

## **Printmaking Process:**

### **Production and History of the Plates**

During their journey across America, Prince Maximilian recorded his observations in journals and Bodmer created watercolors and sketches, documenting the flora, fauna, and Native American peoples of the areas they visited. In the summer of 1834, at the conclusion of their historic journey, Maximilian and Bodmer returned to Europe to begin work on the publication and prints which would publically document their experiences and observations. At home on the family estate, Maximilian began to write the text for the book. In Paris, Bodmer supervised several engravers, printers, and colorists in the production of the printed images. Of the 81 plates he produced, 33 were smaller ‘vignettes’ intended to illustrate the 33 chapters of Maximilian’s opus. Forty-eight larger “tableaux” were issued separately. The subject matter for these prints was derived from Bodmer’s field portraits and landscapes, which were further developed in his Paris studio into final compositions for publication.

Bodmer worked closely with 26 engravers for over seven years to create the 81 plates. Following Bodmer’s compositions and directions, the engravers used a variety of complex, demanding printing processes to produce the desired range of textures and impression of light and shadow. The main technique used in the creation of the plates is called “engraving with aquatint.” Engraving is the method of incising lines into a metal plate; aquatint is an etching process (see below) developed in the seventeenth century as a means of duplicating in print the soft look of watercolor paintings. Engraving and aquatint are frequently combined with other techniques in the creation of a printing plate.

The first step in the aquatint process is the application of powdered resin to a metal plate. Resin, a yellowish organic substance, is a plant derivative from the pine tree. The metal printing plate is then heated, melting the resin which forms tiny particles as it hardens and cools. Aquatint differs from normal etching in that the protective ground (the resin) applied to the plate is semi-permeable by acid. By using such a ground in combination with stop-out varnish, which is completely impermeable by acid, the artist can create varying tones over large areas of the metal plate. The acid filters through the resin ground, producing countless tiny pits in the plate. These pits can be distributed in such a way that the final print resembles a wash of ink or even watercolor—hence the name “aquatint.” The distinctive quality of aquatint is the variety and subtlety of tones that can be produced. The technique is flexible and can be combined with engraving and drypoint.

Variations in tone are achieved by controlling etched areas on the plate with applications of stop-out varnish. In the places where the varnish is applied, no further etching takes place when the plate is retreated with acid. The deeper the etched area, the more ink it will hold and the darker it will print when run through the printing press. When one color of ink is applied to the plate, the final result is a monochromatic print with many gradations in tone.

After the plate is prepared, the image is printed onto paper. First, the plate is cleaned to remove any surface dirt and ink trapped in the lines. Next, the plate is hand inked, using a “dolly,” which is a twist of cloth that works the ink into the engraved lines on the plate. When all the lines in the plate have been filled with ink and the plate has been wiped clean, the plate is placed on the bed of a rolling press and covered with a sheet of heavyweight paper and blankets made of felt, designed to protect the paper and plate from the knife-edge pressure of the press. As the plate passes between the rollers, the pressure forces the dampened paper into the grooves of the plate, creating a characteristic embossed surface on the finished print. After each pass through the press, the plate is cleaned and re-inked for the next impression. Color editions were produced in that era by individually applying watercolor, by hand, to monochromatic prints.

#### History of the Plates:

Maximilian’s North American manuscripts and publications, along with Bodmer’s original artwork, including several sets of the prints and the original printing plates, remained in the Wied family archives after the Prince’s death in 1867. In 1959, Maximilian’s heirs sold the collection to the firm of M. Knoedler and Company, a New York art dealer. The collection was purchased in 1962 from Knoedler by Northern Natural Gas (later named Enron Corporation) and placed on indefinite loan to Joslyn. In 1986, the collection, which includes the original printing plates, was donated to Joslyn by the Enron Art Foundation. Finding both the steel and copper plates in excellent condition, Alecto Historical Editions entered into an agreement with Joslyn in 1989 to produce a new edition of up to 125 sets of 81 prints. In London, under the direction of Alecto’s Master Printer, Edward Egerton-Williams, this new edition was printed and colored by hand to the same exacting standards that Bodmer himself demanded in his Paris studio more than 150 years ago. The works in the exhibition, *Travels in the Interior of North America, 1832-1834: The Maximilian-Bodmer Expedition*, feature a selection from this recent edition of prints.

## **Printmaking Terms**

### **Print:**

A print is an original image made by an artist and designed to be reproduced in identical form multiple—but not countless—times. Printmaking techniques involve two steps: 1) the preparation of the image on some sort of durable surface—wood, metal, stone, or a stencil—and 2) the transfer of that image to another—usually paper. As well as being referred to as “prints,” these multiple-produced images are also often called impressions. Similarly, as well as “making” prints, an artist or printmaker is often said to *pull* or *strike* them.

### **Edition:**

A set of identical prints, usually signed and numbered, made under the direct supervision of the artist and authorized for commercial distribution, is termed an edition. The set is made up to a number agreed upon by the artist, printer, and publisher. Each completed print is compared to a proof approved by the artist and marked “bon à tirer” (good to pull/print), or with some variation of the initials B.A.T. Generally, the standard of comparison between the B.A.T. proof and the editioned print is extremely rigorous. A new edition of prints applies to any subsequent printing of a print beyond the original edition. In the trade, the term *restrike* identified editions that are totally independent of the original artist.

### **Intaglio:**

Pronounced either with the “g” or without (in-tall-ee-o), intaglio describes all processes, including engraving, mezzotint, drypoint, etching, and aquatint, where the image is created from various gouges and indentations made into a metal plate. The plate, usually copper, is then inked all over and wiped with a cloth, leaving ink only in the indentations. Dampened paper is laid on the plate, covered with a thick blanket, and then all is run through the rollers of a special press under very high pressure. To prevent edges of the plate from slicing the paper as it goes through the press, they are filed at an angle—beveled—producing the indented platemark around the image characteristic of all intaglio processes.

### **Mezzotint:**

An intaglio technique in which the whole surface of a metal plate is uniformly incised with special tools—either a mezzotint rocker or roulette—and, if inked at this stage, would produce a solid, sooty-black field. The mezzotint image is created by scraping away or burnishing (polishing) the roughened metal to establish areas that do not retain ink and which, when printed, produce gradations of grays and whites. The mezzotint method requires that the artist work in gradation from dark to light.

### **Aquatint:**

An etching technique, aquatint achieves fine gradation of tone through the use of powders, usually resin, as the acid-resistant ground. The powdered ground is dusted onto the copper plate (or suspended in alcohol and left to dry on), then heated to fix the particles in place. By applying finer dust in some areas and coarser particles in others, the acid bite will vary minutely from area to area, producing a delicately shaded image.

Differences in the effects of Mezzotint and Aquatint:

-Unlike aquatint, mezzotint process can produce solid, black areas of tone.

-In aquatint, lighter tones are created by applying “stop-out varnish” which blocks the acid biting process on the metal plate, producing firmer edges of light and dark areas. In mezzotint, lighter areas of tone are more gradual and can be identified by the crisscross pattern of the mezzotint rocker.

### **Etching:**

A chemical method of intaglio printing in which nitric acid is used to create an image in a copper plate. The plate is heated and given a coating of wax or resin. This is the etching ground. Once cooled and hardened, the wax is resistant to acid but, by drawing into it with a pointed instrument (see engraving or drypoint descriptions below) and exposing the copper surface, lines are opened in the wax ground. When the plate is placed in an acid bath, these open marks will be eaten into, or “bitten.” The longer the acid is allowed to bite, the deeper and broader the lines will become, the more ink they will hold, and the darker they will print. To print the image, the plate is cleaned, then inked by a roller and dolly and carefully wiped to leave ink only in the grooves. To print the finest lines the paper must be forced deep into the grooves; so it is dampened and printed under very high pressure.

### **Engraving:**

In this intaglio technique, a metal plate is incised with a special tool, called a burin or graver, which is pushed over the plate at an angle, allowing the artist to vary the width of the line. Traditionally, the artist rested on the plate on a small, ball-like cushion and, rather than moving the tool, actually rotated the plate against the burin. The ridge of metal thrown by the burin, called a burr, is removed with a scraper. In the hands of a skilled artist or technician, effects of enormous subtlety can be achieved with this apparently simple linear approach.

### **Drypoint:**

For drypoint, the metal is simply scratched with a sharp point which pushes it up along each side of the line, leaving a ridge, or burr. The drypoint needle (having a sharp, hard steel or diamond point) thus provides a quick way to add final touches to engravings and etchings. Artists also like the drypoint technique for its own effects. The jagged rims of the raised metal burr, when left standing, will hold ink quite differently than the recessed grooves they accompany which give a dynamic, slashing quality when printed.

*The Maximilian-Bodmer Expedition:  
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## **Tools and Materials:**

**Burin:** A special tool used by the engraver to gouge the lines that will hold the ink. The burin resembles an ordinary awl but has a blade that is square or lozenge-shaped so it can be applied at different angles to create lines of different thicknesses.

**Burnishing:** The process of scraping and polishing the plate until some areas contain no pits to hold ink. Those smooth areas appear bright white (or the color of the paper) in the overall gray tonality of an aquatint or mezzotint print.

**Dolly:** The twisted cloth that is used to force ink into the grooves of the plate before printing.

**Drypoint Needle:** A sharp tool with a needle-like point that is used to incise lines into a metal plate.

**Etching Ink:** This type of ink is thick and buttery and is stored in cans because it would be too hard to squeeze from tubes.

**Ground:** A substance such as resin, that coats the plate, leaving some areas permeable by acid during etching.

**Ink Knives:** tools made with strong flexible blades to mix and distribute ink.

**Mezzotint Rocker:** A tool used in the mezzotint process that is “rocked” over the surface of a metal plate, producing a uniform incised grid pattern.

**Plate:** A thin, flat sheet of metal, usually copper, zinc, or steel, used in the printmaking process called intaglio. The plate holds the image that is then transferred onto paper.

**Press Bed:** The flat area of a printing press that holds the plate and paper as it travels through the rollers.

**Resin:** The material that is sprinkled on the plate and then heated to form a semi-permeable surface before etching. Resin is derived from the pine tree.

**Rolling Press:** The type of printing press used in intaglio. The paper and plate pass under a large metal roller that applies a great amount of pressure, transferring the image from the plate to the paper.

**Roulette:** A tool with a serrated roller attached to the end that is used to create a grid of incised lines on a plate. A roulette, like a mezzotint rocker is used to create a grid-like pattern of incised lines; unlike a rocker, this tool can be used in smaller areas of the plate.

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**Scraper:** A tool that removes ridges thrown up by the engraver's burin to prepare a perfectly smooth plate for printing.

**Stop-Out Varnish:** A type of varnish that, when applied to an etched plate, literally stops the etching process after the desired bite has been achieved.



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**Information in Printmaking Processes adapted from:**

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Material from the exhibition *A is for Aquatint*, Joslyn Art Museum.

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