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REMBRANDT'S ETCHING TECHNIQUE:
AN EXAMPLE

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FIGURE 1

Landscape with a hay barn and a flock of sheep.
Etching by Rembrandt, shown in original size.

Rembrandt's Etching Technique: An Example

A Rembrandt print in the collection of the Smithsonian Institution has been made the subject of a study of the artist's etching technique. The author is associate curator, division of graphic arts, in the Smithsonian Institution's Museum of History and Technology.

Rembrandt's print, *Landscape with a hay barn and a flock of sheep*,¹ is a singularly apt example of the variety of etching treatment used by the artist in his mature period.² The print, in black ink, 83 x 174 mm. in size (approximately 3½ x 7 inches), is signed and dated 1650.³ It shows a peaceful Dutch landscape along the Onderdijk Road on the south side of the Saint Anthony's Dike, only a short walk from Rembrandt's home in Amsterdam. The picture is, as usual, the mirror reversal of the actual scene.⁴

The observer's attention, from his raised position, is first drawn to the center of the print, attracted by the bright highlights on the trees and barn, then is snapped abruptly to the left side by the figure of the woman outlined against the sky. Now the eye moves slowly across the bottom, noticing the flock of sheep and the shepherd, and is led further by the soft dark line of the creek bank, to pick up the distant town and then the cows on the right. Only after completely circling the composition does one notice the horse, rolling in the grass and joyfully kicking its feet in the air.

Such artistic command seldom comes spontaneously.

All footnotes appear at the end of this paper, commencing on page 105.



FIGURE 2

Mirror reversal of *Landscape with a hay barn and a flock of sheep*.

In Rembrandt's case, it is clearly the result of careful preparation, many years of learning and experience, and hard work in the creation of each picture. Such a process has produced in this print—one of nine landscapes which mark a turning point in 1650—a work of stylistic synthesis, which integrates Rembrandt's previous knowledge and leads on to his later masterpieces.

In 1650 Rembrandt was evidently in a tranquil state of mind. He was 44 years old. Young Hendrickje Stoffels, who had entered his household in 1645 as a maid, was well settled as housekeeper and mistress. Geertghe Dirck—who had been the nurse of Rembrandt's son, Titus, since the death of his wife, Saskia, in 1642—had just been taken to an institution after a nasty breach of promise suit.⁵ Rembrandt's finances were in good shape; his insolvency was not to come until 1656, after the international economic crisis of 1653.⁶ The artist certainly had the fullest confidence and experience in his working methods, having already done close to 250 prints.⁷ This state of well-being is reflected in the fact that of the 27 prints Rembrandt did in the three years, 1650–1652, no fewer than 14 are landscapes of a serene character.⁸ This is an unusually large proportion of a single subject and surely reflects the artist's state of mind, which helped him to produce

this masterpiece of serenity, humor, and technical virtuosity.

His etching technique can be clearly studied in this print. In summary, all the evidence shows that Rembrandt here laid a foundation of lines on his plate with a single etching. He then mantled the sketch with rich drypoint lines, to give a sensitive chiaroscuro to the finished work. The integration of etching and drypoint is striking. There are few areas of this print (except the sky) that do not contain both kinds of line.

Rembrandt evidently had an excellent idea of his design before he ever touched the needle to the plate. Though he is often admired for his spontaneity, particularly in his landscapes,⁹ this is a misconception. Benesch lists no fewer than 78 landscape drawings by Rembrandt in the years 1648–1650,¹⁰ and there were perhaps many more, now lost or unidentified. For this etching alone, there are at least five likely preparatory drawings, each giving certain essential features of the final print. The most interesting is the *Landscape with a Rolling Horse*.¹¹ Here we see that the horse, apparently the happiest of impulsive inspirations, is instead a carefully considered part of the final design, copied from the drawing previously done on the spot. As the horse in the drawing is the mirror image of that in the print, we can feel certain



FIGURE 3

Landscape with a rolling horse. Drawing by Rembrandt. After Benesch, vol. 6, fig. 1444. (Smithsonian photo 59391, with the permission of Phaidon Press, Ltd., and the Groningen Museum.)



FIGURE 4

A clump of trees. Drawing by Rembrandt. After Benesch, vol. 4, fig. 1001. (Smithsonian photo 59392, with the permission of Phaidon Press, Ltd., and the Hermitage, Leningrad.)



FIGURE 5

Farm building among trees. Drawing by Rembrandt. (Photo courtesy of the Albertina Museum, Vienna.)

Farmstead with a hay barn.
Drawing by Rembrandt.
After Benesch, vol. 6, fig.
1458. (Smithsonian photo
59393, with the permission
of Phaidon Press, Ltd., and
the Royal Museum of Fine
Arts, Copenhagen.)



FIGURE 6



FIGURE 7

Farm buildings beside a road with distant farmstead. Drawing by Rembrandt.
(Photo courtesy of the Ashmolean Museum, Oxford.)

that the drawing came first and not the etching. Two other drawings¹² (figures 4 and 5) delineate the clump of trees, in form and placement very similar to the print. A fourth¹³ (figure 6) is a sketch of a hay barn of the type shown in the print, evidently quite common in the Dutch countryside, and a fifth¹⁴ (figure 7) foreshadows the scheme of composition used in the print, principally the relationship of the road and the dark central mass. All these drawings are the mirror reversal of the print.

It is very much a modern taste to admire spontaneity more than craft. We must understand that

Rembrandt's work was anything but spontaneous in execution. The existence of so many drawings prior to this print certainly suggests that Rembrandt collected his ideas from many sources, on the spot, but did his finished work in the quiet of his studio, with his notes ready at hand. He used the sketches as the raw material for a work of art. Rembrandt said that the only rule that should bind the artist is nature,¹⁵ but he was certainly not distracted by nature. The individual genius here lies in assembling many observations from nature into a work which goes beyond nature and yet appears fresh and natural.

The metal plates he commonly used were of thin, cold-hammered copper, as shown by extant examples.¹⁶ The hammering had the effect of making the metal harder than today's rolled copper sheets. This enabled more prints to be taken from the plate than is possible for a present-day printmaker. Today, we tend to consider drypoint a very fugitive medium, because the burr perishes so quickly under the pressure of the printing press. Rembrandt undoubtedly had fewer inhibitions about drypoint, for he could expect his harder copper to hold up longer, perhaps for as many as fifty excellent prints from the same plate. Hammered copper, unlike the modern rolled variety, is also completely free of grain in the metal. This enables a drypoint needle to move freely in any direction without encountering the resistance of a grain. Here again, Rembrandt had more incentive to use drypoint than a modern artist.

Rembrandt's etching ground has been the subject of considerable discussion. A book published in 1660, nine years before the artist's death, contains a recipe for "The Ground of Rinebrant of Rine."¹⁷ This ground, similar to that described by Bosse as a "soft" ground,¹⁸ consists of two parts wax, one part mastic, and one part asphaltum. There are countless formulae for such grounds, but virtually all are permutations of the same three ingredients, with only slight differences in the proportions.¹⁹ The ground given as Rembrandt's is a thoroughly conventional one.

A knotty problem, however, is introduced by the last line of this 1660 description: ". . . lay your black ground very thin, and the white ground upon it. This is the only way of Rinebrant . . ." ²⁰ No elaboration is given. This one line presents a number of problems, not all of which are soluble. To take it at face value is to accept the contemporary evidence that Rembrandt not only used a white ground but used it exclusively. This assertion cannot be taken uncritically.

It will readily be seen that a white ground might be of considerable assistance to an artist. His needle penetrates the white to the copper, giving the familiar effect of a reddish ink line on white paper. A normal ground, without treatment, is virtually transparent, making the etcher's lines rather difficult to see.²¹ The most usual procedure, both in the 17th century and today, is to smoke the ground and incorporate the soot with the ground by heating the plate slightly. This gives a black ground, against which the lines

appear light, the negative of the ultimate print. The black ground is favored, both out of long-established tradition and because it is very easy to apply. Furthermore, artists today explain that they also enjoy the feeling of working slightly blind, that one of their greatest rewards is the sense of surprise in peeling the first proof print off the plate. For whatever reason, the black ground has been preferred by the great majority of artists, both past and present.

The description of Rembrandt's ground in 1660 takes knowledge of the white ground for granted. Its technique certainly appears to have been generally well known among artists in the middle of the 17th century. Rubens, in a letter as early as 1622, mentions having received a recipe for a white ground, although he could not remember it.²² The first technical explanation of the process appeared in Bosse's pioneer treatise in 1645.²³ There is no reason why Rembrandt should not have known of the white-ground technique and every reason to suppose that he did.

There is one piece of strong evidence that he did use a white ground about 1631. One of Rembrandt's drawings exists which, unlike most of his sketches is an exact prototype (in reverse) of a specific etching, *Diana at the Bath*.²⁴ The back of this drawing is covered with black chalk, and its lines show the indentation of tracing. The only reasonable explanation of this evidence is that Rembrandt placed his prepared drawing on top of a white-grounded plate and traced the lines, depositing the black chalk lines on the ground, where he could then trace them with his etching needle. Another similarly indented drawing—for the portrait of Cornelis Claesz Anso—has been held to show the same procedure as late as 1641. This drawing, however, is backed, not with black chalk as previously cited, but with ocher tempera.²⁵ Although surely used for tracing, this gives perhaps even more evidence of his use of a black ground rather than white, although ocher lines would show on either. These conclusions are not meant to imply in any way that Rembrandt used the tracing of a drawing for his *Landscape with a hay barn* There is every probability that he did not do so. The implication is rather that only where a traced drawing with black backing exists do we have circumstantial evidence for the use, and possibly a more general use, of white ground. Without the published recipe no question would be likely to arise that Rembrandt used anything but the standard black ground. With it, we must search for corroboration.

Though the case must be left as “not proven,” the use of a white etching ground is consistent with Rembrandt’s practice of using the simplest effective means for achieving his artistic aims. The distinctive quality of the print under consideration here is the artist’s remarkable placement and articulation of areas of black against the white paper. Rembrandt may have found it far easier to visualize this ultimate effect by using a white background for dark lines on his plate, rather than the negative.

Rembrandt almost certainly made all the etched lines in this print in a single operation. The lines were put on the plate before it went into the acid. The plate was then etched by the acid in a single biting, without stopping-out. The evidence for these assertions comes from the print itself, as we have no direct testimony in the matter.

In the first place, the etched lines must be distinguished from the drypoint lines applied at a later stage. The differences between the types of line are more easily seen than described. The etched line is clear and strong, from the clean biting of the acid. It is freer and more autographic because it is drawn through a wax surface, not scratched in a resisting metal surface.



FIGURE 9

Detail of *Landscape with a hay barn and a flock of sheep*, left center, showing forceful lines of tree branch in pure drypoint. Enlarged 10 times. (Smithsonian photo 59390.)

The drypoint line, by its nature, is more abrupt and forceful, showing the quality of having been scratched rather than drawn. There are two basic drypoint lines, depending upon the position in which the drypoint needle is held. When it is vertical or nearly so, the resulting line is shallow and prints more weakly and distantly than the etched line.

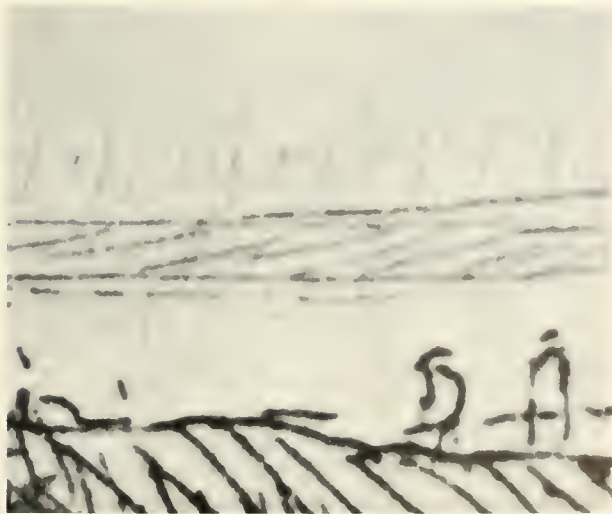


FIGURE 8

Detail of *Landscape with a hay barn and a flock of sheep*, left center, showing light drypoint lines of the horizon and etched lines of figures and hillside. Enlarged 10 times. (Smithsonian photo 59384.)

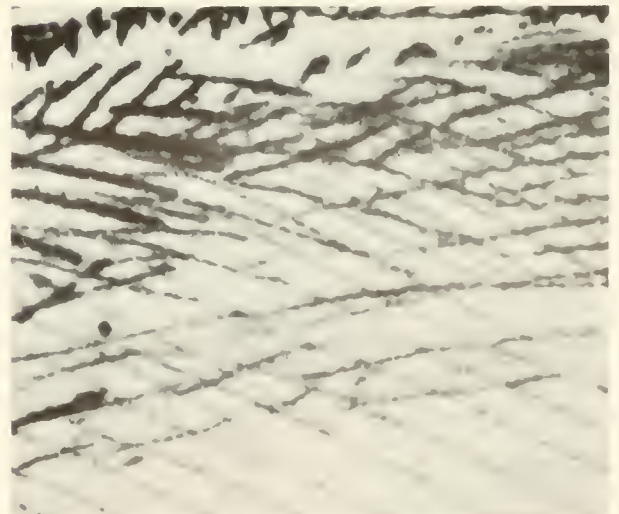


FIGURE 10

Detail of *Landscape with a hay barn and a flock of sheep*, center, showing diagonal lines of light drypoint without burr. Enlarged 10 times. (Smithsonian photo 59385.)

When the needle is pulled at an angle of about 30° to 60°, a very perceptible furrow of copper burr is thrown up on one or both sides of the line on the plate. This burr holds more ink than the clear channel and prints with a highly distinctive inky richness. Basically, etching removes metal from the



FIGURE 11

Detail of *Landscape with a hay barn and a flock of sheep*, bottom right, showing rich drypoint lines with burr. Enlarged 10 times. (Smithsonian photo 59386.)

plate entirely, whereas drypoint displaces it in furrows of burr. The rich fuzzy line produced by the burr is what we most typically associate with drypoint work. The first sort, the thin distant line, is nevertheless just as truly drypoint as the latter and is distinguishable by its forcefulness and clear direction.²⁶ The same line may also be created, with slightly more work, by using a scraper to remove the burr from a rich drypoint line.

Another way of making lines in a plate is with a burin—an instrument with a sharp triangular point—which is pushed through the copper, instead of being pulled, as is the drypoint needle. When used conventionally, the burin produces a very characteristic hard, controlled printed line, one which does not appear in this print. When used lightly, however,

its line is virtually indistinguishable from that of the vertical drypoint needle. It is quite possible that Rembrandt used the burin in some of his work on this and other prints, but it seems a somewhat less likely tool than the drypoint. First, the non-etched lines in this print seem to have a more freely moving quality than could probably be produced with a burin, a rather stiff, if extremely precise tool. Second, when Rembrandt was commissioned in 1665 to engrave a portrait expressly with a burin, he found himself unable to do so.²⁷ His inability, however, may be attributed as easily to Rembrandt's artistic independence as to his inexperience with the burin. Rembrandt's general use of the burin has been widely accepted. The question may not be that simple. These visible differences, then, enable us to separate the kinds of line within this print.

The author has attempted, by tracing only the etched lines in the print, to recreate the state of the plate after Rembrandt's etching and before the application of drypoint (figure 12). It can be seen that Rembrandt's etched lines form only a foundation or skeleton for the finished work. It is in no sense complete in itself. More important, the picture lacks all the rich contrasts of light and shade which distinguish this print and most of Rembrandt's finished work.

It has been generally assumed that Rembrandt went through a fairly normal process of stopping-out and also re-etching in the course of his print-making. The visual evidence would indicate that he did not follow this procedure here. Stopping-out is, of course, a means of creating variations in the printed intensity of etched lines. After a plate has etched for a certain time—depending on the artist's inclination—it may be removed from the acid and some of its lines covered with a stop-out varnish, similar in texture and acid resistance to the basic ground. The plate is then put back in the acid and the remaining lines etched more deeply. This can be repeated any number of times, giving a wide range of intensity to the various etched lines. No such wide range of etched lines appears in the finished print. Further, where the edge of applied stop-out varnish crosses a single line, the change in depth of acid biting at that point is readily visible. Again, no such change of depth of a single line is visible here. The inference, unless attributed to very long coincidence, seems probable that Rembrandt used only a single acid etch on the entire plate, with no stopping-out.

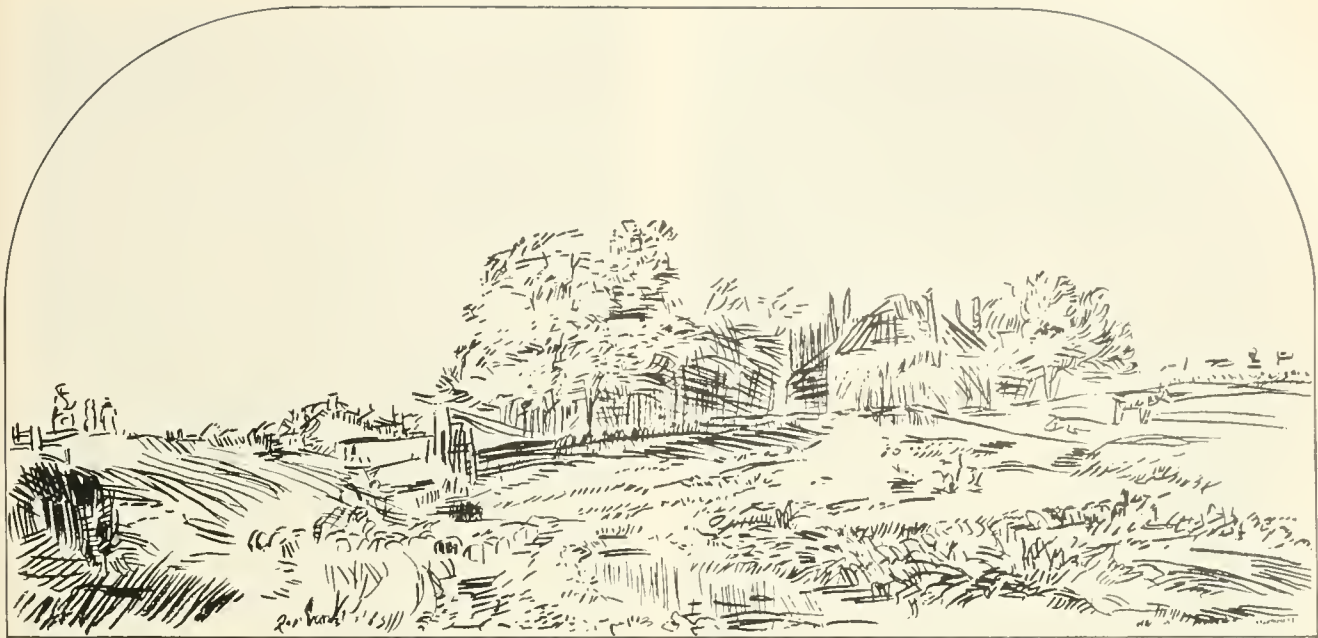


FIGURE 12

Traced sketch by the author, showing only the etched lines in Rembrandt's print, *Landscape with a hay barn and a flock of sheep*. (Smithsonian photo 59398.)

Re-etching also seems unlikely. If the original ground has been removed from a plate, the entire plate must be re-grounded, without smoking or whitening, so that the previously etched lines show through. Noticeably heavier etched lines appear at only a few places on this plate, principally in the grass at the lower right. It is probable that Rembrandt used a number of etching needles of different widths. We do not see the typical changes in the lines produced by stopping-out or re-etching. Re-etching of new lines crossing previously etched lines often causes a slight penetration of acid under the ground into the old lines. This shows in the printing as a dark spot at the point of crossing. Such an effect is not found in this print. A similar result in the cross-hatching at the lower left is caused instead by drypoint lines crossing etched lines.

No direct evidence has been found concerning the acid corrosive used by Rembrandt to bite his plate.²⁸ Only tentative conclusions can be drawn from this and other prints. The etched lines in the *Landscape with a hay barn . . .* appear to be bitten with a

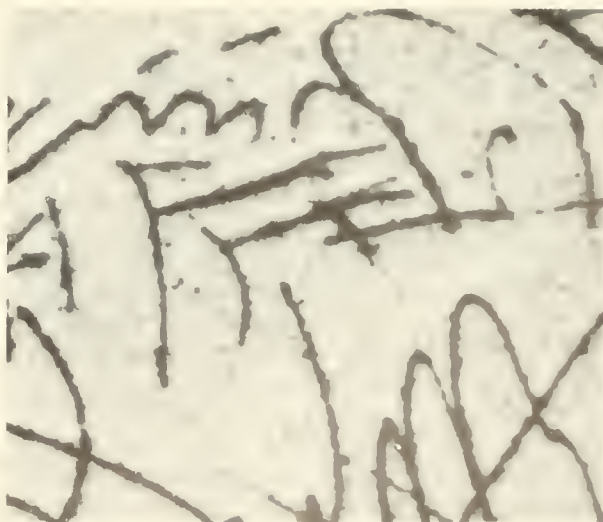


FIGURE 13

Detail of Rembrandt's finished print, *Landscape with a hay barn and a flock of sheep*, lower right, showing lines of pure etching. Enlarged 10 times. (Smithsonian photo 59387.)



FIGURE 14

Detail of the etched copper plate for Rembrandt's print, *Christ seated disputing with the doctors*. After Coppier, p. 117. (Smithsonian photo 59395.)



FIGURE 15

Detail of Rembrandt's finished print. *Landscape with a hay barn and a flock of sheep*, far right, showing drypoint drawing of sheep and post. Enlarged 10 times. (Smithsonian photo 59388.)

fairly strong acid. The lines are relatively broad in relation to their depth, a strong-acid effect. Furthermore, illustrations of some of Rembrandt's original plates from this period show a similar broad line.²⁹ In addition, in the photograph (figure 14) of at least one of the plates there is seen a peculiarly ragged line which is often caused by bubbles formed on the plate by acid action.³⁰ This appearance of bubbles is characteristic only of the strong acids. Of the acid formulae suggested by Bosse in 1645, only one—a distillate of vitriol, saltpeter, and alum—appears to be strong enough to produce the observed effects.³¹ Generally speaking, Rembrandt's later etchings show evidence of stronger acid biting than his earlier work, which has more of the characteristics of weak mordants.³² Certainly, a strong acid would produce a much speedier biting and bolder etched lines, providing him with a solid foundation for his fine drypoint work, and enabling him to work continuously, with a minimum of delay.

Rembrandt's use of drypoint is, as Jakob Rosenberg says, "the most important innovation in Rembrandt's mature graphic work."³³ After etching his skeletal design on the plate, he went to work with his drypoint needles—long, stiff, iron instruments—sharpened to a fine point. An artist generally has several available, so that he does not have to stop and re-sharpen in the course of his work. Rembrandt evidently went even further and deliberately used dull needles to obtain certain light line effects.

When the finished print is compared with the sketch of the etched lines alone, it can be seen how vital the drypoint is to Rembrandt's whole conception. The needle held vertically and slightly dulled, for instance, produced the light shadings on the central hillock at lower left. The sharp needle, held at an angle, threw up the burr which printed as the rich blacks on both sides of the hay barn, along the bank of the stream, and on the road at left center. The sheep and post at the far right were completely drawn



FIGURE 16

Detail of Rembrandt's finished print, *Landscape with a hay barn and a flock of sheep*, showing shepherd in drypoint, erased figures behind flock, signature, and date. Enlarged 5 times. (Smithsonian photo 59389.)

with drypoint, as was the shepherd of the flock at left center (figure 16). It is interesting to note that the flock originally had two shepherds, evidently a man and a woman, standing at the center of the road and behind the flock.³⁴ These figures were drawn in the ground and etched in the first stage of the print. Rembrandt then must have decided that their proportion was wrong for his composition. He reworked the area, using a scraper or burnisher to flatten out his etched lines, and covered the remaining ghosts of the figures with a mesh of drypoint cross-hatching. He then added the single small figure of the shepherd boy entirely in drypoint.

Houbraken, writing in 1718, talked of Rembrandt's technical secrets, "which he would not let his pupils see."³⁵ In truth, there are no secrets to this artist's *technique* in the etching medium. But his mastery of the *art* goes far beyond communicable secrets.

FOOTNOTES

¹ Hind 241 (A. M. HIND, *A Catalogue of Rembrandt's Etchings*, 2 vol., rev. ed., London, 1923), Bartsch 224 (ADAM BARTSCH, *Catalogue raisonné de toutes les estampes . . . de Rembrandt . . .*, Vienna, 1797). The particular example studied here is an impression of the second state (of two) in the collection of the United States National Museum, Smithsonian Institution.

The author wishes to express his deepest gratitude to Jacob Kainen, curator of graphic arts at the Smithsonian Institution, for his acute knowledge, unfailing helpfulness, and encouragement in the preparation of this paper.

² P. G. Hamerton, for one, calls special attention to the technical importance of this print: "I recommend the student to familiarize himself with the workmanship of this plate . . ." (*The Etchings of Rembrandt*, London, 1894, p. 71.)

³ The date is unquestionably difficult to read, Bartsch misread it as 1636 (op. cit., p. 148). Charles Middleton (*Descriptive Catalogue of the Etched Work of Rembrandt van Ryn*, London, 1878, p. 299) was the first to identify the date as 1650. This has been accepted by all modern authorities except George Börklund (*Rembrandt's Etchings: True and False*, Stockholm,

1955, no. 52-A, p. 103) who reads it as 1652. This seems unlikely to me, not only on the great stylistic affinity of this print to Rembrandt's unquestioned works of 1650, but also on the basis of my own reading of the date. The presumed digit "2" is quite unlike the "2" in Hind's 257 and 263, Rembrandt's only dated prints of 1652. (See figure 16.)

⁴ The general location of this scene, as well as many others in Rembrandt's oeuvre, has been identified by Frits Lugt (*Mit Rembrandt in Amsterdam*, Berlin, 1920, pp. 136-140, revised from the original Dutch, *Wandelingen met Rembrandt in en om Amsterdam*, Amsterdam, 1915; see also LUGT, "Rembrandt's Amsterdam," *Print Collector's Quarterly*, April 1915, vol. 5, no. 2, pp. 111-169, and the attached map).

⁵ CORNELIS HOFSTEDE DE GROOT, ed., *Die Urkunden über Rembrandt (1575-1721)*, The Hague, 1906. On the lawsuit, see nos. 113, 117, 118, 120-3, 130, and 165. Geertghe was taken to the institution on July 4, 1650.

⁶ On the financial troubles, starting in 1653, see *ibid.*, nos. 140 ff.

⁷ The exact number is, of course, impossible to determine,

because of many uncertainties of attribution and dating. A. M. Hind, op. cit., lists 236 prints before the year 1650, which seems as accurate a count as is possible.

⁸ According to Hind, op. cit., the 14 landscapes nos. 237–260 and 262–264 are attributable to the years 1650–52. Of the 27 prints from these three years, 16 are actually signed and dated by Rembrandt. Nine of these 16 are landscapes.

⁹ E.g., C. J. HOLMES, "The Development of Rembrandt as an Etcher," *Burlington Magazine* (August 1906), vol. 9, no. 41, p. 313. The well-known story of his having drawn "Six's Bridge" (Hind 209) on the plate while the servant went for the mustard is also often cited (e.g., HIND, op. cit., p. 95), but if true appears to be atypical.

¹⁰ OTTO BENESCH, *The Drawings of Rembrandt*, 6 vol., London, 1954–57.

¹¹ Benesch no. 1225, Groningen (Netherlands) Museum, inv. no. 210, dated about 1650, the wash added by another hand. This drawing was formerly in the personal collection of Cornelis Hofstede de Groot and was first reproduced and discussed by Otto Hirschmann in "Die Handzeichnungen-Sammlung Dr. Hofstede de Groot im Haag, II," *Der Cicerone* (Leipzig, January 1917), vol. 9, no. 1/2, pp. 21–22.

¹² Benesch 850, *A Clump of Trees*, The Hermitage, Leningrad, about 1648–50, and Benesch 1246, *Farm Building Among Trees*, Albertina, Vienna, inv. no. 8873, Hofstede de Groot 1497 (*Die Handzeichnungen Rembrandts . . .*, Haarlem, 1906), about 1650–51.

¹³ Benesch 1236, *Farmstead with a Hay Barn*, Copenhagen, about 1650.

¹⁴ Benesch 1226, *Farm Buildings Beside a Road with Distant Farmstead*, Ashmolean Museum, Oxford, Hofstede de Groot 1138, about 1650, with later additions. Ludwig Münz (*Rembrandt's Etchings*, 2 vols., London, 1952, no. 159, vol. 2, p. 84) cites two drawings, one in the Ashmolean, one in the University Gallery, Oxford. Since the two museums are now one and the same, Münz appears to have confused two listings of the same drawing. Mr. Hugh Macandrew of the Ashmolean Museum has very kindly confirmed, in a letter to the author, that in their collection there is only the one drawing which is similar to this print. There is yet another drawing, *Farm with Hay Barn*, in the Bonnat collection at the Louvre, Paris, Hofstede de Groot 764, which is cited by Hind as a study sketch. Though very similar to this print, in reverse, it is considered a school piece by both Lugt and Benesch. It is quite possible that one of Rembrandt's pupils accompanied him on his walks and sketched many of the same subjects as the master. The drawing reproduced in LUFT, *Mit Rembrandt . . .*, op. cit., fig. 87, is also not by Rembrandt.

¹⁵ Joachim von Sandrart, a former pupil of Rembrandt, writing in 1675, quoted in HOFSTEDÉ DE GROOT, *Die . . . Urkunden*, op. cit., no. 329, p. 392.

¹⁶ The plate for the print under discussion here is not known to have survived. There are, however, still some 79 Rembrandt plates whose present locations are known. Of these, 75 are in the collection of Robert Lee Humber, on deposit at the North Carolina Museum of Art, Raleigh, North Carolina. These are discussed at some length by André Charles Coppier (*Les eaux-fortes de Rembrandt*, Paris, 1922, pp. 94–96). He gives the chemical content of the plate for the *Presentation in the Temple* (Hind 162, about 1640), as 95% copper with impurities of tin, lead, zinc, arsenic, and silver. This may presumably be taken

as typical. MÜNZ, op. cit., vol. 2, p. 47, gives a listing of the surviving plates, but mistakenly presumes the Humber plates to be in the Bibliothèque Nationale, Paris. As a matter of interest, the plate of the print, *The Gold-Weigher* (Hind 167), said by Münz to be in the Rosenwald collection, Philadelphia, is not and never has been in that collection. It is completely unknown to Mr. Lessing J. Rosenwald and his curator. Its present whereabouts is unknown to the author.

¹⁷ *The Whole Art of Drawing, Painting, Limning, and Etching. Collected out of the Choicest Italian and German Authors . . . Originally invented and written by the famous Italian Painter Odoardo Fialetti, Painter of Boloign. Published for the Benefit of all ingenious Gentlemen and Artists by Alexander Brown Practitioner. London, Printed for Peter Stint at the Signe of the White Horse in Giltspurre Street, and Simon Miller at the Starre in St. Paul's Churchyard, MDCLX.* Page 33. London, 1660. Quoted by MÜNZ, op. cit., vol. 2, p. 208, who first discovered the reference. Since Fialetti died in 1638, the reference to Rembrandt's ground is likely to be by Brown or an anonymous contemporary editor.

¹⁸ ABRAHAM BOSSE, *Traicté des manieres de graver en taille douce . . .*, Paris, 1645, p. 41. Bosse's soft-ground formula, for comparison's sake, is three parts wax, two parts mastic, and one part asphaltum, which is very close to the cited Rembrandt ground.

¹⁹ Numerous similar grounds are given in E. S. LUMSDEN, *The Art of Etching* (London: Seeley Service and Co., 1924); reprint (New York: Dover Publications, Inc., 1962), pp. 35–38.

²⁰ Loc. cit. (footnote 17).

²¹ Some etchers, however, prefer this effect. Cf. LUMSDEN, op. cit., p. 42.

²² MÜNZ, op. cit., vol. 2, p. 13, quotes this letter without giving the source. Evidently this is the first written reference to white ground.

²³ Op. cit., pp. 46–48. Knowledge of the process seems to have disappeared completely during the 18th and 19th centuries. Hubert Herkomer, writing in 1892, believed that he had invented the white ground for the first time (*Etching and Mezzotint Engraving*, London, 1892, pp. 4 and 25).

²⁴ The etching is Hind 42. The drawing (Benesch 21, Hofstede de Groot 893) is in the British Museum. The black chalk has been confirmed (see footnote 25). It is also clear that the backing is not graphite, which would, of course, show up on a black ground as well as a white one.

²⁵ The etching is Hind 187. The drawing (Benesch 758, Hofstede de Groot 896) is in the British Museum. Some scholarly misinformation has unfortunately been passed on for years. MÜNZ, op. cit., vol. 2, p. 65, cites Jan Six ("Rembrandt's Vorbereiding . . .," *Onze Kunst*, 1908, II, p. 53), who in turn cites the personal observation of A. M. Hind of the British Museum, to the effect that this drawing of Anso was backed with black chalk. The two drawings had apparently not been lifted from their mounts in something like sixty years. In answer to the author's inquiry, Mr. J. K. Rowlands, Assistant Keeper, Department of Prints and Drawings, the British Museum, very kindly wrote: "I can now tell you about the backs of H. 42 and H. 187 [that is, the drawings for these two prints], which have now been lifted. The reverse of *The Woman Bathing* [*Diana at the Bath*] has the remains of black unrefined chalk upon it and the portrait of Anso is backed with Ochre tempera. I think this news will interest you." I am most

grateful to Mr. Rowlands and his staff for their trouble and kindness.

²⁶ An excellent example of this type of line is seen in the horizon lines on the left, which in this case were added only after several proofs had been pulled from the plate. The addition of these lines constitutes the difference between the recorded first and second states of this print.

²⁷ The documents on this story were first published by Bredius in 1909 ("Rembrandt als Plaatsnijder," *Oud-Holland*, v. 27, pp. 112 f.) and have been frequently cited since then. The print is the portrait of Jan Antonides van der Linden (Hind 268).

²⁸ Confusion has arisen over a note, clearly in Rembrandt's hand, on one of his drawings (Benesch 1351, Hofstede de Groot 763, dated about 1654-55). The Dutch text is given in BENESCH, op. cit., vol. 6, p. 374. It reads, "In order to etch . . ." and gives a recipe consisting of turpentine and turpentine oil. This, of course, could not possibly be a mordant. Münz discusses it (op. cit., vol. 2, p. 14) and concludes that with the addition of mastic, this could be a kind of stop-out varnish.

We are not likely to come closer to an answer for this cryptic inscription.

²⁹ COPPIER, op. cit.

³⁰ *Ibid.*, p. 117. Detail of plate for Hind 277, dated 1654.

³¹ Bosse, op. cit., pp. 5 and 11. Vitriol is copper or iron sulfate, saltpeter is potassium nitrate, and alum is an aluminum sulfate salt. Bosse's other two acids are distilled pure vinegar (acetic acid) and a boiled mixture of vinegar and chloride salts. Both are relatively weak. My thanks to Dr. Robert P. Multhaupt for his advice on 17th-century chemistry.

³² FELIX BRUNNER (*A Handbook of Graphic Reproduction Processes*, New York: Hastings House, 1962, p. 124), suggests that Rembrandt may have used ferric chloride, a weaker mordant, around 1640.

³³ ROSENBERG, *Rembrandt: Life and Work* (London: Phaidon Press, rev. ed., 1964), p. 330.

³⁴ My gratitude to Jacob Kainen for first pointing out the existence of these disembodied spirits.

³⁵ Arnold Houbraken, quoted in HOFSTEDÉ DE GROOT, *Die Urkunden . . .*, op. cit., no 407, p. 471.

