I. In his attitude toward the technical aspects of his art, Degas was at once more radical and more conservative than almost any major artist of his generation. While the other Realists and Impressionists were largely content to employ the most conventional techniques of European art, even as they brought about the most far-reaching changes in its content and formal structure, he experimented constantly with materials and methods whose novelty would match that of his vision of modern life. But on the other hand, while his colleagues accepted the limitations of the relatively simple traditional techniques they used, enjoying the spontaneity of expression these afforded, he longed for the virtuosity and mystery he associated with the more complex methods of the old masters, blaming their loss on the shallow materialism of his own age. He could delight in the search for new procedures and remark with disdain, when told of another artist’s satisfaction at having “found” his method, “Heureusement que moi, je n’ai pas trouvé ma manière; ce que je m’embêterais.”1 But he could also despair of his ignorance, asserting to the young Rouault, “à propos de certaine anarchie actuelle et de la technique admirable des anciens, ‘Il faudra redevenir esclaves.’”2

Underlying these contradictions in Degas’s attitude was a more fundamental contradiction in his creative personality. In addition to the artist and the writer, there was in him something of the amateur scientist and inventor, who drew on the progressive currents in his culture to achieve some remarkable innovations in artistic technique. Yet there was also something of the disenchanted dreamer and reactionary, who regretted the disappearance of time-honored methods and who, despite the expert advice of friends, allowed many of his works to be disfigured by a curious indifference to material requirements.

Both the positive and the negative elements in this attitude have been discussed in Denis Rouart’s pioneering monograph Degas à la recherche de sa technique,3 but without sufficient attention to the strong convictions and prejudices reflected in them. Thus, the explanation of Degas’s nostalgia for the so-called secrets of the old masters seems to accept his own explanation too readily, failing to ask whether the loss was felt as keenly

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1. A. Vollard, Degas (Paris, 1924) p. 80. This statement and the others in A. Vollard, “Degas et la technique,” Beaux-Arts, no. 219 (March 12, 1937) p. c, are simply reprinted from the earlier publication.
3. See the list of frequently cited sources on p. 166; also J. Rewald’s review of Rouart’s book in Magazine of Art 40 (1947) p. 38.
by many of his Impressionist colleagues, some of whom were as deeply interested in older art, or whether it was felt at all by many of his conservative colleagues, who continued to instruct their students in the use of old-fashioned procedures. Moreover, in the twenty-five years since this study was published, much has been learned from more detailed investigations of the artist's notebooks, sculptures, drawings, monotypes, and prints, all of which, when supplemented by Rouart's own fine observations, provides a fuller understanding of this complex subject.

II. Let us begin with the amateur scientist and inventor in Degas, since it is his remarkable achievements that make the whole question worth discussing and at the same time require most explanation. His attitude was one of endless curiosity about the methods he employed and of boundless enthusiasm for the novel results he often obtained. Thus, his friend Desboutin, describing Degas's recent experiments with printing monotypes from zinc and copper plates, wrote in July 1876: "Il en est à la phase métallurgique pour la reproduction de ses dessins au rouleau et court tout Paris—par ces chaleurs—à la recherche du corps d'industrie correspondant à son idée fixe! C'est tout un poème!" And Degas himself, proposing to Pissarro a new method of tinting etchings that made use of wood blocks and copper stencils, wrote in 1880: "Il y aurait là à faire de jolis essais d'impressions originales et curieuses en couleur... Je vous enverrai bientôt des essais de moi en ce genre. Ce serait économique et nouveau." Indeed, while Desboutin, Pissarro, and most of their Impressionist colleagues were working with conventional techniques, Degas was converting his studio into a kind of attic laboratory in which he could experiment with altogether new ones.

It is sometimes said that Degas was forced to do this because the recipes and procedures that had formerly been handed down from master to pupil had disappeared at the time of the French Revolution; and he himself says as much in a conversation reported by his disciple Georges Jeanniot. Actually, there was no such dramatic breakdown of the studio tradition, and well into the nineteenth century conservative artists continued to study and employ Renaissance techniques. Degas himself was trained by pupils of Ingres who did so in their attempt to create a monumental religious art like that of the past, and with a few exceptions he followed their methods closely during the first decade of his career. Nor did he abandon them altogether during the second decade, even though he was by then exploring both the modern urban subjects and the novel compositional schemas that characterize his mature art. Some of his most original pictures, such as A Woman with Chrysanthemums and Sulking (Figure 1), are after all painted in a conventional oil technique—a very sober technique of uniformly thin, flat strokes whose surface displays that smoothness which Degas so much admired in the work of Ingres and other masters. It was only in the third decade of his career, between 1875 and 1885, that the iconographic and stylistic innovations he had achieved in works like these were accompanied by equally radical innovations in material or method.

What seems really to have motivated Degas was something more fundamental—a fascination with the technical as such. He lived in a period of rapid scientific and technological progress, when the experimental method was widely regarded as a model for intellectual achievement, not only in the critical essays of Taine and his followers, but in the novels of the Goncourt brothers, Zola, and other Naturalist writers with whom Degas was acquainted. Hence it was natural for him to apply the same method to his own practice, or at least to invest the latter with an appearance of modernity, however far from strict empiricism his practice actually was. One of his closest friends, Henri Rouart, was an inventor and metallurgical engineer whose circle consisted of other engineers, industrialists, and artillery officers, and as Jacques-Emile Blanche points out, "Ces messieurs avaient l'habitude de la précision, ils étaient des spécialistes dont le langage

Figure I
Detail from Sulking, by Degas. Oil on canvas. The Metropolitan Museum of Art, bequest of Mrs. H. O. Havemeyer, the H. O. Havemeyer Collection, 29.100.43

All expressions of a specialized knowledge or skill seem to have interested him, as they did the Naturalist writers and critics with whom he was acquainted. When he painted laundresses in their shops or dancers in their practice rooms, he observed their characteristic gestures and habits of speech, and later surprised Edmond de Goncourt, himself a connoisseur of the precise word, by showing him pictures of these women while "parlant leur langue, nous expliquant techniquement le coup de fer appuyé, le coup de fer circulaire, etc.... Et c'est vraiment très amusant de le voir, sur le haut de ses...

Nothing reveals Degas's fascination with the purely material aspects of his art more clearly than the recipes and projects scattered through his notebooks, some evidently recording practical advice given by colleagues, others more theoretical and even unrealizable, like many of those in Leonardo's notebooks. About 1879, a period of very active interest in graphic methods for his projected magazine Le Jour et la Nuit, he made detailed notes on the laying down of an aquatint, notes probably based on discussions with Bracquemond, with whom he also corresponded about this subject at the time. A few years earlier, he had recorded many other observations and recipes for printmaking, and in terms that once again show a delight in professional parlance: "L'essence de lavande dissoudre mieux l'encre de report que l'essence terebenthine.... Sur un zinc reporter une gravure imbibée de sulfate de cuivre. En soumettant à un bain léger d'acide chlorhydrique on a une taille douce.... Sur une plaque argentée (de daguerre[otypie]) appliquer une gravure imbibée (et essorée) de chlorure d'or. Mettre sous presse. Il en sort une plaque damasquinée en négatif. . . ."

In reading these completely impersonal formulas, devoted to the mastery of a difficult procedure, we are reminded of the terms Valéry employed to define Degas's whole conception of art: "Il ne voyait dans l'art que problèmes d'une certaine mathématique plus subtile que l'autre. . . . Il disait qu'un tableau est le résultat d'une série d'opérations." And we can hardly
imagine as their author any other artist in the Impressionist circle; even Renoir and Pissarro, both of whom were soon to seek alternatives to the intuitive, spontaneous methods they had previously employed, the one turning back to traditional art in a reactionary mood that resembled the later Degas's, the other temporarily adopting the rigorous process and scientific interests of Neo-Impressionism, never pursued their respective studies so intensively. Moreover, the advice Degas recorded in his notebooks was generally given by colleagues who, thanks largely to his own advocacy, sometimes exhibited with the Impressionists, but whose work sharply distinguished them from the latter: about aquatinting, for example, he learned from Bracquemond, about the monotype from Ludovic Lepic. And the technical discussions he so much enjoyed were usually with artists outside Impressionism, such as Jeanniot, Chialiva, and Henri Rouart.

III. To appreciate the extent to which Degas's lifelong search for technical mastery and innovation manifested itself in his art, we must examine in greater detail his uses of specific materials and media. Denis Rouart has described the remarkable number of ways in which he worked in pastel, a traditionally minor medium that he endowed with the versatility and power of a major one, and at a time when no one else was doing this. If Degas's early pastels, such as The Rehearsal on the Stage (Figure 2), are smooth and highly finished, in the manner of La Tour and other eighteenth-century pastelists whom he admired, those of the 188os, such as A Woman Having Her Hair Combed (Figure 3), are rougher in texture and more vigorously executed, with strokes of vividly contrasted color overlapping each other to create a flickering surface not unlike that in contemporary paintings by Monet and Pissarro. In Degas's late pastels, such as Dancers in the Wings (Figure 4), these overlapping layers of chalk are heavier in substance and even more brilliant in hue, yet they are prevented from smearing by means of a fixative given to him by Chialiva, one whose composition was supposedly so secret—and how this aspect, too, would have delighted Degas—that it could never be duplicated. Previously, Degas himself had

devised an ingenious method of blowing steam over the initial layers of a pastel drawing, either to dissolve them into a vaporous film that would seem to float on the surface or, on the contrary, to melt them into a paste that could then be reworked with visible strokes of the brush, as in the background of Dancer with a Fan (Figure 5). But whether he went so far as to use the intriguing “pastel-soap” that he mentions in a notebook of about 1880—“mélanges des couleurs à l’eau avec de la glycérine et de la soude; on pourrait faire du pastel-savon; potasse au lieu de soude”—we do not know.

Even in oil painting, perhaps the most conventional of the media he employed, Degas experimented with a number of unusual procedures and effects. Although his early works are on the whole rather straightforward technically, there are among them preparatory studies for larger compositions, such as the one for The Young Spartans (Figure 6), which are painted in oil colors on a sheet of previously oiled paper, so that the


brush would slide more swiftly, "glissant avec aisance et volupté (comme il disait lui-même)." Later, while continuing to use this method occasionally, he also discovered a means of obtaining the opposite effect, equally smooth but dry and chalky, without sacrificing ease of execution; this was done by soaking the oil out of the colors, diluting them with turpentine—hence the name peinture à l'essence—and applying them to a matte surface, as in Dancers Practicing at the Bar (Figure 7). And toward the end of his life, when his approach was in general becoming much bolder, he employed the brush with extraordinary freedom and inventiveness, spreading rather dry paint in swirling rhythms reminiscent of chalk rather than oil strokes, as in Scene from a Ballet (Figure 8), or he abandoned the brush altogether and dabbed on paint in heavy masses with a rag or his fingers, thus suggesting in an easel picture something of the roughness and strength of a frescoed wall, as in The Bath (Figure 9). According to Vollard, he had always wanted to paint an actual fresco like those he admired in Renaissance art: "Ça [a] été le rêve de toute ma vie de peindre des murs. . . ."

In view of the importance Degas attached to drawing, it is surprising that he rarely experimented in it with new techniques, except of course in pastel, which

22. M. Guérin, "Notes sur les monotypes de Degas," L'Amour de l'Art 5 (1924) p. 77. The preparatory study is Lemoisne, no. 70; see Boggs, Drawings by Degas, no. 36.

23. Lemoisne, no. 408; Sterling and Salinger, French Paintings, pp. 78-81. Rouart, p. 10, states incorrectly that the medium is tempera. Later examples of the use of oiled paper are Achille de Gas (Lemoisne, no. 307) and Four Studies of Grooms (Lemoisne, no. 383).

24. Lemoisne, nos. 610, 1029. Although begun about 1880, the former was evidently reworked much later. On the technique of the latter, see Rouart, pp. 44-49.

25. Vollard, Degas, pp. 77-78. However, Vollard is often an unreliable source; see J. Guenne, "La Verité sur Vollard," Les Cahiers de Belles-Lettres 1, no. 3 (May 1944).
FIGURE 7
Detail from Dancers Practicing at the Bar, by Degas. Oil on canvas. The Metropolitan Museum of Art, bequest of Mrs. H. O. Havemeyer, the H. O. Havemeyer Collection, 29.100.34

FIGURE 8
Detail from Scene in a Ballet, by Degas. Oil on canvas. Formerly Collection of Mouradian and Vallotton, Paris

FIGURE 9
Detail from The Bath, by Degas. Oil on canvas. The Carnegie Institute, Museum of Art, Pittsburgh
is as much a form of painting. This was probably because, like Leonardo da Vinci, he conceived of drawing as an instrument of thought and intimate expression, in which manipulation for aesthetic effect would be unnecessary or inappropriate. From the beginning, however, he did delight in exploring the traditional methods of drawing and in combining them in unusual ways. Close examination of a preparatory study for his first major composition, Dante and Virgil (Figure 10), shows that, despite its simple appearance, he used pencil and sanguine for the figures and black chalk and wash for the background.\textsuperscript{26} And in a similar study for The Misfortunes of the City of Orleans (Figure 11), he seems to have analyzed the structure of a figure by outlining its unclothed forms in sanguine and superimposing its costume in pencil with white chalk accents, the differences in color corresponding to different levels of visibility.\textsuperscript{27} Later he continued to exploit the chromatic contrasts between media, often choos-

\textsuperscript{26} Boggs, \textit{Drawings by Degas}, no. 25 verso, with incomplete description of the media employed.

ing a sheet of brightly tinted paper to begin with. A powerfully realistic drawing of a young woman on a sofa (Figure 12), for example, combines transparent and opaque peinture à l'essence and delicate pastel on a rose-beige paper; and that of a ballet master seen from behind (Figure 13), which is more complex in technique, was begun in pencil, reworked in pen and ink, shaded in water color or gouache, and finally revised in diluted oil paint. In the 1890s, Degas also developed two unusual, if not novel, methods of correcting his charcoal and pastel drawings easily: by pulling counterproofs of them on heavy, dampened paper, or by tracing their outlines on thin, transparent paper, and then in each case beginning anew. Hence those groups of virtually identical, but reversed or slightly

FIGURE 12
A Woman on a Sofa, by Degas. Drawing in mixed media. The Metropolitan Museum of Art, bequest of Mrs. H. O. Havemeyer, the H. O. Havemeyer Collection, 29.100.185

FIGURE 13
The Ballet Master, by Degas. Drawing in mixed media. The Art Institute of Chicago

enlarged, drawings that are so characteristic of his late work. Ironically, in view of Degas's contempt for the Ecole des Beaux-Arts, he learned of the tracing method from a student of architecture there, where it had long been standard practice.

In the decade 1875–1885, probably the most creative phase of his technical experimentation, Degas

28. Lemoisne, no. 363, and Boggs, Drawings by Degas, no. 66, respectively.
29. J. Chialiva, “Comment Degas a changé sa technique du dessin,” Bulletin de la Société de l'Histoire de l'Art Français 24 (1932) pp. 44–45; he was a student at the Ecole from 1897 to 1906. See also Rouart, pp. 63, 67–68.
began in his paintings and pastels to combine different media, as he had done previously only in his drawings. The advantages were twofold: he could increase the variety of represented textures, without abandoning his principle of smooth, flat painting; and, something that was always important and that probably accounts for his predilection for pastels, monotypes, and wax sculpture, he could prolong indefinitely the process of revision, since each phase of the process was undertaken in a different medium. Denis Rouart has described in detail this use of pastel combined with other media. In The Song of the Dog (Figure 14), for example, Degas contrasted the smoothly modeled arms and face of the figure, drawn in pastel, with the mottled forms of the foliage behind her, painted in gouache.30 In the technically more complex work Dancers behind a Stage Flat (Figure 15), he evidently drew the whole

30. Lemoisne, no. 380. For a more detailed analysis, see Rouart, p. 22.
in pastel, reworked the floor and stage flat in powdered pastel diluted with water, and accented the background foliage and flowers in the dancers' hair in tempera or gouache, thus attaining a remarkable variety of textures. And in the Fan with Dancers (Figure 16) and similar fans, he achieved a virtual tour de force by using pastel, gouache, and peinture à l'essence to establish the forms, adding gold and silver paint to the costumes and decor, and finally sprinkling on flecks of gold leaf, so that the surfaces themselves would suggest the brilliant artificiality of the theaters in which such fans were meant to be used. The unconventionality of this mixing of media was already appreciated during Degas's lifetime; in an article published in 1890, George Moore observed, obviously apropos The Rehearsal of the Ballet on the Stage (Figure 17), which was then in England, "There are examples extant of pictures begun in water-colour, continued in gouache, and afterwards completed in oils; and if the picture be examined carefully it will be found that the finishing hand has been given with pen and ink."

It was also in the 1870s that Degas began to combine several techniques in his graphic works and sculpture. If his prints of the previous decade were almost exclusively simple etchings, with aquatint occasionally added in later states, those of about 1880 were complex combinations of pure etching, soft-ground etching, aquatint, drypoint, and crayon électrique, a system so complicated that more than twenty trial proofs had to be pulled of certain plates, such as At the Louvre:

32. Lemoisne, no. 554; Boggs, Drawings by Degas, no. 94. On Degas's fans, see Choix d'une collection privée, Klipestein und Kornfeld, Bern, October 22–November 30, 1960, pp. 18–33.
33. G. Moore, "Degas: The Painter of Modern Life," Magazine of Art 13 (1890) p. 423. This description, however, is inaccurate; see Lemoisne, no. 400, and especially Sterling and Salinger, French Paintings, pp. 73–76.
FIGURE 17
Detail from The Rehearsal of the Ballet on the Stage, by Degas. Mixed media on canvas. The Metropolitan Museum of Art, gift of Horace Havemeyer, 29.160.26

FIGURE 18
At the Louvre: Mary Cassatt in the Painting Gallery, by Degas. Etching and aquatint. The Art Institute of Chicago

Mary Cassatt in the Painting Gallery (Figure 18). In the same years Degas experimented with the use of aquatint and drypoint to obtain an effect like that of a pastel, by establishing the major areas of tone with aquatint, drawing the lighter forms over them with a burnisher, and adding the dark accents in drypoint, as in Two Dancers (Figure 19). He even took up

34. Delteil, no. 29; *Etchings by Edgar Degas*, ed. P. Moses, University of Chicago, May 4-June 12, 1964, no. 31. Our illustration shows the fifteenth state.
35. Delteil, no. 22; *Etchings by Edgar Degas*, no. 19.
FIGURE 19
Two Dancers, by Degas. Etching and aquatint. The Metropolitan Museum of Art, Harris Brisbane Dick Fund, 25.73.1

FIGURE 21
Nude Woman Standing, at Her Toilette, by Degas. Lithograph. Sterling and Francine Clark Art Institute, Williamstown, Massachusetts

again a plate he had etched twenty years earlier, transforming its delicately bitten lines into a somber Rembrandtesque chiaroscuro by heavily inking the surface and wiping it unevenly before printing. Indeed, so unconventional were the methods he now employed that their exact description still eludes us at times; about the unique proof of the Head of a Woman (Figure 20), on which Mary Cassatt had written the cryptic phrase, “ essaie de grain liquide,” the most recent au-

36. This is The Engraver Joseph Tourny: Delteil, no. 4 (first state only); Etchings by Edgar Degas, no. 8 (both states).
authority can only state, “what Degas actually did remains something of an enigma.”

If Degas's lithographs, more limited than his etchings in number and in chronological span, pose fewer unsolved problems of procedure, they are no less complex and original technically. For some prints, such as Nude Woman Standing, at Her Toilette (Figure 21), he abandoned the lithographic crayon and drew on the stone almost exclusively with a brush and liquid

37. P. Moses, in *Etchings by Edgar Degas*, no. 29; dated there to "around 1879 when the artists [Degas and Cassatt] were collaborating on prints." See also Delteil, no. 42.
lithographic ink. Here he also used the scraper afterward to define a few highlights; elsewhere he employed it much more extensively, either held at an angle to create areas of soft illumination or held upright to pick out brilliant light shapes against a dark ground, as in Mlle Bécat at the Ambassadeurs (Figure 22). Despite the coloristic effects thus obtained in black and white, he felt compelled to add accents of pastel color to some impressions of this and similar prints; and inevitably, once he had begun retouching, he proceeded so far that other impressions became pastels whose lithographic bases were almost entirely obscured.

In the late 1870s, having mastered the monotype process, he ingeniously applied it to lithography, drawing the design first in printer's ink on a copper plate or sheet of celluloid, printing it on a prepared stone rather than a sheet of paper, and reworking it with lithographic ink and crayons in the usual manner. The use of celluloid, of course, made it possible to see the design reversed, as it would ultimately appear.

Far more than a first stage in the creation of lithographs, the monotype soon became for Degas an end in itself, a spontaneous form of graphic expression that allowed and even encouraged him to experiment with unorthodox materials and methods. In the "dark-field manner," where the design is produced by removing ink from a plate completely covered with it, he was forced to abandon conventional means of defining form and to improvise new ones, including the use of rags, pieces of gauze, blunt and pointed instruments, and his own fingers, with which he could blend two tones or create a distinct texture, as in The Foyer (Figure 23). He also learned to vary the viscosity of the medium itself, contrasting areas of diluted ink brushed on (or off) with a rag or soft brush and areas of thick, tacky ink worked with a stiff bristle brush. And if, in the "light-field manner," he did draw directly on the plate with a brush, he often combined this more incisive draftsmanship with densely textured or patterned forms produced in the other manner, as in Siesta in the Salon (Figure 24). The outstanding examples of his confidence in the suggestiveness of the medium, an attitude that anticipates twentieth-century practice, yet also recalls a famous passage in Leonardo's notebooks, are the landscape monotypes Degas executed in the early 1890s; for here printer's ink or oil pigment was manipulated by all the means previously mentioned, but was also allowed to spread and drip into accidental patterns of its own, as in the Landscape with Chimneys (Figure 25). Equally prophetic here are the chromatic effects Degas achieved by reworking in pastel an impression printed in oil colors rather than black ink, the two types of color partly harmonizing and partly contrasting, so that "the most dramatic spatial effect is not in the view represented but rather in the optical vibration set up between the two layers of color."

There was a similar development toward greater colorism and technical complexity in Degas's sculpture. If the earlier statuettes of horses and dancers were modeled entirely in monochromatic wax with the intention of casting them eventually in bronze, the later ones, representing more difficult subjects with clothed and unclothed figures and occasional accessories, were made of multicolored waxes, of clay with small pebbles sometimes added, or even of wax combined with actual objects and fabrics. When it was exhibited in 1881, the Ballet Dancer (Petite Danseuse de Quatorze Ans) (Figure 26), a figurine of astonishingly lifelike colored wax, wore a linen bodice, a muslin tutu, a satin ribbon on its hair, and satin slippers lightly coated with wax, all of

39. Delteil, no. 49; Lithographs by Edgar Degas, no. 3.
41. Janis, Degas Monotypes, no. 37; Guérin, "Notes sur les monotypes de Degas," p. 79.
42. Janis, Degas Monotypes, no. 18. For the range of effects Degas could thus obtain, see the other monotypes in this series, nos. 16–27.
which heightened its startling illusionism.\textsuperscript{45} Even the long ponytail was made of real hair, which Degas had gone to the trouble of buying from a manufacturer of dolls’ wigs. Among those who saw it, however, Huysmans alone realized that with this work Degas had challenged the principle of material unity which governed most traditional sculpture: “Tout à la fois raffinée et barbare avec son industieux costume, et ses chairs colorées qui palpitent, sillonnées par le travail des muscles, cette statue est la seule tentative vraiment moderne que je connaisse, dans la sculpture.”\textsuperscript{46} What


FIGURE 25
Detail from Landscape with Chimneys, by Degas. Monotype. Private Collection, New York

FIGURE 26
Ballet Dancer: Statuette, by Degas. Bronze, with tulle skirt and satin hair ribbon. The Metropolitan Museum of Art, bequest of Mrs. H. O. Havemeyer, the H. O. Havemeyer Collection, 29.100.370
Huysmans could not foresee, of course, was the extent to which it also anticipated the assemblage techniques of the twentieth century, preparing the way, in its realism that was also a form of surrealism, both for the brilliantly inventive formalism of Cubist sculptures and the more psychologically disturbing combinations in Surrealist and later works.\(^47\) Nor was this the only example of such a practice in Degas's sculptural oeuvre: in the Woman Washing Her Left Leg, he placed beside the wax figurine a porcelain pot, playing its cool green against the warmer tones of the wax; and in The Tub (Figure 27), he set a similar figurine of red-brown wax inside a metal basin, surrounded it with a piece of cloth, then coated the basin and cloth with liquified plaster.\(^48\)

Nothing is more revealing of the confidence and even the audacity with which Degas approached technical problems in his maturity than the delight he took in triumphing over them under particularly difficult conditions. He seems in fact to have gone out of his way to practice his art during vacation sojourns in his friends' country homes and at other times when he was deprived of the materials normally available to him.\(^49\)

Our illustration shows a bronze cast, where the differences in material are obscured.

48. Rewald, *Degas Sculpture*, nos. lxviii and xxvii, respectively.
49. In addition to the examples discussed here, see also that of the bust of Hortense Valpinçon, discussed below, p. 165.
Thus, when a heavy sleet storm prevented him from leaving the house of Alexis Rouart one day in 1882, he succeeded nevertheless in making an etching, the Woman Leaving Her Bath (Figure 28), by using a crayon électrique, an instrument made of the carbon filament from an electric light bulb, which Rouart had found in his factory next door; and significantly, this then became one of Degas’s favorite means of etching.50 And when an attack of bronchitis obliged him to take a cure at Mont-Doré in 1895, he took up outdoor photography with what was, even for him, an extraordinary
fervor, ordering the latest panchromatic plates from Paris and specifying unusual methods of development, so that he could capture such subtle effects as the fleeting illumination of dusk.51 His references to panchromatic plates in letters of August 1895 seem all the more remarkable when we discover that the earliest scientific report on their usage, employing the term panchromatisme for the first time, had been made by Auguste and Louis Lumière only a few months earlier. After Degas’s death, enlargements of similar photographs, taken of the countryside around Saint-Valéry-sur-

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50. Delteil, no. 39; Etchings by Edgar Degas, no. 35. Our illustration shows the eighth state. See Rouart, p. 65, and Degas’s letter to Alexis Rouart, 1882, in Degas, Lettres, pp. 61–62.

Somme, were found in his studio and recognized to have been the inspiration for a number of landscapes he had made in the 1890s; and according to Cocteau, he even worked directly on some of these photographs in pastel, "émerveillé par la mise en page, le raccourci, la déformation des plans," thus anticipating what would later become a familiar Surrealist technique.52

IV. Photography was evidently one of the few fields in which Degas remained enthusiastic about technical innovations in his old age, for as he grew more disillusioned and more conservative generally, he seems to have turned more nostalgically toward the past. All those who knew him at this time report his fascination with the methods employed by the Renaissance masters, the loss of which eventually came to obsess him. "Il me parla de Memling et de Van Eyck," Roualt recalled, "il aurait voulu une matière rare mais solide et éternelle. Ces tableaux de Memling n'ont pas encore bougé" disait-il."53 And in one of those numerous discussions of technique with Chialiva and Jeanniot, about which the latter informs us, Degas sounded the familiar lament: "Nous vivons à une époque d'heure, il faut l'avouer. Cette peinture à l'huile que nous faisons, ce métier très difficile que nous pratiquons sans le connaître! pareille incohérence ne s'est jamais vue."54

In this condition he found at once a further reason for rejecting what he considered the shallow, naturalistic art of his own age and an initiation into the cult of the mysterious past. "Le beau est un mystère," he told Daniel Halévy, "mais on ne sait plus! On oublie les recettes, les secrets; on plaît un jeune homme en pleins champs, et on lui dit: peignez! et il peint une ferme sincere; c'est imbécile!"55 In this nostalgia for the technical secrets of the Renaissance there was, of course, also a certain amount of fantasy, of which Degas's remark that "Van Dyck tenait d'une vieille demoiselle, qu'il avait connue à Gênes, des secrets confiés à celle-ci par Titien" is an amusing example.56

The so-called secrets of the Venetians, the methods of underpainting and glazing whereby they achieved subtle, glowing colors, which had previously intrigued three generations of English artists from Reynolds to Turner, also preoccupied Degas. About 1865 he had already made three careful copies in oil of a Holy Family in the Louvre that was then attributed to Giorgione (e.g., Figure 29),57 but his study of its coloristic structure seems to have remained without immediate influence on his own art. Some fifteen years later, however, Jeanniot was amazed to see him complete a picture of

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53. Roualt, Souvenirs intimes, p. 94.
jockeys by adding oil glazes: "Ce prétendu 'impressionniste' aimait les vieilles méthodes qui étaient, à son avis, toujours les meilleures." Moreover, Degas began to seek similar effects, based on the interaction of warm and cool tones in different levels of the color structure, in the pastels to which he turned increasingly after 1875, and above all in those that he drew over a monotype base, which constitute about one-fourth of the total. Indeed, so fascinated was he with this procedure that he began regularly to pull two impressions of his monotypes, so that the second one could be reworked extensively in pastel. By allowing the layers of chalk to remain distinguishable from that of the ink below them, thus partly blending and partly competing with it in pattern and color value, as in the Nude Woman Combing Her Hair (Figure 30), he obtained an effect not unlike those he admired in Venetian art, although more modern in its directness and intensity. He must in fact have studied the Venetian masters closely again in the 1890s, for in a number of oil paintings he seems to have followed their procedure of underpainting in monochromatic cool tones and glazing in warm bright ones, as is particularly evident in After the Bath (Figure 31), which was left unfinished in the grisaille state.

61. Lemoine, no. 1231. For a more detailed discussion, see Rouart, p. 50.
In the mistaken belief that Mantegna, too, had employed this method, Degas required his friend Henri Rouart’s son, an informal pupil of his in 1897, to copy the Virtues Victorious over the Vices in the Louvre by underpainting in earth green tones and, when these did not seem bright enough to Degas, in apple green tones, and then glazing in warmer red tones. The results were, of course, disastrous, for as Ernest Rouart himself realized, “Il avait alors des idées neuves sur la pratique des anciens, et prétendait me faire exécuter cette copie suivant une technique imaginée par lui et qui rappelait beaucoup plus celle des Vénitiens que celle de Mantegna.”62 Ironically, Degas’s own copy of the Virtues Victorious over the Vices (Figure 32), which he began at the same time, working in his studio from a photograph, was drawn directly on a brown-toned canvas in charcoal and white chalk.63 Yet there was some reason in Degas’s apparently foolish instructions to his pupil: he had probably read about just such a progression from green to red tones in the discussion of fresco painting in Cennino Cennini’s Il Libro dell’Arte,

63. Not in Lemoine; see Reff, “New Light on Degas’s Copies,” p. 256 and fig. 5.
where in fact it is recommended that the same procedure also be followed in panel painting. A translation of Cennini’s treatise by Victor Mottez, a pupil of Ingres, had been published in 1858, at just the time when Degas, who had studied under other pupils of Ingres concerned with the revival of monumental religious art, would have been most inclined to read it. Indeed, according to his niece Jeanne Fèvre, his library already contained then “des ouvrages sur la technique du peintre, en particulier ce traité étonnant de Cenino Cenini sur la fresque.”

Among the other technical treatises in his library was probably Eastlake’s Materials for a History of Oil Painting, an equally popular work, in which Degas would have found a chapter describing what the “Venetian Methods” actually were. It was evidently this account of the Venetian system of underpainting in red, black, and white tones, laying on a thin, semitransparent film of white, and glazing over it in warm tones that Degas had in mind when he painted a café interior in the presence and for the benefit of his disciple Jeanniot. According to the latter, he outlined its principal lines in black ink on a white canvas, drew a grid of red and yellow lines over them, dissolved and spread all these colors over the surface to produce a warm, semitransparent film, and finally reworked individual forms with more opaque colors. Obviously, however, Degas’s method was as much his own invention as a faithful imitation of the Venetian one, and although his café interior is unknown today, it can hardly have possessed the subtlety or depth of color he admired in Venetian art. It is interesting that Degas, in attempting thus to combine effects of transparency and opacity in a single process, was repeating Leonardo’s equally unsuccessful experience when painting the Last Supper, as Rouault seems already to have realized at the time: “Comme Léonard, Degas eut rêvé d’allier fresque et peinture à l’huile, de réunir pour bien dire deux qualités un peu opposées.”

V. The story of Ernest Rouart’s copy is not the only instance, even in Degas’s own oeuvre, of failure due to inadequate knowledge of or indifference to traditional techniques. One of his most important early pictures, Mlle Fiocre in the Ballet from “La Source,” was partly ruined when he tried to remove a coat of varnish he had impulsively decided to have applied on the eve of its exhibition at the Salon of 1868, and it was only many years later that he was able to have the remainder of the varnish removed and to repair the damaged areas; even then, “il ne fut qu’à demi satisfait du résultat.” Another picture, painted entirely in egg tempera, quickly cracked and was ruined, because he had used as a vehicle the white rather than the yolk, although here too it is likely that he was confused by Cennini’s discussion of the legitimate uses of egg white in tempera painting. When another picture became badly cracked, he at first blamed modern methods of color manufacture, expressing a reactionary attitude typical of his old age: “On ne saurait jamais tout le mal que la chimie a fait à la peinture.” But as Vollard, who tells the story, goes on to explain, the damage was in fact caused by Degas’s having painted on a canvas whose lead white priming was not thoroughly dry. That the latter was always somewhat uneasy about the consequences of his technical experiments is evident from a remark reported by Edmond de Goncourt in 1890: “Il n’a pas été voir ses tableaux de la vente May, parce qu’il . . . redoute une désagrégation de sa peinture, à cause d’un


67. Jeanniot, “Souvenirs sur Degas,” pp. 293–294. The only known picture that fits this description, In the Café (Lemoisne, no. 624), is painted on panel, not canvas.

68. Rouault, Souvenirs intimes, p. 94. Significantly, Degas’s friend Chialiva maintained that Leonardo had used peinture à l’essence as a means of underpainting before glazing; see Rouart, p. 15.

69. Valéry, Degas danse dessin, pp. 163–165, from a memoir by Ernest Rouart. The painting is Lemoisne, no. 624.

mélange de vinaigre avec je ne sais quoi, un mélange dont il a été toqué un certain moment."72

If the number of Degas's pictures ruined by unsound procedures is relatively small, the number of those disfigured by later revisions, often in a different technique from the one originally employed, is surprisingly large. After his death, many of these partially repainted works were found in his studio, including not only youthful ones like Alexander and the Bucephalus (Figure 33), whose carefully rendered details were half obliterated by heavy paint applied with a palette knife rather than a fine brush, but also mature ones like The Ballet Class (Figure 34), a picture of about 1880 whose equally de-

72. Goncourt, Journal, XVII, p. 64, dated June 7, 1890. The picture in question is probably The Dancing School (Lemoisne, no. 399), painted in distemper.
73. Lemoisne, nos. 91 and 587, respectively. See also Ernest Rouart’s observation, in Valéry, Degas danse dessin, p. 163: “Le

FIGURE 33
Detail from Alexander and the Bucephalus, by Degas. Oil on canvas. M. Knoedler and Co., New York

FIGURE 34
Detail from The Ballet Class, by Degas. Oil on canvas. Private Collection, Zurich

structive repainting many years later is more difficult to understand.73 Probably the most poignant evidence of this dangerous compulsion to revise is found, once again, in Ernest Rouart’s memoir:

... revoyant constamment chez mon père un délicieux pastel que celui-ci avait acquis et qu’il aimait beaucoup, Degas fut pris de son habituel et impérieux besoin de retoucher le tableau. Il y revenait sans cesse et, de guerre lasse, mon père finit par lui laisser emporter l’objet. On ne le revit jamais. Mon père demandait souvent des nouvelles de son cher pastel; Degas répondait d’une façon dilatoire, mais il dut finir par avouer son crime; il avait complètement démoli l’œuvre à lui confiée pour une simple retouche.74

74. Valéry, Degas danse dessin, pp. 161–162, from Ernest Rouart’s memoir.
Still more numerous are the examples of Degas's sculpture disfigured by excessive revision or by technical inexperience—indeed, so numerous that they constitute the rule rather than the striking exception. Determined to create figures with a powerful effect of movement and immediacy, yet impatient with the usual methods of building armatures, he improvised with pieces of wire and wood; and when these began to collapse, as they inevitably did, he repaired them with matchsticks or paintbrushes, or simply propped up the broken limb with whatever was at hand.75 For perverse reasons of economy, he also insisted on making his own wax, which soon became too friable, and on mixing into it some tallow, which made it less durable. At times he also added bits of cork, which periodically rose to the surface, destroying the modeling and making necessary extensive repairs.76 It is not surprising, then, that when his dealer Durand-Ruel inventoried the contents of his house after his death, he found “about one hundred and fifty pieces [of sculpture] scattered over the three floors in every possible place. Most of them were in pieces, some almost reduced to dust.”77 Indeed, as early as 1890, before the majority of them had been made, George Moore wrote that in Degas’s studio “there is much decaying sculpture—dancing-girls modelled in red wax, some dressed in muslin skirts, strange dolls . . . .”78

It has been argued that what led Degas to devise such primitive methods, rather than rely on the sounder ones urgently recommended by his friend Bartholomé, a professional sculptor, was his love of independence and improvisation; and it is true that with them he was able to create effects of motion and intimacy unknown to Bartholomé and his colleagues.79 Nevertheless, there is something paradoxical in the obstinacy with which Degas, who had long been fascinated by artistic techniques and indeed by the technical as such, refused to follow expert advice or even common sense and instead allowed many of his finest statuettes to be destroyed. Nor was this attitude typical only of his old age, when a profound pessimism seems to have pervaded all his activities. In 1882, for example, he allowed an ambitious clay relief with half life-size figures, his one attempt at bas-relief sculpture, gradually to dry and eventually to crumble; “J’ai vu de lui,” Renoir recalled, “un bas-relief qu’il laissait tomber en poussière, c’était beau comme l’antique.”80 This is Picking Apples, of which only a small wax replica or sketch now survives (Figure 35).81 And in 1884, after weeks of frustrating work on a bust of Hortense Valpinçon—typically, it had become a half-length figure by the time he had finished—he decided impulsively to mold it himself, rather than call in an expert as he had planned, and then mixed ordinary plaster with the inadequate supply of molding plaster he had at hand, so that both the figure and its mold were broken and soon lost.82 While working on the bust, Degas had lamented his insufficient technical knowledge, but far from trying to supplement it, he seems to have enjoyed groping and experimenting. “Que j’ai pautage d’abord, bons Dieux!” he wrote to Henri Rouart, “et que nous savons peu ce que nous faisons quand nous ne laissons pas un peu au métier le soin des choses qu’il nous faut. On y arrive peut-être, mais si salement.”83 In this case, unfortunately, he did not “arrive” at all.

The chronicle of these technical disasters recalls those that beset Leonardo da Vinci, with whom we have already compared Degas several times. His “disregard for media of execution,” writes Kenneth Clark, “marked all his most important works. The Last Supper, the Battle of Anghiari, the canalisation of the Arno

81. Rewald, Degas Sculpture, no. 1; generally dated 1865–1870. For the correct date, see Reff, “Degas’s Sculpture, 1880–1884,” pp. 278–279.
83. Letter to Henri Rouart, datable to 1884, in Degas, Lettres, p. 89.
were all damaged or even annihilated by this defect, which sprang not only from impatience and experimentalism but from a certain romantic unreality.\textsuperscript{84} In a less extreme form, the same might be said of much of the sculpture and some of the painting of Degas, whose artistic personality and attitude toward creation resembled Leonardo’s in many respects. This fascinating parallel, which we have also seen Roualt draw, has struck other artists who knew Degas or have studied his oeuvre. Thus the American painter R. H. Ives Gammell, for whom Degas’s notes and remarks are equalled only by those of Leonardo and Ingres as “verbal records of their professional thinking which are of comparable value to practicing painters,” concludes that Degas’s “experimental turn of mind and wide-ranging curiosity relate his thinking more closely to Leonardo’s... .”\textsuperscript{85} And the French painter Henri Rivière, “évoquant devant nous Degas, rappelait à son sujet les scrupules de Léonard de Vinci... . Scrupules admirables dans leur humilité mais qui, s’ils poussaient l’artiste à des recherches utiles, l’amenaient aussi à des déceptions retardant sa production.”\textsuperscript{86} As in Leonardo, however, the “romantic unreality” in Degas was only the reverse of the coin: its obverse was a remarkable ingenuity and daring in the invention of new media or new methods of combining traditional ones. No matter how poignant or intriguing the failures may be, it is because the successes were so brilliant that the problem is worth discussing at all.


\textsuperscript{85} R. H. Ives Gammell, \textit{The Shop-Talk of Edgar Degas} (Boston, 1961) p. 46.

\textsuperscript{86} Reported in Lemoisne, I, p. 46. Rivière had known Degas in the 1890s.

\textbf{FREQUENTLY CITED SOURCES}


