The Mysterious Deplated Finish: The Color of 1930s Aluminum

Preston Hull

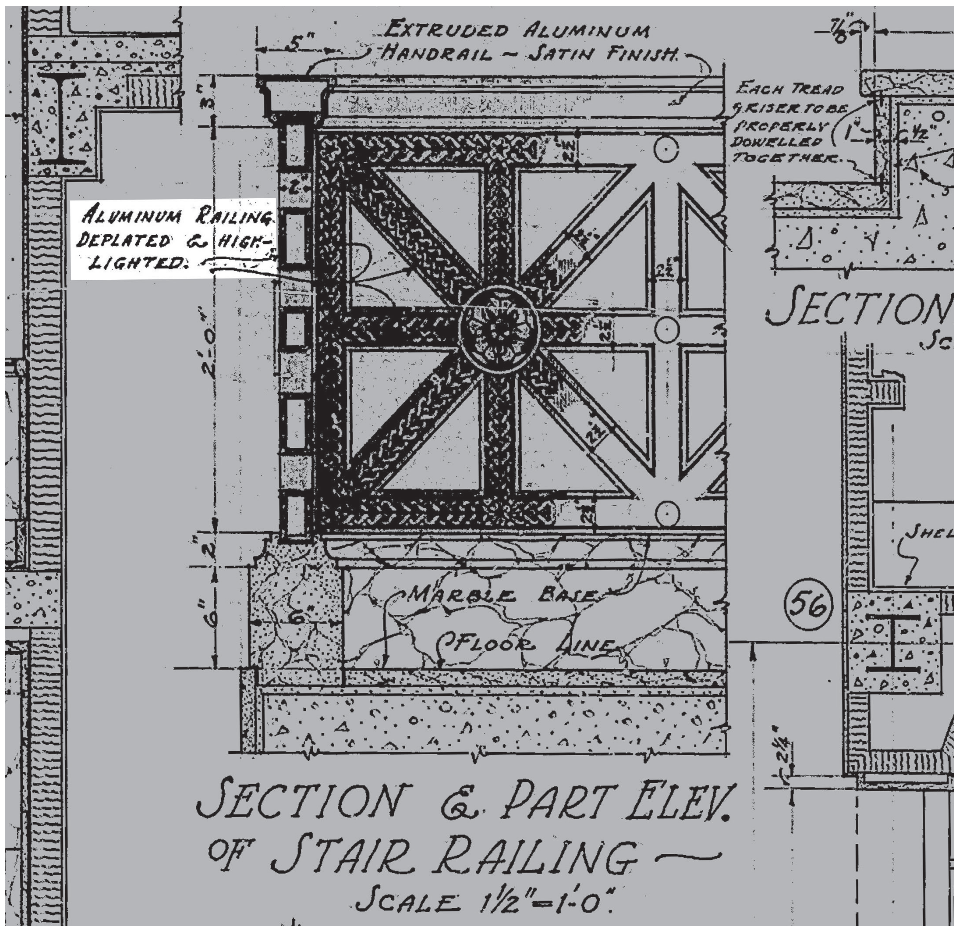

Fig. 1. Federal building, Washington, DC, 1933, drawing indicating that a railing was to be deplated and highlighted. National Archives and Records Administration.

One of the most common aluminum finishes of the 1930s has entirely disappeared from architecture and memory. The author sought to recreate it.

What color is aluminum? The word calls to mind the silvery metal of everyday objects such as aluminum foil and beer cans. In modern buildings, we are familiar with bright-gray flashings, extruded window and door frames, and claddings such as rainscreens. How fitting that aluminum came into widespread use in architecture in the early decades of the twentieth century, when—alongside brass and chrome—it put the shine on so many Art Deco masterpieces.

Today, aluminum is available in virtually any color imaginable as a result of the anodization process. But even before the use of modern anodization in architecture—in the early 1930s, the heyday of ornamental metalwork—cast aluminum was often used as a decorative element on buildings nationwide, and it frequently had finishes unlike those we associate with it today.

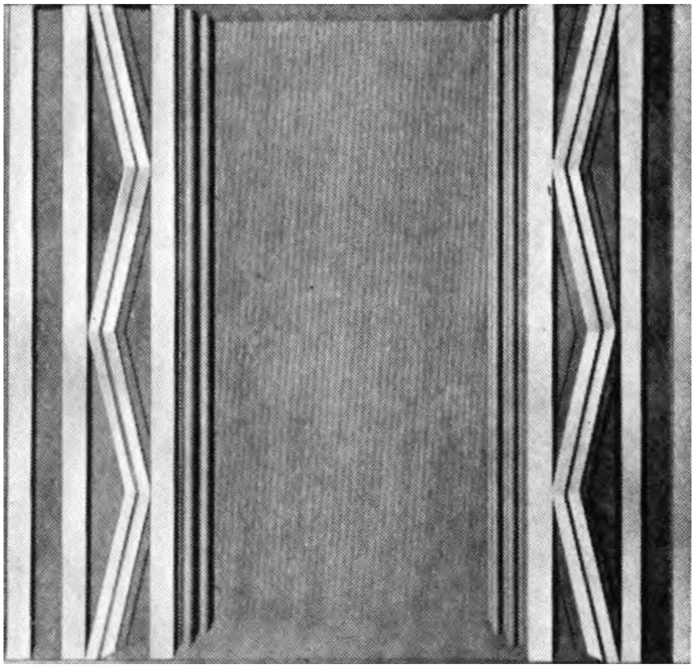

Fig. 2. Central Union Trust Building, Evansville, Indiana, 1930, Alcoa spandrel design, deplated and highlighted. Aluminum Company of America, *Aluminum in Architecture*, 38 (1932).

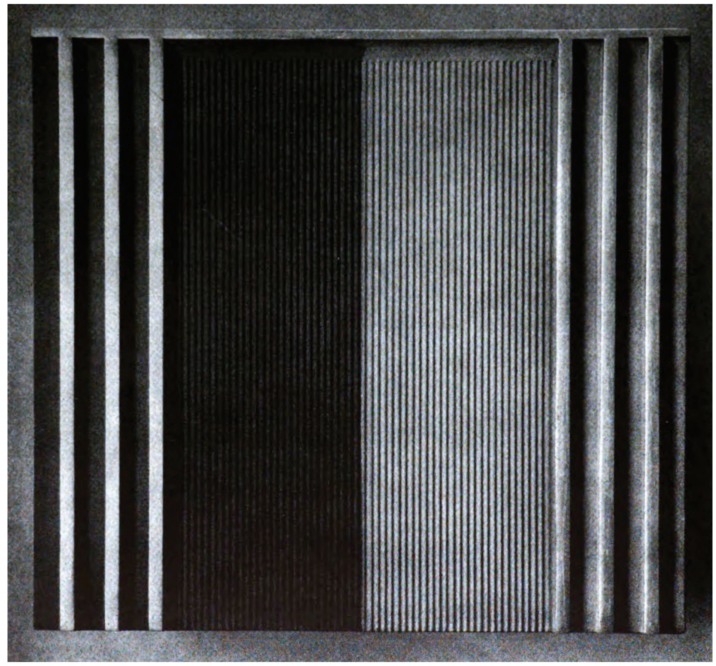

Fig. 3. Koppers Building, Pittsburgh, Pennsylvania, 1929, spandrel design showing deplating and highlighting at left vs. the initial sandblasted finish at right. "Finishes for Architectural Aluminum," *The Metal Arts* 2, no. 9 (1929): 454.

Construction documents from this period, as well as information from the same era published by the Aluminum Corporation of America (Alcoa), show that aluminum castings commonly received a "deplated" finish (Fig. 1). Alcoa's publications do not explain the proprietary finishing method, except to note that it was an electrolytic process. The publications do, however, describe the finish itself: they report it as having a dark, slate-like appearance.[1]

The deplated finish was a complement to others offered by Alcoa. The company recommended that all aluminum castings be sandblasted to even out their appearance and remove imperfections; the result was a neutral gray that was sometimes the final finish. Castings could also be further manipulated to achieve additional tones. For example, they could be brightened by "highlighting" (mechanical polishing) or darkened by deplating.[2] Alcoa's publications from this era show that a range of finishes could be applied to a single casting. A common pairing was deplating and highlighting, with the entire casting darkened and its raised portions subsequently highlighted to achieve a two-tone, high-contrast finish (Figs. 2 and 3).

Probably the most well-documented use of the deplated finish was on the Empire State Building, whose spandrel panels received the dark-gray treatment and were described in an article reprinted in newspapers around the country in 1930 (Fig. 4). In this case, the spandrels themselves were monochromatic, but a "striking modernistic effect" was created by "polished nickel-chrome steel mullions running vertically between the windows and deplated aluminum spandrels in [a] contrasting darker shade between windows."[3] Other prominent skyscrapers with deplated aluminum features include the Cathedral of Learning and the Koppers Building in Pittsburgh, Pennsylvania; and, in New York, the Bankers Trust Building at 14 Wall Street, the City Bank/Farmer's Trust Building at 20 Exchange Place,

Fig. 4. Empire State Building, New York, New York, 1931, window assemblies showing the contrast between the bright chrome-nickel steel of the vertical trim and the dark windows and deplated spandrels. Empire State Building archive, 1930–1969, Avery Architectural & Fine Arts Library, Columbia University.

Fig. 5. Federal building, Washington, DC, 1933, showing original deplated and highlighted finishes. National Archives and Records Administration.

Fig. 6. Federal building, Washington, DC, 1933, showing the neutral gray of the features after the passage of time. Photograph by Preston Hull, 2020.

and Rockefeller Center at 45 Rockefeller Plaza.[4]

Deplated aluminum was not only found on architectural landmarks in America's flagship cities; the finish appeared on buildings in small cities throughout the country—particularly on post offices and courthouses erected during the New Deal. Although the deplated finish was only in use for about a decade, this period coincided with the boom of federally driven construction funded by the Public Works Administration (PWA) and overseen by the Office of the Supervising Architect (OSA). The latter was a division of the Treasury Department that designed federal buildings in-house and had an interest in developing standards for its projects.

There is clear evidence that deplated aluminum was used on a number of New Deal government buildings, including large post offices in Boston, Chicago, Kansas City, and Greensboro, North Carolina.[5] Given the OSA's interest in standardization and the nature of federal specifications, there is every reason to suspect that deplated aluminum was used in many more such projects. If preservationists seek to restore any of these buildings to their original appearance, it is important to understand that these elements—which have long since weathered to a neutral gray—may once have featured starker tones of dark and light (Figs. 5 and 6).

Identification

How might one determine whether an aluminum feature was originally deplated? Because there is no known way to answer this question definitively through testing, archival investigation is required. First, the age of the building should be considered: 1929 and 1940 are the earliest and latest references to the finish identified in the research for this article. Drawings and specifications from the period sometimes indicate that a feature was to be deplated, but projects are not always executed as designed. And, like all finishes, aluminum finishes were often finalized during submittals, records of which are frequently incomplete.

The single best way to identify deplated aluminum features is through photographs taken near the time of construction. Especially when deplating was paired with highlighting, the telltale contrasts of light and dark are readily visible. Compare a historic photograph of Alcoa's Aluminum Research Building in New Kensington, Pennsylvania, with the same building as documented by the Historic American Engineering Record (HAER) in 1987 (Figs. 7 and 8). The original locations of deplating and highlighting could never be inferred from the building's appearance 50 years post-construction.

Available documentation suggests that the sculptural spandrel panels of the era were by far the most common application. Alcoa advertised that the deplated finish, when viewed from a distance, blended with dark window glass to create uninterrupted vertical lines of black. In 1934, Alcoa published a book called *Contemporary Spandrel Design*, in which just over half of the examples were deplated, alone or with the raised portions of the casting highlighted.[6] The same pairing was used on other architectural elements featuring ornamental relief, any of which should also be considered candidates for investigation.

The term "deplating," in this context, has completely fallen out of use in the aluminum and metal-finishing industries, and there are no known published references to deplated aluminum after 1940.[7] The lack of primary-source documentation has led to a lack of historical and conservation discussion: deplated aluminum is rarely described, and never satisfactorily explained, in preservation literature. Conservators Xsusha Flandro and Helen Thomas-Haney related historic accounts of deplated aluminum as dark gray, making the logical inference that the finish was related to anodization, which is also

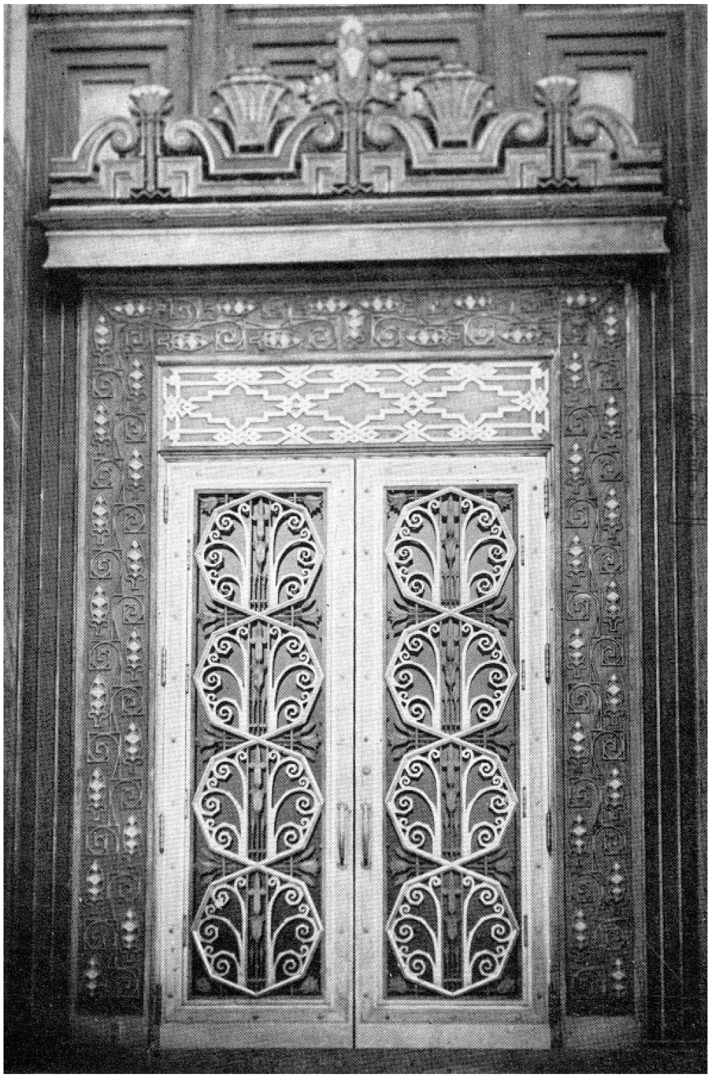

Fig. 7. Alcoa Research Laboratory, New Kensington, Pennsylvania, 1929, entrance doors showing original deplated and highlighted finishes. "Architectural Uses of Aluminum," *American Architect* 137, no. 2583 (1930): 49.

Fig. 8. Alcoa Research Laboratory entrance doors showing original deplated and highlighted finishes. Photograph by Jet Lowe, HAER PA-295, Photo 5, 1987.

an electrolytic process.[8] The trouble is, linking anodization to "deplating" only raises more questions.

Anodized Aluminum

Iron corrodes to a rust-red; copper corrodes to brown and green. Aluminum, however, produces a corrosion product that is typically nearly clear. Left to weather, aluminum naturally develops a hard oxide layer—recall that aluminum oxides are used in sandpaper—that protects the substrate, and to some extent its appearance, from deterioration. While some exacerbating conditions can damage this oxide layer, many architectural aluminum castings have been left exposed to the elements for nearly 100 years—soiled, perhaps, but otherwise intact. Conservation professionals are understandably aware of the mechanisms that might damage aluminum, but experience shows that, in many cases, the castings are remarkably resilient without intervention.

Anodization is a method of enhancing the formation of this naturally occurring oxide layer, increasing its thickness from approximately 0.0001 mils (thousandths of an inch) to as much as 1.2 mils.[9] This thicker oxide layer confers even greater protection to the substrate and its appearance from deterioration. Anodization involves submerging the aluminum work in a bath of acid along with another piece of metal, also usually aluminum. A voltage is applied, with the workpiece as the anode and the other the cathode; the current frees oxygen ions from the solution that then bind with the surface of the anode. The effect is the accumulation of aluminum oxide on the surface of the workpiece. The earliest patents related to anodization date to the 1920s, but the term does not appear in an architectural context until the mid-1930s, when it briefly coexisted with the term "deplated."[10]

Anodized aluminum can be produced in virtually any color by inserting dyes or metallic salts into the pores of the aluminum oxide crystal structure. Without deliberate coloration, however, anodized finishes are typically described as clear—that is, aluminum after anodizing generally looks the same as aluminum before anodizing. This begs the question: if deplating was an early form of anodizing, why would the finish have been dark? And a second, related question: what color was deplated aluminum, precisely?

Deplated Aluminum

Fortunately, answers were preserved in Alcoa company records donated to Pittsburgh's Heinz History Center in 1996.[11] Fortuitously, the collections contained a folder titled "Finishes, 1930–1935," which included detailed instructions for the deplating process. They were written in 1930 by H. J. Rowe, an employee of Cleveland's United States Aluminum Company, a subsidiary of Alcoa, suggesting that the process originated in that office. The document demonstrates quite clearly how the deplating process was performed and offers Rowe's explanation for why the resulting finish was dark gray.

Rowe stated that alloy selection was paramount: the deplating process was to be performed on Alcoa's alloy No. 43, which was essentially 95 percent aluminum and 5 percent silicon. In this period, Alcoa recommended its No. 43 alloy for most aluminum castings regardless of finish, but Rowe specifically attributed the color change from deplating to the presence of silicon. Rowe described how the electrolytic process removed the aluminum from the surface of the workpiece, exposing the bluish-gray silicon and creating the overall slate-like appearance. Rowe's instructions therefore explained the origin of the term "deplating." Importantly, however, Rowe's proposed mechanism of action is likely incorrect, as discussed later.

With Rowe's instructions in hand, the logical next step was to attempt to replicate the deplating process to provide the preservation community with a crucial visual reference point for the original finish of so many aluminum elements of 1930s buildings.

Experiment Design

Rowe's 1930 instructions for deplating aluminum were followed as closely as possible. Deplating was accomplished using an electrolytic bath, similar to that later used in anodizing.

The required materials are shown in Table 1.

Obtaining a sample of Alcoa's No. 43 alloy, now known as #443, was one of the greatest challenges of this experiement. The alloy is rarely used today, having been superseded for technical reasons. But because Rowe claimed that alloys containing any other elements, especially copper, would quickly result in galvanic corrosion and erode the deplated finish, it was important to obtain a sample of #443. A foundry in Erie, Pennsylvania, was ultimately identified that uses #443 in its manufacture of plumbing fittings and other goods. The company generously provided four samples of the small discs used to calibrate its machinery.[15]

Aluminum Sample 1 was designated as the control, to preserve and document the as-cast appearance of #443 aluminum. Sample 2 was to be sandblasted, which Alcoa specified as preparation for deplating, to record the change in appearance attributable to that process. Samples 3 and 4 were to be sandblasted and then deplated for varying lengths of time.

Rowe noted that the amount of deplating, and therefore the ultimate color, is dictated by many factors, including the dilution of the acid bath, the surface areas of the anode and cathode, the temperature of the bath, the electrical current, and the time. To simplify the procedure, he recommended that the dilution, area, temperature, and current be kept constant so that the deplating effect is controlled by a single variable: time. Rowe noted that the maximum effect should be achieved in just 20 minutes.

Procedure

The deplating experiment was performed in December 2023. Like many electrolytic reactions, the process produces hydrogen gas, and, in this instance, reportedly an airborne form of sulfuric acid. For safety reasons, the experiment was conducted outdoors. As discussed below, this had the unintended benefit of demonstrating the importance of temperature to the deplating process.

Table 1. Materials Used for Deplating

Function	Material Specified by Rowe	Material Used
Blasting material	Silica sand, 6 to 20 mesh[12]	Silica sand, 30 to 40 mesh
Anode	Alcoa No. 43 aluminum	#443 casting alloy[13]
Cathode	"Pure aluminum"[14]	#1100 aluminum sheet
Conductors	Aluminum wire	#1100 aluminum wire
Power source	Capable of delivering 0.3 amperes per square inch	12V, 5 A DC power supply
Electrolytic bath	7.5% v/v sulfuric acid	7.5% v/v sulfuric acid
Container	Lead-lined tank	Pyrex baking dish

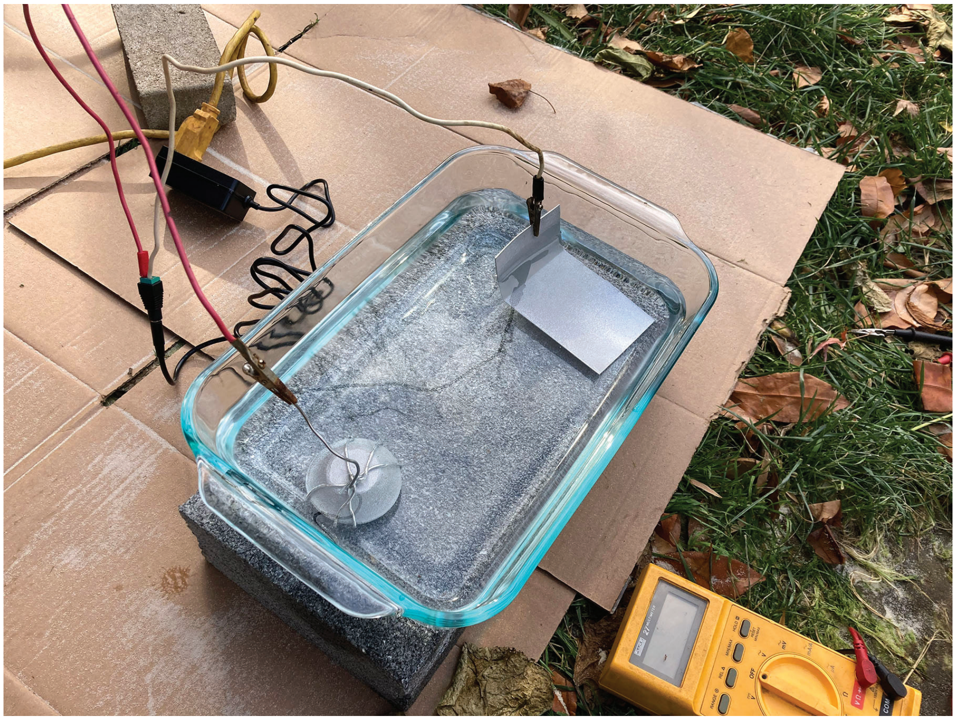

Fig. 9. Deplating experiment setup. The sample to be deplated (anode) is at left, and the cathode is at right. Photograph by Preston Hull, 2023.

The first step involved sandblasting Samples 2 through 4 using a low-pressure microabrasive system. The sandblasting immediately resulted in a whiter, more matte finish among the samples. Sample 2 was retained for reference.

Sample 3 was then wrapped with aluminum wire to form a tight cage, and the wire was connected to the positive lead. The #1100 aluminum cathode was connected directly to the negative lead. Both connections were made using steel alligator clips located above the electrolytic bath to prevent galvanic action and contamination of the solution. The circuit was completed by adding just enough sulfuric acid, previously diluted to 7.5 percent, to submerge both samples (Fig. 9). The power supply was plugged in to begin the flow of current.

The experiment was initially unsuccessful. After 20 minutes, the time after which Rowe indicated that the maximum deplating effect should be achieved, color change in the sample was negligible. Two variables were investigated to determine the cause of the failure.

First, the resistance between the two conductors (i.e., the resistance of the bath) was measured using a digital multimeter, yielding a value of 13 Ω. Ohm's law states that electrical resistance is directly proportional to voltage and inversely proportional to current ($R = V/I$), allowing a current of approximately 0.92 amperes to be inferred, less than 25 percent of the current density specified by Rowe.[16] Power supplies only provide their rated capacity if a sufficient load is demanded of them; it appeared that something was preventing the bath from drawing the expected amount of current.

Next, the temperature of the samples in the bath was measured using an infrared thermometer. Rowe's only note regarding temperature was that the bath must never exceed 86 °F. Because the outside air temperature was only approximately 40 °F, this variable was not anticipated to be a concern. Measurements confirmed that the temperature of the samples in the bath, roughly 55 °F, barely exceeded the ambient air temperature.

The temperature of the bath was then modified to determine the effect on the reaction. This was accomplished by placing the Pyrex dish containing the electrolytic bath inside a larger tub of water at approximately 150 °F. The temperature of the bath quickly exceeded 100 °F, and Sample 3 achieved a dramatically darker gray finish that appeared to reach its limit after roughly 10 minutes.

Clearly, temperature was a critical variable in the deplating process. The reason behind Rowe's admonition not to exceed 86 °F, however, was soon apparent. When Sample 3 was removed from the bath and rinsed with water, most of the dark deplated finish was removed from the surface.

The experiment was repeated on Sample 4 while implementing much stricter temperature controls. The bath was placed on a hot plate and the temperature monitored until a range of 70 °F to 80 °F was maintained. Under these conditions, the resistance of the electrolytic bath was measured at around 5 Ω, implying a current of 2.4 amperes. The temperature of the bath evidently had a direct influence on its conductivity.

The increased conductivity, despite still measuring less than the recommended 0.3 amperes per square inch to be deplated, was sufficient to produce the desired effect. Sample 4 achieved a dark gray finish in just over 10 minutes, and no additional color change was observed after 20 minutes. Unlike Sample 3, the finish of Sample 4 withstood removal from the bath and rinsing. Sample 4 is believed to represent an accurate reproduction of the deplated finish that was typically applied to architectural aluminum castings throughout the 1930s.

Limitations

There were many ways in which this backyard experiment did not replicate laboratory conditions. However, this discussion of limitations focuses on known deviations from Rowe's process that may have impacted the appearance of the finished sample.

First, the grade of sand used in blasting was slightly less coarse than that used by Alcoa. Rowe stated that "a roughened surface will always take on a darker finish than a smooth surface," and that "a thorough sand blasting is the best means of roughening." A coarser, higher-pressure abrasive preparation may have led to a darker finish.

Second, the experiment design included no provision to ensure that the dilution of the acid bath remained constant during the hours-long procedure. The applied heat and outdoor air movement surely resulted in evaporation and deviation from the initial 7.5 percent solution, with an unknown impact on the results.

Finally, as noted above, the current density likely never reached the target specified by Rowe. Although the current achieved was not only sufficient to induce a color change but also appears to have reached a limit state, it is nonetheless possible that a greater current would have produced an even more substantial darkening.

Mechanism

With a sample of deplated aluminum in hand, the question of the finish's appearance had been answered. Unfortunately, the second question—why the finish should be dark—was not adequately resolved. There was a problem with Rowe's explanation for the deplating process: the procedure was, in all important ways, indistinguishable from the modern anodization process. Anodization also uses a bath of sulfuric acid and induces a current flow in the same direction, with the workpiece as the anode, resulting in a finish that is typically described as clear. Why, then, was Rowe's process achieving a different result?

The perplexing question was posed to an online community of metal finishers. A member of this community proposed that Sample 4 had, in fact, been anodized: he reported that when anodization produces an oxide coating of sufficient thickness, the once-clear finish becomes dark gray.[17] The term of art is "hard anodizing," or Type III anodizing, in which the oxide layer reaches 2 or even 3 mils. This alternative explanation—a thick buildup of aluminum oxide—was, of course, the precise opposite of Rowe's theory that the aluminum had been "deplated" from the sample's surface. So, which was it?

With the help of Catherine Matsen, senior scientist at the Scientific Research and Analysis Laboratory of the Winterthur Museum, Garden & Library, a probable conclusion was reached. Matsen examined Samples 1, 2, and 4 (untreated, sandblasted, and deplated, respectively) using SEM/EDS.[18] This technique detects elements present on a sample surface and produces false-color maps to represent the spatial distribution of elements. The data indicate that compared to the control sample (1), the deplated sample (4) had both a significant increase in oxygen and a decrease in silicon at the surface, indicating the accumulation of aluminum oxide (Fig. 10). This analysis strongly suggests that Rowe's theorized mechanism of action was incorrect and that so-called "deplated" aluminum was, in fact, receiving a thick anodic coating. Although the remainder of this article continues to use the term "deplated" for consistency, the term should be understood to be a likely synonym for hard anodizing.

Implications

This article does not attempt to resolve the question of how best to reproduce or replicate the deplated finish. Instead, that task is left to the talents of the preservation design community and knowledgeable contractors and fabricators to determine the most feasible means of restoring these aluminum features to their original appearance.

In this context, the most important aspect of the findings is the establishment

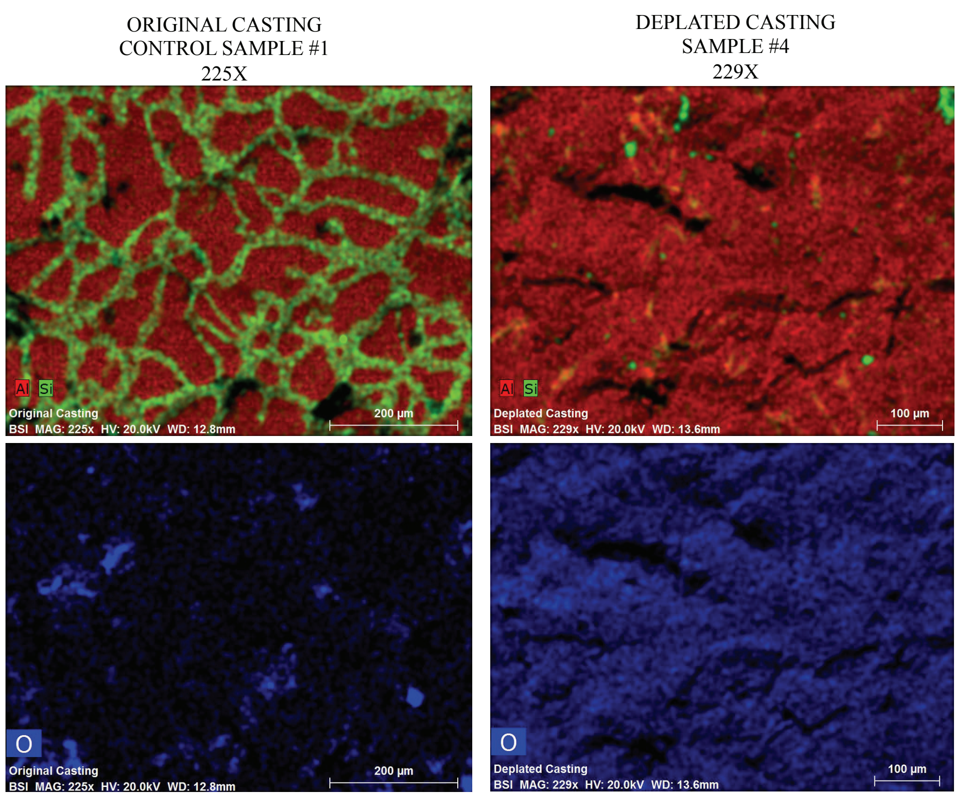

Fig. 10. False-color maps prepared using SEM-EDS. Aluminum is shown in red, silicon in green, and oxygen in blue. Images by Catherine Matsen, 2025.

Fig. 11. Post-experiment color differences between Samples 1, 2, and 4, with other aluminum objects included for comparison. Photograph by Preston Hull, 2024.

of a color reference. Color-corrected images of the aluminum samples were developed from the experiment. The three samples—as-cast #443 aluminum, sandblasted, and deplated—were photographed alongside a sample of 99 percent aluminum bar and a sheet of common aluminum foil to illustrate the visual differences (Fig. 11). The deplated finish was also compared to the standardized Munsell color system, as well as to the commercial Benjamin Moore library.[19] While the color references in Table 2 vary slightly, they are all substantially similar to the color of the deplated finish as reproduced and demonstrate how different the finish appears compared to today's common mental image of aluminum.

Table 2. Color References for the Deplated Finish

Color System	Reference
Munsell	N 5.25/
Benjamin Moore	Between 2121-20: Steel Wool and 2134-40: Whale Gray

Alcoa also advertised that deplating could be performed to varying shades of gray; the values in Table 2 should be close to the maximum, darkest appearance. By deplating for less time and building up less aluminum oxide on the surface, a lighter gray could be produced. Images of deplated elements, however, suggest that a maximally dark finish was often used to provide a strong contrast with highlighted regions.

Conclusions

The experiment broadly confirms descriptions of the deplated finish from the 1930s as being a dark, slate-like gray, and provides a specific color reference for the same. The appearance of this popular finish is perhaps counterintuitive during an era now associated with bright metallic tones. However, the results confirm the degree of contrast that the deplated finish offered when juxtaposed with mechanically polished, silvery aluminum within the same or adjacent castings.

The research also indicates that the original 1930s understanding of "deplating" was likely incorrect and that Alcoa was inadvertently performing an early form of hard anodizing. One fortunate implication of this finding is that the so-called deplated finish can be reproduced today using the terminology and techniques familiar to the modern finishing industry. Another benefit is that #443 aluminum, now rare, is probably not required to replicate the finish.

Unfortunately, the logistics of immersion finishing limit the ability of preservationists to truly restore deplated finishes to the buildings where they originally appeared. That said, it is important for preservationists and building stewards to be aware that aluminum from this period should not necessarily be finished to a uniformly bright, polished appearance—all should bear in mind that the question "What color is aluminum?" is not simple. The possibility of instrumental identification of features that were originally deplated deserves further investigation.[20] Additionally, alternative methods of achieving a dark, slate-like appearance should be explored.[21] Successful in-situ identification and replication techniques would be welcome additions to the conservation literature.

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Notes

1. Aluminum Company of America, *Aluminum in Architecture* (Pittsburgh: Aluminum Company of America, 1932), 120. The company states that "the deplating or electrolytic oxide process is carried out in a special electrolyte in which the piece to be finished is immersed as the anode (positive electrode) for approximately twenty minutes. The details of the procedure with respect to electrolyte composition, temperature, current density, etc., form a proprietary process." The finish is described as "dark, slate-gray" in another Alcoa publication by T. D. Stay, technical director of the Castings Division, "Finishes for Aluminum: Lustrous Surfaces for Ornamentation," reprinted from *Metal Progress*

33, no. 1 (Jan. 1933). Aluminum Company of America Records, 1857–1992, MSS 282, Box 8, Folder 9, Heinz History Center, Pittsburgh.

2. Aluminum Company of America, *Aluminum in Architecture*, 117–24.

3. In 1930, a short article titled “We Return to the Iron Age,” discussing the use of metals in skyscrapers and interior design, was syndicated in newspapers ranging from the December 1 *Kentucky Advocate* to the December 25 *Pierce County [Neb.] Call*.

4. Aluminum Company of America, *Contemporary Spandrel Design* (Pittsburgh: Aluminum Company of America, 1934). For a description of the aluminum features at Rockefeller Center, see Richard Pieper, “The ‘White Metals’ of Early-Twentieth-Century American Architecture,” *APT Bulletin: The Journal of Preservation Technology* 46, no. 1 (2015): 23–28, jstor.org/stable/43390258.

5. *Ibid*.

6. *Contemporary Spandrel Design* includes forty-two spandrel designs, twenty-two of which feature deplating. The spandrels were from thirty-one unique buildings, seventeen of which included deplating.

7. This end date is corroborated by previous research presented in Xsusha Carlyann Flandro, “Redesign, a Recipe for Results: 1930s Architectural Aluminum Finishes, Restoration and Conservation,” *Smithsonian Contributions to Museum Conservation* 9 (2019): 194–95. The latest reference to deplated aluminum identified in the research for the present article is in the July 1940 minutes of the Washington, DC, Commission of Fine Arts, in which architect A. R. Clas indicated that deplated spandrels would be used at a new office building (no longer extant) at 18th St. and H St. NW. “Deplating” is sometimes used today in a different sense—to describe the opposite of electroplating, that is, the removal of a plated metal finish.

8. Xsusha Flandro and Helen M. Thomas-Haney, “A Survey of Historic Finishes for Architectural Aluminum, 1920–1960,” *APT Bulletin: The Journal of Preservation Technology* 46, no. 1 (2015): 13–21, jstor.org/stable/43390257.

9. This paper uses mils to reflect the practice of the metal finishing industry in the US. The authors of a 2015 paper used a variety of instruments to measure the naturally occurring aluminum oxide corrosion product on a range of aluminum alloys and found a typical range of 30 to 40 angstroms, or approximately 0.0001 mils (one ten-millionth of an inch). See J. Evertsson, F. Bertram, F. Zhang, et al., “The Thickness of Native Oxides on Aluminum Alloys and Single Crystals,” *Applied Surface Science* 349 (Sept. 15, 2015): 826–32.

10. The earliest patent related to the most common form of anodizing, the sulfuric acid method, was filed by Charles Hugh Roberts Gower in Great Britain in 1927 and in the United States in 1931 (US Patent No. 1,869,058). Alcoa’s anodized finishes were marketed as its “Alumilite” finish. The term “Alumilite” appears to have been first used by the Metals Protection Corporation of Indianapolis, Indiana. The Gower patent on anodized aluminum was assigned to Aluminum Colors Inc., also of Indianapolis. The relationship between these two firms, and their relationship to Alcoa, if any, are subjects for additional research.

11. Aluminum Company of America Records, 1857–1992, MSS 282, Heinz History Center. The instructions for deplating are in Box 188, Folder 9.

12. The grade of sand was not specified in Rowe’s instructions. However, the type of sand used for deplating is described in *Aluminum in Architecture*, 118–19. That document recommends a “coarse” sand (10 to 20 mesh) or, secondarily, a “medium” sand (40 to 80 mesh), so the grade selected represents a middle ground.

13. Alcoa’s proprietary alloy numbering system was replaced later in the twentieth century with two standardized systems, one for casting alloys and one for wrought alloys: Alcoa’s #43 alloy was renamed #443.

14. The surface area of the cathode needs to be greater than the surface area of the aluminum to be deplated.

15. The author wishes to thank Kayla Konieczny of Erie Bronze for making this project possible.

16. Rowe specified a current density of 0.3 amps per square inch. The current requirement was calculated to be 4.2 amps based on the size of the sample.

17. Credit goes to Ted Mooney, founder and president of finishing.com, for suggesting this theory. His remarkable online community dates back to 1989.

18. The samples were examined using a Zeiss EVO MA15 scanning electron microscope with a LaB_6 source at an accelerating voltage of 20 kV, a working distance of approximately 10 mm, and a sample tilt of 0°. Energy-dispersive spectroscopy (EDS) data were collected with the Bruker Nano X-Flash® 6|30 detector and analyzed using Quantax 200/Esprit 1.9 software.

19. CIE L*a*b* values could not be obtained because the samples were too large for the colorimeter available to the author.

20. Alcoa recommended the application of a clear protective lacquer for some elements, identification of which through finish analysis might point to the use of a deplated finish. Of course, a deplated finish is not the only possible explanation for such a coating. Profilometry or similar investigations of the surface of samples known to have been originally deplated merit further investigation as diagnostic tools. Qualitative techniques capable of identifying specific elements are less promising, as the presence of aluminum oxide could be indicative of either deplating or typical weathering.

21. An approximation of the deplated finish can be achieved using metal patination products (as illustrated in an image included in Flandro and Thomas-Haney, 13), although any such finish requires a clear protective coating that must be maintained. To truly evaluate the benefits and drawbacks of alternative finishing methods, a better understanding of the durability of the true deplated/hard anodized finish would also be required.

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