

Allegory and Analogy in Menzel's *The Iron Rolling Mill*

Adolph Menzel's *Das Eisenwalzwerk*, or *Moderne Cyclopen* (*The Iron Rolling Mill*, or *Modern Cyclopes*; fig. 1), completed in 1875, depicts an expansive factory floor largely occupied by a row of rolling mills into which men are laboriously feeding heavy iron rails. It visualizes the technology and labor that made possible the era's ever-expanding rail networks and the accompanying transformations in travel, communication, and the very experiences of space and time. Even more impressive than the painting's careful attention to the technology of rolling iron are the workers washing (to the left) and eating (to the right) in the foreground. They call our attention to the shift system of the mill.

Much of the rich and plentiful commentary on this painting concerns whether the prominent depiction of the laborers is sympathetic to the dismal labor conditions in Prussian iron mills, conditions well known at the time,¹ or whether the painting represents the laborers as modern-day heroes, an objective that would be consistent with classifying the work as a history painting, as suggested by its great format. To my mind, Werner Busch is exactly on point when he writes that the painting lacks the pathos to be either.² The depiction of the laborers aims at something very different from either overt social critique or the making of modern-day heroes. As I will argue, Menzel's *The Iron Roll-*



1 Adolph Menzel, *The Iron Rolling Mill (Modern Cyclopes)*, 1872–1875, oil on canvas, 158 × 254 cm. Berlin, Alte Nationalgalerie, Staatliche Museen zu Berlin – Preußischer Kulturbesitz

ing Mill is, first and foremost, an ambitious and profound reflection on the rhythm of modern industrial labor, which relies on the synchronized activity of coal-powered machines and human work.

Included in that reflection on industrial labor is a subtle yet consequential allegorical reflection on the activity of painting. Recognizing *The Iron Rolling Mill* as an allegory—albeit of a specific kind—will entail reevaluating what Menzel considered, and what we consider, to be the project of his picture-making. It also entails reevaluating the notion of allegory in mid-nineteenth-century realist painting. At first sight, an allegorical reading may seem improbable since *The Iron Rolling Mill* is quite clearly a depiction of industrial labor and not a picture of or about painting. Compounding that initial improbability is the decline of classical allegory in European painting since the late eighteenth century and the skepticism the genre encountered; Craig Owens summarizes that trajectory with the strong words that “allegory has been condemned for nearly two centuries as aesthetic aberration, the antithesis of art.”³ The insistence with which Menzel’s project is described, today more than ever before, as realist places it squarely in the lineage of that decline. No matter how differently his realism is defined—as a preoccupation with exactitude and historical accuracy, as a concern with corporeality, or as a social realism—these accounts leave little room for objects standing for something other than themselves. Characterizing *The Iron Rolling Mill* as an allegory of painting invites the question of whether and how realism allows for allegorical operations. My argument thus more broadly concerns the afterlives of allegory in nineteenth-century painting that complicate its supposed demise.

Michael Fried’s reflections on the place of allegory in nineteenth-century painting bring one such afterlife into focus. Indeed, reading Menzel’s *The Iron Rolling Mill* as an allegory of painting provides an opportunity to demonstrate how

Fried’s plural accounts of nineteenth-century realist painting can be productively read together. Fried’s trilogy on realism, composed of monographs on Thomas Eakins, Gustave Courbet, and Menzel, is based on the observation that all three painters felt the need to reflect on their art through allegory and that they specifically did so in the genre of “real allegories,” namely, realist depictions of everyday life that can, but need not, be read allegorically.⁴ The expression *real allegory* is borrowed, of course, from the title of Courbet’s painting *The Painter’s Studio: A Real Allegory Summing Up Seven Years of My Artistic and Moral Life* (1855). To my mind, Fried’s extensive list of allegories by all three painters is characterized by a significant but unmentioned divide: whether a painting, like Courbet’s *The Painter’s Studio*, allegorizes itself in explicit terms through depicting the act of painting; or whether another type of activity, such as stone-breaking or the sifting of wheat in Courbet, stands in for aspects of painting.⁵ What makes my reading of *The Iron Rolling Mill* unlikely is then not a categorical absence of allegory in realist painting. Fried has characterized many of Menzel’s paintings as allegories akin to Courbet’s, including *Crown Prince Frederick Pays a Visit to the Painter Pesne on His Scaffolding at Rheinsberg* (1861) and *Bricklayers on a Building Site* (1875).⁶ Other scholars have described *The Balcony Room* (1845) and also the second *Studio Wall* (1872) as real allegories as well.⁷ What is instead so astonishing is that *The Iron Rolling Mill* describes the activity of painting by means of labor prototypical of nineteenth-century industrialization. Virtually all commentators on *The Iron Rolling Mill* (beginning with the original purchasers of the painting) have felt the need to give an account of what could possibly have motivated Menzel to choose so unusual a subject as factory work. This makes the crucial question all the more poignant: Why did Menzel choose to include an account of his own art of painting in a picture dedicated to the rhythms of indus-

trial, anonymous, and perhaps even “inhuman” labor?⁸

Whether a painting depicts the act of painting through painting or through another activity has implications for how we understand the term *real allegory*. For one, an allegory of painting that depicts an altogether different subject matter alters the very status of the real since the depicted persons and objects no longer simply stand for themselves but instead stand for something else. Having discarded the ideal transparency of traditional allegory, the real allegory presents a riddle to be deciphered. Viewers are compelled to combine looking closely with a different kind of imaginative work that relies on recognizing processes of transference and substitution, of metonymy and metaphor, and to tolerate the uncertainties these operations introduce.⁹ But reading a real allegory also requires eschewing a facile relationship between the depicted thing itself and its allegorical referent. The risks are apparent when, for example, Werner Hofmann reads *Studio Wall* as a real allegory that advocates dismissing the conventions of academic painting and then identifies the various profane objects hanging on the wall as representing different isms of the nineteenth century: a Venus for idealism, the head of a dog for realism, the busts of famous men for historicism. Mounted on the atelier’s walls, these positions are, Hofmann argues, presented as a nonhierarchical scattering of fragments. To my mind, such a one-to-one relationship between object and ism cannot be accurate because these relationships seem unmotivated and because it offers a reductive reading of the depicted objects. Menzel’s real allegories are instead a site of playfulness that many have mistakenly found to be absent in his painting.

Second, allegorizing the activity of painting with a dissimilar type of work introduces different possibilities for defining the operation at the heart of allegory. Courbet’s real allegories, as described by Fried, could be characterized as relying on a function (or fantasy) of identification—

as expressing the painter’s desire to displace himself into the painting. Fried similarly reads Menzel’s oeuvre as an art of empathy with parallels in nineteenth-century *Einfühlungsästhetik*, which describes the imaginative projection of a subject into an aesthetic form and the ensuing pleasure of empathic identification. However, as I read it, *The Iron Rolling Mill* should instead be situated in what Devin Griffiths has named the “age of analogy.”¹⁰ Both the painting’s depiction of factory labor and the allegorical description of the activity of painting reject processes of identification. Instead the painting establishes multiple analogies: first, an analogy between the coal-powered motor and the human motor, and second, between industrial labor and painting, between the handling of steel and that of oil.¹¹

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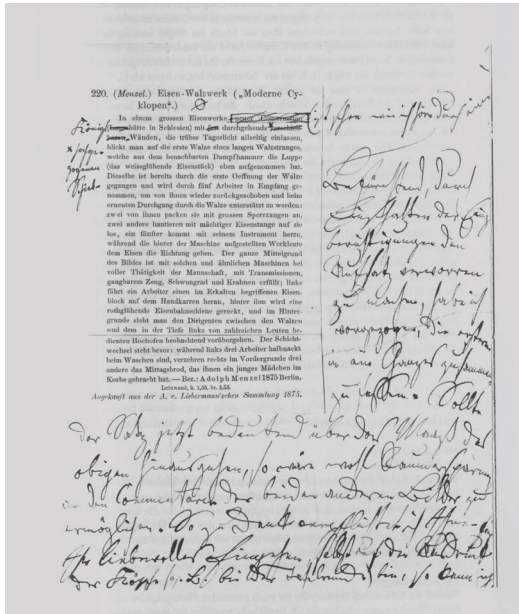
Menzel’s *The Iron Rolling Mill* was executed between 1872 and 1875. While it remains disputed whether or not the painting was commissioned by its first purchaser, the Berlin banker Adolph von Liebermann (Max Liebermann’s uncle), it is certain that Menzel freely selected the subject matter.¹² As Marie Ursula Riemann-Reyher and others have emphasized, this sets *The Iron Rolling Mill* apart from contemporaneous depictions of industrial production that were typically commissioned by factory owners. Such a commission would dictate both the subject matter and a typically laudatory presentation.¹³ Menzel’s *Diploma for the Fiftieth Anniversary of the Heckmann Factory* (1869; fig. 2) is an example of such a commissioned illustration of industrialization, which makes it informative for interpreting the later *Iron Rolling Mill*. As the title notes, the *Diploma* is a commemoration of the prosperous Heckmann foundry, which fabricated iron, copper, and brass products, on the occasion of its fiftieth anniversary. While the central vignettes are mimetic depictions of two stages of production—melting on the left



2 Adolph Menzel, *Diploma for the Fiftieth Anniversary of the Heckmann Factory*, 1869, gouache, 50 × 61 cm. Berlin, Kupferstichkabinett, Staatliche Museen zu Berlin – Preußischer Kulturbesitz

and casting on the right—the frame displays numerous recognizable elements of allegorization and mythologization, as remained typical for nineteenth-century commissioned commemorative artworks.¹⁴ In Menzel’s *Diploma*, these elements include the woman in the center of a marble edifice, who is pointing to the bust of Carl Justus Heckmann and is typically identified as Fortuna, and the playful putti and flowering garlands at the base and top. More unusual for such commemorative images and a signature of Menzel’s work is that the factory technology spills over into the allegorical frame: for example, three putti wield wrenches; the telamons are entangled in snake-like metal

coils; the belt of the central female figure is made of chain links, metal plates, and cogs; and the bottom inscription spells “Aller Anfang ist schwer” with iron hooks. The decorative frame thereby brings together two important surviving sites of allegory in the nineteenth century, namely, commemorative placards and ironic caricature.¹⁵ At the same time, these elements of factory work in the frame anticipate *The Iron Rolling Mill* as a very different type of allegorical project in which conventional allegorical frames and frameworks are discarded. This allows the tools to move front and center as tools (rather than as ornamentation) and to become themselves constitutive of a real allegory.



3 Adolph Menzel, letter to Max Jordan, 28 April 1879

When choosing the subject matter of *The Iron Rolling Mill*, Menzel was certainly motivated by a longstanding interest in metalworking that can be traced back to at least 1861, when he completed a set of sketches of a Berlin hammer mill.¹⁶ To prepare for *The Iron Rolling Mill*, he famously visited the privately owned Königshütte mill in Upper Silesia, Prussia’s largest producer of steel railroad rails,¹⁷ where he produced over 100 sketches with a carpenter’s pencil.¹⁸ The painting, executed in Menzel’s Berlin studio, relied directly on these sketches, which he supplemented with later drawings executed in Berlin’s Königliche Eisengießerei and studies of models in the studio. The plentiful sketches from the Königshütte can be roughly classified according to three subject matters that anticipate the priorities of the painting: portraits of laborers, close-ups of different tools and equipment, and studies of the factory’s architecture. Menzel is also known to have consulted an array of popular accounts of rolling mills and technical handbooks to ensure the technical accuracy of his painting.

Both sources would have been easy to come by: the national interest in nativizing rail production so as to free Prussia from British imports¹⁹ and the labor strikes repressed with military force at the Königshütte in 1871 and 1873²⁰ meant that iron mills were regularly featured in popular periodicals. So although the size and density of the picture may make it difficult to orient oneself at the outset, the technology depicted was likely familiar to Menzel’s contemporaries.

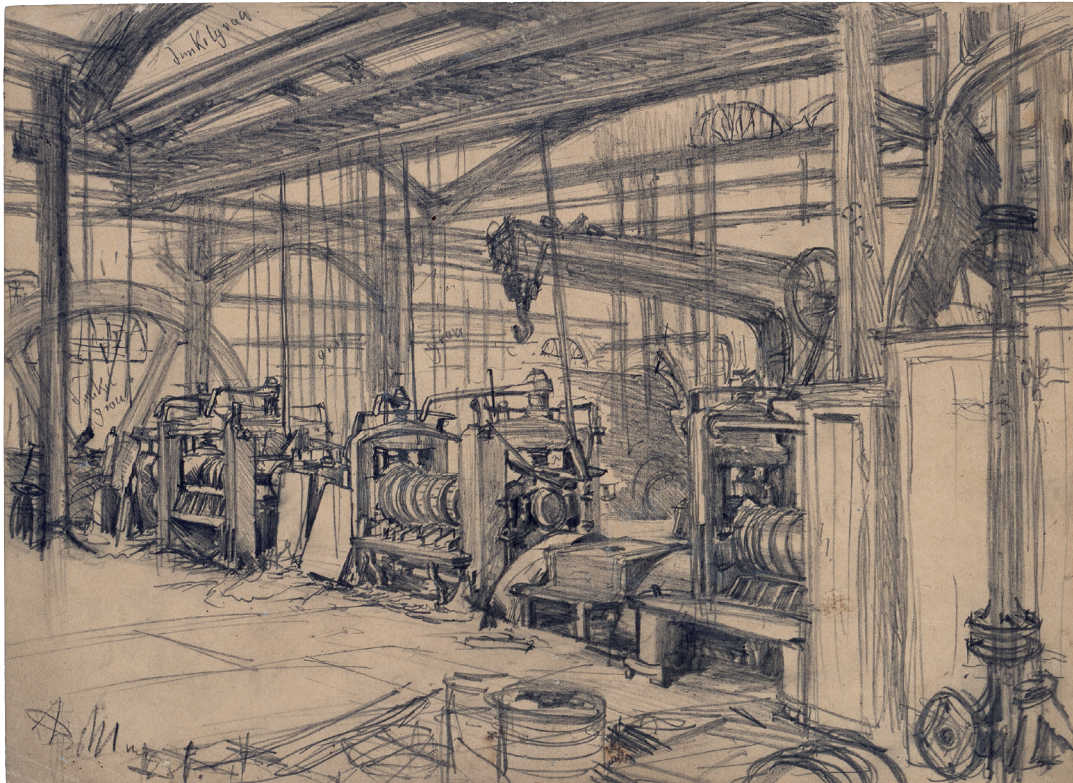
A year after Adolph von Liebermann acquired the painting for his private collection, he sold it for an incredible profit to the newly established Berlin Nationalgalerie, which was seeking to expand its collection of contemporary German art.²¹ As a result, the painting, which began its history in a highly private setting where viewing access was limited, soon became accessible, as it is to this day, to a diverse public. In acquiring the painting for the Nationalgalerie, its director Max Jordan added the second title *Modern Cyclopes* to Menzel’s own simpler *The Iron Rolling Mill* (perhaps in the hopes that the mythical allusion would justify its exorbitant asking price to the museum board) and sent Menzel his draft of the catalogue entry.

Menzel took the liberty to rewrite the entry entirely. Still today the text—which Julius Meier-Graefe casually yet wonderfully dismissed as “ein Abriss des Konversationslexikons über die Herstellung von Eisenbahnschienen”—provides an initial orientation in the dark, dense, and almost chaotic painting.²² It also provides an important clue as to what is at stake in *The Iron Rolling Mill*. Menzel writes (fig. 3): “Der Schauplatz ist eine der großen Werkstätten für Eisenbahnschienen zu Königshütte in Oberschlesien. Schiebewände, die hochgezogen sind, lassen allseitig Tageslicht ein. Man blickt auf einen langen Walzenstrang, dessen erste Walze die aus einem Schweißofen geholte ‘Luppe’ (das weißglühende Eisenstück) aufnehmen soll. Die beiden Arbeiter welche dieselbe herangefahren haben sind beschäftigt durch Hochdrängen der Deichsel des

Handwagens die 'Luppe' unter die Walze gleiten zu machen, während drei Andere mit Sperrzangen der Luppe die Richtung zu geben bemüht sind. Die Arbeiter jenseits der Walze halten sich fertig die Luppe, nachdem sie zwischen dem Walzengang hindurchgezängt sein wird, mit Zangen und Hebestangen Hebestangen welche letztere beweglich an Ketten vom Gebälk herabhäng[en], in Empfang zu nehmen, um sie über den Walzengang hinüber den Vorigen wiederum zuzuschieben behufs weiterer Wiederholung desselben Verfahrens an den sämtlichen unter sich verschiedenen profilierten Gängen des ganzen Walzenstranges, bis zu schließlich vollendeter Umwandlung der Luppe in die fertige Eisenbahnschiene. Links fährt ein Arbeiter einen Eisenblock dem der Dampfhammer die Form

gegeben zum Verkühlen hinweg. Auf derselben Seite ~~wird~~ ganz im Hintergrunde wird ein Puddelofen von Leuten bedient, in deren Nähe der Dirigent sichtbar ist. Der Schichtwechsel steht bevor: während weiter im Mittelgrunde Arbeiter halb nackt beim Waschen sind, wird rechts Mittagbrod verzehrt, das ein junges Mädchen im Korbe gebracht hat."²³

The entry begins by identifying the picture's main axis as consisting of a row of three rolling mills (in German, a *Walzenstraße*) used to produce railroad rails; they are shown more clearly in a preliminary sketch (fig. 4). The steel rails are made by heating steel ingots in puddling baths (that are difficult to make out in the painting—preliminary sketches suggest that they are located in the upper left); the ingots are then



4 Adolph Menzel, *Foundry Hall at Königshütte Rolling Mill*, study for *The Iron Rolling Mill (Modern Cyclopes)*, 1872/1874, pencil on paper, 22.3 × 30.5 cm. Berlin, Kupferstichkabinett, Staatliche Museen zu Berlin – Preußischer Kulturbesitz

heated in a second bath until they are sufficiently malleable to be formed by being passed back and forth through the different profiles of a mill. The metal tongs that the foregrounded workers are holding and the rakes hanging from the ceiling aid the passing of the hot steel through the mill. Framing the axis of mills is, in an arrangement frequently described as a triptych,²⁴ evidence of the newly introduced shift system, which allowed for around-the-clock production: workers on the left washing and a pair on the right eating. The rotational movement implied by the shift system is reinforced by the preponderance of differently sized wheels in the picture—including the largest one that dominates the background and is responsible for turning the rolling mills—and by the implied rotational movement of the mills themselves. Rather than foregrounding a single action or turning point, the image is suffused with repetitive rotation.

While Jordan's draft of the catalogue entry was schematically organized according to different parts of the picture (foreground, middle ground, background, right, and left), Menzel's revisions endow the entry with a new structure that places remarkable emphasis on the emergence of rails through the many steps of production. The revised passage is organized to reproduce the production process from formlessness to form rather than abiding by the picture's composition. Beginning with "Die Arbeiter jenseits der Walze," the centerpiece of Menzel's text is a single prolix sentence that reproduces the rolling of steel back and forth through the profiles of the mill. The sentence begins with an ingot (*Luppe*) and ends with the finished and formed rail (*Eisenbahnschiene*). The process from formlessness to form is a process of transformation (*Umwandlung*), which here employs the prefix *um-* to connote transformation through turning. Change, in other words, is not achieved through linear progress but through rotation—a point that the painting's multifaceted depiction of rotational movement reinforces. To achieve its final form as a rail, the

ingot must first be passed through one profile of the mill in one direction, and then back through another in the reverse direction. In the passage, Menzel even marks the rail's change of direction with the conjunction *um*, which echoes the two further appearances of "um" in the sentence in "wiederum" and "Umwandlung," and so suggests the repetitive movements of rotation. This single aphoristic sentence thus summarizes the transformation of steel from the most protean state as ingot to its perfected form as rail within a single complete grammatical unit that delivers its argument around an axis of rotation. The painting is, the catalogue entry tells us, about the making of form—of rails, of painting, and of grammar—by means of rotation. If, as Helmut Müller-Sievers has recently argued in *The Cylinder*, the ubiquity of rotational processes in the nineteenth century invites us to imagine a poetics of rotation, the making of poetic form by means of circular motion, then Menzel's catalogue entry captures in nuce what such a poetics might look like.

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As I have noted, *The Iron Rolling Mill* implies movements of rotation in multiple respects: the rolling mills turned by the enormous wheel in the background and the rotations of laborers as determined by the shift system. These various movements of rotation and their relationship to one another are integral to the analogies the painting draws, the first of which concerns the work performed by the coal-powered mill and the work of the laborers. This comparison is at the heart of the nineteenth century as an age of analogy: the steam engine and the human body as two machines that perform mechanical work through dissimilar yet comparable chemical processes. In the German context, this analogy was most famously articulated in 1869 by Hermann von Helmholtz, whose popularity in Berlin and beyond could not have escaped Menzel's notice.²⁵ *The Iron Rolling Mill* depicts these very

different engines side by side: the human motor and the coal-powered wheel moving the rolling mills, while also alluding to the steam engines that will operate on the rails being produced. While the cooperation of these machines is necessary to the production of rails, *The Iron Rolling Mill* represents them as possessing individual rhythms that are asynchronous. First, the rate of production is determined by the rate of the mill's rotation, which itself is dictated by the coal-powered wheel depicted in the back and also by the mill's supervisor, who regulates its rate. The role of the supervisor is typically attributed to the man in the left background of the painting, at almost the same height as the wheel.²⁶ The figure is notable for his formal dress, for the fact that he faces away from us and looks upward, and most of all for his empty (that is, toolless), folded hands, which emphasize their freedom from labor. The second rhythm constitutive of production, to which the glowing ingot to the left and the rails on the right draw our attention, is the heating and cooling of steel (that is, its specific heat), which must be matched by the rolling mills and also by the laborers passing the rails. The third rhythm is that of the human body.

In order for the transformation from formlessness to form summarized in the catalogue entry to succeed, the laborers operating the mills must match their "motors" to the other two rhythms I have just mentioned: the cooling of the steel and the rolling mills' rate of revolution as determined by the factory manager. But the inclusion of the partially unclad laborers washing on the left and those eating and resting on the right, including the woman, broadens the representation of the human motor to encompass its need for sustenance, for water, and for rest. It is that need for sustenance, water, and rest that marks the difference between the life of the body and the operations of a coal-powered machine. These framing clusters present, in other words, rhythms of bodily life—bodily life as disciplined by the new shift system but also in excess thereof.

Thus, Menzel's painting visualizes the analogy of the steam engine and the human motor but also draws attention to its limits by revealing the mismatch or asynchronicity between the rhythms of coal-powered machines and of iron, and those of human life in light of its need for rest.

What is the effect of the mismatch of these different rhythms, the different rates at which they convert heat into work? From the perspective of the late nineteenth century, the answer is entropy, that is, energy that is not fully converted to work and so dissipates into the environment as heat. On account of such dissipation, systems should gradually experience a cooling until they attain a state of equilibrium in which work can no longer be performed. As Rabinbach has discussed at length, the fact that the human motor is subject to fatigue and thus cannot maintain the pace of production established by a coal-powered engine exacerbated nineteenth-century fears of entropy and motivated widespread attempts to minimize the consequences of fatigue, including with the shift system.²⁷ Entropy is not, however, only constitutive of rolling iron because of the mismatch between the human motor and the coal engine, but also because iron inevitably cools during the process of rolling, causing heat to dissipate into the environment. Entropy, in other words, is an inevitable byproduct of manufacturing rails in multiple respects.

In *The Iron Rolling Mill*, entropy becomes visible as heat dissipating across the factory floor. Heat is perceptible throughout the painting and largely has its source in the hot yet gradually cooling iron: the heat of the foremost rail being passed through the cylinder, the second red rail behind it, and the ingot on the wagon to the left; the heat dissipating in the back left, presumably from the baths where the ingots would be heated to 1,000 degrees Celsius; the heat reflected from the rails onto the machinery and the glowing skin of the workers; and finally, the heat of the laborers' glowing pipes. As a result of these pipes, the bodies of the laborers mimic the processes of

combustion and cooling we know to power the mill's machinery and the steam engines that will eventually run on these rails.

In Menzel's painting, these multiple sources of heat act as sources of light. Although the catalogue entry claims that daylight enters on the sides through the raised factory walls, the primary source of light in the painting is clearly the central glowing rail, which is in the process of cooling, that is, of transferring its heat onto the bodies of the surrounding laborers and also into the immediate atmosphere. Entropic energy manifest as heat and light becomes the enabler of visibility, the possibility of something being shown and seen. The painting, in other words, recovers heat—energy lost to work—for the purpose of making itself visible. It is certainly no coincidence that the reddish color of the foremost rail corresponds most closely to the coloring of the artist's signature in the lower left corner. By its reddish color, the signature identifies the painter with heat as the agent of visibility. Menzel thus attributes to painting the potential to harness the energy emitted as a result of the asynchronous rhythms of these individual energetic systems.

One might view *The Iron Rolling Mill* as a reflection on entropic processes not only with regard to the heat depicted as light but also with regard to the sheer density of objects depicted in the painting, which give the impression of disorganization and threaten the cohesion of the composition. Its forty-plus figures, its wide assortment of machinery and instruments, and its dusty atmosphere all suggest an entropic disorganization that this composition must contain. A similar excess informs the history of the painting's execution, which, as I have mentioned, relied on the more than 100 sketches Menzel drew at the factory that then needed to be absorbed into a single painted canvas. In view of that high number, Busch describes the transition from sketches to canvas as a "Montage" of these "Wahrnehmungsfragmente." The necessarily fragmented composition of the painting captures a

chaotic perceptual experience of the factory floor that withstands synthesis.²⁸ Finally, the impression of entropic disorganization might account for disputes concerning the painting's appropriate genre classification. Although Jordan, when justifying the considerable price of the painting, designated *The Iron Rolling Mill* as a history painting, it has been, to my mind, very aptly characterized as a multitude of genre scenes. As other scholars have discussed at length, these are the very terms in which Menzel's friend Friedrich Eggers had, as early as 1852, suggested that industrial work should be painted.²⁹ While early scholars have noted how more traditional principles of composition organize the painting,³⁰ Menzel's catalogue entry provides us with an additional lead as to how it contains this abundance of scenes and related objects: what holds the painting together is depicting form-giving processes and their constituent steps. As I will argue in the following, the production of rails and the activity of painting are put on display as analogous form-giving processes.

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Recognizing *The Iron Rolling Mill* as an allegory for painting requires letting our gaze first rest on the painting's foreground. The painting admittedly invites its viewers to skip over the foreground to the center, the best-lit area of the canvas, where a group of laborers operate the foremost mill. While the central workers are relatively light and easier to make out, the bottom-most plane of the painting is obscured in a contrasting darkness. The piece of sheet metal that shields the workers consuming their meal on the right not only protects them from the heat; it guards them and the foreground from the glowing light and consequently from our sight. Should our gaze stray to the bottom of the canvas, the loosely triangular arrangement of tools angled toward the bright center helps, like the light itself, to return us once again to the central

figures. Since Menzel scholars typically abide by these implicit instructions, the foreground has largely escaped attention.

The bottom plane is inhabited on the right by a group of workers eating and on the left by a worker pulling a wagon with a heated ingot. The wagon is oriented such that its handle juts into the viewer's space. The center depicts a seemingly careless scattering of tools: to the left, at least one pair of tongs (and perhaps two crisscrossed ones); to the right, a rake hanging from the ceiling, which cuts through the entire picture, and the disassembled wheels of a handcart; and precisely in the center of the painting, an overturned bucket or barrel with a broom resting on it. The depiction of the workers eating their lunch is particularly striking for the number of utensils it includes: the cloth-lined basket, presumably for transporting the food; the two bowls held in the hands of the two workers in front of the sheet metal; the prominent glinting knife and spoon resting beside one worker as well as the cutlery in the bowl of the second worker sitting next to him; and the various bottles and canisters including one held by the woman alongside the basket and others resting on the seat and ground next to the workers. The placement of these tools and utensils suggests at least a similarity if not a democratizing equivalence between the tools needed for handling the heated steel (tongs, rakes, broom, and wagon) in the middle and the utensils for eating on the right. To make the analogy explicit: the tongs are to steel as the fork and knife are to food.

What lends these clusters of tools and thus the bottom plane its coherence is that they are all specifically manual instruments. Their quality of handedness is emphasized in each instance: the handle of the wagon, for example, whose grip juts into the foreground, or the spoon on the bench protruding outward to the right. Littering the foreground, these instruments are at hand, ready to be taken up by one of the painting's personages so as to act as intermediaries between

body and world. What is more, the selection of instruments implies not merely handedness but, more specifically, two-handedness, since these are tools that only function when operated bi-manually: the tongs consist of a double-lever intersecting at a fulcrum, while the fork and knife, as used by the man eating on the right, each occupy one hand and work together to cut and serve the food. In the foreground, however, all of these instruments are placed, like the workers eating, in a situation of rest, waiting to be taken up again. Finally, the tongs in the center and the eating utensils suggest an affinity with one another because of the production processes they imply—at least the metal eating utensils, wagon, and tongs are produced in metallurgical processes similar to those depicted in the picture (and usually produced at the same type of facility). In contrast, the basket, the broom, and the barrel represent artisan handicrafts and recall the manual labor that went into their making.

At the very bottom center and, of all the objects depicted, seemingly closest to the viewer is the broom, whose purpose is to brush away the glowing embers that lie, for example, below the foremost mill. Yet given this ostensible purpose, the placement of the broom is an awkward one. It is clearly positioned at a leftward angle with the handle jutting out of the painting and into the viewer's field (like the wagon handle, tongs, and spoon) such that it is not actually at hand for any of the depicted workers. If it had been laid to rest by any of the workers we see in the foreground, its handle would likely point toward the foremost mill. It would instead appear that someone standing in the position of the painting's beholder, and presumably left-handed given the angle, had just laid the broom to rest on the barrel. The significance of the broom's awkward placement is all the more appreciable if one recalls Paul Friedrich Meyerheim's contemporaneous depiction of a broom with a similar purpose in his cycle of wall paintings *History of a Locomotive* (1873–1876. Menzel was certainly familiar with the cycle, and



5 Paul Friedrich Meyerheim, *History of a Locomotive: Engineering Works*, 1873, oil on copper, 315 × 230 cm. Berlin, Märkisches Museum

it may have even served as a source of inspiration.³¹ In the center foreground of the third painting of Meyerheim's cycle, entitled *Engineering Works* (fig. 5), lies a broom on a comparatively empty and well-lit factory floor, positioned such that it could be easily grasped by the worker in the center, who is hammering the locomotive wheel. In contrast to Meyerheim's naturalistic placement of the broom, the handle of the broom in Menzel's *The Iron Rolling Mill* is strangely angled out of the painting and away from the laborers.

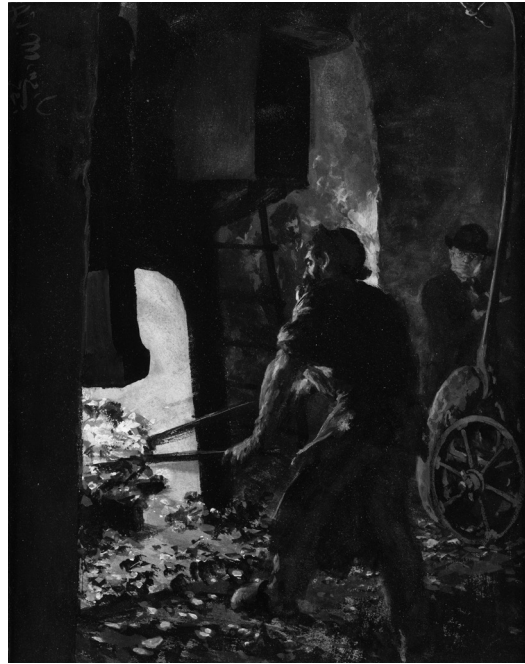
The broom constitutes the allegorical turning point of *The Iron Rolling Mill*, for it is nothing other than the painter's brush that has been laid to rest by the famously ambidextrous Menzel, presumably after having completed the painting's final strokes: the signature that completes the painting and seals it off as a picture to behold from the space in which it was completed. The

broom-as-brush along with the (paint) pots assembled on the right and the blank canvas waiting to be painted in the form of the white cloth lining the basket insert the painter's presence into the painting's space through metonymy. Given the glowing reddish color of the signature that associates it with the embers, only the broom could execute the strokes of the signature since the broom is specifically purposed for sweeping such heated elements. The fact that the signature and broom-as-brush are similarly angled reinforces the impression that the broom was just used to complete these strokes before being placed on the barrel. Regarded as a paintbrush, the broom-as-brush shares the qualities of the tools I have described above as lending coherence to the set of objects presented in the foreground: it is at rest yet recalls the labor that went into its own making and the labor it was used to perform. Its orientation not only emphasizes its handedness but more specifically suggests its participation in a two-handed task, namely, sweeping or, in its allegorical mode, Menzel's ambidextrous painting. As both oral accounts and plaster casts of his hands that Menzel had molded in 1904 indicate, Menzel typically drew with his left hand and painted with his right. Hence, an affinity for bimanual tools or tool combinations seems natural.³² And although Menzel, schooled in rigorous nineteenth-century right-handed pedagogy, predominantly wrote and painted with his right hand, it is well known that he both sketched and signed his sketches with his left hand and, on occasion, painted and signed with his left as well.³³ Indeed, the horizontal of the capital *A* in the signature appears to be drawn from right to left, as would be typical of script executed with the left hand. These subtle clues in the foreground entangle the viewer in the fiction that this painting, executed as a two-handed project, has just received the final stroke, performed by the left hand before the brush (and the painter) came to rest.

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Assuming that the foreground is rendered coherent by virtue of the qualities I have named above—handedness and being at a state of rest—the broom-as-brush too suggests the painter has completed his task: painter is to brush is to painting as man is to spoon is to food as worker is to tongs is to steel. Although it is at rest (perhaps after being cleaned in the overturned bucket), the placement and outward angle of the broom-as-brush still invoke the painter's immediate proximity to the canvas and what it shows. The gaze of the painting's only woman, who seemingly looks at the beholder, reinforces the impression that somebody is standing next to the cluster of tools. The broom-as-brush thereby feeds a two-fold fiction: first, the painter's presence on the factory floor and, second, his presence in front of the canvas at the time of its completion.

Why imply the painter's presence on the factory floor? In the first place, to establish the fiction of the painting's realist authenticity, a fiction Menzel was keen to advance throughout his life.³⁴ The impression of authenticity then relies not merely on the painting's historical or technical accuracy, nor merely on the detail and precision of its execution, but also on the suggestion of the painter's copresence with the subject of his painting. A comparison with a second painting underscores the point. His *Self-Portrait with a Worker at the Steam Hammer* (1872; fig. 6) was painted after visiting the Königshütte in the same year as he began work on *The Iron Rolling Mill*. Inserted between the foregrounded laborer operating the steam hammer and the two standing in the smoky back is a self-portrait. Menzel depicts himself as he would have wanted to be seen and recognized—as occupied in looking and simultaneously drawing (with his left hand) in one of his pocket sketchbooks. In later recollections of visiting the Königshütte, Menzel similarly remembers himself as an inhabitant of the factory floor, so much so that he imagines himself being rolled like steel through the mill, subjected to its rotating movement. He was constantly at risk,



6 Adolph Menzel, *Self-Portrait with a Worker at the Steam Hammer*, 1872, gouache, 16 × 12.5 cm. Leipzig, Museum der bildenden Künste

he recounts, “mitverwalzt zu werden. Wochentlang von morgens bis abends habe ich da zwischen den sausenenden Riesenschwungrädern und Bändern und glühenden Blöcken gestanden und skizziert.”³⁵ To insert the painter onto the factory floor, either through self-portraiture or through metonymy as in the case of *The Iron Rolling Mill*, is integral to Menzel's own and our insistence on the painting's authenticity, its realism.³⁶

As I have noted, the broom-as-brush suggests not only the presence of the working artist in the rolling mill but also his status as the painting's first beholder—Menzel's presence outside the picture frame in, as the signature reminds us, the Berlin studio. The painter paints himself into the painting as a resting brush so as to resituate the canvas in the studio; it establishes the fiction that the artist has just signed the painting, thereby endowing it with closure and guaranteeing its status as an artwork rather than a work in



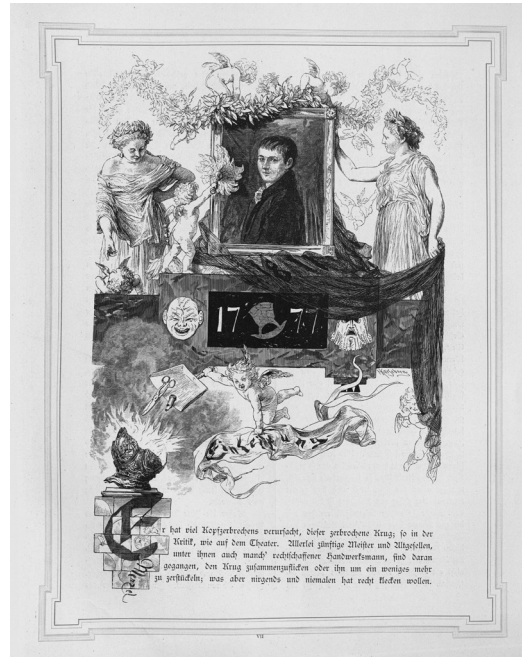
7 Adolph Menzel, *Crown Prince Frederick Pays a Visit to the Painter Pesne on His Scaffolding at Rheinsberg*, 1861, gouache on paper, mounted on cardboard, 24 × 32 cm. Berlin, Nationalgalerie, Staatliche Museen zu Berlin – Preußischer Kulturbesitz

progress. While it may seem tedious to reinstate the painter as the first beholder, it is of particular importance in Menzel's case because it helps dismantle what has endured as a persistent yet inadequate classificatory distinction of Menzel's work as either public or private.³⁷ The distinction was employed by Menzel himself again and again in retrospectives of his life and work and also in the earliest scholarship concerning the artist. Meier-Graefe's monograph claims to focus on Menzel's "private studies" so as to bring to light a different and more modern aspect of the artist than his public persona as the "painter of Frederick the Great." Despite acknowledging the history of this distinction, Françoise Forster-

Hahn, for example, defines the relationship between the consecutively painted *Studio Wall* and *The Iron Rolling Mill* as being characteristic of the tension between private and public in Menzel's oeuvre.³⁸ While the 1872 *Studio Wall* was first exhibited thirteen years after completion (and only sold in 1896), *The Iron Rolling Mill* left the studio to join Adolph von Liebermann's collection soon after completion (and after being varnished in the presence of friends) and shortly thereafter pursued a history of public hangings: first in the Nationalgalerie in 1876 with journeys to world's fairs in Chicago in 1893 and in St. Louis in 1904. However, while it is certainly the case that *The Iron Rolling Mill* was much more accessible to the

public than *Studio Wall* was, it is by no means clear that it was intended as a public work. At the time of painting *The Iron Rolling Mill*, Menzel relied heavily on the purchases of wealthy individuals like Liebermann seeking acquisitions for their private collections.³⁹ An allegorical reading of *The Iron Rolling Mill* further complicates this enduring distinction between public and private paintings. It underscores the studio as the site of the painter's labor, the place where he and his brush come to rest, and where the painting is first viewed; it describes the act of painting in this case as a primarily and thus constitutively solitary, private undertaking. For Menzel, even the large-scale format of history painting is initially at home in the private interior, where it is first beheld by the painter himself.

Reading *The Iron Rolling Mill* allegorically suggests that it and the earlier but also programmatic *Studio Wall* are similar because they invoke the privacy of painting—bringing light into the dark interior of one's solitary room. More basically, they are depictions, in more or less disguised terms, of the props of painting. This too is no great surprise since Menzel (an avid self-portraitist) is well known for inserting himself into paintings in the form of props, transforming them into allegories in an often clandestine and witty manner. A key example is *Crown Prince Frederick Pays a Visit to the Painter Pesne on His Scaffolding at Rheinsberg* (fig. 7), where the center of the painting flaunts Menzel's chair, which was especially fashioned for his short stature; it is a reminder that this is not just a painting about the eighteenth-century painter Antoine Pesne but also about the project of Menzel's painting.⁴⁰ That chair, moreover, is only one of a wide scattering of instruments and props in the painting: brushes, paint pots, an assortment of vessels, and a mannequin flat on its face. Another example that is particularly interesting in the context of *The Iron Rolling Mill* and its metonymical representation of the artist as instrument are the title pages of the 1876 illustrated anniversary edition



8 Adolph Menzel, illustrated page with portrait of the author, in Heinrich von Kleist, *Der zerbrochene Krug*, Hamburg 1877, VII

of Heinrich von Kleist's *Der zerbrochene Krug* (*The Broken Jug*; fig. 8). In the center is a portrait of Kleist surrounded by emblems of commemoration and allegorization, again including tool-wielding putti: one cleaning the portrait with a feather duster and below him another with a dustpan, from which scissors and a whistle are falling. To the lower left of Kleist's portrait are a stack of squares that serve as a pedestal for the toppling jug and are arranged to form a drop cap *E*. Inscribed across the lower two layers of blocks and falling off their edge is Menzel's signature. When unscrambled, this stack of blocks also contains an incomplete self-portrait of Menzel. By means of the signature and self-portrait on the title page, Menzel too becomes an author of this now illustrated classic.

Consider another vignette from the title page of the same book in which again the toppling jug is framed by yet another metonymi-



9 Adolph Menzel, title page of Heinrich von Kleist, *Der zerbrochene Krug*, Hamburg 1877

cal self-portrait, again in the form of Menzel's tools: brush, burnisher, and scribe for etching, a camera being operated by the left putti; and Menzel's eyeglasses, whose arabesque arm mimics the flourishes of the immediately adjacent signature (fig. 9). The tools and signature again function as two mutually reinforcing inscriptions of the illustrator's authorship on the title page. It is then tempting to read Menzel's decision to employ manual instruments to act as his surrogate in *The Iron Rolling Mill* and on the title page of *Der zerbrochene Krug*—his choice, that is, to represent himself by means of instruments of labor—as a programmatic statement of his vigorous work ethic⁴¹ and also perhaps as a reminder of his artistic origins in his father's lithography workshop. That workshop, for which Menzel assumed responsibility when he was sixteen (at the time of his father's death), meant that

Menzel was surrounded by and very much engaged in a highly technical means of producing and reproducing pictures from a very early age. By technical, I mean that a significant proportion of the labor of production was performed by a wide range of instruments and machines and that the success of production depended on handling them skillfully. Responsibility for the workshop also meant that Menzel need not have regarded artistic practice as antithetical to production for profit. The democratizing equivalence between the products of handicraft (broom and barrel) and factory products (metal instruments) across the bottom plane of *The Iron Rolling Mill* suggests the same. If one then broadens one's view of *The Iron Rolling Mill* slightly to include the central group of laborers operating the foremost mill, the analogy between their tongs and the artist's broom-as-brush might be taken to emphasize the diligence with which they perform their work or the lack of antithesis between labor and art. The highly individualized laborers in the central foreground, who are represented as absorbed in and skilled at their work, speak more to such diligence and to craft than to commonplaces of alienated labor. As Menzel himself observed, guiding the ingot into the mill and passing it back and forth through the different profiles was the most difficult step in the production of rails. The heat emitted by the ingot, its relatively protean state, the speed of production demanded by its progressive cooling, and the imperfect grasp of the tongs on the steel made passing the rail laborious and precarious.

Just as the rolling of steel is a process that depends on the difficult coordination of one's entire body, particularly one's hands, the instrument, and the handled object, so too does painting succeed only through an analogous act of coordination. The painter too must operate with the chemical properties of his medium and in particular with the specific heat of its elements, though, to be sure, the solidification of oil allows for more time, easier manipulation, and

correction than does steel. Even if the painter does not drop his brush like the dancing Pesne, this contact, like the guiding of steel by means of tongs, is precarious. Because Menzel chooses to emphasize the handedness of the tools across the painting's foreground and so implies the bodily presence of the artist, it is fair to say that he skirts the question of alienated labor and laborer to make a different point entirely: the physicality of labor, its necessarily mediated relationship to its object, and the concomitant need to accommodate the (chemical) properties of that object. The need to satisfy equally these demands means that the process from formlessness to form might very well fail. Conversely, successful execution bespeaks craftsmanship.

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There is one final analogy to be drawn. As numerous commentators of the painting have noted and as is typical of Menzel's pictures, *The Iron Rolling Mill* both demands sustained looking and makes such a concentrated gaze laborious. The profu-

sion of bodies, machinery, and tools combines with the painting's overall darkness to make the individual objects difficult to decipher and situate. It is precisely Menzel's incredible technical skill in drawing, the precision, detail, and density with which these objects are represented—his ability, in other words, to coordinate between body, instrument, and world—that has its counterpart in the visual labor that the beholder of his paintings is asked to perform. The exertion of seeing is already thematized in the central cluster of the painting with the foremost central rail. The heat and concomitant brightness of the rail, which is the enabler of visibility in the painting, is of such intensity that it deters beholding as much as it enables it. The fact that the man resting behind the metal shield has closed his eyes is a potent reminder that rest encompasses resting one's eyes from exposure to heat and light, respite from the labor of seeing. Just as an account of human labor is not complete without including the body's need for rest, so too must an account of the labor of painting encompass putting to rest one's tools, hands, and eyes.

1 For example, Marie Ursula Riemann-Reyher argues that Menzel was well aware of the workers' plight and that his painting constitutes a sympathetic commentary: "Within the context of conflicts presaging the second world economic crisis of 1873, Menzel began to prepare a work depicting factory workers, who represented the disturbing 'Fourth Estate', that threat which had made the potent German bourgeoisie renounce its autonomous position of strength and its potential access to power. At that time Bismarck's government supported the interests of industrial entrepreneurs in order to safeguard international competitiveness, while at the same time refusing to adapt industrial working conditions to human needs. *The Iron Rolling Mill* is the first German painting to use the 'social question' as a theme." Claude Keisch and Marie Ursula Riemann-Reyher (eds), *Adolph Menzel, 1815–1905: Between Romanticism and Impressionism* (exh. cat. Washington, D.C., National Gallery of Art, New Haven 1996, 379–385, here 382, cat. 160 (Marie Ursula Riemann-Reyher).

2 Busch agrees that Menzel was informed about the poor working conditions at the Königshütte yet concludes: "Doch sowohl Heroisierung der Arbeit wie Sozialkritik an den Verhältnissen der Arbeit setzen in der Darstellung entweder das Pathos der Verklärung oder das Pathos der Anklage voraus. Beides ist bei Menzel definitiv nicht zu finden." Werner Busch, *Adolph Menzel: Leben und Werk*, Munich 2004, 111.

3 Craig Owens, *The Allegorical Impulse: Toward a Theory of Postmodernism*, in: *October* 12, 1980, 67–86, here 67. On closer examination, what transpires in nineteenth-century painting is of course better described as a reinvention of allegory that breaks away from the strict parameters of personification. It is a process of dynamization in which contemporary history and everyday life may be depicted in a realist fashion but still may contain or be subjected to an allegorical reading. See Heinz D. Kittsteiner, *Die geschichtsphilosophische Allegorie des 19. Jahrhunderts*, in: Willem van Reijen (ed.), *Allegorie und Melancholie*, Frankfurt 1992, 147–197.

- 4 “For the moment I want simply to note how each of the nineteenth century’s three arch-realists felt compelled on one or more occasion to reflect allegorically on the nature of his art, as if the obsessive particularity of their respective projects demanded to be given explicit expression in this way. That nothing comparable seems to have taken place in the work of their foremost non-realist contemporaries is an equally interesting fact.” Michael Fried, *Menzel’s Realism: Art and Embodiment in Nineteenth-Century Berlin*, New Haven 2002, 117–118. Fried’s other two works on realism are *Realism, Writing, Disfiguration: On Thomas Eakins and Stephen Crane*, Chicago 1987, and *Courbet’s Realism*, Chicago 1990.
- 5 In his readings of Courbet’s *The Stone Breakers* (1849) and *The Wheat Sifters* (1854), Fried interprets the labor being performed as indirectly representing different aspects of the act of painting and of the act of beholding paintings. For example, the depiction of spreading wheat on the white cloth in *The Wheat Sifters* is “an action that invites being read, once the context I have been elaborating is even tentatively accepted, as a representation of the project of transporting and applying paint to canvas.” Fried 1990 (as note 4), 152.
- 6 The fact that Menzel had the opportunity to see *The Stone Breakers* in Frankfurt in 1852 and again in Munich in 1869 also invites a comparison between this painting and *The Iron Rolling Mill*. Riemann-Reyher suggests that these encounters were formative for Menzel’s early idea to paint a picture of labor. See exh. cat. *Adolph Menzel* 1996 (as note 1), 382, cat. 160 (Marie Ursula Riemann-Reyher).
- 7 Peter-Klaus Schuster, for example, describes Menzel’s *The Balcony Room* as “most definitely an allegory of painting” or more precisely as an “allegory of the real,” emphasizing the subjectiveness of the painter’s views. Peter-Klaus Schuster, *Menzel’s Modernity*, in: exh. cat. *Adolph Menzel* 1996 (as note 1), 138–160, here 148. Werner Hofmann, in turn, characterizes Menzel’s 1872 *Studio Wall* as a real allegory. Hofmann argues that the term *real allegory*, which he defines as an ennoblement of the everyday, profane, and banal that enables it to carry meaning, should be widely applicable to nineteenth-century painting. The characterization of *Studio Wall* as a real allegory is significant for interpreting *The Iron Rolling Mill* since Menzel painted them consecutively. Furthermore, both paintings are considered disguised epitaphs for Menzel’s friend Friedrich Eggers, who died in 1872. See Werner Hofmann, *Menzels Atelierwand*, in: idem, *Bruchlinien: Aufsätze zur Kunst des 19. Jahrhunderts*, Munich 1979, 201–213.
- 8 Helmut Müller-Sievers argues that rolling (*walzen*) defines the nineteenth century and that it is the most “genuinely technical, ‘inhuman’ motion”—inhuman because when the amorphous material of heated steel is pushed through the rolling mill, it acquires only the imprint of the machine and bears no evidence of the human labor that went into its production. Helmut Müller-Sievers, *The Cylinder: Kinematics of the Nineteenth Century*, Berkeley 2012, 67. Menzel’s *The Iron Rolling Mill* only receives a passing reference in *The Cylinder*, though the painting makes an excellent illustration of the ubiquity and poetics of rotational movement. Müller-Sievers also provides a brief summary of the technology of rolling mills (ibid., 266–270).
- 9 This is at odds with recent accounts of realism as a protomodernist semiotic breakdown in which representations can only refer to their own status as signs and not to real or allegorical referents. See Christian Begemann, *Die Welt der Zeichen: Stifter-Lektüren*, Stuttgart 1995; Sabine Schneider and Barbara Hunfeld (eds), *Die Dinge und die Zeichen: Dimensionen des Realistischen in der Erzählliteratur des 19. Jahrhunderts*, Würzburg 2008.
- 10 Devin Griffiths, *The Age of Analogy: Science and Literature between the Darwins*, Baltimore 2016.
- 11 As Griffiths writes, analogy became so important to nineteenth-century thought because it allows for “multipart comparisons that establish a pattern of similarity between two different sets of relationships.” Ibid., 28.
- 12 The best source for the claim that Menzel delivered *The Iron Rolling Mill* for a commission from Adolph von Liebermann is Ottomar Beta’s recollection of a conversation with Menzel in which he writes that Menzel stated the following: “Noch als ich 1872 dem mich um ein Bild angehenden Bankier Liebermann *Das Eisenwalzwerk* zu malen vorschlug, welches von Geheimrat Jordan später den Titel ‘Moderne Cyklopen’ erhielt, war er zunächst ganz erstaunt.” Ottomar Beta, *Exzellenz lassen bitten: Erinnerungen an Adolph Menzel*, Leipzig 1992, 40. However, as Riemann-Reyher points out, these conversations are by their nature unreliable, and the claim that the piece was commissioned has yet to be verified with further evidence. See Marie Ursula Riemann-Reyher, *Moderne Cyklopen: 100 Jahre ‘Eisenwalzwerk’ von Adolph Menzel* (exh. cat. Berlin, Kupferstichkabinett and Sammlung der Zeichnungen der Nationalgalerie, Staatliche Museen zu Berlin), Berlin 1976, n. p.
- 13 Commentary on the painting has gone to great lengths to describe *The Iron Rolling Mill* in relation to (and also to distinguish it from) the rare contemporaneous depictions of industrialization. Comparisons with earlier examples such as Eyre Crowe’s *The Foundry* (1869) and Ignace-Francois Bonhomme’s *Manufacture of Rails: View from the Old Creusot Foundry* (1867) typically reiterate Menzel’s historically unprecedented realism. A second pictorial tradition perhaps even more relevant to *The Iron Rolling Mill* are depictions of Vulcan’s forge. Fried points to

- Luca Giordano's *The Forge of Vulcan* (ca. 1660) and Francisco Goya's *The Forge* (ca. 1815–1820), which he regards as having a certain affinity to *The Iron Rolling Mill* since all three portray forge work in what Fried considers a subtly sexual manner. Fried 2002 (as note 4), 121.
- 14 Examples of such an allegorical frame decorating an illustration of factory work to which one might compare Menzel's *Diploma* include Eugen Napoleon Neureuther's *The Klett & Co. Machine Works and Foundry* from 1858 and the 1854 lithograph commemorating the manufacture of the 500th locomotive at the August Borsig Works. For a discussion of the conventions of allegorical frames in early commissioned depictions of industrialization, see Françoise Forster-Hahn, Adolf Menzels *Eisenwalzwerk: Kunst im Konflikt zwischen Tradition und sozialer Wirklichkeit*, in: Tilmann Buddensieg and Henning Rogge (eds), *Die Nützlichen Künste: Gestaltende Technik und bildende Kunst seit der industriellen Revolution*, Berlin 1981, 122–129, here 123–124.
 - 15 For an extensive discussion of the ways in which more traditional elements of allegorization were incorporated into mid-nineteenth-century representations of industrialization, in particular into those of the railroad industry, see Monika Wagner, *Allegorie und Geschichte: Ausstattungsprogramme öffentlicher Gebäude des 19. Jahrhunderts in Deutschland von der Cornelius-Schule zur Malerei der Wilhelminischen Ära*, Tübingen 1989, 165–196. For a detailed and helpful account of the reinvention of allegory in Menzel's commemorative art, see Christina Grummt, *Adolph Menzel: Zwischen Kunst und Konvention. Die Allegorie in der Adressenkunst des 19. Jahrhunderts*, Berlin 2001.
 - 16 See Riemann-Reyher 1976 (as note 12), n. p.
 - 17 At the Königshütte, 3000 laborers produced 55,000 tons of raw iron, 43,000 tons of raw zinc, and 10,000 tons of iron for railroad rails annually. See exh. cat. *Adolph Menzel* 1996 (as note 1), 384, cat. 160 (Marie Ursula Riemann-Reyher). For another summary of the historical rolling mill, see Stefan Hauser, Adolph von Menzel: *Das Eisenwalzwerk (Moderne Cyklopen)*, in: *Ferrum* 79, 2007, 121–132. In 1869, the factory was sold from holdings of the Prussian state to Graf Hugo Henckel von Donnersmarck and absorbed into the Vereinigte Königs- und Laurahütte AG für Bergbau und Hüttenbetrieb. In 1871, it was then made into a public stock company. Henckel reportedly extended a personal invitation to Menzel to visit the Königshütte.
 - 18 Riemann-Reyher notes that "the fact that [...] he exchanged his artist's pencil for a cruder carpenter's pencil is clear evidence of the sympathy he brought to the task." Marie Ursula Riemann-Reyher, *The Draughtsman – and Master of the Glance*, in: exh. cat. *Adolph Menzel* 1996 (as note 1), 125–135, here 131.
 - 19 The Prussian endeavor to catch up to British technology and production is also evidenced by the fact that the rolling mills Menzel visited and painted in *The Iron Rolling Mill* were replaced in 1874 since they were already considered outdated mid-century technology. Menzel himself commented on the dated status of the mills, "dass noch während ich an diesem Bild malte, diese Construction der Betriebseinrichtung schon veraltete." Menzel to Max Jordan, 7 March 1880, in: Adolph Menzel, *Briefe*, ed. Claude Keisch and Marie Ursula Riemann-Reyher, 4 vols, Munich / Berlin 2009, vol. 3, 1127.
 - 20 The strikes at the Königshütte in 1871 and 1873 were both suppressed with military force. The fact that the majority of workers were Polish Catholics, who were subject to Bismarck's anti-Catholic initiatives (including being placed under military supervision for the entire decade), made the relationship all the more problematic.
 - 21 Liebermann originally paid Menzel 11,000 Prussian thaler for the painting; in 1876, it was sold to the Nationalgalerie for nearly three times the price (30,000 thaler). See exh. cat. *Adolph Menzel* 1996 (as note 1), 384, cat. 160 (Marie Ursula Riemann-Reyher).
 - 22 Julius Meier-Graefe, *Der junge Menzel: Ein Problem der Kunstökonomie Deutschlands*, Munich 1906, 215.
 - 23 Menzel to Max Jordan, 28 April 1879, in: *Menzel* 2009 (as note 19), vol. 2, 764–766.
 - 24 Forster-Hahn, for example, speaks of the painting's triptych structure. Françoise Forster-Hahn, *Ethos und Eros: Adolph Menzels Eisenwalzwerk und Atelierwand*, in: *Jahrbuch der Berliner Museen* 41, 1999, 139–163, here 144.
 - 25 Hermann von Helmholtz's popular lecture "Über das Ziel und die Fortschritte der Naturwissenschaft" is an important example of such analogical thinking that undergirds the idea of the "human motor." Common to the steam engine and the human motor is their need for fuel, which is converted into mechanical work. "Bald brauchen wir eine Dampfmaschine, bald ein Wasserrad oder eine Turbine, bald Pferde oder Ochsen an einem Göpelwerk, bald eine Windmühle oder, wenn nicht viel Kraft nöthig ist, den menschlichen Arm, ein aufgezoogenes Gewicht oder eine elektromagnetische Maschine. [...] In der Dampfmaschine ist es die Spannkraft der erhitzten Dämpfe, welche den Stempel hin- und herschiebt; diese wird hervorgerufen durch die Wärme, die im Feuerraume durch Verbrennung der Kohlen, das heisst durch einen chemischen Prozess, erzeugt wird. Letzterer ist hier die Quelle der Triebkraft. Ist es ein Pferd oder der menschliche Arm, welche arbeiten, so sind es deren Muskeln, welche, angeregt durch die Nerven, unmittelbar die mechanische Kraft erzeugen." Hermann von Helmholtz, *Über das Ziel und die Fortschritte der Naturwissenschaft*, in: idem, *Phi-*

- losophische und populärwissenschaftliche Schriften*, ed. Michael Heidegger, Helmut Pulte, and Gregor Schiemann, 3 vols, Hamburg 2017, vol. 1, 576–605, here 588. Anson Rabinbach has amply demonstrated how important this analogy and the ensuing push to optimize the performance of the human motor was to the nineteenth century and beyond in *The Human Motor: Energy, Fatigue, and the Origins of Modernity*, Berkeley 1990.
- 26 Busch observes that *The Iron Rolling Mill* can be read as organized according to the proportions of the golden ratio. In that case, the horizon and the left vertical of the ratio intersect in the figure of the mill's supervisor, suggesting that he embodies the overarching unity of the painting, a figure of apprehension. See Busch 2004 (as note 2), 113. I regard the supervisor as representing only one of many factors determining the rate of production, which are themselves not hierarchized in the painting.
- 27 Rabinbach 1990 (as note 25), 19–45.
- 28 Busch 2004 (as note 2), 107. Schuster similarly describes the painting as a "rendering of fragmented simultaneity, the palpable paradox of a totality in decomposition." Schuster 1996 (as note 7), 146. Max Liebermann, who observed the painting in its early stages in Menzel's studio, attributed what he regarded as its lack of unity to the fact that Menzel worked only with these earlier sketches and never produced a preparatory sketch of the painting in its entirety. See Busch 2004 (as note 2), 107.
- 29 "Ich wollte nur von dem riesenhaften malerischen Bilde reden, das sich da ausbreitet und welches wie ein Kaleidoskop 100 und aber 100 kleine Genrebilder in dem mannigfaltigsten Wechsel dem erstaunten Auge vorüberführt, sei es, dass dieses den grossen, weiten Raum umfasst, wo die Räder und Werke wie beseelte Zauberwesen ihr buntes, ernsthaftes Spiel treiben, wie aus Lust an Bewegung und an dem Jubel der schwungvollen Existenz, wo unter dem rastlosen Wirbel der Maschinengestalten die Menschen in den mannigfaltigsten Gruppen wie geheimnisvolle Zwerggeister hin und wieder hausen [...]; sei es, dass man einzelne Bilder festhält, wie sie hier durch eine Gruppe von Cyklopen sich darstellen, die mit mächtigen Zangen die rohe Gluthmasse des Eisens durch den quietschenden Zahn der Dehnmaschine hinüber und herüber wirft [...]. Hier ist wirklich eine reiche Fundgrube zu den schönsten Bildern aus dem Arbeiterleben und das alles ohne "Tendenz", lauter kräftiger und nahe liegende lebensvolle Natur." Friedrich Eggers, *Über Stoffe für Genre- und Landschaftsmaler*, in: *Deutsches Kunstblatt* 3, 1852, no. 13, 107–108, here 108.
- 30 For one, the painting is done in perfect perspective; the vanishing point is situated at the head of the manager of the factory floor. Furthermore, as noted earlier (see note 26), the painting divides along the classic proportions of the golden ratio. It would be better to say that none of these compositional principles suffice to undo the impression of fragmentation and entropy-like disorganization. Entropy is constitutive of both the process of manufacturing rails and the painting's form.
- 31 Indeed, Riemann-Reyher suggests that Menzel may have even conceived of *The Iron Rolling Mill* as a supplement to Meyerheim's *History of a Locomotive*, since it depicts a step in that story that is otherwise not represented in the cycle. See Riemann-Reyher 1976 (as note 12), n. p.
- 32 In 1904, Menzel had his hands cast in plaster by the sculptor Reinhold Begas (who would later make his death mask). The left hand holds a pencil, the right a brush. Menzel reportedly claimed to have drawn in pencil and gouache with his left hand, and painted oils with his right. For a discussion of Menzel's hands, see Ulf Küster, *Links zeichnen, rechts malen? Adolph Menzel und seine Hände*, in: *Jahrbuch der Berliner Museen* 41, 1999, 69–88.
- 33 For example, in her detailed analysis of the signature on *The Lying in State of the March Dead* (1848), Karin Gludovatz concludes that the signature was likely done with Menzel's left hand. Karin Gludovatz, *Fährten legen – Spuren lesen: Die Künstlersignatur als poetische Referenz*, Munich 2011, 203. Gludovatz's discussion of Menzel's two-handedness does much to undermine the strict contrast of right for painting, left for drawing.
- 34 For example, he writes in 1839 that he seeks to give his work "die größtmögliche Authentizität." Menzel to Johann Jacob Weber, 23 April 1839, in: Menzel 2009 (as note 19), vol. 1, 110. And in a much later letter: "Jene von Experten freilich viel gerühmte Präcision in Darstellung aller technischen Requisiten auf meinem Bilde: die 'mod. Cyklopen' kann ich doch nur als eine nothwendige Consequenz meines Versuchs, die Vorgänge an solchem Ort als rein malerische Aufgabe auszugenießen, angesehen wissen wollen." Menzel to Hermann Alexander Müller, 17 November 1882, in: *ibid.*, vol. 3, 943. In his defense of the painting's purchase, Jordan emphasizes the quality of accuracy, claiming that the artist brings the "Tageswerk der Eisenhütte mit so lebensstreuer Wahrheit und so genialer Beobachtung vor Augen." Quoted from Forster-Hahn 1999 (as note 24), 147 n. 21. Meier-Graefe emphasizes the same point: "Der Betrachter, der nie in einem Eisenwerk war, sagt sich, so muß es sein, und der Kundige bestätigt, es sei so echt, wie er es selbst gesehen habe. Ingenieure haben behauptet, jede Schraube, jeder Hebel sitze an der richtigen Stelle und die Arbeiter seien mit absoluter Genauigkeit beobachtet." Meier-Graefe 1906 (as note 22), 215. On these grounds, Meier-Graefe considers *The Iron Rolling Mill* to have failed and to be the beginning of the

- end of Menzel's greatness. The objects, he writes, appear merely as they are without having been raised to the status of signs (ibid., 215–216). An allegorical reading of the painting might assuage his critique.
- 35 Quoted from Beta 1992 (as note 12), 21.
- 36 There is also an interesting parallel to Courbet in the shift from self-portraiture to metonymical representation of the artist. Of Courbet, Fried writes, "For there is an important sense in which the basis of Courbet's breakthrough paintings was, first, his disappearance from them *in propria persona* and, second, the replacement of his literal image by a multiplicity of metaphorical or otherwise nonliteral self-representations, all of which moreover tended to be evenly distributed across the pictorial field." Fried 1990 (as note 4), 98.
- 37 Küster even suggests that the distinction between private and public could be associated with Menzel's two hands: the left executed the private sketches, the right the public oil paintings. Küster 1999 (as note 32), 75. The fact that the so-called Friedrich paintings were likely executed with the left hand, which Küster notes at a different point in his essay, clearly undermines this association.
- 38 "Eisenwalzwerk und Atelierwand markieren die Spannung zwischen Öffentlichem und Privatem; sie sind Zeichen einer Dualität, die Menzels Existenz ein Leben lang bestimmte, aber vielleicht zu Beginn der siebziger Jahre, als die Stadt Berlin den Rathausauftrag zurückzog, besonders akut war." Forster-Hahn 1999 (as note 24), 141. A more conservative and convincing interpretation of the relationship between the two paintings is Meyerheim's suggestion that *Studio Wall* was a study of lighting in preparation for *The Iron Rolling Mill*. See Busch 2004 (as note 2), 106.
- 39 Following *The Coronation of King William I at Königsberg* (1861), Menzel was increasingly reliant on private customers among Berlin's wealthy. See Riemann-Reyher 1976 (as note 12), n. p.
- 40 Further evidence for such a personal reading of *Crown Prince Frederick Pays a Visit to the Painter Pesne*, as numerous scholars have noted, is the watercolor sketch *Menzel in the Pose of Pesne* (1861). The sketch is interesting in the context of *The Iron Rolling Mill* because its playful pose—the artist, like Pesne in the painting of the same title, seems to be dancing rather than painting—stands in such contrast to the intensity of the physical labor of rolling rails. Common to them, however, is that whether it is playful or laborious, painting in both instances is obviously perilous.
- 41 Menzel's mottos were reputedly "Nulla dies sine linea" and "Alles Zeichnen ist gut, alles zeichnen noch besser." Paul Meyerheim, *Adolph von Menzel*, Berlin 1906, 133. These mottos were made manifest in the incredible profusion of drawings he produced daily. On Menzel's work ethic, see Riemann-Reyher 1996 (as note 18), 125–126.

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