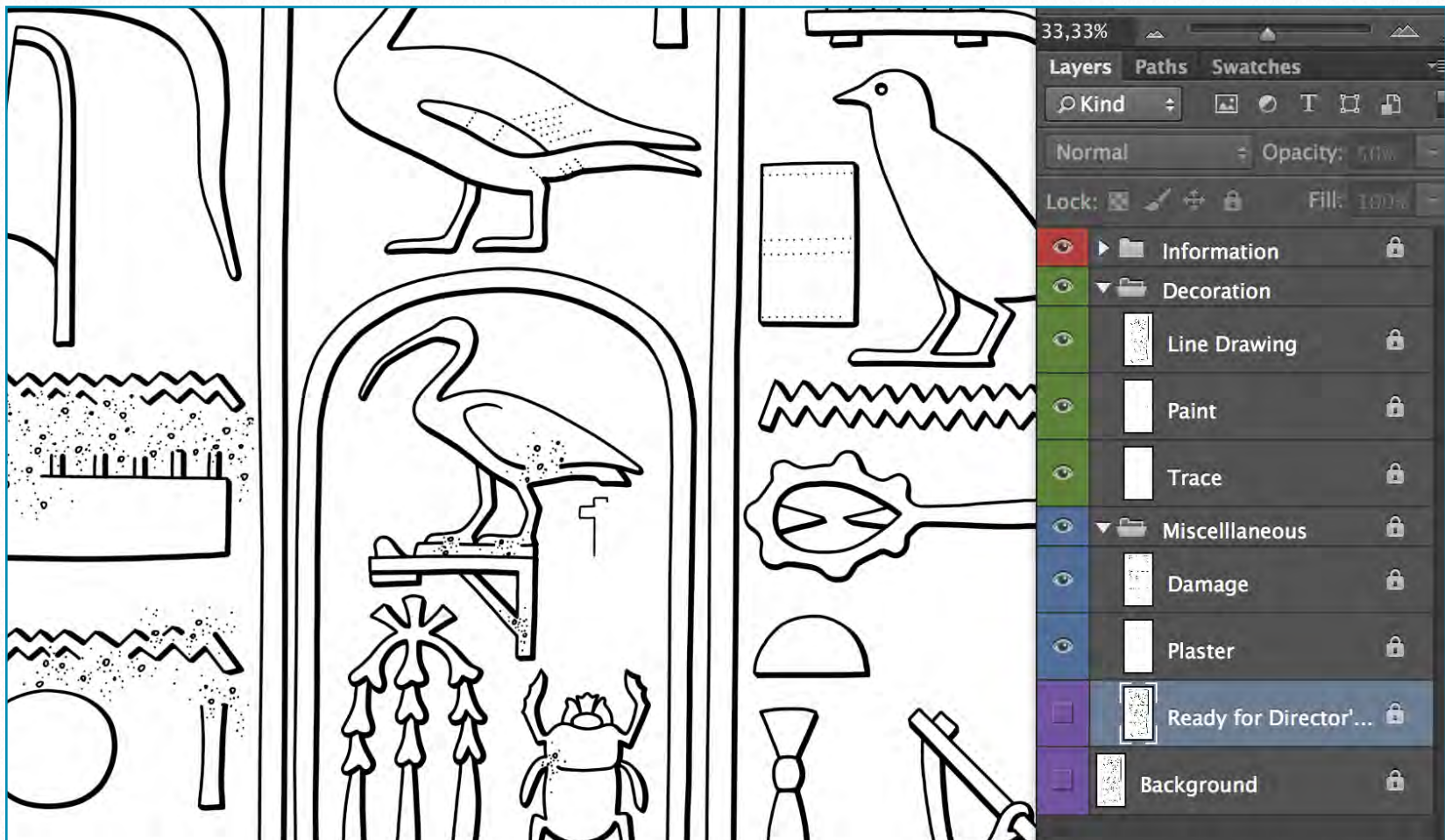
Transforming Objects and Selected Areas in Photoshop CS6:

<http://helpx.adobe.com/photoshop/using/transforming-objects.html>

Get More Creative with Photomerge:

http://help.adobe.com/en_US/photoshop/cs/using/WSfd1234e1c4b69f30ea53e41001031ab64-75e8a.html

Setting Up the Layers



MhB 91 (detail) - Layer arrangement of a typical inked drawing

Now that photo manipulation, workspace customization, and the layer-based environment don't seem to be such alien concepts anymore, we have to deal with the task of producing actual drawings. In this section the artist will use all the skills he/she has learned about in the previous chapters, starting with the enhancement of the primary material upon which our final inked version is based. From now on, all the steps are based on certain inking projects, which we'll follow from the very be-

ginning until they reach their final stage and are ready for the final review by the field director. Of course, some of the Epigraphic Survey's projects don't contain all of the following steps, and in some cases additional steps might have to be added as well.

We will pick up the work process at the stage when the original enlargement is already scanned, merged, and ready to be enhanced to provide better visibility of the

pencil lines. Artists tend to like lighter photos to be able to see their pencil lines better, but it affects the details of the image, which are much needed when inking damage, plaster, etc. Therefore the photo should be enhanced in more than one way.

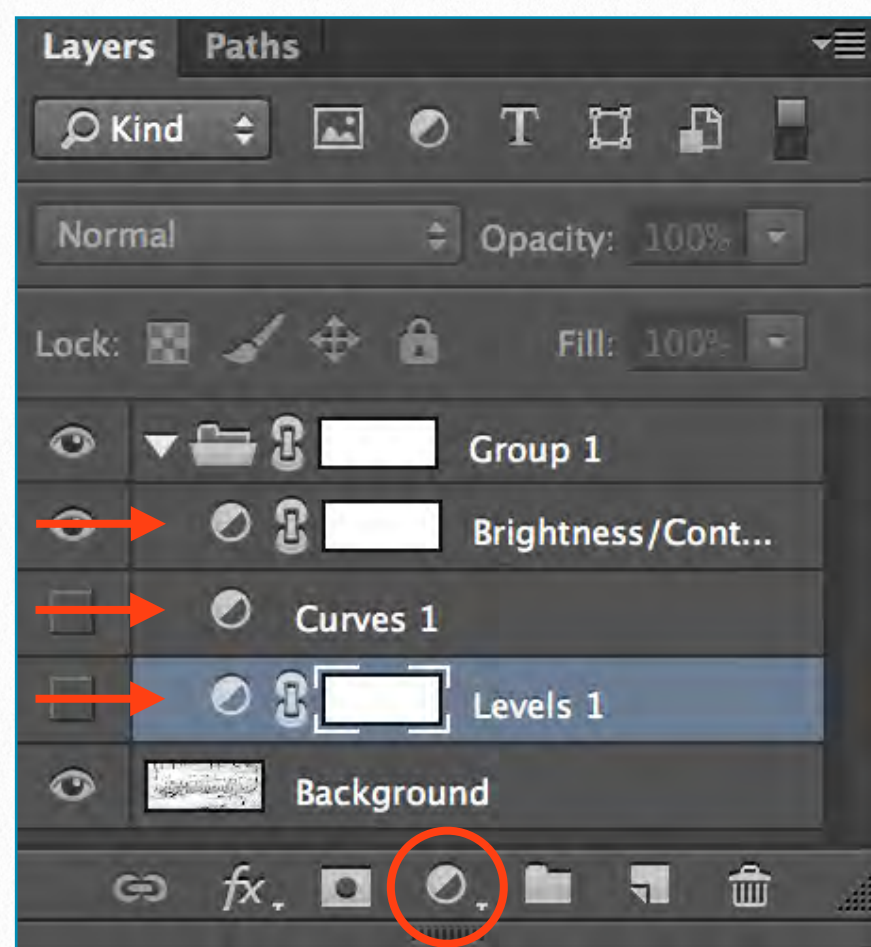
Enhancing pencil lines

There are endless methods of photo modification in Photoshop; in fact the entire software is mainly dedicated to enhancing and modifying images. We don't have the necessary space in this guide to give the user a detailed manual for photo manipulation, although some basic steps were already mentioned in *Chapter 3, Section 2*. Nonetheless there are a few standpoints that the Epigraphic Survey artist must take into consideration:

- Photo manipulation doesn't necessarily have to preserve the overall quality of the image, because the enlargement itself is never part of the final product. Therefore it's best to duplicate the *Background Layer* as many times as needed for all the different problematic areas, and just use the one that provides the best result for a particular area when inking. These background *copies* can be deleted when no longer needed so as to reduce file size. One has to make sure the original background image is preserved un-

touched (i.e., locked to prevent any modification) and that all the enhancements happen on different layers.

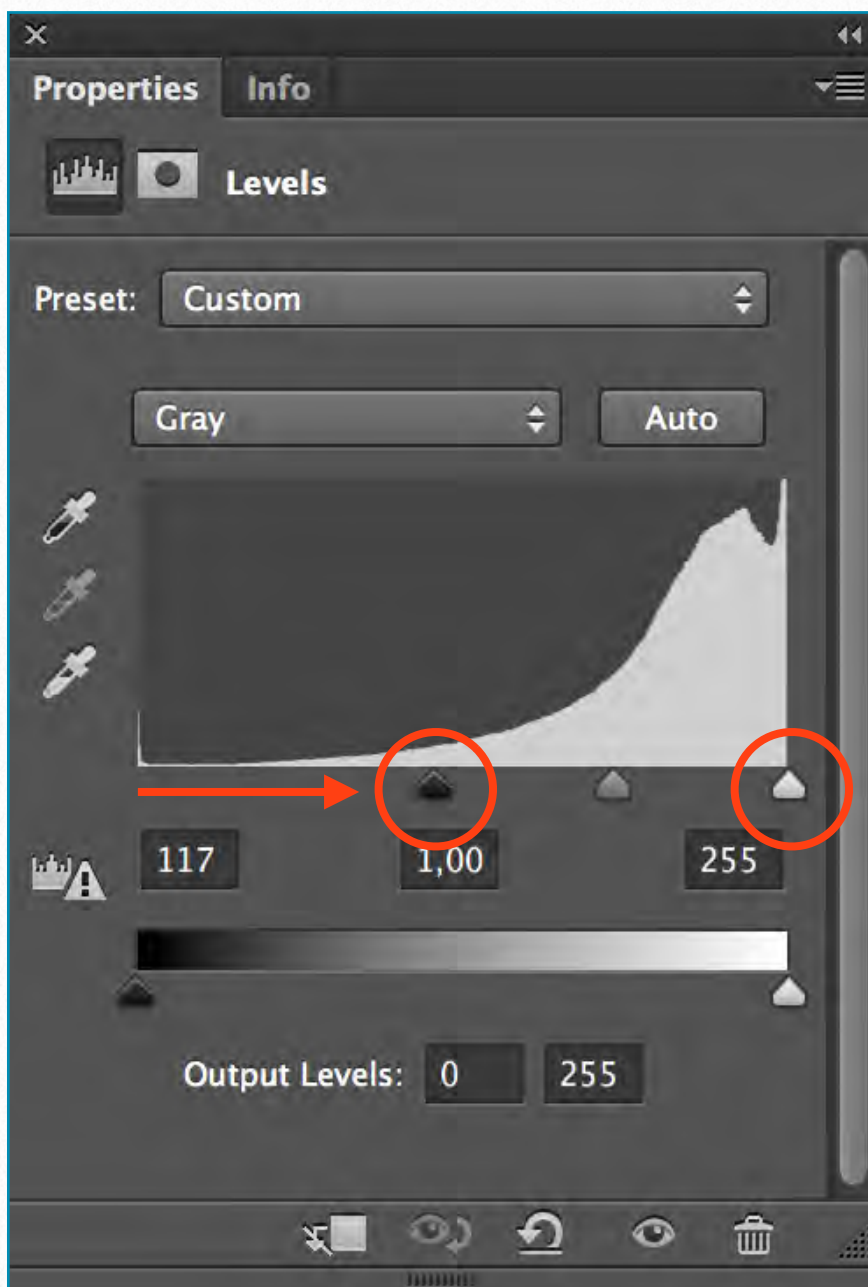
- Another good way to add nondestructive modifications to our *entire* background photo is by adding as many *Adjustment Layers* (*Layer/New Adjustment Layer/Levels*, etc.) to the photo layer as needed. In doing so, the artist doesn't have to deal with the increased number of layers, and the effects can be inactivated or deleted separately whenever they are not needed. One should keep in



Adjustment Layers

mind that the *Adjustment Layers* always affect **all** the layers beneath them; therefore they must be placed right above the background photo to be modified. These

Adjustment Layers also have their own settings panels that are very similar to their image modification counterparts (*Image/Adjustments/Levels*, etc.), which



Levels' Adjustment Layer Panel

might be a little confusing at first sight. These settings can be called up and edited by hitting the *half-full circle* in front of the Adjustment Layer on the Layers Panel.

- The best way to make local enhancements over *smaller areas* is by using the *Burn* and *Dodge* tools. The *Burn tool* can

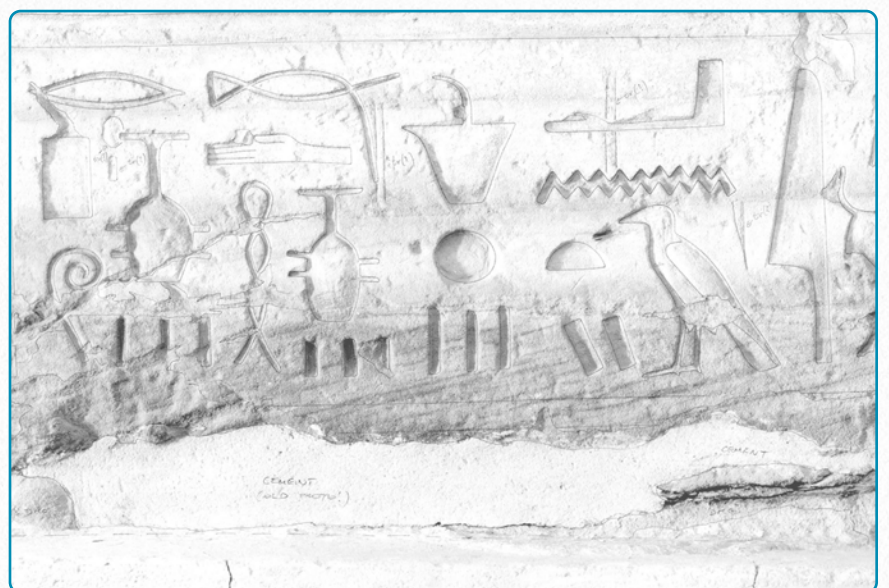
be used over light areas to make the pencil lines appear *darker*. When the artist uses the Burn tool, he/she has to be very careful about setting the *Range* to *shadows* or *Midtones*, because setting it to Highlights just draws a cast over the area. The *Dodge tool* can be used to lighten up dark areas, to make the photo enlargement around the pencil lines appear *lighter*. When applying this tool, the range has to be set to *Highlights*; otherwise the line disappears.

- If further clarification of the pencil lines is needed for some reason, the artist has one more tool in his/her hands, but the

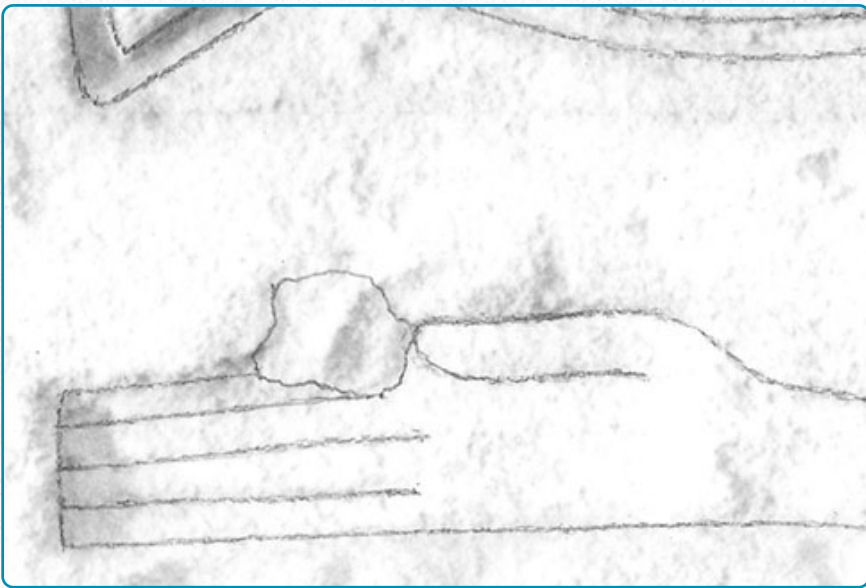


LEARN SKILLS

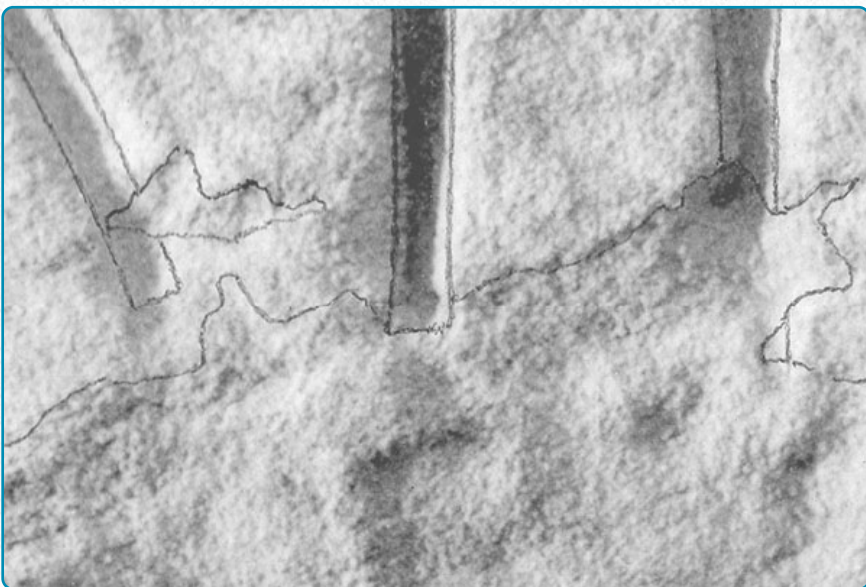
Modifying Pencil Lines on B/W Photo Enlargements



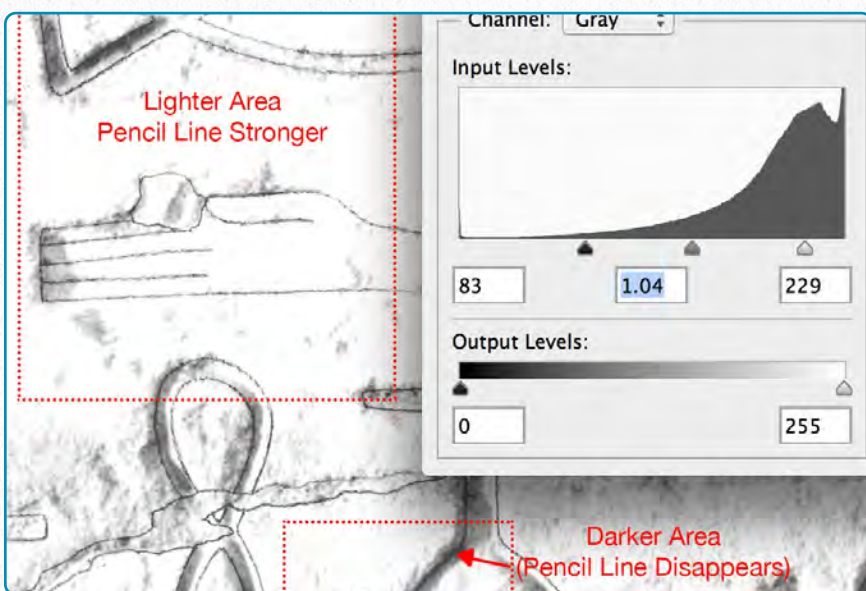
- (1) Original scanned photo with darker and lighter areas. While lighter photos are generally better backgrounds for penciling, the photo details tend to disappear.



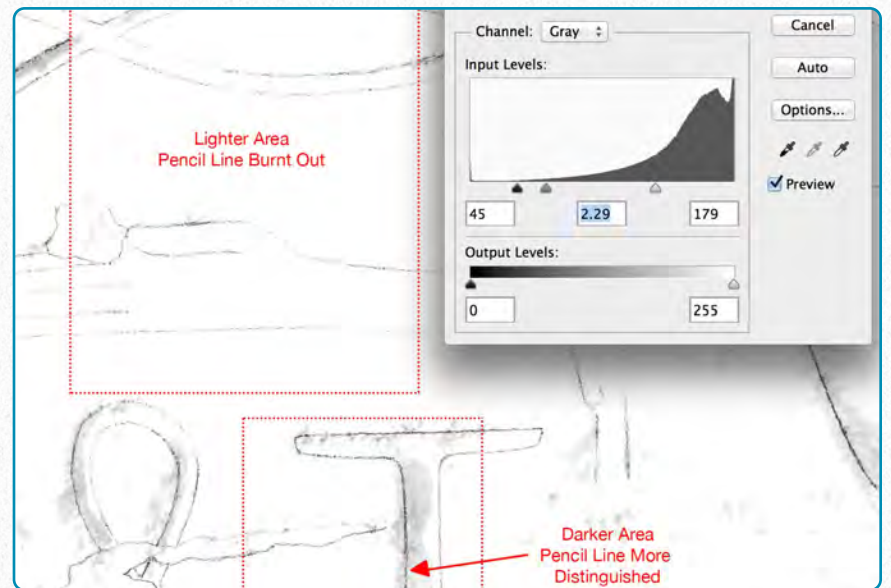
(2) Pencil lines over lighter areas are more visible, but sometimes need to be darkened for more contrast.



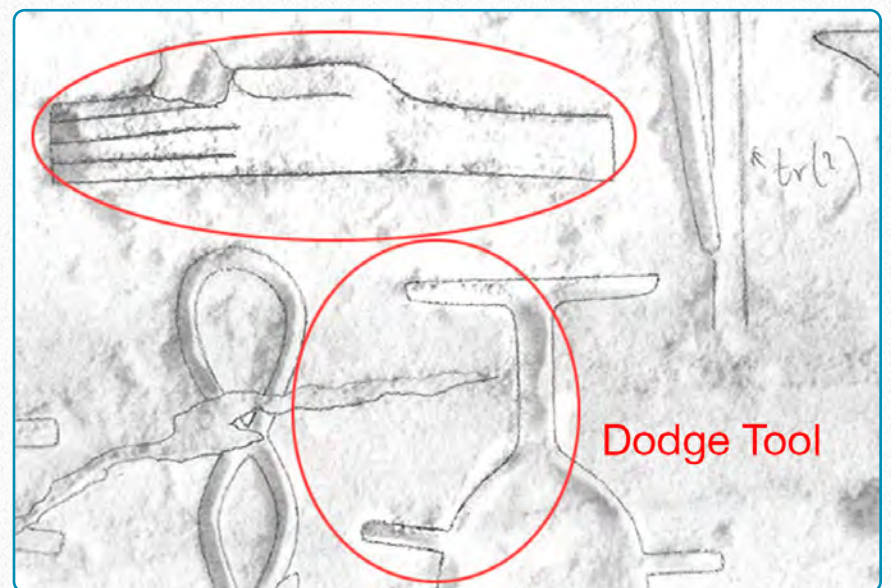
(3) Pencil lines over darker areas tend to be less visible, and sometimes they need to be further emphasized by lightening up the background.



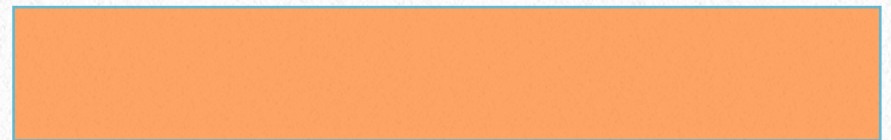
(4) One can make general photo enhancements by using Levels. These modifications can be counterproductive when used over the entire photo.



(5) One option is to select certain areas for particular modifications and/or to use Layer Masks for specific enhancements.



(6) The easiest way for quick enhancements is to use the *Burn and Dodge tools* for strengthening pencil lines or for lightening up darker areas respectively.



process has to be carried out meticulously from the first manipulation of the enlargement. There is a way to produce a separate pencil layer over the photo enlargement thanks to the bleaching system, which the Epigraphic Survey has been us-

ing for many decades. Traditionally, bleaching is used at the very end of the drawing process, as has been described in *Chapter 1*. Because inking in Photoshop eliminates the necessity of any background enhancements, we would obviously eliminate the bleaching part of the process. But we can benefit from erasing the photo background *after* the pencil draft has been applied, but *before* the entire inking process starts. We need to have 3 scans in our hands:

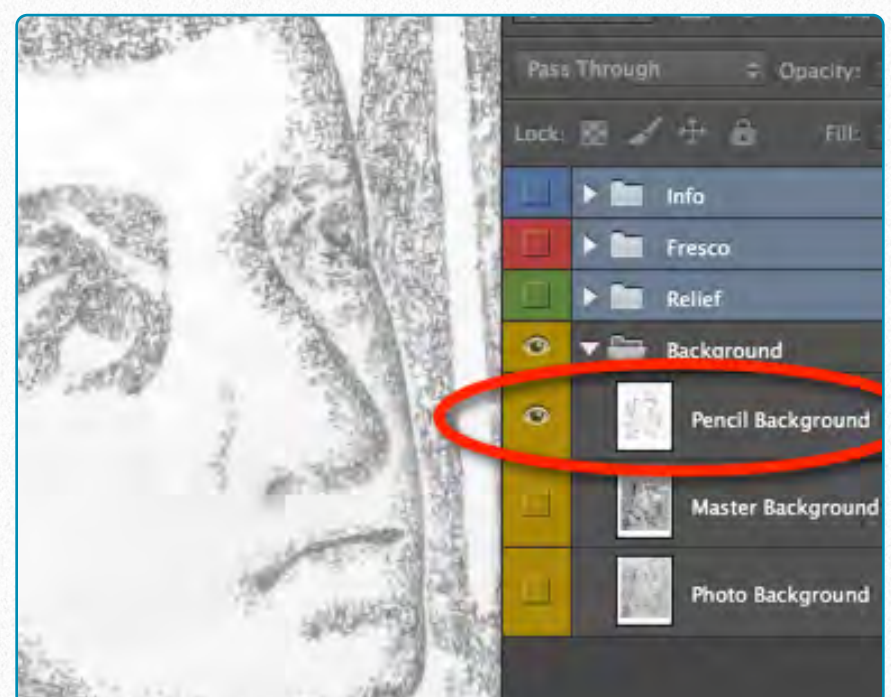
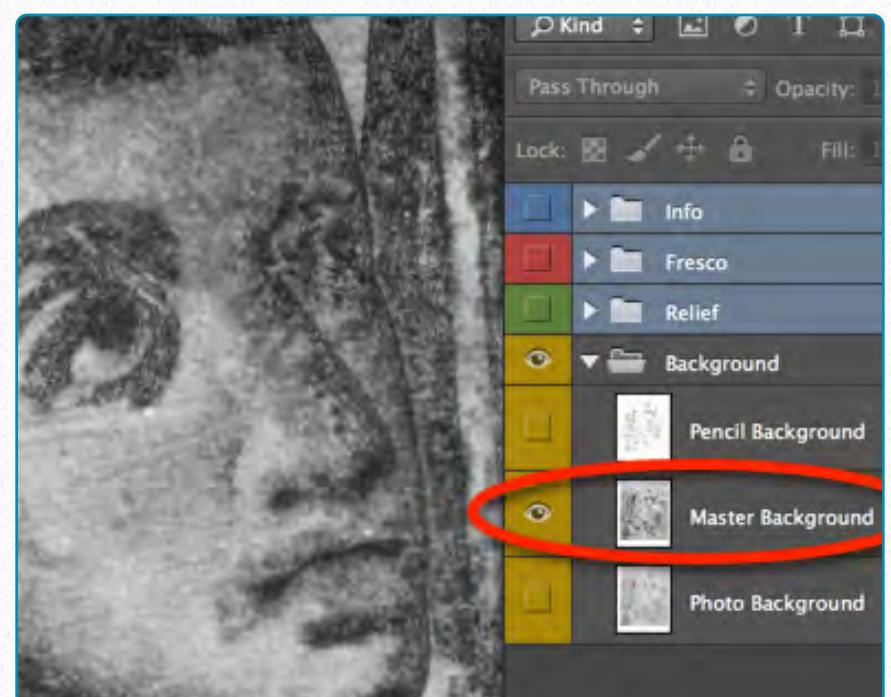
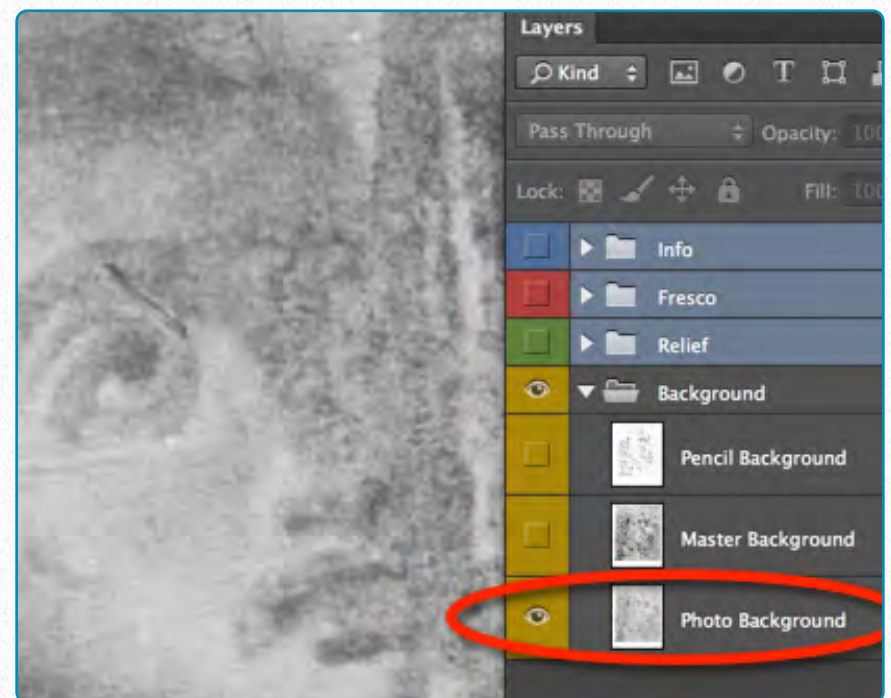
1. Scan of the photo enlargement *before* any pencil lines are added to it.
2. Scan of the photo enlargement after adding all the pencil lines to it.
3. Scan of the *bleached* photo enlargement with its white background and exposed pencil lines.

When we have all three scans open in Photoshop, we have to set them up as three aligned layers on top of each other. We have to use the one with both the photo and the penciling present (*Master Background*) as our alignment guide. Once it's done, we can delete the Master Background.

Setting up the drawing layers

Drawing layers should be set up according to the various categories of information

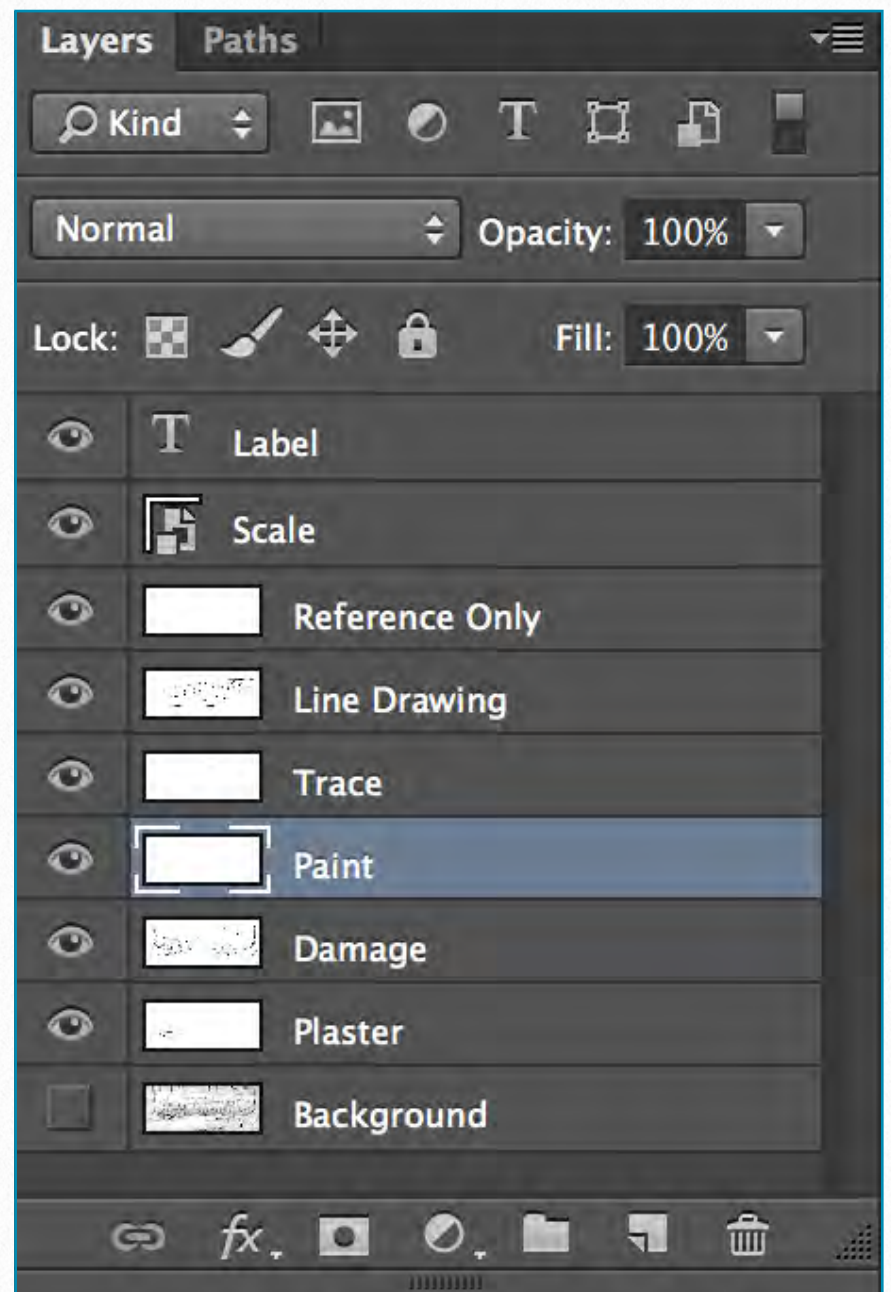
Detached Pencil Lines on Photo Enlargement



appearing on the wall. Each layer allows its content to be treated separately from the other layers, so it's very important to determine and sort out important data categories early on. As described in *Chapter 1*, the Epigraphic Survey has strict rules about what kinds of information should be represented, and how. The main categories are:

- carved lines of the final decorated surface, along with any earlier versions, in either raised or sunk relief
- painted details associated with the final and with any earlier carved decoration
- any intentional non-decorative surface modification (hacking, plastering, etc.) if it gives historically relevant information
- damage obscuring carved lines

A layer, when set up, automatically becomes transparent, meaning that the lines drawn on a layer at the bottom of the stack are still visible even when the artist works on the top layer. This feature is indispensable for keeping an eye on the relationship between various decorative elements. Although the layer setup might vary on certain drawings, the Epigraphic Survey's digital layer set is as represented in the following screenshot:



The main layers of digital inking

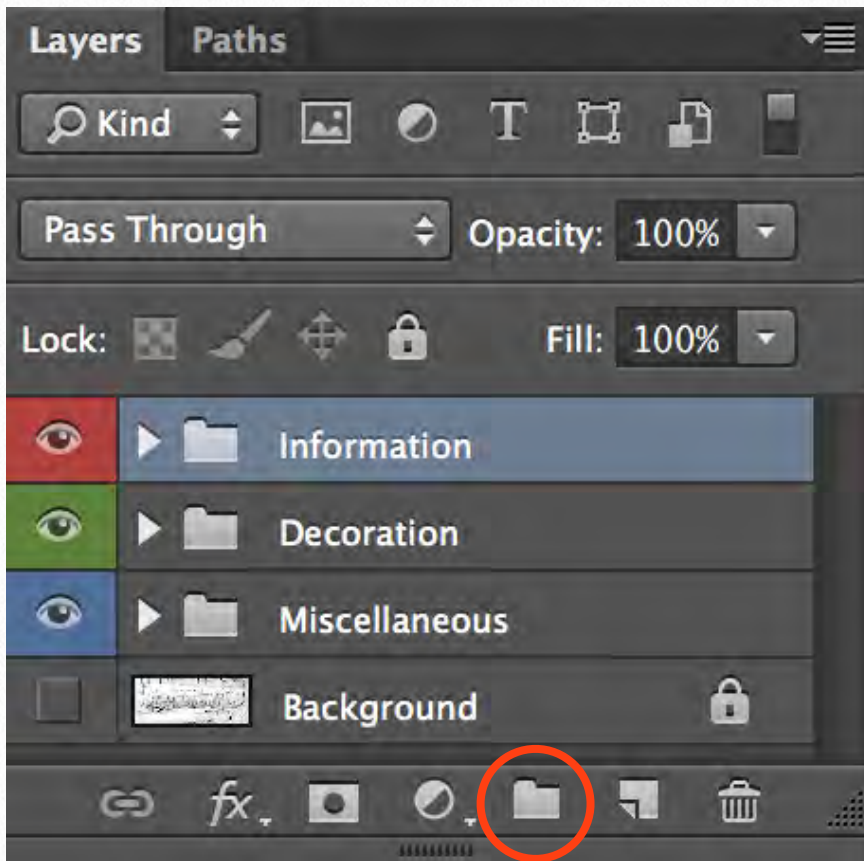
- **Background** - scan of the photo enlargement (or any other material) containing the initial epigraphic information as recorded in the field.
- **Plaster** - represented by an irregular arrangement of dots and circles, shown using solid outlines around the affected area.
- **Damage** - shown by hatched lines representing the damage surface texture of the photo enlargement. Lines have to be

broken with a “*digital scalpel*.” Outlines for damaged areas should be represented using intermittent lines. Note that the artist should avoid drawing damage outlines when shared with plaster outlines to avoid duplication.

- **Paint** - regular dotted lines representing the outlines of painted details. By drawing individual dots (instead of setting up a brushstroke for this convention), the artist can be flexible when showing the amount and density of details.
- **Trace** - a solid line is used to indicate the traces of any earlier carved decoration on the surface. More than one trace layer needs to be set up if there is more than one set of traces, i.e., traces from more than one period or traces of graffiti vs. carved features, etc.
- **Line Drawing** - this layer represents all the carved lines associated with the final surface decoration. According to the Epigraphic Survey’s drawing conventions discussed in *Chapter 2*, a system of lines (inked in various thicknesses) is used to create an accurate rendering of the original carving, whether in raised or sunk relief. Any architectural features shown as part of the final print should be drawn on this layer as well.

- **Reference Only** - contains all the information necessary to join the drawn section with other sections, artist’s remarks, different versions, etc. The data on this layer are not included in the final print.
- **Scale** - a preset (unified) scale has to be included with every drawing. It has to be resized and fitted to the drawing’s actual scale as accurately as possible, based on whatever scale information we have on our initial field copy.
- **Label** - represents the precise alphabetical and/or numerical information regarding the drawing (site, *Nelson number* or drawing number, negative number, date, status or stage of drawing, artist’s initials, etc.).

The representation of the above data should be as consistent as possible throughout the entire corpus of drawings. In case the artist feels that he/she has too many layers to navigate, they can be grouped according to the nature of data they represent. Therefore Label, Scale, and Reference Only can be grouped into an *Information* folder, Line Drawing, Trace, and Paint can go in the *Decoration* folder, and finally all the non-decorative layers can form the *Miscellaneous* folder. If one needs further differentiation, associating different



Adding folders to simplify the layer-arrangement

colors with given layers is also a possibility.

As an important rule, the artist has to keep in mind the necessity of *locking* the layers he/she is not working on to avoid drawing on the wrong layer.



MORE READING

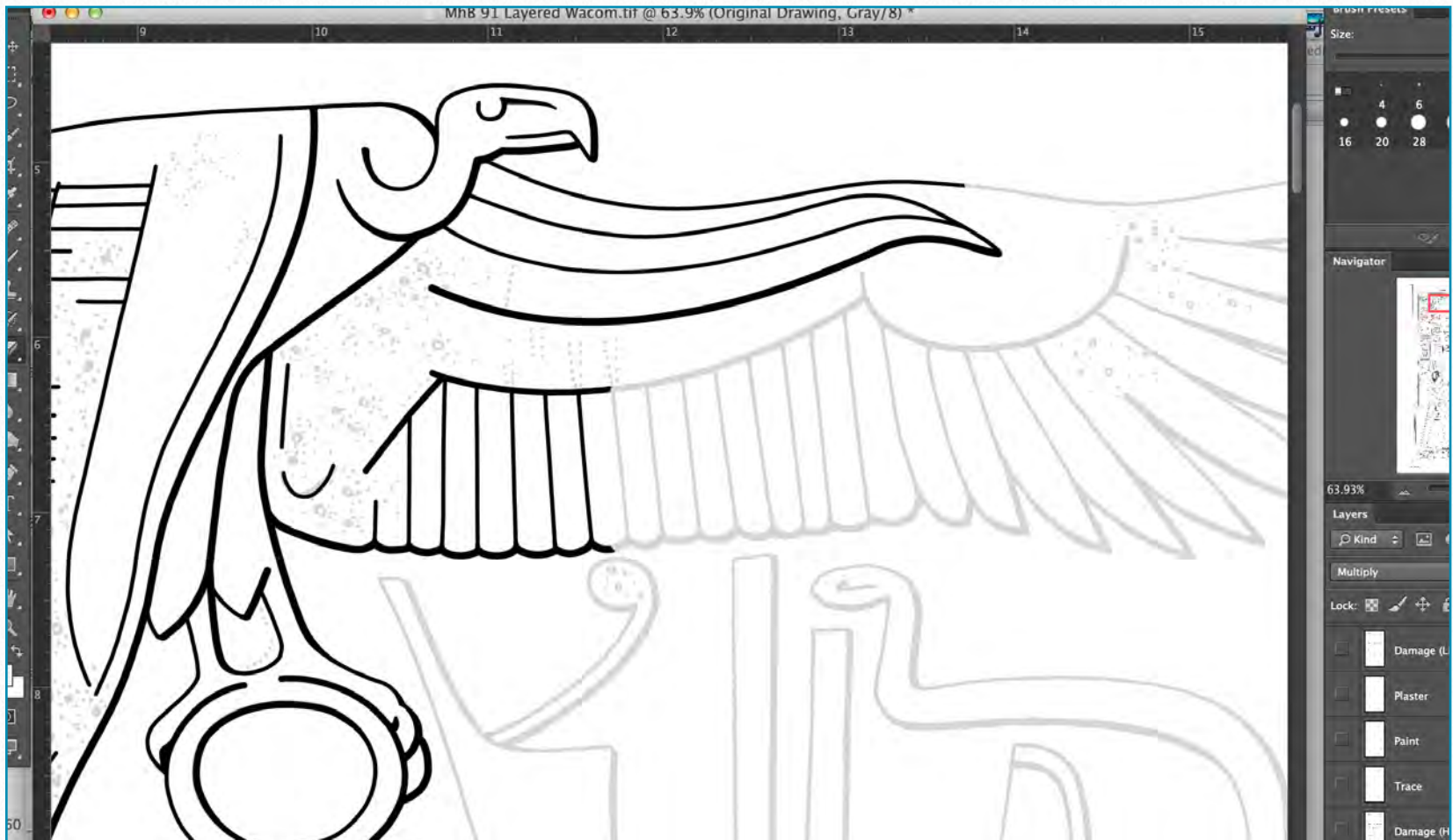
Using Adjustments Layers in Photoshop CS6:

<http://www.myphotocentral.com/tutorials/using-adjustments-layers-in-photoshop/>

Non-Destructive Dodge and Burn in Photoshop:

<http://www.photoshopessentials.com/photo-editing/dodge-burn/>

Inking Digitally











MHB 91 (detail) - Digital inking of heraldic vulture in progress

Once our layers are set up, our drawing is ready for inking. First we have to open the *Brush tool* and set up the Epigraphic Survey's standard brush stroke sizes:

To do this we have to open the *Brush Panel* and set up each and every brush thickness we'll use, name them, and save them to the brush palette. We also have to make sure that *Smoothing* is the *only* box checked, because - as we've already learned - all the other options cause a variety in line quality, a certain randomness in size, texture, and angle, and we don't want

that. We also have to make sure the brush *Roundness* and *Hardness* are set to 100%, and *Spacing*, which determines the distance in between the dots that build up our lines, is as little as possible (the smallest here is 1%). Clicking on the *folded paper icon* in the lower right corner, lets us give our new brush a name and save it.

All of the new brushes we save appear at the end of the custom brush list. To move them to the beginning of our list, we have to open the *Preset Manager*, highlight our new brushes (hold down *Shift* or use *cmd*

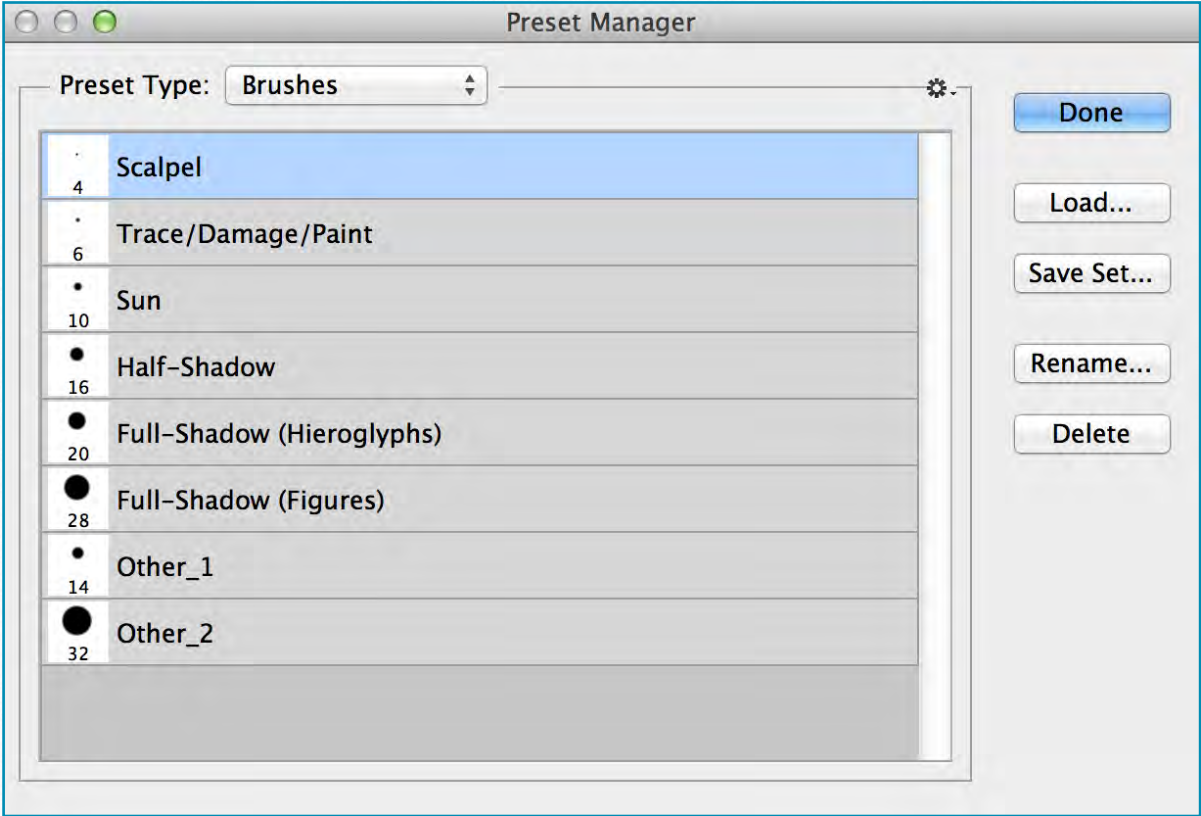
	Scalpel - 4 pixel brush width
	Trace/Damage/Paint (6x0/.13 <i>Teal</i> pen) - 6 pixel brush width
	Sun line (4x0/.18 <i>Pink</i> pen) - 10 pixel brush width
	Half-shadow (00/.30 <i>Yellow</i> pen) - 16 pixel brush width
	Full-shadow (i.e. hieroglyphs - 0/.35 <i>Gray</i> pen) - 20 pixel brush width
	Full-shadow (i.e. figures, architectural lines - 1/.50 <i>Brown</i> pen) - 28 pixel brush width
	Other available pens/brushes: 3x0/.25 <i>Beige</i> pen - 14 pixel brush width
	2/.60 <i>Red</i> pen - 32 pixel brush width

These brush line thicknesses are the digital equivalents of the line weights discussed in *Chapter 2, Section 1*. They were matched and created to represent the same line weights as the ones being used in previous Oriental Institute Epigraphic Survey publications. Because Photoshop uses pixel-based brush lines (unlike Illustrator’s vector-based lines), these thicknesses represent the actual line weights only in the 1200 dpi environment. If the artist needs to set up a less (or more) pixel-dense environment, he/she has to change the digital line weights accordingly.

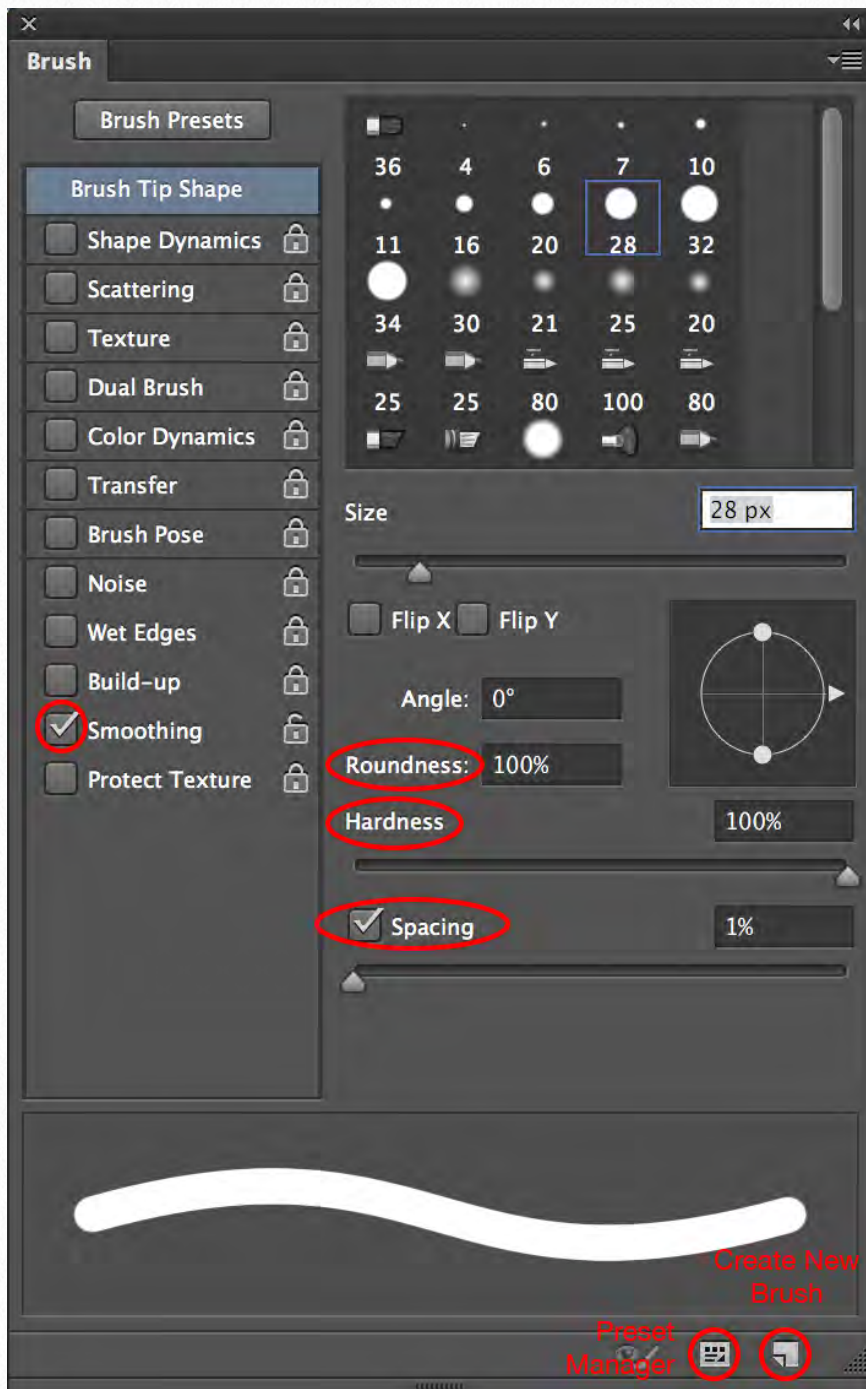


to highlight more than one at the same time) and drag the set to the front of the list. Since we don’t need Photoshop’s pre-set brushes right now, we can delete them as well. Once the preset window contains only our preferred brushes in the desired order, we should save the set and give it a name. Every time the artist needs to switch to a different brush set he/she should hit the little *cog wheel* in the upper right corner at the Preset Manager and choose from either Pho-

toshop’s options or his/her own saved sets. One more important setting that can be adjusted at this point is changing the



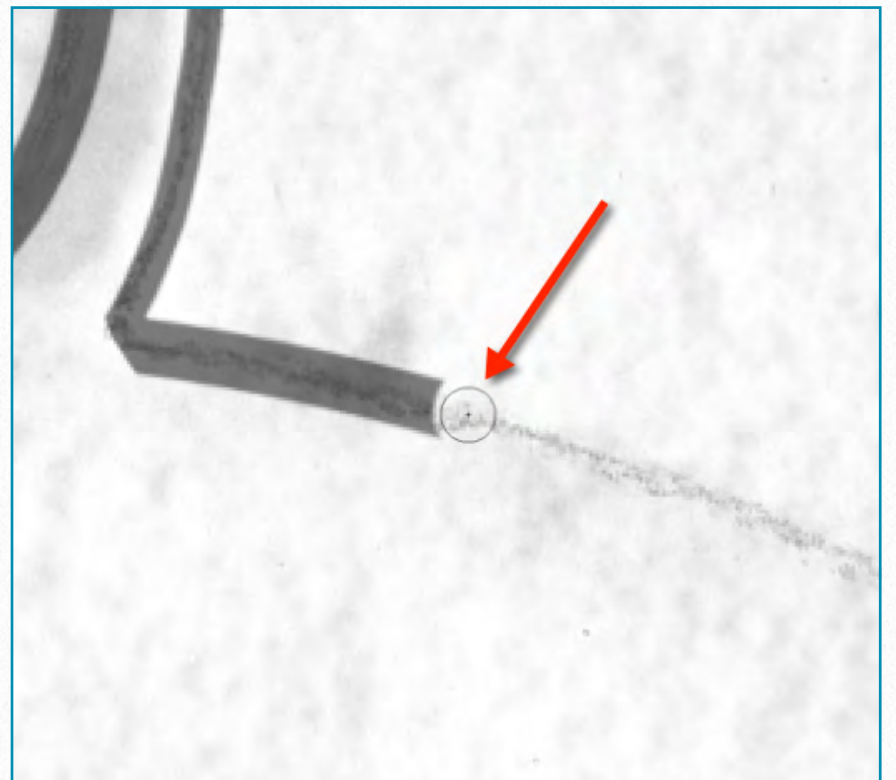
Standard brush sizes shown in the Preset Manager



Brush panel with the important settings indicated

control for the *brush cursor's* appearance. As a factory setting, the brush cursor reflects the size and shape of whatever brush is chosen. This is one of the most important brush attributes when the artist draws in an extremely zoomed-in environment. For example, it is necessary to see the edge of our brush tip when refining sun-shadow transitions to their desired shape. The artist has to be sure to set the cursor to *Normal Brush Tip* (*Photoshop/*

Preferences/Cursors). A further useful setting is to make the center point of the brush cursor visible (*Photoshop/Preferences/Cursors/Show Crosshair in Brush Tip*). Seeing the center point when working with transparent brush strokes helps the artist to determine and control the relationship between the original thin pencil lines and the - quite often - much thicker brush strokes.

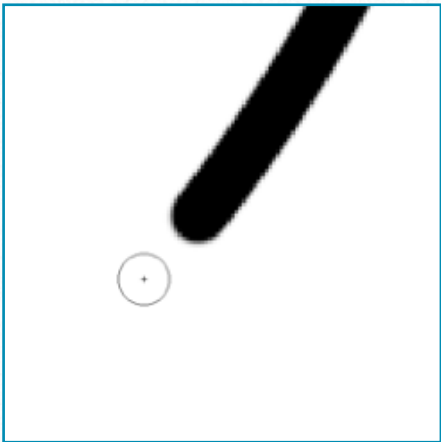


Normal brush tip with center point indicated

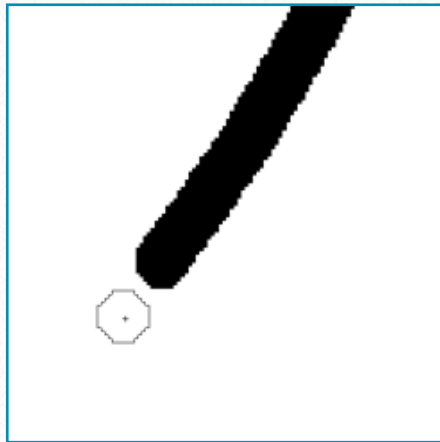
Freehand Drawing

As is obvious from reading the previous sections, the tool we use for inking is the *Brush tool*. Theoretically we could use the *Pencil tool* as well, but there is one major difference between the two: the Pencil tool is limited to drawing with only hard brush tips of any size or shape. If we compare

the two lines drawn with the same line weight, the difference is obvious:



Brush and cursor

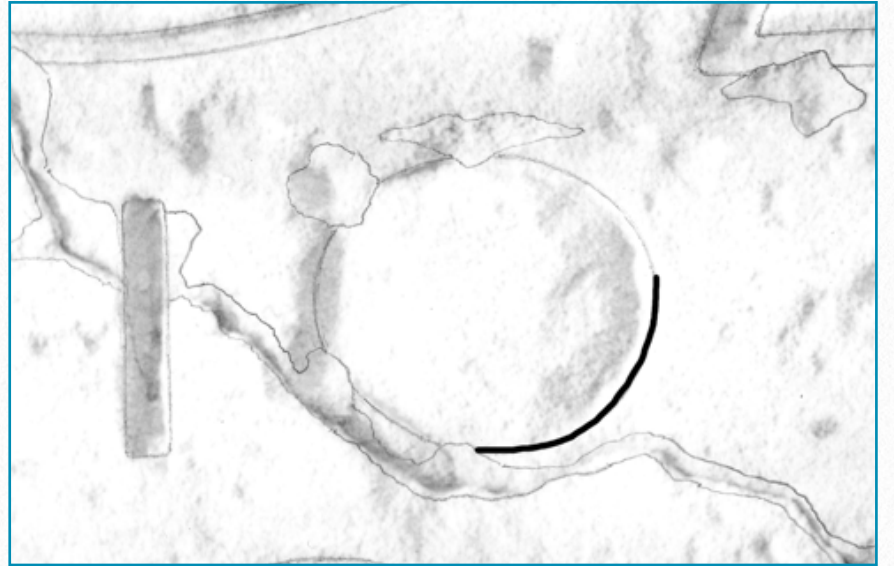


Pencil and cursor

While black brush strokes have much smoother (and therefore more realistic) edges, thanks to using grayscale pixels, black pencil strokes have serrated edges due to the absence of gray pixels. Even their cursors' shapes indicate this differentiation.

As we start drawing we immediately realize two problems:

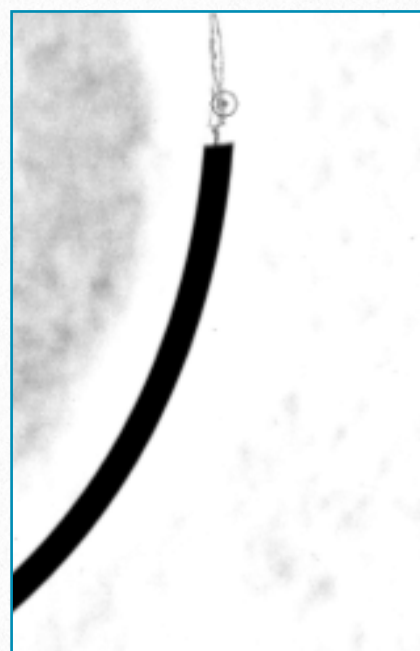
1. Our black ink line covers up our initial penciled guidelines as we draw, and therefore we do not have much control over their relationship.
2. No matter how hard we try, our brush strokes seem to be shaky and misplaced. Lifting up the Wacom pen and continuing a line where we left off seems especially problematic, not to mention adding sun-shadow transitions.



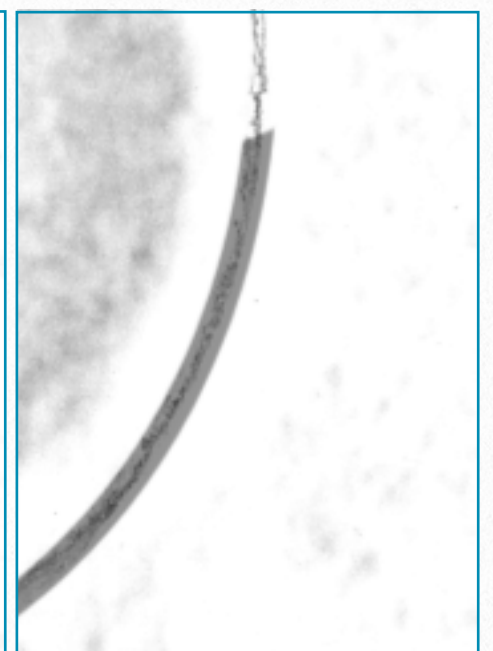
Freehand drawing in reduced view

There are a few very useful tips to help the artist accomplish the inking process keeping the same quality he/she is used to when drawing on paper:

- Always use semi-transparent brush strokes (by changing the *layer's transparency*) when tracing over initially produced guidelines (penciling on enlargements, mylar, markers on plastic, etc.). Brush transparency and the above mentioned center point help with determining and controlling brush stroke alignment while



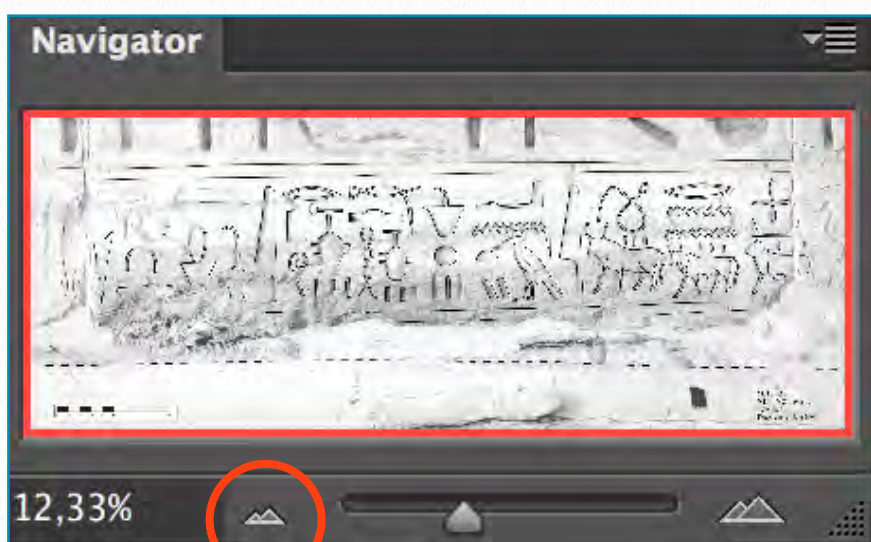
Solid brush stroke



The same at 50% opacity

drawing. Layer transparency has to be adjusted back to 100% before finalizing the drawing.

- Try different *zoom* settings for dealing with different features. *Zooming in* by 200% (do not confuse changing the viewing ratio with changing the actual image size!) helps when drawing delicate details, such as small hieroglyphs. By contrast, *zooming out* by 50% helps when dealing with non-decorative elements, such as damage and plaster, where faster paced, lighter brushwork yields a more realistic effect. The easiest way to zoom in/out is by using the *Zoom tool*. Switching between brush and zoom requires a whole sequence of commands, which can be very distracting. An easier way to change the viewing ratio is by clicking on the little *pyramids* at the bot-

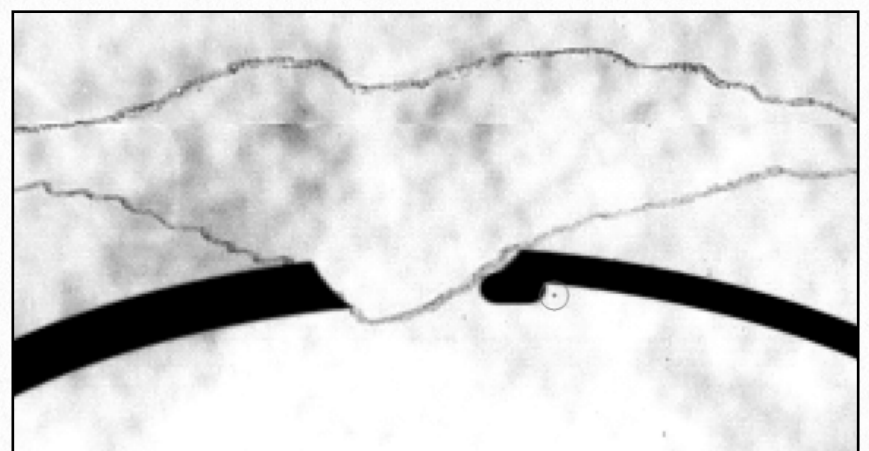


Navigator's zooming area

tom of the *Navigator* panel. These buttons change the drawing's viewing ratio

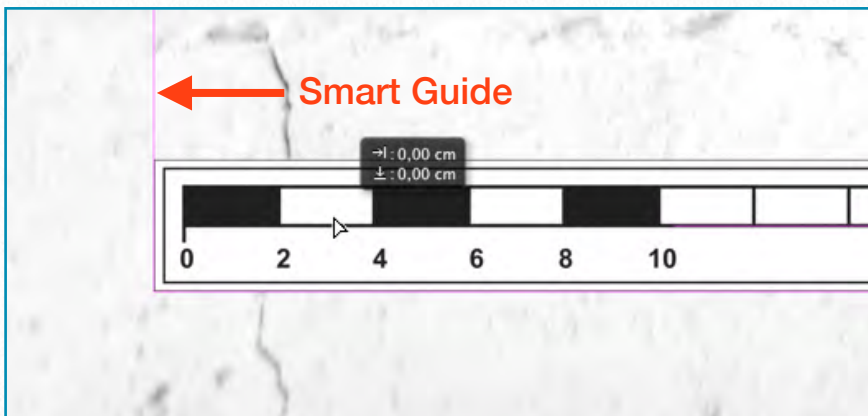
by a certain preset percentage without deactivating the actual tool that is being used. This even works in situations when we can't apply the *Zoom tool*, such as scaling or rotating, etc.

- As a general rule, the artist should draw faster when working in a zoomed-out view and slower when working in a zoomed-in view to accomplish the best quality-accuracy ratio.
- Erasing from and adding to the brushstrokes are common when dealing with sun-shadow transitions. Adding to the *inside* and erasing from the *outside* of the brush line usually has the best result when drawing curves.



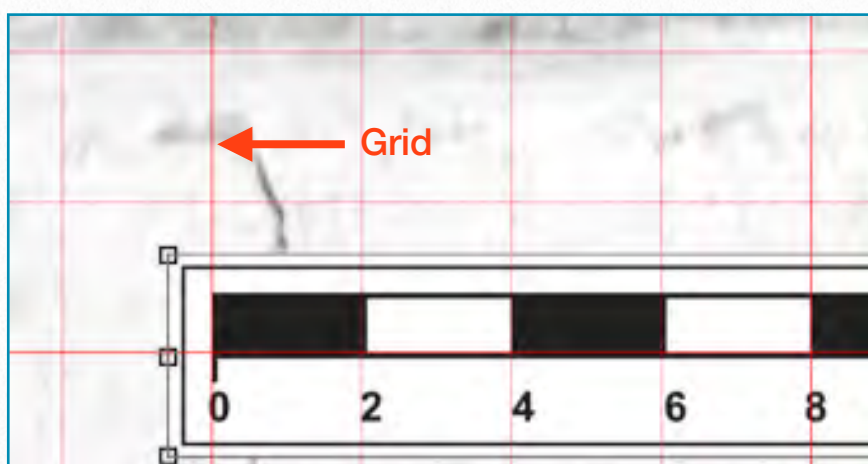
Inking sunk relief by adding to the brushstroke

- Try adding extra guides to the drawing. The most useful are Smart Guides (*View/Show/Smart Guides*), Grids (*View/Show/Grids*), and Rulers (*View/Rulers*). *Smart Guides* are a very handy tool for lining up different objects on a drawing. They enable the artist quickly and easily to see if



The Smart Guides are indicated in purple

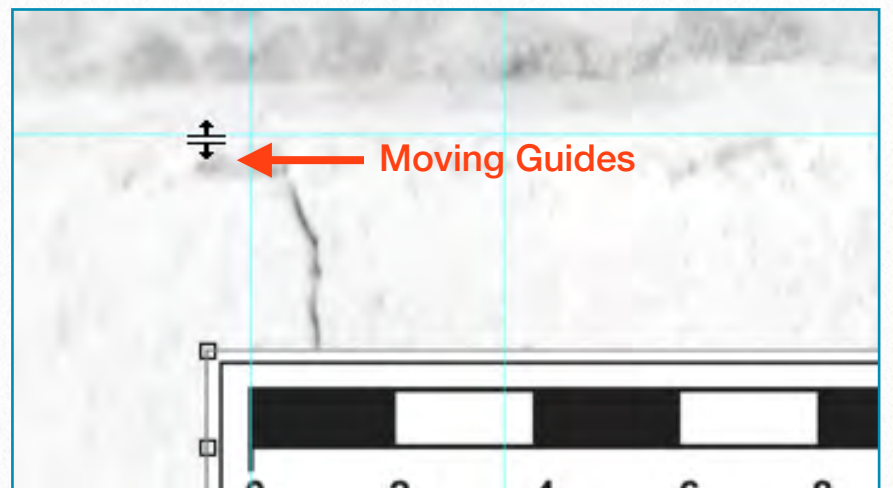
the objects are lined up without having to use rulers, grids, or create ruler guides. The *Grid* is the perfect alignment tool if one has many repetitive elements on a drawing and they need to be positioned in a certain way. Combined with the *Snap* feature (*View/Snap*) the grid provides the



The Grid is indicated in red

same magnetic effect as the Smart Guides. Finally, having the *Rulers* visible at the horizontal and vertical edges of the drawing helps when rescaling any drawing elements. Rulers provide another helpful feature: they allow the artist to add any individual horizontal or vertical guideline to the drawing by clicking on the ruler and dragging the cursor away from it. These *Guides* can be moved, multiplied, etc. and can be deleted when

they are not needed anymore (*View/Clear Guides*). All of the above features are fully customizable (including their colors) and can be adjusted in *Photoshop/Preferences/Guides, Grid & Slices*.



Grab and hold to move guides around

Learn the **shortcuts** necessary for your basic tasks! Although many keyboard combinations can be associated with our tablet's hot keys (*Chapter 3, Section 3*), the artist should know about and learn the most common keyboard shortcuts for his/her day-to-day work. Only the ones related to using the Brush tool will be mentioned here, but one can find a more detailed list at the end of this manual (*Supplements*).

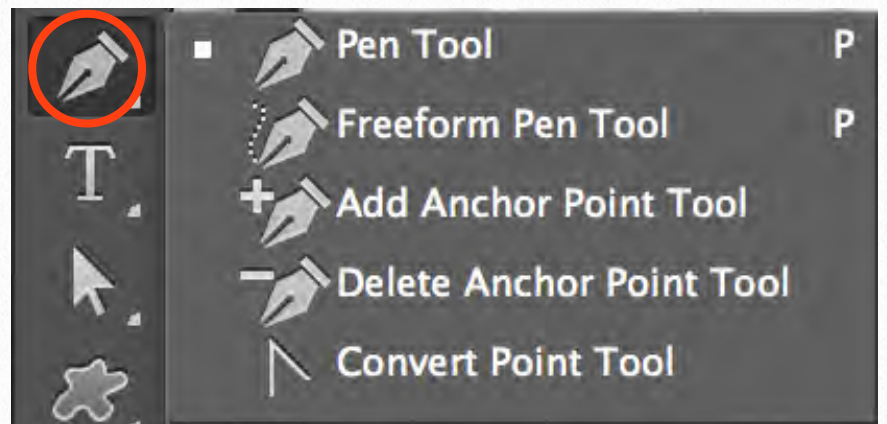
- [(Decrease Brush Size) - Quickly decrease your brush size (based on your preset list).
-] (Increase Brush Size) - Quickly increase your brush size (based on your preset list).

- **Shift + [** (*Decrease Brush Softness*) - Decrease the softness of the brush by 25%.
- **Shift +]** (*Increase Brush Softness*) - Increase the softness of the brush by 25%.
- **1-0** (*Tool Opacity*) - Press one of the numbers from 1 to 0 and your *tool* opacity (but not the layer, therefore it can't be changed back later!) will change from 10% up to 100%. If you want finer control, press a second number quickly after the first, and you can get any percentage you want. Thus pressing 5 will get you 50% opacity, while pressing 5 then 3 will give you 53% opacity.
- **Hold Shift** (*Straight Lines*) - With the brush you want to use active, click once where you want your straight line to start, then hold down *Shift* while you move to the end of your straight line and click again. This will paint a straight line from the first point to where you just clicked.

Anchor Points and drawing with the Pen tool

The pen tool is one of the few tools available to the artist in Photoshop that works with *Vector Graphics* as opposed to *Raster Graphics*. With the Pen tool, one can create lines and smooth curves that can be modified to any desired shape. (*Vectors*

are lines whose curvature, thickness, and length are determined by mathematical formulae.) Using the Pen tool and its siblings (Freeform Pen tool, Add/Delete Anchor Point tool) is the best way to draw smooth sun-shadow transitions and dynamic brush lines.

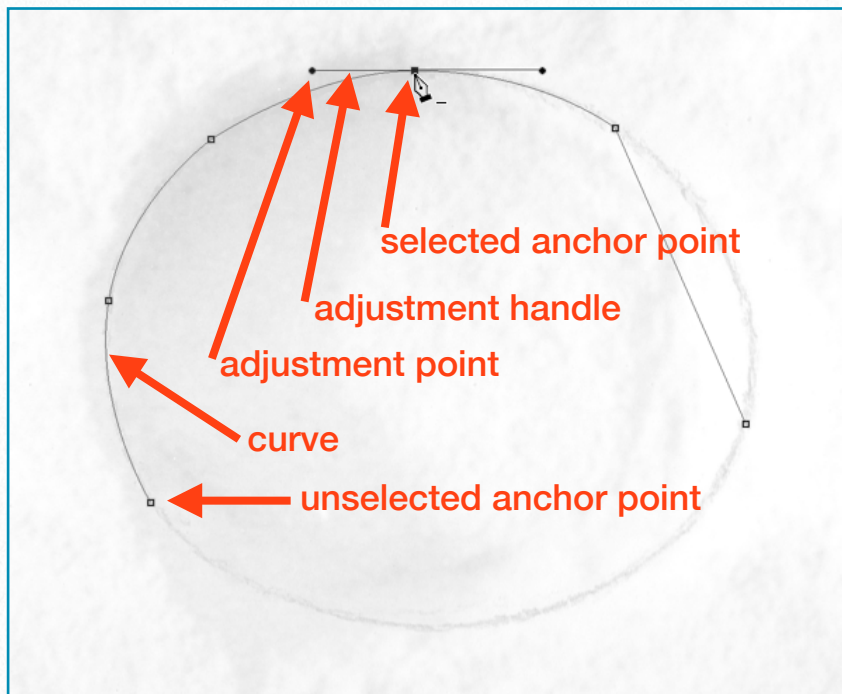


Pen tool and its siblings

It might seem strange to find vector-drawing tools in a pixel-based program like Photoshop; vector drawing is usually associated with very different programs, like Illustrator. Photoshop can't create entire vector documents. Instead it uses vector elements and stores them in layers and as *paths*. We use these paths to determine the exact track whereon our brush stroke is *placed*.

In Photoshop the mathematical name for the lines (paths) that determine vectors is *Bézier* (after a French creator, Pierre Bézier, who came up with a clever way to make computer-drawn lines bend to his will.) A Bézier curve's direction and angle is determined by the position of little *anchor*

points that lie along the path. A path is this series of curves joined together from anchor point to anchor point. As one clicks a point, it changes color and becomes black. This is called “*filled* or *selected*” meaning that that portion of the path can now be modified.



Drawing curves in Photoshop

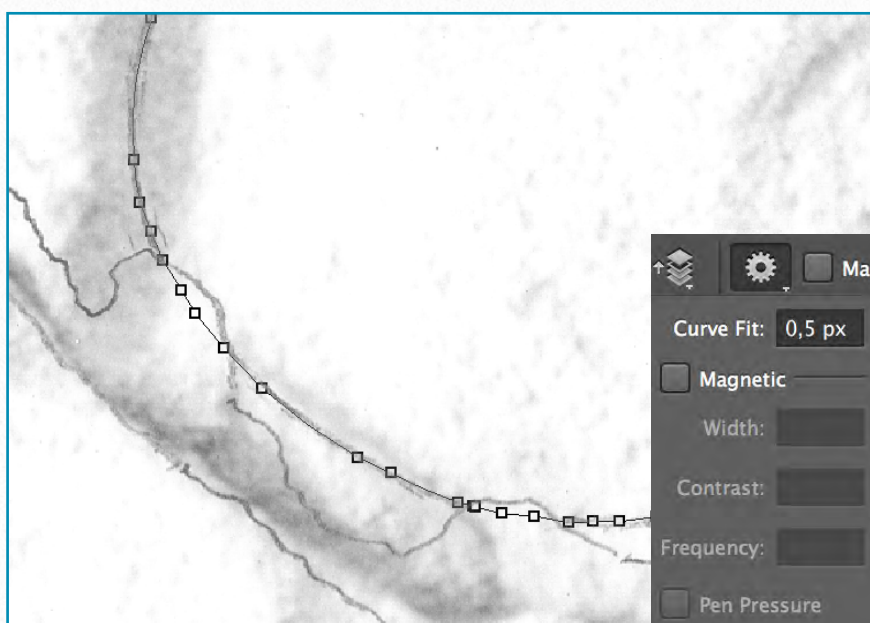
Drawing with the Pen tool is - unfortunately - not a very natural process, especially to anyone who is used to drawing with a regular pen on paper. This is because, unlike the *Brush tool*, we are creating the shape with points and handles. The artist doesn't just draw on the canvas, he/she has to add points and manipulate them to create the desired shapes. The pen tool is the tool used to add these points, and the way one drags the tool when creating the points determines how they will look. One general rule: the fewer

points we add, the smoother a path will be.

Freeform Pen Tool - The Freeform Pen tool is kind of a hybrid *Lasso/Pen* tool. The artist clicks and drags around the element he/she wants to trace, and the tool creates an outline that follows the cursor, exactly like the Lasso. After the Wacom Stylus has been released, Photoshop provides the anchor points, lines, and curves for that path. In this way, the Freeform Pen works exactly like the *Pen*. The downside of using the Freeform Pen is that the artist needs a steady hand in order to get an accurate selection, just like when working with free-hand brush lines. The Freeform Pen tool is probably one notch better than the Brush tool because we get a path that can be refined before we turn it into a brush stroke.

To create straight segments by using the Freeform Pen, we can hold down *Option* (*Alt* on the PC) while drawing with the Wacom Stylus, and then click to create the anchor point. This command temporarily turns the Freeform Pen into the regular Pen. The artist can return to using the Freeform Pen by releasing *Option*, while keeping the Wacom Pen on the tablet screen. If one releases *Option* *after* releasing the Wacom Stylus, Photoshop immediately ends the path.

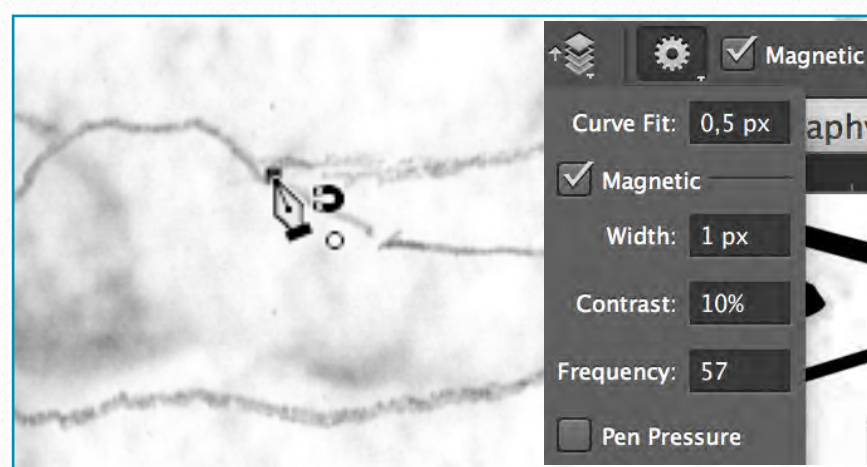
The *Curve Fit* option lets the artist adjust the amount of error (0.5-10 pixels) Photoshop allows when trying to fit the cursor movement to a path. Setting the value to *0.5 pixels* makes the Freeform Pen very sensitive to any movement and forces the tool to follow the edge closely. The disadvantage of this option is that using it also causes unnecessary anchor points. Although a value of 10 pixels corrects this problem by making the tool less sensitive, now the path may not be as accurate as we desire.



Adjusting Curve Fit

The *Magnetic* option makes the Freeform Pen act much like the *Magnetic Lasso* tool when the artist clicks anywhere on the edge of the element he/she wants to trace. By lifting up the Wacom Stylus and then moving the cursor along the lines to trace, the tool snaps to the edge of these elements, creating anchor points and seg-

ments. Unfortunately the proper use of this *magnetic effect* needs a lot of contrast and definition for the elements to be traced. Therefore it has very limited use for the digital artist when inking on photo enlargements. The magnetic effect gets exponentially more useful when tracing black marker lines on transparent plastic background. We will talk more about the Magnetic Pen tool when we discuss modifying inked lines in *Chapter 5, Section 3*.



Turning on and adjusting the magnetic effect

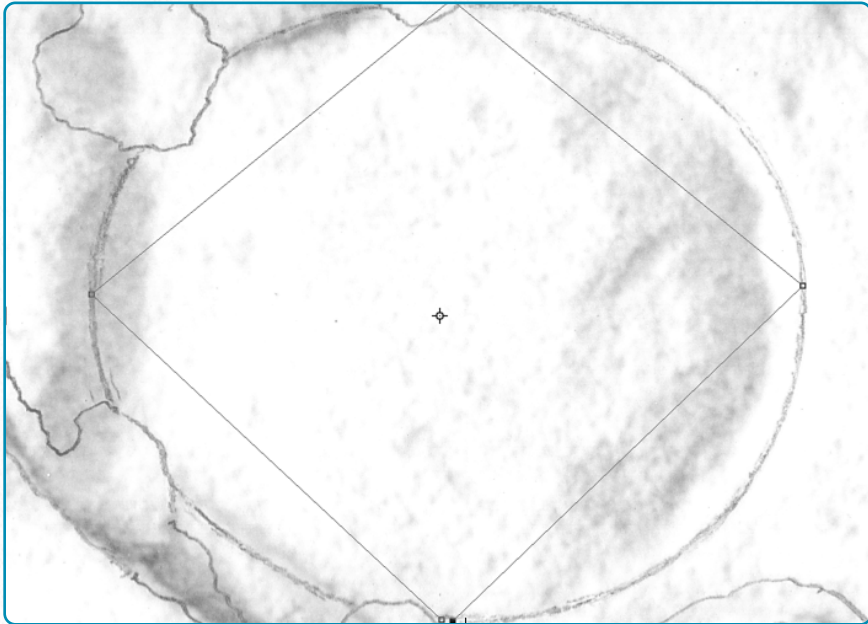
Pen Tool - using the Pen tool is the most precise and most controllable way of drawing curved paths for brush strokes. Its main advantage over the Freeform Pen tool is that the artist determines the *number* and *position* of the Anchor Points he/she wants to use along the path. The step-by-step guide below shows the process. Its advantages are even more obvious when dealing with fine transitions between different line thicknesses, such as *sun-shadow adjustments*. Adding sun-

shadow transitions by freehand can be very difficult when the artist works with large curved elements (circles, loops, figures, etc.). When inking on paper we usu-

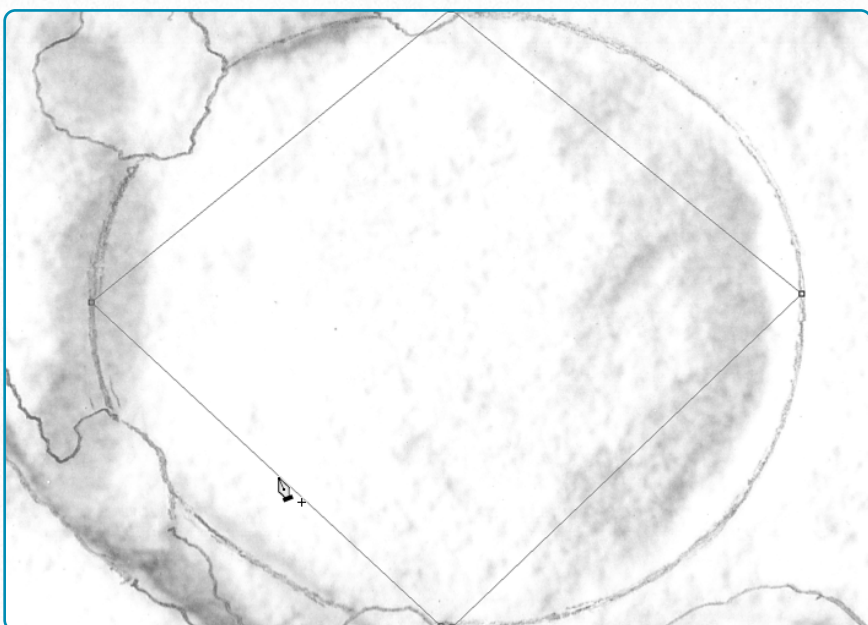
ally use templates (French curves) to help accomplish this task, and - in a way - the Pen tool is our *digital French curve* in Photoshop.



LEARN SKILLS

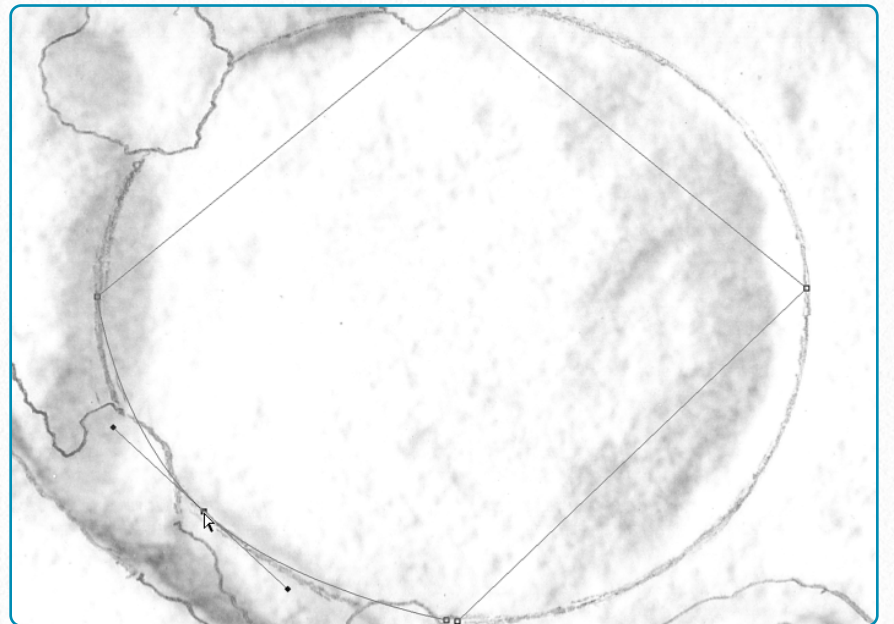


(1) Draw a rectangular area *touching the lines* you want to trace over. Don't use too many anchor points and don't close the path, to prevent it from becoming a *Shape*.

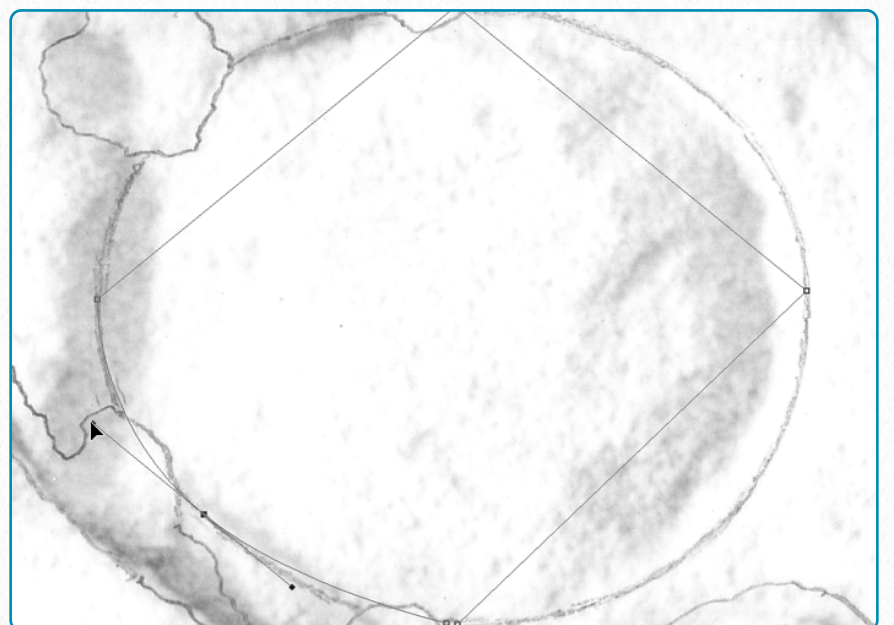


(2) Make sure *Auto Add/Delete* is active on the Tool Menu and add your first extra *Anchor Point* to the path.

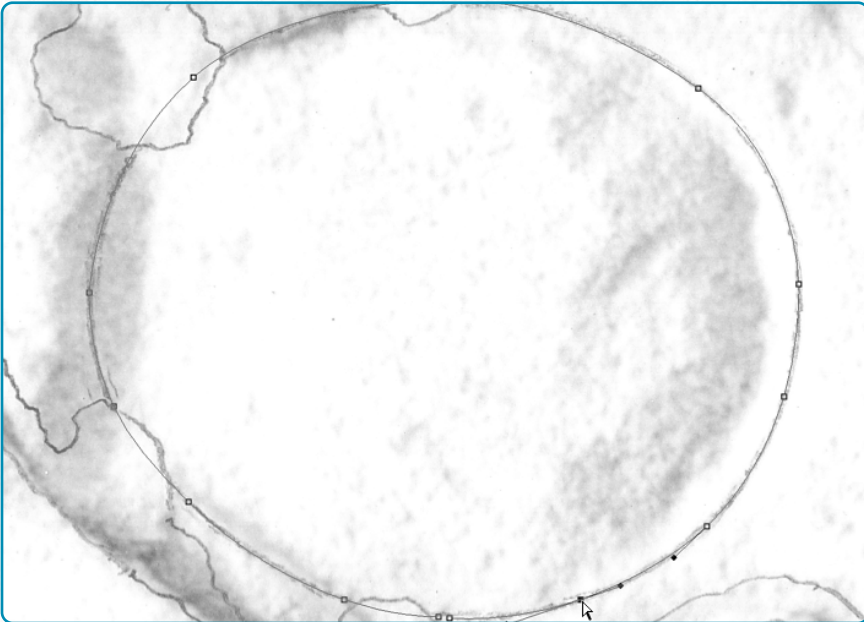
Drawing Curves by Using the Pen Tool



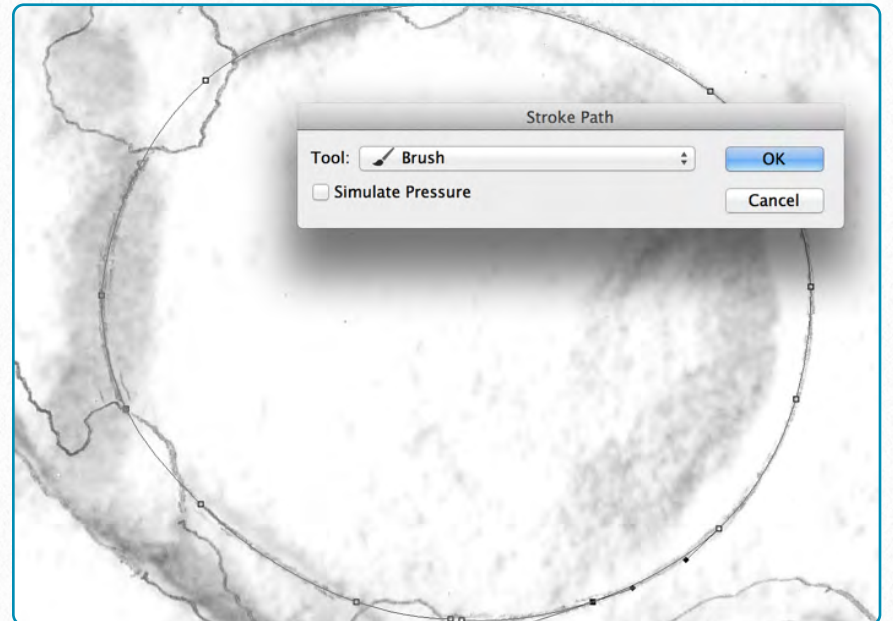
(3) Adjust the shape of your curve by holding down *Command (Cmd + Drag)* and moving your path section towards the line. Try to position it so it follows the line as closely as possible.



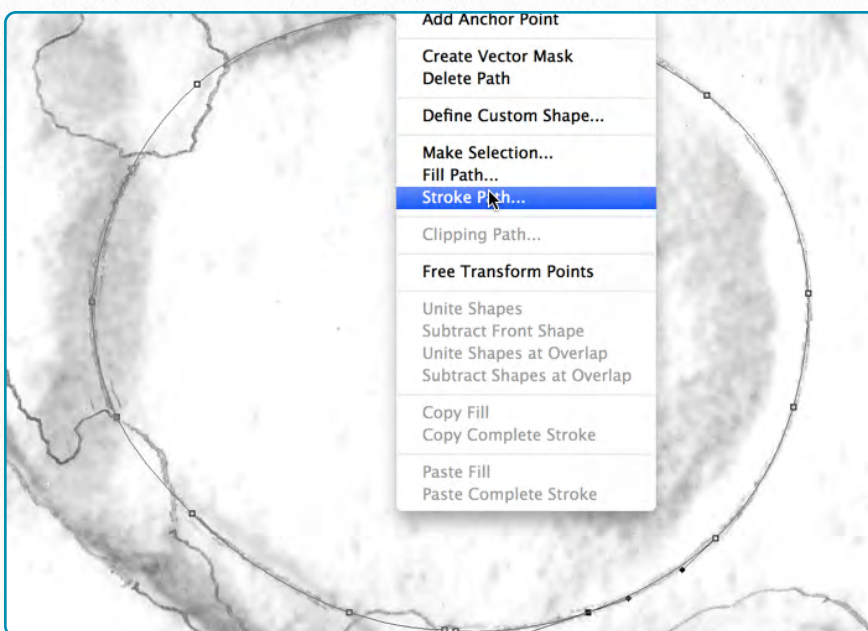
(4) Adjust your path section further by holding down *Command* and clicking and moving the *Adjustment Points* until you get the desired shape. Add more anchor points if necessary.



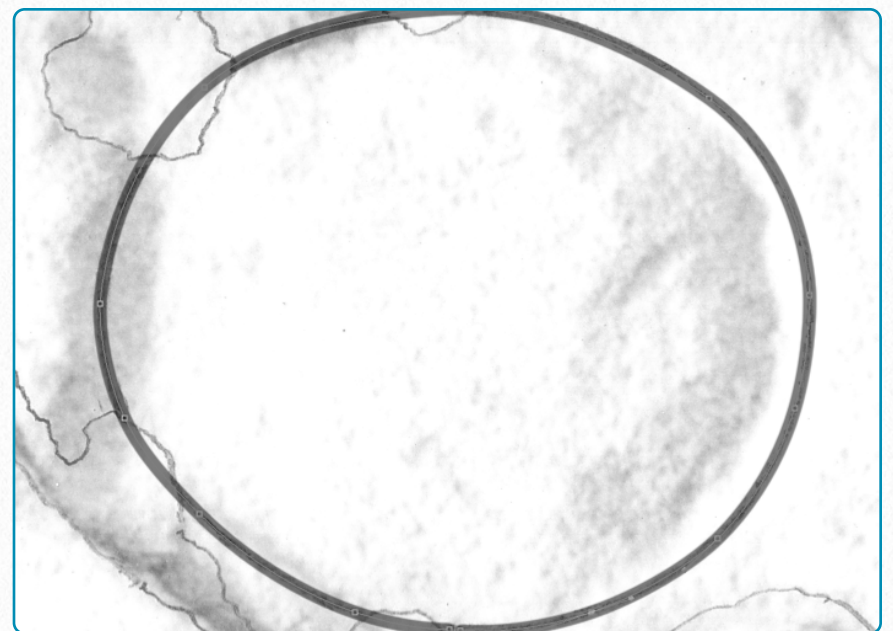
(5) Don't forget that because Auto Add/Delete is checked, you can add any number Anchor Points by hovering over your path, but Command should be *released* while adding them.



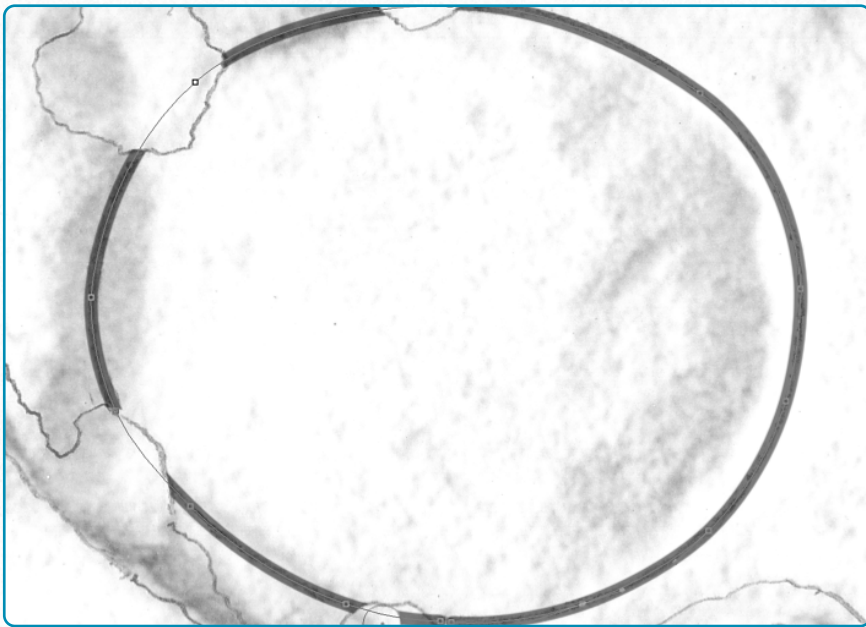
(7) This option opens up another panel, where you can choose the tool with which you'd like Photoshop to stroke your path. The width of the stroke is the same as what you used last time with that particular tool. Use the *Brush tool* for inking purposes.



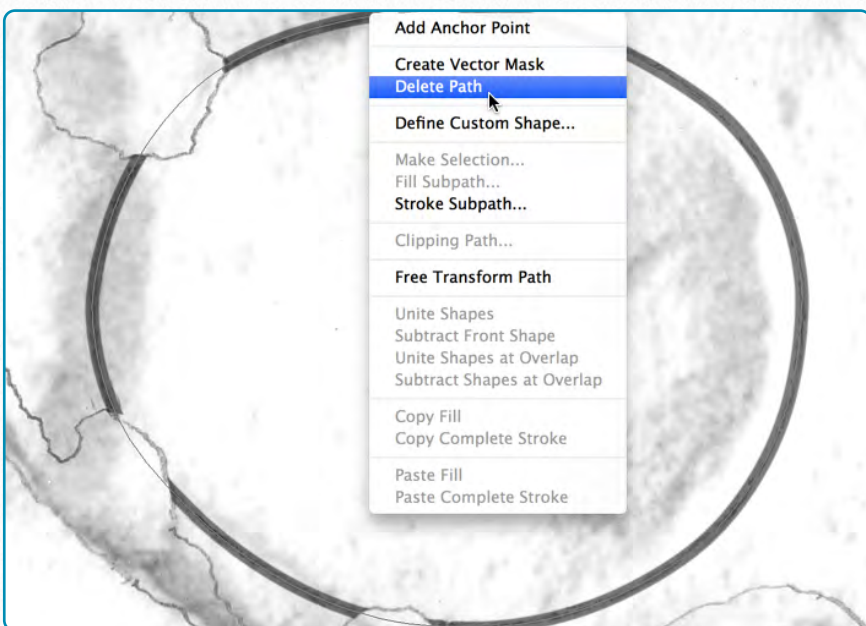
(6) Once you are satisfied with your path, *right click* (secondary click) anywhere along the path and choose **Stroke Path** from the menu.



(8) The generated brush stroke uses your path as a center line, so half of its width is added to the outside of the path, the other half is added to the inside. You must take this into consideration when drawing paths.

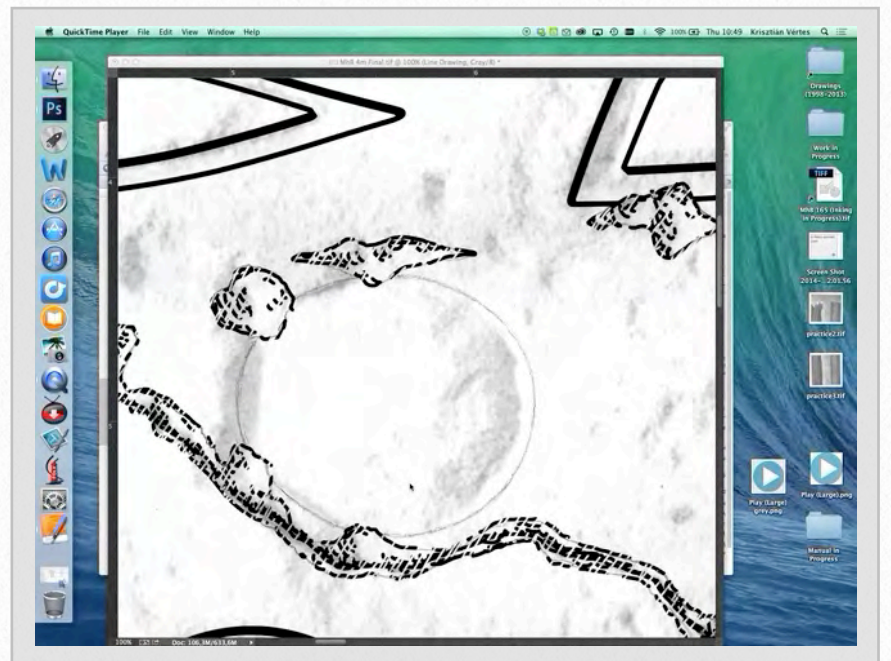


(9) As a general rule, it is easier to draw one *continuous* path for the entire shape, even if it has some damaged areas, than to draw separate paths for each section. Unwanted brush strokes can always be deleted later.



(10) When you have your desired lines stroked along the path, it can be deleted by using *right click* (secondary click) anywhere along the path and choosing **Delete Path** from the menu.

There are two slightly different methods that can be introduced here: the artist can either delete from or add to the initial curves. They are both very effective and, once mastered, they can be useful comple-



To download the demonstration video, click on the following link:

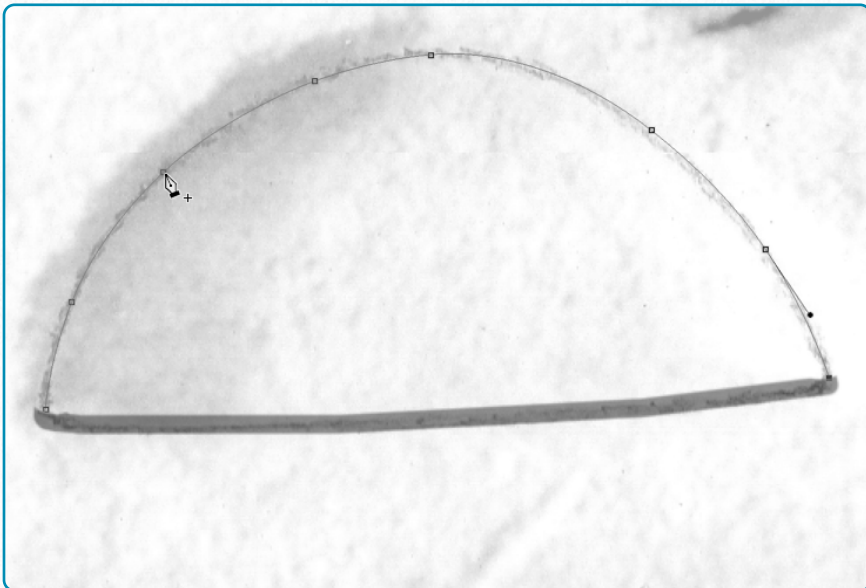
<https://www.dropbox.com/s/qnjqrvcot0ed24a/Drawing%20Curves%20by%20Using%20the%20Pen%20tool%20%28SD%29.m4v>

ments to hand-drawn brush strokes. The artist has to keep in mind that sometimes it's *easier* to draw freehand than to *force* drawing with the Pen tool.



LEARN SKILLS

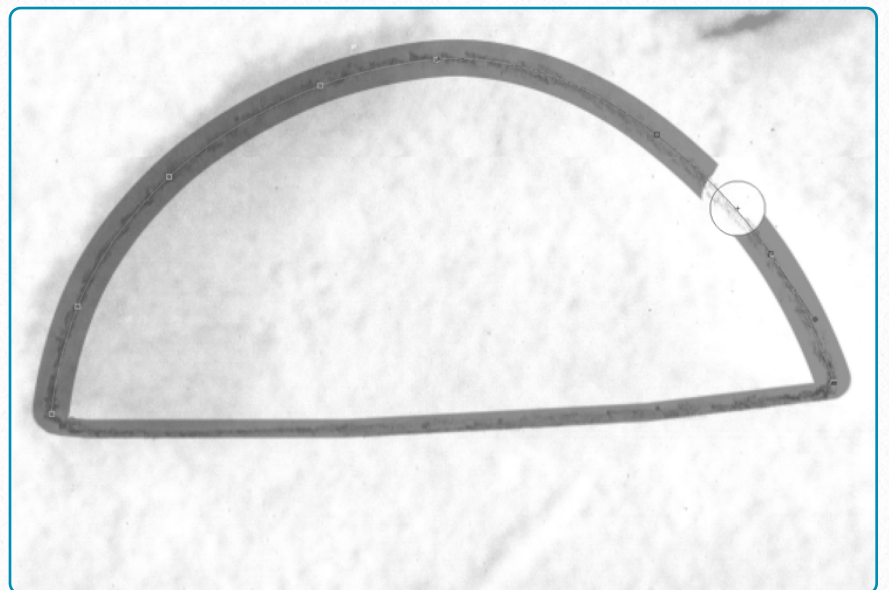
Delete Transitions with Path Selections



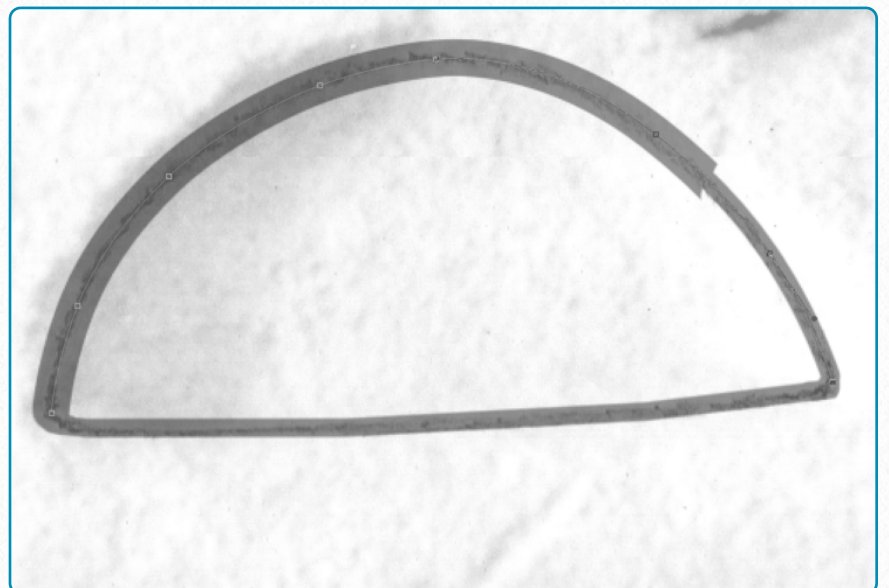
(1) Draw a path by carefully following the line you want to trace. This path will be the *center* for both shadow and sun lines.



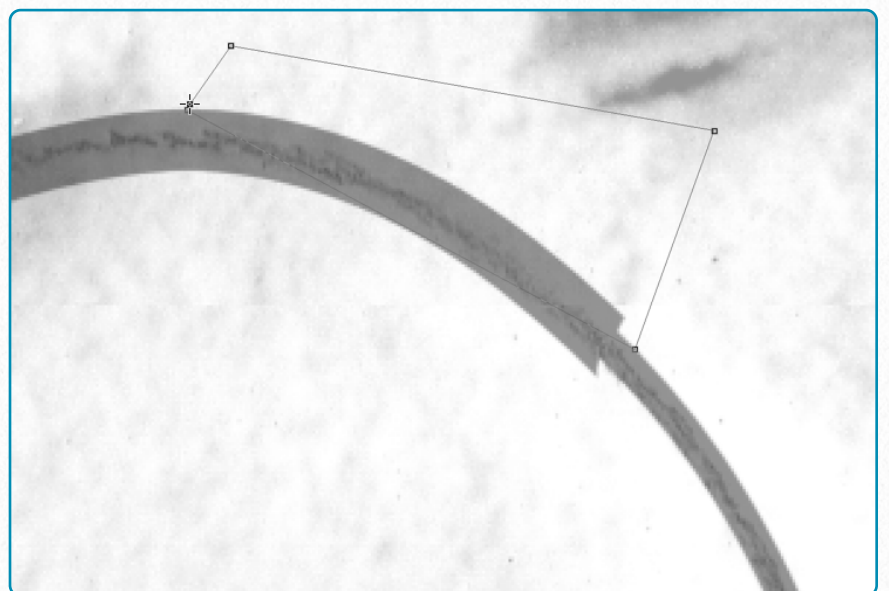
(2) Stroke your path with the shadow line weight first (16 or 20 pixels accordingly).



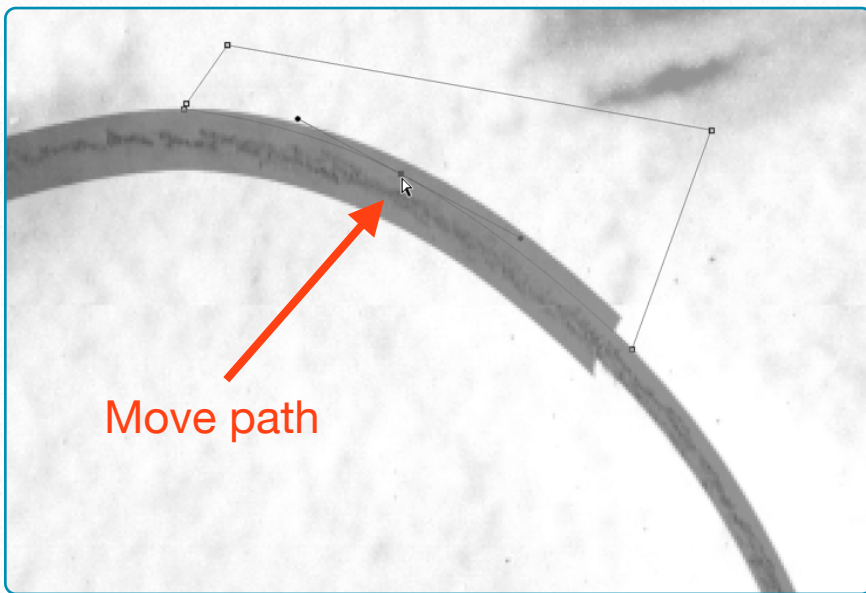
(3) Keep your path and erase the section where the sun-shadow transition ends, and you will be drawing a sun line.



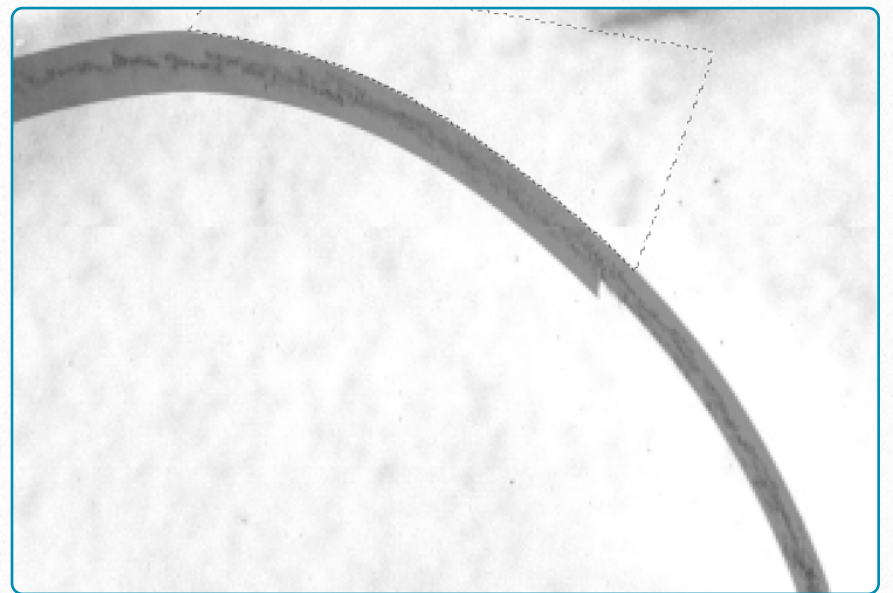
(4) Repeat *Step 2*, but this time use the sun line weight (10) instead of shadow. (Change brush size to sun!)



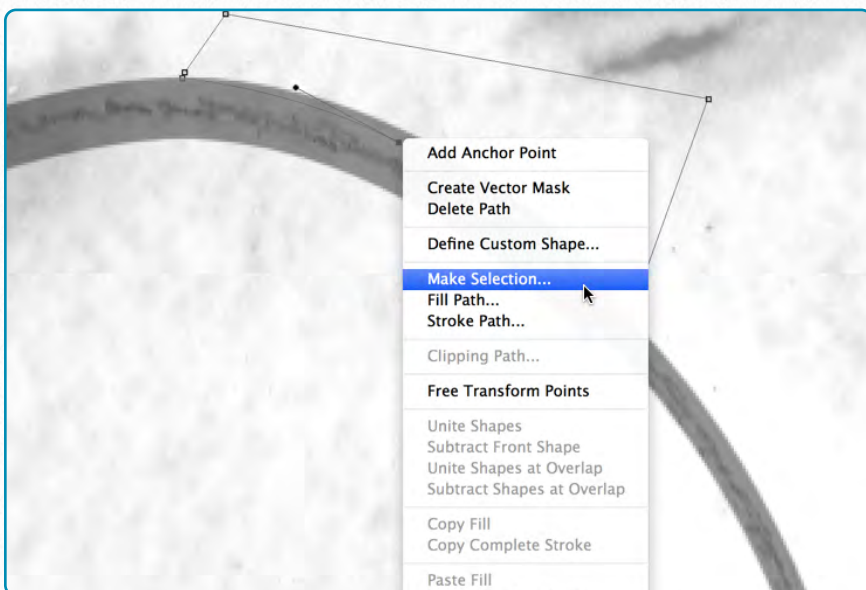
(5) Delete your path and draw another one over the transition area as shown on the image. Don't close the path!



(6) Adjust your path to form the outer curve of your sun-shadow transition. Starting and ending points must touch the lines.



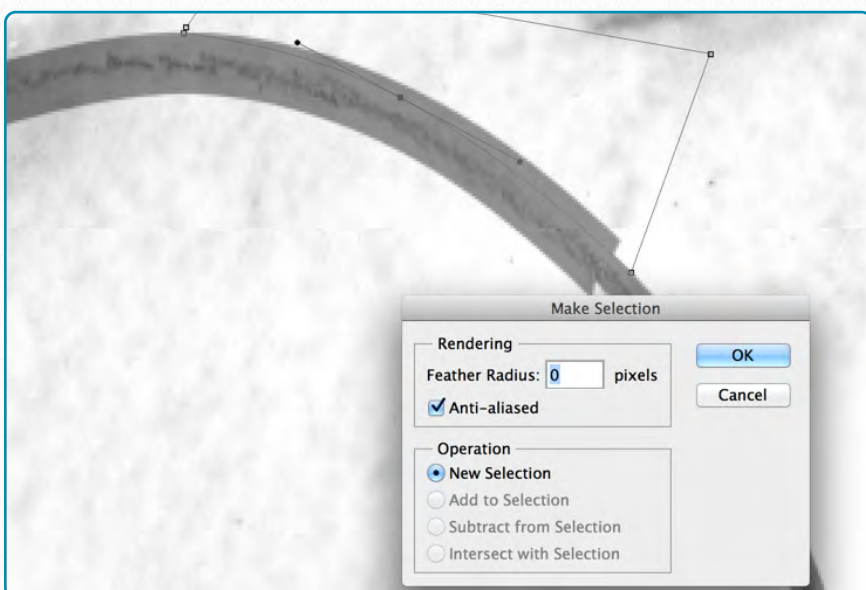
(9) Once you hit OK, your path turns into the usual “marching ants”. Now you can hit delete and clear the selected area.



(7) **Make** your new path a selection by calling up the same panel as you’d use for *Stroke Path*.



(10) You have to repeat Steps 5–9 again, but this time on the inside. Place your selection carefully!



(8) You don’t have to change anything in the Make Selection pop-up window, unless it looks different from the one here.



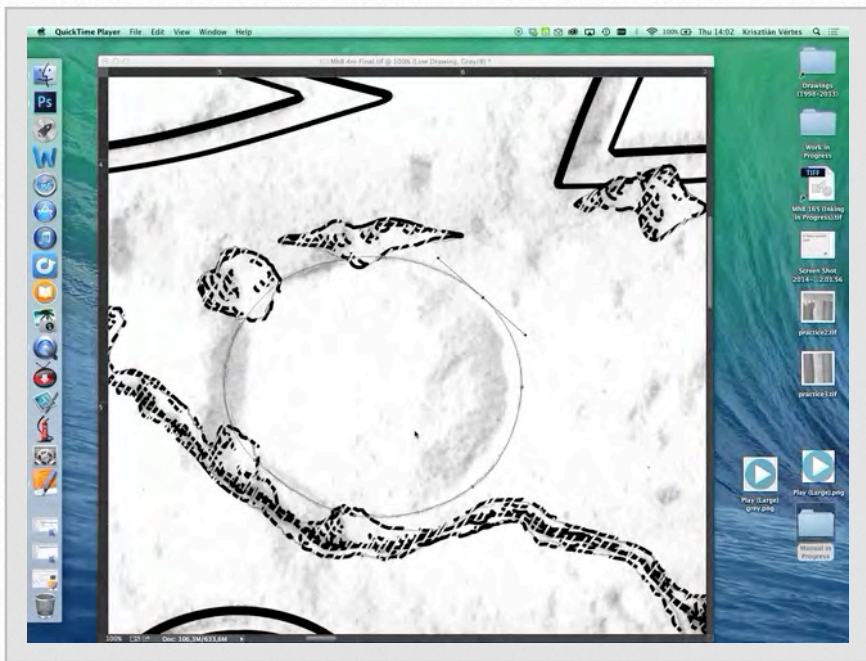
(11) The final inked circle with the transparency changed back to 100%. Unevenness in transitions can be corrected manually.



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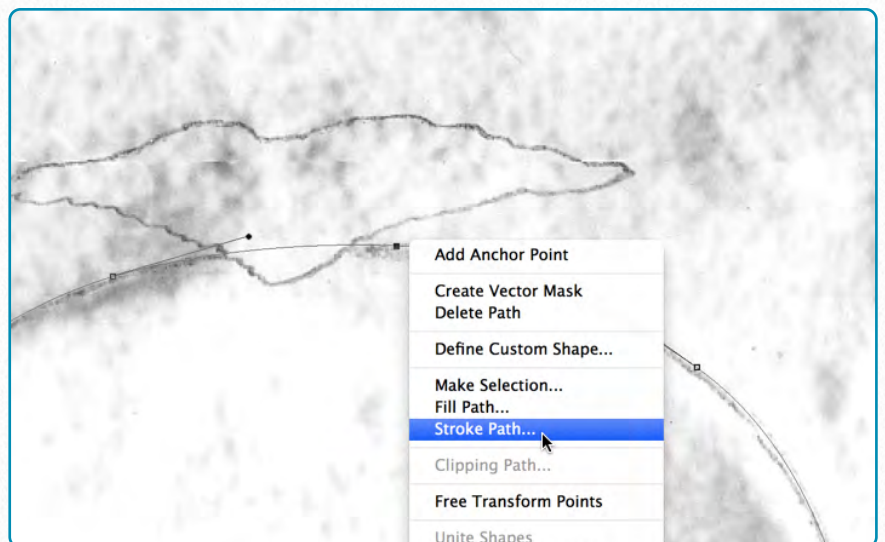
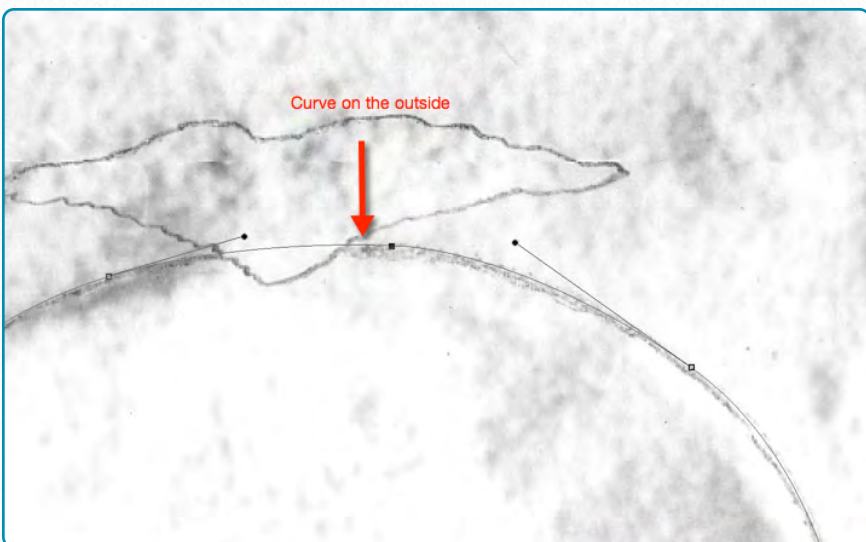
To download the demonstration video, click on the following link:

<https://www.dropbox.com/s/qyz3vj3nskeb91g/Delete%20Transitions%20with%20Path%20Selections%20%28SD%29.m4v>



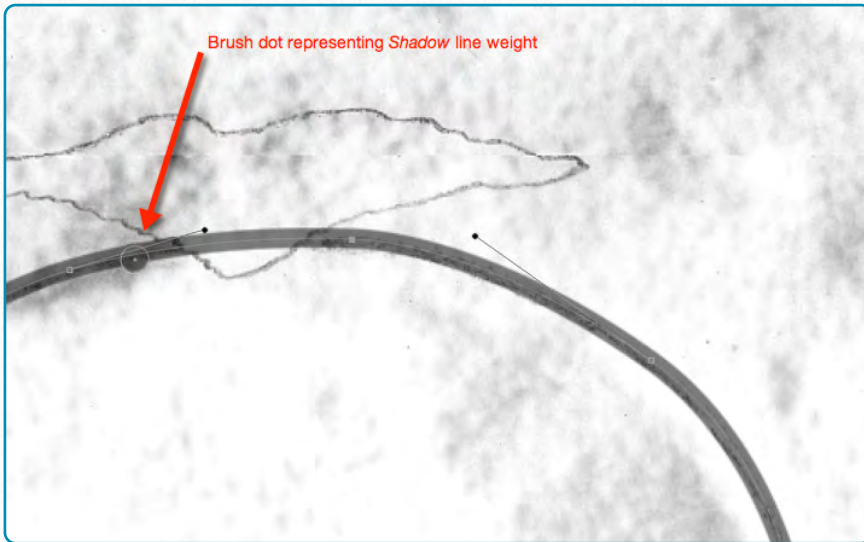
LEARN SKILLS

Adding Transitions by Moving the Path

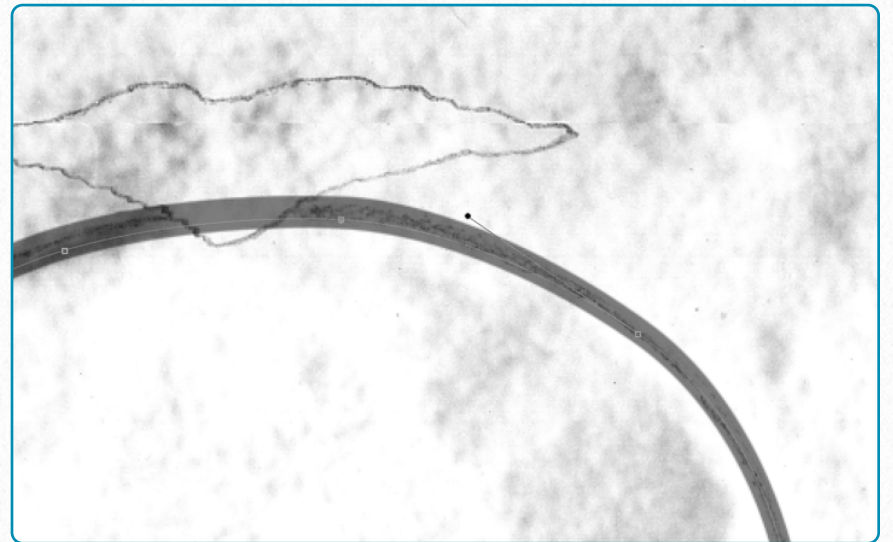


(1) Add your path in a way that reflects where you want to place your final brush stroke. Note that adding shadow lines to sunk relief requires placing your path slightly on the outside of your guideline, so you can build inwards.

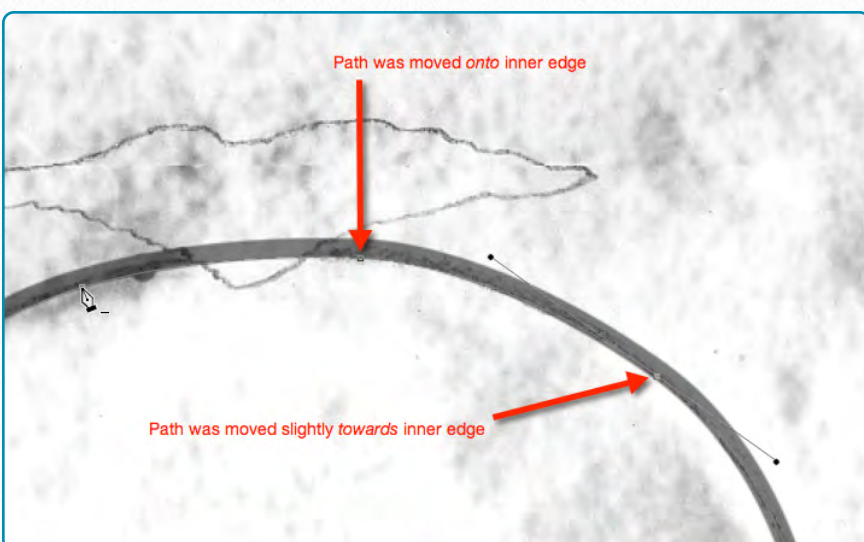
(2) Stroke your path with the *sun line* brush weight (10 pixels), and note that even the shadow line areas get the sun line width first. This brush stroke represents the outside of your inked line, so make sure its curvature is accurate.



(3) Change your brush size to shadow line weight (16 or 20 accordingly) and add a dot which would represent the actual shadow thickness and shows you how much you have to move your path to get the desired thickness.



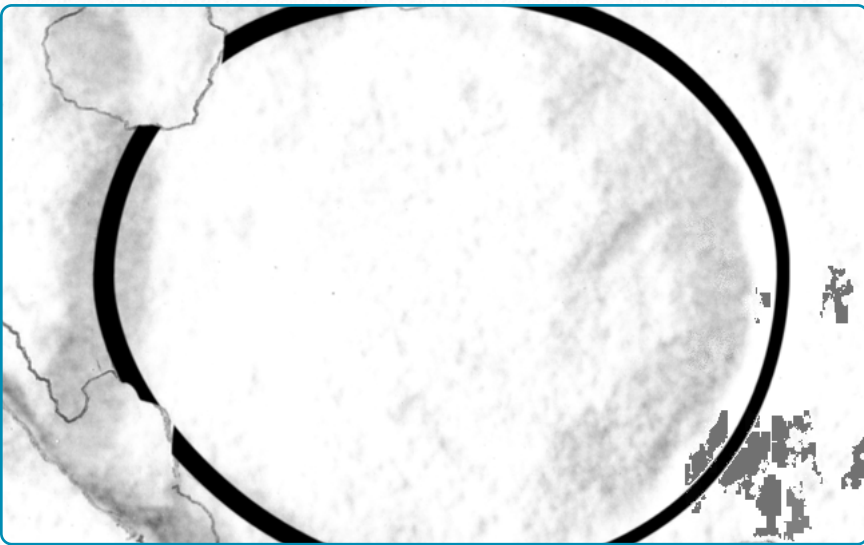
(5) Repeat the second step and add a sun line weight (10) brush stroke to your new path. Don't forget to change the brush thickness back to sun line! Note that the width doesn't change on the areas where the path wasn't moved.



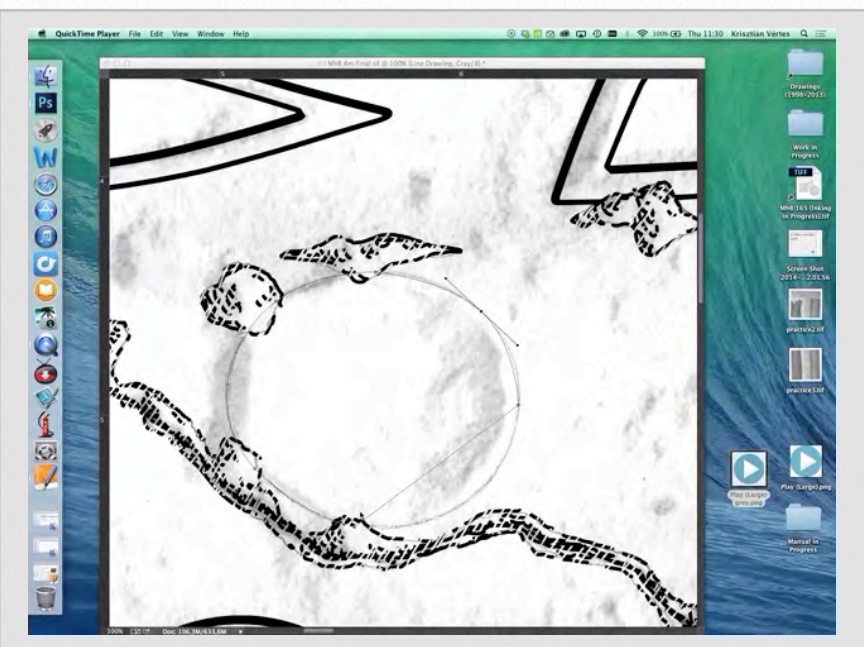
(4) Move your path according to the sun-shadow transition. Note that the path needs to be moved more wherever you want to have full shadow and less (or not at all) where you want to have your transition.



(6) Delete the damaged areas and, once everything looks as desired, delete your path as well. Adding entire features and deleting the missing parts later is especially easier than dealing with sections, especially when drawing sun-shadow transitions.



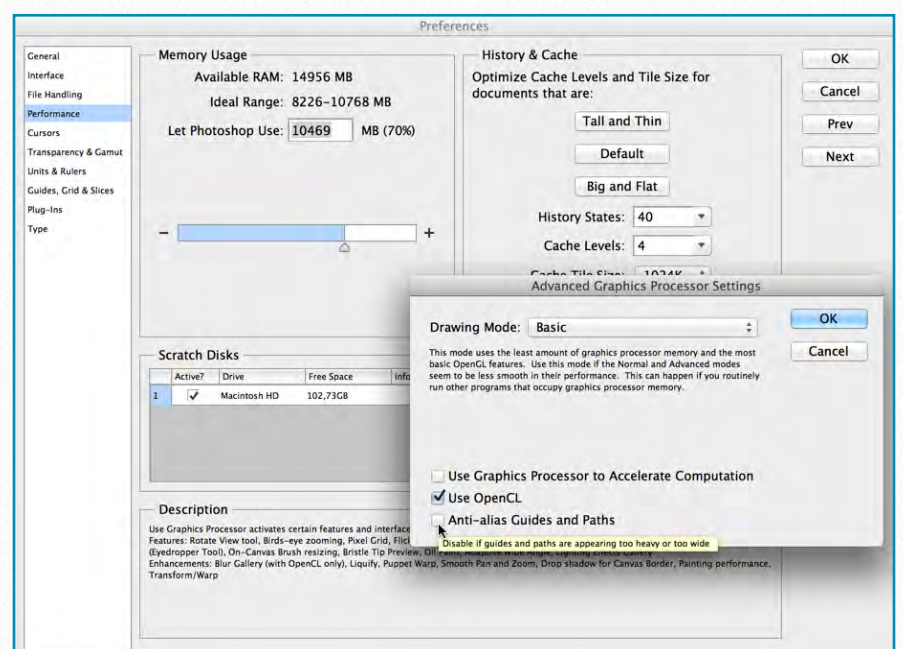
(7) The final inked circle with the transparency changed back to 100%. Unevenness in transitions can be corrected manually by using very thin brush strokes and the eraser.



To download the demonstration video, click on the following link:

<https://www.dropbox.com/s/tcsugvfba5qy71k/Adding%20Transitions%20by%20Moving%20the%20Path%20%28SD%29.m4v>

Unfortunately, by default paths are very difficult to see, especially when they're on the edge of an object. Since it is impossible to change the color of the path, the only enhancement one can do for the visibility is to change the *Anti-alias for Guides and Paths*. To change this setting, one needs to go to *Photoshop/Preferences/Performance (Edit on PC)*, click on the *Advanced* tab, and uncheck *Anti-Alias Guides and Paths*. This setting makes all the guidelines, including paths, a little sharper and thicker, and thus more visible.



Adjusting path visibility in Preferences

Inking Additional Details

Adding Painted Details - According to the Epigraphic Survey's drawing conventions (*Chapter 2, Section 6*), painted details are added by applying a series of dots along the painted outlines. *Dotted lines* can be configured in Photoshop in the *Brush tool*

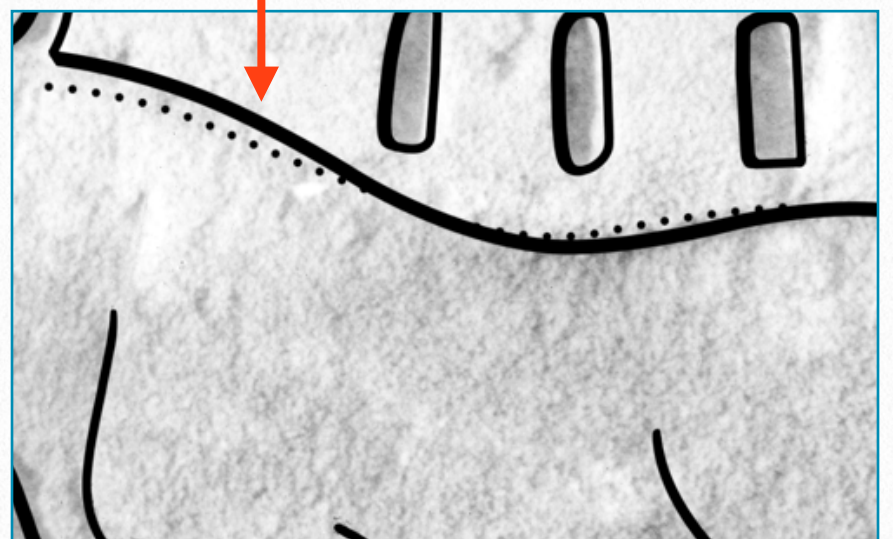
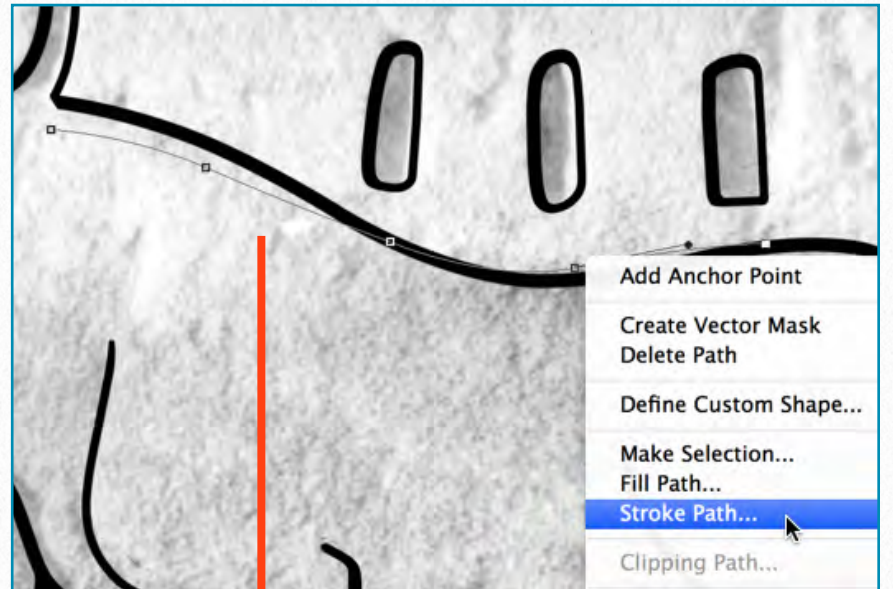
Menu by calling up the *Brush Panel* and changing *Spacing* for the brush we use for inking painted details (6 pixels). Our newly configured “painted line” brush stroke can be saved to the brush set (so the spacing



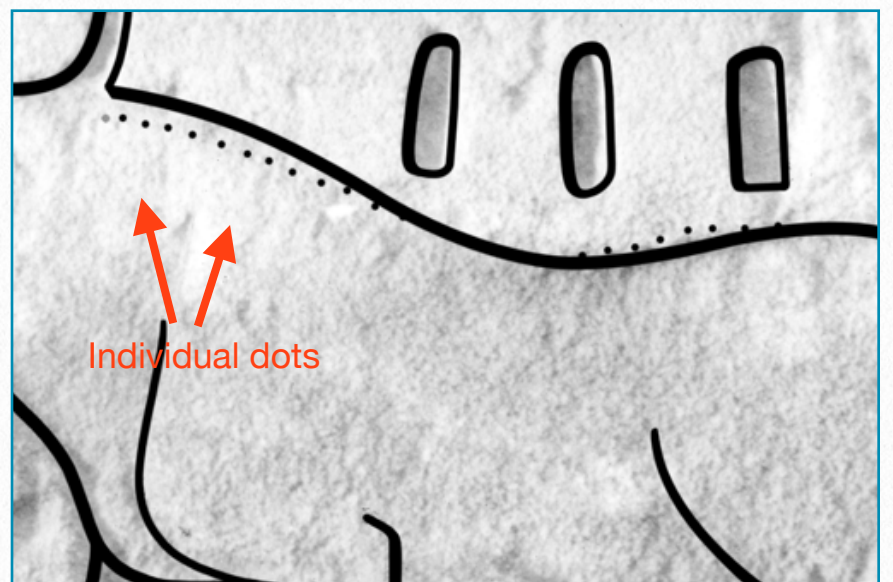
Adjusting distance between dots

stays consistent) and used any time for inking painted details. It can be combined with the *Pen tool* and stroked over *paths* just like any other preset brush type.

Using dotted lines instead of individually applied dots is preferable when one has to draw very detailed areas in small scale, and placing a dot in the right place matters even more (e.g., for collars, costumes, etc.). Of course, not every artist will prefer to use artificially placed dots when dealing with painted details. Sometimes *individual dots* result in a more natural look, especially when we don't have that much paint to add. The artist has to make these deci-



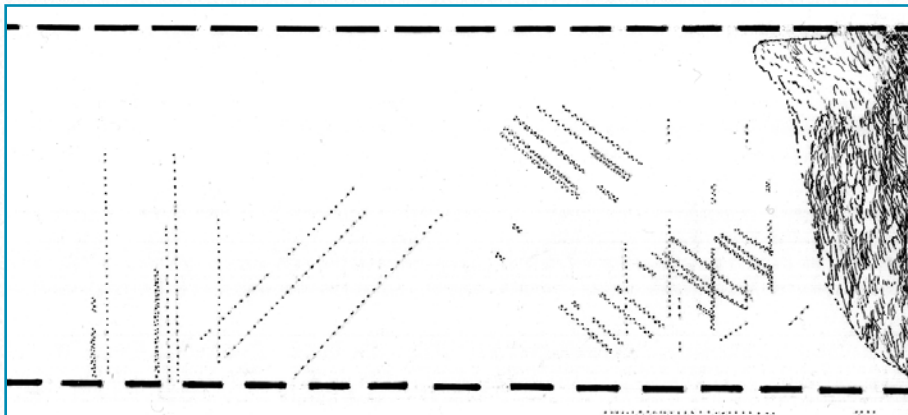
Using paths for even dot distance



Using individual dots

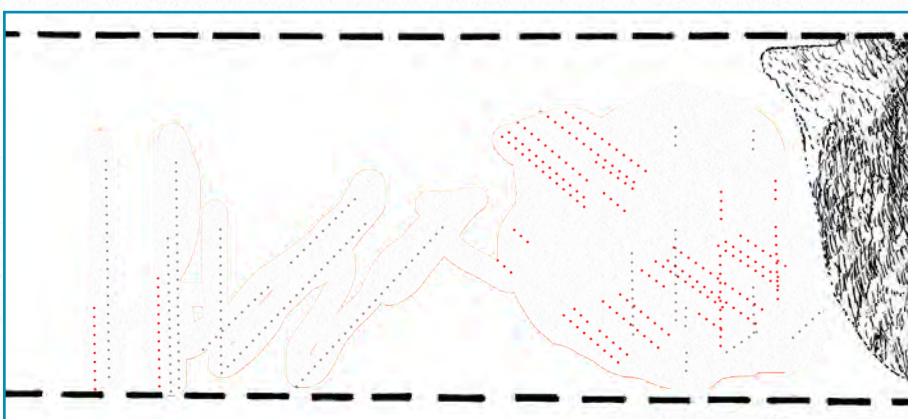
sions (just like when drawing solid brush lines) based on what suits his/her work the best.

Adding more than one layer of paint - Often there is more than one layer of painted decoration to be found on a decorated surface. In the past, the Epigraphic Survey has had to deal with the issue of representing and distinguishing between two sets of dotted lines by introducing a new conven-



MHB 207 North/Left (detail) - Drawing by Osgood

tion. On paper the more recent painted layer is indicated by a *double row* of dotted lines, which makes its appearance stronger, indicating the actual situation. When added digitally, painted decorative elements applied in different historic periods can be represented on different layers, just like traces of carved decoration. These layers can be then modified and repre-



MHB 207 North/Left (detail) with paint added digitally

sented in many different ways including adding color, transparency, etc.

Restoration and Architecture - Restored decorative elements and architectural features, when part of an inked drawing, are represented by a series of dashed lines, as we've discussed in *Chapter 2, Section 3*. Again, just as with dotted lines, drawing dashed lines digitally can be accomplished in more than one way. The most obvious would be drawing dashed lines by *free-hand*, but it raises a few issues:

- It is very hard to draw a sequence of straight line sections when tracing over complicated shapes.
- Holding down and releasing *Shift* repetitively while drawing (the easiest way to draw straight lines) would unnecessarily overcomplicate the process.
- The line segments become misaligned because of the difficulty caused by repeatedly releasing the pen from the screen.
- It is hard to preserve the uniform length of line segments as well as keep an even distance when drawing freehand.

A much better solution can be accomplished by drawing a *continuous line* along the shape that has to be shown as a dashed line. Once the line is drawn, the

necessary gaps can be produced by simply *erasing* those sections.

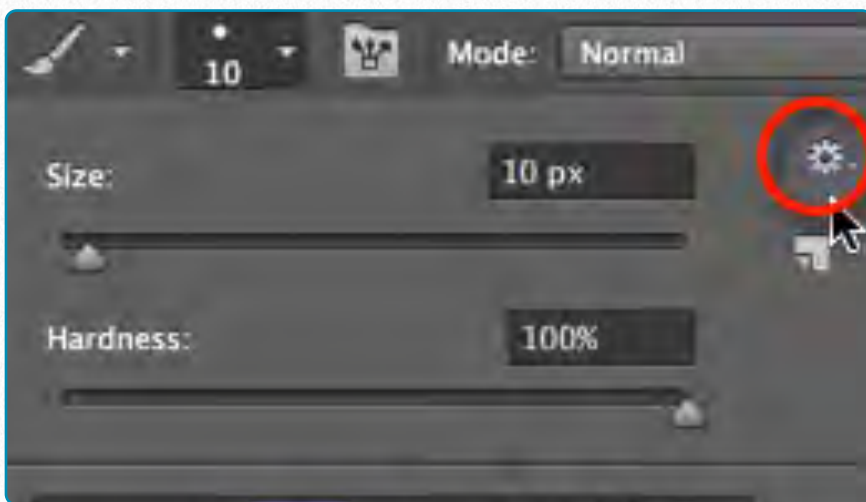
There is, however, an even more elegant way of generating dashed lines in Photoshop. The artist can set up a *Square*

Brush and tweak its behavior by changing some of its attributes to be able to produce dashed lines as a custom brush stroke.



LEARN SKILLS

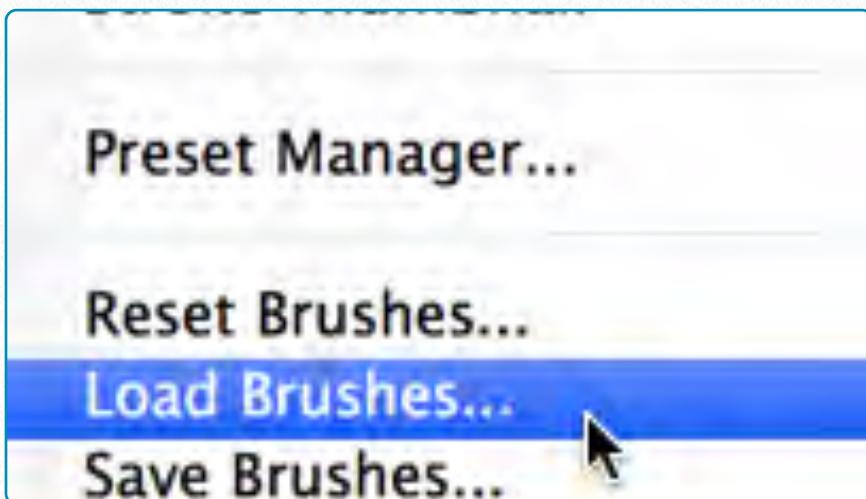
Dashed Brush Line



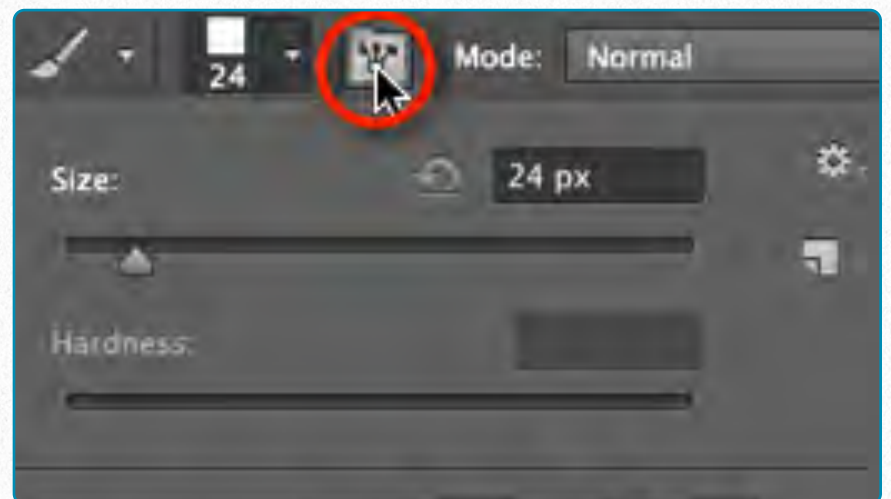
(1) *Square Brush Strokes* are not part of the standard Photoshop *Brush Set*, therefore they need to be added first.



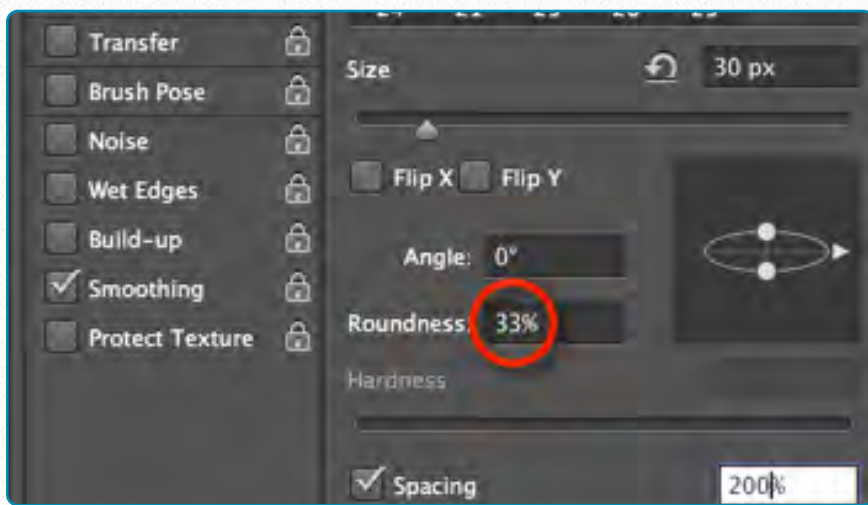
(3) Find the *Square Brushes* among the preset Photoshop Brush Sets (*Applications/Adobe Photoshop CS6/Presets/Brushes on the Mac*).



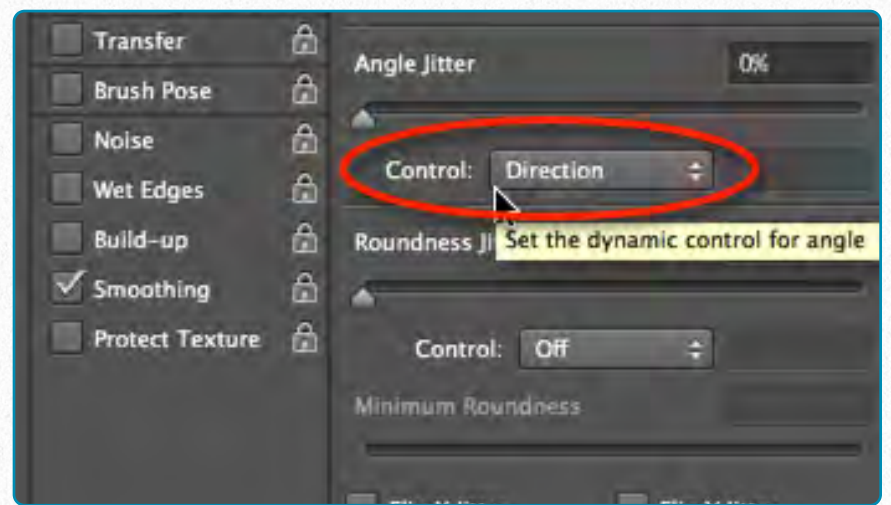
(2) In *Brush Settings* click on *Load Brushes*.



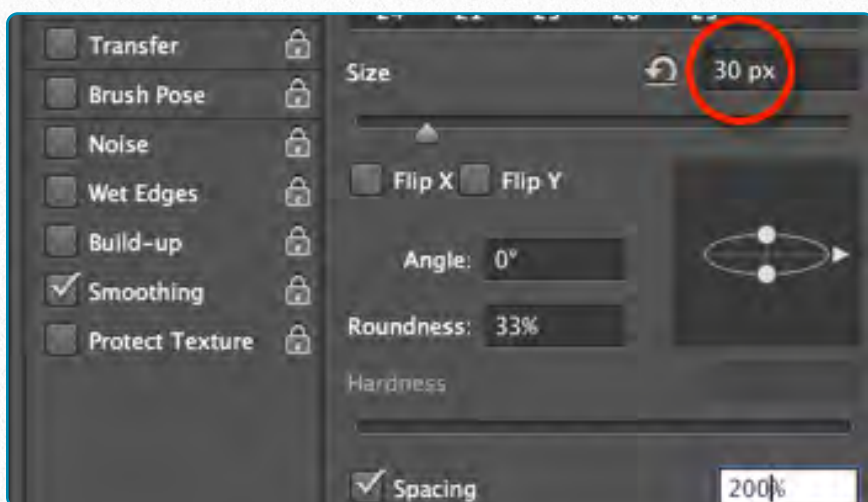
(4) Pick a random *Square Brush* and hit *Toggle Brush Panel* to call up the *Brush Editing Window*.



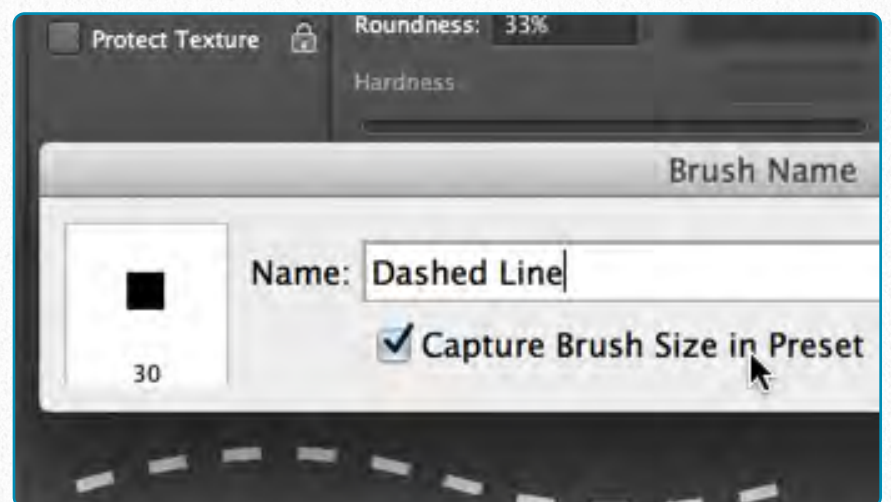
(5) Changing the Roundness of our brush by 33% (reducing it by 1/3) adds the necessary flatness to the dashed segments.



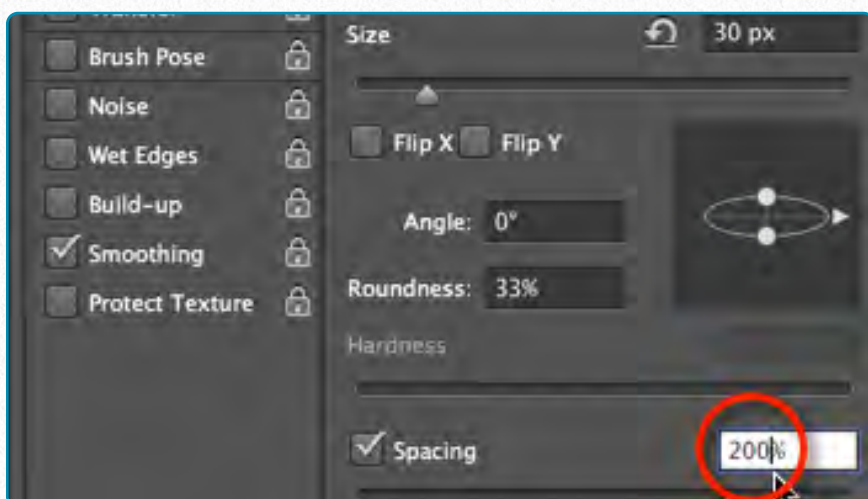
(8) Check Shape Dynamics on the right and make sure the Angle Jitter is controlled by Direction. Everything else should be off.



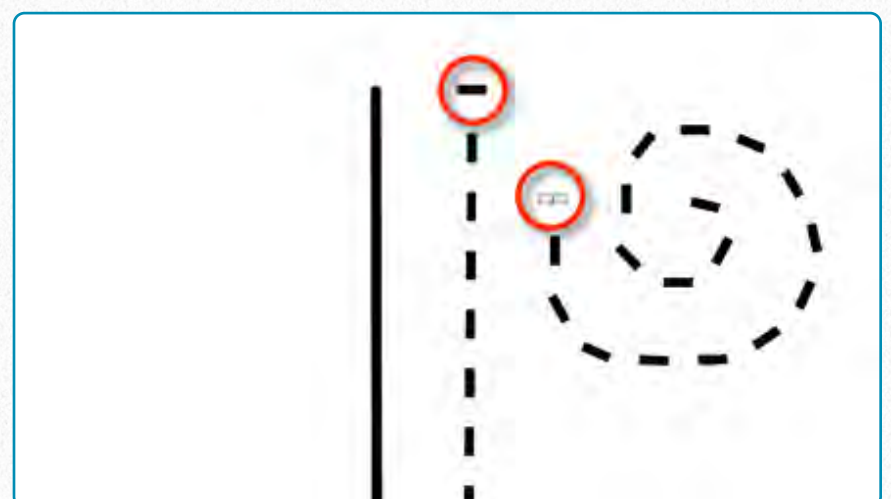
(6) Reducing Roundness reduces the brush thickness as well, so you have to multiply Size by 3 to get back the original line weight.



(9) Save your newly configured dashed line as a Brush Stroke, check *Capture Brush Size in Preset*, so it can be part of your Brush Set.



(7) Spacing determines how much space you'll have in between the dashed segments. The higher the number the more space you'll have.



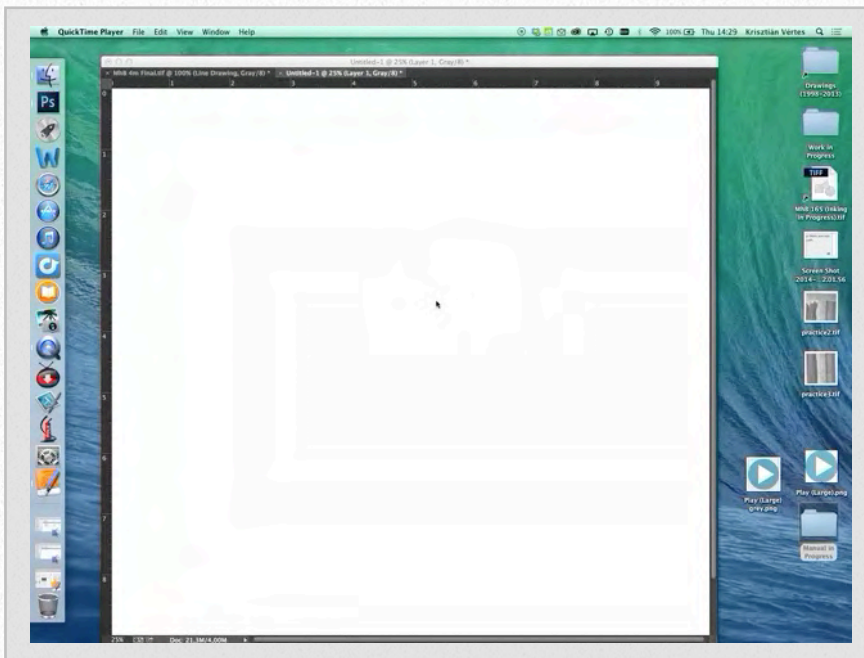
(10) Note that when you are drawing, hitting the screen *once* results in only a *single horizontal segment*, no matter what the direction is.



VIDEO TUTORIAL



DOWNLOAD HERE



To download the demonstration video, click on the following link:

<https://www.dropbox.com/s/lztum8hn7mg27s3/Dashed%20Brush%20Line%200%28SD%29.m4v>



Freehand dashed segments



Customized Square Brush



Using eraser on continuous lines

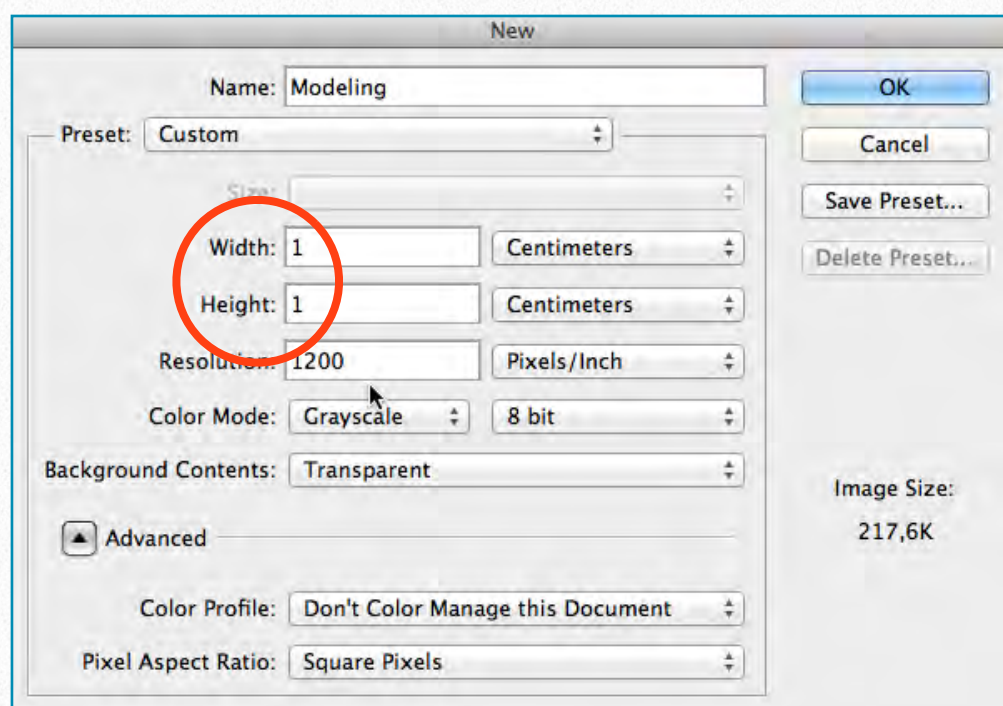
On these three screenshots we can make some observations about the three different ways of handling dashed lines. As always, before the artist starts a new project, it's advised to make lots of observations and some careful planning about the features to be drawn. The artist shouldn't be afraid to create custom brush types if it makes his/her work faster and/or more accurate.

The following three epigraphic features (*modeling*, *plaster*, and *damage*) are by nature very different from the previously described elements. *Lines*, either carved or painted, can be treated with a single brush stroke (solid, dotted, or dashed), because they refer to a decorative element that we represent as an *outline*. However, there are some *three-dimensional surface features* that need to be represented by adding some texture as well. To be able to add texture to a drawing in Photoshop, the artist needs to learn how to use yet *another tool*.

Modeling is indicated by a stippled area in which the variety in dot density adds a certain dimension to the texture. As with dotted paint lines and dashed architectural lines, the artist is free to add all the dots individually, and this is probably the easiest way to do so,

especially when the area to be modeled is fairly small.

Nevertheless there are cases when the artist has to add modeling to larger areas, such as large-scale figures, etc. Adding repetitive elements on the drawing can be made easy by *defining patterns* and using the *Pattern Stamp tool* to apply them. To set up a pattern one has to open a new



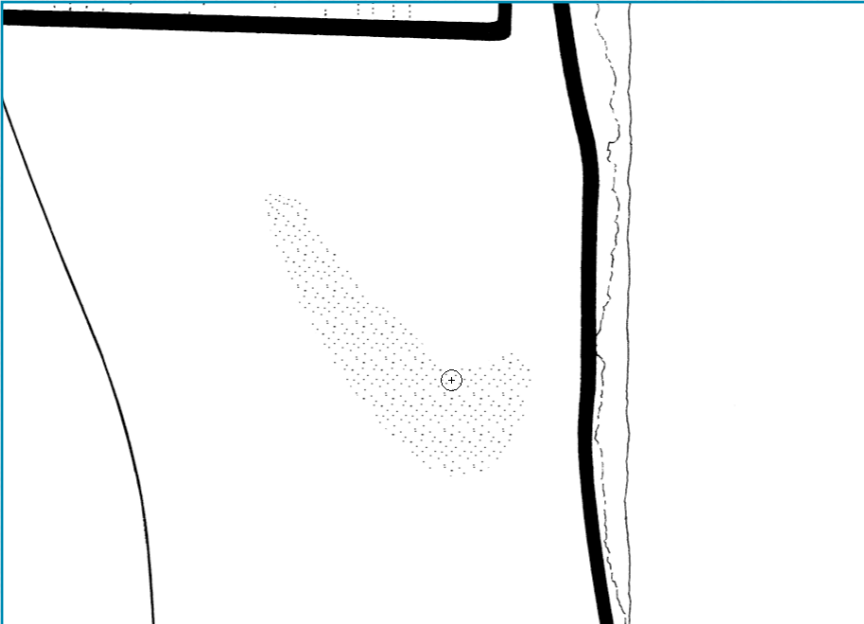
Setting up a new canvas for Modeling Pattern

canvas (*File/New*) and configure it to the same *Resolution*, and *Color Mode* as the drawing he/she intends to use it on. Of course the *Size* should be smaller; in our case 1x1cm is more than enough.

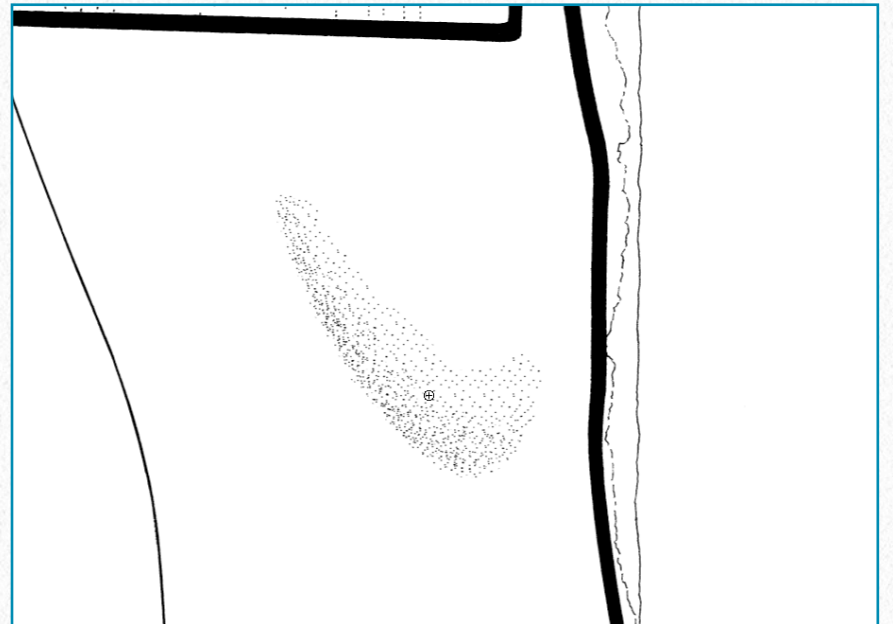
When adding the *modeling pattern* digitally, first the artist has to cover the entire area with one light layer of dotted pattern (one should use a rather *large* Pattern Brush size).



Modeling applied on bull's wrinkles



KHF172 (detail) - First layer of modeling pattern added to the drawing



KHF172 (detail) - Second layer of modeling pattern added to the drawing

Once the area to be modeled is covered with a layer of dots, the artist has to change his/her pattern brush to a *smaller* size and, by going over and over the darker areas, add some depth to the texture.

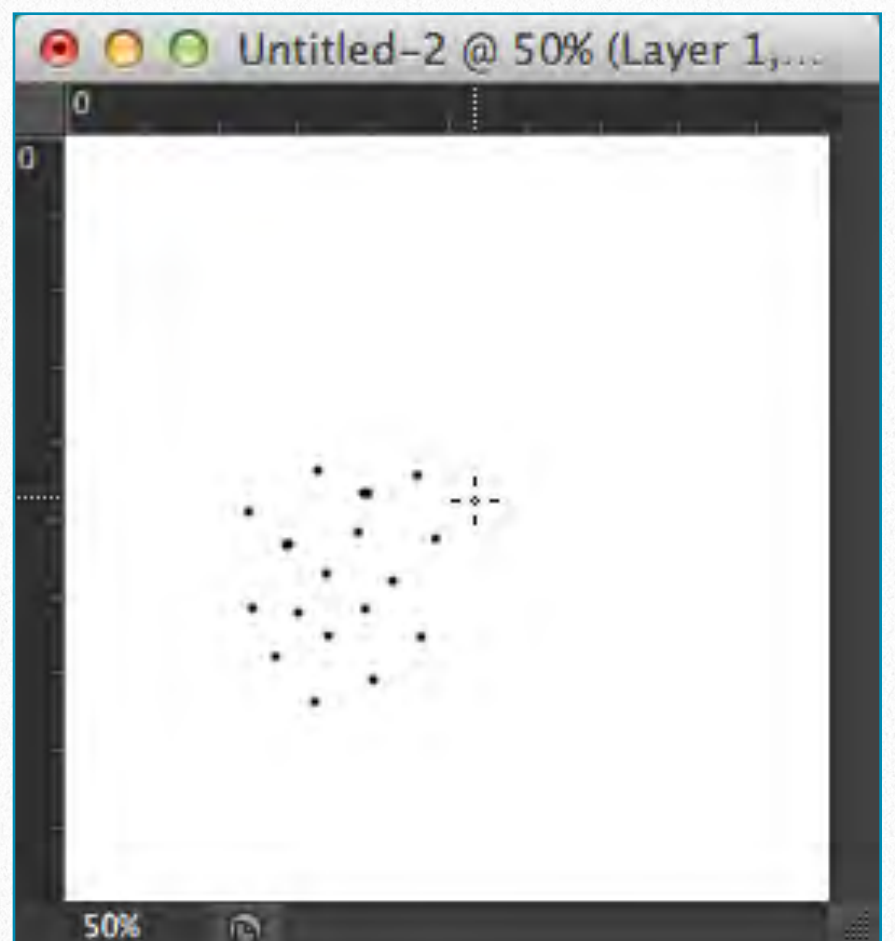
Certainly there is more than one way to provide satisfactory results when using patterns, and experimentation will be necessary.

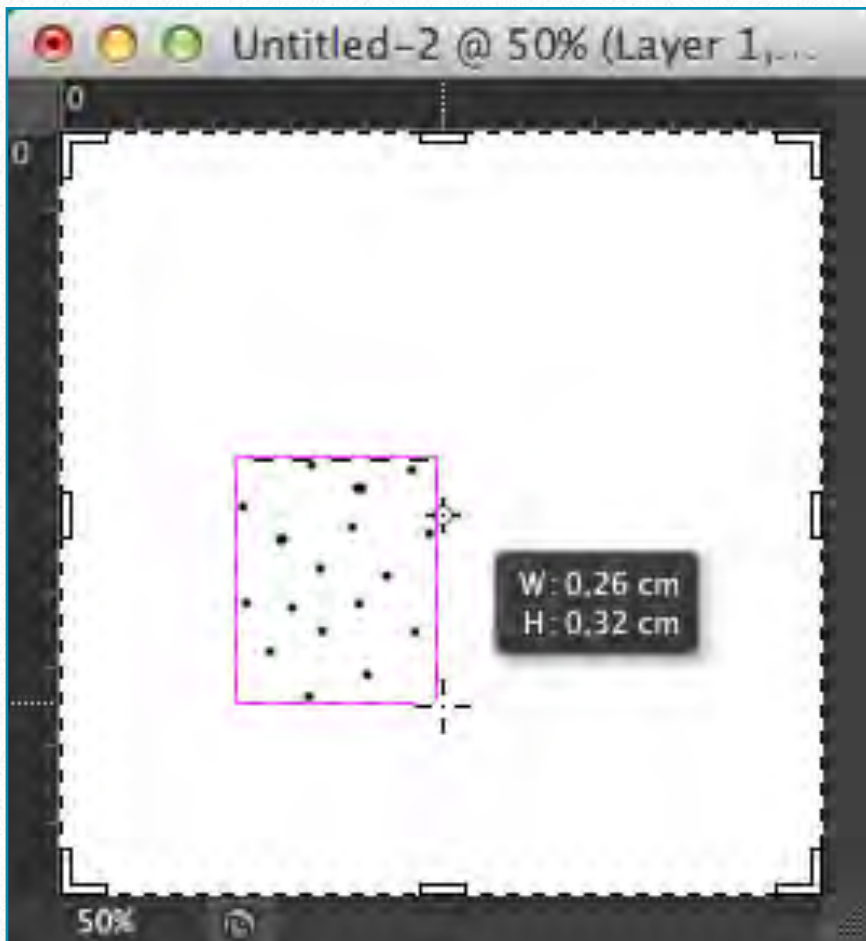


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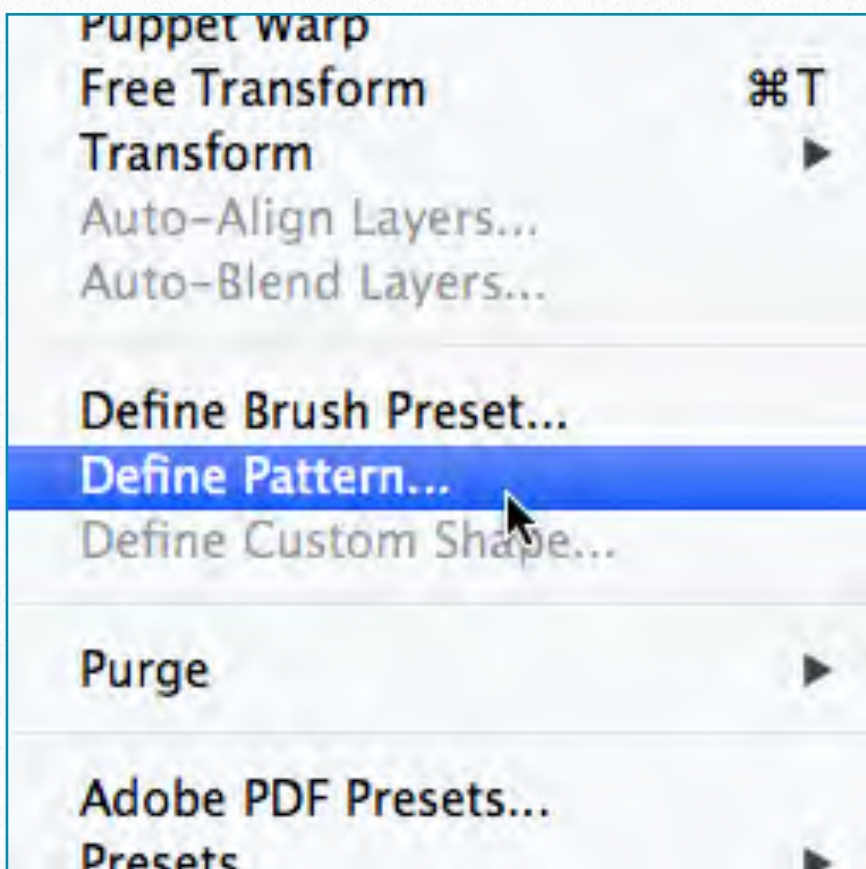
Creating a Pattern for Modeling

(1) Start painting dots on the canvas using the same brush size you would use for modeling. Keep a certain distance in between your dots, keeping in mind that your pattern needs to refer to the lightest parts of the modeled area. You don't need to add too many dots.

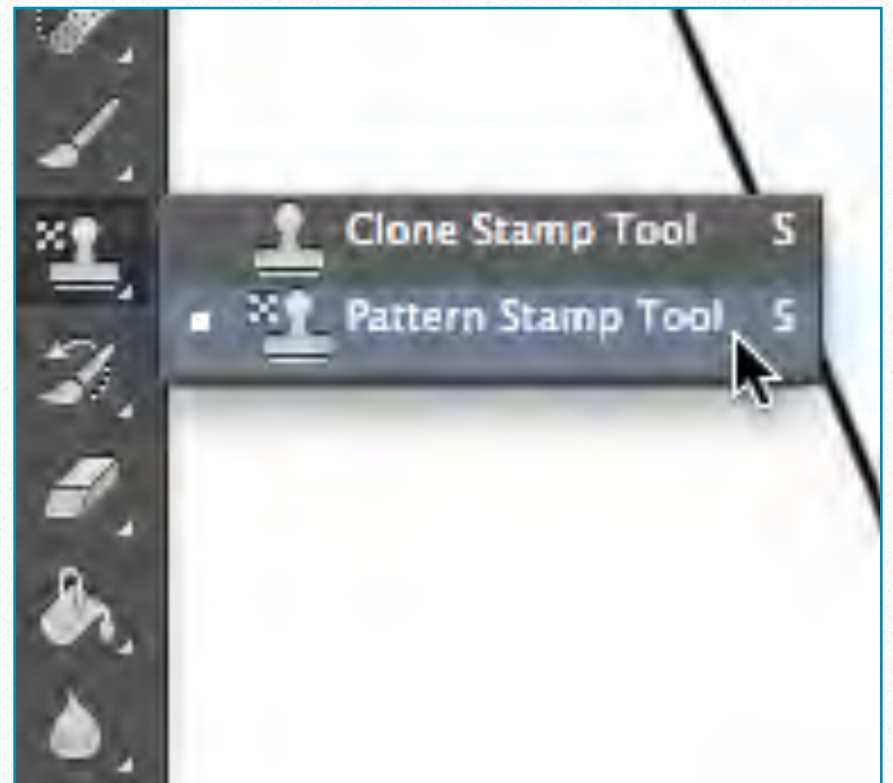




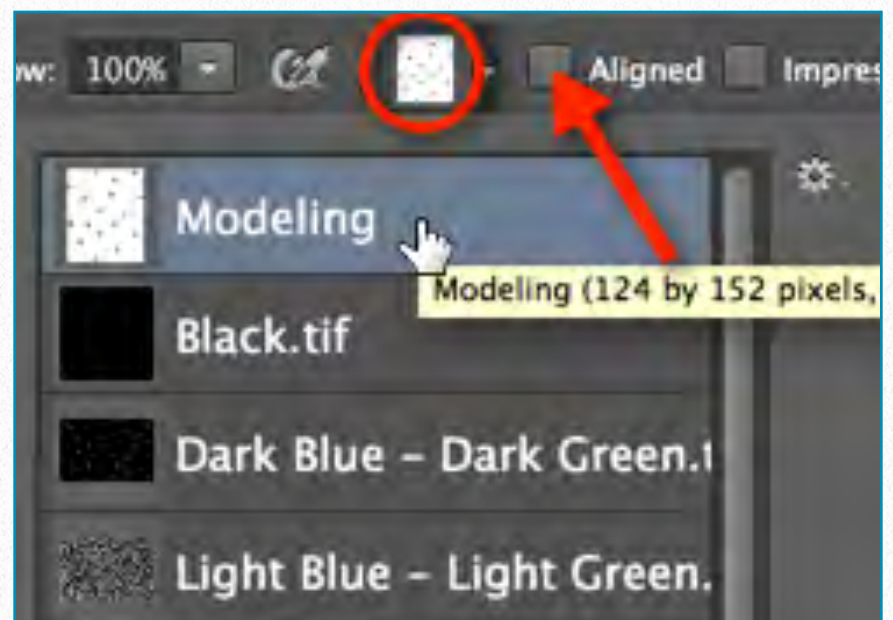
(2) Crop your canvas as small as possible around the dots. The easiest way to do so is by turning on *Snap* and *Smart Guides*.



(3) Open *Edit/Define Pattern* and give your pattern a name. It can be called *Modeling* (or *Modeling_1* if you have different variations).



(4) Now your pattern is defined and, whenever you'd like to use it, all you have to do is hover over the *Tools Bar* and right click (secondary click) the Stamp tool. Choose *Pattern Stamp tool*.



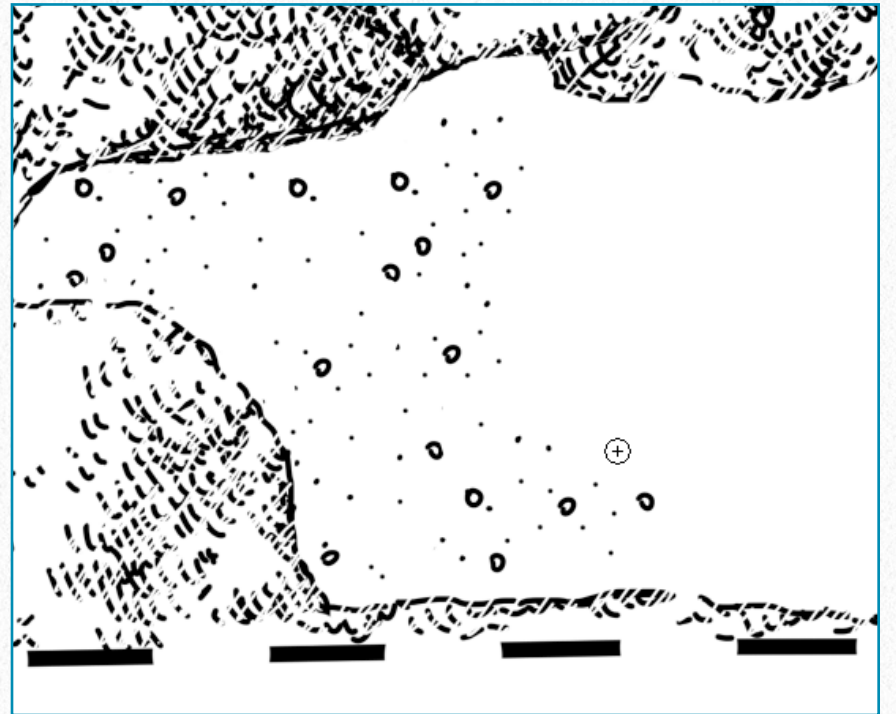
(5) Now find your pattern in the *Pattern Tool Menu*. Click on the Pattern drop-down window and pick the pattern for *Modeling*. (You'll find your new pattern at the bottom of the list, but - as always - they can be rearranged, deleted, or modified by clicking on the cog sign.) Make sure **Aligned** is *not* checked, so instead of using your pattern in a grid Photoshop generates a random arrangement of your pattern.

Drawing Plaster - Plaster, when it is inked, is indicated by a random pattern of dots and circles, where depth is emphasized by the density of these elements. Obviously plaster can be added entirely by freehand and, again, it is advisable to do so when the artist is dealing with small areas. Setting up a *Plaster Pattern* might nevertheless prove useful when adding plaster to large parts of the drawing.

Creating a plaster pattern is fairly similar to setting up a modeling pattern, except that the artist has to be even more careful to *not overdo* the quantity of elements (i.e., dots and circles) when drawing the pattern sample. As a general rule, *less is usually more*; one has to think about the lightest

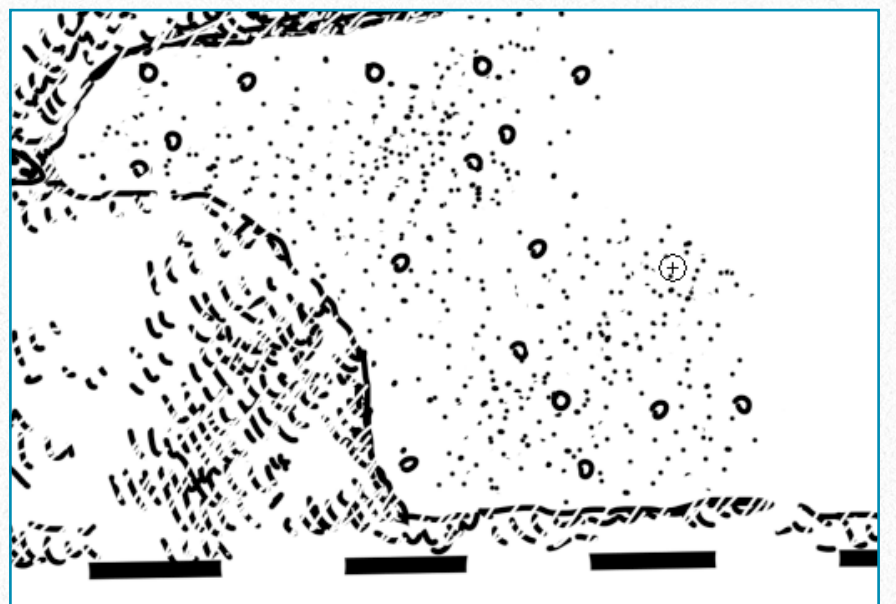
possible occurrence of that particular texture when creating a certain pattern.

When adding the *plaster pattern* digitally, the process starts with drawing a light

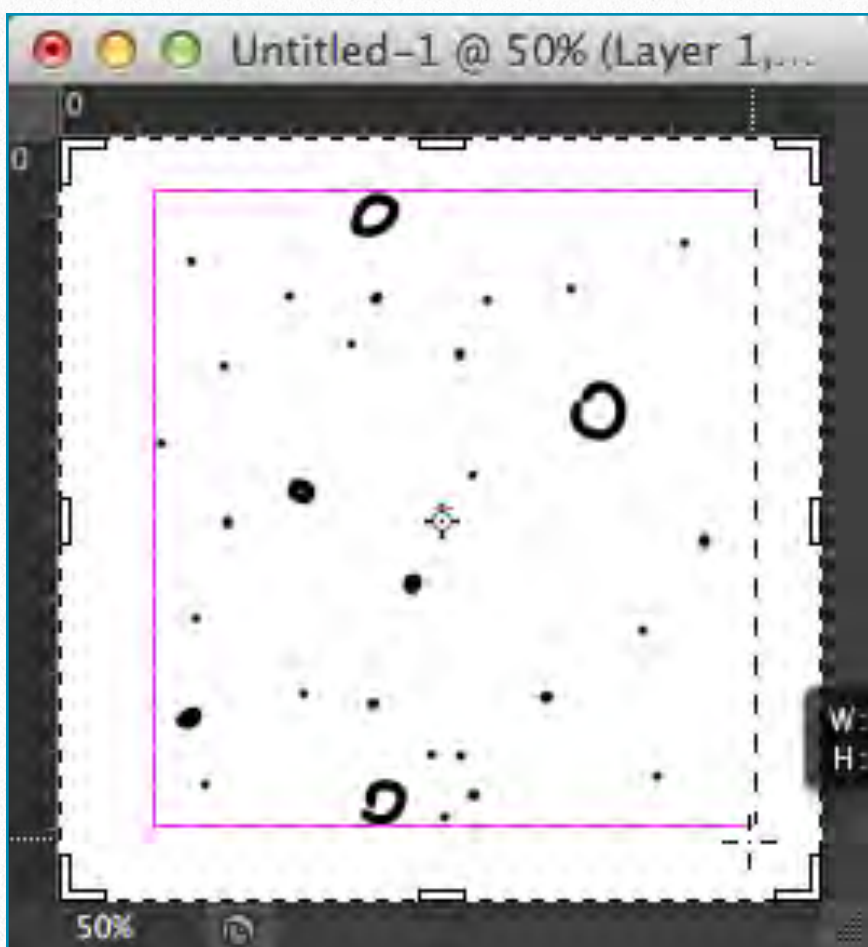


Adding a light layer of plaster pattern

layer of plaster over the entire area by using a fairly large pattern brush size. The artist has to keep in mind that drawing numerous separate strokes gives a more realistic result. One has to make sure that **Aligned** is **unchecked** in the *Pattern Tool Menu*.



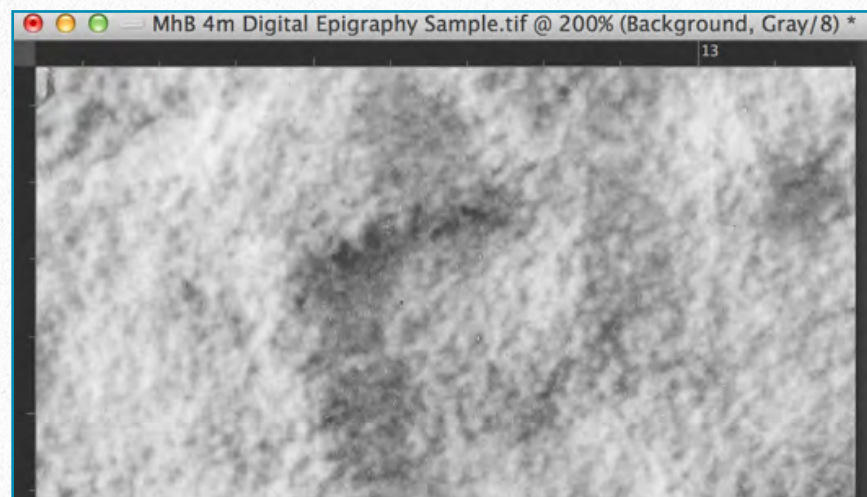
Emphasizing darker areas by using Modeling Pattern



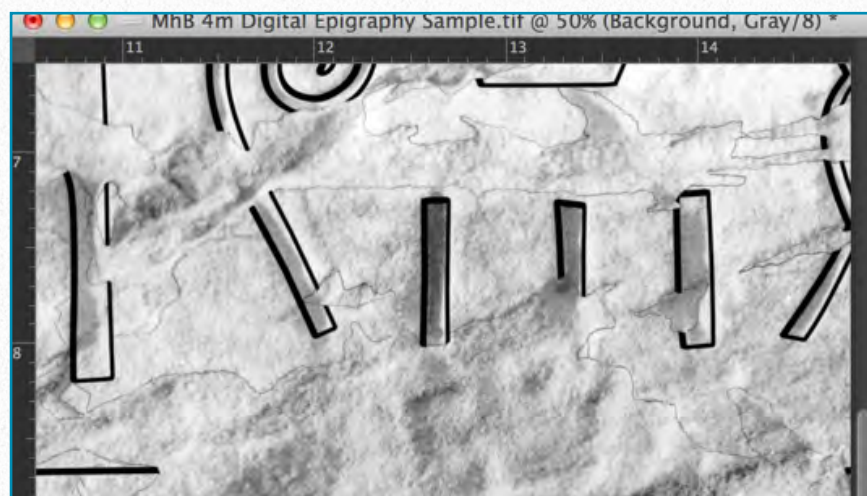
Plaster pattern including a variety of dots and circles

In the next step, the artist has to give some depth to the plastered area. It is advisable to use the already configured *Modeling Pattern* (to avoid the overwhelming presence of circles) for adding more dots over darker areas.

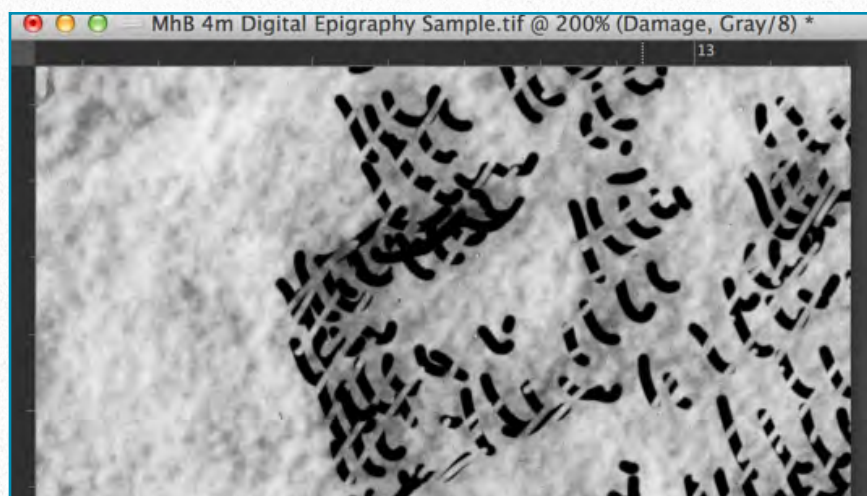
Inking Damage - Damage is the most complex surface texture the Epigraphic Survey artist has to indicate when inking an artwork. As discussed in *Chapter 2, Section 4*, it is traditionally shown with *hatched* inked lines. This inked pattern reflects the nature of the damaged surface captured on the photo enlargement. Because of the unique character of each damaged area to be inked, it is not possible to set up a unified pattern to represent it. The artist has to experiment with different zoom levels when inking different features. While an extremely zoomed-in view (200%) works much better for drawing decorative elements, zooming out (50%) proves to be more fruitful for adding textural elements, such as modeling, plaster, and damage. With a larger portion of the background image being visible at one time, one can have more control over texture consistency. Needless to say, scanned images tend to blur as we zoom in, making the individual features very difficult to see. The difference in zoom levels is shown at right:



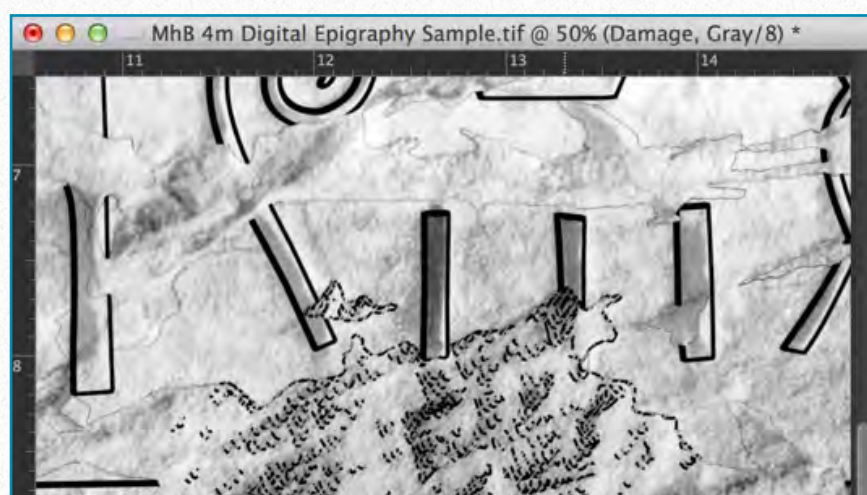
Damage detail shown at 200%



Damage detail shown at 50%



Inked damage detail shown at 200%



Inked damage detail shown at 50%

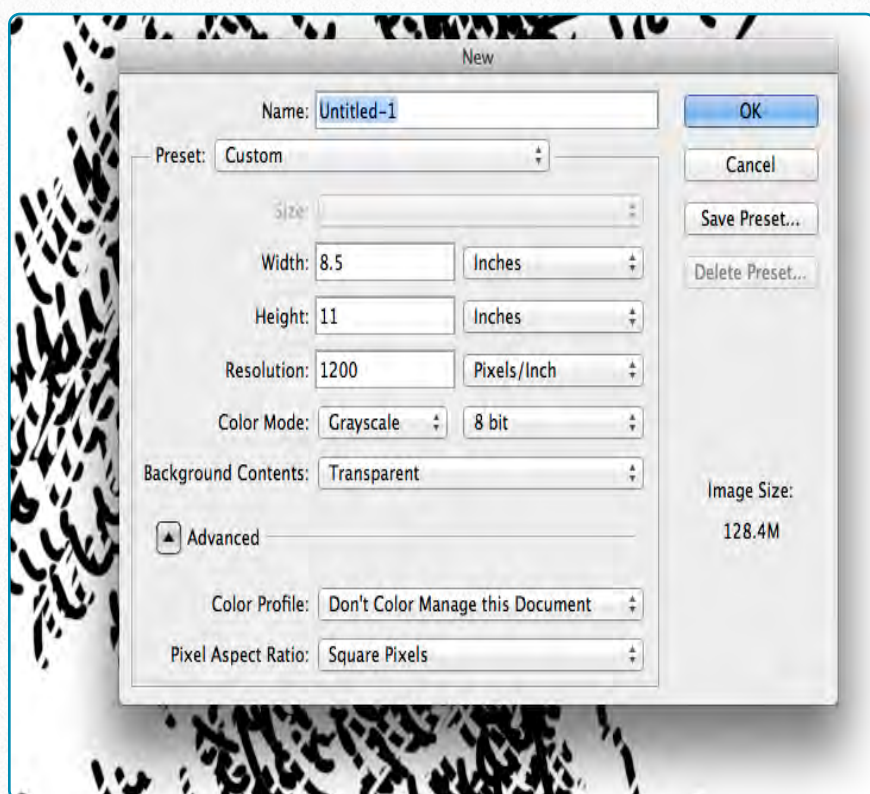
Although creating damage texture digitally cannot be automated, there is a certain part of the damage inking process wherein setting up a pattern proves useful. When inking on a photo enlargement, the scalpel is used as a final addition to “break” the damage lines. This treatment makes damage appear lighter in comparison to the solid lines used for carved details. In order to make our digitally inked drawings fit into the already existing corpus of Epigraphic Survey publications, we have to imitate the same effect digitally.

Once again there is the obvious method of applying a “*digital scalpel*” over painted lines, using the Eraser, except that using the Eraser tool to get this lighter effect takes a very long time. To speed up the process, one can set up a *Scalpel Pattern* and apply it over the inked lines the same way as he/she would do when modeling or drawing plaster. Although it acts like an eraser, we use a pattern based on *white brush lines* to accomplish our task:

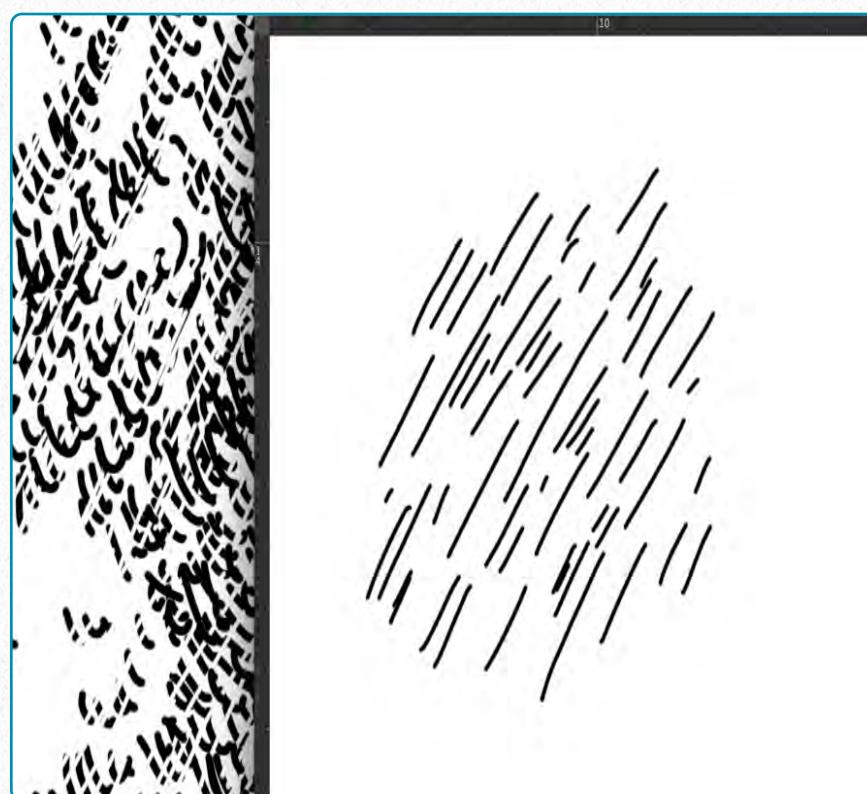


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Setting up a Digital Scalpel Pattern



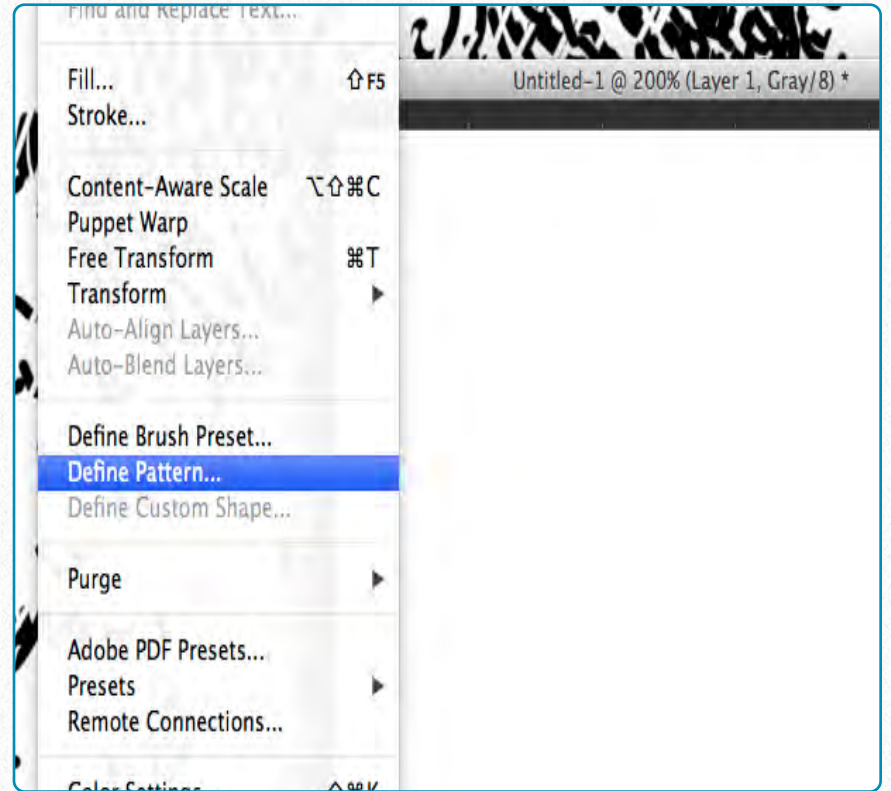
(1) In a similar fashion to setting up all the previous patterns, open a new canvas, set the *Resolution* to 1200dpi, with *Color Mode* to grayscale.



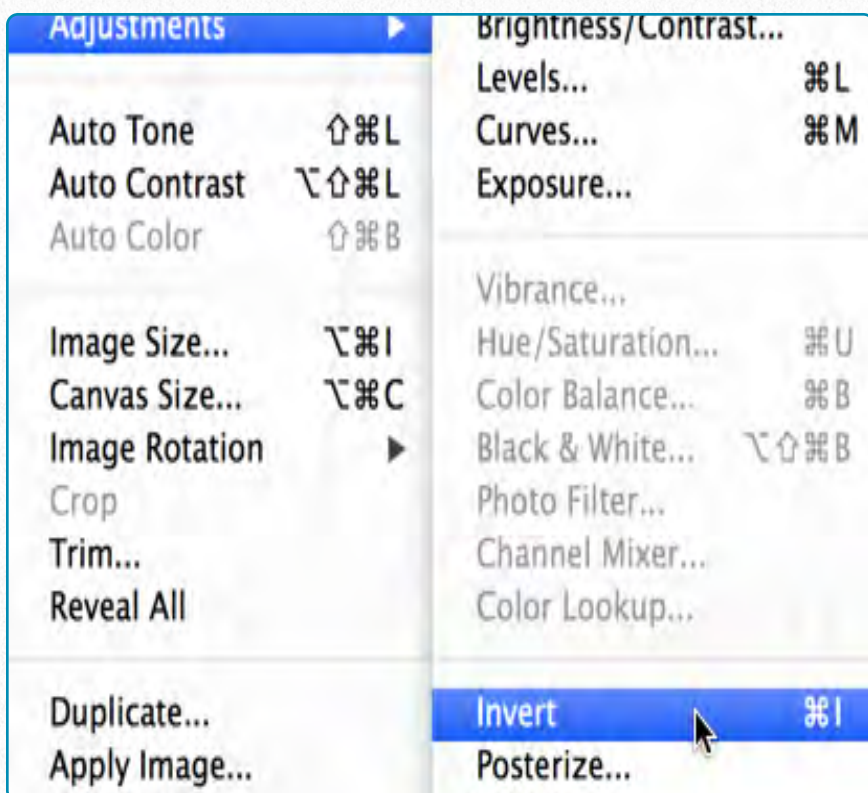
(2) Draw a few *Brush Strokes* with the same orientation as your scalpel would have. Add some variety in length.



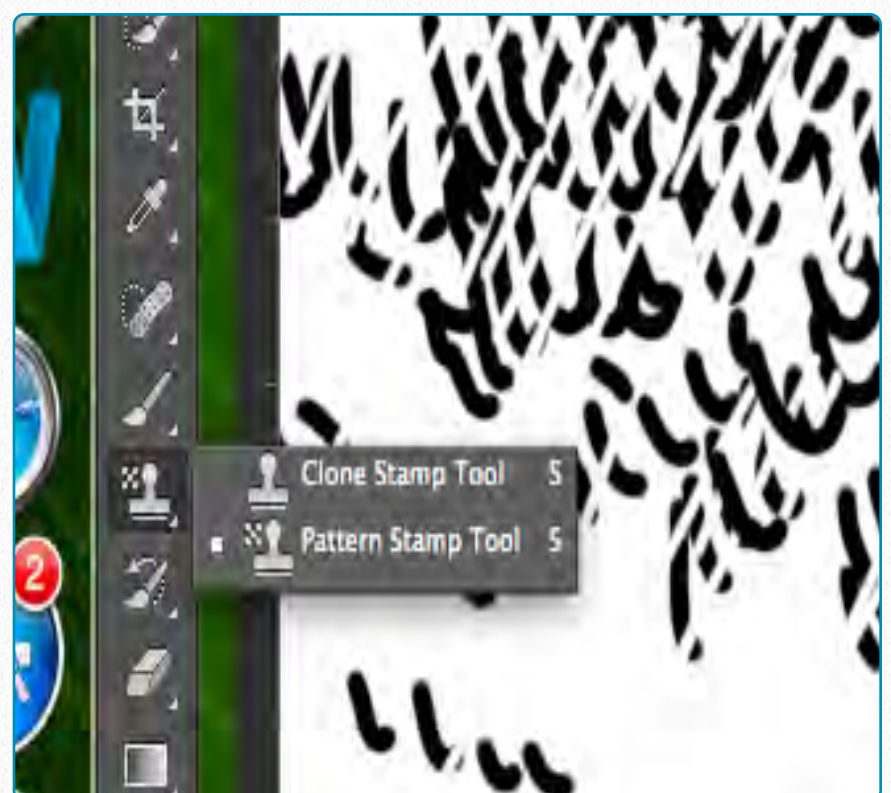
(3) Crop the area around your pattern in a way that no significant white space remains and the texture looks homogeneous.



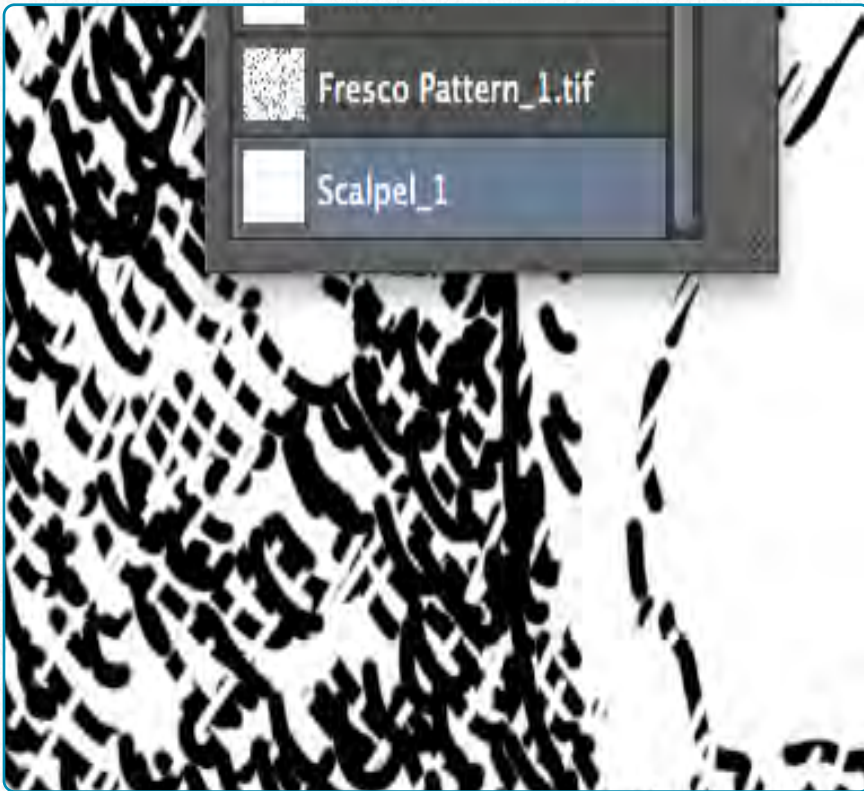
(5) Hit *Edit/Define Pattern* and set your new pattern up as Scalpel_1. (Try different patterns with slightly tweaked brush work.)



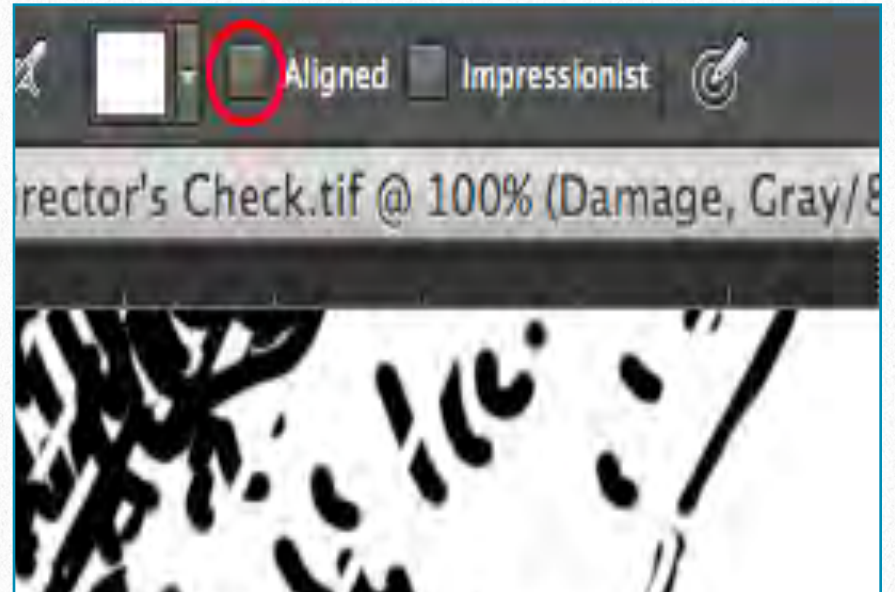
(4) Go to *Image/Adjustments/Invert* transform your black brush strokes to *White*. It turns your *entire* canvas white.



(6) Hover over the *Tools Bar* and hit right click (secondary click) at the Stamp tool. Choose *Pattern Stamp tool*.



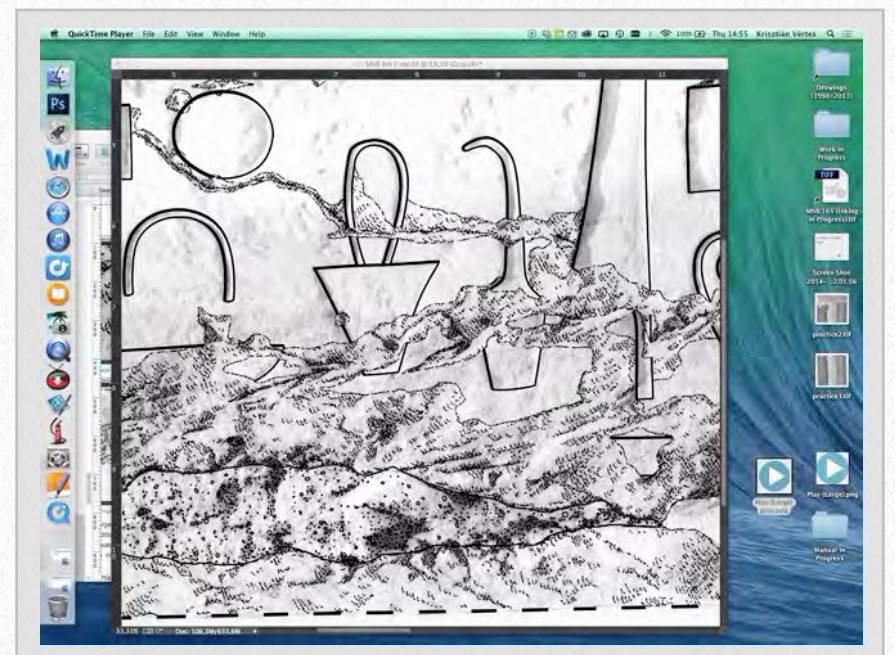
(7) Pick the *Scalpel_1* pattern you want to use. Note that newly set patterns always end up at the bottom of the pattern list.



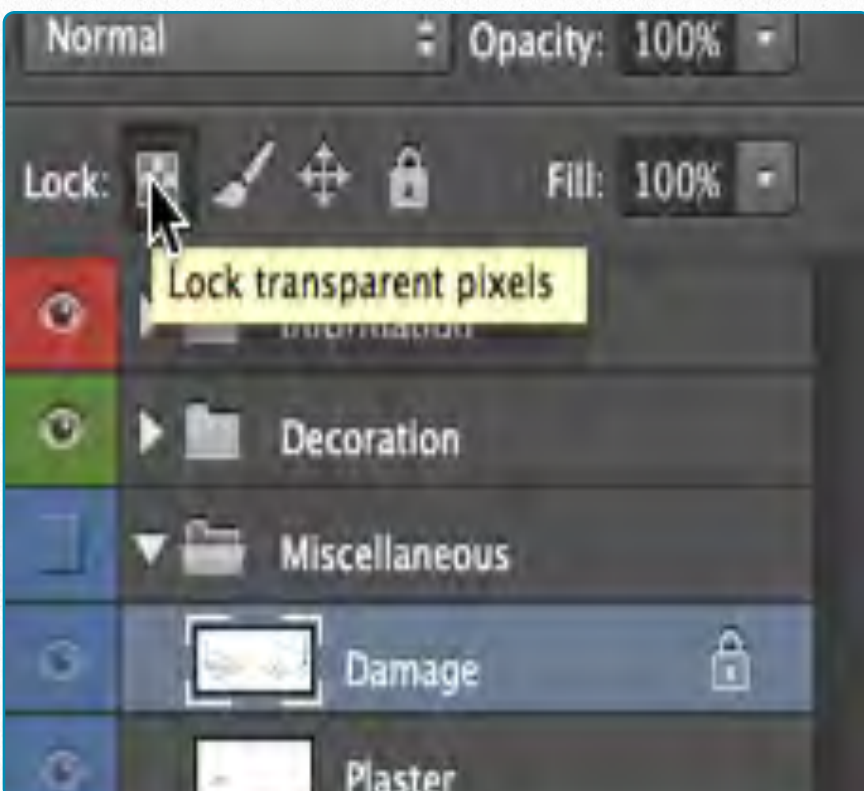
(9) Make sure *Aligned* is deactivated on the *Tools Panel*. Use the pattern by painting separate strokes over the damage.



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(8) Go to the *Layers Panel*, and with the *Damage* layer active, *lock the transparent pixels* by hitting the first tab on the *Lock Menu*.

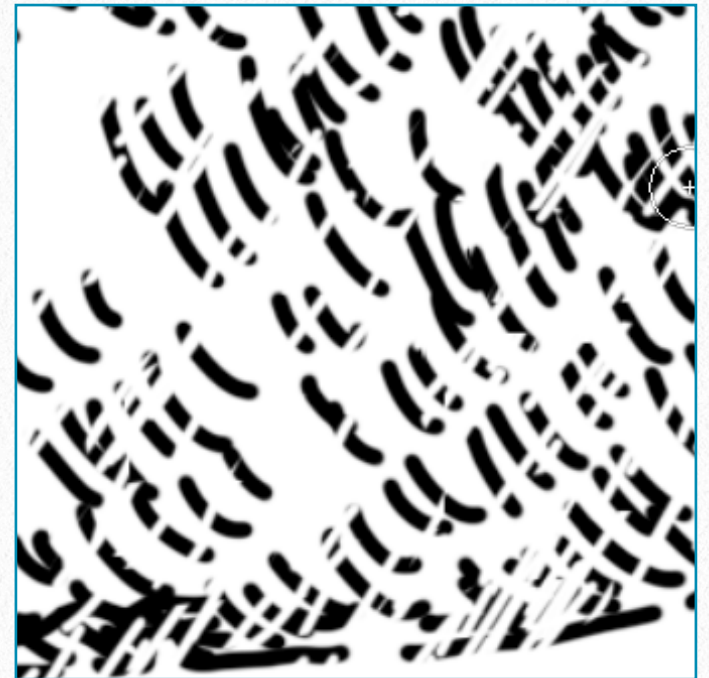
To download the demonstration video, click on the following link:

<https://www.dropbox.com/s/0qlala5y827ss2i/Setting%20Up%20a%20Digital%20Scalpel%20Pattern%20%28SD%29.m4v>

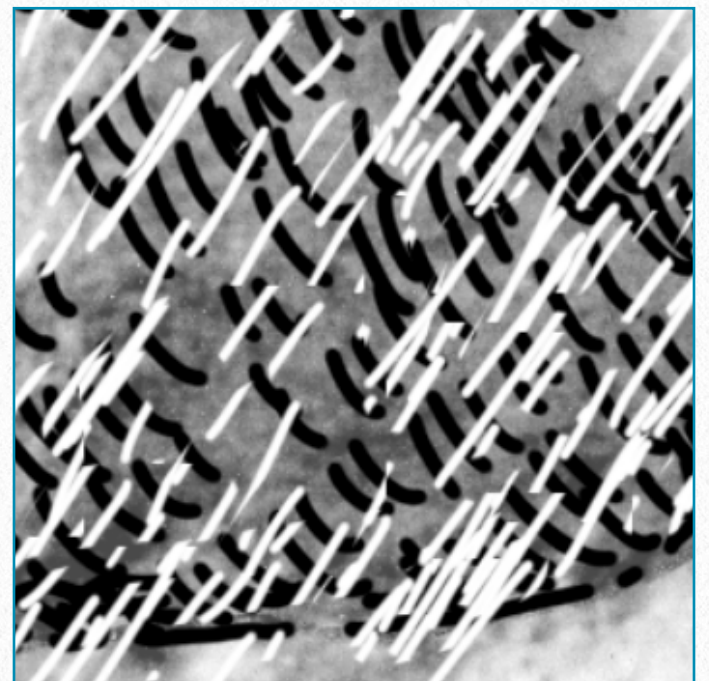
As we can see on the tutorial panel, *locking the transparent pixels* on the damage layer is an important part of the process. This command prevents the brush from leaving brush strokes on the background. One would think it doesn't matter, because we are using a white brush on a white background, but as soon as we make our background visible the difference becomes obvious:

As demonstrated in this example, the artist has to be sure that he/she is in full control of every little modification applied on the surface, either visible or (in some cases) invisible. Changes in certain settings can cause a lot of trouble later on when further enhancements or modifications are added to the drawing. The artist has to experiment carefully with the features introduced in this chapter and be fully aware of the technical background behind each step.

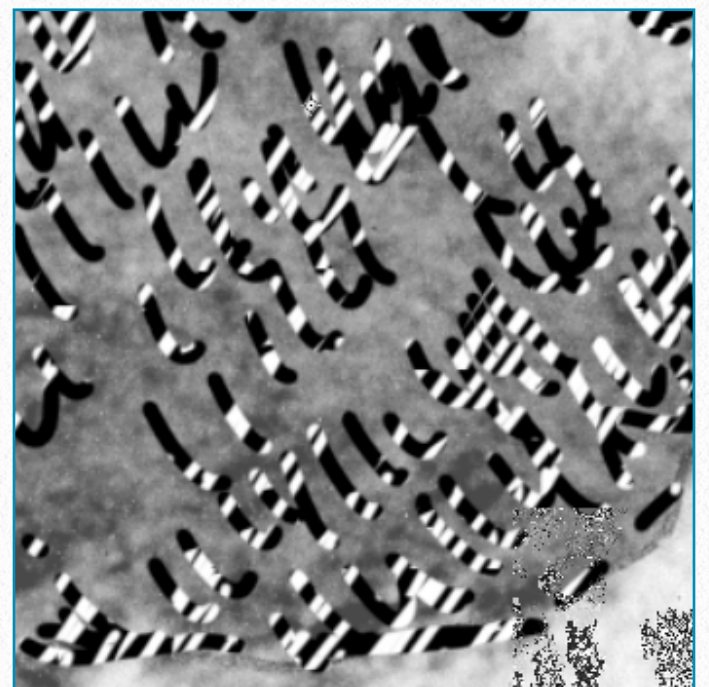
Situations might occur when the artist, although seemingly following these guidelines, doesn't get the desired result. In some cases going back to an older version of one's drawing and starting over seems to be the only solution. Saving the drawing before experimenting with new features is a good idea, especially for beginners. Once the scene is collated, adding modifi-



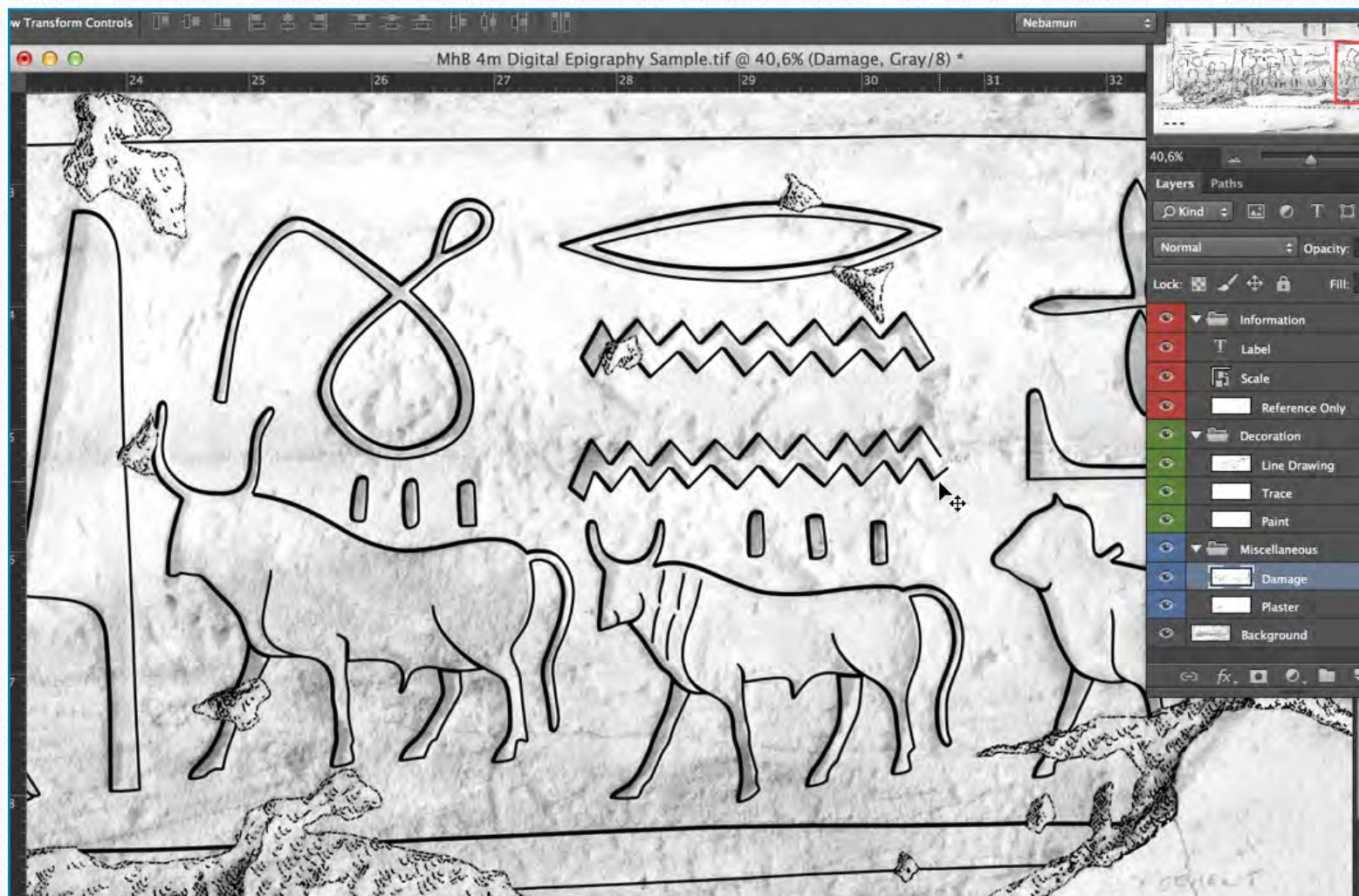
Final drawing



Unlocked transparent pixels



Locked transparent pixels



MHB 4m (detail) - Finished inked drawing with all the layers represented

cations to the drawing is standard procedure; therefore the artist should know how to change his/her drawing to apply these modifications.

In the next chapter we'll have a look at how to make additional changes to our drawings, but first the artist has to know how to manage the huge amount of *digital data* that a single drawing project creates.



MORE READING

How To Make Your Own Custom Photoshop Brushes:

<http://www.photoshopessentials.com/basics/photoshop-brushes/make-brushes/>

Read More About Guides and Grids:

http://help.adobe.com/en_US/photoshop/cs/using/WSfd1234e1c4b69f30ea53e41001031ab64-74cda.html

A funny and very useful tutorial to master the Pen Tool in under 30 minutes:

<http://psd.fanextra.com/tutorials/become-a-master-of-the-pen-tool-in-under-30-minutes/>

5

Post Production

Saving data in different locations, Preparing the drawing for collation and adding modifications, Managing many versions simultaneously

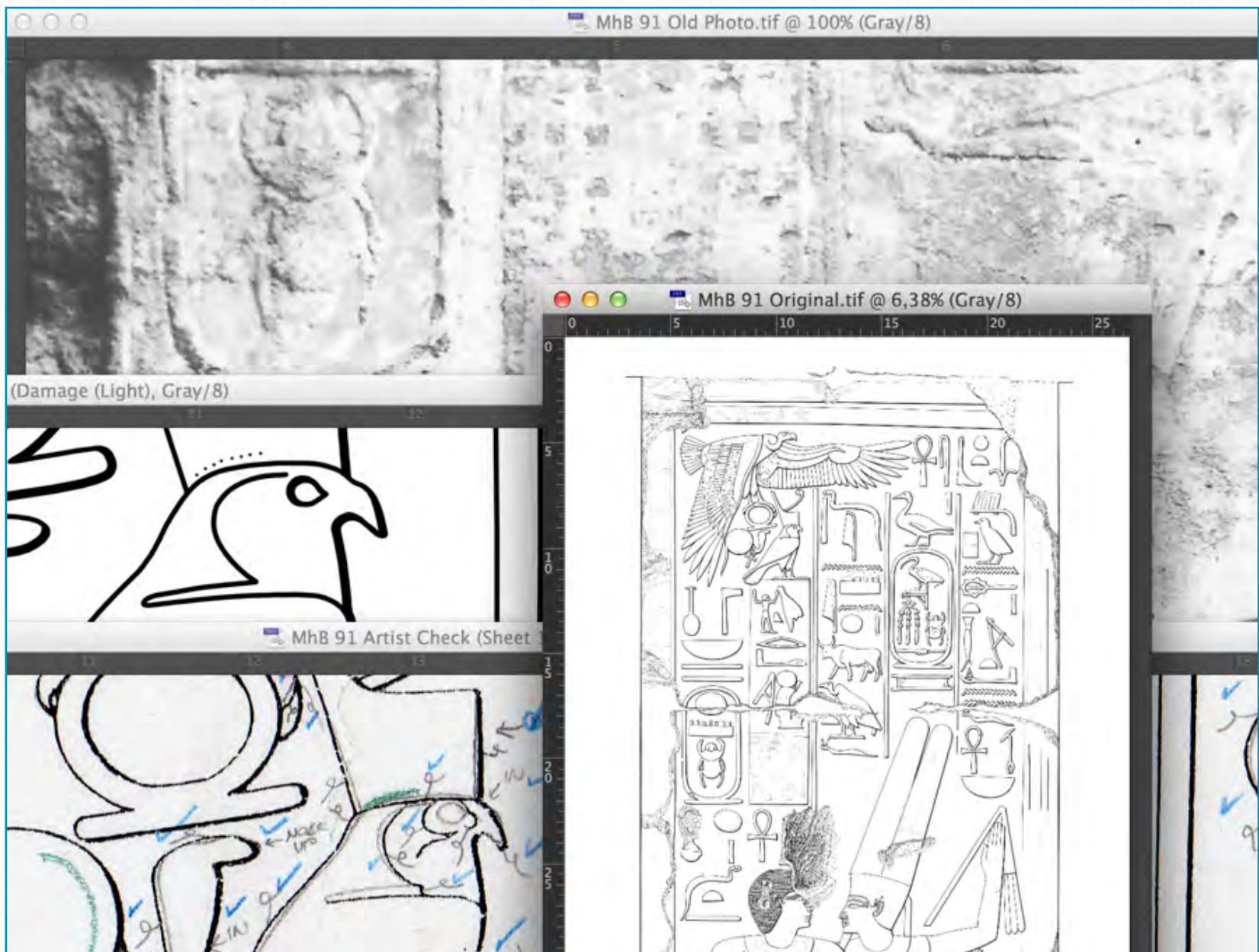


MHB 91 (detail) - Collation sheet aligned with inked drawing

In this chapter we will learn how to modify the inked drawing according to the changes indicated by the collation process. The Epigraphic Survey collation system is a very thorough check and crosscheck of the drawing against the

wall, undertaken by two Egyptologists. In the next few pages we'll introduce a few methods to enhance and simplify the process of applying these modifications in the Photoshop environment.

The File and Folder System



MHB 91 (detail) - Collage of different documentation material opened in Photoshop

According to the Epigraphic Survey's documentation method, the data package for a regular wall section consists of the following items: *archival photo(s)*, the *drawing created* on the photo enlargement, and the *collation package*. Traditionally these three elements are stored in three different locations.

When drawing digitally, however, the artist will find it useful to collect and organize all the available data related to the specific scene he/she is working on. This package is called the *Virtual Collation Package* and contains a well-organized system of *Files* and *Folders* representing all the data available for each scene:

Main Folder:

- *Site Name/Drawing Number* - (MHB XXX - Medinet Habu B represents the Small Amun temple in Medinet Habu and is used throughout this manual as an example.)

Subfolders:

- *Original Artwork* (Penciled enlargement, Facsimile on plastic, etc.)
- *Inked Artwork in Progress* (All layered versions)
- *Inked Artwork FINISHED* (Merged and layered versions)
- *Collation Package* (Blueprints, Collation Sheets, Translations, Epigraphers' Comments, etc.)
- *Photo Archive* (any official photo, whether old or recent, associated with the artwork)
- *Artist's Internal Use Only* (reference photos, parallels, reminders, notes, etc.)

Subfolder Files:

Original Artwork:

- MHB XXX Sheet 1, 2, etc. (1200 dpi grayscale) - contains as many separate scans

of the drawing enlargement as needed to digitize the entire scene.

- MHB XXX Merged (1200 dpi grayscale modified) - this is the main file used as background for inking purposes; therefore - as discussed earlier - it needs to be enhanced if necessary.

Inked Artwork in Progress:

- MHB XXX Inking in Progress (1200 dpi grayscale .tiff) - this is the file used during the *entire drawing process*, containing the most layers and changes, including the ones added during collation.
- MHB XXX Ready for Collation (1200 dpi grayscale .tiff) - a layered "safety" version of the *Inking in Progress* file created at this specific stage. The blueprint is generated from this particular file.
- MHB XXX Ready for Transfer Check (1200 dpi grayscale .tiff) - a layered "safety" version of the *Inking in Progress* file created after the corrections have been entered from the collation sheets, but prior to the Transfer Check.
- MHB XXX Ready for Director's Check (1200 dpi grayscale .tiff) - a layered "safety" version of the *Inking in Progress* file created after the Transfer Check is

completed, but prior to the Director's Check.

Inked Artwork FINISHED:

- MHB XXX Director's Checked (1200 dpi grayscale .tiff) - merged and layered versions of the final artwork as approved by the Director, ready to be published. The layered version should not contain any additional layers besides the ones established in *Chapter 3, Section 4*.

Collation Package:

- MHB XXX Blueprint (merged 1200 dpi color .tiff) - read more on how to create blueprints in *Section 2*.
- MHB XXX Paint Check (merged 1200 dpi grayscale .tiff) - read more on how to create special prints for paint check in *Section 2*.
- MHB XXX Collation Sheet 1, 2, etc. (1200 dpi grayscale .jpeg) - scanned versions of each collation sheet, to be used when adding changes digitally. Note that collation sheets are scanned only as .jpegs to minimize their file size. The setup for this process is explained in detail in *Section 3*.
- MHB XXX Epigrapher's comments (.pdf) - not used during the drawing process, but

contains important information related to the understanding of a particular scene.

- MHB XXX Translation (.pdf) - not used during the drawing process, but contains important information related to the understanding of a particular scene.
- Etc. - any information (epigrapher's sketches of a particular detail, different variations of a problematic area, etc.) related to the changes to be made on a drawing that doesn't fit into the previous categories.

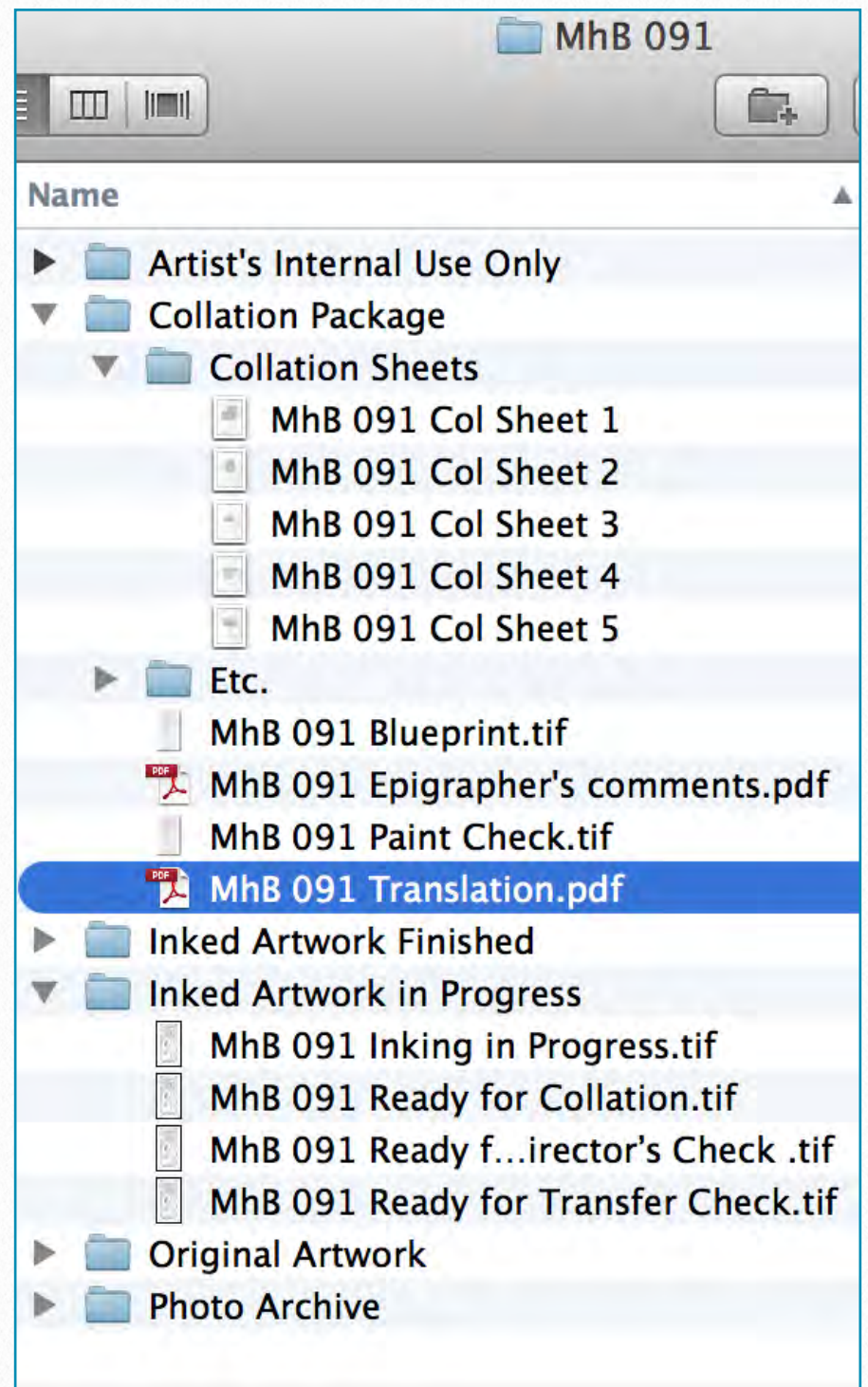
Photo Archive (incl. neg. numbers):

- Original Photo used for Photo Enlargement (1200 dpi grayscale) - scan of the photo negative provided for the artist for archival purposes.
- Old Photo/Photos used for additional details (1200 dpi grayscale) - scan of any earlier photos showing wall conditions or details that are no longer visible (missing parts of decorative surface, exposed damaged areas that were subsequently covered with cement, etc.). Read more on how to use old photos for missing details in *Section 4*.

Artist's Internal Use Only:

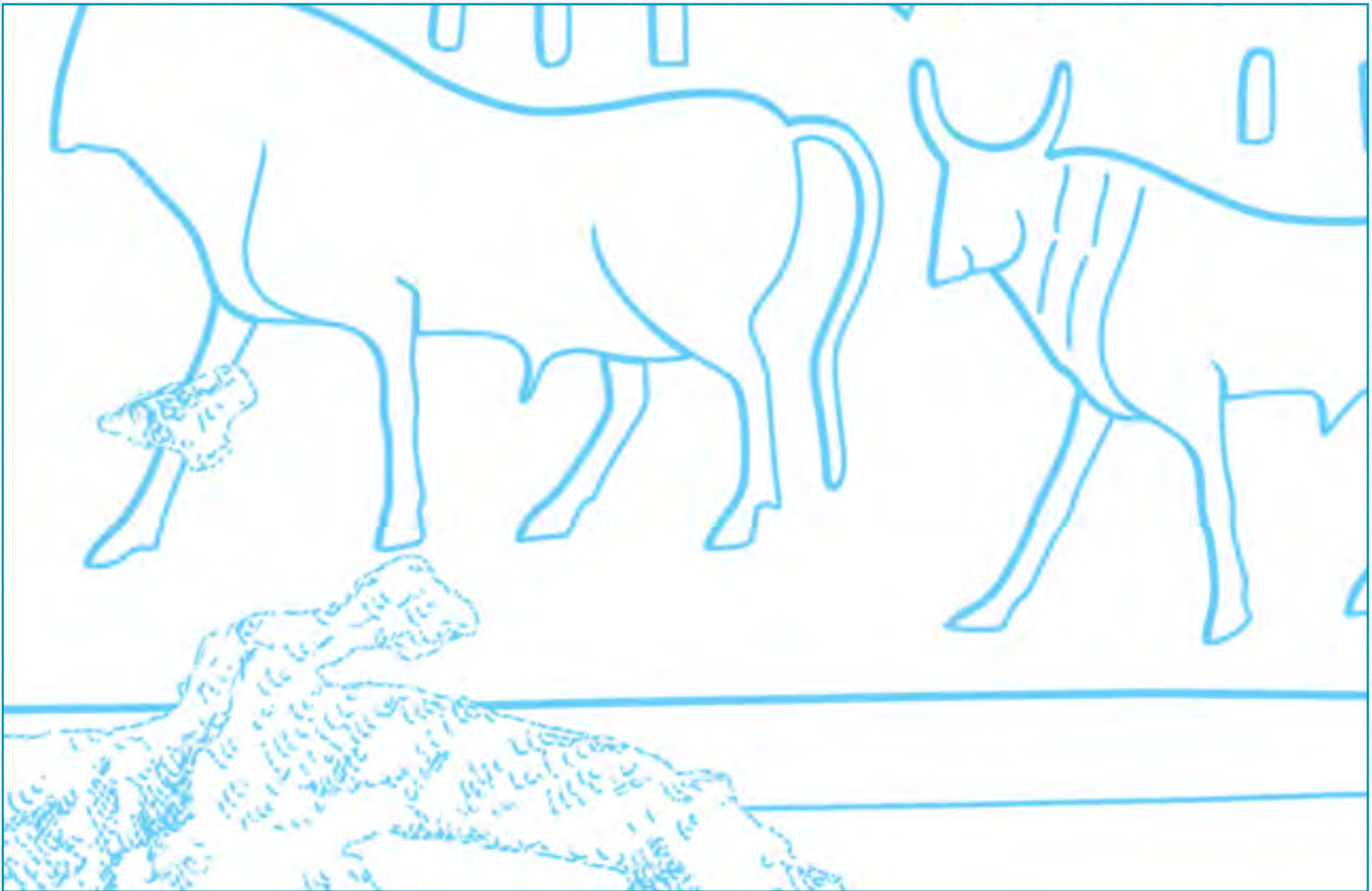
- Any additional important information, recorded by the artist (notes, reference photos, reminders, research, etc.) and associated with the particular scene he/she is working with.

Collecting and organizing all the above information for every single drawing may seem like an unnecessarily complicated effort. Moreover, this amount of data needs a lot of disk space, wherever it's stored. Yet having the entire dossier of information for a given scene at hand makes revising old drawings, adding additional information, or studying the documentation process a lot more convenient and enables complete flexibility at the post-processing stage.



Virtual Collation Package made for MHB 091

Preparing the Drawing for Collation



MHB 4m (detail) - Digital blueprint prepared for collation

Blueprints of the original artwork have always been essential to the Epigraphic Survey's collation methodology. They are an exact reproduction of the original drawing, created by using a contact print process on light-sensitive sheets. The color *blue* helps the epigraphers by making it possible to record corrections clearly in pencil on the printed sheets. There are usually blueprints of each drawing made, one of which is cut up into several manageably sized sheets and is used for indicating individual corrections and recording additional

details, while the other one is used for overall reference and for adding modifications that affect the entire drawing. Drawing in Photoshop, however, means that the artist has to produce the blueprinted copy *digitally*. For now, this Manual will show the user how to produce the blueprints exactly as one would have when drawing on paper. But one must keep in mind that, with the technical background constantly evolving, this particular area will go through some necessary changes as well.

Preparing the Digital Blueprint

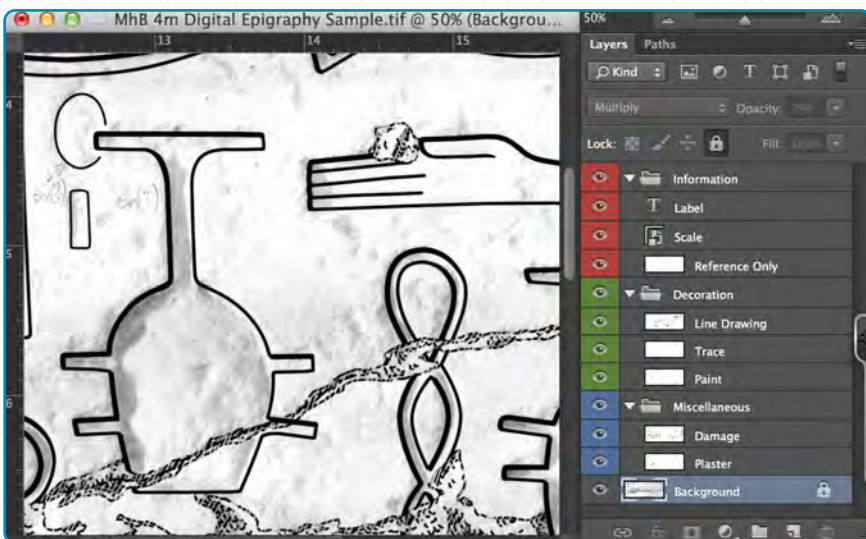
The artist needs to execute a few modifications to be able to work with a color version of his/her drawing. The drawing is created in a *grayscale* environment, so any color that would be applied on it would show as a shade of gray. To be able to add colors to our drawing, we have to change its Image Mode to *RGB*. When the artist chooses a different color mode for an image, he/she permanently changes the color values in the image. It is recommended to *merge* the layers (collapse all

layers into the top one) before applying any color modifications, because the interaction of colors between layer blending modes changes when the mode changes. For a certain sequence of actions to be applied repeatedly, it's advisable to save a *template (Style)* to add some automation to the process.

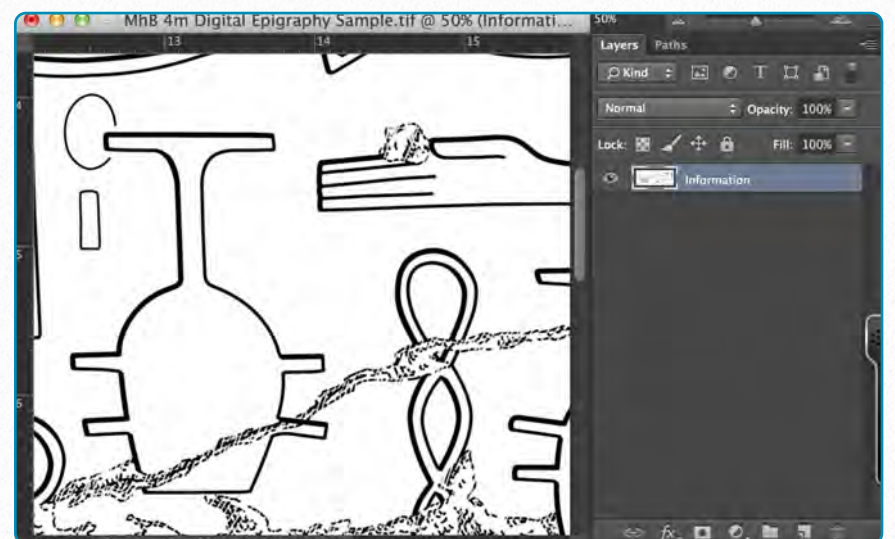


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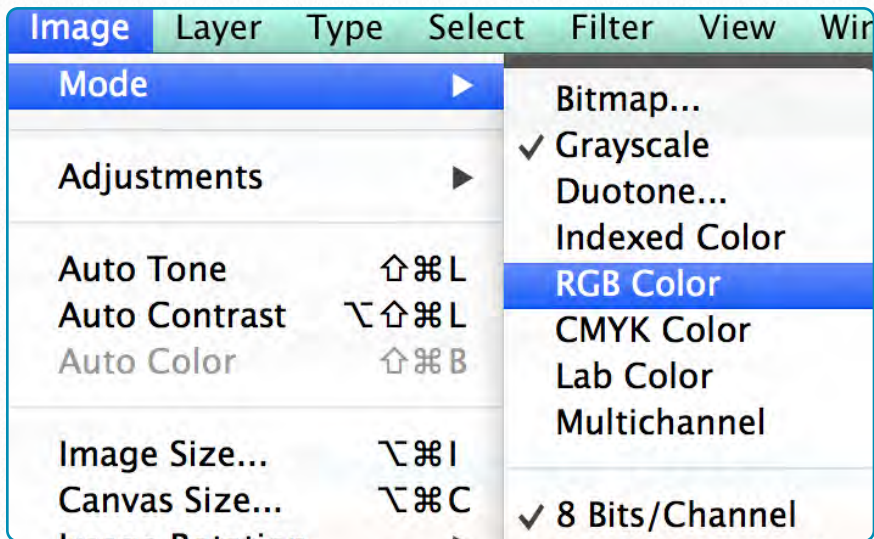
Setting Up the Drawing for Digital Blueprint



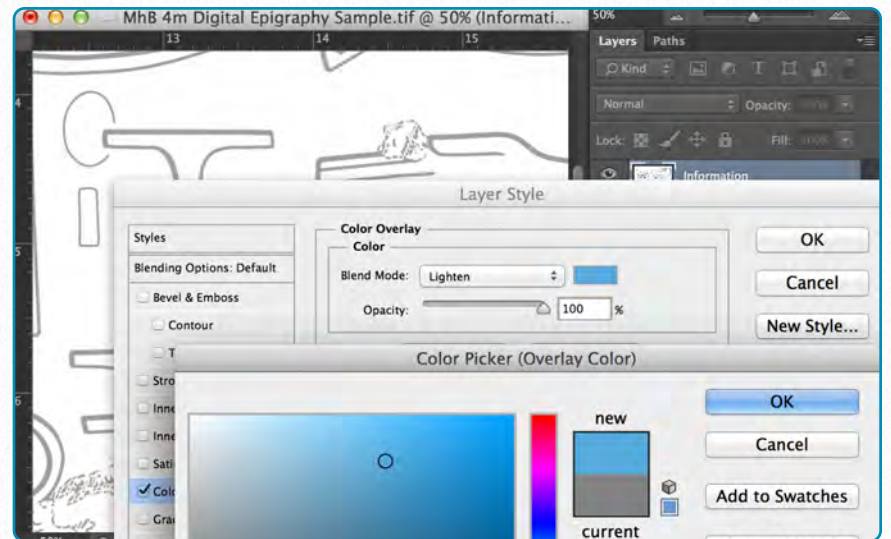
(1) Any enhancement of the entire document should happen on a *merged* version of the drawing, with no background or reference layers included.



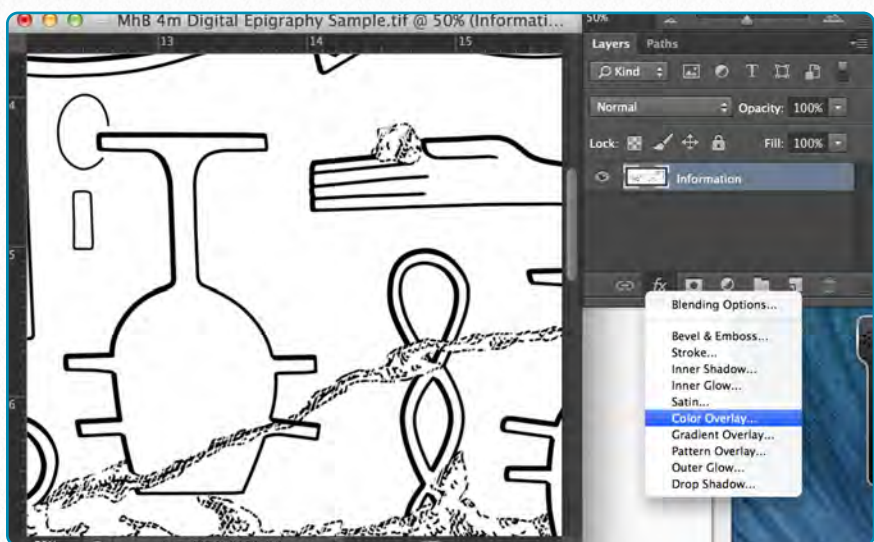
(2) Make all the layers that *shouldn't* be part of your blueprint *invisible*, then go to Layer and choose *Merge Layers*. When asked if you want to “discard hidden layers” click OK.



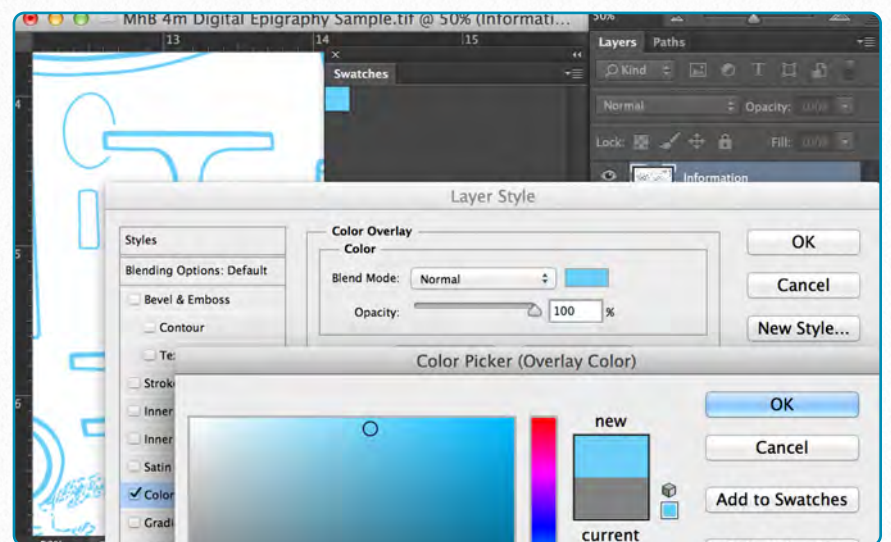
(3) Change the color mode of your drawing to RGB (*Image/Mode/RGB Color*). Note that using RGB mode adds quite a bit to your file size. The image quality shouldn't be changed (8 Bits/Channel).



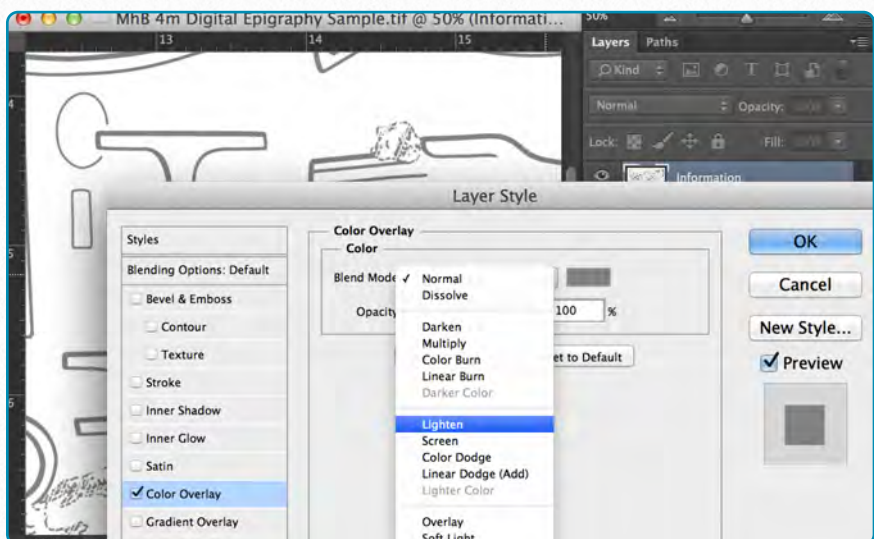
(6) Hit the color panel next to the Blend Mode drop-down menu and choose the color you want apply on the drawing. Use the *Color Picker* or the preset *Color Libraries* to determine your color.



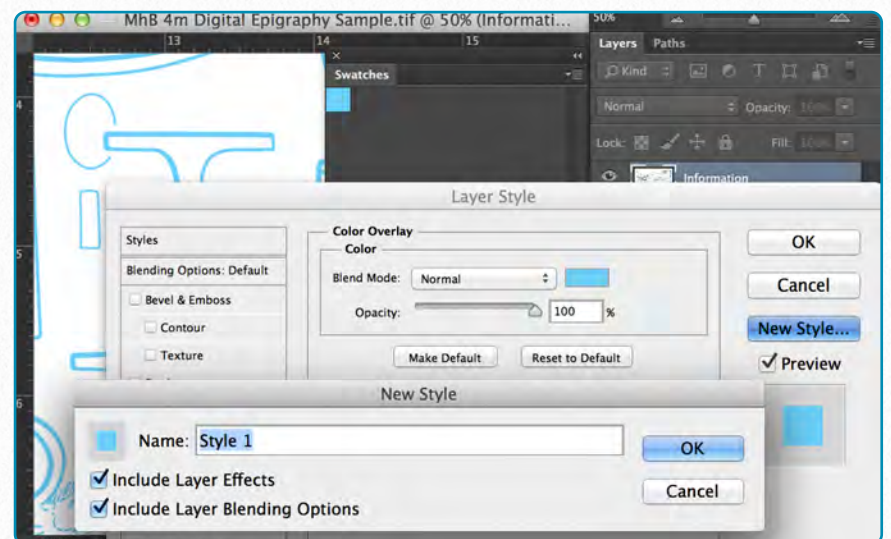
(4) Add a *Layer Style* to your drawing. Pick *Color Overlay* from the drop-down menu. This command opens the *Blending Options* panel at the Color Overlay side menu.



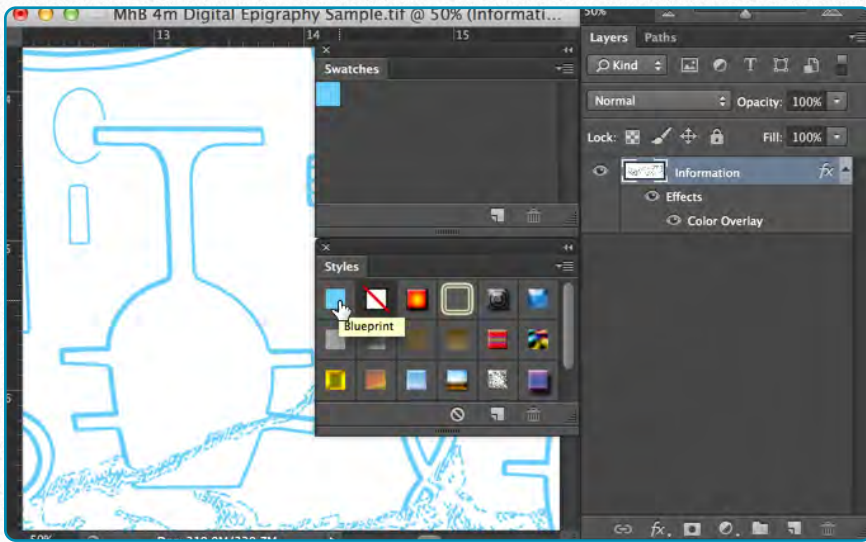
(7) Once you find the right shade of your blueprint it can be added to the Photoshop swatches (*Add to Swatches*), so it doesn't need to be reset every time you need it (*Window/Swatches*).



(5) Change the blend mode of the drawing from Normal to *Lighten*. Lighten excludes all the white pixels (white brush strokes over damage) from the color changes applied in the next step.



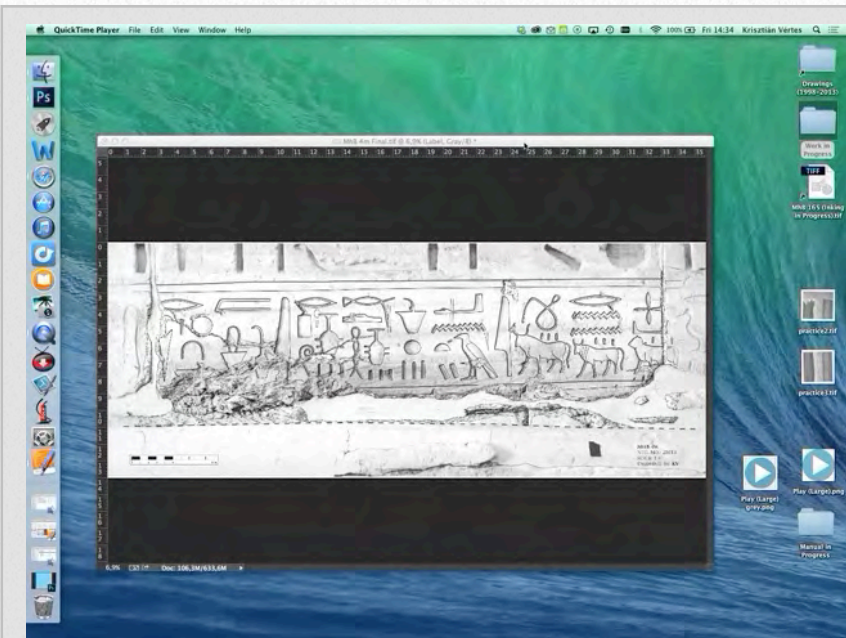
(8) The entire sequence of action (changing the Blend Mode and applying the Color Overlay) can be saved as a *New Style*. Make sure both options are checked on the New Style panel.



(9) Your new Style can be found in the Styles Panel. (*Window/Styles*) It can be applied from right here every time you need to create a blueprint, eliminating steps 4-8 from the process.



VIDEO TUTORIAL



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To download the demonstration video, click on the following link:

<https://www.dropbox.com/s/0g2wxt8qhjwzj3j/Setting%20Up%20the%20Drawing%20for%20Digital%20Blueprint%20%28SD%29.m4v>



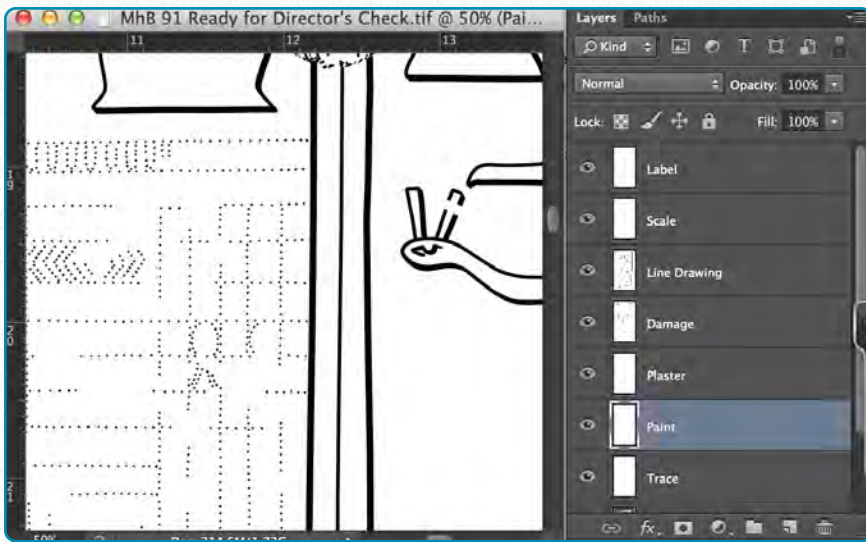
Preparing the Digital Paint Sheet

As part of the collation package, paint sheets are regular (i.e., black-and-white) printed copies of the inked drawing. They can thus be made fairly easily by *flattening* the digital drawing and hitting print. As an advantage of working with layers, however, one can emphasize certain features while making other features less obvious. *Highlighting* the (sometimes barely visible) dotted lines by using a different color directs the focus on the paint during collation. There is a further advantage of this color differentiation: we are able to *distinguish* between painted and carved lines when they overlap each other. This feature opens up a whole new set of opportunities for collecting color data, especially when dealing with very fine small-scale painted details. Any layer can be emphasized or made less apparent by changing its color scheme.

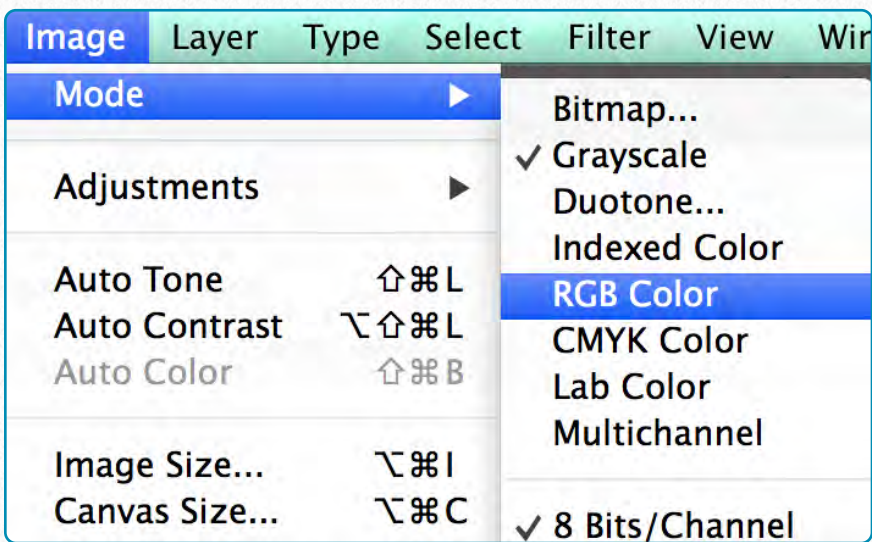


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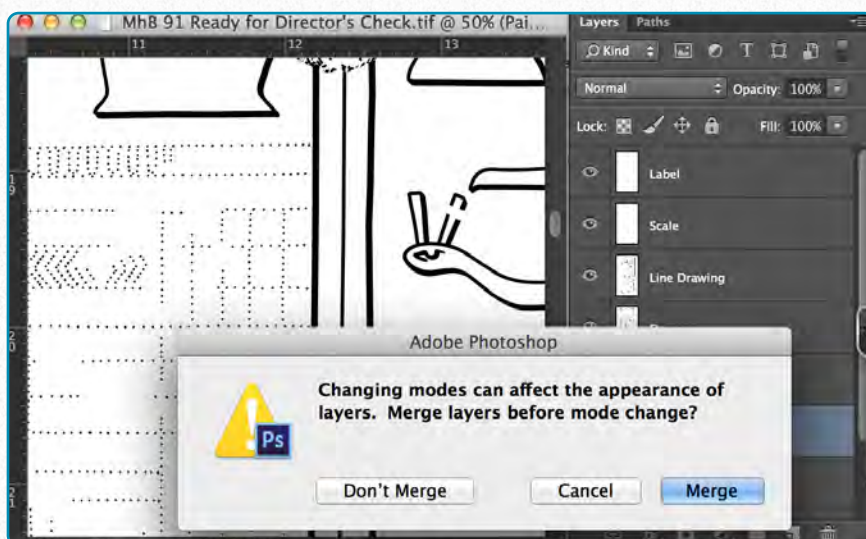
Creating Digital Paint Sheets



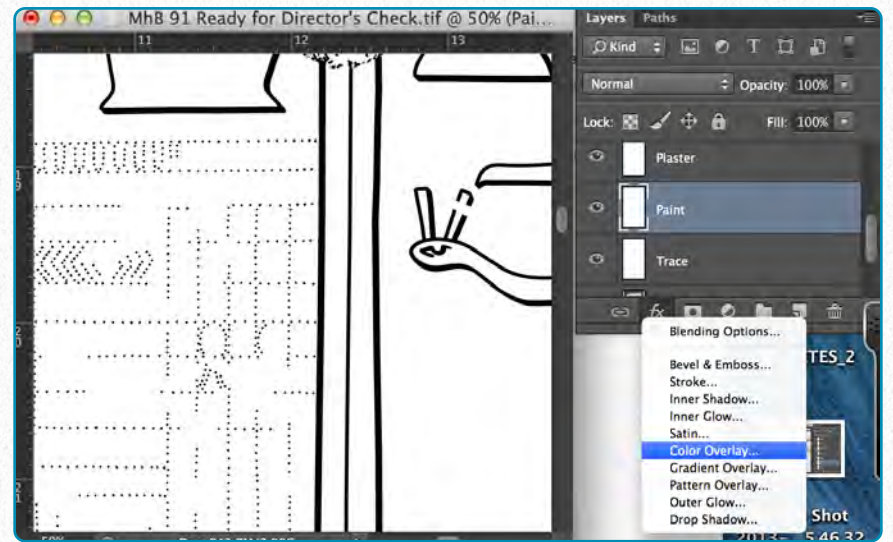
(1) Open your drawing and make all the layers that *shouldn't* be part of your Paint Sheet *invisible*. Make sure that the Opacity is 100% on all the layers. *Don't* flatten your image.



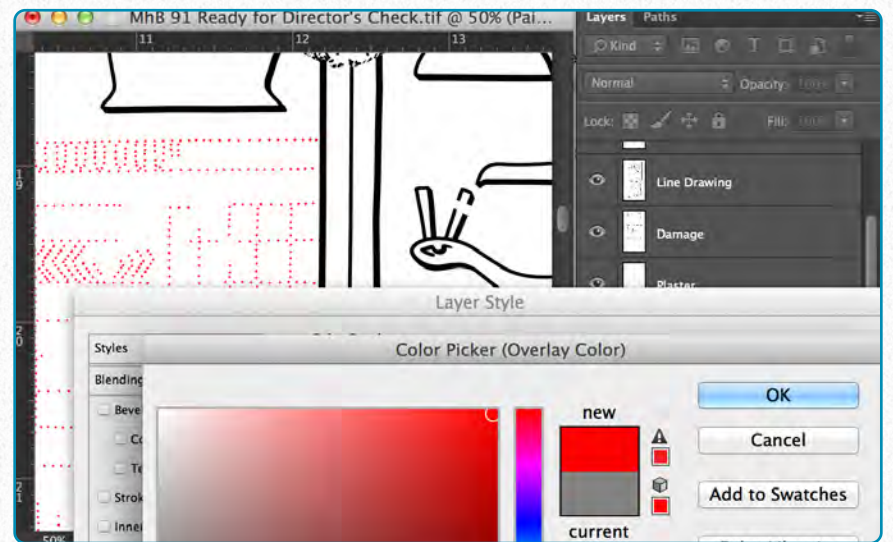
(2) Change the color mode of your drawing to RGB (*Image/Mode/RGB Color*). Note that RGB mode adds quite a bit to your file size. The image quality shouldn't be changed (8 Bits/ Channel).



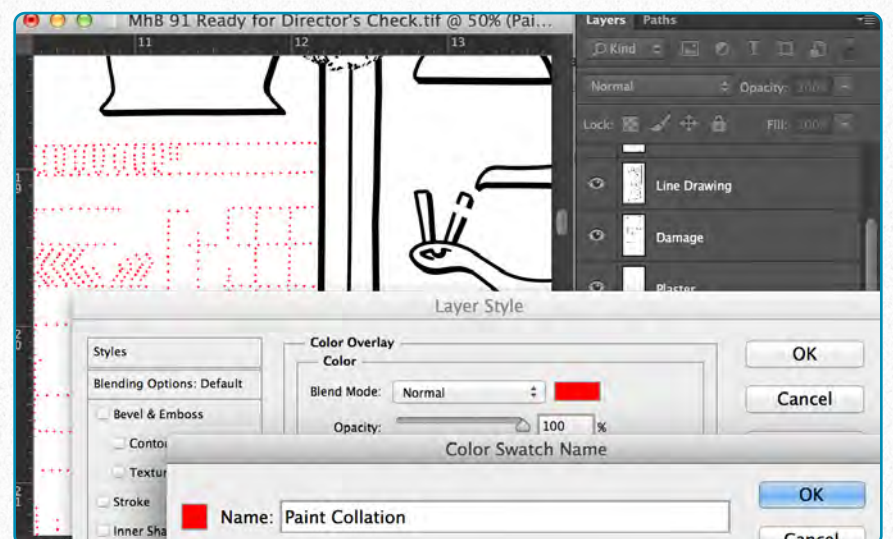
(3) When asked if you'd like to merge the layers before the mode change, choose *Don't Merge*. Merging the layers would prevent you from being able to modify the Paint Layer *separately*.



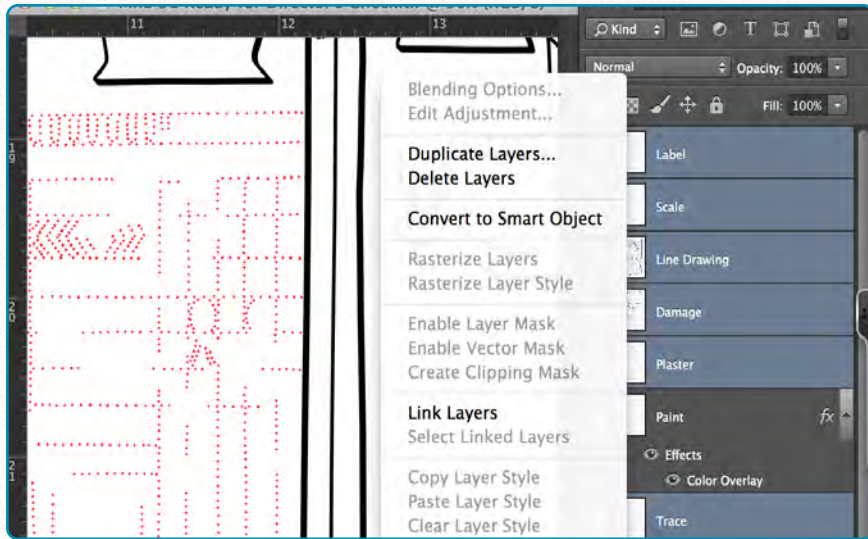
(4) Make sure you are on the Paint Layer. Hit "fx" and add a *Layer Style* to your drawing. Pick *Color Overlay* from the drop-down menu.



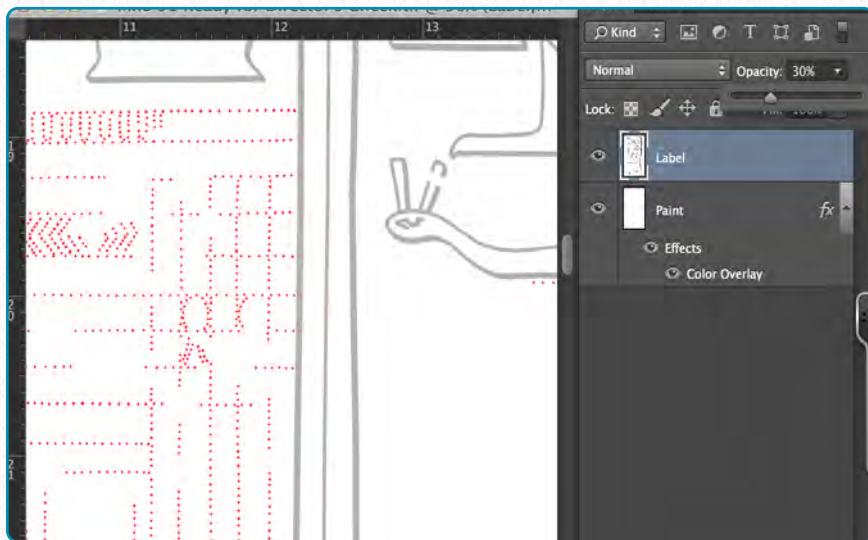
(5) Hit the color panel next to the Blend Mode drop-down menu and choose a color to apply on the drawing. The full red in the upper right corner on the *Color Picker* panel is recommended.



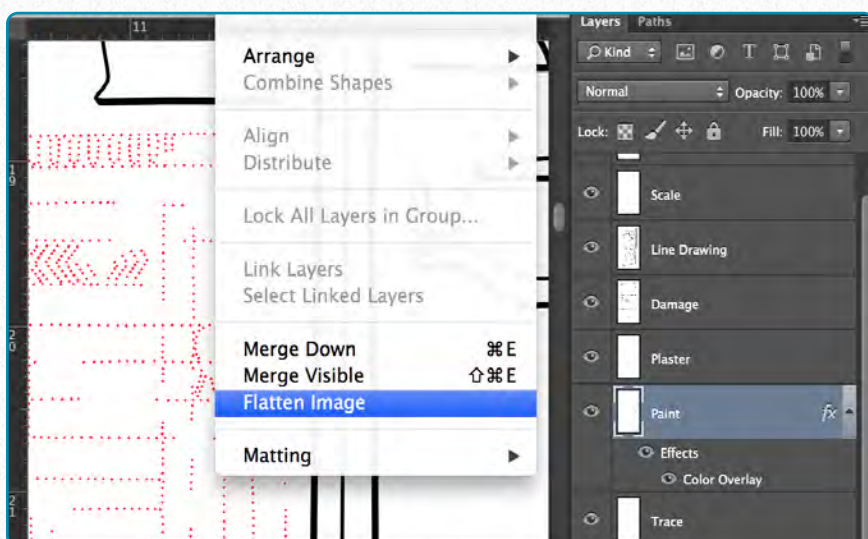
(6) Save your color pick by adding it to your *Swatches* collection. Remember that swatches can be customized so that a particular collection would refer to a particular working environment.



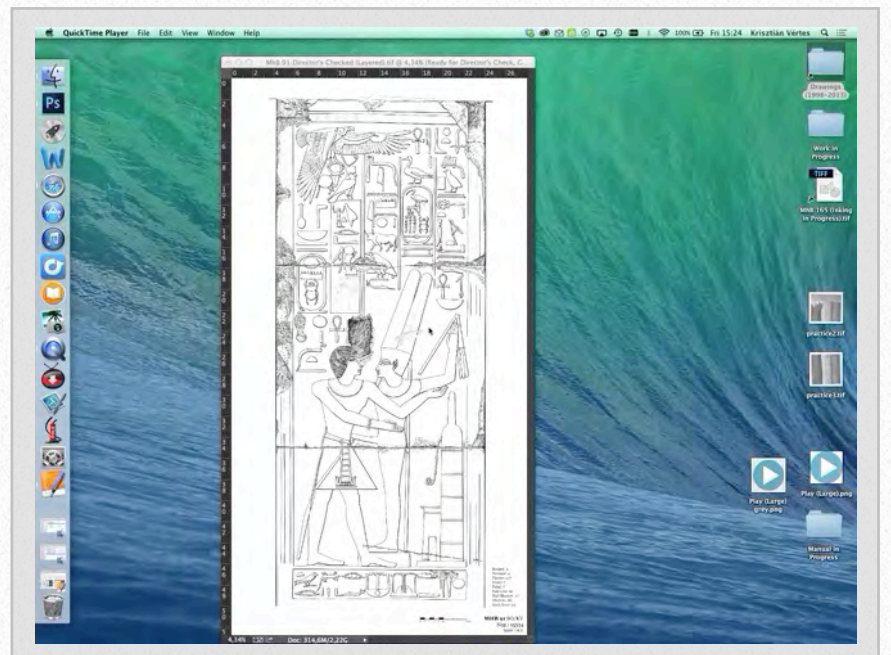
(7) Now select *all* the other layers except your Paint Layer. Hit right click (secondary click) and pick *Merge Layers* from the drop-down menu.



(8) All your layers except the Paint Layer should collapse into the top layer. Change the **opacity** of the layer to 30%. This makes the inked lines stay in the background while the paint lines glow.



(9) Now go to Layer and choose *Flatten Image*. This command collapses all your layers into the top one. Always save your image as a new file, don't overwrite your source file (*Save As*).



To download the demonstration video, click on the following link:

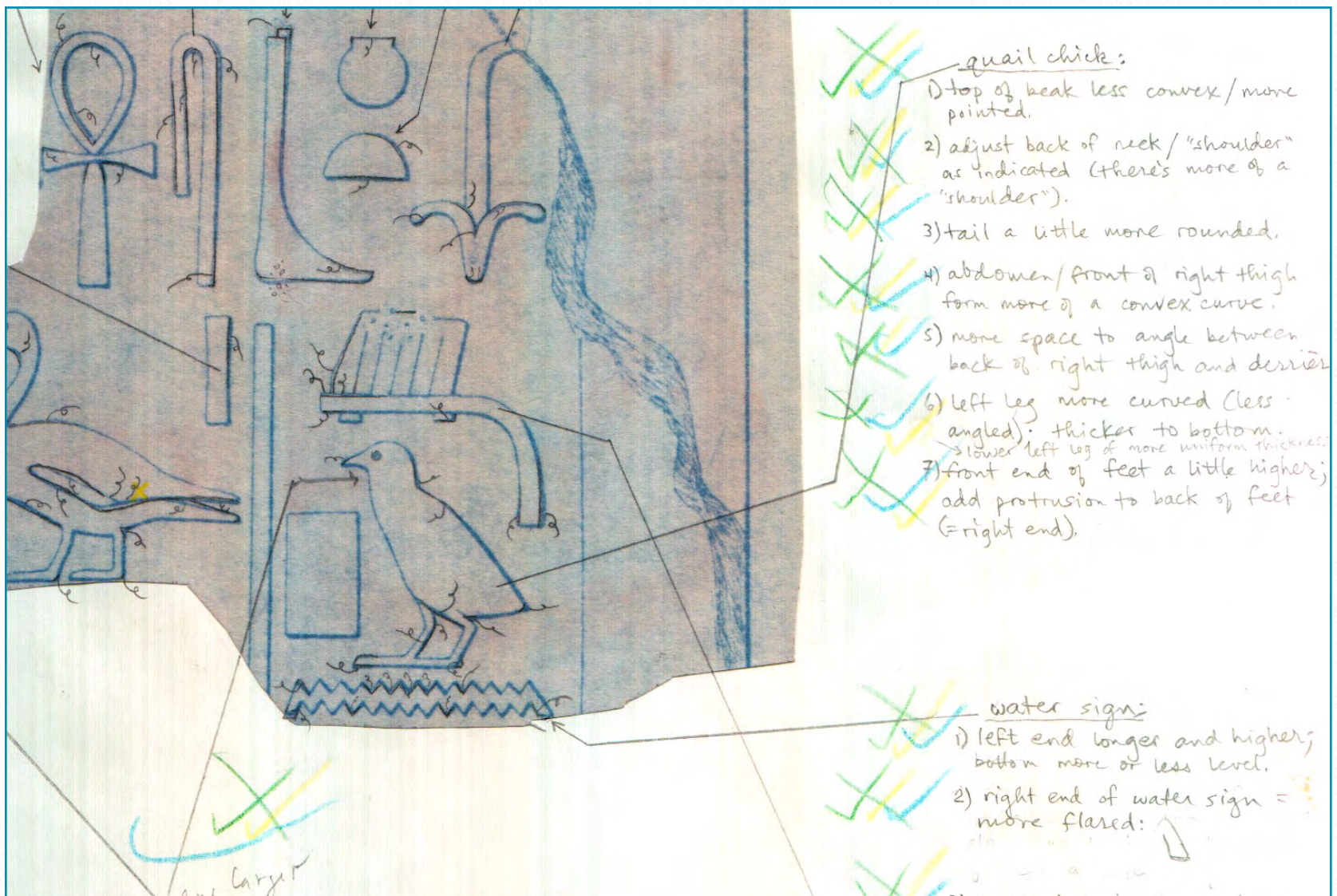
<https://www.dropbox.com/s/byuyxj0cv23lncq/Creating%20Digital%20Paint%20Sheets%20%28SD%29.m4v>



A very thorough article explaining the math behind Photoshop blend modes:

<http://photoblogstop.com/photoshop/photoshop-blend-modes-explained>

Adding Modifications Digitally



MHB 91 (detail) - Collation sheet sample

Once the collation is done and the epigraphers and the artist are all in agreement about the changes to be made to a drawing, the artist has to transfer all these modifications from the collation sheet to the computer. When *working on paper*, one has very limited options for how to change an inked line: in fact, the only way to do it is by keeping the collation sheet and the drawing next to each other and eyeballing the extent and shape of the change. Once a line is changed, it cannot be seen where

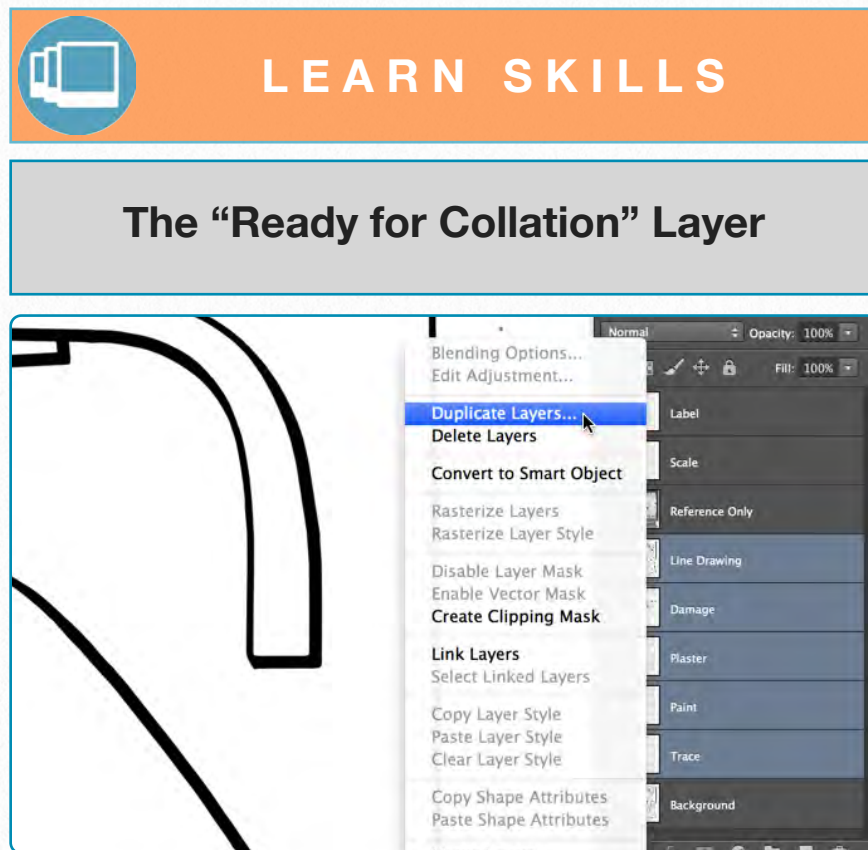
the original line was, and therefore the epigrapher has very limited options when verifying the changes during the Transfer Check.

When working digitally, we have an array of tools that help us to make the modifications needed for producing an accurate drawing. First of all, we have to make the collation sheets available as part of the digital drawing, meaning that we have to set them up as layers in Photoshop.

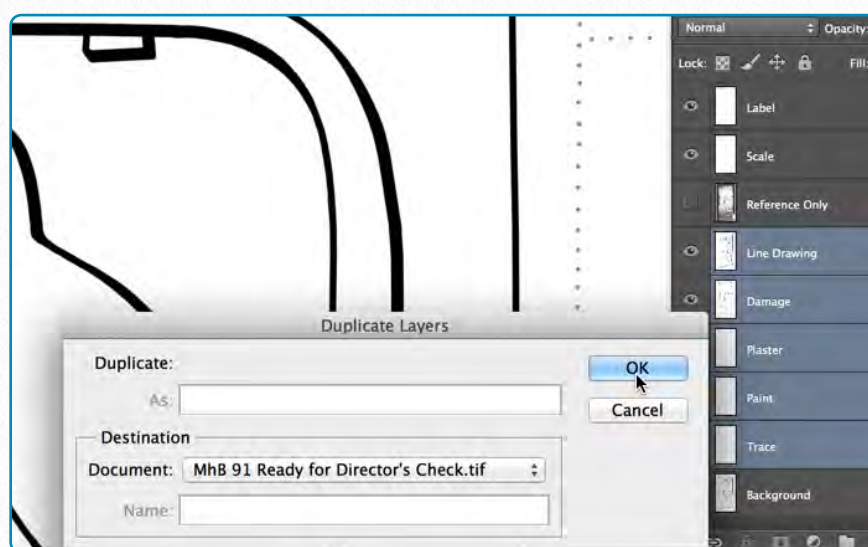
Importing Collation Sheets

Before the artist starts adding the collation sheets to the digital drawing, he/she needs to set up the current stage as a layer for future reference.

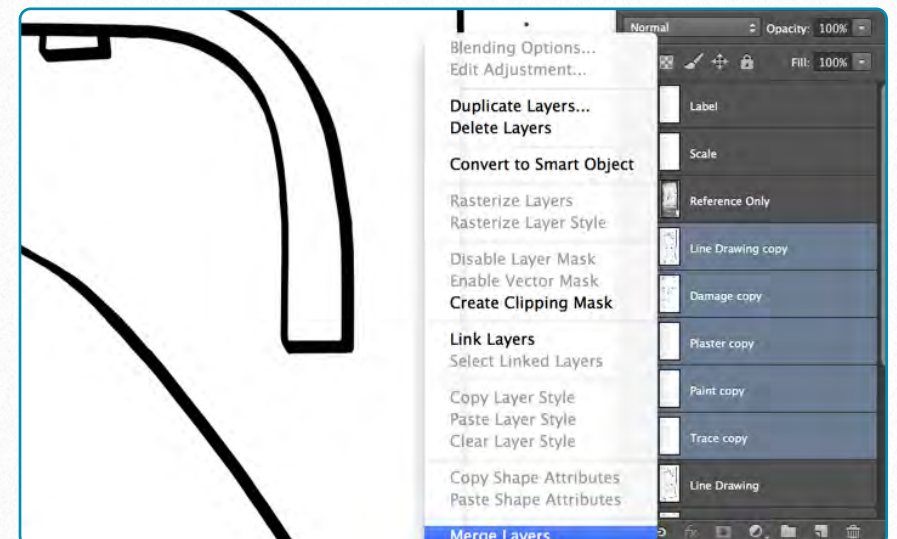
Later on, when we need a *before* and *after* collation comparison, this layer will be the one to which all subsequent changes can be related.



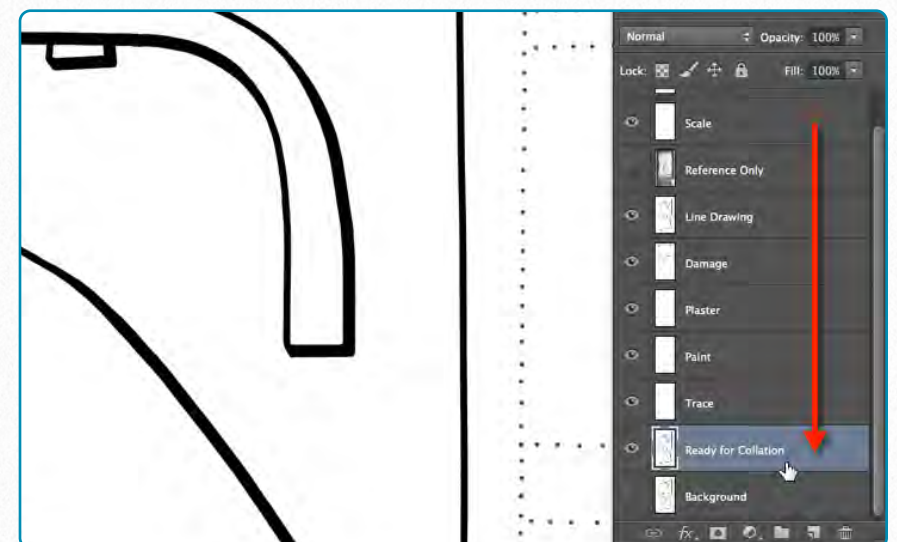
(1) Select all the drawing layers, hit right click (secondary click) and pick *Duplicate Layers* from the drop-down menu.



(2) When asked about the destination you'd like to add the new layers, hit OK without changing anything.



(3) Notice that all the new layers have the same name with "copy" added automatically. *Merge* your new layers.



(4) *Rename* your new layer and move it to the bottom of your stack right *above* the Background Layer.

Once the “Ready for Collation” layer is created, it should be locked. It needs to be visible only when comparing drawing stages to each other.

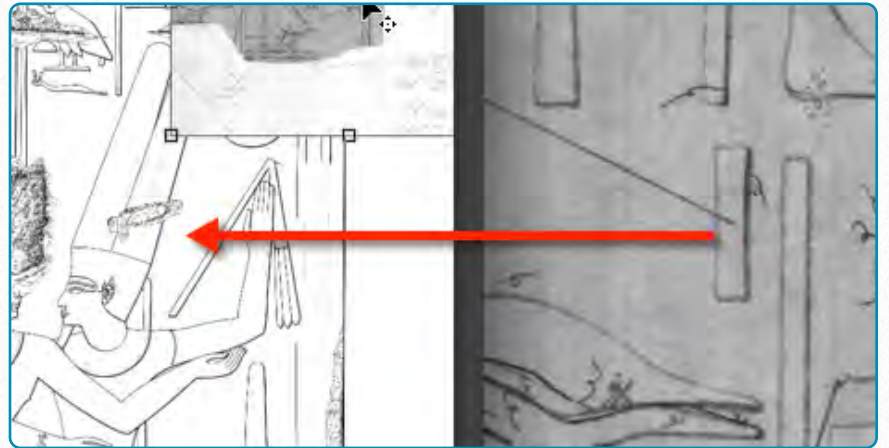
Now we are ready to import the first collation sheet to the drawing. Of course it needs to be scanned first, but the scan must not be saved as a *.tiff* file, but rather as *.jpeg* to keep its file size at the minimum (resolution stays at 1200 dpi, image is grayscale scanned in 8-bit mode). If one needs a reminder he/she can find more information about the scanning process in *Chapter 4, Section 1*. Needless to say, once the sheets are scanned, they have to be saved to their specified folder (see *Section 1* in this chapter).

Along with refreshing our scanning skills, we also need to remember how to align layers properly. The Collation Sheet Layer needs to be *matched exactly* with the drawing, otherwise the changes end up being misaligned. Sometimes moving the layers on top of each other is not enough, and the collation sheet needs to be rotated as well to get the desired result (see *Chapter 4, Section 2* for more details about layer alignment). In the meantime, the artist has to remember to *lock* all the drawing layers while adjusting the collation sheets to avoid accidental modifications.

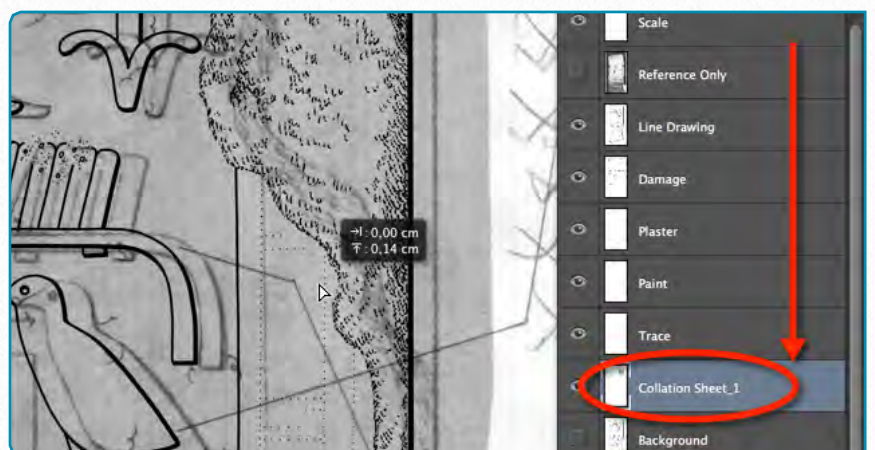


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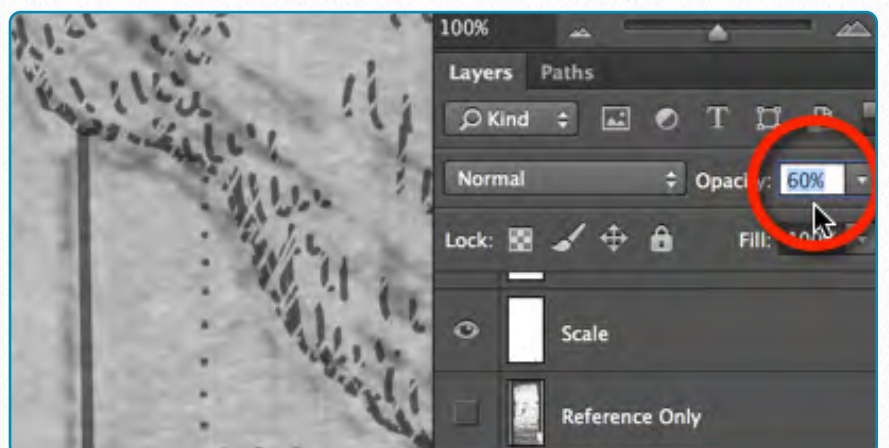
Setting Up Collation Sheets



(1) Open both the drawing and the collation sheet in Photoshop, and *transfer* the sheet to your drawing by moving it over the drawing area.



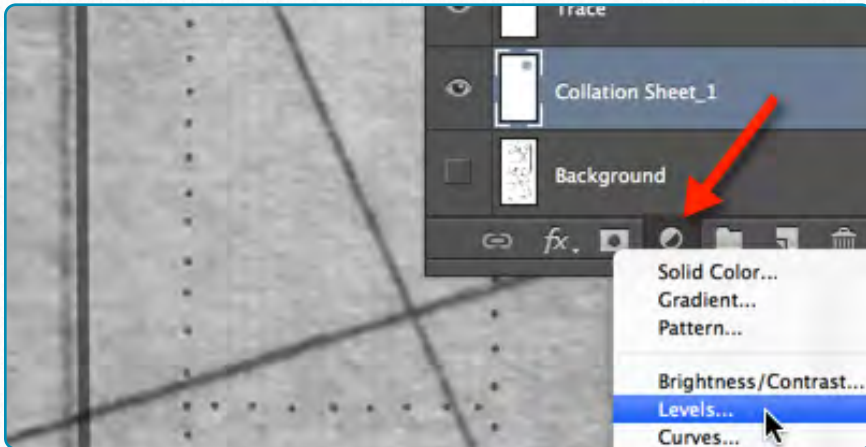
(2) Move your Collation Sheet Layer *below* the drawing layers. Zoom in and start aligning the collation with the rest of your drawing.



(3) Once the layers are aligned, select all the drawing layers and change their *Opacity* to 60%. Refine the alignment if necessary.

Simple Modifications

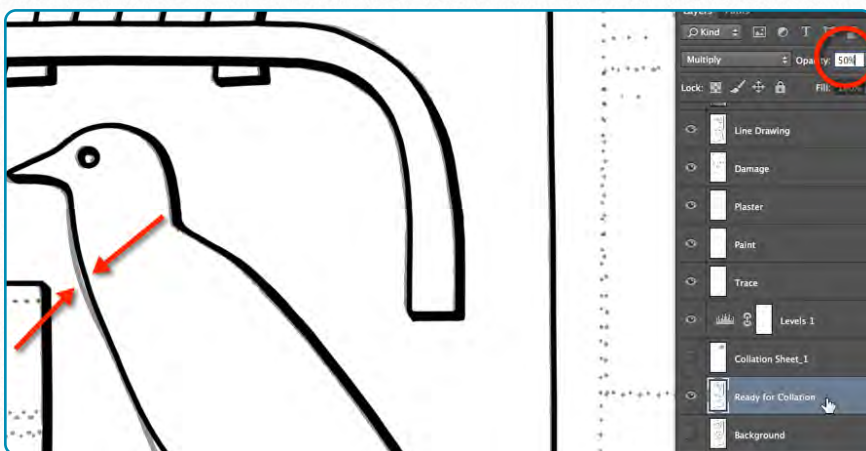
There are certain types of modifications that can be achieved by *selecting* an area



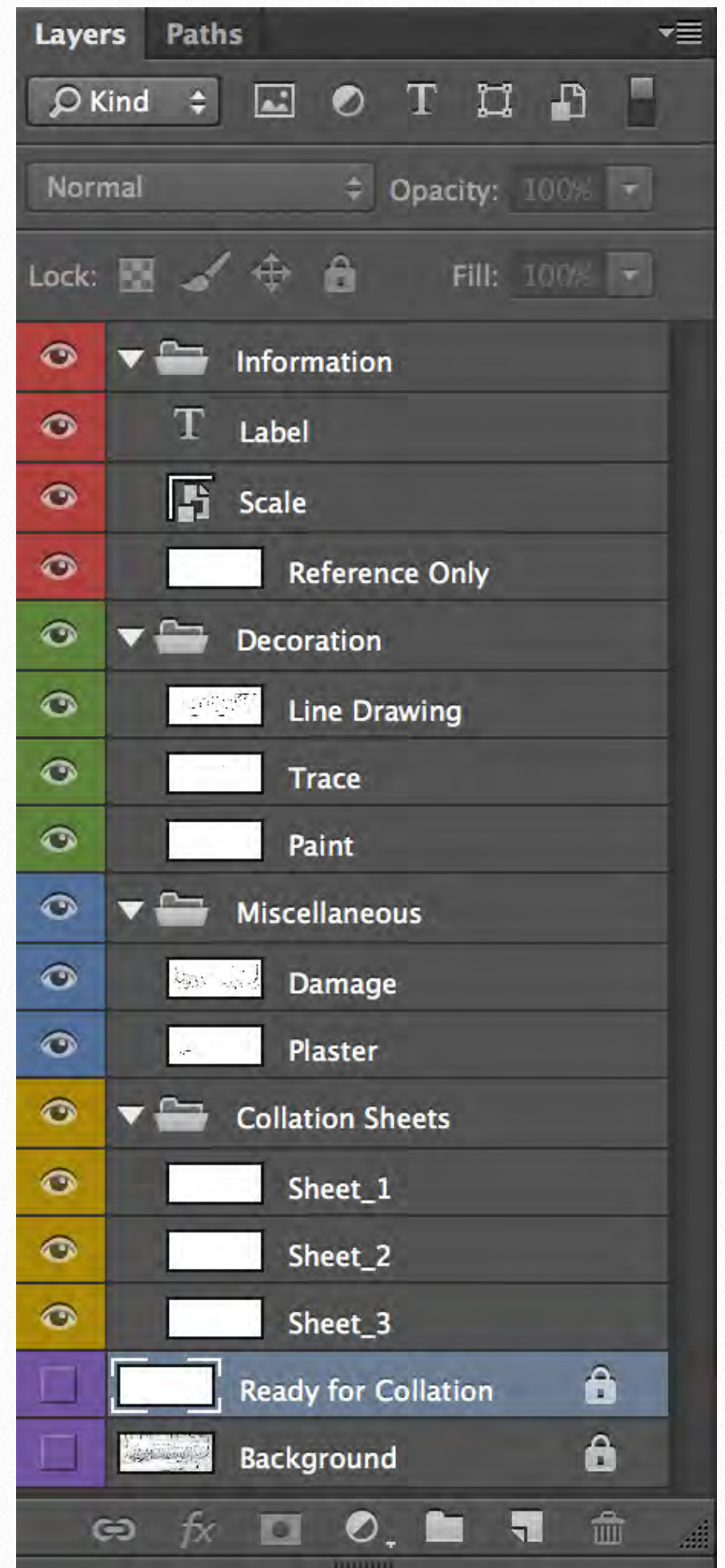
(4) Highlight the Collation Sheet Layer and create an *Adjustment Layer* on it. Pick *Levels* from the drop-down menu.



(5) Adjust the *Levels* on the Collation Sheet by moving the *black-and-white* levels towards the center. Make sure you don't lose any details.



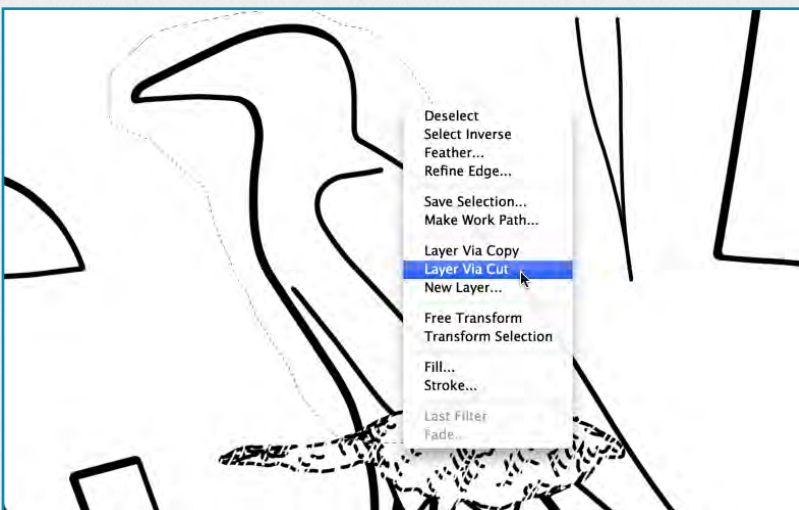
(6) As you're done adding modifications, compare your changes to the original by making the "Ready for Collation" layer visible at 50%.



The Layer System at the collation stage

and manipulating it in a very simple way. Such modifications largely depend on the accuracy of the selection, and therefore everything the artist has learned about selections in *Chapter 3, Section 2* proves useful here.

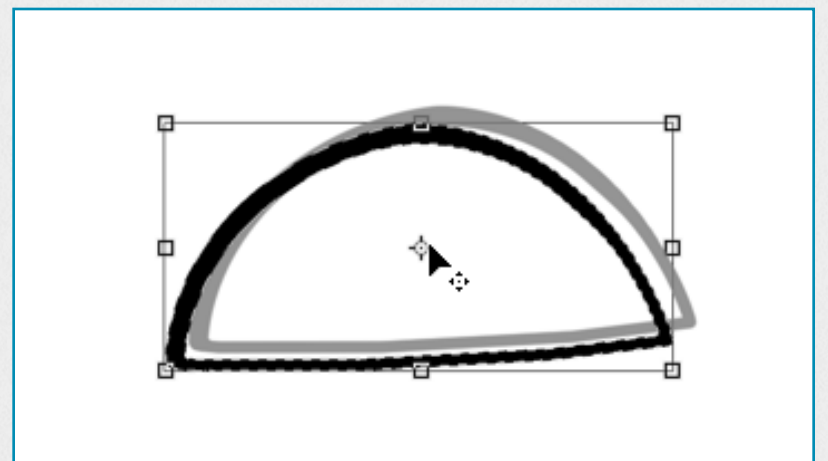
Moving lines in between layers - no matter how careful we are about locking layers, sometimes we realize that we've been working on the wrong layer. If this happens, we don't have to redraw that section; all we have to do is select the area, hover over it, hit the right click (secondary click) and choose *Layer Via Cut* from the drop-down menu. Our selection becomes a new layer which can be *merged* with whatever layer we intend our selection to be part of.



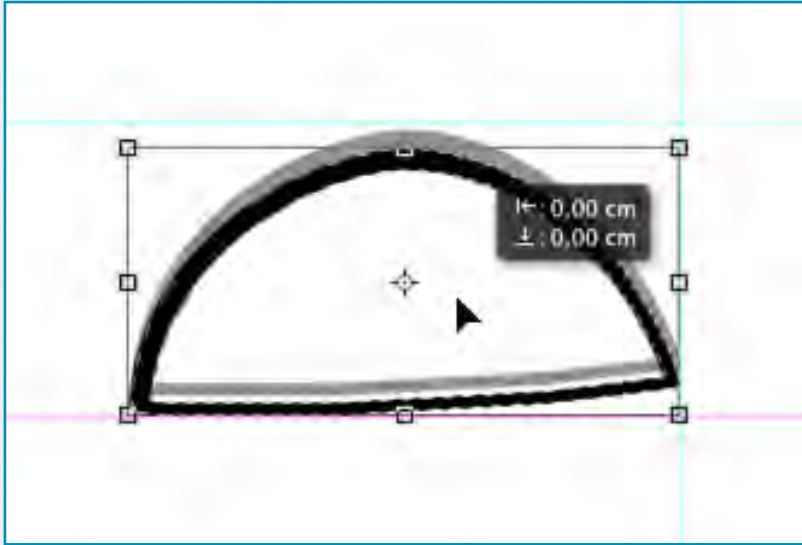
Deleting large areas - this is probably the simplest of all modifications. Whatever one wants to delete should be selected (this requires being on the right layer) and deleted by hitting *Backspace/Delete* on the keyboard. Selections can be used for fine deletions as well. When an area is selected, the eraser can do

modifications only within the selected portion, therefore one doesn't have to be that careful when erasing. Furthermore, selections are layer-independent, letting the artist erase the same areas on more than one layer.

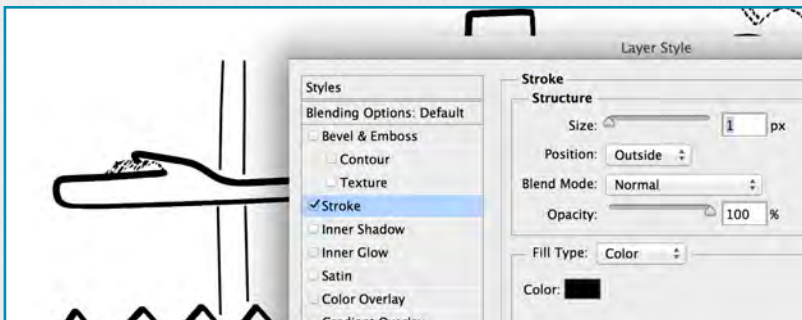
Moving entire features - this is yet another simple solution for a difficult problem. When penciling on a photo enlargement, one of the most common mistakes made by the artist is drawing a certain feature with its position slightly misplaced. It can be the result of distortion, deep shadows on the photo, or simply the trick of the eye.



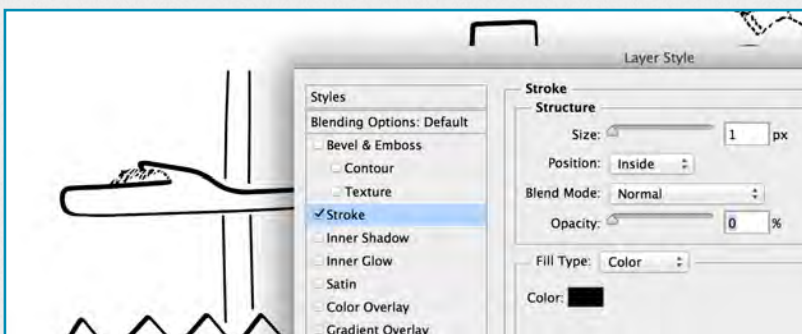
Shifting entire hieroglyphs on paper would mean deleting and redrawing them properly on a different spot. In Photoshop, however, all we have to do is *select* the feature and shift it (*Tools Bar/Move*) to the right place. The artist should use the *arrow keys* on the keyboard for fine movement. (Guidelines - combined with the magnetic effect - are also a great help with proper placement).



Changing Line Weights - one can add to or deduct from the pixels of *all* the lines appearing on a layer by changing the stroke option settings on the layer's Blending Options panel. The artist has to be careful modifying these settings:



setting the Position to *Outside* and Opacity to 100% *adds* a certain number of pixels to the line weights,



while setting the Position to *Inside* and Opacity to 0% *subtracts* a certain number of pixels from the line weights. These changes have an effect on all the lines on a layer, so selecting the desired

area and moving it to another layer for modification is strongly advised.

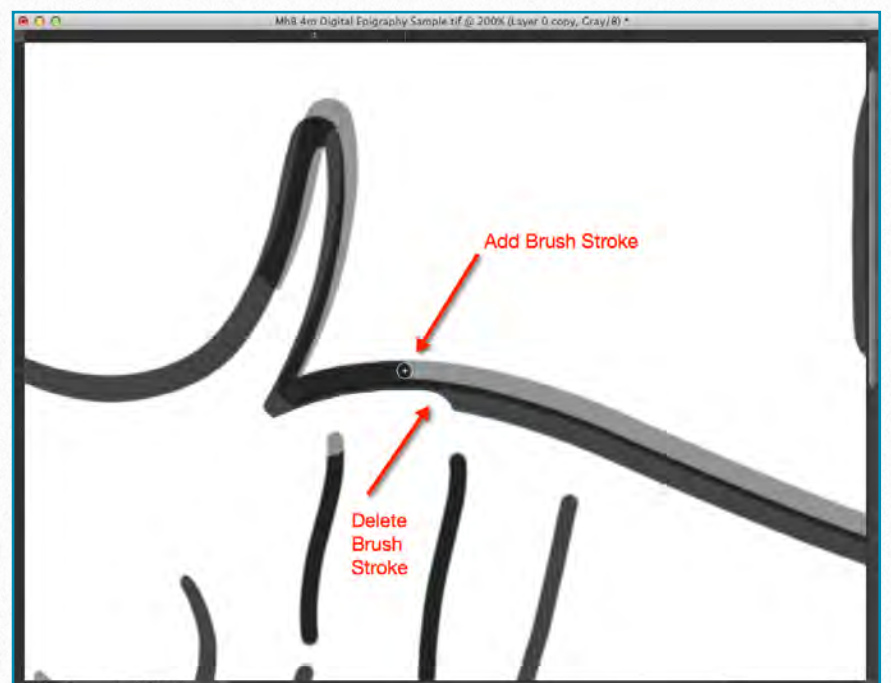
Freehand Modifications - before moving on to the more complex operations, it should be mentioned that in most cases the simplest way to modify a line is by *drawing freehand*. The artist always has to be able to judge when it's worth the effort to create selections or more complex paths and guides to accomplish a certain correction.

i

Complex Modifications

Most of the changes the artist has to make on a drawing require adjusting curves, modifying brush strokes, and adding or deleting certain features.

Using the Pen Tool - Changing the arc of a curved line is just as hard in Photoshop as it is on paper - assuming the artist is drawing freehand. The artist has to pay at-



Adding and deleting brush strokes

tention to keeping the smoothness, the thickness, and the sun-shadow transitions of the original line while carefully adding and removing extra brush strokes. It is a painstaking procedure and often doesn't provide the desired result in terms of quality of line.

Adding Modifications with the Pen Tool

Add a *Path* to the area to be changed by using the *Pen tool*. Make sure to extend it in both directions so your new line will blend in.



Adjust the *Path* by adding *Anchor Points*. Make sure your path curves smoothly into the part that doesn't have to be changed.

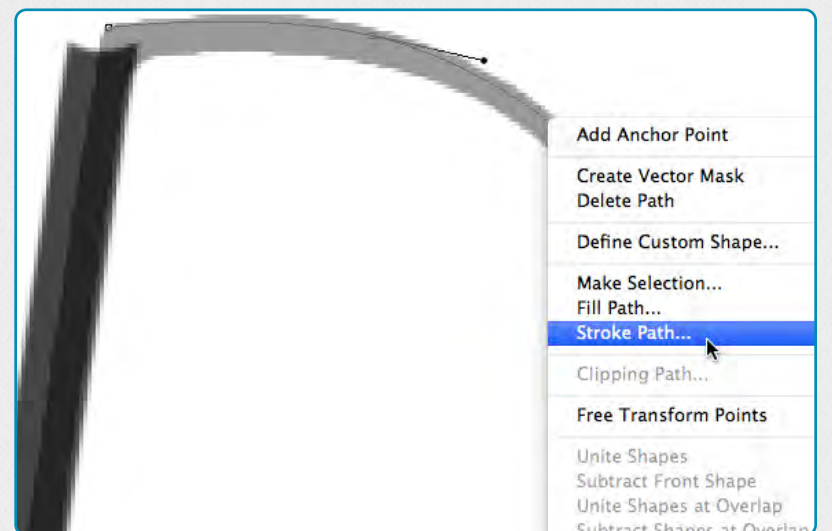


We've already learned how to use the Pen tool as a "digital French curve" for drawing smooth strokes and transitions. As one would expect, we can use the same tool for modifying them:

Delete the section that should be changed on the original drawing. Always double-check that you're working on the right layer.



Stroke the path with the appropriate brush thickness set up. For transitions use the *sun-weight* instead of the shadow-weight.



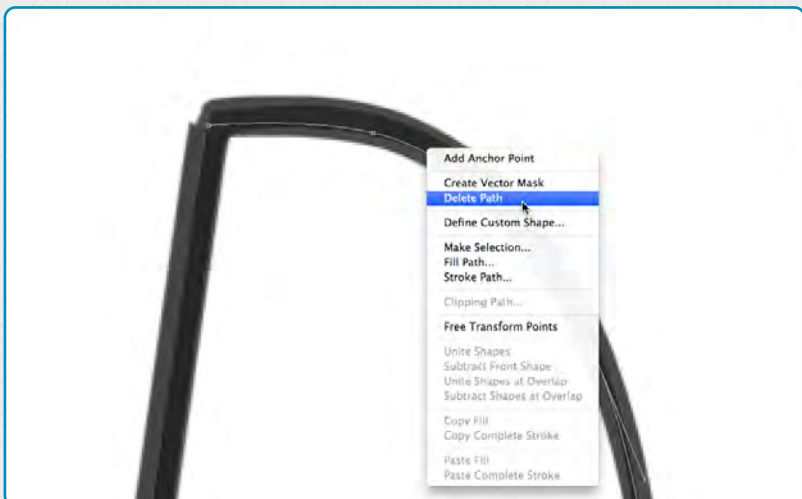
Move your path slightly to get the desired sun-shadow effect. Check both endpoints of the path to be sure that they *blend in* with the rest of the lines.



Adjust the *brush strokes* at your path's endpoints to make the transition nice



and smooth. Add corners if necessary. Once you're happy with the result, don't forget to *delete* your Path.



Magnetic Pen Tool - It is an option of the *Freeform Pen tool* that lets the artist draw a path that *snaps* to the edges of defined areas on the drawing. We can set up the range and sensitivity of its behavior as well as the complexity of our path (i.e., the number of anchor points). Although this tool is not particularly useful when defining edges on photo enlargements (it works best on *high-contrast* areas), it proves extremely convenient when modifying inked lines.

Once the artist sets up the Magnetic Pen tool (see the *gallery*), he/she needs to modify its settings on the *Options Bar*, so it can be used for adjusting inked lines on the drawing.

Curve Fit - controls the stylus movement sensitivity when drawing the path (0.5-10 pixels). Higher values create simpler paths.

Width - the Magnetic Pen detects edges only within this specified distance (1-256 pixels) from the cursor's center point.

Contrast - the percentage value to specify the contrast required between pixels for a certain area to be considered an edge. Lower contrast requires higher values (1-100 percent).

Frequency - specifies the rate at which the Pen sets anchor points (0-100). A higher

value anchors the path in place more quickly.

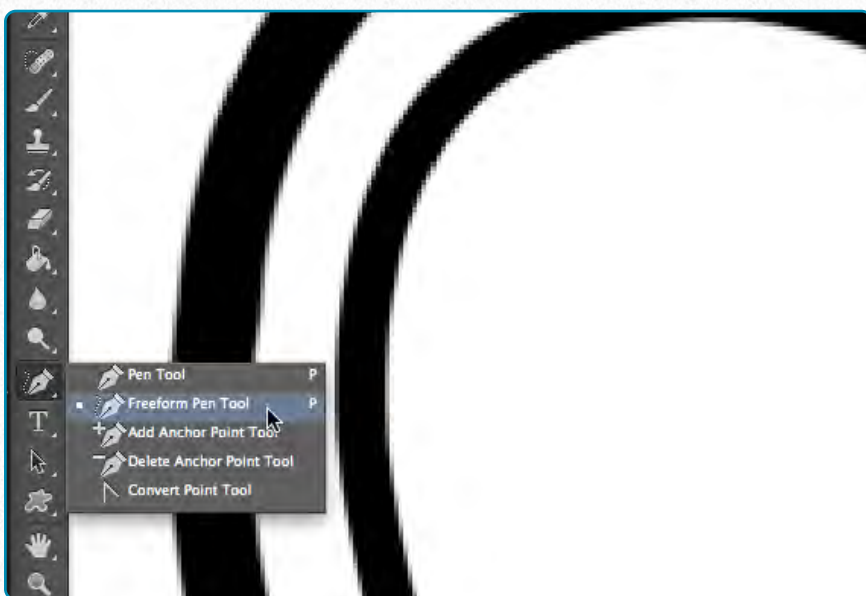
When drawing a freehand segment, the cursor has to be moved along the edge the artist wants to trace. Periodically, the Magnetic Pen adds *fastening points* to the border to anchor previous sections. As the tracing proceeds, the active segment snaps to the edge of the inked line connecting the segments to the last fastening point. Only the most recent segment of the border remains active. If the border doesn't snap to the desired edge, the artist can add a fastening point manually by

clicking once, in order to keep the border from moving. If a mistake is made, the last fastening point can be removed by pressing *Delete* on the keyboard.

The artist can finish drawing a freehand path in 3 ways: by hitting *Return* (*Enter* on PC) to end an open path, by double-clicking, which closes the path with a magnetic segment while holding down *Option* (*Alt* on PC), or by double-clicking *without* Option, which closes the path with a straight segment.

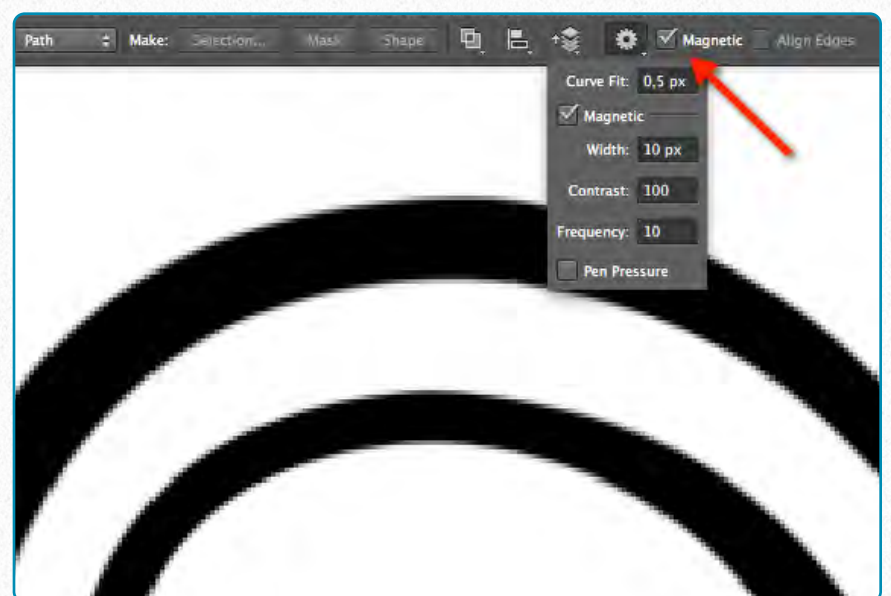


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(1) Go to the Tools Bar and right click (secondary click) over the Pen tool. Pick the *Freeform Pen tool*.

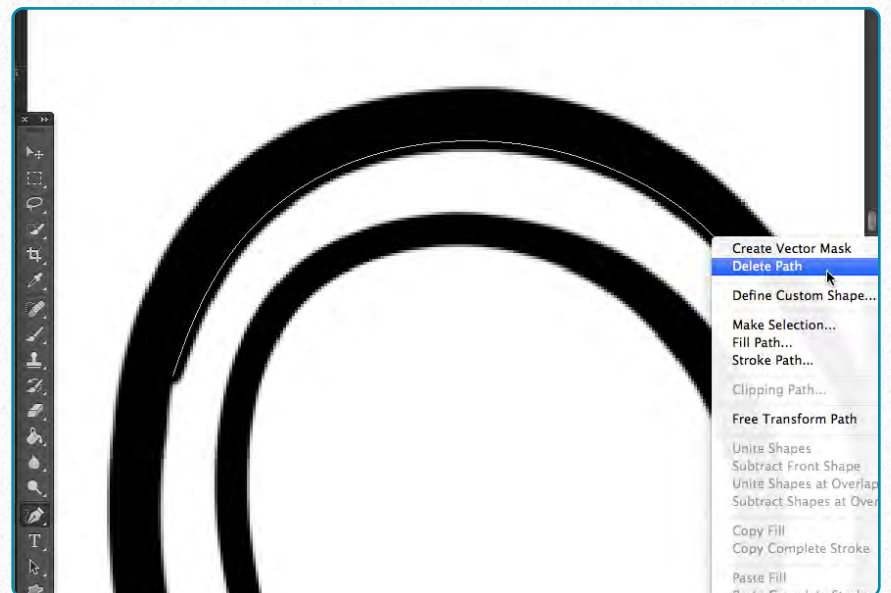
Using the Magnetic Pen for Snapping Paths



(2) In the Options Bar select *Magnetic* to activate the Magnetic Pen tool. Hit the *cog wheel* and set up *Curve Fit*, *Width*, *Contrast*, and *Frequency* as shown on the screen shot.



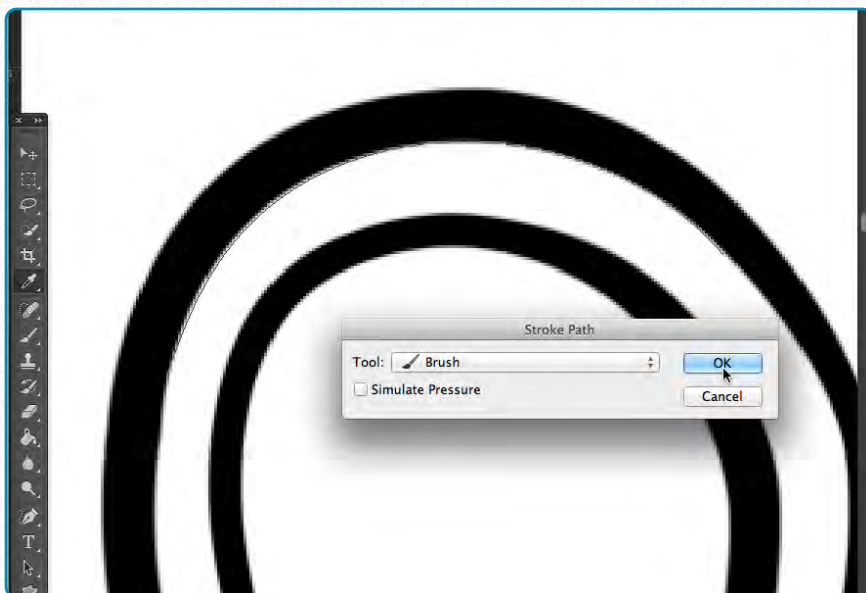
(3) Start drawing your path along the area you want to modify. When you finish your path, hit *Return/Enter* (it works best when it's configured as a hot key on your Wacom tablet).



(5) Once you're satisfied with the result, you can *Move* your path to a different location by hitting the *Select Path tool* (black arrow on the Tools Bar) or delete it (*Right Click/Delete Path* or *Esc*).



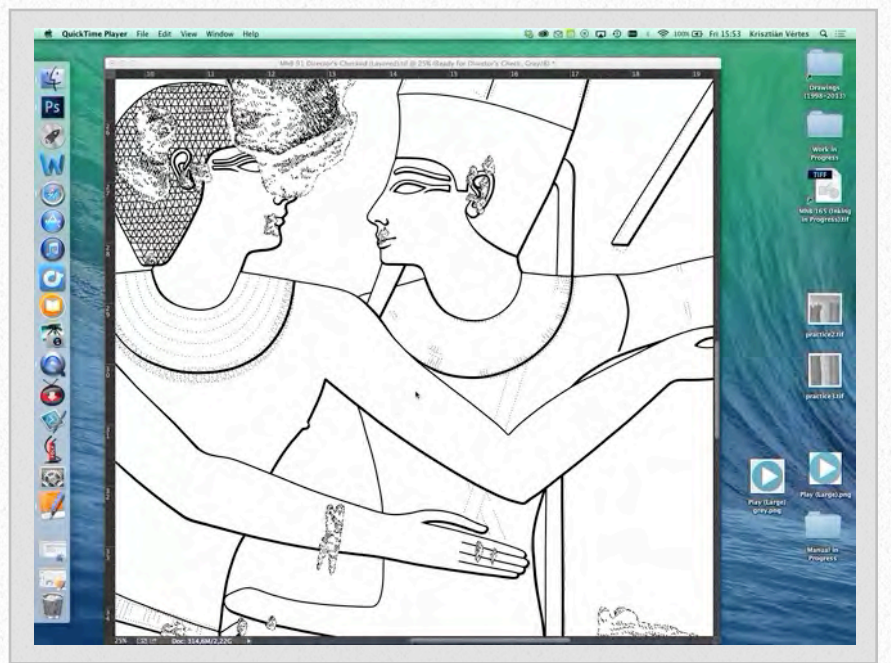
VIDEO TUTORIAL



(4) Now that the path is set up, right click/secondary click on it and choose *Stroke Path/Brush* or *Stroke Path/Eraser* depending on the nature of modification you'd like to apply.



DOWNLOAD HERE



To download the demonstration video, click on the following link:

<https://www.dropbox.com/s/erhfk7x908rehdb/Using%20the%20Magnetic%20Pen%20for%20%E2%80%9CSnapping%E2%80%9D%20Paths%20%28SD%29.m4v>

Puppet Warp - this function enables the artist to distort selected areas on a drawing via a *mesh overlay* and the placement of *pins*. Although we've already applied certain transformations on selected areas (*File/Transform/Scale*, *Rotate*, or *Distort*), these are not comparable with Puppet Warp when it comes to flexibility. Before starting any interaction with the selected areas the artist - as always - needs to familiarize himself/herself with the tool's settings on its *Options Bar*:

Mode - determines the elasticity of the mesh, *Distort* being ultra-stretchy and

Rigid being the opposite (*Rigid* is suggested).

Density - specifies the spacing of the mesh, where small changes in moving the pins result in larger warps (*fewer points* is suggested).

Expansion - expands or contracts the outer edges of the mesh (changing it to at least 3 *pixels* suggested, so as to pick up the grayscale edges of the inked line)

Show Mesh - displays the pins without the mesh when unchecked. This helps the artist when executing fine line movements.

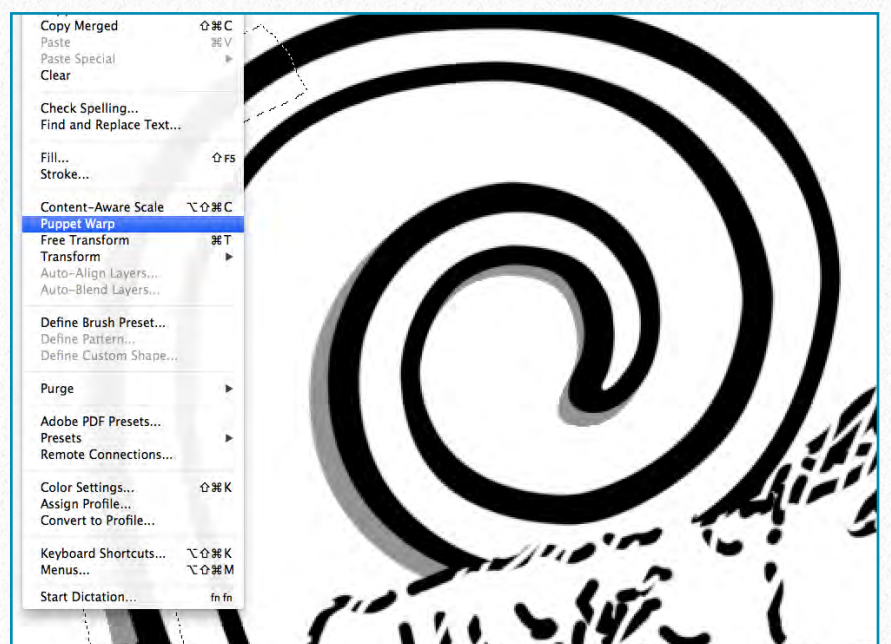


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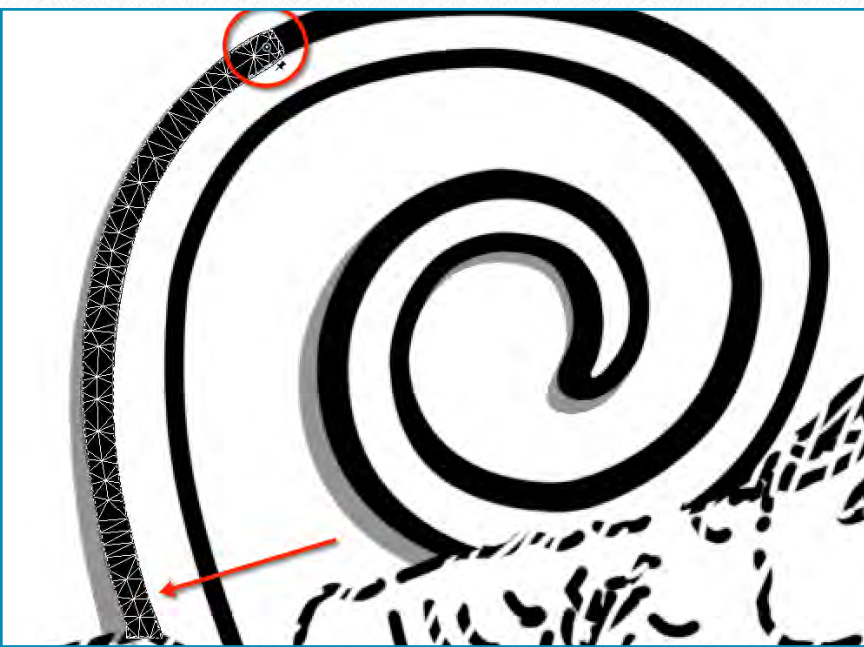


(1) Select the area that needs to be modified by using the *Lasso Selection* tool.

Puppet Warp



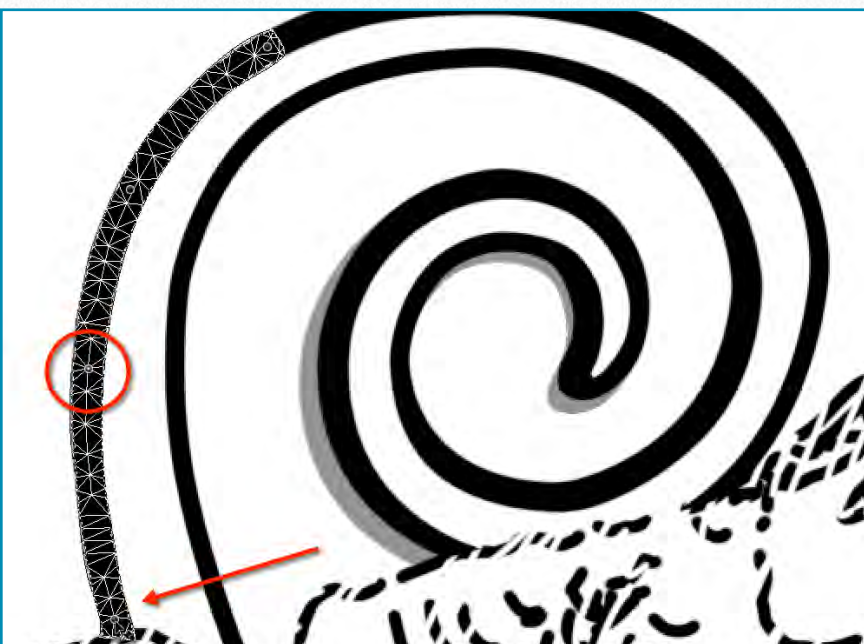
(2) Go to File and select the Puppet Warp tool. Make sure you're on the right layer.



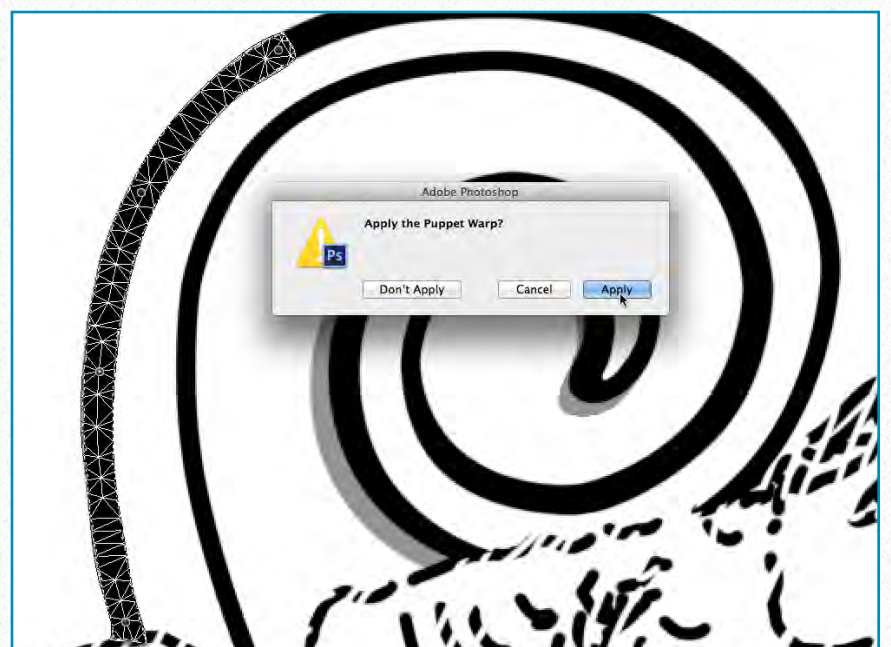
(3) Pin down (*click*) the sections you *don't* want to move and start “pushing” your line to the right direction (*click and drag*).



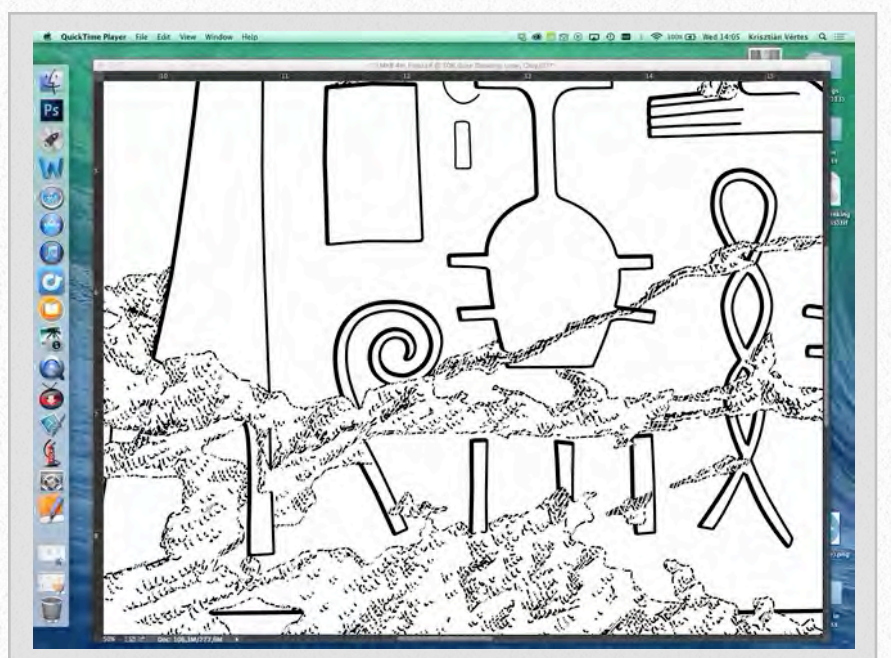
(4) Once more of your line is in place, use *additional pins* to prevent the sections from movement. Keep “pushing” the line.



(5) *Repeat* the last sequence of actions until your line is on the right place.



(6) When done, hit any other tool on the Tool Bar and *Apply* the changes when asked. Alternatively you can just press *Return/Enter*.



To download the demonstration video, click on the following link:

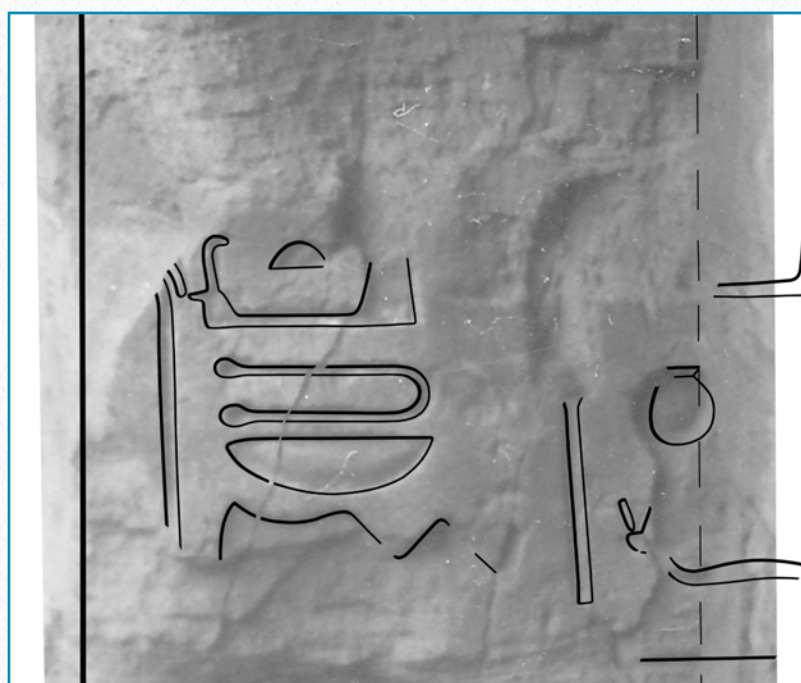
<https://www.dropbox.com/s/kjpgbc8xp4ogj7w/Puppet%20Warp%20%28SD%29.m4v>

Just as when drawing with the Magnetic Pen tool, the artist has a few options to make working with the Puppet Warp more flexible. For instance, one can select multiple pins by using *Shift+click* on the desired pins. Releasing *Shift* allows all pins to be dragged simultaneously. Selecting a pin and pressing *Delete* (*Backspace* on PC) removes the selected pin. Clicking on the curved arrow at the right end on the Options Bar removes all pins at once (*Remove All Pins*). Pressing *Cmd+A* (*Ctrl+A* on PC) selects all pins, while *Cmd+D* (*Ctrl+D* on PC) deselects them. One can hide the mesh by simply pressing *Cmd+H* (*Ctrl+H* on PC) as well. If the artist wants to cancel Puppet Warp he/she can click the *slashed circle icon* at the right end on the Options Bar, or simply press *Esc*. To apply the changes and exit Puppet Warp, one can click the *checkmark icon* at the right end on the Options Bar or simply press *Return* (*Enter* on PC).

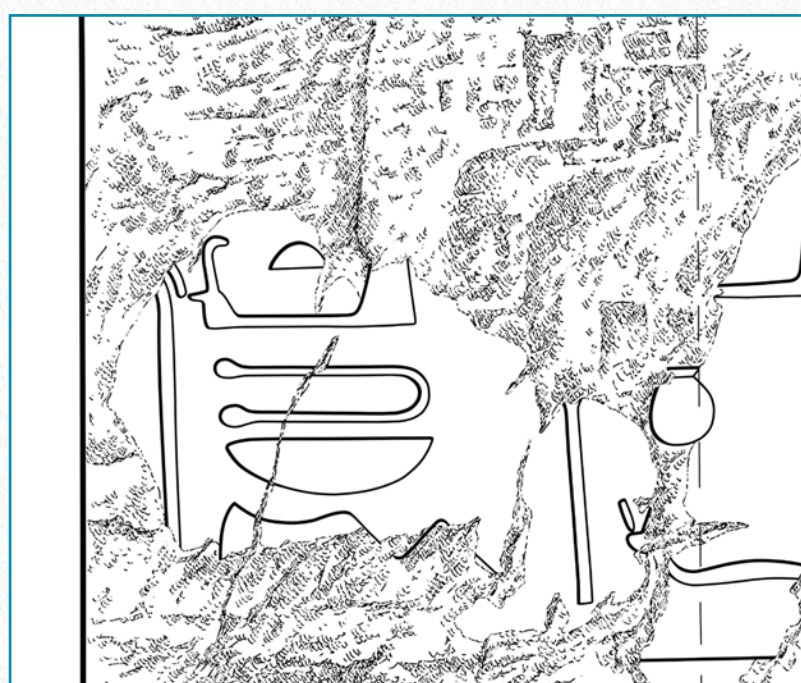
Adding Extra Information from Old Photos - during the process of thoroughly documenting a particular monument, the artist might find additional information by looking at archival photos. Whenever extra information is available (damage under cemented areas, more of the carving exposed, etc.), the artist needs to add it by



MHB 4s (detail) - Recent photo with cement



MHB 4s (detail) - Archive photo aligned



MHB 4s (detail) - Old damage added

importing and aligning the appropriate photos with the rest of the decoration.



MORE READING

On how to use Puppet Warp for photo modification (pointing out some of its drawbacks as well):

<http://www.photoshopdaily.co.uk/tutorials/use-the-puppet-warp-tool/>

6

Ongoing Projects

Working digitally on-site with portable tablet computers, Using Photoshop for studying color enhancements, Presenting more complex decorative programs



MhB Facade (detail) - Digital color pencil enhancement over photo

Technology is evolving in giant leaps, and as a result the digital artist has constantly to keep an eye on how to incorporate the new achievements into his/her work. As of the writing of this Manual, portable tablet

computers, such as Apple's iPad, are coming into common use in field archaeology. Although they are fairly powerful devices and widely used for *in situ* data processing, they haven't quite reached the level of

accuracy needed for epigraphic documentation. If the artist wants to draw digitally on site at the monument, he/she needs to have a portable yet powerful device with large graphic memory, a very high-resolution screen with minimal glare, and a very accurate digital stylus. Until now this setup could be achieved only in the studio, by using the equipment explained in this Manual.

The method described in the past chapters is a *hybrid*. Although the final version of the Epigraphic Survey's documentation process can now be done digitally, the initial documentation is still made by free-hand on traditional media (i.e., a printed photographic enlargement). This means that the artist has to go to the wall, create the initial copy (done manually), scan it, ink it (done digitally), print different versions at certain stages for collation (done manually), and finally reenter the modified data (done digitally). When the epigraphic method used by the Epigraphic Survey was invented, it was invented in a way that would keep data loss at the minimum during the entire documentation process, and this is why *digital epigraphy* has to move in the same direction.

Until that happens, there are still plenty of different directions that can be explored.

Some of the new digital projects carried out by the Epigraphic Survey take digital documentation even a step further. One of these approaches concentrates on the enhancements that can be applied to already existing drawings, while the other one extends the layer system to the extreme when dealing with complex decorative programs. But it is important to emphasize that both of the following methods are based on the artist's close observations made at the wall while drawing a carefully executed initial version of the decoration.

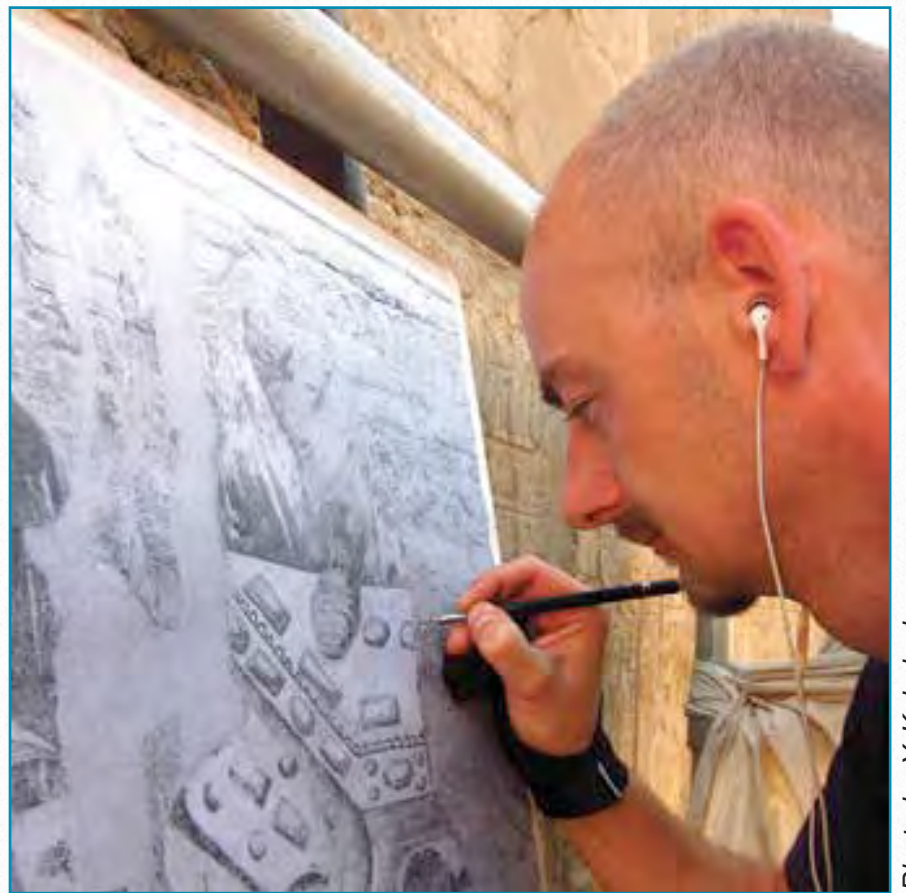


Photo by Y. Kobylecky

*Krisztián Vértés penciling Roman frescoes,
Imperial Cult Chamber, Luxor temple*

Medinet Habu B - Façade Color Composite



MHB 118 - Enhanced color pencil drawing (detail)

This project is a *Digital Color Pencil* enhancement based on the scene numbered MHB 118, which shows multiple layers of carved and painted decoration from various historical phases. The original drawing was created on paper using the traditional Chicago House Method. At a later stage, it was set up as the background for a color study of its Ptolemaic layer's painted details. This enhanced color pencil drawing was drawn on mylar (matte acetate paper) and - after scanning - was set up as a

layer over the traditional black-and-white line drawing. MHB 118 is one of the central scenes at the Medinet Habu Small Amun Temple façade, and therefore it's one of the best candidates for demonstrating how the temple looked in all its polychrome glory in Ptolemaic times.

Once the existing façade section drawings (*MHB 207 NL*, *MHB 207 NR*, *MHB 118*, *MHB 210/211 L* and *MHB 210/211 R*) were scanned and pasted together in Photoshop, they had to be aligned with the fa-

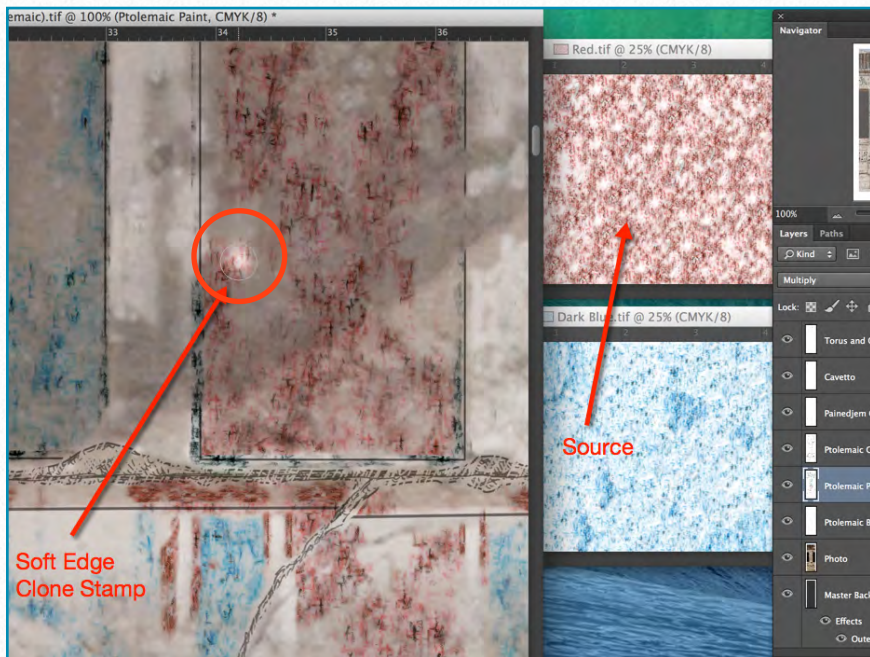
çade *photo* and the *color pencil* drawing made of MHB 118. Since the top and the bottom of the façade (i.e., the cavetto cornice and the base of the wall) weren't formally drawn, these architectural elements were added digitally and inked in Photoshop.

When the composite drawing was ready to be colored, color patterns had to be made, based on the actual color pencil texture used on MHB 118. These textures were the result of *cloning* more intense and less intense color areas into a rectangular pattern. Each color panel was saved as a .tiff and used later on as a sample for adding colors to the scene (1).

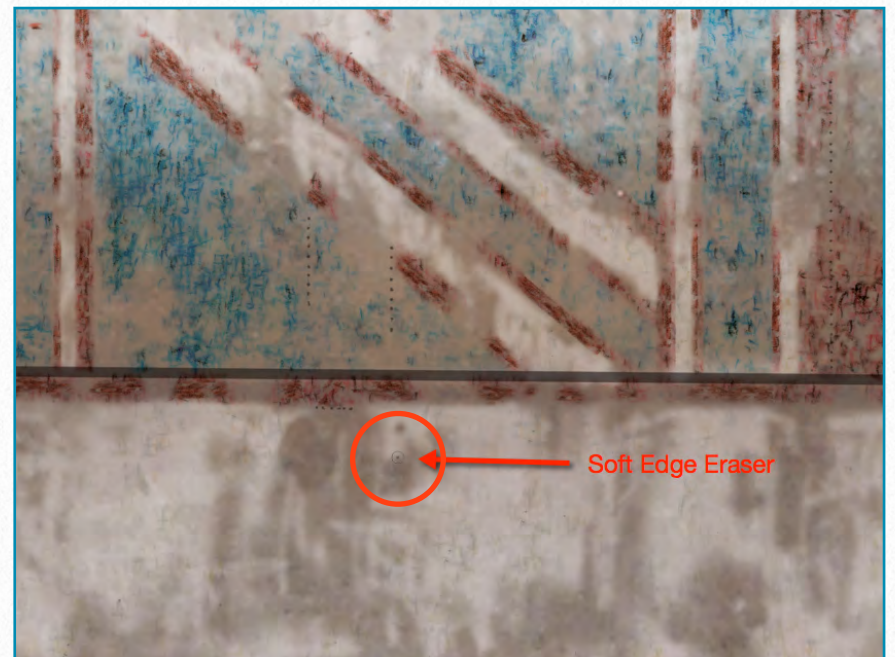
Particular difficulties arose when *outlines* needed to be added. Some of the simpler outlines, such as straight lines, were created digitally and used the same way as the rectangular color patterns. The Clone Brush needed to be set very soft to get the necessary blending effect when applied (2).

More difficult outlines, such as the *cavetto* cornice details, had to be drawn on mylar first, than scanned and used as a clone pattern for each detail. Of course, all of these details were carefully studied at the temple and marked on the photo for reference (3).

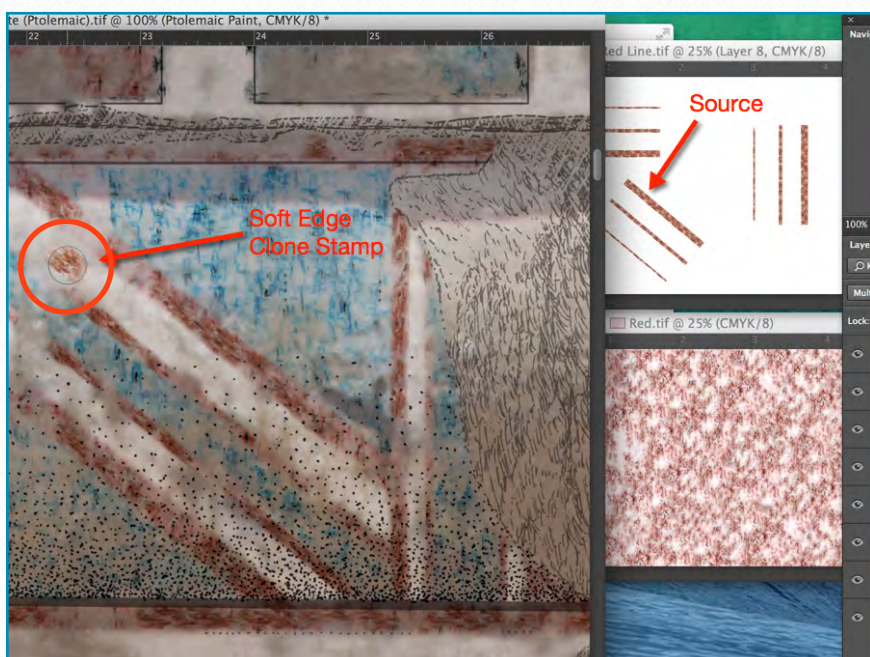




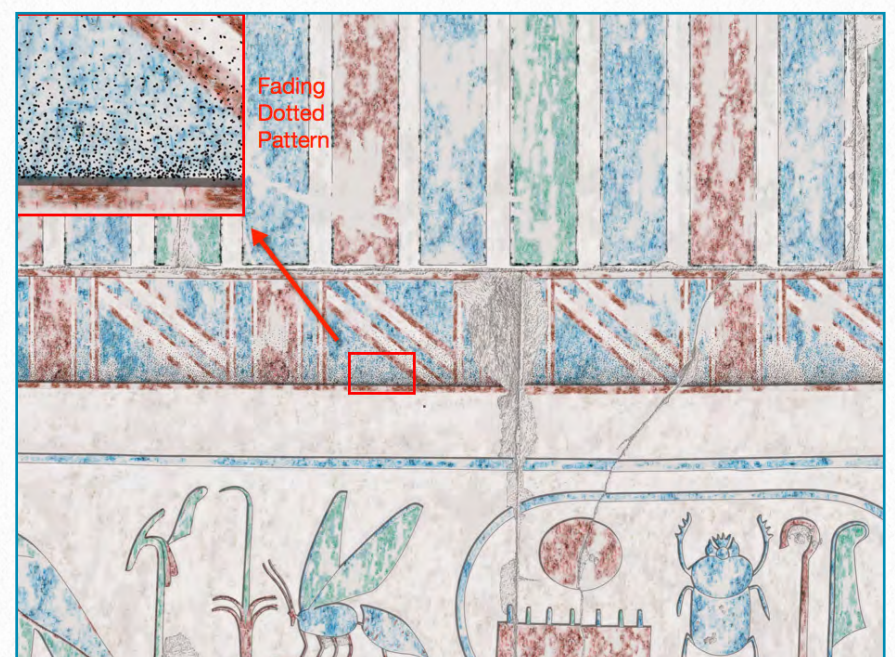
(1) Cloning red color pencil pattern



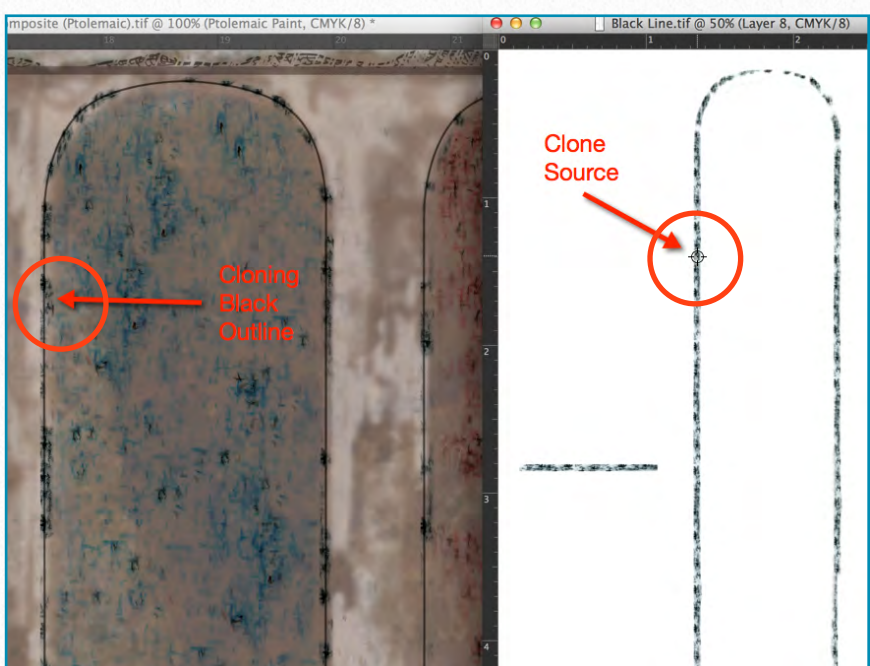
(4) Creating damaged paint surface



(2) Cloning angular red outlines



(5) Adding dotted pattern for depth



(3) Cloning curved black outlines



(6) Adding background to show white paint

Once all the color details were added to the surface it needed to get the same slightly *worn paint texture* that made MHB 118 distinctive. (The reason for applying worn paint texture on MHB 118 was to avoid adding dubious details over faded or damaged areas.) Some of the paint needed to be deleted by using the *soft edge eraser* in different sizes (4).

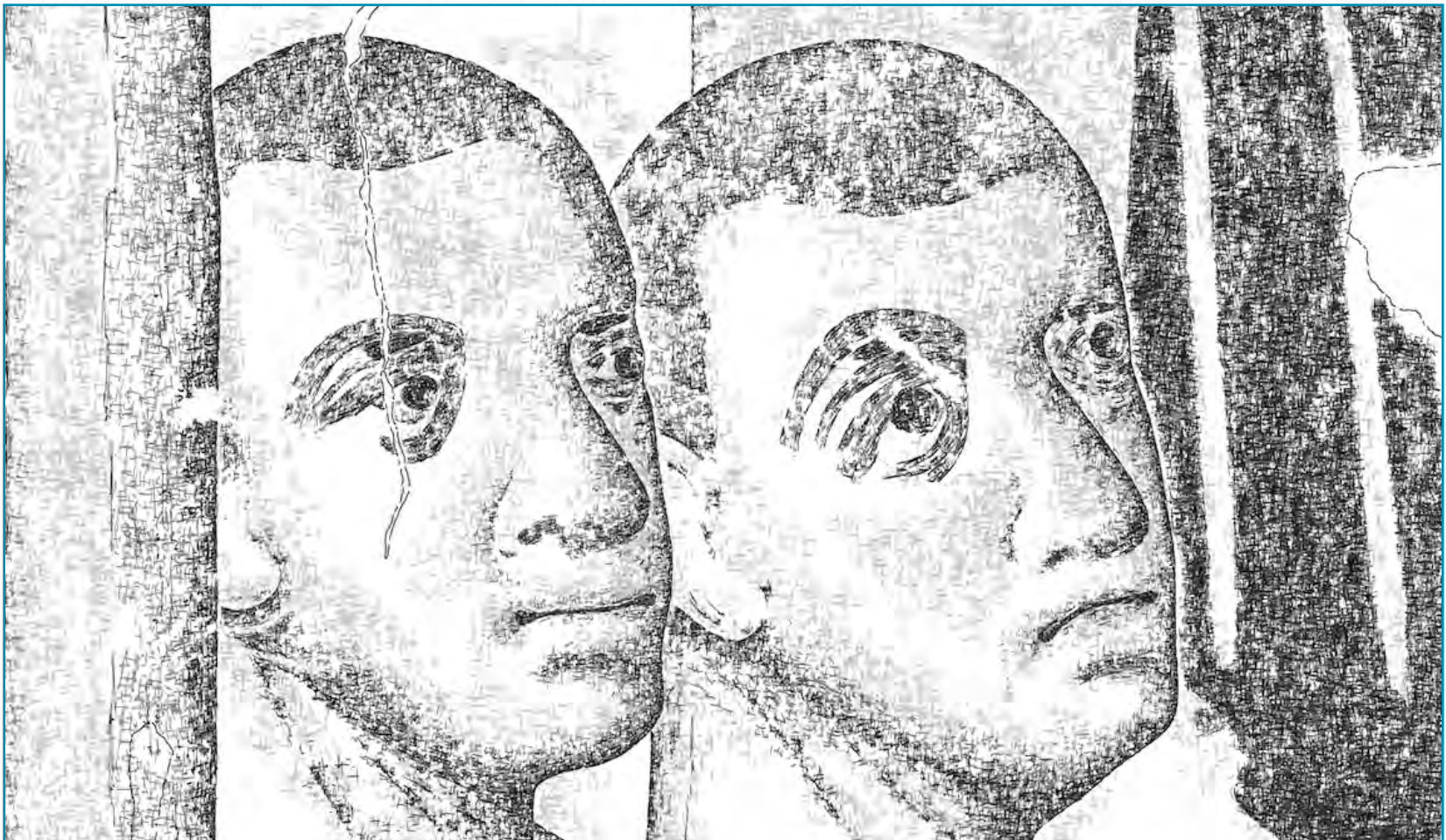
When all the paint-related additions were applied and the photographic background was turned off, certain *architectural features* (the cavetto cornice and the torus) lost their three-dimensional appearance. Therefore additional stripes of *fading dotted pattern* were added to the drawing over the top of the cavetto cornice and the bottom of the torus, emphasizing these projecting architectural elements (5).

Finally, the drawing's background needed to be changed to *light gray* to prevent the white brush strokes from disappearing. An effect (fx) was applied over this background (*Outer Glow*) for a more natural interaction with the transparent paint layers. The *blend mode* of the whitewash paint layer (the painted background on the façade) was changed to *Pin Light*, which gave a more moderate brightness to the white texture (6).



MHB façade drawing (detail)

Luxor Temple - Roman Fresco Studies



LT 20115 (detail) - Multilayered representation of Roman fresco

Documenting the Roman frescoes in the *Imperial Cult Chamber* at Luxor temple is a rather unique Epigraphic Survey project. A few years ago, these frescoes went through a very thorough restoration process, including extensive photo documentation. The results of this preliminary work are being published now by the American Research Center in Egypt.

When the decision was made to undertake more in-depth recording of these frescoes, there was a long debate about which aspects of the fresco should be emphasized on a drawing and about how to differenti-

ate its rather distinctive style from the Pharaonic scenes behind it. The solution was to design a method that shows a wide range of (mostly) eroded painted details, at the same time keeping the simplified graphic language that the Epigraphic Survey invented for relief documentation. Once again, the goal was not to replace the already-produced color photos, but to complement them with drawings showing synthesized and enhanced details of the paintings.

The *in situ* drawing was created by using *pencil lines* on a photo enlargement. The

underlying Eighteenth Dynasty relief decoration, visible in areas where the fresco had fallen away, was treated using the traditional Epigraphic Survey conventions, while the fresco was penciled using a crisscrossed pencil *pattern* instead of outlines. This method allowed the artist to indicate such subtle areas as eroded surfaces where very little pigment was left, and regular pencil lines couldn't be used. In most cases the observer's eyes piece these patterns together into distinct features.

Scanning was executed *in stages* to be able to separate the penciling from the background photo, and we've written about it in detail in *Chapter 4, Section 3*. The first attempt was to recreate the fresco pattern digitally, which required a thorough copy of the *in situ* pencil crisscrosses throughout the entire drawing (1).

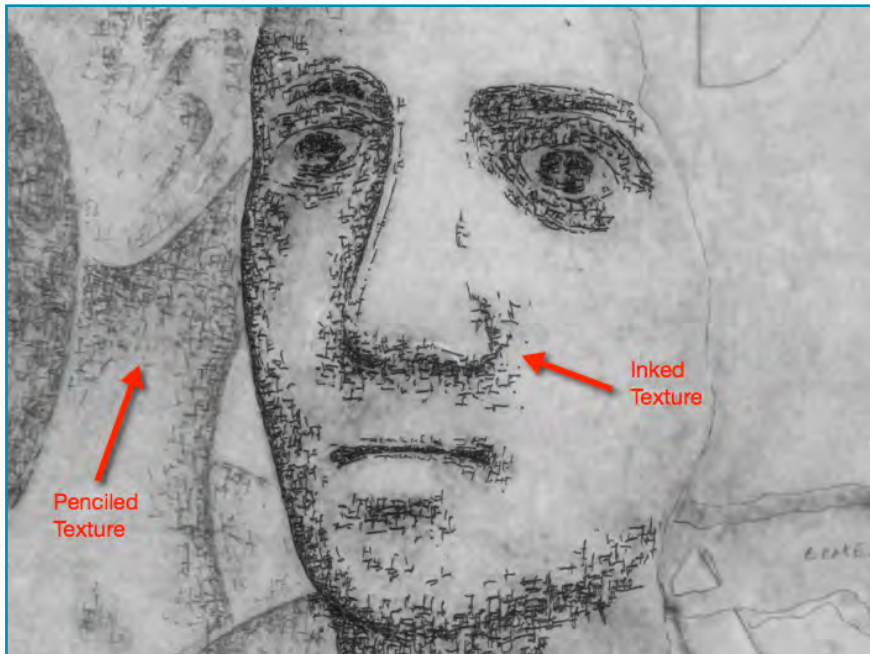
Later on another layer was added on top of the first, containing much less texture, but a lot more depth and definition. To distinguish between layers and get the desired effect, different opacity effects were added to each layer. Changing the *Layer Opacity* instead of setting up different brushes allowed the artist to work with the same brush sets on every layer (2).

In the next step, a lighter texture was added on yet another layer, indicating sub-

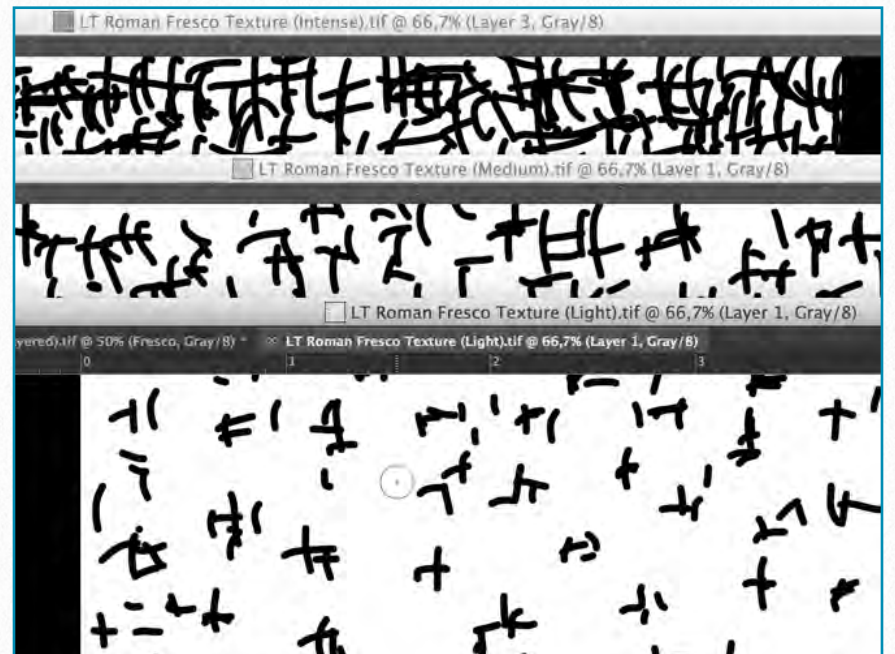


LT 20115 - Enhanced color photo (detail)

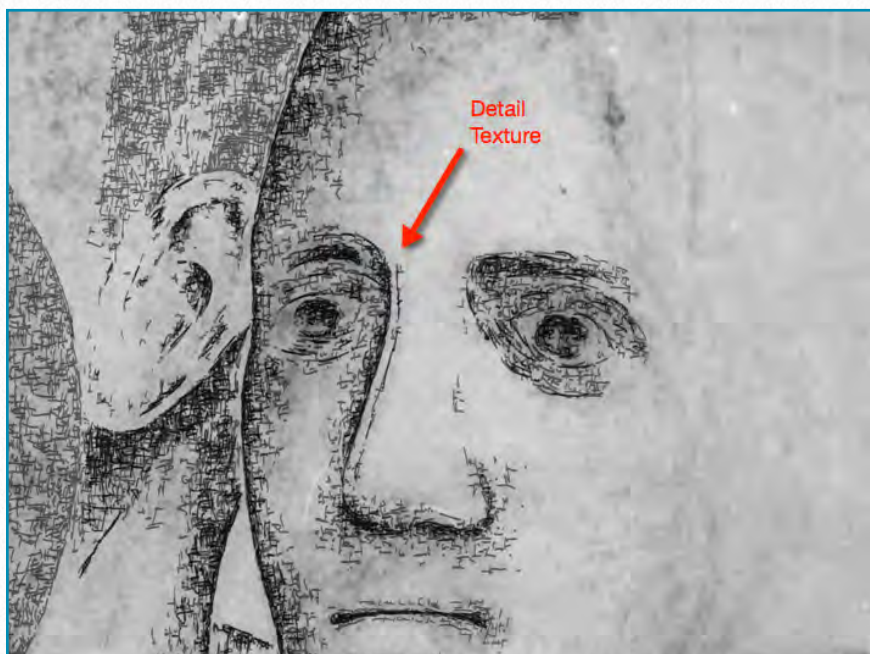
Photo by Y. Kobylecky



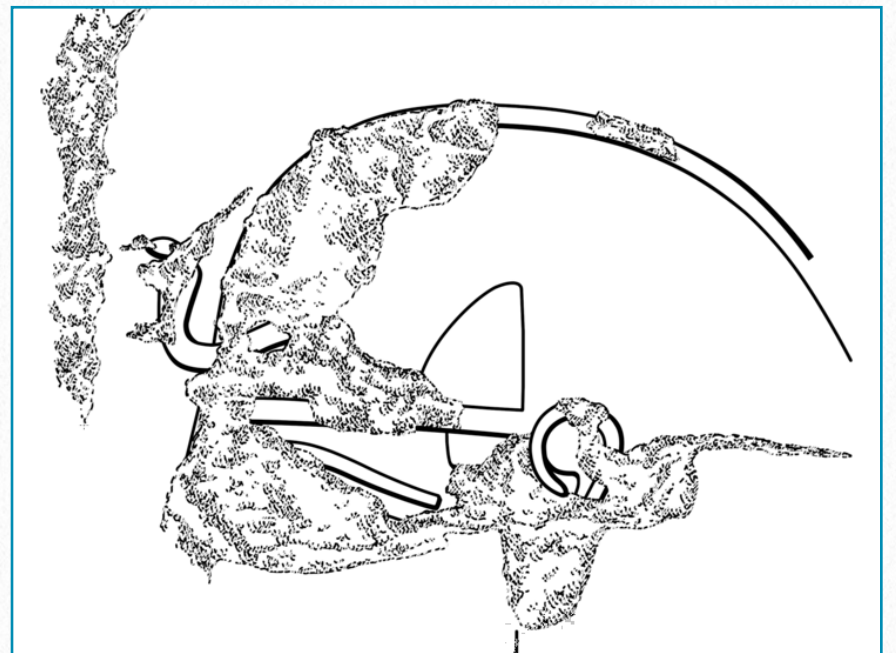
(1) Inking penciled texture



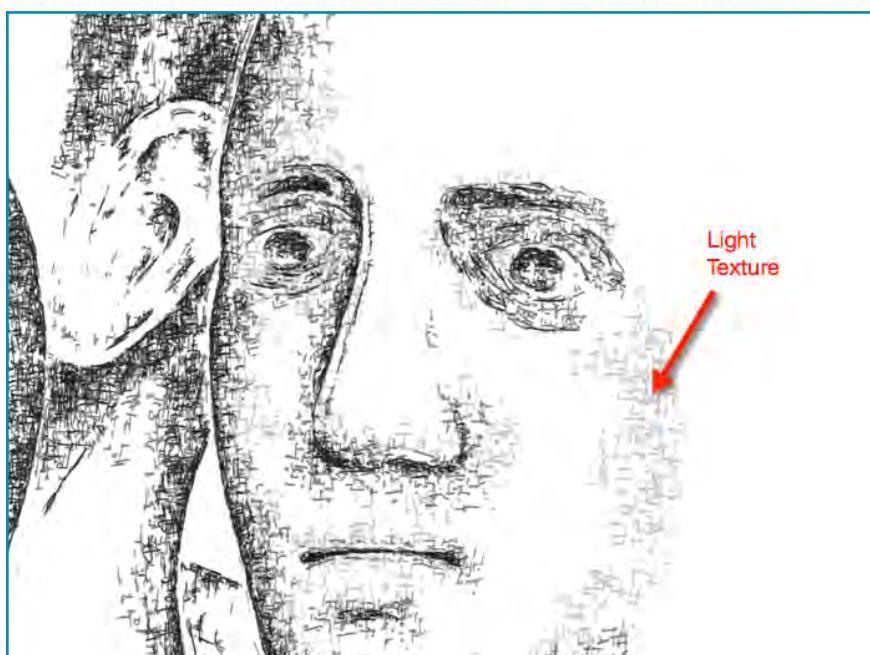
(4) Light, medium, and intense texture patterns



(2) Adding a darker texture for depth



(5) Drawing carved lines and damage on the relief



(3) Adding a lighter texture for details



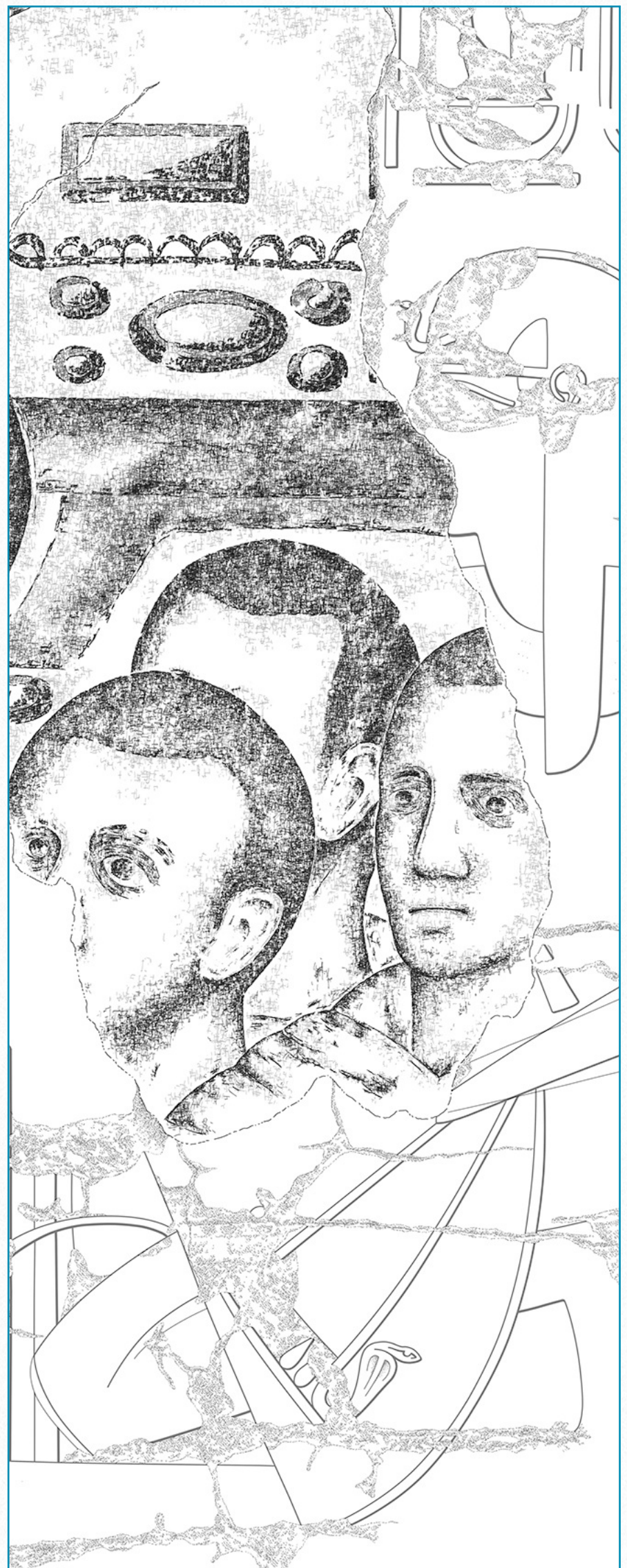
(6) Reducing relief opacity to emphasize fresco

tle enhancements for capturing details. At this point, all three layers were based on the same black brush line texture, with the opacity being 30-60-80% respectively (3).

When adding texture to large homogeneous areas (draperies, background, etc.) a pattern of crisscrossed lines in different densities was used to speed up the process. The same *Pattern Stamp tool* was used for adding lighter detail textures as well (4).

While no damaged areas or any other non-decorative surface elements were added to the fresco to avoid overcomplicating its appearance, the Pharaonic layers were treated in the opposite way. The result was a richly textured fresco drawing with only damage outlines included, juxtaposed with a much more simply outlined relief representation, including rich textured damage surfaces (5).

For presentation purposes, the Pharaonic layers had to *stay in the background*, so all these layers' opacities were taken down to 50%. This change gave the layers a very similar appearance to the actual situation on the wall. Many different versions can therefore be printed based on the opacity of each layer, depending on what features need to be emphasized (6).



LT 20115 (detail) - Digital composite drawing

Photo by Y. Kobylecky

Digital Penciling - First Impressions



Keli Alberts and Sue Osgood “penciling” digitally at Medinet Habu

One of the most recent and exciting new Epigraphic Survey projects, as mentioned earlier, is to experiment with Wacom’s technology on-site. Until very recently it was nearly impossible to undertake digital drawings in the field, right at the monuments, due to the limitations caused by the digital tablet’s large size and heavy weight. Portability will no longer be an issue, however, with the release of *Wacom’s Companion* line. In the winter of 2014 the Survey is testing these new tablets, which use the Windows 8 operating system and the full version of Adobe Photoshop Creative Cloud.

With *Wacom’s Companion*, it is possible to use a scanned photograph instead of a printed enlargement for the drawing background, “penciling” directly on the digital image in the presence of the inscribed wall surface. There are a few issues to be addressed with this new technique:

- The tablet needs to be secured at the wall, but at the same time the artist must be able to perform the usual rotation of the surface and bending movements, etc., while supporting his/her arms to draw with the full range of physical motion.

- The computer interface has to be somewhat simplified, so as to focus on producing content in the on-site environment, rather than constantly adjusting the computer's settings and controlling the technical aspects of the software.
- The brush needs to imitate the feel of an actual technical pencil on paper, allowing the artist to search for the right curve by going over and over the same area and gently building up his/her drawing.

Due to the tablet's size, it needs to be inserted into some kind of wooden frame to give the necessary support to the artist's arms. While the first experiments have been made on the tablet by simply putting it on a regular drawing board, a special drawing case is now being designed and produced **(1)**.

To simplify the drawing environment for the artist, special preset templates have been made containing all the necessary layers he/she will encounter during the entire drawing process (from penciling through inking). These templates are provided according to the actual scale in which the drawing is made. Therefore, once the scanned photo negative is imported into the appropriate template and adjusted to the proper scale, it is ready to be penciled **(2)**.



MHB 172s - Scanned photo negative (detail)

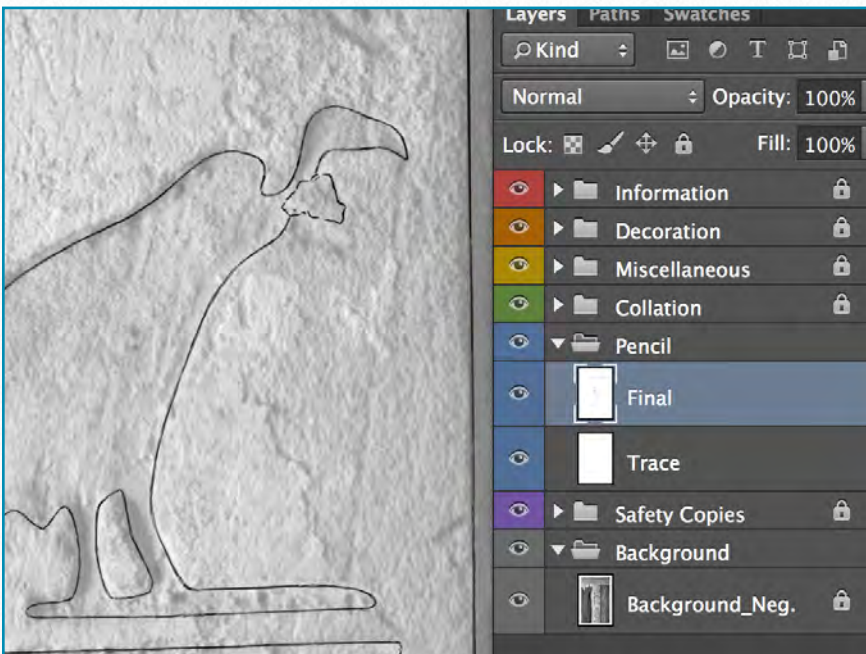
Photo by Y. Kobylecky



(1) Setup made for working on the tablet



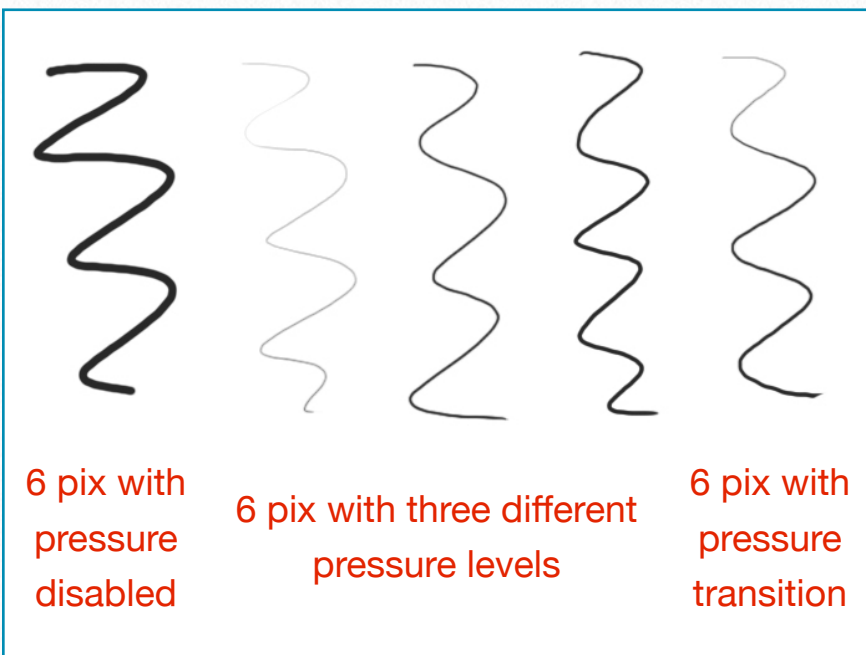
(4) Searching for the right curve with the Brush tool



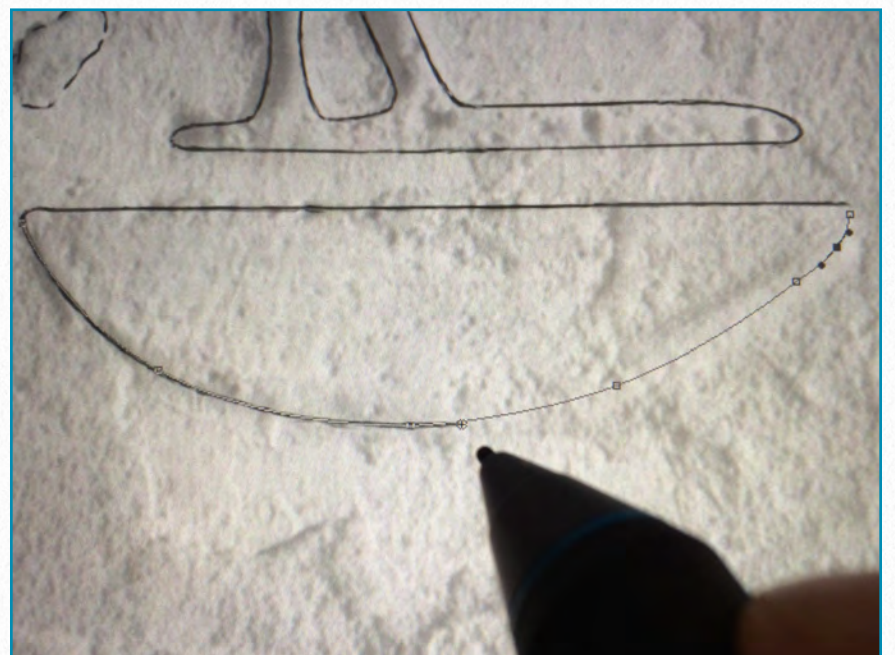
(2) Template with the Pencil Layers included



(5) Using a "soft" eraser for refining edges



(3) Changes in line weights by adding pressure



(6) Work path indicating pencil line placement

A new pressure-sensitive brush type was designed for digital penciling, allowing the artist to perform very light, almost invisible strokes with the brush. There are many different ways to imitate pencil in Photoshop, from texture-based strokes all the way to using erodible brush tips. Our choice at Chicago House was aimed at simplicity and effectiveness **(3)**.

Every artist's penciling style is obviously different, but one thing is common to all: the artist has to search for the right curve (i.e., the correct rendering of the inscribed line) before putting down the final version. The pressure-sensitive brush helps by using fine transitions and imitates the way in which the artist accomplishes the same strokes on paper **(4)**.

Although erasing on the surface can be relatively straightforward, sometimes one just wants to make the "pencil" line a little thinner, a little straighter, or somewhat less wiggly. In these cases using a soft eraser (Hardness at 50%) helps a great deal to improve the line quality **(5)**.

Finally, there are the usual technical aids when penciling: by holding down *Shift* we can draw straight lines and, by *selecting* certain areas, we can move line sections or perform the usual *transformations*, as described earlier in this Manual. Some-



MHB 172s - Digital penciling on photo (detail)

times setting up *work paths* as guides when testing out where to put the pencil lines can also be useful **(6)**.

Of course, these observations and the nuances of the evolving techniques are based on our very first impressions using Wacom technology in the field. A more complete treatment of this new approach to field documentation will appear in the first major update to this book in the near future.



The Epigraphic Survey at Work

Digital Epigraphy

Written and designed by Krisztián Vértés



7

Supplements

Additional reading material for the digital artist, The most important Photoshop shortcuts for the Mac, Shortcut cheat-sheet for the artist

Additional reading material for the Digital Artist:

General knowledge:

Lesa Snider: Photoshop CS6: The Missing Manual (2012)

<http://www.amazon.com/Photoshop-CS6-Missing-Manual-Manuals/dp/1449316158>

Adobe Creative Team: Adobe Photoshop CS6 Classroom in a Book (2012)

http://www.amazon.com/Adobe-Photoshop-CS6-Classroom-Book/dp/0321827333/ref=sr_1_1?s=books&ie=UTF8&qid=1384499524&sr=1-1&keywords=photoshop+cs6

Peter Bauer: Photoshop CS6 For Dummies (2012)

http://www.amazon.com/Photoshop-CS6-Dummies-Peter-Bauer/dp/1118174577/ref=sr_1_5?s=books&ie=UTF8&qid=1384499616&sr=1-5&keywords=photoshop+cs6

Digital painting:

Carlyn Beccia: Digital Painting for the Complete Beginner (2012)

http://www.amazon.com/Digital-Painting-Complete-Beginner-Carlyn/dp/0823099369/ref=sr_1_4?s=books&ie=UTF8&qid=1384499696&sr=1-4&keywords=digital+painting

Nykolai Aleksander: Beginner's Guide to Digital Painting in Photoshop (2012)

http://www.amazon.com/Beginners-Guide-Digital-Painting-Photoshop/dp/0955153077/ref=sr_1_1?s=books&ie=UTF8&qid=1384499859&sr=1-1&keywords=digital+painting

Periodical:

Practical Photoshop Magazine (<http://www.practicalphotoshopmag.com>)

Photoshop CS6

Useful Keyboard Shortcuts: Mac

nobledesktop.com

TOOLS

V	Move
M	Marquee tools
L	Lasso tools
W	Quick Selection, Magic Wand
C	Crop and Slice tools
I	Eyedropper, Color Sampler, Ruler, Note, Count
J	Spot Healing Brush, Healing Brush, Patch, Red Eye
B	Brush, Pencil, Color Replacement, Mixer Brush
S	Clone Stamp, Pattern Stamp
Y	History Brush, Art History Brush
E	Eraser tools
G	Gradient, Paint Bucket
O	Dodge, Burn, Sponge
P	Pen tools
T	Type tools
A	Path Selection, Direct Selection
U	Rectangle, Rounded Rectangle, Ellipse, Polygon, Line, Custom Shape
K	3D tools
N	3D Camera tools
H	Hand
R	Rotate
Z	Zoom
D	Default colors
X	Switch Foreground and Background colors
Q	Quick Mask Mode

SWITCHING TOOLS

To switch between all tools within groups, add the Shift key to the letters above.
For example, to switch between rectangular and elliptical marquee.....Shift-M

SELECTING

Draw Marquee from Center	Option-Marquee
Add to a Selection	Shift
Subtract from a Selection	Option
Intersection with a Selection	Shift-Option
Make Copy of Selection w/Move tool	Option-Drag Selection
Make Copy of Selection when not in Move tool	⌘-Option-Drag Selection
Move Selection (in 1-pixel Increments)	Arrow Keys
Move Selection (in 10-pixel Increments)	Shift-Arrow Keys
Select all Opaque Pixels on Layer	⌘-Click on Layer Thumbnail (in Layers panel)
Restore Last Selection	⌘-Shift-D
Feather Selection	Shift-F6
Move Marquee while drawing selection	Hold Space while drawing marquee

VIEWING

Fit on Screen	Double-click on Hand tool or ⌘-0
100% View Level (Actual Pixels)	Double-Click on Zoom Tool or ⌘-Option-0
Zoom in	⌘-Space-Click or ⌘-Plus(+)
Zoom out	Option-Space-Click or ⌘-Minus(-)
Hide all tools and panels	Tab
Hide all panels except Toolbox and Options bar	Shift-Tab
Rotate through full screen modes	F
Scroll image left or right in window	⌘-Shift-Page Up/Down
Jump/Zoom to part of Image	⌘-drag in Navigator panel
Toggles layer mask on/off as rubylith	\

LAYER SHORTCUTS

Create new layer	⌘-Shift-N
Select non-contiguous layers	⌘-Click layers
Select contiguous layers	Click one layer, then Shift-Click another layer
Delete Layer	Delete key
View contents of layer mask	Option-Click layer mask icon
Temporarily turn off layer mask	Shift-Click layer mask icon
Clone layer as you move it	Option-Drag
Find/Select layer containing object	Control-Click on object w/Move tool
Change layer opacity	Number keys (w/Move tool selected)
Cycle down or up through blend modes	Shift-Plus(+) or Minus(-)
Change to a specific blend mode (w/Move tool) Shift-Option-letter (ie: N=Normal, M=Multiply. etc.)
Switch to layer below/above current layer	Option-[or Option-]
Move layer below/above current layer	⌘-[or ⌘-]

TYPE SHORTCUTS

Select all text on layer	Double-Click on T thumbnail in Layers panel
Increase/Decrease size of selected text by 2pts	⌘-Shift->/<
Increase/Decrease size of selected text by 10 pts	⌘-Option-Shift->/<
Increase/Decrease kerning/tracking	Option-Right/Left Arrow
Align text left/center/right	⌘-Shift-L/C/R

PAINTING

Fill selection with background color	⌘-Delete
Fill selection with foreground color	Option-Delete
Fill selection with foreground color using Lock Transparent Pixels	Option-Shift-Delete
Fill selection with source state in History panel	⌘-Option-Delete
Display Fill dialog box	Shift-Delete
Sample as background color	Option-Click w/Eyedropper tool
To get Move tool	While in any painting/editing tool-hold ⌘
To get Eyedropper with Paint tools	Option
Change paint opacity (with Airbrush OFF)	Number keys
Change paint opacity (with Airbrush ON)	Shift-Number keys
Change Airbrush flow (with Airbrush ON)	Number keys
Change Airbrush flow (with Airbrush OFF)	Shift-Number keys
Cross-Hair Cursor	Any painting/editing tool-turn Caps Lock on
Decrease/Increase Brush Size	[or]
Decrease/Increase Hardness of Brush	Shift-[or Shift-]
Switch between preset Brushes	< or >
Open Brushes pop-up panel	Ctrl-Click in Image window
Erase to History panel's source state	Option-Eraser
Cycle down or up through blend modes	Shift-Plus(+) or Minus(-)
Change to a specific blend mode	Shift-Opt-letter (ie: N=Normal, M=Multiply, etc.)
Create fixed color target from within a dialog box	Shift-Click in image window
Delete fixed color target	Option-Click on target with Color Sampler tool
Create new spot-color channel from current selection	⌘-Click on New Channel button in Channels panel

PEN TOOL SHORTCUTS

To get Direct Selection tool while using Pen	⌘
Switch between Add-Anchor and Delete-Anchor Point tools	Option
Switch from Path Selection tool to Convert Point tool when pointer is over anchor point	⌘-Option
To Select a whole path w/Direct Selection tool	Option-click
Convert path to a selection	⌘-click on path name (in Paths panel)

PANEL SHORTCUTS

Show/Hide Brushes panel	F5
Show/Hide Color panel	F6
Show/Hide Layers panel	F7
Show/Hide Info panel	F8
Show/Hide Actions panel	Option-F9
Open Adobe Bridge	⌘-Option-O

OTHER SHORTCUTS

Switch between open documents	⌘-~
Undo or Redo operations beyond last one	⌘-Option-Z/⌘-Shift-Z
Apply Last Filter	⌘-F
Opens Last Filter Dialog Box	⌘-Option-F
Hand Tool	Spacebar
Reset Dialog Box	Hold Option, Cancel turns into Reset Button, Click it
Increase/Decrease value (in any option field) by 1 unit	Up/Down Arrow
Increase/Decrease value (in any option field) by 10 units	Shift-Up/Down Arrow
Repeat Last Transformation	⌘-Shift-T
Measure Angle between Lines (Protractor Function) After ruler is drawn, Option-Drag end of line with Ruler Tool
Move Crop Marquee while creating	Hold Space while drawing
Snap Guide to Ruler ticks	Hold Shift while dragging
Highlight Fields in Options bar (n/a for all tools)	Return
Don't Snap object edge while moving	Hold Control while dragging



Useful Information for the Epigraphic Survey Artist



Pen tool + Command whilst creating path: changes to Direct Selection tool allowing repositioning of previously drawn anchor points.

8

Glossary

Short description of the most common technical terms appearing in this book. This list is based on the digital artist's special needs.

Align - Allows the artist to align layers or selections within an image. There are several ways to align objects: top, vertical center, left, horizontal center, and right.

Anchor points - As lines and curves are drawn using the Pen tool, anchor points are created that define the line, its endpoints, and its curves. Anchor points can be added or deleted from a shape, and they can be edited.

Anti-aliased/Anti-aliasing - Anti-aliasing is the process of smoothing edges around a selection. It differs from feathering in that it does not blur the edges but instead softens them by blending the colors of the outer pixels with the background pixels. This results in no loss of detail. One must choose anti-aliasing before selecting; it cannot be added after a selection has been made.

Art History Brush - Allows the artist to change an image to make it look like some other type of artwork—artwork that is older, such as impressionist artwork, an oil painting, or a watercolor. These changes are unlike filters and similar tools because they allow you to brush over only part of

the image to make the changes and do not apply the change to the entire image or layer.

Blending modes - A layer's blending mode determines how the layer's colored pixels will mix (relate) with the underlying pixels in the image. By default, there is no blending of layers, but by choosing and applying a blending mode, one can change this. When the blending mode is changed, the order of the image's composition is changed too. Blending modes are generally used to create special effects like adding soft light or hard light or to change the color, saturation, hue, luminosity, or other attributes of how the layers can be combined.

BMP files - Bitmap files, which are pixel-based files usually considered standard Microsoft Windows files. Bitmap files only support RGB color spaces and 1, 4, 8, or 24 bits per channel.

Bounding box - A square or rectangle around an image that allows it to be resized or distorted. When printing, one can check Show Bounding Box. Checking this option adds a bounding box around the im-

age so it can be resized using the corner handles.

Brush tool - The Brush tool allows the artist to select a brush, choose its characteristics, including size, shape, spacing, roundness, hardness, angle, diameter, mode, opacity, and more, and then use the brush for various types of artwork.

Brushes palette - Here the artist can create or access thousands of types of brushes and configure them to meet any drawing need.

Burn tool - The Burn tool is used to darken areas of an image or drawing.

Calibration - Brings a device like a monitor, scanner, or printer to an absolute standard that ensures consistency across devices. Calibrating is especially necessary when files are being passed from one person to another; what others see on their computer, compared to what the artist sees on his/her computer, compared to what the service bureau sees on their computer can differ outrageously.

Channels - Channels are located in the Channels palette and are created automatically when a color mode is chosen and determined based on the colors in the image. In RGB mode, for instance, there are three channels: red, green, and blue.

Clear - This command enables the artist to delete a selection without placing that selection on the clipboard. It's similar to the

Cut command. One has to make sure if there are multiple layers in an image that the layer he/she wants to work with from the layers palette is selected.

Clone Stamp tool - Lets the artist duplicate any area in an image/drawing and "paint" that area over any other part of the image/drawing.

CMYK mode - A color mode that uses cyan, magenta, yellow, and black to create its colors. CMYK mode assigns colors to pixels in percentages that are determined by the inks used (and have configured in the Color Settings). Color values range from 0 to 100 percent. For instance, a teal color might have 51 percent cyan, 4 percent magenta, 19 percent yellow, and 0 percent black. You can see these numbers in the Info palette. All zeroes produces a pure white.

Color gamut - The range of colors that a specific color mode can print in. The RGB color gamut can produce over 16 million colors, while the CMYK color gamut produces substantially less. A gamut is also the range of colors that a system can print or display.

Color palette - Displays information on the current foreground and background colors and allows the artist to change the colors as desired and/or base the colors on different color models.

Color Sampler - Like the Eyedropper tool, this allows one to match a color exactly by

clicking on an area of the image and then offers information about that color. The Color Sampler tool is located with the Eyedropper in the options bar. This tool lets the artist take a snapshot of up to four color samples in an image and lists them in the Info palette. This is useful when one needs to compare one color to another or when it's needed to see the changes in colors after applying image transformations.

Copy - Copies the selection and leaves the image on the original file or image, while at the same time placing it on the clipboard for later use with the Paste commands. Copying a selection, a layer, or text allows one to quickly place the information in another file or the same one without having to recreate it.

Copy Merged - This command makes a merged copy of the visible layers in an image or selected area and places it on the clipboard. This command allows the artist to copy multiple layers at once.

Crop tool - The Crop tool lets the artist remove extraneous portions of an image/drawing or file by selecting a specific portion of the image/drawing and deleting the area outside of it.

Curves tool - Allows one to control the color changes precisely and from the entire tonal spectrum. The Curves tool also allows the artist to preview changes as he/she makes them, as well as view the changes to the ink values in the Info palette at the same time.

Custom shapes - Vector-based clip art that comes with Photoshop that is available from the toolbox under Shapes. Custom shapes can be chosen from the pop-up palette in the options bar.

Cut - A command that is used in many software programs to remove a selection from the file. One can cut text, layers, and manual selections and thus remove them completely from the image. Cutting places the deleted selection onto the clipboard, where it can then be pasted into the same image or another one.

Diameter - Controls the size of the brush and can be set using the slider or by typing in a number.

Direct Selection tool - This tool is used when the artist wants to edit the paths that have been created. Paths allow one to create custom outlines of shapes for various uses, including creating a custom shape, using the shape or path as a mask to hide areas of a layer, adding brush strokes, or for using it as a clipping path.

Distort - A Transform tool that allows one to move an image/drawing in any direction. Distort is also a filter that allows the artist to manipulate the selected part of an image/drawing drastically, offering special effects.

Distribute - Allows one to distribute layers or selections within an image. There are several ways to distribute objects: top, ver-

tical center, left, horizontal center, and right.

Dodge tool - Used to darken areas of an image or drawing. The Dodge tool's name comes from the traditional photographer's method of reducing the amount of light made available when exposing the film to get the picture.

Dot gain - The inherent "growth" of a half-tone dot when printed on paper, vellum, or film. A small dot can grow as much as 50 percent or more when printed.

Dpi - Dots per inch. This describes how many dots per inch can be printed on a page and is a measure of how good a printer is. Generally, printers can print many more dots per inch than the pixels per inch that need to be printed.

Duplicate - Used to duplicate an entire image/drawing and is useful when the artist wants to make changes to a file, such as an image or a drawing, without applying any changes to the actual file that's saved on the hard drive. Duplicate is a choice in the Image menu.

Edge Contrast - This option can be used with the Lasso tools to define the Lasso's sensitivity to the edges of the selection that one's trying to lasso. Values can range from 1 percent to 100 percent. A lower value detects low-contrast edges (those that don't have much contrast with their backgrounds), and a higher value detects edges that contrast sharply with their back-

grounds. Configuring this prior to and during a selection can make selecting an object manually much more efficient (it should be combined with the Zoom tool for best results).

Eraser tool - Erases to the background layer by dragging the mouse.

Eyedropper tool - Like the Color Sampler tool, this allows the artist to match a color exactly by clicking on an area of the image/drawing and then offers information about that color.

Feather - Feathering is the process of blurring edges around a selection. Blurring the edges helps the selection blend into another object, file, or selection when it is moved, cut, copied, and/or pasted.

Filters - Filters allow one to change the look of an image or layer simply by choosing the desired look from the menu options and configuring any dialog boxes that appear.

Flattening - Like merging, flattening an image combines all of the layers into a single layer.

Flow - Used to specify how quickly paint is applied when using a Brush. A heavier flow lays on more paint more quickly; a lower flow lays on less.

Font - Used to create text. Fonts are categorized by family, style, size, and other attributes.

Foreground color - Configured from the toolbox, the foreground color is used when paint tools are chosen and when Fill and Stroke tools are selected. When using a brush or the Paint Bucket tool, the foreground color will be applied. The foreground color is also used by some of the special effect filters.

Frequency - This option can be used with the Lasso tools to determine at what frequency or how often anchor points are added as one traces around an object. Values from 0 to 100 can be used; higher values add more anchor (fastening) points. Frequency is available when using the Pen tool too, with values ranging from 5 to 40.

Gradiation - Often used as a screen printing term, the gradual changing of color across a substrate.

Gradient tool - Fills a closed object with a range of colors that fade into each other.

Gray Balance - How cyan, magenta, and yellow are combined to produce gray, often called a neutral gray.

Grayscale - A color mode that uses up to 256 shades of gray (or black). Every pixel in the image is defined by its brightness values between 0 and 255 or its percentage of black ink coverage (0 percent to 100 percent).

Hand tool - Allows one to scroll through an image that doesn't fit completely in the viewing window. It's like using the scroll

bars at the bottom and right side of the window, except one has to do the moving with the mouse or stylus by dragging. When the Hand tool is chosen, the cursor becomes a hand.

Handle - Small squares that appear around an object when transforming it that allow one to move, resize, reshape, or distort the image/drawing or selection.

Hardness - Controls a brush's hard center and can be set using the slider or by typing in a number. Hardness can be compared to using a pencil by pressing hard to create a darker and more forceful print; lower this number for a softer effect.

Healing Brush tool - The Healing Brush lets the artist correct imperfections in images such as dirt and smudges or lighten darker areas. One can match the background texture, lighting, and shadows or shading to "cover up" these flaws.

Hidden tools - In the toolbox, many of the icons have arrows in the bottom-right corner. This signifies that there are additional tools located underneath the tool that is showing. Selecting a hidden tool from the toolbox can be achieved by clicking, holding, and choosing the tool one wants from the resulting list of tools.

History Brush - One can use the History Brush to paint over something that he/she has recently added to an image/drawing to erase it.

History palette - Shows the list of steps taken to create the image that the artist is currently working on. The History palette helps to correct errors (by storing what one has done to a file previously) and allows the artist to “go back” to a point before a particular edit was made simply by clicking on the appropriate step.

HSB - This mode uses a color’s hue, saturation, and brightness to define it. Hue is defined by its location on the color wheel and is denoted by a number from 0 to 360 degrees. Saturation is the purity and strength of the color and is defined by the percentage of gray in the image (0 to 100 percent). Brightness is how light or dark a color is and is defined by a percentage (0 percent is black and 100 percent is white).

Import - Available from the File menu, this command lets the artist import files from a scanner or digital camera and import PDF images, annotations, and WIA support. PDF (Portable Document Format) is the primary file format for Adobe Illustrator and Adobe Acrobat.

Indexed color - This mode uses from 1 to 256 colors. One can convert an RGB image to an indexed color image, and Photoshop will look at the colors and convert them to the colors available in the indexed color model. Indexed color can be used for web images but is used in screen printing as well. Screen printers can use indexing to color separate an image using only a few colors, and those colors can be hand picked.

Info palette - Displays color information about the color directly underneath the mouse pointer and displays additional information depending on the tool chosen.

Interpolation - Photoshop’s way of figuring out what should be in a specific pixel when enough information isn’t given, such as when one resamples an image. If the artist starts with a small image and tries to double the size, Photoshop has to guess at what’s supposed to be in those extra areas. If one takes a large image and reduces its size, it has to guess at what to throw away. There are several types of interpolation: Bicubic, Bilinear, and Nearest Neighbor.

JPEG - Stands for Joint Photographic Experts Group and is sometimes also written JPG. JPEG files are lossy, meaning that as they are compressed, they lose detail. When the file is changed from a JPEG to another format, those compressed or lost pixels must be reconstructed. This usually results in jagged edges in the design. Alternatives to JPEG include GIF and BMP.

Lasso tools - There are three Lasso tools: the Lasso tool, the Polygonal Lasso tool, and the Magnetic Lasso tool. The first two choices let the artist draw around an object using curves and line segments, respectively, and the third lets him/her draw around an object and have the drawn lines snap to the object (based on calculations determined by color differences in the object and the background).

Layer - Layers are like transparencies, which are clear plastic sheets of material that can be printed on. The transparencies can be printed and stacked on top of one another to form a complex picture, and single transparencies can be removed from the stack for editing or removal. When one creates artwork in Photoshop, he/she can create it on layers similar to these transparencies—text on one layer, background image on another, and perhaps a selection pasted from another file on another. These layers can then be edited independently of each other, making the editing process more efficient and precise.

Layer masks - Used to obscure entire layers and layer sets. By using masks, one can apply special effects without actually affecting any of the original data on that layer. After the artist has found the perfect effect, he/she can then apply the changes. The changes can also be discarded. Layer masks are created using the painting and selection tools.

Line tool - Allows one to draw straight lines using the mouse. The Line tool is located with the other Shape tools and draws vector-based lines.

Magic Eraser tool - Lets one erase by clicking with the mouse and erases all pixels similar in color to the area he/she clicks on.

Magic Wand tool - Allows the artist to make a selection automatically, based on a color, without having to physically trace

the outline by clicking in a specific area with the mouse. Options for the Magic Wand are set in the options bar.

Magnetic Pen tool - A variation of the Freeform Pen, this Pen tool snaps to the edges of an image, making tracing around an image easy.

Marquee tools - There are four Marquee tools—rectangular, elliptical, single row, and single column. These tools allow the artist to select portions of an object, file, photo, or subject for editing. These selections must be elliptical, rectangular, circular, or 1 pixel wide or thick.

Mode - Mode options allow the artist to control how he/she wants pixels to be affected by the application of the painting or editing tool he/she chooses. Modes, also called blending modes, are generally used for creating special effects.

Move tool - Allows one to move a selected part of an image/drawing, align layers, and distribute layers in an image. When the Move tool is selected, a box is placed around the selected part of the image/drawing. This box can be used to move the selection and edit its shape and size.

Navigator palette - Allows one to quickly change the viewing area of the file that he/she is working on.

Opacity - Used to specify how transparent a layer should be, either on its own or in re-

gard to other layers. When color-separating artwork, one can use the Opacity Slide to "pull" more color from the image/drawing, thus making color separating artwork easier.

Options bar - This bar is located at the top of the interface underneath the menu bar and changes each time a new tool is selected. The options bar contains choices for configuring and working with the various tools in the toolbox.

Overlay - Color screens that are layered, and once layered produce additional colors on an image.

Paint Bucket tool - The Paint Bucket tool fills a closed object with a solid color.

Palette - These are located on the right side of the interface. They are contained in rectangular boxes and offer tools to help the artist modify, monitor, and edit images/drawings. Palettes are stacked together, and each rectangular box holds two or three separate palettes.

Palette well - The palette well can be fully customized, additional palettes can be selected from the Window option in the main menu.

Paste - This command pastes the selection (from Cut or Copy) into another part of the image or into a new image as a new layer.

Paste Into - This command pastes a selection into another part of the image or into a new image as a new layer, and the destination's selection border is converted into a layer mask. One can then decide if he/she wants to apply the mask or discard it.

Patch tool - Similar to the Healing Brush tool, this allows the artist to choose a part of the image and use it as a sample for repairing another part of the image. The Patch tool combines the selection power of the Lasso tools with the correction properties of the Healing Brush and other cloning tools.

Path Selection tool - This tool can be used when the artist wants to edit the paths that he/she has created using the Pen or Shape tools.

Pattern Stamp tool - Allows the artist to paint with a specific pattern from the pattern library or from his/her own pattern creations.

PDF - Stands for Portable Document Format and is used mainly for documents. PDF file format preserves fonts, page layout, and other document information and can be imported into Photoshop for editing. PDF files are platform independent, meaning almost any computer Operating System can be used when opening them. PDF files are not used in Photoshop for creating artwork.

Pen pressure - When the artist uses a Wacom tablet, he/she can set pen pressure.

This allows one to draw on the tablet and have the resulting amount of pressure one uses while drawing applied to the tool he/she is using on the screen. Pen pressure is available with several tools, including the Pen tool and some Brush tools.

Pen tool - The Pen tool is used for drawing paths and custom shapes. As lines and curves are drawn, anchor points are created that define the line, its endpoints, and its curves.

Pencil tool - The Pencil tool allows the artist to select a brush, choose its characteristics including size, shape, spacing, roundness, hardness, angle, diameter, mode, opacity, and more, and then use the brush for various types of artwork.

Perspective - A Transform tool that allows the artist to apply perspective to an image/drawing or selection.

Pixel - Images such as photos are made up of pixels, which are small squares that contain color. An image's resolution is determined by how many pixels there are in the image per inch. Monitors display output using pixels as well.

Ppi - Image resolution is a ratio of pixels per inch; the more pixels are squeezed into each inch of the image, the higher the resolution. Higher resolution means a better quality image.

Preset Manager - The Preset Manager provides a central management tool for all

the options that are individually available from the panels and tools themselves. Just like with the tools, one can select, edit, and delete presets. The only thing one can't do with the Preset Manager is actually create a preset. The artist must do this with the Tool Preset Picker, Tool Presets panel, Gradient Editor, Brushes panel, and other locations.

PSD file format - Photoshop's own format for saving files. Files saved in this format retain layer and channel information. The image's resolution and spot color channels are also saved, as is image bit depth. PSD files save information about the file, including its layers and channels, so that those items can be continually edited.

Range - Used with the Dodge and Burn tools, this allows the artist to select a tonal range to lighten or darken (midtones, highlights, or shadows).

Rasterize - Converting vector data to raster data. Performing this conversion is called rasterizing.

Resolution - Resolution determines how many pixels are shown per unit (such as inch or centimeter) in an image. Higher resolutions contain more pixels (thus more detail) than lower resolution images.

RGB mode - A color mode that uses red, green, and blue to create the colors we see. Computer monitors use RGB mode to output color, and RGB mode is Photoshop's default.

Rotate - A Transform tool that allows the artist to rotate an object around its center point. The center point can be changed.

Roundness - Controls how round the brush stroke will be. A setting of 100 percent creates a circular brush stroke; 0 percent creates a linear brush stroke.

Scale - A Transform tool that allows the artist to enlarge or reduce an image's size horizontally, vertically, or both.

Shape tools - Shape tools include rectangle, rounded rectangle, ellipse, polygon, line, and custom shapes. Shape tools are mostly used by graphic artists for creating logos, setting type boundaries, creating custom artwork, creating trademarks, and more. Shapes are vector images too, meaning they can be resized without distortion.

Show Bounding Box - Available from the options bar when one chooses the Move tool or the Path Selection tool. Checking this box allows the artist to see the bounding box that surrounds a selected object, which in turn makes it easier to move, resize, and rotate a selection.

Skew - A Transform tool that allows the artist to slant an image vertically or horizontally.

Smudge tool - Smudges an area of the image using any brush one chooses.

Spacing - Controls the distance between the brush strokes when using a brush. In-

creasing the spacing creates a skipping effect; decreasing the spacing creates less of a skipping effect (or none if set to 0).

Step Backward - Like the Undo command, one can revert to a previous state. With Step Backward the artist can undo even after he/she has saved the image with the state change.

Step Forward - Allows the artist to move forward one state. Moving forward is the opposite of moving backward and is only available after using the Step Backward command from the Edit menu.

Styles palette - Lets the artist apply a preset style to a selected layer, which can be the foreground or background or load different libraries of styles.

Swatches palette - Allows the artist to choose a foreground or background color and allows him/her to add or delete colors from the swatches library of colors.

TIFF files - Tagged Image File Format files (also called TIF files) that are widely used files in graphic design. TIFF files are raster-based and support almost all color spaces. TIFF files can be compressed using a lossless compress scheme, making them better for saving than JPEG files.

Tolerance - This option is available with several tools and used to set how "tolerant" a tool is with regard to the colors with which it is working. For instance, when using the Paint Bucket tool to fill an area with

color, the tolerance level determines how close the color must be to the original color (where one clicks) before it gets filled. Values can be from 0 to 255. A lower number only fills colors very similar to where one clicks; a higher number fills a broader range of colors. Tolerance can also be set for the Magic Eraser tool, the Art History Brush, and the Magic Wand tool.

Tool Presets palette - Lets the artist load, save, and replace tool preset libraries for quick reference. Saving custom preset tools allows one to reuse these tools without recreating them each time. Each tool in the toolbox has its own icon in the left corner of the options bar, and there is a down arrow beside it. Clicking on this arrow brings up the tool presets. Here, one can save and reuse tools and tool settings, as well as load, edit, and create libraries of tools he/she uses most often.

Transparency - When an area of an image/drawing is “erased to transparency,” there is a checkered (depending on the general settings one has) background showing. There is nothing on that part of the image.

Undo - The Undo command is usually accompanied by the name of the last tool used, such as Undo Paint Bucket or Undo Trim. Undo simply moves back one step and reverses the last action taken. The Undo command is not available after a file has been saved.

Vector data - Type and shapes are vector data. Vector data is computed mathematically, and the object or type is defined by its geometric shape. Type, shapes, and vector masks are all considered vector data.

Vector masks - Created from paths, these masks can be used to mask (or hide) part of a layer, they can be edited by configuring styles or adding special effects, and they can be used to reveal specific areas of a layer. Vector masks are created with the Pen and Shape tools.

Workspace - Once the artist has created the desired workspace, he/she can save that configuration using the Window>Workspace>New Workspace command. When the name is typed in for the workspace in the New Workspace dialog box, it becomes available from the Window>Workspace choices.

Zoom tool - Works much like any Zoom tool in any other graphics program. Simply choose the Zoom tool and click on an area of the image to zoom in or out. When the Zoom tool is chosen, the options in the option bar change, offering Zoom In and Zoom Out along with choices to resize the window to fit on the screen and other options.