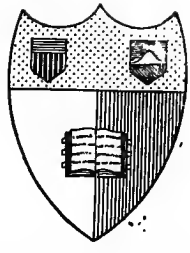

ETCHING

This EDITION DE LUXE is Limited
to Three Hundred and Fifty Copies
for sale in America and England.

Number 207

ETCHING
AND OTHER GRAPHIC ARTS
AN ILLUSTRATED TREATISE

BY

GEORGE T. PLOWMAN

WITH
AN ORIGINAL ETCHING FRONTISPIECE
AND TWENTY-SIX ILLUSTRATIONS

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TO

SIR FRANK SHORT, R.A., P.R.E.

WHOSE KINDLY GUIDANCE HAS LED SO MANY BEGINNERS
THROUGH THE FIRST STEPS OF ETCHING

ACKNOWLEDGMENT

The author desires to acknowledge his indebtedness to the various artists who have kindly allowed their etchings to be reproduced in this work. Also to the Berlin Photographic Company of New York City for the use of prints, and to Martin Birnbaum, Esq., for permission to reproduce prints from his private collection.

FOREWORD

THE awakening interest in the Graphic Arts now evident in America is most apparent when we consider Etching. A number of our large cities already have flourishing Etching societies and more are being organised. There is an increasing number of successful exhibitions of the works of American Etchers—successful both in the matter of attendance—and, quite as important, in the number of prints sold. Our discriminating collectors are showing more interest in the work of living Artists, while the numerous Art Clubs throughout the country, after years of delving into art history, are coming to realise the interest and worth of modern reproductive Art.

Many of the most useful books on etching are published abroad and are either out of

print or expensive. In addition none of the practical manuals are written for use in this country, with the possible exception of Lalanne's "Treatise on Etching." An English translation of this book was published in Boston some thirty years ago and is now out of print.

The first part of the present volume is devoted to the subjects which are necessary to a complete understanding of etching. They will also serve as a guide to the beginner in his preliminary work. The point cannot be too strongly emphasised that etching should not be attempted until one has a thorough knowledge of drawing.

In the second or technical part of the book I have endeavoured to omit nothing, no matter how elementary, that might assist the beginner. Even the more experienced may find these chapters of use, at least in saving themselves the trouble of consulting various works for some needed formula. Those who already enjoy the Graphic Arts will appreciate

them more intelligently and derive additional pleasure from them by knowing something of the technical side.

The fact that most etchings do not tell a story, lack the assistance of colour, are not concerned with the mere copying of facts, thus leaving much to the imagination, tends to make this art less easily understood by the amateur. The more numerous the conventions the greater is the knowledge required for intelligent understanding. "Scorn for limited means of expression in art arises from imperfect culture." The finest thoughts of the great Masters have often been expressed by a few lines and with the cheapest materials.

While naturally placing great stress on the manual and technical part of Black and White, it is hardly necessary for me to point out that all this is of no avail if one is not an artist. It is true that manual dexterity never made an artist, and it is also true that no work of art has been injured by being well presented. I am not forgetting that

there are many most charming little etchings which are crude in execution. To do a thing thoroughly well one must do it with ease. An artist should be sufficiently master of methods not to be hindered in working out his design. Working methods in etching are greatly influenced by the individuality of the artist. Every etcher has his own way of working which he considers, and which usually is, the best for him.

Much of the contents of this book is derived from notes made during the last three years in England, and on the Continent. As a student in the Engraving Department of the Royal College of Art at South Kensington, it was my great privilege to be initiated into the mysteries of acids and grounds by the master craftsman, Sir Frank Short.

GEORGE T. PLOWMAN.

CONTENTS

PART ONE

PART TWO

ILLUSTRATIONS

ILLUSTRATIONS

PART ONE

CHAPTER I

PENCIL DRAWING AND COMPOSITION

"Go slowly at first in order that you may go fast in the end."

AS a preliminary to the making of pen and ink drawings or etchings, many pencil drawings should be made. The pencil employed for this purpose should be rather hard—an H or HB. The hard pencil approaches the directness of the pen. A rather smooth paper is best, and the same kind should be used all the time, as a different technique is required when drawing on rough paper. Soft pencils and rough paper are usually employed when making pencil drawings which are not intended for use in etching. Often pencils of varying degrees of hardness are used in the same drawing. The usual practise is to employ those grading from 3 or 4B to H, although every

artist has his own way of working. The pencil is not so black as the chalk or pen. It has a disagreeable shine, and looks grey when placed beside ink drawings. In good pencil work black is used sparingly. Excessive blacks and a high degree of finish are signs of the amateur. The sketch should be drawn with decision, first slightly indicating the main contours and masses. Selection will come with practise. At first you will do too much. Local colour should be sparingly suggested or omitted altogether. Bear in mind that the fewer facts consistent with completeness the better the sketch. "So long as a drawing is harmonious, it need not be carried far." In time you will learn to feel your drawing, and without thinking select only what will assist the effect desired.

It is good sometimes to make careful studies—of trees, for instance—carrying the work as far as possible and trying to learn something of the way in which trees grow. Another good exercise is to make fifteen-minute

NAPLES
Pencil Drawing by
GEORGE T. PLOWMAN

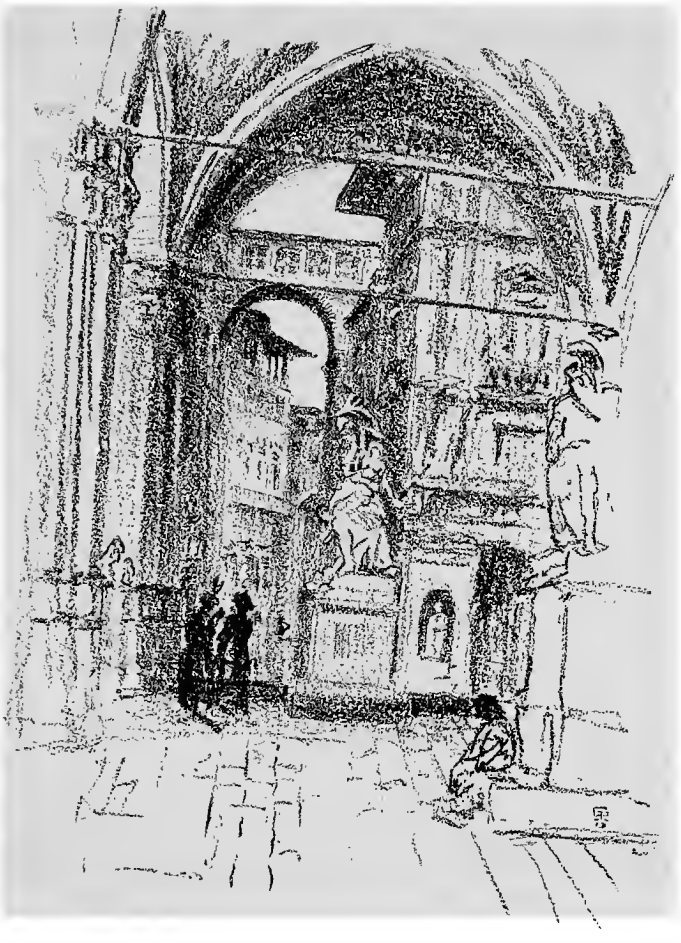
sketches. Stop at the end of the time, whether the sketch is finished or not. Do this regularly for a month, and you will find much improvement. Do not be too worried if your work has not the looseness or freedom of handling you could wish. This most desirable quality will come in its own time, and should not be forced. One who strives too much for looseness in the beginning loses in solidity.

There is no pleasure equal to the ability, acquired after long practise, to express with ease on paper any subject you may select. This is the only way by which quality of line may be developed and improved; and quality of line is of vital importance in etching. Draw from nature every day. Be composing all the time. Constant practise with the pencil is most important for the beginner in etching. The musician practises scales and exercises every day. In the same way the etcher should employ his sketch book constantly. The ability to make good pencil

drawings is surprisingly rare among artists. Most of them are content to jot down a rough memorandum with a very soft pencil. The softer the pencil the easier it is to get some sort of an effect. For the rapid sketch from nature, no medium equals the soft pencil.

"Koh-i-noor" or Faber drawing pencils, 3-ply smooth, or Strathmore or Harding's drawing papers, are all that is necessary in the way of materials. Many valuable hints for pencil sketching will be found in Sir Alfred East's "Landscape Painting."

Silver Point.—A silver point is a drawing on prepared paper with a silver pencil or stylus. The paper is usually prepared with a coating of Chinese white. This method of drawing was employed before lead pencils came into use. It was a favourite medium with the Old Masters, especially in the Florentine school of the fifteenth century. In appearance silver point is not unlike a hard lead pencil drawing. It is characterised by



FLORENCE
Soft Pencil Drawing by
GEORGE T. PLOWMAN

precision of line and delicacy of tone. The point gives a beautiful grey line of even width. Mistakes are not easily corrected, and the only way to erase lines is to use a brush with Chinese white. Tinted papers were sometimes used by the old Masters, the light being brought out with white. The silver point is best adapted to figure drawing. Legros' beautiful portraits done in this medium are examples of modern work. The points come in various sizes, usually three—fine, medium and thick. Robertson & Co., of Piccadilly, London, supply the materials for this work.

Chalk Drawings.—Chalks of different degrees of hardness and various colours are used on tinted papers with interesting results. Black and white chalk on grey paper is very effective. Black, white and sanguin are used for figure work. Rubens' drawings are examples. Landscapes are best rendered in brown chalk. Nature may be suggested by more limited means with coloured chalks

than in any other way. Interesting examples of chalk drawings are shown in the Studio Special Number on "Pen, Pencil and Chalk."

Charcoal Drawing.—Charcoal is employed by the painter in outlining his subject on the canvas. It is only in comparatively recent times that it has been used as an independent medium, when it is chiefly employed for landscapes and the figure. The coal comes in sticks of various degrees of hardness, and is used upon a grained paper. The facility with which the work can be removed from the paper by dusting with a cloth or rubbing with bits of stale bread allows of great changes, so that one can compose and rearrange the design with ease. This characteristic is also a difficulty, as the greatest care must be exercised to guard against damaging the drawing. The slightest touch may spoil the work of hours. When finished the drawing should be fixed on the paper by using a blower and fixative. Charcoal is employed for tone rather than line, although

SILVER POINT

By

GEORGE T. PLOWMAN

a combination of the two is common. The rapidity with which one gets an effect in sketching from nature is one of the advantages of this medium, but it is more adapted to making large drawings than small ones. While sometimes employed with crayon or pen, it is at its best when used alone. Russian or compressed charcoal and rough note paper have been used by Mr. Joseph Pennell with interesting results in a series of drawings of New York City.

Composition.—In making pictures, it is found that some arrangements of form and values please the eye and others do not. The conventions of composition are employed to bring about pleasing pictures. Balance of parts, simplicity and restfulness through selection, and what Ruskin calls the laws of principality and repetition, all tend toward good composition. The balance of parts is best illustrated by the familiar example of the steelyards. With two pounds of lead the bulk will be the same, but if a pound of

feathers is balanced with a pound of lead, the unequal bulk excites the curiosity and makes the pivotal point a matter of interest. In a composition this point is known as the blind spot, and is the proper place to put the principal accent, such as a group of figures. Equal dark areas or equal light areas should be avoided. Ruskin's law is: a principal dark value with its repetitions or echoes, or a principal light value with its repetitions or echoes. Simplicity and restfulness are best attained by employing few values simply arranged and broadly treated. Three values are the least that one can use successfully—black, grey and white. Black values attract the eye first and should be treated as broadly as possible and be placed in such a manner as to insure restfulness. The more black there is, the greater the number of values which can be employed.

These arrangements will help to indicate the "centre of interest," which should be at or near the centre of the picture. The lines

WOOLWORTH BUILDING,
NEW YORK,
AT NIGHT
Charcoal Drawing by
GEORGE T. PLOWMAN

of the composition should lead up to the "centre of interest" in graceful curves. The remainder of the picture should be given only enough expression so that the eye will instinctively seek this point. Whistler's method, or "secret of drawing," was to "draw the centre of interest first and finish it. Then draw in the surroundings. Keep all the composition well within the frame."

CHAPTER II

PEN DRAWING

"Art is Emphasis"

"THE pen is the piccolo flute of the artistic orchestra," as C. D. Maginnis calls it in his delightful treatise on "Pen Drawing." While the pen has not the perfect freedom of the etching point, it is very near to it in this respect. The limitations of the medium are not unlike those of etching. There is the same convention of the outline which does not exist in nature, and the same disregard for colour, except by suggestion. Economy and individuality of line, combined with a proper regard for the limitations of the medium, are found in the work of the best pen draughtsmen. Individuality should be as pronounced in pen work as in one's handwriting.

The technique of pen drawing has undergone great changes in comparatively recent times, largely on account of the employment of photo-chemical processes. The "process" block has almost entirely superseded the old method of interpreting the artist's drawing by a wood engraving. This change is responsible for the limitations in the technique of pen drawing as practised to-day. Briefly, these limitations are: making the lines clear and distinct, keeping the work open, avoiding involved passages which might become a blotch in reproduction, especially if the drawing is much reduced; keeping the values as few and simple as possible, and using only black ink on white paper. The improvements in mechanical reproduction have been so rapid of late that these limitations have not the force that they formerly had. However, they all tend to good, clear technique, and should be considered for that, if nothing else. Almost any drawing can now be satisfactorily reproduced. A compara-

tively new method, called collotype, gives facsimile reproductions of the most delicate work.

The first method of reproducing pen drawings was to trace them on a block of wood. The engraver then cut away the wood between the lines of the design, which would print the same as type. Later photography was employed to transfer the drawing to the block or metal plate, which had still to be worked over by the engraver, who cut away the material between the lines. The best engravers, notably those working in America in the 80's, did most wonderful work in their close imitation of the artist's design. The last stage was the discovery of a method of cutting away the metal in the space between the lines by means of acid. The metal plate thus treated was fastened to a block of wood the height of type. "Process," as this is called, has many advantages over the old method, not the least of which is its cheapness. The fact that the artist's work is re-

produced in facsimile instead of being interpreted is a great step forward.

A "process" block is made in the following manner: The drawing is photographed and the glass negative is placed over a metal plate coated with a gelatine and bicarbonate of potassium composition, and exposed to the light. When placed in a bath of warm water the unexposed gelatine will dissolve, leaving the drawing as gelatine lines on a metal surface. This surface is lowered by placing the plate in an acid bath. Another method is to photograph the drawing directly onto a zinc plate and then roll prepared ink over it; the ink adheres only to the lines which are then brought into relief by employing acid as before. We now have the drawing in raised lines on a metal plate which can be printed from the same as type. You will note that this is the opposite of etching, where the lines of the drawing are eaten into the plate by the acid.

A variation of the above method, known

as "half tone," is employed more especially for the reproduction of wash drawings or paintings. In this a screen of varying degrees of fineness is placed in front of the drawing to be photographed, thus dividing the tones into dots or squares, which are treated just as the lines are in the "process" method. The screen causes the values to lose in strength, and this should be considered in the drawing. In photographing the drawing the size can be changed at will. In most cases the drawing is reduced in size. As this affects the technique the draughtsman should know beforehand how much the drawing is to be changed and work accordingly. A photogravure is made by photographing the drawing onto a copper plate and then biting the lines into the copper as in etching. The work can then be gone over with a graver, if necessary, and must be printed in an etching press. The photogravure is more like an etching than the other photo mechanical methods, and is of

SANTA MONICA,
CALIFORNIA
Pen Drawing by
GEORGE T. PLOWMAN

course more expensive, as it requires separate printing. The history of illustration has been a striving after better and cheaper methods of reproduction. Line engraving, lithography, wood engraving and process each show an advance in ease and cheapness. The successful illustrator must know all about process and keep informed as to the improvements which are being made from time to time.

Some confusion exists as to the difference between etching and pen and ink work. The pen and ink reproductions, which are familiar to us in prints, are usually made by means of the "process" method described above, while etching is seldom seen in illustrated magazines except in reproduction, as its cost is practically prohibitive outside of very expensive art publications. Some years ago the "Studio" printed a few etchings and lithographs, and issued them as a part of the magazine. Owing to the great pressure employed in printing an etching, the edge of

the plate leaves a decided mark on the paper. This plate mark and the moulded ridges of ink, which can be felt by passing the fingers lightly over the darker parts of an etching, are means of distinguishing an etching from a reproduction of a pen drawing or of an etching. The etched line having depth as well as width, contains more ink than the pen line. The gamut of pen and ink is therefore less than that of etching, where one finds deeper and more velvety blacks, and, at the other end of the scale, more delicate greys. The blacks of the pen are much deeper than those of the pencil, and do not have their unpleasant shine.

The technique of the pen is entirely different from that of the etching needle. Changing pressure with the pen results in giving lines of varying width and intensity. Sometimes pens of different sizes and strength are employed, but usually with a loss of simplicity. As the etching needle must be used with the same pressure in all parts, a

beautiful grey in the distance is attained by drawing many lines close together and biting lightly. Should the pen draughtsman work in the same way, not having the advantage of the light biting, he would probably have to call for "first aid" from the photo-engraver to get a result.

Simplicity and variety of line are to be kept constantly in mind by the beginner. A very careful pencil drawing should be made first, and over this the ink lines should be drawn. The pencil drawing may then be erased with a soft rubber. Don't try to tell as much with the pen as with the pencil. Be satisfied with a partial expression. Strive to make each line valuable, telling as much as possible of shade and form. A good plan is to make numerous pen drawings directly from nature without preparatory pencil work; then do the same subject carefully and compare the results. The ideal is to retain the strength and freshness of the quick sketch in the finished drawing. Pen and ink

drawing is a kind of shorthand. Always remember that light and shade are most important in pen and ink, and that colour is only to be suggested, and even may be entirely disregarded. There should be few lines, but each should be made to tell. It is not easy to make the result look easy, and yet that is an important requisite. The values should be few and simply treated. The black blot is most effective in pen work. It represents all values below a certain level, just as the white paper represents those above a certain level. Indicate as much as possible in the dark values and as little as possible in the light.

Pen drawing is characterised by large, light areas, and has therefore few values. Employing three values, the following are some of the most useful arrangements: Black area against white surrounded by grey. Black area against grey surrounded by white. Black, grey and white from edge of picture to centre. Grey at top or bottom, dark in

centre, and then white. A gradation from dark through grey to light is simple, and therefore good. Avoid all complicated effects.

The method of printing determines the technique in pen drawing as much as it does in etching. The ink should be very black and each line distinct, with an extra allowance of space between to allow for the thickening in reproduction. As to materials, the requirements are simple: A Gillott No. 303 and a Crow-quill pen, a bottle of Higgins' waterproof ink, and for paper Bristol board, Whatman's Hot Press or Strathmore. The treatise on "Pen Drawing," by C. D. Maginnis, mentioned above, and the large volume, "Pen Drawing and Pen Draughtsmen," by Joseph Pennell, may be consulted by those who wish to learn more of the technique of this most fascinating art.

CHAPTER III

WOOD ENGRAVING

WOOD-CUTTING, or wood-engraving, is a relief process. The design is drawn on or transferred to a block of wood and a knife is employed to cut away the surface of the block between the lines. The wood-engraver does not work on the lines of the design; it is the wood that is left untouched which prints. This is the older method, but later an engraver's burin was used as well as a knife. The oldest woodcut is dated 1423. Block books were made before the invention of movable type, both the illustrations and the letters being cut in the block. Many artists worked in this medium in Germany in the sixteenth century. A later development was the white method, where the design was cut into the wood, so that the print therefrom showed

WOOD CUT
By
ALBERT DÜRER

as white lines on a black ground. Thomas Bewick (1753-1828) introduced many new methods into the art. In the old method pear-wood was cut with the grain. He used boxwood cut across the grain. Bewick was the first to interpret the design rather than to follow slavishly the lines. To illustrate: the shadow side of a rock would be made, in the first method, by digging out all the space between the artist's lines. In the later method the effect would be attained by running white lines through the shadow in such a way as to get the proper tone and character. This required much more skill on the part of the engraver.

A further change in the character of wood-engraving came about through the use of photography in transferring the design to the block. This brought about the subordination of line to tone and texture, giving results not unlike line engraving. It became a reproductive art. Artists were employed in reproducing painting. Timothy Cole's

beautiful woodcuts of the Old Masters in the "Century" are examples. At present a return to the earlier method is shown in the work of Lepere, whose woodcuts are as great, if not greater, than his etchings. The influence of the Japanese is seen in this revival.

It should be noted that woodcut is the opposite of engraving. In the former the lines are in relief as the space between is cut away, while in the latter the lines are cut into the surface. It was the art of the people until superseded by "process." The woodcut can be printed with the letterpress, and is therefore a cheap method of reproduction. As the cut would wear away in time, an electrotype is made which can be renewed as often as desired. Different values are obtained by varying the width of the lines. Boxwood is now generally used for the blocks, and is cut across the grain. The woodcut should not be made to imitate the line engraving. The artist should work from

WOOD ENGRAVING
By
JNO. P. DAVIS

Artist proof in the possession of George T. Plowman

Jno. P. Davis
1934

the black to the white, showing a flat black, white lines and white spaces, with no cross hatching. If a woodcut is made in the correct style, it cannot be copied with pen and ink. Colour prints are made with a separate block for each colour, and one is printed over the other. Japanese colour prints are familiar examples of this method.

CHAPTER IV

LITHOGRAPHY

LITHOGRAPHY (writing on stone) is a method of reproduction by which a drawing is printed from the surface of a slab of limestone. Aluminum or zinc plates are sometimes used. The process was invented by Aloys Senefelder in 1796. Senefelder was born at Prague, Bohemia, on November 6, 1771. It was while living in Munich, making a precarious livelihood by writing plays, that he stumbled upon this method of getting impressions from stone. The great cost of printing his plays led him to try reproducing the copy, written in reverse, on copper by the etching process. He could not afford a separate copper for every page, and so was compelled to repolish the plate after each printing. The great amount of labour involved in this caused him to experi-

MODERN WOOD CUT
By
LEONARD W. PIKE

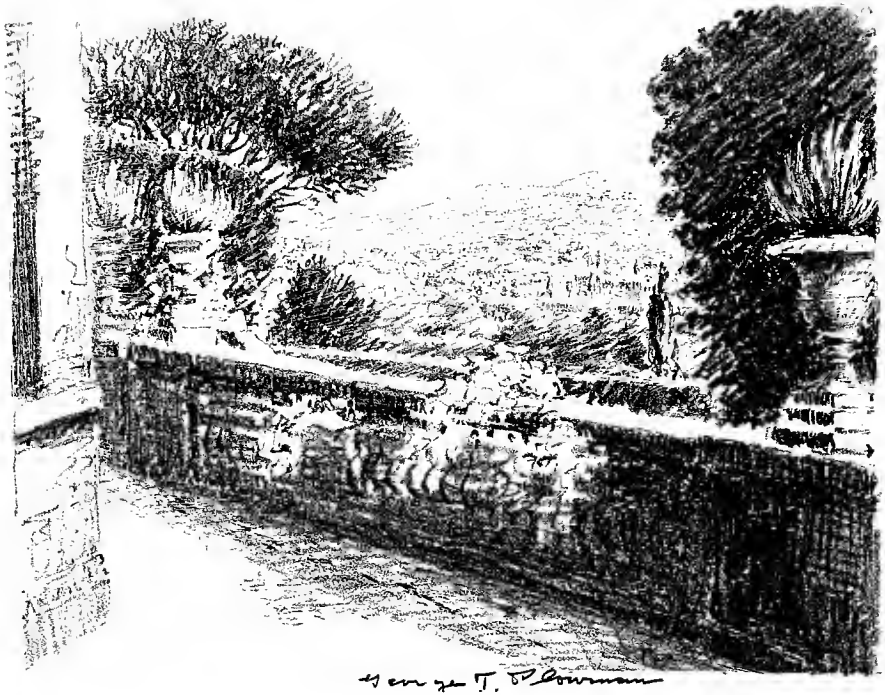
From the "Art Chronicle," London

ment with a fine-grained limestone much used in Munich for floor-paving. His first trials were not very successful. The necessity for quickly jotting down the items of a washing list forced him one day to use a stone and some ink made of soap, wax and lampblack. As he was about to erase this the idea came to him to try to get an impression on dampened paper, first treating the surface of the stone with acid. From his success in making prints of this washing list, he worked out the whole process of lithography as used to-day.

The fact that grease and water repel each other is taken advantage of in lithographic printing. The calcareous limestone employed has an equal affinity for water and grease. A drawing is made on this stone with a greased chalk and chemically fixed with a weak solution of nitric acid. After this the surface is moistened and gone over with a roller charged with greasy ink which will adhere only where the lines have been drawn.

A print can then be made from the stone by using dampened paper. The artist nowadays seldom works directly on the stone, but makes his drawing on transfer paper. This drawing is transferred to the stone by the printer and reproduced in the usual way. It is generally conceded that this method is as legitimate as working directly on the stone, and it is naturally much more convenient. However, some artists in the medium prefer the stone. Lithographic ink is sometimes employed in place of greased chalk. The stone should have a smooth surface for ink work. The combination of ink and chalk gives an effect that might be compared to Turner's mezzotints for the Liber Studiorum, the ink corresponding to the etched line. Ink may also be used as a wash and stumping may be employed in the same manner as in a charcoal drawing.

Owing to the facility with which reproductions can be made, lithography is extensively used in commercial work. In recent



ROME, FROM VILLA AURELIA
Lithograph by
GEORGE T. PLOWMAN

years this art has been brought back to its legitimate sphere, chiefly through the work of Whistler and of Way the printer. The best traditions of the art are being conserved by the Senefelder Club of London—a club formed for "the advancement of artistic lithography." The first president of the club, Mr. Joseph J. Pennell, is a distinguished exponent of this fascinating art. Almost all of the world's supply of lithographic stone comes from the Solenhofen quarries in Bavaria. There are some good French stones on the market also. The chalk used in drawing is composed of beeswax, tallow, castile soap, shellac and Paris black. More wax and tallow are used than soap and shellac. The black is added that the work may show. It is put up in convenient sticks and pencils of several grades of hardness by Korn, of Cedar Street, New York. The ink for drawing on the stone is composed of equal portions of the same materials as the chalk. It comes in the form of sticks,

like India ink, and is ground in the same manner, using distilled water. It is put on with a pen or brush. The ink used in printing is composed of Frankfort black and linseed varnish. A lithographic press is quite unlike any other form of printing press. The impression is obtained by carrying the stone on which a dampened paper has been placed on a movable bed under a bar known as a scraper. This scraping motion is entirely different from the roller motion of an etching press. The possibilities of artistic printing of lithographs are being much developed of late, and many methods are employed to vary the result. The number of prints possible is much greater than from an etched plate. The work fails by becoming blacker until it finally clogs up instead of becoming weaker as in etching.

As compared with etchings, lithographs lack relief, as all lines show equally black. It is an autographic art and this is its chief merit. In looking at a lithograph you may

RUE BOUTEBREA, PARIS
Lithograph with Crayon and Ink by
GEORGE T. PLOWMAN

note white lines running through it. These are made by scraping the surface of the stone with the point of a sharp knife. Some artists employ the knife much more than others. Of late colour lithography is coming into favour, especially in Germany. In this method there is a separate stone for each colour.

CHAPTER V

LINE ENGRAVING

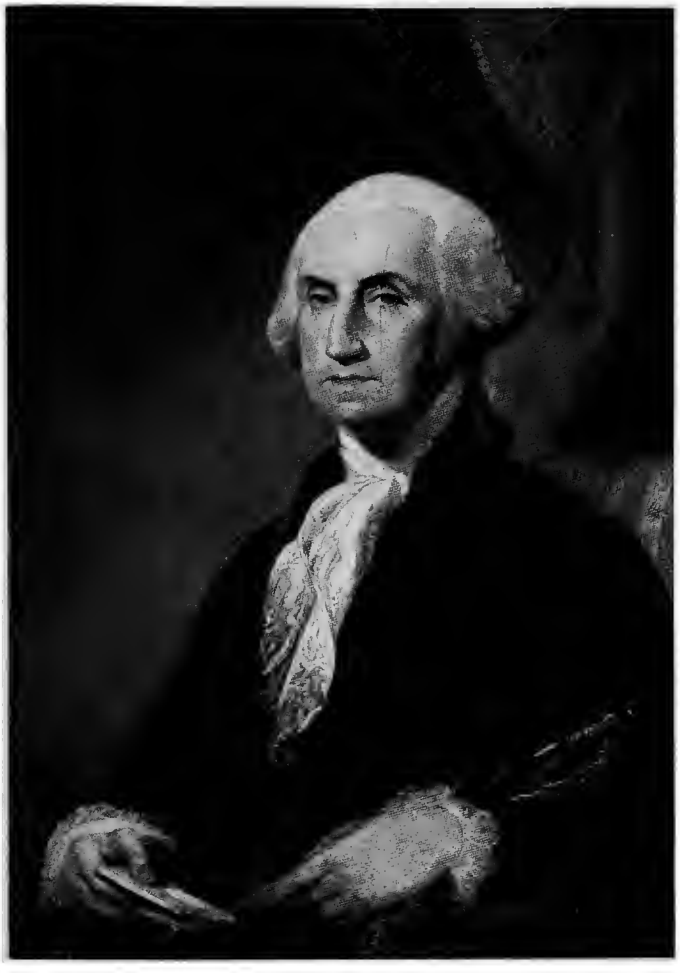
ENGRAVING (gravure en taille-douce) is drawing in intaglio—i.e., with incised lines. It is perhaps the oldest known form of drawing, for even the pre-historic races have left records scratched on the surface of bone. In this sense Egyptian hieroglyphics might be called engraving. In its more general sense it covers all methods of drawing by incised lines, and therefore includes etching and dry point. The restricted and more common use of the term is to limit it to a design cut on a metal plate with an instrument called a burin, the resulting impression constituting a line engraving. Vasari relates how printing from engraved plates was discovered about 1460 by Maso da Finiguerra, a Florentine silver-

smith. Having filled the lines of a plate on which he was engraving some ornaments with lamp black and oil, the more readily to see his work, he happened to lay the plate face downward on a sheet of paper, and thus produced the first line engraving. The Germans, however, practised the art some years before, and it probably originated there. So far as the student is concerned, engraving may be said to begin with Albrecht Dürer.

The instrument used in line engraving is the burin, a steel rod, lozenge-shaped in section, sharpened by being cut obliquely at the end. The handle is shaped to fit the palm of the hand, and the instrument, held between the thumb and second finger, is used by pushing it forward, thus cutting a clear, sharp V-shaped furrow in the metal. This furrow may vary in width from the moment the point digs into the metal until it leaves. It is a most laborious method, and the resulting line is naturally more formal than the etched line. It is this absence of spontaneity,

together with the varying thickness of the line, which distinguishes line engraving from etching. The burin leaves very little burr, as the metal forced above the surface of the copper by the instrument is called, since most of the metal comes up as a shaving. This burr is removed with a scraper. All engraving is based on the line, and as there are no lines in nature, artistic convention plays a most important part, tones and textures being translated by the line.

Stipple engraving is a form of engraving where dots are employed instead of lines; it if often used in parts of line engravings. To save labour engravers sometimes bite their lines in with acid, afterward going over them with the burin. Line engraving is chiefly employed in translating painting into black and white; that is, the colour and tones of the painting are interpreted by the lines on the plate. It is practically a lost art to-day. Some confusion may occur through the misuse of the term "steel en-



PORTRAIT OF
GEORGE WASHINGTON
AFTER STUART
Steel Engraving by
HALPIN

graving." As used nowadays, "steel engraving" is nearly always a misnomer. All work previous to 1820 was on copper, when steel plates were first used to enable the printer to get more impressions from the harder metal. However, since the invention of steel facing of copper, steel is seldom used on account of the difficulties in its manipulation. We are all collectors, more or less, of modern steel engravings, as American bank-notes are engraved on steel. They are the only real "steel engravings" of the present day.

There are three kinds of printing used in the graphic arts—relief printing, surface printing, and intaglio printing. In relief printing the ink is taken from a raised surface, as exemplified in woodcuts, wood-engraving and process. In surface printing, the ink is transferred to the paper from a flat surface, as in lithography. In intaglio printing the ink is taken by great pressure from below the surface of the plate, as in line engraving and etching. In relief print-

ing the process is a flat squeeze, in surface printing it is a scraping motion, and in intaglio it is a roller motion.

CHAPTER VI

ETCHING

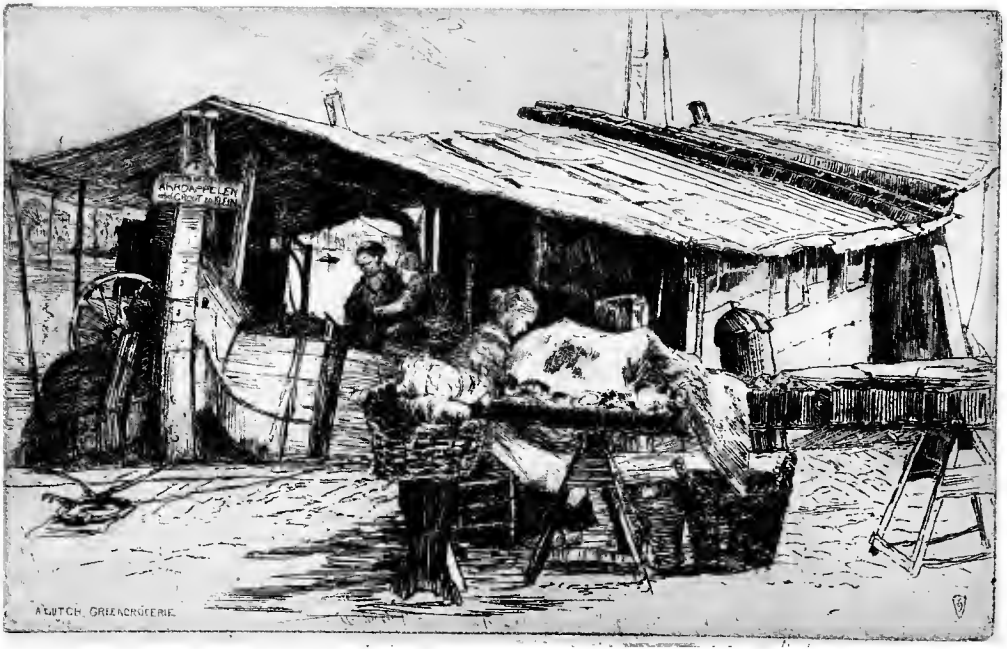
"If you cannot sketch you cannot etch."—HAMERTON.

ETCHING (from the Dutch "etsen," to eat) is a form of engraving where the lines are bitten into the metal plate with acid. An etching is a print made from a plate in which the design has been bitten with acid. Usage includes dry point with etching, although no acid is employed, the design being cut into the plate with sharp steel needles. In section the bitten line is U-shaped, while the dry point and engraved lines are V-shaped. It is not unusual for even cultured people to use the word etching when they refer to pen drawing.

The etched line is characterised by great freedom, the steel point gliding with ease in all directions over the metal plate. Etch-

ing is the only form of engraving in which an artist can sketch. The technique of etching is quite different from that of pen or pencil. The vigour and delicacy possible in the biting serve to differentiate this art. The artist who draws on copper just as he would draw with the pen or pencil does not understand the medium and will be disappointed in the result. The artist who draws on the copper and does not himself bite the plate with the acid is not an etcher. This should also be true to a less degree with regard to the printing. The true etcher draws, bites and prints the plate himself.

Briefly, the methods employed in making an etching are as follows: a polished copper plate is covered with a kind of varnish called an etching ground. The ground is smoked with wax tapers to assist the artist in seeing his work. On this he draws his design, employing a steel needle which cuts through the varnish and exposes the copper. The plate is then covered on the back and edges



A DUTCH GREENGROCERIE
An Etching by
SIR FRANK SHORT
R.A., P.R.E.

From a print in the possession of George T. Plowman

with some varnish impervious to acid and immersed in an acid bath. The acid will attack the copper only where the artist has drawn with the needle. When the acid has sufficiently eaten the lines of the distance or the lightest part, the plate is removed from the bath and washed in water. A brush charged with stopping-out varnish is used to cover over these lines. The plate is again put into the acid, which again attacks all the remaining lines. This stopping out, as it is called, is repeated until all parts are bitten to the required depth. The ground is then removed with turpentine and a trial proof taken on an etching press.

The artist has many ways of correcting his work, should this print, as is usually the case, prove unsatisfactory. Another ground can be put on, new work added, and the plate bitten as before. The lines already on the plate can be enlarged by putting on a rebiting ground, which covers the surface of the plate but leaves the lines

exposed. Lines which are too deep can be reduced by using a tool called a burnisher or by a scraper. Or charcoal may be employed to bring down the surface of the plate by rubbing, thus making the lines shallow. In etching it is more possible to make sweeping changes and still retain the freshness of the work than it is in pen or pencil. A whole foreground is sometimes scraped out, the copper pounded up from the back, and new work added. As Sir Frank Short puts it, "While there is copper there is hope."

The press used in printing etchings is not unlike an ordinary washing mangle. The rollers are usually of steel and between them is a movable metal plank on which the plate is placed. The warmed plate is first covered with ink, which is then carefully wiped off the surface, leaving the lines full. Sometimes a thin film of ink is left on the surface of the plate as well. To get a richer print the plate is again warmed and a soft rag flicked across the lines, pulling some of the ink

over their edges. This is called retroussage, or stumping. A dampened piece of etching paper is then placed over the inked plate, and it is passed between the steel rollers under a heavy pressure. Several thicknesses of blanketing are placed between the rollers to equalise this pressure, which is so great that the edges of the plate make a distinct mark on the paper, and the ink from the darkest lines is moulded in relief. This relief in the dark lines can be felt by passing the fingers lightly over an etching. The plate mark and the relief help to distinguish intaglio printing. The absence of the plate mark in old prints is not a proof that they are not etchings because the paper may have been cut in the margin between the plate mark and the edge of the etched work. Almost all old etchings had these margins, and they were sometimes quite wide.

Printing of etchings is unlike the printing of other forms of black and white work in that it is an important part of the process

of attaining the desired result. Pen-and-ink reproductions by the process block, or half-tone method, go through the press with very little more care than type, but in etching the printing is almost, if not quite, as important as the drawing and the biting. A good etching is a combination of a successful drawing, a successful biting and a successful printing. If the etcher delegates the printing to another, he should be sure that he is placing his plate in experienced hands, and in addition should give his personal supervision to the prints; at least until one comes to his satisfaction which can serve as a guide for future impressions. The result may be varied in many ways. The kind of ink, the way it is put on, the different papers, and the printing in the press all have their influence. From the beginning one should have in mind the kind of printing to be employed.

"Is this an original or a copy?" is a common question. Every impression made from a copper plate is an original print. In etch-

From a print in the possession of George T. Plowman

AN ETCHING
By
MAXIME LALANNE

ing, a design can be duplicated and still be an original. There are no copies in the usual sense of the word. The copper plate is merely a means to an end, and is of no value in itself. It is destroyed as soon as it shows signs of wear. A trial proof is a print made before an etching is finished to prove or try the condition of the plate. There may be a number of these, but none are signed by the artist until the plate is finished to his satisfaction. An artist's proof is a print signed by the artist, and therefore satisfactory to him. The prints not signed by the artist may not be made under his supervision, and are likely to be poor. They are always of less value than artist's proofs. The "Remarqué," which is a characteristic of some of the old work, is not possible in most modern work because the margin on which these little sketches were drawn does not exist, the artist working up to the edge of the plate. Proofs before and after lettering are also terms which seldom have a sig-

nificance now. No two proofs are or should be exactly alike. The great musician does not interpret the work of the master exactly the same each time. He has an ideal toward which he strives. In the same way the artist printer manipulates his materials to bring about that most elusive result—a perfect print.

The number of prints made from a plate depends on many things. A deeply bitten plate will yield more good impressions than a delicate one. Much dry point will cut down the number of good proofs obtainable. Dry points with the burr on print only a few satisfactory proofs because the projecting burr soon breaks down under the pressure of the press. The number, therefore, varies from eight to ten prints in delicate dry points to fifty, one hundred or more in strong work. By employing steel facing the number of prints is materially increased. This is a process for depositing a thin film of steel by electrolysis over the surface of the copper.

Copper thus protected will give many more proofs without wear. Should the steel facing wear away in some parts it can all be removed by a moment's immersion in a weak solution of nitric acid and another put on. The plate prints the same when steeled as before. Steel plates should be protected from rusting by a coating of beeswax. Sir Seymour Haden's qualifications for a printer of etchings are: "A finely organised man with the palm of a duchess." The two greatest printers were Delâtre in France and Goulding in England.

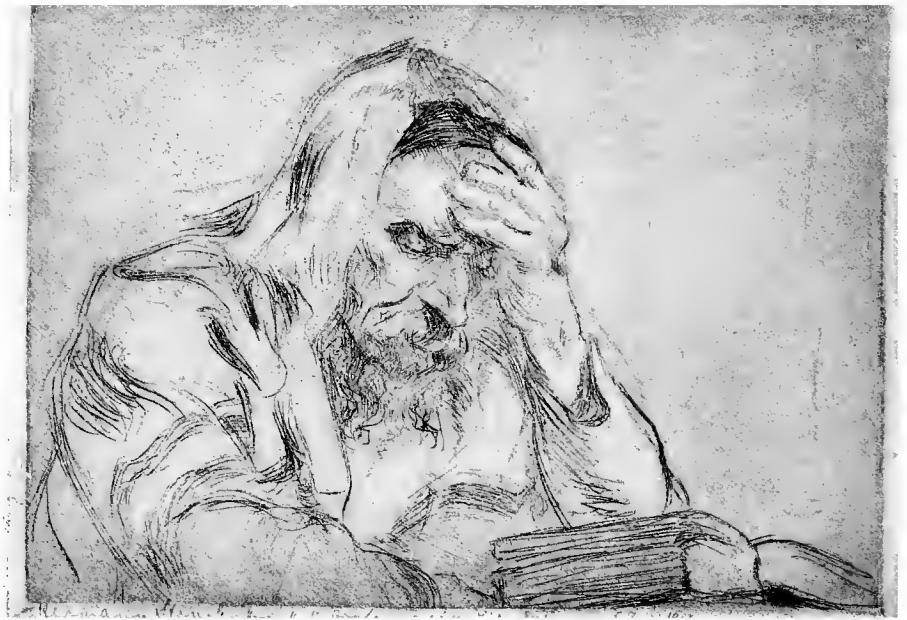
Should the artist decide, after making a number of prints, to change the work in any way—for example, by taking out or adding another figure—the prints made after this change become another "state of the plate." With some artists there are innumerable states, with others very few. Naturally the fewer prints there are for a given state the more valuable they are to the collector. However, an early state is not necessarily

the best, because the changes made are intended to and usually do improve the work. Provided there have not been too many impressions made, and the plate is therefore in a good condition, the later "states" may be better than the earlier.

To tell much in as few lines as possible is the ideal of etching. Rembrandt and Whistler should be studied for their masterly suggestion, and for their omission of non-essentials, leaving much to the imagination. The pleasure of etching lies in this suggestion which appeals to the intelligence of the beholder. Ruskin, who did not understand etching, called it the "art of scratch." On the contrary, each line should be considered and nothing left to chance. There are two kinds of etching, reproductive and original. In reproductive etching the work of the painter is translated into etching. In original etching the artist translates nature directly, and he is then known as a painter-etcher.

The following are some of the difficulties which etchers have to contend with: A negative process is always more difficult than a positive, the drawing showing light golden lines on a black ground. All line work must be done with a view to the future action of the acid and of the printing. The requirement of even pressure in all passages is another difficulty. The biting is very uncertain. One never knows surely what the acid has done until a proof is made. "Etching is always a chemical experiment." While it may be true that you can learn all there is to be learned about the technique in a half day, as I have been informed by a distinguished artist, it is possibly wise for ordinary mortals to take a bit more time in learning the "teasing" art. The possibilities of the medium are not fully realised until you know your copper, and that is a matter of years. To quote Hamerton: "You will have many a hard battle, many an hour of mortification, but let me tell you that all

good etchers have passed through these ordeals and been dirty with charcoal and oil and printing ink, and burnt their skin with acid, and spent hours and days in rubbing and scraping and correcting, often with no immediate result except utter disappointment."



THE TALMUDIST
A Dry Point by
HERMANN STRUCK

From a proof in the possession of Martin Birnbaum, Esq.

CHAPTER VII

DRY-POINT, SOFT GROUND, ETC.

DRY-POINT (pointe-sêche) is a method of engraving on copper with a hard and very sharp steel point. Although it is a misnomer to call it etching, as no acid is employed, yet custom sanctions the use of the word. In etching, the copper is dissolved to make the line; in dry-point it is dug out. The steel point in cutting the copper turns up a furrow known as the burr. If this is left on it catches the ink and gives that velvety richness and softness which we associate with dry-point. The burr may be partly cut off with a sharp scraper, or it may be entirely removed, as is generally the case when dry-point is used in connection with etching.

Dry-point needles are usually made of extra hard steel and are of varying sizes.

The needle should have a shorter cone than the etching needle and a sharp point. Diamonds are often used in dry-point, their great advantage lying in their always being sharp. However, they have this objection, that they are brittle, and should not be used in the heavier passages. The dry-point needle can make very faint lines, and it is therefore good for putting in the delicate lines of sky. Light dry-point lines harmonise well with etched lines, whereas deep ones do not. It is wise therefore to add dry-point only in the distant or the lighter parts of an etching. Much dry-point added to an etching decreases materially the number of satisfactory prints. The needle when held upright throws up an equal burr on both sides of the line. When held slanting it throws up a much heavier burr for a given pressure, and so is more effective. To see your work, rub some lampblack mixed with oil into the lines and wipe off with a rag.

Dry-point is much simpler than etching

proper, as the uncertainty of the biting with acid is avoided and the work can be easily seen. The play of the needle on the plate is less free in this method than in etching, on account of the pressure required to cut into the copper. To sum up, the distinctive characteristics of dry-point are: velvety richness and softness of line, arising from the action of the ink on the burr, and lack of perfect freedom in the line, owing to the resistance of the copper to the point.

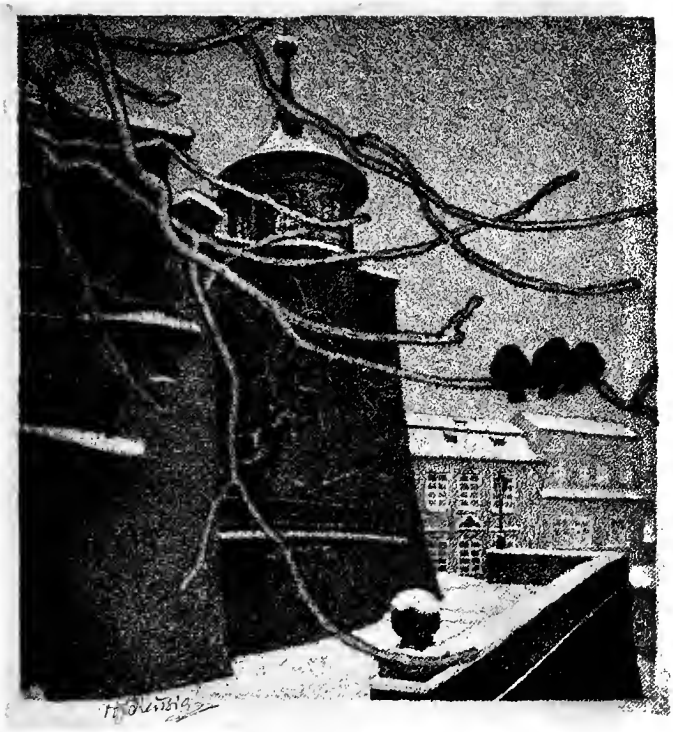
Sir Seymour Haden discovered that Rembrandt's etchings could be divided into three periods of about ten years each—the first period, pure etching; second period, etching mixed with dry-point; third period, pure dry-point.

Soft Ground.—This is a method of drawing on a plate with a lead pencil. The ordinary etching ground mixed with tallow to soften it is put on the plate in the usual way. A sheet of grained tissue paper is stretched over this ground. The design is

then drawn on the tissue with a pencil. When the paper is removed, it will be found that the ground has adhered to the paper wherever the pencil has been. The lines thus left on the copper are bitten in the usual way. The resulting print resembles a soft pencil drawing or a lithograph.

Aquatint is engraving with tones instead of lines. A plate is covered with finely powdered resin and the tones are produced by the stopping out method. Sand grain is a kind of aquatint where the grain is produced by running a plate, covered with an ordinary ground and on which a piece of sand paper has been placed, through an etching press.

Mezzotint is a means of engraving in tone. It has been much used for the reproduction of painting. Neither lines nor acid are employed. A copper plate is uniformly roughened by going over it in many different directions with a toothed instrument called a rocker. A rocked plate would print a uniform black. A steel tool called a mezzotint scraper



Permission of Berlin Photographic Co.

THE DARK TOWER
Aquatint in Color by
VOJTĚCH PREISSIG

is used to reduce the roughness and get the various tones, working from the dark to the light. An outline of the organic parts of the design is sometimes rather deeply bitten on the plate before rocking. Most interesting examples of this are Turner's beautiful outlines for the plates of the Liber Studiorum. Mezzotint is much richer than charcoal drawing, which it somewhat resembles. On account of the burr in mezzotints, it is only possible to get a comparatively few good impressions; twenty or thirty are all that are usually printed without steel facing.

Monotype.—If a picture is painted on a polished copper plate and the plate, covered with a dampened piece of etching paper, is run through an etching press, or even through an ordinary washing mangle, the resulting impression is known as a monotype. In theory only one print can be taken, but in practise a second or even a third are often more interesting than the first. Some amusing results are attained, but it is not a method

to employ for serious work. It is an artistic plaything and the effects are accidental. Colour may be used, but more often the drawing is made with black ink.

Glass Prints.—This is another process with which artists have amused themselves. A sheet of glass is covered with an opaque varnish on which a drawing is made with an etching needle. A print can be made by exposing sensitized paper to the light behind this plate—the Barbizon painters made many glass prints. Neither glass prints nor monotypes are in any sense engravings or etchings.

A MEZZOTINT
By
E. MARSDEN WILSON
A.R.E.

From a print in the possession of George T. Flowman

PART TWO

CHAPTER VIII

LIST OF MATERIALS FOR ETCHING

Plate	Scraper
File	Burnisher
Vise, with handle	Olive Oil
Turpentine	Charcoal
Whiting (Blanc d'Espagne)	Dry-Point Needles
Ammonia	Oil Rubber
Dabber	Graver or Burin
Ball of Etching ground	Roller
Wax tapers (Rat de cave)	Chamois skin
Etching needles	Oil Stone
Varnish for back of plate	Snake Stone
Tray for acid	Emery Paper
Acid	Lamp Black
Blotting paper	Anvil
Stopping-out varnish	Hammer
Water-colour brushes	Callipers.

IN addition one should be provided with feathers, running water if possible, means of heating and clean cotton rags.

The Plate as it comes to the etcher is polished but needs to be bevelled on the edges and

corners so that it will not cut the paper when printing. Use 18-gauge American etching copper for ordinary work. For mezzotints or large etchings use 16 gauge. English copper is preferred by some and may be had in New York. Old hand-hammered copper is desirable but very difficult to procure. Zinc plates are much cheaper than copper. They require a different proportion in the acid. The beginner would do well to use copper.

The File is used to bevel the edges and corners of the plate.

The Vise should have a wooden handle and one of the jaws should be covered with a piece of an old kid glove to protect the surface of the plate.

Turpentine is used to clean the plate and for removing the ground after the biting is finished.

Whiting softened with Ammonia is rubbed over the plate with printing muslin for further cleaning. Electro Silicon or Gilder's Whitening are good for this purpose. If the

AN ETCHING
By
SIR FRANK SHORT
R.A., P.R.E.

From a print in the possession of George T. Plowman

plate is tarnished vinegar and salt are sometimes used.

The **Dabber** is easily made as follows: Cut a disk of stiff cardboard about three inches in diameter. Lay a piece of silk, twelve inches across, flat on a table. On this, make a pile of cotton wool and horse-hair, on top of which place the cardboard. Draw up the silk around the disk and tie with a string. Cut off the ends of the silk, leaving enough for a handle. Sometimes fine kid or chamois skin is used instead of the silk.

Etching Ground.—A good etching ground should resist the action of the acid perfectly. It should adhere to the plate so well that it will hold up even when a small amount is left between closely drawn lines. The lines should be clear cut with perfect edges. The ground should not be so hard that the needle will not expose the copper under ordinary pressure. In other words, the ground should be so good that the etcher need not give it a thought.

COMPOSITION OF ETCHING GROUND

Bees-wax (pure)	2½	ounces
Syrian Asphaltum	2	"
Burgundy pitch	½	ounce
Black pitch	½	"

GROUND KNOWN AS REMBRANDT'S

White Wax	30	grains
Gum Mastic	15	"
Asphaltum or Amber	15	"

BOSSE'S GROUND AS USED BY HAMERTON

Bees-wax (pure)	5	ounces
Gum Mastic	3	"
Bitumen (in powder)	1½	"

This ground is used for the Dutch mordant.

MODIFICATION OF BOSSE'S GROUND USED BY PATON FOR NITRIC BATH

Bees-wax (pure)	3	ounces
Gum Mastic	1	ounce
Burgundy pitch	1	"
Bitumen (in powder)	1	"

Increase the amount of Asphaltum in the Rembrandt Ground to 30 grains for summer

use. Some etchers add a small ball of concentrated solution of rubber to the above formulas.

Making Etching Ground from formula given first.—First powder the pitch and the asphaltum. The black pitch is added for colour only. If this is omitted, twice as much Burgundy pitch must be used. Put the beeswax into a glazed double boiler and melt over a slow fire. Add the Syrian asphaltum and stir with a glass rod. Next add the pitch, making sure that each ingredient is melted before the next is added. Take the pot off the fire when putting in asphaltum, as it is liable to ignite. A good plan is to keep at hand a copper plate larger than the dish to put over the boiler in case the asphaltum does catch on fire.

Let the mixture simmer for fifteen minutes stirring all the time. Pour into a pail of warm water and when cool enough form into balls squeezing out the water. Cover with a bit of silk cloth and it is ready for use.

Wax Tapers.—A twisted bundle of wax tapers, known as the "Rat de Cave," is used for smoking the plate. These may be had of any dealer in Etching supplies.

Etching Needles are usually made with wooden handles. Sometimes the handle is adjustable so that a number of points of different sizes can be set in as required. The disadvantage of these is that they may work loose in time. Good etching needles are also made of one piece of steel. The extra weight helps in cutting through the ground. Needles sharpened at both ends are to be avoided as they are somewhat dangerous if carelessly used. Large sewing or darning needles make good etching points, provided a firm wooden handle can be devised. I have a number of very successful etching needles made from broken dental tools. An etching needle should be sharpened to a conical point slightly blunted. It should not scratch the copper but go equally well in all directions, gliding on the copper and not digging into it. To

sharpen the needle, place it between the palms of the hands and holding the point at an angle on the oilstone rub the hands together. Describe circles of varying sizes on a sheet of cardboard to polish the point. Do this until the point will glide on the thumb-nail without catching.

Dry-Point Needles are the same shape as etching needles, but are of much harder steel. They are made very sharp for cutting the copper.

Asphaltum Varnish or French Polish is used for painting over the back and sides of the plate to protect it from the acid.

The **Tray** for **Acid** can be of porcelain, enamel ware, or any flat-bottomed dish that is impervious to acid. In Paris, trays of papier-maché, covered with many coats of Brunswick Black, are to be had. They are liable to leak, as I have found to my sorrow.

Acid.—The principal acids used in etching are nitric, hydrochloric and perchloride of iron. All acids should be kept in bottles, with

ground glass stoppers, in a safe place. Work before an open window when using nitric acid as the gas given off is injurious to the throat and eyes. Acid will turn the clothing or the skin a bright yellow. Some etchers add a small piece of sal-ammoniac to the bath before biting, to make it work more smoothly. Use a piece the size of a hazel-nut to a pint of acid. The colour of the acid is clear and slightly yellow until the copper is laid in it, when it becomes green. For copper, the proportion is three parts of pure nitric acid of a specific gravity of 1.42 and 5 parts of water. Many use distilled water. For zinc or steel one part of acid to seven parts of water should be used. Never use the same acid for zinc and copper.

In mixing, always remember to add the acid to the water. It is dangerous to pour water into acid. As the chemical action generates heat the mixture should be allowed to stand for several hours. It is a good plan to put a strip of copper or a copper coin into

the acid before using. This makes it work better. Always have beside the bath a basin of clean water to wash the plate in and also to wash off any acid from the fingers. Have a bottle of ammonia handy, in case acid gets on the clothes. Be sure to get nitric and not nitrous acid, for the fumes from the latter are much more disagreeable, and, as the acid is not as strong as nitric, the proportions given will not hold. Sir Frank Short uses acetic acid instead of water in the nitric bath.

DUTCH BATH

The Formula for Dutch Bath is:

Hydrochloric acid	10 parts by weight
Chlorate of Potash	2 " " "
Water	88 " " "

Take half of the water hot and dissolve the potash. When cold add remainder of water and hydrochloric acid. The chemical action will heat the mixture again. The proportions of the Dutch bath may be varied.

Smillie used:

Muriatic acid	1	ounce
Chlorate of Potash	$\frac{1}{5}$	"
Water	5	ounces

The Dutch Bath is useful for starting a plate as it attacks all the lines evenly, whereas nitric acid sometimes plays tricks by starting some lines before others. With some plates it is a good plan to bite the distance in the Dutch and the remainder in the nitric. When you are doing the whole plate in the Dutch, it is a good idea to give it one bubbling all over in the nitric before removing ground. For extremely fine, close and delicate work use the Dutch bath cold. This bath is very slow in action compared with the nitric and bites deeper into the plate for a given width of surface. The bath should be heated to from 70° to 90°. The usual temperature is about 80°. Use a thermometer to keep the same degree as the rate of biting varies with the temperature.

The above is the mordant used for working

directly in the bath. When employing this method, begin by drawing the lines of your subject which are to be the darkest and work toward the light. It is more difficult to see the work than with nitric because the Dutch turns the lines nearly as black as the ground. A time-gauge can be made in the following manner: A strip of copper having on it a series of lines can be bitten ½, 1, 2, 5, 10, 15, 20, 30, 40, and 60 minutes to use as a guide, noting the temperature and employing the same when biting the plate. One of the advantages of the Dutch bath is that no unpleasant and injurious fumes are given off.

Perchloride of Iron is used pure as a mordant. When the plate is taken from this bath it should be washed in water and then in a weak solution of nitric acid. Wash again in water before putting back in the perchloride. This method will give the best results. One of the advantages of this acid is that there are no injurious fumes. The resulting line resembles the Dutch.

Kind of Line resulting from different baths.—Nitric line is wide with a ragged edge and more V-shaped. The Dutch mordant bites deeper and afterward sidewise. At first it is like a shallow "U" and in deeper biting it takes the form of an inverted Moorish arch. Deep lines therefore hold more ink than would appear from the width of line on the surface.

Stopping Out Varnish.—Japan Black thinned with turpentine is a good stopping out varnish, but takes too long to dry. Hamerton recommends a saturated solution of white wax in ether, adding ⅛ part of Japan varnish. Chloroform can be used instead of ether. Another good mixture is of Asphaltum varnish mixed with some old etching ground. Sir Frank Short recommends etching ground dissolved in chloroform or benzol. The above formulas are to be used when you may wish to draw over the ground. For ordinary stopping out use any varnish that is impervious to acid and quick drying. Rhind's

From a proof in the possession of Martin Birnbaum, Esq.

THE WATCHMAN
An Etching by
MARCUS BEHMEN

quick drying stopping out varnish is excellent. Penrose Mogul Varnish is quick drying, acid resisting and not brittle.

Scraper.—This triangular tool has three cutting edges which must be kept sharp all the time or they will scratch the plate. It is used for scraping the surface of the plate to reduce over-bitten lines. The scraper is also used to remove dry point burr. It should be very sharp for this purpose as sometimes one wishes to remove only the top of the burr. Should the scraper be used too much on any one part of the plate it will cause a depression which will hold ink.

Hammer, Anvil and Callipers.—A depression is remedied by knocking up the plate from the back by means of a hammer and polished anvil. A map of the depression can be drawn on the back of the copper by using a pair of long-armed callipers, one prong of which is sharpened to scratch the back of the plate. Be careful not to knock up the plate too much or it may buckle.

Burnisher.—This is also used to reduce over-bitten passages. It consists of an oval-shaped piece of highly polished steel set in a wooden handle. The tapering point is the part used in reducing the lines. It is held at an angle to the plate and passed diagonally across the lines, thus partly closing them so that they hold less ink and will print lighter. The burnisher is a most useful tool, and in the hands of an expert can be made to perform wonders. Some etchers over-bite certain passages purposely to get the exact tones with the burnisher. To keep the burnisher in good condition rub it back and forth along a groove in a piece of wood in which some emery powder has been placed. Tripoli powder and olive oil are also good for polishing the burnisher.

Graver or Burin.—This is a tool which must be sparingly used in etching. It is useful to strengthen a weak line, following each irregularity. To slightly rebite lines which have been gone over with the burin restores

the quality of the etched line. Avoid employing the burin in the stiff manner of the engraver.

Charcoal.—Willow Charcoal in sticks is used to polish the plate and reduce over-bitten passages. It comes in varying degrees of hardness and is used with water as well as olive oil.

Oil Rubber.—An Oil Rubber is made by binding tightly a roll of old printing blanketing. The roll is usually about 6″ long by 2″ in diameter. The end is used with oil for polishing the plate.

CHAPTER IX

PREPARING THE PLATE FOR ACID

FIRST make sure that there are no scratches on the surface of the plate. Remove any you may find with the burnisher and some olive oil. Clean the plate with turpentine and a soft rag. Benzine is also sometimes used. Use salt and vinegar to remove tarnish. Afterward use a mixture of ammonia and whiting. Wash off the whiting with water and dry the plate, after which it is ready for the ground. Warm the plate until the ball of ground will just melt through the silk when passed over the surface. Be careful not to have the plate too hot or the ground will be burned. Rub over the surface evenly with a bit of printing muslin to distribute the ground; then, using the dabber, tap first vigorously all over the plate; then softly, as it cools. The ground should be

evenly distributed and as thin as possible, and yet resist the acid. The plate should not be heated too quickly or too much. Keep it just hot enough to melt the ground through the silk. If bubbles come on the plate, it is too hot. Should you have too much ground, remove the surplus by first cleaning the dabber on another plate or a sheet of tissue paper, warmed on the heater. With this cleaned dabber take up the extra ground from the plate. The two things to guard against in putting on the ground are grease and dust on the plate.

To smoke the plate use a bundle of twisted wax tapers. Let the plate get cold before smoking on account of the danger of burning the ground. In smoking, hold the plate face downward by the hand-vise high above the head. Pass quickly backward and forward the lighted tapers. Be careful to smoke the edges. The centre will get enough smoke in covering the edges. Be very careful not to burn the ground either

by stopping too long in one place or getting the taper too near the plate. The flame, but not the wick, should touch the ground. A little practise will enable the beginner to get a beautiful, dull black surface, like polished ebony, all over the plate. If you find any parts that are not smooth and are grey and shiny, the ground has been burned, and you must wash it all off with turpentine and begin again, since burned ground will not resist the acid.

Roller Ground.—Use equal parts of etching ground broken into bits and spike oil of lavender, 1 oz. by weight to 2 oz. by measure. Warm until dissolved, stirring with a glass rod. Place in a wide-mouthed bottle and keep corked. Use this paste ground with a leather-covered roller. Spread the ground with a palette knife on a piece of plate-glass or another plate and charge the roller evenly with this paste. Roll the plate many times in various directions until it is covered with a thin even film of the ground. Heat the plate to

expel the oil of lavender. This is shown by a slight change in colour. Smoke as usual.

Liquid Method.—Dissolve etching ground in spike oil of lavender, chloroform or mentholated ether in the following manner: A small piece of ground is put into a 6 oz. bottle filled with the liquid. Shake well and leave for a day or so. Pour off the liquid a couple of times to get rid of the sediment. Level the plate with a small spirit level and pour the liquid ground on until it just covers all the surface and fills all the corners. Put surplus back into bottle and allow plate to dry. Smoke as before.

To polish the plate after working on it with the scraper, use the materials in the following order: Arkansas stone, snake stone, water charcoal, oil charcoal, felt and powdered emery with water, oil rubber, and putty powder with a bit of old blanketing. All of the above are seldom needed—usually the oil charcoal and oil rubber are enough. The bur-

nisher may be used to take out scratches which have a mysterious way of appearing on the plate no matter how careful you are.

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SELF-PORTRAIT
Etching by
MAX LIEBERMANN

CHAPTER X

I

DRAWING ON THE PLATE

EVERY line of the drawing should be made, bearing in mind the effect of the acid and printing. Different acids bring different results. The technique is entirely different from pen or pencil drawings —the fewer lines for a given effect the better. Lalanne's rule for drawing is: "The breadth of the space between lines should be in proportion to the depth of biting." That is, for shallow biting keep the lines close together, and for deep biting wide apart. This rule allows for the action of the acid which bites sidewise as well as down. Etching is an interpretation of nature, and no attempt should be made to conceal the line which is the most vital fact of this medium.

The needle should be held as near upright

as possible to get the best results. At first you will get the lines in the distance too far apart, because they will look closer than they really are on account of the shining of the copper on the black ground. Using a reading glass or placing a piece of tracing paper over the plate will show you the real state of the lines. Draw with evenness of pressure all over and with enough firmness to expose the copper. The temptation is strong to press lightly in the fainter parts. The copper may be exposed so that it shines through and yet enough of the ground will be left to prevent the acid from biting. To put on extra pressure in a place where deep biting is required will assist the result, but in general it is best to leave the values to the acid. Do not cross the lines at too acute an angle or you will find the acid has made a hole at the intersection. The more surface exposed in a given area the faster the nitric will bite. This should be considered in the stopping out or you will find some parts too deeply bitten.

A soft-haired brush should be used to brush off the particles of ground which come up from the needle. Temperature affects the work of the needle as cold hardens the ground. A single needle may be used or a number of different sizes, employing the finer for the distance. When drawing indoors place a screen of tracing paper stretched over a wooden frame at an angle of 45° in front of the window, and draw in the light which filters through. This makes the lines of gold on the black ground very plain. At night a light can be placed back of the screen.

II

METHODS OF TRANSFER

Transfer Paper.—First a piece of black or red transfer paper is cut the size of the plate. Over this is stretched a tracing of the subject, face down if it is desirable that the print come as it is in nature. In any case all lettering must be done in the reverse or it will be wrong in the print. After the tracing is

stretched in place and you have made sure that the vertical and horizontal lines correspond to the sides of the plate, you draw over the tracing with a hard pencil or blunt etching needle. In working out-of-doors, it is difficult to start directly on the plate without preliminary outlines. There are two ways of overcoming this. One is to place a transfer paper over the plate and stretch drawing or tracing paper over this. Make your outline drawing on this paper. Another method is to outline your subject on the ground with a small brush dipped in Chinese White.

The Gelatine Method is as follows: Scratch the outline drawing with the etching needle on a sheet of gelatine. Fill scratches with black lead. Put on plate face down and rub back of gelatine with burnisher.

Transferring through press.—Draw on tracing paper using a sharp B pencil. Dampen the paper by laying between moist blotters. Place on plate, pencil side down, and run through the press, first reducing the

pressure. In working direct from nature if you sit with your back to the subject and draw what you see in a mirror, the result will be right in the print.

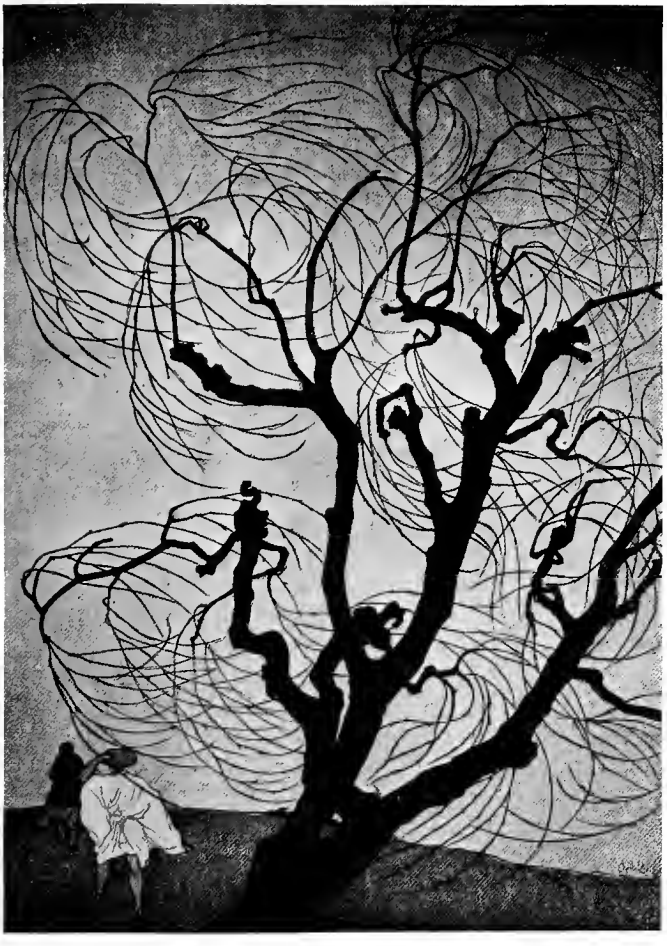
There is a question among etchers as to the importance of reversing. With Whistler the subject, as such, was secondary, and therefore he did not consider it at all necessary to bother about reversing his drawing on the plate. He was not producing illustrations of places, but works of art. Others care so little for this that they even letter correctly on the plate, thus allowing the lettering to come reversed in the print. A familiar building, such as Notre Dame in Paris, certainly looks odd when printed in reverse.

CHAPTER XI

I

BITING THE PLATE

IF the plate has stood for some time after being drawn upon, it may be necessary to wash the ground in a solution of acetic acid and salt in order that the acid may bite more evenly. To a half cupful of acetic acid, of about the strength of ordinary vinegar, add two teaspoonfuls of common salt. To remove any grease that may be on the ground, brush with a piece of cotton dipped in alcohol before putting in the bath. Cover over the sides and back of the plate with an acid-resisting varnish. If nitric acid is to be used, pour it into a porcelain dish to a depth of about one inch and put the plate in, first having water handy to wash off the plate and also any acid from the fingers. The old way to make the dish for the acid was to



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THE LEAFLESS TREE
Wood cut in color by
EMIL ORLIK

build a wall of wax around the plate. The wax was made to adhere to it by running a hot key around the inside of this wall. This method is rarely used now.

Soon after the plate is put into the nitric bath, bubbles of gas form on the lines, first on those which are drawn near together and last on the isolated lines. This bubbling is one of the ways of gauging the biting. If some of the lines refuse to bubble you may be sure that you did not employ enough pressure to remove all the ground. However, they may start later. The bubbles should be gently brushed off with a soft feather. For very faint lines in the distance of your subject two to three bubblings will be found to be enough. That is, the bubbles are allowed to accumulate and are brushed off with the feather two or three times. You will find that as the biting progresses the acid tends to bite faster, even when the temperature remains the same. When the distance is bitten enough, the plate should be removed, washed in water and dried

by pressing blotters lightly over the surface. Be careful not to let the blotters slip or the ground will be damaged.

There are several ways of telling how deeply the lines are bitten. One way is to hold the plate up high and look across the lines toward the light. The amount of shadow cast by the lines will give you an idea of their depth. Another way is to draw a needle over a line and gauge the depth by the drop of the needle in crossing the line. Still another way is to select some line or set of lines that are not important and scrape off the ground to look at them. They will of course have to be covered with stopping-out varnish whether deep enough or not. When you have decided that the distance is bitten enough, paint out carefully with a stopping-out varnish, taking great care not to run into lines you wish to bite more. The lines must look less heavy than they will be in the print because the ink is darker than the shadow. You can take the plate out of the acid with

your fingers if you wash your fingers at once, or you can use a piece of wood, with a chiselled end to press under the edge of the plate for a lifter. Grease on the fingers will protect them from the acid.

If anything, over-bite the distance because it is easier to reduce than to deepen shallow lines. It is wise to wear a blouse, similar to the workman's blouse in France, which will entirely cover your clothes, as the acid has a most mysterious way of making bright spots on clothing, no matter how careful you are. It is best not to try to finish a plate in the first biting. Get the essential parts. Leave the large light, etc., for future biting which you can do so much better with a proof of the work before you. Increasing the temperature of the acid increases speed but decreases the variety. Nitric acid bites quicker on a warm damp day. Strong acid tends to roughen and foul the plate. An old saying of etchers is, "One day of stopping-out is worth five with the needle."

II

OTHER METHODS OF USING ACID

Etching in the bath.—Place the grounded plate in the acid bath and begin by drawing those lines which are to bite the deepest and work toward the lightest. It is a most difficult way for a beginner to etch. I would not advise trying it until you have had a good deal of experience with the stopping-out. Of course you will use this method some in the stopping-out process. Use an old needle or a sewing needle in a wooden handle because the acid will eat the needle as well as the copper. However, it will last for some time. This method was invented by Sir Seymour Haden, but is not used by many etchers. It has too many difficulties.

Avoiding stopping-out.—In this method first draw in only the parts that are to be bitten the most. Place the plate in acid until these lines are bitten enough, and, on removing it, wash in water and draw in the set of lines

that are the next grade lighter than the first, and so on to the lightest. Of course at any time between bitings you can remove the ground in order to make a print which will be a guide in further work. One of the advantages of this way of working is that you can run lines across those already bitten. For instance, the lines of a sky showing through foliage would require a lot of careful stopping-out in the old method.

Still another method is to place the plate on an inverted dish in the bottom of the empty tray, pour the acid on the plate and manipulate it with a feather. The acid will stay where wanted if mixed with a little saliva. This method is not as nice as it is useful. Start the acid where you want the darkest lines and enlarge the space covered by the acid with the feather until you have the faintest lines bitten.

Whistler's method of biting a plate as described by Otto Bacher is as follows: "He put the plate ready for biting on the corner of

the table, then poured the acid slowly onto a feather held against the mouth of the bottle, the acid dripping from the end of the feather. By moving the bottle and feather back and forth he covered the plate entirely with acid. The feather was employed to keep the plate equally covered. When the biting was finished he would place the feather against the tilted edge of the plate and drain the acid back into the bottle." If you employ this method it would be wise to have plenty of water near in case of accident.

Hamerton's Positive Process.—This is a method of working in black on a white ground. The ground is made white instead of black and the Dutch bath is used, thus giving a white surface and black lines. I doubt if this method is much used because in practise one soon becomes accustomed to the golden lines of the copper on the black ground. This process, and the one following are fully explained in Hamerton's Etcher's Handbook. Bracquemond drew with pen and ink on a

clean copper plate. He then ground the plate in the usual way and immediately immersed it in water—the ink softens in the water and in a quarter of an hour the ground will come up where the ink lines are if rubbed with a flannel. Bite as usual and the result resembles a pen and ink drawing. Flour of sulphur and oil put onto a plate with a brush for five or ten minutes gives a flat tone. The sulphur makes the plate look darker than it prints.

In practise, the etcher usually employs a combination of several or all of the above methods. A good general rule in biting is to err, if at all, in over-biting the distance and under-biting the foreground.

III

FOUL BITING

Should the ground be improperly laid the acid may find its way through in spots and show what is known as foul biting. Some of

this fouling may come where it can remain with advantage, but should any of it come in the delicate parts such as the sky, it must be removed. Gouge it out first with a scorper, a tool something like a burin, knock the plate up from the back and polish. This is tedious work, and if your plate is covered with a deep fouling you may find it easier to do a new plate.

Sometimes fouling is purposely done. If there is not much wanted, a simple way is to take a coarse needle and tap or dot the ground on the plate wherever you want the fouling. Another method is to lay a dusty ground. Work in a cool bath until the parts to be kept clear are finished. Paint these out and warm up the bath when the dust spots will probably foul all you want. Or warm the plate and touch ground with a fluffy rag where you want fouling. Put sandpaper on the ground and rub on with burnisher. This can also be done on the plate after the ground is removed, using more pressure with burnisher.

Warm up the ground and sprinkle with a little salt. Wash off the salt and bite. Fouling will show wherever the salt has touched the ground.

CHAPTER XII

I

REWORKING GROUND

SHOULD you find, as is very probable, that some parts of the etching require more work to bring out the desired effect, proceed in one of two ways: either by putting in dry-point or by re-etching, as follows: The plate is first carefully cleaned with turpentine, ammonia, whiting and water. Then melt some of the etching ground and rub into the lines with a bit of printing muslin. This protects the lines already bitten. Put on a ground with the dabber, or you can go over it with a roller, and remove any extra ground by passing the roller over another heated plate. Go over the surface until the ground is even. Do not smoke. The old work will show through this ground.

Instead of using the roller with the hot

EGYPTIAN DANCER
From an Original Etching by
ANNE GOLDTHWAITE

plate clean off as much of the ground as possible from the surface with a pad of linen rag, lightly folded. Let the plate cool and put a roller ground on in the usual way. This is the method recommended by Sir Frank Short.

II

REBITING

The rebiting is for the purpose of deepening any lines which may have come out too light. Use a paste ground made of the ordinary etching ground dissolved in spike oil of lavender. Some of this paste should be spread on a clean piece of plate glass or an extra plate and gone over many times with a leather roller until the paste is evenly distributed on the roller. Then roll over the plate to be rebitten a number of times in every direction, employing no more pressure than the weight of the roller. The plate should now be in the same condition as before removing the ground. That is, the surface of the plate is covered

with a ground and the lines are free to receive further biting. You must heat the plate until it shines, to drive off the oil of lavender. A little practise will enable you to get this result. Some etchers fill the lines first with whiting and rub off with chamois. This is not necessary, however.

The most important thing is to clean the plate thoroughly before applying the ground and have the plate and roller free from dust. Don't smoke a rebiting ground, because the heat may cause the shallow lines to fill up. If the plate is irregular on the surface the roller cannot be used. It is then necessary to use the dabber. This is a very delicate operation and requires much practise to succeed.

CHAPTER XIII

OTHER METHODS

I

SOFT GROUND

FOR soft ground etching melt together lard or tallow and an equal amount of etching ground. This is the proportion for cold weather. In warm weather use less, and in hot weather only one-half as much tallow or lard as ground. This ground is to be put on in the usual way, using a separate dabber. The ground is tender and will not bear touching with the hand. Thin-grained paper or tissue paper is placed on a piece of soft blotting paper. Then carefully place the grounded plate face down on the paper and turn up the edges and paste on back. Sometimes the paper is dampened and stretched. You now make your drawing on this paper using an H or F pencil, being careful to sup-

port the hand on some kind of rest so that it will not touch the surface of the paper. The pencil is employed as in ordinary drawing, i.e., varying the pressure to get values. But there is not as much difference between pressures as in ordinary drawing. Remove the paper carefully from the plate and you will find that it has picked up the ground wherever you have drawn with the pencil. Bite the plate in the usual way, noting that the biting is somewhat quicker than in ordinary etching. Variety is gotten by using different paper and pencils.

II

AQUATINT

In aquatint, spaces are bitten instead of lines. It is best to etch lightly the construction lines first. The plate is then thoroughly cleaned and dusted all over evenly with powdered asphaltum placed in a muslin bag. Strike the hand containing the bag against a ruler. When completely dusted warm the

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D'ANDRADE AS DON JUAN
Soft Ground Etching by
MAX SLEVOGT

plate moderately until there is a change in colour. Use stopping-out varnish and acid in the usual way. Paton recommends a bottomless box with a piece of fine muslin stretched over it. Place fine white resin on this, putting box over the plate on a table. Strike the box and the resin will sift evenly over the plate. There are other methods of getting a tint on a plate,—for instance, running a plate with an ordinary ground on it and covered with a piece of cloth through an etching press. Sandpaper is sometimes used in the same way. Salt sprinkled on a heated plate covered with etching ground is also used. The print from an aquatint is not unlike a wash drawing.

Spirit Ground.—Fill a bottle one-third full with powdered resin, and fill up with rectified spirits of wine. Be sure it is all dissolved before using. Pour over the plate and let it run evenly all over. Let the plate dry and bite as usual. In the resin and spirit methods, the acid bites the spaces around the particles of resin. In the cloth, salt and sandpaper

methods, the dots made by these materials bite. To get a variety of tone in a sky, put the upper edge in the bath first, and gradually lower until all the plate is in the bath. This will make the top of the sky darker.

III

MEZZOTINT

The mezzotint rocker or cradle is shaped like the rocker of a child's cradle. It is a piece of steel about 2½ inches wide and ½ inch thick. One end is rounded to the segment of a circle and shaped like a chisel. On the side corresponding to the back of the chisel a number of parallel grooves are run perpendicular to the chisel edge. There are from 40 to 120 of these grooves to an inch. The intersections of these grooves and the chiselled edge become a series of sharp teeth. The rocker may have a wooden handle or it may be clamped to a long rod not unlike a billiard cue and rocked by allowing the other

end of the rod to run in a groove set perpendicular to the plate. A small rocker in a handle can be used to go over a place where too much burr has been removed. Use a burnisher to polish the surface for strong lights. Olive oil and lamp black rubbed over the plate gives an idea of the plate's condition. A proof may be printed to serve as a guide. By varying the number of teeth in the rocker you change the grain. Seventy-two teeth to the inch is the usual number employed. The fewer teeth the coarser the grain. Rocking costs about ten cents a square inch. The teeth of the rocker make a hole in the plate's surface and also raise a burr. The greater the amount of burr removed the lighter the tone.

The mezzotint scraper is shaped something like the blade of a knife, but it is sharpened at the end only. To transfer an outline to a rocked plate, use red chalk transfer paper, first smoking the plate. A blunted dry-point needle may be used to fix the outlines. In scraping, one should be careful to follow the

last stroke or the work will be uneven. Mezzotint may be combined with dry-point. Use a dull point in order that the work may be the more harmonious.

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ETCHING FROM
THE DON JUAN PORTFOLIO
By
HANS MEID

CHAPTER XIV

FOR A FIRST EXPERIMENT

I PROPOSE to give here only the most necessary materials required to carry a plate through to the printing stage. The cost of those purchased should be under five dollars. I would not advise this limited equipment for more extensive work.

The artist should choose a simple subject employing as few positive values and lines as possible. Draw with an even pressure, being sure to expose the copper with each stroke.

Materials to Purchase.—

Plate	Scraper
Ball of Etching Ground	Burnisher
Acid	Charcoal
Varnish	Lampblack.

Plate.—Get a small plate from one of the firms mentioned in the appendix, or use the back of an old visiting card plate. You can

get some old plates from a card engraver. These must be cleaned and polished and the edges filed.

Ball of Etching Ground.—It will probably be found more convenient to purchase a bottle of the liquid etching ground or a small ball of the ground about the size of a walnut. The cost of the materials for making a larger quantity will be about the same.

Acid should be pure. Get it from the druggist. Nitric is best for the first trial.

Varnish.—Get asphaltum varnish or any good varnish that is impervious to acid and can be removed readily with turpentine.

Scraper.—One of medium size will do.

Burnisher.—The burnisher and scraper can be purchased from any dealer in etching supplies.

Charcoal.—One stick is enough.

Lampblack.—While not absolutely necessary it will be useful to mix with olive oil and rub on the plate so that the work may be seen.

The following materials can be easily procured if you do not already have them:

File	Stopping-out Varnish
Vise	Water-Colour Brushes
Turpentine	Olive Oil
Whiting	Chamois Skin
Ammonia	Oil Stone
Tapers	Hammer
Tray	Large Wire Nail
Blotting Papers	Feathers
Dabber	Rags
Etching Needles	Heater.

File.—Any file that will round the edges of the copper.

Vise.—A pair of tweezers will do, wrapping cloth about the handle to protect the fingers from heat. Remember to put a small piece of blotting paper on the face side of the plate to prevent the tweezers from scratching the surface.

Turpentine.—A small bottle of turpentine will answer.

Whiting.—Electro Silicon as used in the house for silver-polish will do as well as whiting. Gilders whitening is good.

Ammonia.—Washing ammonia can be used.

Tapers.—Any smoky flame may take the place of tapers. For instance: that from a spirit lamp. As the blackening of the ground is only for seeing the work more clearly, in a first plate it is possible to omit it.

Tray.—Photo developing trays are not expensive, but any flat-bottomed dish will do. I have known of a wash-basin being successfully employed.

Blotting Paper.—Large, soft sheets are required.

Dabber.—For making the dabber, refer to page 75.

Etching Needles.—For this experiment a sewing needle in a handle of wood will do; or get a couple of broken tools from a dentist and sharpen them.

Stopping-out Varnish.—Dissolve some of the etching ground in chloroform or benzole.

Water-Colour Brushes.—You have plenty of them no doubt.

Olive Oil.—As used in the house

Oil Stone.—Such as is used for sharpening a knife.

Hammer and Wire Nail.—These are used to knock up the plate from the back in case you have scraped a depression in the surface. Place the plate face downward on a piece of soft blotting-paper and mark the spot by measuring from two adjacent sides with a pencil.

Feathers.—A couple of small ones will do.

Rags.—Clean cotton rags are the best.

Heater.—A gas burner is best. You can use a gas-jet if necessary.

CHAPTER XV

PRINTING

List of Materials.—

Press	Heater
Blankets	Jigger
Inks	Printing Muslin
Plate Oils	Retroussage, or
Palette Knife	Stumping Muslin
Ink Dabber or Ink Roller	Whiting
Slab	Sponge
Muller	Brush

AN etching press has nothing in common with a type printing press. The principle is that of the ordinary clothes-wringer or laundry mangle. The essential parts are two steel rollers, ten inches or more in length, placed one above another, the lower being larger in diameter. Originally these rollers were made of wood. Between them is a movable bed of steel on which is sometimes placed a sheet of zinc and upon this the plate to be printed is laid. If the

RICHMOND CASTLE, YORKSHIRE
An Etching by PERCIVAL GASKELL, R.E.

From a print in the possession of George T. Plowman

pressure is uneven, pieces of paper can be put under the zinc plate. To pass this bed between the rollers, the upper wheel has attached to its axis a hub with either long-handled spokes or a geared wheel. The former type is known as the Star press, the latter is called a Geared press. A rigid enough frame to hold these parts in position and a couple of screws connected by grooves in the frame with the upper roller to regulate the pressure, complete the essential parts of an etching press. Custom has sanctioned the practise of putting several thicknesses of cardboard between the axis of the upper roller and the screw. All presses have this cushion, as it is called, but I have been unable to find any one who would maintain that as good a print could not be made from a press in which these boards were lacking. However, in the early form of presses, these bits of cardboard were necessary to regulate the pressure. The saying still exists in printing establishments, "Take a card out," meaning to reduce the pressure. As the

pressure in printing etchings is very great, all parts of a press should be especially strong. Some beautiful examples of old presses are to be seen in the Plantin Museum at Antwerp.

Blanketing.—Blankets used in printing are of two kinds, Swanskin and fronting. Two thicknesses of the fronting go next to the plate and three thicknesses of the Swanskin next to the top roller. These blankets act as a pad and help to force the paper into the lines of the plate. They should be washed from time to time, oftener when using sized papers. The corners of the blankets should be rounded off and the upper ones made smaller than the lower. The blankets should be a little wider than the plate to be printed.

Etching Inks are made from the lees of the grape after the wine has been pressed out. The inks most commonly used in printing are:

Frankfort Black	Forcing Black
Winston Black	Heavy French
Michael Angelo Black	Light French
Rembrandt Black	

Burnt Umber is used to warm the ink.

The following formulas are good, but different combinations can be experimented with.

STRONG INK, NO. 1

1 part Heavy French.
1 part Winston's Frankfort Black.
1 part Michael Angelo Black.
3 parts Light French.

Burnt Umber to warm. Use medium and thin oils in equal parts.

INK FOR TRIAL PROOFS

Frankfort Black.
Burnt Umber to warm.
Medium Oil.

STRONG INK, NO. 2

1 part Heavy French mixed with thin oil.
1 part Michael Angelo Black.
1 part Haddon's Forcing Black.
2 parts Light French.

Burnt Umber to warm.
Equal parts medium and thin oil. Grind as stiff as possible.

STRONG INK, NO. 3

1 part Heavy French.
1 part Forcing Black.
1 part Frankfort Black.
2 parts Light French.
Burnt Umber to warm. Use medium oil.

INK FOR MEZZOTINTS

Frankfort Black.
Burnt Umber to warm.
Use thick oil.

Good inks are sold in cans ready for use.

Plate Oils.—Three grades of burned linseed oil—thin, medium and thick—are employed in printing. Thin and medium oils are used for etching, the thick for mezzotinting. The essential thing is to get burned oil, as boiling is not enough. The oil is placed in caldrons under which fires are lighted. When the boiling point is reached red-hot pokers are plunged into it. It is burned from six to ten hours. The longer the burning the thicker the oil. This burning of the oil was one of the most picturesque features of the old printing establishments.

Palette Knife.—A large size palette knife as used by painters will do.

Ink Dabbers.—The best way to make an ink dabber is to take as a foundation a wooden stocking darner shaped in the segment of a sphere with a handle attached to the flat side. Cut old stocking legs into sections and pull them over one at a time until you have made a ball at least four inches in diameter. Some of them can be pulled over the handle. To finish the dabber stretch over it a circular piece of printer's blanketing and lace at the handle with strong thread. This handle can be previously covered with a piece of kid from an old glove. The blanketing is laced that it may be easily renewed without making a new dabber.

Ink Roller.—A good ink roller is made by using as a foundation a small size rolling-pin. Proceed as with the dabber, covering tightly with blanketing laced at either end.

Slab.—A smooth surface for grinding the ink may be of polished marble, granite or

lithographic stone, in size from eighteen to twenty-four inches square. A good shape is eighteen by twenty-four inches.

Muller.—A piece of marble, polished on one side and shaped so as to be comfortably grasped with both hands.

Heater.—The best heater is a smooth sheet of iron on legs under which a gas burner is placed. Some etchers make this plate so large that by placing the burner at one end the other remains cool thus doing away with the jigger.

Jigger.—A jigger is a wooden box of the same height as the heater and placed beside it. The front of the box can be hinged and the interior utilised for keeping the printing muslins.

Printing Muslin.—A very satisfactory material to use for removing the ink from the plate in printing is a kind of muslin known as tarlatan. For retroussage or stumping, a fine grade of cheesecloth is satisfactory.

Whiting (Blanc d'Espagne).—To prevent

scratches on the plate, gritty particles should be removed from ordinary whiting by precipitating in water. Both Electro Silicon and Gilder's whiting are good.

Sponge.—The sponge should be very fine and soft.

Brush.—A stiff hat brush is used to bring up the pile on the surface of the paper just before printing.

Grinding the Ink.—The dry ink is ground on the slab with the muller. This takes some time and is not easy work. The several inks are placed on the slab and the lumps crushed. Then some oil is added and the muller, held in both hands, is passed many times forward and back over the slab. Employ pressure only when pushing the muller away; then bring it back with the edge farthest away slightly raised. More oil is added from time to time. The ink must be thoroughly ground or you will find scratches on your plate. Over-grinding is as bad as under-grinding. Any grit or dirt in the ink will make itself

known in scratches. When grinding a lot of ink at once it is wise to divide it into small portions and grind each part separately, bringing them all together at the last grinding. For thick ink use less oil. Take some up on your palette knife to see if it is of the right consistency and thoroughly ground. It should feel like butter. You will soon learn the look of the ink when it is just right. It is better to grind the ink two or three days before using.

Inking.—The ink is put on the plate in the following manner: First, with a **dabber.** Put some of the ink on the dabber with a palette knife and dab it all over the surface of the warmed plate with a rocking motion, paying particular attention to the deep lines, to make sure that they are full of ink. For the first proof, rub the ink well into the lines with a bit of printing muslin. The dabber should never slide on the plate because of the danger of scratching. The dabber should have old ink taken off its surface by working it on the heater. Second, with a **roller.** Take

up some of the ink from the slab on the roller and distribute it uniformly over the plate. For deeply bitten lines, the dabber is safer than the roller.

Wiping the Plate.—The whole surface of the plate is now covered with a layer of ink. To remove this ink, the printing muslin or tarlatan is used in the following manner. A piece of muslin about a yard square is made up into a flattened ball which can be easily held. The outside should be smooth, with no hard lumps beneath the surface. Printers have a way of folding the muslin by grasping two adjacent corners and tossing it in the air, at the same time passing first one hand and then the other underneath toward the centre of the square. You should have at least three balls of this tarlatan. With the first one take off the bulk of the ink from the surface of the plate, which should be warm at this stage. This ball is passed across the plate exerting the pressure with the palm of the hand, the idea being to remove the surface ink without

disturbing any in the lines. It soon becomes charged with ink. A "fat" rag is one with quite an amount of ink on it. It is more sympathetic than a clean one. Take another ball of muslin and with a twisting motion work over the surface of the plate, which by this time should be almost cool. You may finish the wiping with this rag or use another for the final work. The last rag should be more fat than the others or your print will look weak. This is the most important part of the inking and the method is varied according to the effect desired. For book-plates, portraits, and work that needs clear printing, ink is put on the palm of the hand with the dabber. The hand is drawn several times over a piece of whiting. Mix by rubbing the hands together. With the hand thus prepared, pass over the plate with a caressing motion, cleaning away the surface ink more or less without disturbing the lines.

The first method is known as rag-wipe; the second as hand-wipe. Thoroughly clean the

edges of the plate with a bit of rag dipped in whiting. When the plate is wiped to your satisfaction, it is again heated until quite warm. Now drag a bit of loosely folded cheesecloth over the plate across the lines you wish to print strong. The fluff on the cloth pulls some of the ink over the edge of the lines and gives a rich effect in the print. This is called stumping or retroussage. It is very important but should be employed with judgment. Over-stumping is worse than no stumping at all, as it gives the print a mussy appearance. The plate is now ready for the press. Aquatints should never be stumped. In the beginning one is tempted to depend too much on what Hamerton calls artificial printing. In this method the printer uses whiting to paint out parts and get effects which should have been arrived at with the needle and acid. It is much the best to complete the effect on the plate and print simply. The plate should always be cleaned with turpentine after printing to get all the ink out of the lines. Old

ink in the lines is hard to remove. Use a saturated solution of potash to remove old ink.

Paper.—Etching paper is of various colours and thicknesses, from the heaviest plate to the thinnest Japanese. Plate paper is of a spongy nature not unlike blotting-paper. It is used for proofs, but mezzotints are sometimes printed on it. It is also used as a backing for very thin China paper. The paper is cut to the exact size of the copper plate, flour paste is put on the back, and it is then run through the press with a sheet of plate paper to which it adheres. Good etching paper should be soft or half-sized. Japanese paper and plate paper can be wet down just before printing. The Japanese should be drier. Most papers except the Japanese should be dampened with a sponge the day before printing and kept between blotters making sure that the edges are wet. The Japanese paper can be dampened an hour or so before. All sized papers should be wet down the day before printing. A good way to dampen paper

is to pass each sheet through a tub of clean water, and then place between wet blotters. Thin sheets of zinc are used to hold the dampened paper. Thin Japanese paper should be dampened with a sponge by tapping lightly on the back. All paper should be limp but not wet on the surface. Sized papers should be brushed on the right side before printing. Old account books of hand-made French or Dutch paper are much sought after by etchers. Dry out any paper that may be left after printing before putting it away, as it is liable to mildew.

Printing the Plate.—To test the pressure on the press pass a clean plate through with a piece of plate paper. Hold the paper toward the light and looking across it, study the shine. This should be equal at both ends of the plate if the pressure is even. The strong lines of the design will be embossed on the paper.

In most cases the inked plate should be warm but not hot. Make sure that the zinc

on the bed of the press is perfectly clean. Use a rag with turpentine for this. Place the warm plate on the zinc with the long side parallel to the rollers. Over this carefully place the moistened paper and upon this place a sheet of tissue paper and pull the blankets down. These are already part way through the rollers nipped in far enough to hold them. Turn the press with a steady motion not stopping while the plate is between the rollers. Lift the blankets and throw the free end over the top roller. Take off the tissue paper, beginning at a corner nearest roller. Now lift the print carefully by the two corners farthest from the rollers. A couple of pieces of cardboard folded once to grip the paper will prevent black finger marks on the margin of the print.

Treating a Fresh Print.—The old etchers had wires stretched across the room and hung their fresh prints on them face up, for a number of days to dry. It is now more usual to place them between large sheets of blotting-

paper. But in no case are they to be put under pressure until the ink has had a chance to harden. The ridges of ink would be crushed down under the pressure. Afterward they should be put in fresh blotters and subjected to pressure so that the paper will dry perfectly smooth. A better way, but one taking more time, is to stretch (or strain) the etching, after dampening the back, on a drawing board or academy board, pasting down the edges with photo paste. When perfectly dry, cut the paper inside the pasted edge.

Some Suggestions for Inking and Printing.—If the plate is bitten lightly use strong ink. Old ink gives more tone. A cold plate printed slowly with heavy pressure leaves more tone. For a bright proof print hot and quickly with normal pressure. Do not leave so much ink on the plate that the line is lost. To make a strong print, hand-wipe cold, stump cold with a fat rag, then heat and stump in the usual way. For plates with over-burnished lines, ink hot, hand-wipe cold, and warm up well

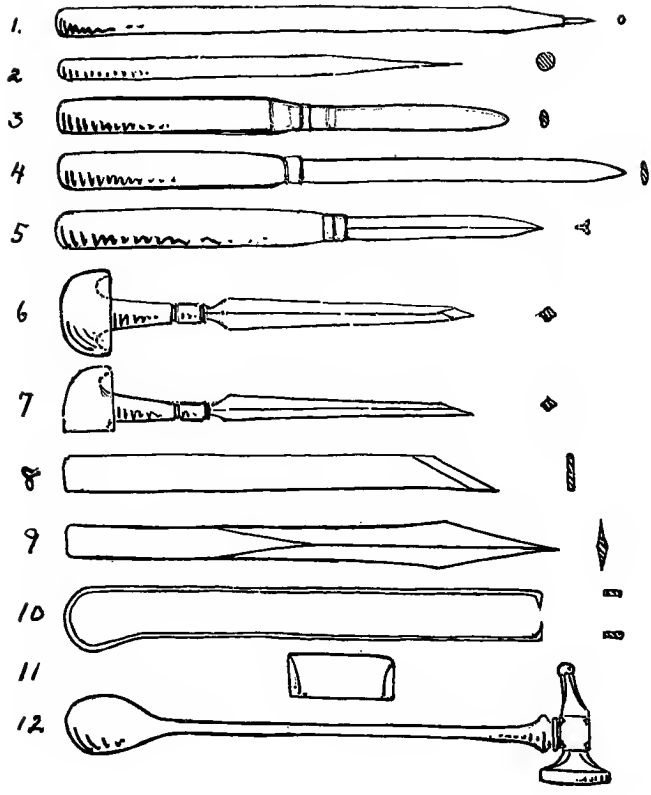
to stump. For over-bitten plate, use Frankfort, burnt umber, rag-wipe and do not stump. Thick ink gives more brilliancy.

Greater pressure gives greater tone. To take out some of the ink in over-bitten lines, wipe with stumping muslin. Passing the print back through the press a second time gives additional strength. Start wiping with a rather clean rag and finish with a fat one. Some plates are improved by going over them with printing muslin after hand-wiping. The thinner the ink, the more mat tone the print has. The hardest plate to print is the delicately bitten one. Hand-wiping is usually best for dry-point. In retroussage or stumping, pull out the dark parts first.

If your proof is a failure, look first to the pressure and then to the paper. The paper will not print well if it is either too wet or too dry. The ink may not be just right. Often a beginner wipes the ink out of the lines, thus giving a poor proof. When you are through printing be sure to remove all ink from the

plates by warming them and going over them with turpentine. If the plate is steel faced it must be covered with a coating of beeswax put on hot. This will prevent the steel from rusting and you can remove the beeswax with benzine when you wish to use the plate again. Clean everything which has ink on it with turpentine and leave all tools in good condition for the next printing.

PLATE No. 1



1. Etching Needle in Wooden Handle
2. Solid Steel Etching Needle
3. Burnisher with Blunt End
4. Burnisher with Sharp End
5. Scraper
6 and 7. Top and Side View of Burin
8 and 9. Two Kinds of Mezzotint Scrapers
10. Plate Callipers
11. Anvil of Steel and Polished on Top
12. Hammer to Knock Up Plate

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INDEX

INDEX