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The Air of Objectivity: Albert Renger-Patzsch and the Photography of Industry

It was fresh—that was all. It lacked odor, content, moisture,
it went easily into the lungs and said nothing to the soul.
—Thomas Mann, *The Magic Mountain*

IN 1932, ALBERT RENGER-PATZSCH WAS commissioned by the architects Fritz Schupp and Martin Kremmer to photograph the newly completed Shaft 12 of the Zollverein colliery, located just northeast of Essen in the heart of the Ruhr Valley. The commission was only one of many to arrive in the wake of the photobook *Die Welt ist schön* (The world is beautiful, 1928), which secured Renger-Patzsch's reputation as a leading representative of the emerging tendency in photography known as New Objectivity. Following the success of this publication, Renger-Patzsch became highly sought after amongst architects and industrialists across Europe, producing some of the most memorable pictures of modern industry.[1] In Zollverein 12, however, Renger-Patzsch encountered a subject whose reputation matched his own. Upon opening in February 1932, the facility stood as the most advanced of its kind in Germany. Its centralized winding shaft and integrated washing plant not only streamlined the transportation and processing of coal but also boasted all of the latest innovations in electrical engineering, air compression, and shaft ventilation.[2] More productive than the company's four other mining pits combined, Zollverein 12 represented the culmination of a process of modernization and rationalization that

ABSTRACT Focusing on Albert Renger-Patzsch's photographs of the Zollverein colliery, this essay investigates the tension between the clarity of Renger-Patzsch's aesthetic and the physical reality of the industrial environment in which he worked. In doing so, it offers an account of New Objectivity photography that is attentive to both the environment from which it emerged and the way in which photography, in turn, acted upon this environment. Placing particular stress on the clear contours and white backgrounds of these photographs, as well as their material and technical prerequisites, it argues that the radical clarity of Renger-Patzsch's photographs is best regarded as an active intervention into a compromised environment, in which the photographer was called upon to bring forth clarity from the dust and smoke of industrial extraction. REPRESENTATIONS 157. ISSN 0734-6018, electronic ISSN 1533-855X, pages 90–114. DOI: https://doi.org/10.1525/rep.2022.157.5.90.

FIGURE 1. Albert Renger-Patzsch, *Zollverein Colliery (Fritz Schupp and Martin Kremmer, Essen-Stoppenberg, 1932)*, 1932. Gelatin silver print. © Albert Renger-Patzsch / Archiv Ann u. Jürgen Wilde, Zülpich / Artists Rights Society (ARS), New York, 2021.

fundamentally transformed the region's coal industry during the interwar period.[3] More important still, the complex's steel-frame construction, exposed trusses, and curtain-wall windows gave visual expression to this achievement, embodying the promise of a new era of industry in its neat functionalist design.

Renger-Patzsch's photographs communicate this confidence through a visual language whose calm, clarity, and precise delineation of form is at once modernist and classical, lending the structure all the silent grandeur befitting an icon of industry (figs. 1–3). Bathed in a strong light that neatly articulates each line and edge, the complex is presented as a sturdy geometric mass against a neutral, undifferentiated ground. With these photographs, Renger-Patzsch would seem to have realized his ambition to create a picture adequate to the "rigid lines" and "airy crisscross patterns" of modern technological forms.[4] Indeed, the pictures possess an almost limpid quality. So sharp is the registration throughout that, despite the visible presence of a chimney in one photograph and a coal-laden wagon in another, it is difficult to imagine any dust in the air—only the slightest hint of smoke can be surmised from the faint whiteness hovering about the chimney's rim. Looking at these pictures, one is left with the impression that

FIGURE 2. Albert Renger-Patzsch, *Zollverein Colliery (Fritz Schupp and Martin Kremmer, Essen-Stoppenberg, 1932)*, 1932. Gelatin silver print. © Albert Renger-Patzsch / Archiv Ann u. Jürgen Wilde, Zülpich / Artists Rights Society (ARS), New York, 2021.

nothing stands between the viewer's eye and the represented structure. Even the shadows cast by the tower and its cables appear neat and precise against the brick façade below, as through produced through a direct impression.

This, clearly, is not the vision of heavy industry familiar from the films of Walter Ruttmann, Albrecht Viktor Blum, or Dziga Vertov. To take just one example, consider Vertov's *Enthusiasm*, which screened across Germany in 1931. In this film, the space of industry is presented as roiled with smoke, sparks, and constant activity. Machinery swings, chimneys belch, and dense clouds of steam, at times multiplied by disorienting superimpositions, waft and eddy upwards, obscuring significant portions of the image. It is hard to imagine a starker contrast to this agitated vision than that presented in Renger-Patzsch's photographs, where nothing but stillness seems to hang in the air. Considering these representations alongside one another, it becomes possible to perceive something almost anti-cinematic in Renger-Patzsch's photographs, an aversion to movement that is coextensive with an aversion to atmosphere.

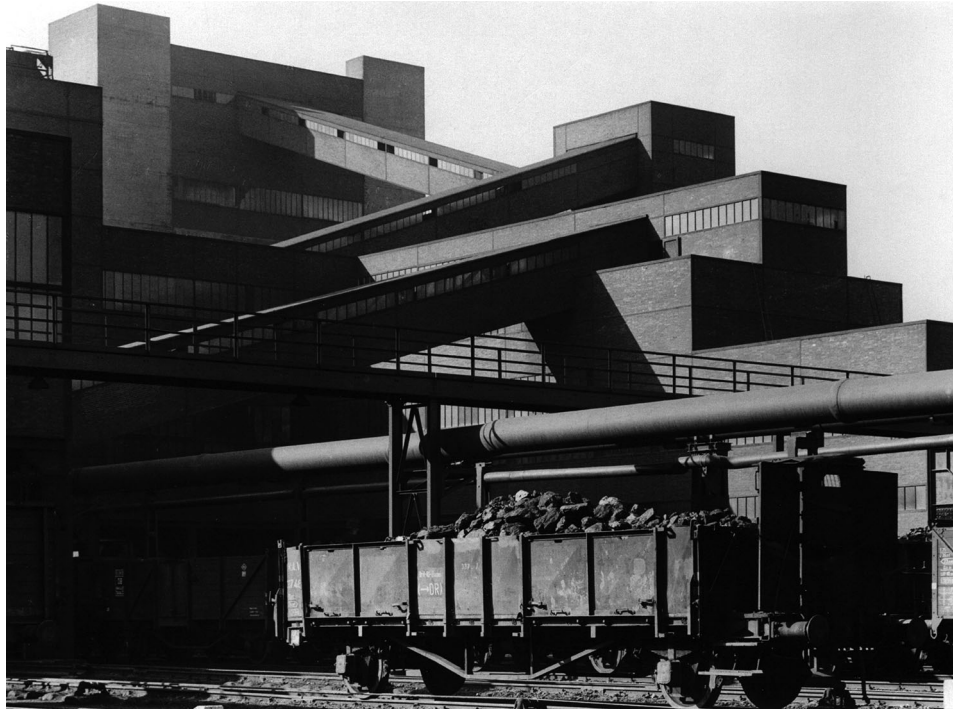

FIGURE 3. Albert Renger-Patzsch, *Zollverein Colliery (Fritz Schupp and Martin Kremmer, Essen-Stoppenberg, 1932)*, 1932. Gelatin silver print. © Albert Renger-Patzsch / Archiv Ann u. Jürgen Wilde, Zülpich / Artists Rights Society (ARS), New York, 2021.

This aversion did not belong to Renger-Patzsch alone, nor was it exclusive to the domain of photography. Rather, it can be regarded as a common thread that linked the aesthetic of New Objectivity to that of the New Building in the pursuit of a clarity that was at once pictorial and environmental. For this reason, this essay steps back from the notions of medium-specificity and photographic realism that have so often structured accounts of interwar photography, considering Renger-Patzsch's photographs instead as objects in which discourses of photography, architecture, and environment intersect. My discussion thus begins with a series of questions: What would it mean to take seriously—and, to a certain extent, literally—the frequent invocations of atmosphere that animated the interwar debates on photographic modernism? To approach its metaphors not as stylistic flourishes but as historical symptoms, expressing a deep-seated anxiety in the face of a rapidly changing environment? What might it mean to consider the sharp

focus and clean surfaces of New Objectivity as part of an aesthetic strategy calibrated to bring clarity to the dirty business of industrial extraction and production? To reframe modernist purity itself as an attempt to grapple with the increasingly adulterated air of industrial modernity?

In posing these questions, my aim is to offer an account of interwar photography that is at once permeable to the environment from which it emerged and attentive to the way in which photography, in turn, acted upon this environment. This shift in perspective not only makes it possible to excavate the emergence of a specifically modernist ideal of environmental clarity; it also directs attention to the critical role that modernist photography performed in the production of this environment, which, as we shall see, was realized nowhere so fully as it was on the surface of the New Objectivity print. That being said, this radical clarity was nothing if not hard-won. If photographs like those of Zollverein 12 enacted a visual cleansing of the industrial environment, this operation was possible only by means of rigorous negotiation with a host of environmental contingencies, in both the field and the darkroom. Far from mere documentation, then, Renger-Patzsch's photographs are better understood as an active intervention into the industrial environment—an attempt, we might say, to extract clarity from the smoke of industry.

Clearing the Air (One Picture at a Time)

In a well-known passage from the "Little History of Photography," Walter Benjamin positioned Eugène Atget as the model for a new realism in photography, hailing the French photographer in the following terms:

> [Atget] was the first to disinfect the stifling atmosphere generated by conventional portrait photography in the age of decline. He cleanses this atmosphere—indeed, he dispels it altogether: he initiates the emancipation of object from aura, which is the most signal achievement of the latest school of photography.[5]

In a manner analogous to Benjamin's description of his own project as an attempt to "aim [his] telescope through the blood-fog [*Blutnebel*] at a nineteenth-century mirage," the passage suggests a periodization of atmospheric conditions, linking the last decades of the nineteenth century to an atmospheric density that the photographer is called upon to dispel.[6] By the time Benjamin's essay appeared in October 1931, this trope was already a well-established one. The pages of trade periodicals, amateur magazines, and photobooks contained no shortage of quips denigrating the hazy aesthetic of pictorialism, which was presented as not only antiquated but also, at times, as degenerate.[7] The frequency with which advocates of modernist photography resorted to such atmospheric motifs is hardly surprising given

the pictorialist preoccupation with *Stimmung*, a term whose meaning encompasses the English notions of atmosphere, mood, and attunement.[8] Regarding *Stimmung* as essential to the legitimization of photography as an art, pictorial photographers experimented with soft-focus lenses, artisanal printing methods, and specialty papers in an effort to bring this nebulous quality to the surface of the photographic print. As Benjamin's comment suggests, however, by the end of the 1920s, the category of *Stimmung* had markedly lost favor, appearing less as a quality to be cultivated than a foreign substance to be purged from the picture.

By contrast, the new photographer was called upon to wrench the object from its atmospheric entanglements. Adopting the term "New Objectivity" from contemporaneous developments in painting, the curator Kurt Wilhelm-Kästner formulated its aesthetic in the following terms:

> In photography, objectivity expresses itself in the sharp reproduction of the object; in its clear articulation, indeed, its near isolation from the surrounding environment and the background; in penetrating, even lighting, which banishes as much shadow as possible or uses it as a strong outlining element; and above all in a preference for clear, distinct objects with a clear, formal structure.[9]

The opposition of this aesthetic to that of pictorialism was made even clearer in another article from 1929 by the critic Wolfgang Born: "Structure [*Architektur*], and no longer *Stimmung*, is the governing element of the picture. The crystalline, severe, logical, balanced, transparent: these are the qualities that we demand from a work of art."[10]

The censure of *Stimmung* was also a recurrent theme in the writings of photographers. In an article from 1925, polemically titled "Heretical Thoughts on Art Photography," Renger-Patzsch insisted:

> The serious amateur photographer must not indulge in the *Stimmung* [of the landscape] when he works: he must negate the ozone, which makes his step light, he must see no colors, he must not let himself be influenced by the spring wind, he must see only with one eye, for the camera with one lens has no plastic insight.[11]

Here Renger-Patzsch instructs the photographer to align his perception with the apparatus of the camera precisely by isolating himself from the influence of the surrounding environment. Evincing a highly material understanding of atmospheric phenomena, the passage goes beyond the mere invocation of *Stimmung*. Not only a vague, sentimental mood but also the wind—even the ozone particles in the air—are to be negated in the photograph's production.[12]

As I have already suggested, such calls to clear the air were not unique to the context of photography but rather linked photographic aesthetics to ongoing debates about the dense and insalubrious air of Germany's rapidly

growing urban and industrial centers. Already by the turn of the century, the "bad air" of the city had become a recurrent motif in critiques of the metropolis from across the political spectrum. The conservative *Lebensreform* spokesman Heinrich Pudor, for instance, delighted in comparing city-dwellers to the sickly camelias grown in hothouses, which he contrasted with the strong linden trees in the mountains, nourished by thick roots, ample sunlight, and fresh air.[13] In this context, fresh air became an object of intense longing, spurring the creation of new architectural types such as garden-city satellites, mountain sanatoria, and air baths (*Luftbäder*) for the working classes. Detailed statistics on levels of sunlight, humidity, and ozone, moreover, became a regular feature of travel guides and advertisements, resulting in an increased sensitivity to atmospheric conditions that pervaded culture at large.[14]

This cultural discourse was complemented by a growing body of scientific research on the problem of air pollution, which, by the end of the nineteenth century, had grown severe enough to be christened the *Rauchplage* (smoke plague). Over the next two decades, German scientists, armed with a panoply of tools, including rain gauges, Aitken dust counters, and Ringelmann charts, engaged in a systematic effort to measure the rising air pollution levels in cities across the nation.[15] Medical professionals, moreover, were quick to grasp the consequences of this problem for public health. As early as 1905, the physician Louis Ascher published a detailed report on the harmful effects of smoke on the human respiratory system, drawing on a combination of statistical research and animal experiments to demonstrate that long-term exposure to smoke particles rendered humans both more susceptible to respiratory ailments and less likely to recover from them.[16]

This research brought precision to what was already a perceptual fact, furnishing medical professionals and social reformers with ample evidence in their campaigns for smoke abatement. Regulating emissions, however, proved difficult. Manufacturers pointed to domestic chimneys as the primary culprit for smoke emissions, and legislators were reluctant to implement anything more binding than voluntary measures.[17] As a result, even modest improvements in smoke filtration did little to ameliorate the problem of urban air pollution. Taking stock of the situation in a report from 1917, the state functionary Albert Reich put the matter bluntly, describing the smoke plague as a "permanent nuisance" characterized by the increased frequency and density of fog formations, the regular deposit of soot, dust, and other corrosive particulates on surfaces of all kinds, and the presence of a "thick, grey, standing cloud over the entirety of the city."[18]

Interestingly enough, Reich also framed the smoke plague as a "problem from an aesthetic point of view." Discussing the prospect offered by the industrial city, Reich noted that such sites often "appear as though

shrouded in a thick, almost impenetrable veil that obscures all buildings."[19] The description is one that readily recalls the haziness of pictorialist prints, offering a potent reminder of the extent to which problems of aesthetics intersected with problems of environment. Placed against this background, the anti-atmospheric rhetoric of photographic modernism begins to emerge as itself contaminated, marked by both the dense air of industrial modernity and an increasing awareness of the vulnerability of the body to its influence.

To this point, it is telling that Renger-Patzsch explicitly invoked the city's unhealthy air in an article about plant photography directed at amateur photographers. "By engaging with nature," wrote Renger-Patzsch toward the conclusion of his text, "we bring our whole organism, which has been enfeebled by the air of the metropolis, into vital contact with nature, and this alone would be reason enough to spend our leisure hours in such a manner."[20] At first glance, the statement seems to instill the act of photographing plants with a restorative dimension analogous to that of a country excursion. This analogy, however, becomes rather strange when one considers the accompanying illustrations, which feature greenhouse specimens photographed against an abstracted ground. Species aside, it is difficult to imagine encountering these plants while ambling through the country: the photographs' tight framing, sharp focus, and indeterminate backgrounds all conspire to isolate the plant from its environment, just as Renger-Patzsch insisted that the photographer must isolate himself—and thus the photograph—from the ozone in the air. The incongruence is enough to make us wonder if it is not the act of photography itself that Renger-Patzsch here posits as an antidote to the harmful effects of the urban atmosphere.

The Air of Objectivity

In order to appreciate how photography might, in itself, be seen as a corrective to the harmful influence of the urban air, it is helpful to consider the work of New Objectivity photographers alongside that of their contemporaries in the domain of architecture, the discipline that is perhaps most intimately concerned with problems of environment. In drawing this connection, my aim is less to propose the architectural as a context for photography than to suggest a collaborative, mutually reinforcing exchange between the two fields. This move is motivated, moreover, by the deep professional ties that linked architectural and photographic modernists of the interwar period. By the end of the 1920s, photographs had become an almost mandatory feature of architectural publications. Architects thus

became important clients for photographers like Renger-Patzsch, Hans Finsler, and Arthur Köster, whose photographs in turn supplied the visual archive that continues to inform our understanding of the modernist environment today. More important than this commercial relationship, however, was a shared aesthetic sensibility, which united the functionalist geometry and airy openness of the New Building with the clean lines and sharp focus of the New Objectivity print.

Objectivity, we might say, was simply in the air—and this in more ways than one. There was no more powerful slogan for the New Building than the words "light, air, and sun," which interwar architects readily adopted from the *Lebensreform* movement as a shorthand for the world that the new architecture was meant to bring into being.[21] "The New Architecture," wrote Walter Gropius, "throws open its walls like curtains to admit a plenitude of fresh air, daylight, and sunshine."[22] To realize this ambition, architects took advantage of innovations in steel-frame construction and plate glass to break open the narrow walls of the so-called "rental barracks" that dominated working-class housing. At its most extreme, there were calls for a complete dissolution of walls, such that architecture itself becomes a matter of air. As the architectural historian Sigfried Giedion exclaimed, "Cubes of air within, cubes of air without. Cubes of air down to the very smallest units. . . . Maximum of air, minimum of walls!"[23] The partnership between modernist architecture and photography was thus not only pragmatic but also serendipitous. Architects and photographers became nothing less than allies, engaged in parallel projects to purify lived and pictorial environments.

This, of course, was easier said than done. Despite the very real achievements of interwar modernists, architecture alone was quite simply not equipped to solve the environmental problems of the industrial city. Although the impassioned rhetoric of the New Building readily consigned the dust and smoke of the metropolis to the nineteenth-century past, hygiene reports continued to describe sights such as those described by Reich. "If one looks out over a modern industrial city," related one author, "it appears regularly enveloped in a rather dense gray or blackish cloud, even in the clearest weather. The same is true . . . for all large cities. In all of these cases, the natural air that many thousands of people breathe in these cities is continually polluted."[24] To point to this incongruity is not to invalidate the achievements of the New Building but rather to qualify them. In an urban environment dominated by smokestacks and still largely dependent on coal consumption, the best that architects could hope to achieve, as Ernst Bloch would later put it, was the creation of "vacuums cut in air and light."[25]

FIGURE 4. Arthur Köster, *Exterior of the Taut House, Garden Side (Bruno Taut, Wiesenstraße 13, Dahlewitz bei Berlin, 1926)*, 1926. Halftone print. © 2021 Artists Rights Society (ARS), New York / VG Bild-Kunst, Bonn.

In light of such comments, it is worth pausing to wonder how the rhetoric of "light, air, and sun" came to define our conception of the modernist built environment in the first place. In what follows, I would like to propose that the world of light and fresh air that critics like Giedion proclaimed was, in large part, a visual affair dependent on the photographic production of clarity. Premised as it was on the rigorous isolation of the object from its surrounding environment, this operation was one to which the aesthetic of New Objectivity was remarkably well-suited. The extremes to which this separation could be taken are evident in a sequence of four photographs by Arthur Köster, which illustrated an article on architectural photography in the February 1929 issue of *Die Form* (fig. 4). Arranged vertically on a single page as though simulating a film strip, Köster's photographs convey a sense of movement toward the building that the article's author singled out for praise.[26] But what is perhaps most interesting about the sequence is its differential treatment of the background. The first picture boasts a white background; the second, white clouds against a dark sky; the third, a pale grey sky. In the final picture, the white background returns, now rendered even more severe by the sharp angle of the structure's roof, enhanced by a wide-angle lens. Although it received no comment at the time, this

FIGURE 5. Arthur Köster, *Exterior of the Carl Legien Housing Estate (Bruno Taut and Franz Hillinger, Erich-Weinert-Straße, Berlin-Prenzlauerberg, 1929–1930)*, 1930. Halftone print. © 2021 Artists Rights Society (ARS), New York / VG Bild-Kunst, Bonn.

incongruity offers a striking demonstration of the background's status as an independent—and, to a certain extent, interchangeable—element in the context of architectural photography.

That being said, the use of such a stark white background had definite pictorial consequences, and its prominence in architectural photography suggests a certain appreciation of its effects among both architects and photographers. Blank backgrounds had long been a common convention in photographic practices aimed at the precise delineation of form, from mid-nineteenth-century representations of classical sculpture, to the chronophotographic motion studies of Etienne-Jules Marey, to early twentieth-century catalogues of industrial wares, such as that designed by Peter Behrens for the Allgemeine Elektricitäts-Gesellschaft (AEG).[27] In the context of interwar architectural photography, such backgrounds had both a practical

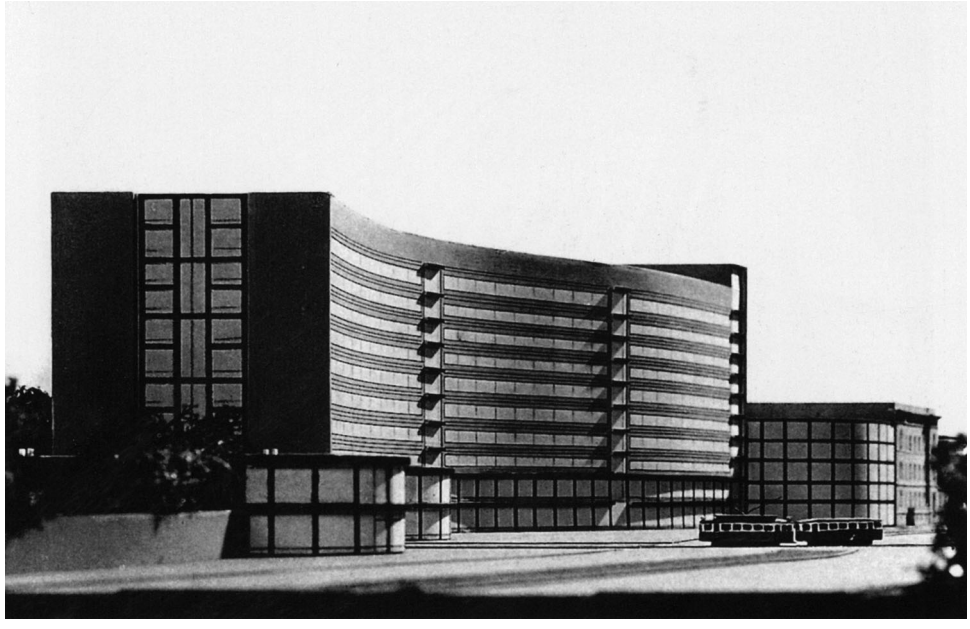

FIGURE 6. Arthur Köster, *Model by Hans Scharoun*, 1927. Halftone print. © 2021 Artists Rights Society (ARS), New York / VG Bild-Kunst, Bonn.

and visual appeal. In addition to facilitating the reproduction of images across a range of formats and layouts, the blank background had the effect of rendering each line that much crisper, amplifying the strong contours, geometrical form, and airy openness of the modernist building. Moreover, it had the additional advantage of isolating the architectural object from the surrounding environment. Given the location of so many modernist structures in heavily industrialized areas, the importance of this operation should not be underestimated (fig. 5).[28] Guarding the modernist structure from a larger field beyond the architect's control, these backgrounds endowed the building with something of the optimism of the model, which exists in the abstract space of pure possibility (fig. 6).

Albert Renger-Patzsch wrote extensively about backgrounds, which he considered a neglected but crucial aspect of the photographic image. Discussing the blank background as a convention, Renger-Patzsch suggested that "the background as such should not appear at all; it should be experienced as air, not as solid matter."[29] Megan Luke has described the backgrounds that result from such an approach as a "uniform medium, a nonspace that frustrates attempts to describe it as flat or deep, to describe it as anything at all."[30] Stranger still, these backgrounds also dispense with one of

the medium's most salient characteristics: its function as a mediating substance. Like Zollverein 12, the objects that appear in such photographs do so *against* the background rather than *within* it. The "air" of which Renger-Patzsch speaks is thus patently distinct from the aerial medium of the Romantic tradition, which has been usefully discussed by Antonio Somaini as the fluid milieu in which perception occurs.[31] Rather, it is an air without substance or qualities—an air so pure that it exists only as an abstraction.

Like the white background itself, there is a certain effortlessness in the phrase—"the background should be experienced as air"—that belies the challenges involved in the production of such surfaces. Because the blank background readily evinced small imperfections, it demanded additional care and attention at each stage of the photographic process. Such problems had long plagued photographers, giving rise to a host of strategies to control environmental variables during shooting, development, and printing. To achieve the self-effacing backgrounds of his chronophotographic studies, for instance, Marey conducted detailed experiments with black backgrounds, continually updating the design of the Physiological Station's photographic hangar to reduce fogging and ensure maximum precision in registration.[32] But light was not the only factor to be grappled with; particulate matter in the air also posed a significant challenge. Renger-Patzsch, who considered faults in the background "especially annoying," thus cautioned his readers to take care when loading and unloading the camera, since "every grain of dust and the smallest damage on the verso becomes a disagreeably noticeable fleck or stroke after enlargement."[33]

To minimize such imperfections, professional photographers inspected their negatives carefully (often under a loupe) and employed a variety of retouching techniques to correct any marks that marred their surfaces. One such method involved simply matting out or coating the negative's background in India ink or a red medium, resulting in a uniform white surface on the final print.[34] This method had been widely used since the 1850s and remained common well into the 1950s, as staff working in Köster's postwar workshop reported.[35] By the interwar period, photographers could also take advantage of the panoply of papers offered by firms like Agfa to obtain a whiter surface or higher contrast, which had the added benefit of enhancing contours.[36] Although methods varied, the salient point is that the blank background was anything but the automatic outcome of a purely mechanical process. Rather, it should be understood as the product of concerted intention and considerable technical finesse.

Photographers went to great lengths to achieve these backgrounds. As recent research on the Thomas Walther collection at the Museum of Modern Art has demonstrated, such efforts extended even to the surface of the print. Of particular interest is a report by conservation scientist Hanako

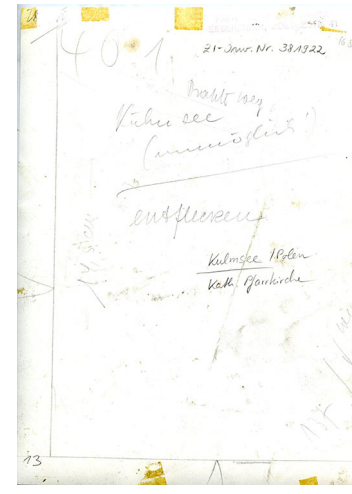

FIGURE 7. Verso of a vintage print by Albert Renger-Patzsch, from the collection of the Photothek of the Zentralinstitut für Kunstgeschichte, Munich. The print features Renger-Patzsch's annotations, including the verb "entflecken" (remove the flecks).

Murata concerning the collection's vintage Karl Blossfeldt prints, which revealed systematic etching to remove flecks from the background.[37] Evidence of etching was also found on a number of other interwar European prints, including one by Renger-Patzsch. The widespread use of this practice suggests that, for all their opposition to the embellishment of images through fine printing methods, photographic modernists did not shy away from retouching that aimed at cleaning the surface of the print. To this point, it is notable that a number of Renger-Patzsch's vintage prints bear annotations on the verso, instructing his printer to remove spots (*entflecken*) and sometimes even clouds and wires from the background of his images (fig. 7).

Taken together, these minute interventions speak not only to the malleability of the photographic image but also to a routine struggle that pitched photographers and printers against a number of atmospheric contingencies that extended from the moment of exposure to development and printing. For although photography allowed for a high degree of control in the construction of pictorial environments, it remained extremely sensitive to the physical environment on a material level. Imperfections could arise as a result of any number of factors: dust or lint caught on the negative, light leakages, humidity levels, air bubbles in the developing tray, or chemical traces in the darkroom.[38] For this reason, instructional texts offered no shortage of advice on how best to control and compensate for these variables, the most important of which was to maintain an impeccably clean working environment. This technical literature not only lends a concrete dimension to the clinical language employed by critics like Benjamin; it also prompts us to reconsider the aesthetic of New

Objectivity as one that brought a new rigor to photography's long-standing dependence on a series of highly regulated environments, from the manufacture of the photographic plate to the production of the final print.[39] As one author intoned, "Arm yourself with patience, caution, and cleanliness—meticulous, chemical cleanliness."[40] An ethos of environmental control was thus already part of photography and integral to the radical clarity of the New Objectivity print.

Exposures in the Smoke

If a single grain of dust was enough to spoil a print, there would hardly seem to be an environment less hospitable to the aesthetic of New Objectivity than the Ruhr Valley. Home to Krupp, Hoesch, and the Vereinigte Stahlwerke AG, the Ruhr represented the largest center of coal, iron, and steel production in Europe. By the late 1920s, the region was covered with an extensive patchwork of mines, foundries, factories, and midsized cities largely dependent on an economy of resource extraction and processing. The amount of dust and smoke released into the air by this activity was prodigious enough to shroud the entire region in a thick haze, which lifted only occasionally, when political events such as workers' strikes, or the French occupation of the Ruhr in 1923, brought production to a halt. Nonetheless, the Ruhr became an important point on the map of interwar photography. This was thanks in large part to the activities of the Folkwang Museum, an institution whose support was particularly important to Renger-Patzsch's career.[41] It was in the image archive of the Folkwang's publishing house, then located in Hagen, that the photographer obtained his first professional appointment, and his move to Essen in December 1929 was facilitated by the curator Kurt Wilhelm-Kästner, who not only assisted Renger-Patzsch in finding housing but also furnished him with an atelier in the museum.

During this period, Renger-Patzsch's reputation for architectural and industrial photography was cemented by two publications focused on technical forms, *Wegweisung der Technik* (The way of technology, 1928) and *Eisen und Stahl* (Iron and steel, 1931). Attesting to the esteem in which local industrialists held the photographer's work, this latter featured a forward written by Albert Vögler, the general director of the Vereinigte Stahlwerke AG. Vögler's forward framed German industry as a creative enterprise, emphasizing not only its economic prowess but the beauty of its forms. The photographs included in the volume communicated this aesthetic potential through a strategy reminiscent of Renger-Patzch's earlier botanical photographs isolating his subjects in a series of tightly framed, fragmented views

that transform iron and steel structures into an abstract network of lines against an undifferentiated ground.

Renger-Patzsch's ability to extract formal beauty from industrial structures was prized by architects of the period, themselves engaged in an aesthetic reform of industry. Alongside modernist monuments like the Turbine Factory and Fagus-Werk, Kremmer and Schupp's Zollverein 12 can be regarded as one of the most accomplished products of this effort. Describing the facility in a trade publication, Schupp stressed not only its functionalist ethos but also the abundant light that its curtain-wall windows would admit into workspaces, reminding us that the rhetoric of light and air was as potent a force in the context of industrial architecture as it was in housing design.[42] The modern factory, as Walter Gropius insisted in a lecture delivered at the Hagen Folkwang in 1911, was to become nothing less than a "palace for labour," offering those who worked within not only "light, air, and cleanliness" but also a "sense of beauty."[43] It was precisely this optimistic vision of a clean and bright industry that Renger-Patzsch's photographs communicated, performing a critical role in a larger ideological project aimed at cleansing the sites of industrial production through modernist form.

Of course, there was no greater threat to such a vision than the dust and smoke that industrial production released into the air. This problem had long been recognized by industrialists like Alfred Krupp, whose company would become an important sponsor of both photographic production and smoke mitigation efforts in the region. In a letter dated 12 January 1867, the industrialist recommended that the Krupp facility be photographed on a Sunday, maintaining that it would be disadvantageous if "too much steam [made] the environment unclear."[44] This comment is remarkable less for its shrewd recognition of photography's promotional potential than for its prescient identification of a fundamental contradiction between an industrial aesthetic premised on clarity, cleanliness, and order and the material reality of the industrial environment.

The photography of industry thus emerges as a battle against the elements, the difficulties of which are apparent in contemporaneous photographs of the region, such as those included in *Der Gigant an der Ruhr* (The giant on the Ruhr, 1928). Consisting largely of panoramic views over the urban and industrial landscape, the pictures included in this mammoth photobook showed skylines dotted with smokestacks and public squares shrouded in a thick, standing fog (fig. 8). More than anything else, these murky pictures reveal the extent to which the sharp definition, crisp lines, and strong light of Renger-Patzsch's photographs were hard-won. For the atmosphere that suffused the book's pictures was no mere pictorial artifice

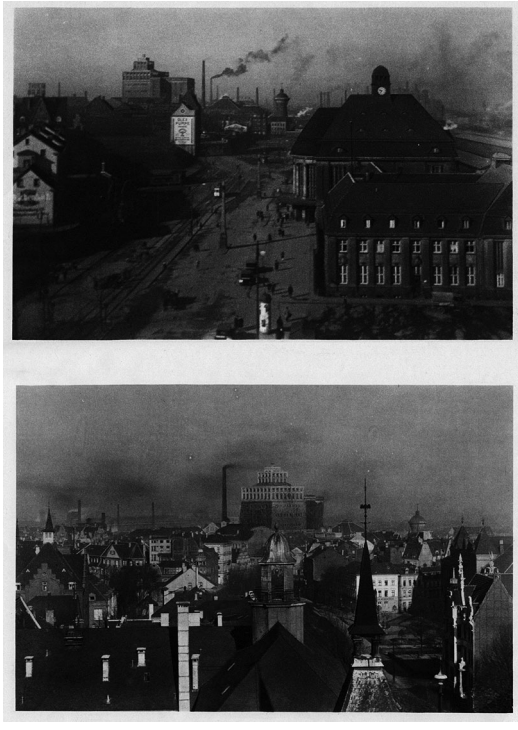

FIGURE 8. Two views over Dortmund reproduced in rotogravure from *Der Gigant an der Ruhr* (Berlin, 1928).

but the quotidian reality of a heavily industrialized region that had seen a steady decline in air quality since the 1860s.

Nicknamed the *Kohlenpott* (coal pot) and *Schwarzes Revier* (black territory), the Ruhr was famous across Germany for its overcast skies and standing fog, a noxious mix of coal dust, soot, and smoke that carried traces of carbon dioxide, sulfur oxide, and ammonia. The visual effect of this concoction was so notable that it soon became *the* identifying feature of a region that otherwise lacked obvious geographical markers. "How and where does the Ruhr begin?" asked the journalist and photographer Heinrich Hauser in his travelogue, *Schwarzes Revier* (1930). The answer, for Hauser, was in the air:

> A sign, when the air becomes hazy with yellow smoke, when the sunlight acquires a gangrenous hue. The *Revier* hangs in the air, with the smell of glowing red iron, scorched earth, sulphur, and ammonia. It announces itself with dust, ashen rain, and great fires, like an active volcano.[45]

These atmospheric conditions, unsurprisingly, had severe consequences for health in the region. As Louis Ascher's research demonstrated, residents of the Ruhr, especially those employed in coal mines and foundries, faced

FIGURE 9. Else Thalemann (or Heinrich Hauser), *Nach der Wäsche, Industrie Ruhrgebiet*, negative circa 1929. Gelatin silver print circa 1950. Gift of the Sandor Family in honor of Professor James Zanzi. © The Art Institute of Chicago, Chicago / Art Resource, NY.

significantly higher chances of death due to respiratory illness.[46] Vegetation also suffered: the constant presence of ash, soot, and sulfur in the air caused a marked decline in the productivity of even relatively smoke-resistant crops like potatoes, to say nothing of more vulnerable produce. Trees grew stunted and lost their leaves, especially the local population of conifers, which was so sensitive to sulfur that it was recommended to simply replace these trees with hardier varieties.[47]

The dust and smoke in the air also posed serious problems for photography, reducing access to sunlight and compromising visibility. "The view is never clear," wrote Hauser. "Even on the brightest day, the air is so thick with the smoke of countless chimneys that one sees as though through dark glasses."[48] As Elizabeth Hutchinson notes in her discussion of Eadweard Muybridge's work on the foggy Pacific Coast in the 1870s, such conditions readily "unsettled the photographer's confidence in his

tools."[49] This observation can easily be extended to work in the Ruhr. Although the materials available to the photographer of the twenties boasted greater sensitivity than the collodion plates that Muybridge used, the chemical haze of the Ruhr was also more opaque than the water-based fog of the Pacific, placing interwar photographers in a position rather analogous to their nineteenth-century predecessors. Hauser himself commented twice on this problem, exclaiming: "The exposure time must be extended more than five times!"[50]

This struggle against atmospheric conditions is registered in the photographs that Hauser included in his book. Although the pictures vary greatly in terms of subject matter and composition, the smoke of the Ruhr is a palpable presence in almost all the photographs, which are at times so poorly exposed that one might be tempted to dismiss them as the work of an amateur. In one particularly striking photograph, the viewer is presented with a clothesline hanging in front of a large industrial complex, which only partially emerges from the haze of the horizon (fig. 9).[51] Both foreground and background lack definition—the background obscured by smoke, the foreground by what may very well be a focal issue. But for all its haphazard quality, the picture nonetheless shows evidence of patience and intention. A thick cloud of smoke rising in the background neatly rhymes with the billowing laundry on the clothesline, whose whiteness strikes a pathetic note amid the haze.

The pathos of this juxtaposition corresponds to a major theme in Hauser's book, namely, the fragility—or, rather, *futility*—of the desire for clarity under the shadow of industry. This theme is announced from the book's opening pages, where Hauser framed his project in the following terms:

> The serious reader wants to see the object represented in black and white with clear contours and thick lines. The author has above all strived for clarity but has also found that many things cannot be sharply outlined or painted in black and white. For example, when it comes to the description of a large factory, the technical structure may be perfectly clear and describable. The social structure of the same factory, on the other hand, can be very opaque, very complex, and difficult to represent objectively. [This book therefore] should be regarded as a magic lantern from the early days: pictures thrown on a screen, often unsharp, poorly lit, and poorly exposed.[52]

Prefiguring Bertolt Brecht's famous critique of photographic objectivity, Hauser invokes the visual language of New Objectivity—structure, contour, sharpness, and, of course, the autonomy of the object—only to insist on its insufficiency.[53] He then presents his own project as an effort to grapple with a fog that is not only material but also epistemological. The "unsharp" (*Unschärfe*) thus emerges not as a technical defect to be overcome but as the only adequate way to represent the social and environmental realities of

the Ruhr, which intermingled in its smoke-laden air. Although Hauser stops short of any indictment, the unsharp quality of his pictures expresses a deep uncertainty, reminding us that the air of industrial modernity cannot be so easily grasped, manipulated, and controlled.

Renger-Patzsch's Zollverein photographs present quite a different case. Their graphic precision holds out the promise of a modern, rationalized industry that is at once productive and hygienic. When considered alongside those included in Hauser's book, however, the clean lines, strong lighting, and pristine backgrounds of Renger-Patzsch's pictures begin to appear almost improbable. How long did the photographer have to wait for sunlight bright enough to cast such stark shadows? How long was the plate exposed, to extract such distinct lines from the dusty air? And what of the ground against which the structure stands, so uniform and immaculate? Is this simply the result of a long exposure, or has it been helped along—*entfleckt*? Although these questions cannot be answered with certainty, what is clear is the degree to which the confident clarity of these photographs was premised on a meticulous negotiation with the industrial environment. To banish the heavy atmosphere of the Ruhr, as we have seen, was no easy task, requiring both an adroit command of the photographer's tools and the acumen to manage, finesse, and bend an adverse environment to one's will. The Zollverein photographs thus emerge as a pictorial intervention into a compromised environment, and it is perhaps in this intervention, more than anything else, that their power lies. For although Renger-Patzsch's intervention into the environment was one that could exist only on the surface of the print, to extract pictorial clarity from the thick air of the Ruhr demonstrated a mastery over the environment that architects and industrialists could only imagine.

Conclusion

This essay began by suggesting that the world of light and fresh air imagined by interwar modernism achieved its most complete realization not in the realm of the built environment but in the purified pictorial environment of the New Objectivity print. But is the world presented in these photographs really a world of light and air, or is it something altogether stranger? Although it is difficult not to be impressed by the radical clarity of Renger-Patzsch's Zollverein pictures, there is something almost aggressive about their purity. For the very same qualities that demonstrate the photographer's mastery over the environment—his ability to clear the air—also effect a destabilization. The uniform sharpness, the emphatic precision of each line, and the undifferentiated ground against which the architectural

object stands all deprive the viewer of important depth cues, causing the space of representation to collapse into a graphic pattern. It is as though, in expelling the dusty air of the Ruhr, Renger-Patzsch has left the viewer caught in an oscillation between object and background, with nothing to mediate the distance between the two. To put it another way, the longer we dwell *with* these pictures, the more difficult it becomes to imagine dwelling *within* them. How could we, when even the last vestiges of air have been evacuated from the space of representation?

In this respect, Renger-Patzsch's photographs raise the threat of the vacuum as the outer limit of an aesthetic of clarity. The vacuum has long served as a canonical trope in art historical discussions of New Objectivity, from Ernst Bloch to Helmut Lethen and Wieland Schmied, with Schmied describing the world depicted in the New Objectivity image as a "glassy space" in which "the air often seems to have been pumped out."[54] Yet as we have seen, such spaces cannot be so easily separated from the ideal of fresh air that animated interwar modernism. No matter how evacuated the space of Renger-Patzsch's photographs may seem, it is important to remember that the photographer himself maintained that his backgrounds should be experienced as air, a turn of phrase that suggests the degree to which the modernist ideal of fresh air coexisted in precarious tension with the threat of the vacuum. Ultimately, the question is not whether these photographs present a world of fresh air or a vacuum but how these seemingly contradictory ideals could come into such close proximity in the first place.

To answer this question, it is helpful to revisit the passage from Thomas Mann that serves as this essay's epigraph. At this point, it should be plain that this passage is less a description of fresh air than a fantasy about it—and an emphatically modernist one at that. As rarefied as his deadpan prose, Mann's mountain air evinces a certain morphological congruence with that imagined by Renger-Patzsch. In both cases, fresh air emerges as an abstraction, one which can be described and depicted only through negation. At issue, then, is less a question of purity than purification—and how could it be otherwise? By the late 1920s, access to fresh air had already become precarious for many. No longer a substance that could simply be found out there, in the natural world, it was increasingly recognized as a product of filtration and negation, in which a purified visual aesthetics proved as, if not *more*, critical than systems of ventilation.

The vacuum thus emerges as the logical outcome of the interwar longing for fresh air. In this respect, we might say that Renger-Patzsch's photographs reveal the dialectical tension in which these two possibilities coexisted. In bringing this aesthetic of clarity to its extreme, however, these photographs also disclose a fundamental disjunction between pictorial and lived environments. For while there are no constraints on the degree to

which one can purify a pictorial surface, it is quite a different case when it comes to lived environments. How rarefied can the air become before it precludes human habitation? The longer we look at these photographs, the more we begin to suspect that the environment presented within them is as inimical to human habitation as the industrial atmosphere that has been dispelled from their surfaces. For while the camera, perhaps, can thrive in a vacuum, the human viewer cannot.

Notes

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1. For a survey of Albert Renger-Patzsch's work for industrial firms and architects, see Carl Pfingsten, "Albert Renger-Patzsch: Early Industrial Photography," *History of Photography* 21, no. 3 (1997): 187–91.
2. For more information on the Zollverein 12 facility, see Wilhelm Busch and Thorsten Scheer, eds., *Symmetrie und Symbol: Die Industriearchitektur von Fritz Schupp und Martin Kremmer* (Cologne, 2002); Thorsten Seifert, "Kurze Geschichte der Zeche Zollverein," in *Welterbe Zollverein* (Essen, 2008); and Claus Stiens, "Schacht 12—Ein Werk von Fritz Schupp und Martin Kremmer," in *Welterbe Zollverein* (Essen, 2008). The technical innovations of Zollverein 12 are also featured in Max Burchartz's photobook *Kohle an der Ruhr* (Essen, 1933).
3. Only a decade earlier, the industry was still largely dependent on hand-and-hoe mining.
4. Albert Renger-Patzsch, "Ziele," *Das Deutsche Lichtbild* 1 (1927): xviii. All translations from the German, unless indicated, are my own.
5. Walter Benjamin, "Little History of Photography," in *Selected Writings, Volume 2, Part 2: 1931–1934*, eds. Michael Jennings, Howard Eiland, and Gary Smith (Cambridge, MA, 1999), 518. This essay was first published in *Die literarische Welt* (October 1931). The term that Benjamin uses for atmosphere in the original is *Atmosphäre* rather than *Stimmung*, a choice that already hints at a more concrete understanding of the atmospheric.
6. Walter Benjamin, letter to Werner Kraft, 28 October 1935, reproduced in Walter Benjamin, *Gesammelte Schriften V*, ed. Rolf Tiedermann (Frankfurt, 1991), 1151.
7. In the introduction to *Foto-Auge* (Photo-eye, 1929), for instance, the art historian Franz Roh scoffed at the "softening impressionist minds" of a generation of photographers who "cloaked everything in dusk," casting the atmospheric aesthetic of pictorialism as a pictorial decadence to be overcome; Franz Roh, *Foto-Auge* (Stuttgart, 1929), 6.

8. The critic Fritz Matthies-Masuren, whose tenure as editor of *Photographische Rundschau* lasted into the 1930s, described the "true goal" of artistic photography as the "reproduction of *Stimmungen* as opposed to expressionless views, of artistic impressions before nature, which cannot arise from uniformly sharp and indifferent depictions of individual objects"; Fritz Matthies-Masuren, *Künstlerische Photographie* (Leipzig, 1907), 43.
9. Kurt Wilhelm-Kästner, "Fotografie der Gegenwart: Grundsätzliches zur Ausstellung im Museum Folkwang Essen," *Photographische Rundschau* 66 (1929): 93–94.
10. Wolfgang Born, "Die Photographische Weltanschauung," in *Theorie der Fotographie II: 1912–1945*, ed. Wolfgang Kemp (Munich, 1999), 140.
11. Albert Renger-Patzsch, "Ketzergedanken über künstlerische Photographie (1925)," in *Die Freude am Gegenstand: Gesammelte Aufsätze zur Photographie*, eds. Bernd Stiegler, Ann Wilde, and Jürgen Wilde (Munich, 2010), 46.
12. This material understanding of atmospheric conditions is evident across Renger-Patzsch's writings. For instance, Renger-Patzsch discussed the wind as a concrete problem, expressing frustration at its propensity to spoil negatives by throwing the leaves of a tree or the petals of a flower out of focus; Albert Renger-Patzsch in Wilhelm Schöppe, ed., *Meister der Kamera erzählen: Wie sie wurden und wie sie arbeiten* (Halle, 1937), 44.
13. Heinrich Pudor, *Nackende Menschen: Jauchzen der Zukfunft* (Dresden, 1893), 40–41.
14. Alison Frank, "The Air Cure Town: Commodifying Mountain Air in Alpine Central Europe," *Central European History* 45, no. 2 (June 2012): 199.
15. See Albert Reich, *Leitfaden für die Rauch- und Rußfrage* (Munich and Berlin, 1917). For a more detailed account of scientific research on air pollution in Wilhelmine Germany, see Ulrike Gilhaus, *Schmerzenskinder der Industrie: Umweltverschmutzung, Umweltpolitik und sozialer Protest im Industriezeitalter in Westfalen, 1845–1914* (Paderborn, 1995), 123–87.
16. Louis Ascher, *Der Einfluss des Rauches auf die Atmungsorgane* (Stuttgart, 1905).
17. For more on policy related to air pollution, see Frank Uekötter, *Age of Smoke: Environmental Policy in Germany and the United States, 1880–1970* (Pittsburgh, 2009).
18. Reich, *Leitfaden*, 101–3.
19. Ibid., 11.
20. Albert Renger-Patzsch, "Pflanzenaufnahmen (1926)," in *Die Freude am Gegenstand*, 67. Renger-Patzsch's article addresses the advantages and disadvantages of shooting in the open versus an enclosed space; his photographs, however, skew toward the latter.
21. The words "*Licht, Luft, Oeffnung*" (light, air, openness) emblazoned in triplicate the cover of Sigfried Giedion's *Befreites Wohnen* (Zurich, 1929), functioning as a kind of visual manifesto.
22. Walter Gropius, *The New Architecture and the Bauhaus*, trans. P. Morton Shand (Cambridge, MA, 1964), 44.
23. Sigfried Giedion, *Building in France, Building in Iron, Building in Ferroconcrete*, trans. J. Duncan Berry (Los Angeles, 1995), 168.
24. Albrecht Frübose, *Die Bedeutung der verunreinigten Luft für die menschliche Gesundheit mit besonderer Berücksichtigung der Großstädte und der Industriebezirke* (Berlin, 1927), 5.
25. Ernst Bloch, *The Principle of Hope, Volume 2*, trans. Neville Plaice, Stephen Plaice, and Paul Knight (Cambridge, MA, 1995), 736. The architectural historian Reyner Banham made a similar point, arguing that "it was in Germany, more than anywhere else, that the promise of improved environmental quality was most

ruthlessly sacrificed on the altar of a geometrical machine aesthetic"; Reyner Banham, *The Architecture of the Well-Tempered Environment* (Chicago, 1984), 124.

26. Wilhelm Lotz, "Architekturfotos," *Die Form* 4, no. 3 (February 1929): 70. Köster's photographs had appeared earlier in Bruno Taut's *Ein Wohnhaus* (Stuttgart, 1927), arranged in the same manner.
27. See Megan Luke and Sarah Hamill, eds., *Photography and Sculpture: The Art Object in Reproduction* (Los Angeles, 2017); Marta Braun, *Picturing Time: The Work of Etienne-Jules Marey* (Chicago, 1994); and Rolf Sacchse, "Made in Germany as Image in Photography and Design," *Journal of Popular Culture* 34, no. 3 (Winter 2000): 45.
28. Bruno Taut's Wohnstadt Carl Legien, which appears in figure 5, was located in the working-class neighborhood of Prenzlauer Berg, in the immediate vicinity of the Danziger Straße Gasworks, which served as Berlin's largest gasworks. Barry Bergdoll has noted a similar function of the blank ground in the architectural photographs of Edouard Baldus, which may be regarded as important precursors. See Barry Bergdoll, "A Matter of Time: Architects and Photographers in Second Empire France," in *The Photographs of Edouard Baldus,* ed. Malcolm Daniel (New York, 1994), 111.
29. Albert Renger-Patzsch, "Über das Photographieren von plastischen Kunstwerken (1925)," in *Die Freude am Gegenstand*, 38.
30. Megan Luke, "Artificial Blindness," in *Photography and Sculpture: The Art Object in Reproduction*, eds. Sarah Hamill and Megan Luke (Los Angeles, 2017), 138.
31. Antonio Somaini, "The Atmospheric Screen: Turner, Hazlitt, Ruskin," in *Screen Genealogies: From Optical Device to Environmental Media*, eds. Craig Buckley, Rüdiger Campe, and Francesco Casetti (Amsterdam, 2019), 162–74.
32. For more on Marey's experiments with backgrounds as a mode of environmental control, see Brian Jacobson, *Studios Before the System: Architecture, Technology, and the Emergence of Cinematic Space* (New York, 2015), 36–39. As Jacobson argues, Marey's experiments with dark backgrounds at the Physiological Station would have a strong influence on the development of early cinema, in terms of both studio architecture and aesthetics.
33. Albert Renger-Patzsch, "Winterphotographie und Schneeschuhsport," in *Die Freude am Gegenstand*, 51. Such flecking has been discussed more amply in relation to the wet collodion process; however, it remained an issue even with the gelatin plates and film used in the 1920s. Agfa's amateur photography monthly, the *Agfa-Photoblätter*, contains numerous articles addressing the problem, with titles such as "Misserfolge und Ihre Ursachen: Helle Flecke im Negativ" (August 1926), "Helle Striche und Punkte auf dem Abzug" (September 1926), "Wie entfernt man durch photographische Beschäftigung verursachte Flecken?" (November 1926), and "Löcher in der Schicht?" (October 1929).
34. Johannes Grasshoff-Loescher, *Die Retouche von Photographien* (Berlin, 1903), 44–48. For more on the history of this practice, see Mia Fineman, *Faking It: Manipulated Photography Before Photoshop* (New York, 2013), 9–11, 45–48; and Dagmar Keultjes, "Praktiken und Diskursivierung der fotographischen Retusche" (PhD diss., University of Cologne, 2018), 147–50.
35. Michael Stöneberg, *Arthur Köster, Architekturfotografie, 1926–1933: Das Bild vom Neuen Bauen* (Berlin, 2009), 70–71.
36. Ewald Thielmann, "Die Wahl des Papiers," *Agfa-Photoblätter* (December 1929): 171.
37. Hanako Murata, "Material Forms in Nature: The Photographs of Karl Blossfeldt," in *Object: Photo, 1909–1949*, eds. Mitra Abbaspour, Lee Ann Daffner, and Maria Morris Hambourg (New York, 2014), 322–25. Although Blossfeldt

belonged to an older generation of photographers, his photographs became icons of New Objectivity following their exhibition and publication in the late 1920s. The MoMA prints were produced between 1920 and 1932.

38. Renger-Patzsch, *Ketzergedanken*, 44; Rudolf Kuttroff, "Photographieren ist leicht wenn . . . ," *Agfa-Photoblätter* (April 1931): 337–69; also see note 29. For a recent scholarly account, see Peter Geimer, *Inadvertent Images: A History of Photographic Apparitions* (Chicago, 2018).
39. Manufacturers like Agfa were at pains to emphasize the care taken to avoid dust during the manufacturing process, citing both air filtration systems and the inspection of each plate under a loupe in their public communications; Max Rayner, "Das Stammwerk der Agfa-Photographie in Berlin-Treptow," *Agfa-Photoblätter* (September 1928): 95, 102.
40. W. Konen, "Diabolus Photographicus," *Agfa-Photoblätter* (March 1927): 435.
41. For more on the Folkwang Museum's importance to interwar photography, see Pepper Stetler, "The Object, the Archive, and the Origins of Neue Sachlichkeit Photography," *History of Photography* 35, no. 3 (Summer 2011): 281–95; and Rainer Stamm, *Der Folkwang-Verlag: Auf dem Weg zu einem imaginären Museum* (Frankfurt, 1999).
42. Fritz Schupp, "Gestaltungsfragen beim Industriebau, erläutert am Bau beim Kohlenwäschen," *Zentralblatt der Bauverwaltung* 52/54 (December 1932): 641.
43. Walter Gropius, quoted in Frederic J. Schwartz, *The Werkbund: Design Theory and Mass Culture Before the First World War* (New Haven, 1996), 55.
44. Alfred Krupp, letter to the Krupp Photography Department, 12 January 1867, reproduced in Franz-Josef Brüggemeier and Thomas Rommelspacher, *Blauer Himmel über der Ruhr: Geschichte der Umwelt in Ruhrgebiet, 1840–1990* (Essen, 1992), 129.
45. Heinrich Hauser, *Schwarzes Revier* (Berlin, 1930), 10–11.
46. Ascher, *Der Einfluss des Rauches*, 16.
47. Franz-Josef Brüggemeier, "A Nature Fit for Industry: The Environmental History of the Ruhr Basin, 1840–1990," *Environmental History Review* 18, no. 1 (Spring 1994): 41–42.
48. Hauser, *Schwarzes Revier*, 21.
49. Elizabeth Hutchinson, "Conjuring in Fog," in *Picturing*, ed. Rachael Z. DeLue (Chicago, 2016), 121.
50. Hauser, *Schwarzes Revier*, 13.
51. This photograph could also be the work of an uncredited Else Thalemann, whose estate includes a number of photographs presented in Hauser's book. The collection of the Art Institute of Chicago includes a postwar print of this image bearing Thalemann's stamp on the back; the authorship, however, remains disputed.
52. Hauser, *Schwarzes Revier*, 9.
53. "A simple 'reproduction' of reality is now less than ever able to say anything about reality. A photograph of the Krupp factory or AEG reveals almost nothing about these institutions"; Bertolt Brecht, "Der Dreigroschenprozeß: Ein soziologisches Experiment (1931)," in *Werke: Große kommentierte Berliner und Frankfurter Ausgabe, Band 21: Schriften 1*, ed. Werner Hecht et al. (Berlin, 1992), 469.
54. Wieland Schmied, *Neue Sachlichkeit and German Realism of the Twenties* (London, 1978), 13–15; and Helmut Lethen, *Cool Conduct: The Culture of Distance in Weimar Germany* (Los Angeles, 2002).