# THE FAGUS-WERK
## INDUSTRY, URBAN LAND, AND ARCHITECTURAL IDEOLOGY

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□ In a broad sense, this paper deals with the connection between architecture, urban land economics, and certain political questions. In doing so, it seeks a conceptual link between architecture and urban planning by reference to the effect on design ideology of social change and urban structural transformation. The events that shaped the production of a single building—the Fagus-Werk, a manufacturing plant designed largely by Walter Gropius in 1911—are examined from the perspective of contemporary industrial and urban restructuring. Emphasis is given to the functional and political problems that faced German industry at the time, attributable in part to the virtual absence of available suburban land. The damaging effect of these problems upon the relationship between manufacturing and community, at a time when the leading industrialists were bringing scientific management and public relations techniques into practice, is examined as a crucial source of the ensuing modernist experiment. The Fagus-Werk, it is suggested, was the first mature resolution of these problems. Its suburban location, land-intensive character, and the needs and personalities of Gropius and his client, Carl Benscheidt, form the basis for drawing some conclusions about architectural ideology, political economy, and planning analysis. □

The contemporary disaffection with the architecture of the recent past has given rise to a number of conflicting theories about what should replace the body of ideas that was largely based upon the culture of modernism, now widely held to be responsible for the alleged visual poverty of the twentieth-century city. However disparate these new theories seem to be, a common theme runs through at least some of them: the reintegration of architecture into the historical structure of the city. According to this theme, the city has become a mere aggregation of projects, each conceived in response to its own internally derived program, a situation sometimes attributed to the functionalist and reductionist side-effects of modernism. Now, the city itself must be applied as a kind of organizing

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template—an external program—from which architecture ought to be derived (e.g., Rossi, 1982).

It is a matter of great interest that this particular emphasis in architectural ideology is being stressed at a time when the imposition of public sanctions on private development decisions seems to be gaining ground throughout the West through the process known as urban design. As an instrument of local policy urban design mirrors, at one remove, certain power relations that operate within the fabric of society. In urban design, therefore, we are witnessing the forging of an institutionalized channel through which external power relations are translated into architectural form. It would, nevertheless, be rash to assume that the reflexive shift in architectural discourse itself is a direct consequence of these external factors, just as it would be rash to claim that it is—or ought to be—entirely self-referential. Rather, the parallel streams of culture and political economy seem to merge and eddy more strongly on some historical occasions than on others.

On those occasions when culture and political economy are joined, architecture becomes a distillation of the more important forces around which society at large is organized, and not only because buildings are a repository of contemporary aesthetic ideals, technology, and capital. Architecture is also associated with the wielding of power, less as a mirror of politics than as an instrument used to sustain authority and control, whether on behalf of the state, in production and the marketplace, or even in the family. Secondly, architecture is dependent on, and undergoes mutations in conjunction with, large-scale alteration in the structure of the city itself (if by the term structure we refer to the distribution and intensity of human activity across urban space).

What follows is an examination of certain events that took place in Germany near the beginning of this century. It is not coincidental that the crucible of modernist architecture existed at a historical turning point in the adjustment of power relations in society and, connected thereto, in the widespread structural transformation of the city.

In particular, I wish to show how certain local events in conjunction with more durable circumstances culminated in a single, now often misunderstood building: the Fagus-Werk, which was mainly designed by the firm of Walter Gropius and Adolf Meyer. The crucial first stage of this manufacturing plant was built in 1911 in the small Saxon town of Alfeld-an-der-Leine. Although the roots of architectural modernism are multifarious, the Fagus-Werk is still regarded by many as the building that finally propelled architecture into the twentieth century, the first mature prototype upon which many subsequent oeuvres, both in Europe and the Americas, were based (cf. Wilhelm, 1983). Of immediate concern here, however, is the extent to which the ideas that inspired the Fagus-Werk were woven from new initiatives taken by industry to maintain its dominant position, and to understand the influence that widespread urban structural change was destined to have upon ensuing architectural, as well as city planning practice.

## ARCHITECTURE AND INDUSTRY IN BERLIN BEFORE THE FAGUS-WERK

The primary catalyst of German social and urban change during the last quarter of the nineteenth century was the transformation and fantastic productive success of the manufacturing industry. These events did not quite begin with, but can be signalled by a particular decision made by Werner von Siemens, inventor of the dynamo and founder of the giant electrical firm that took his name. Up until 1872 Siemens had enjoyed inventing gadgets and improvising in the former kitchen of a Berlin house in the Markgrafenstrasse surrounded by a few bright young mechanics from the shop floor. Over the previous three

years his firm had experienced a sevenfold increase in production, a situation commanding more and more of Siemens' reluctant attention. Finally, he announced "I don't have time now for basic research, nor to coach the new lads; in any case I can no longer keep up with the whole scientific field." He then hired a physics professor to set up the firm's first research department, to be strategically placed between the shop floor and the management wing (Kocka, 1969, p. 140).

This kind of decision reflects two impending changes that were to make Germany at least the equal of the United States in the pioneering of scientific industrial management and industrial psychology by the beginning of the century (see, for instance, the commentary on p. 1907 of the *American Machinist,* (1899)). The first change was the functional compartmentalization of the whole production process, initially by shifting people around within the factory, then by determining the most strategic spatial relationships of a hierarchy of specialized tasks and machines. The second change was the bureaucratization of production (the separation of mental from physical labor) by gradually increasing the ratio of technical/professional staff to shop floor employees (Hausen, 1981). These innovations were the beginnings of an inexorable move away from the use of heavy discipline on the shop floor in favor of surveillance and standardized procedure. While similar changes were also happening outside Germany, their conjuncture with the situation in cities like Berlin was destined to give industrial-location decisions and factory design a special cast in Germany that had far-reaching consequences for architecture and planning. Unlike the United States and Britain, the internal reorganization of industry in Germany was not accompanied—at least throughout the nineteenth century—either by the suburbanization of production and the work force or the large-scale provision of suburban infrastructure. The indifference of the Prussian state in particular to the needs of industry when confronting the long-entrenched land-holding monopolies had virtually confined the manufacturing sector to the inner city, in close proximity to its employees (Hegemann, 1930). In Berlin, the concerted pressure of an unlikely alliance of workers and industrialists would break the suburban monopolies only after the turn of the century (Figure 1), finally bringing some relief to the pathological overcrowding and inflated land rents of the capital (Sutcliffe, 1981, pp. 14–15).

Prior to the break-up of the suburban monopolies, the cases of industrial decentralization were few, so that even the otherwise powerful, less labor-dependent firms were tied to the inner districts of the Oranienburger and Rosenthaler Vorstädte (Figure 2). Only in 1898, for instance, did the weapons plant of Ludwig Loewe and the Borsig locomotive works finally move to Tegel on the outskirts (Schinz, 1964, p. 162). Then the few abandoned sites in Moabit, and along the Chausseestrasse and Schönhauserallee were taken over by newer, but more labor-intensive firms, such as the burgeoning AEG complex, where the winding of electric motors was still largely a manual operation.

Thus, even after the partial opening up of the urban periphery, the confinement of new development was predominant in Berlin up to the Weimar era of the 1920s. A combination of acute land shortages, low industrial wages, a lethargic Prussian government, and the continuation of archaic but highly profitable building practices had nurtured the infamous *Mietskaserne*—the courtyarded tenement. All kinds of uses—production, commerce, and domestic life—were packed into this single generic building type. The form of constructed space was thus derived not from considerations of human activity and material flows, but from severe constraints imposed by the narrow lots and high land rents, a condition that inevitably induced the very antithesis of what would be known as architectural functionalism. As a general rule, the close spatial association between home

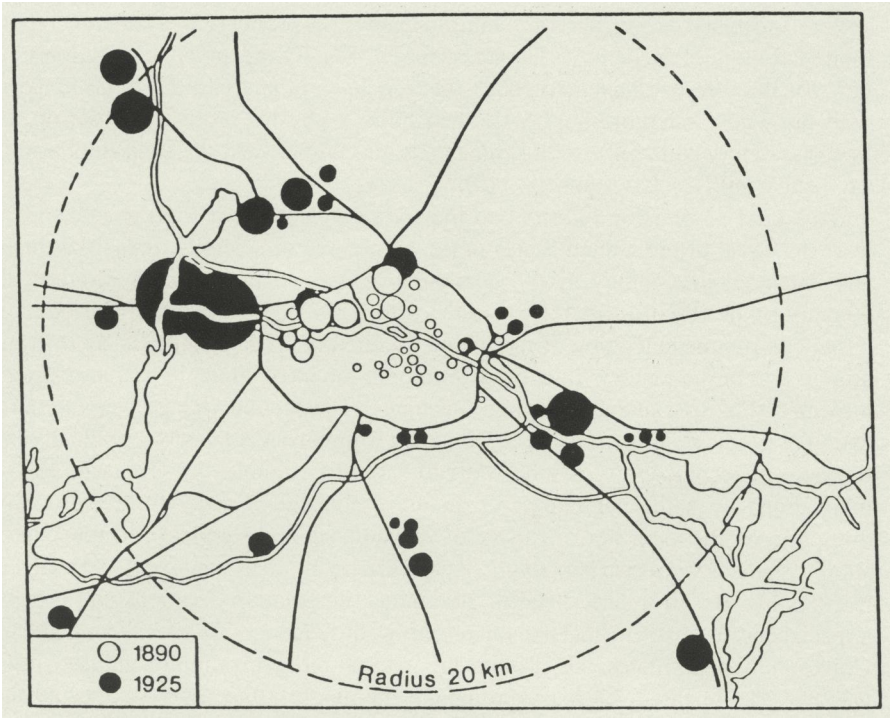
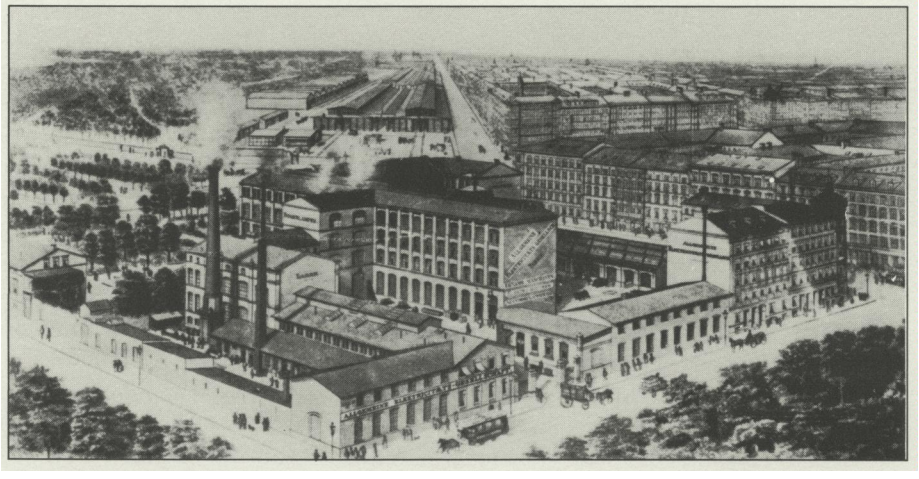



FIGURE 1. The suburbanization of industry in Berlin 1890–1925. Firm size is represented by the diameter of the circles. Only major industries are shown. (Source: after M. Pfannschmitt)

FIGURE 2. The AEG Apparatefabrik in the Ackerstrasse. Froman 1889 drawing by Julius Pathe. (Source: AEG Berlin)



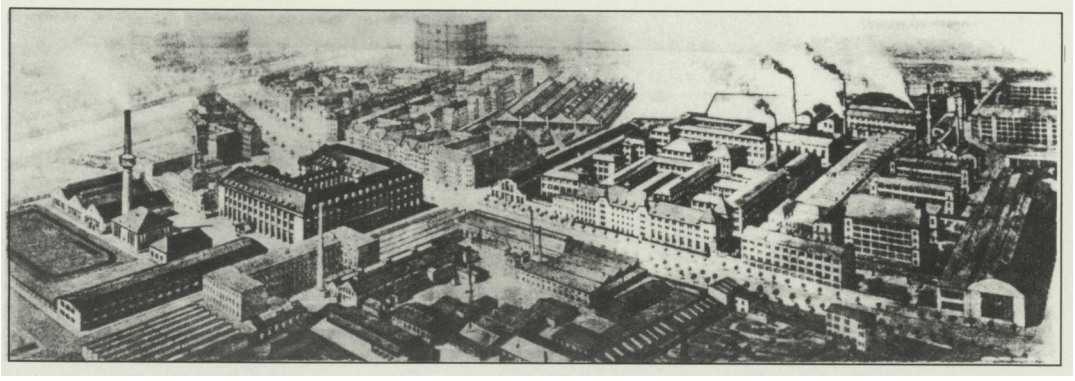


FIGURE 3. The Loewe–AEG Martinekenfelde complex in Moabit. Peter Behrens' Turbinenhalle is located on Huttenstrasse at bottom right. Grenander's Administrative building is at the center of this 1929 view. (Source: Ludwig Loewe A.G. Berlin)

and work meant that wherever industry was labor intensive, architecture was nonfunctional and capital intensive, in the sense that each costly unit of land absorbed large amounts of construction capital needed to accommodate the high population densities (Figure 3). There were few exceptions to this rule; those uses not so confined by the market, such as the extravagent government edifaces in the old Friedrichstadt, or the villas of the very rich, offered no relief to the ubiquitous mass of construction that burdened each plot of land.

Clearly, circumstances such as those outlined above were ill-suited to industrial transformation. The need to shake loose from architectural restriction, to mold space according to the needs of compartmentalization, efficient material flows, and the demands on the work environment of an emerging class of industrial bureaucrats were essential to the further flowering of new techniques of production and control of the work force. But equally as important, by the 1900s, was the ambivalence with which German society and industry perceived each other.

This ambivalence originated, on the one hand, from the dominant, almost patriarchal role played by industry in all walks of life but the land market as it established its economic hegemony in the final years of the century. It also stemmed from the realization on the part of a few astute industrialists that an assertive image was neither propitious nor necessary to improve its position of authority in society and over the workforce (cf. Münsterberg, 1912). The factory, once a great tourist attraction, had lost its popular appeal; indeed its calamitous effects upon the Berlin community were bringing hostility from urban reform groups and inner-city developers alike (Lange, 1967, pp. 73–74). Moreover, the fortress-like factory evoked the indifference and rugged disciplinary control associated with coal, iron, and the industrial ascendancy. It hardly captured the more indulgent, although still manipulative spirit of *Partnerschaft*—cooperation—that was the foundation of scientific management, nor did it mirror the increasingly rapid shift to electrically driven precision machinery and the innocuousness that manufacturers wished it to represent in the public eye. Nineteenth-century Berlin was not the place where either complete internal change or a more benign external image could effectively be realized by industry. The tightly knit, ossifying urban structure, entrenched and hostile property

interests, and old-guard politics were hardly conducive to what was now required: the hiding of industrial power from society at large.

But apart from a few far-sighted firms, the old ways still tended to prevail among many industrialists so there was no concerted effort to conceal industrial authority and assertiveness. For instance, the views of many factory owners about shop floor discipline were not only antiquated, but publicly announced. Heinrich Herkner proclaimed as late as 1908: "The worker is, and by definition will remain, an uneducated man of limited understanding." At Bergmann G.M.B.H. Bergmann himself had all the doors removed from the toilets, while in 1902 workers in the Greater Berlin Streetcar Company complained about the absence of daylight when the windows were covered with oil paint to prevent distractions (Lange, 1967, p. 142).

Extreme conservatism also dominated architectural practice; Karl Liebknecht himself (n.d.) was angered by the cost and gross monumentalism of the Royal Opera House, newly erected in the Tiergarten. "This unfortunate, useless space for the narrowest of publics is the formal essence of court pomposity. If architecture tells us anything at all about economic and political circumstances, we see that efforts such as this are the concrete representation of the powerless mass against the privileged few."

Most of all, class politics in the larger Berlin region for a long time served to obstruct the industrial decentralization required to ease the increasingly problematic relations between factory and city. In 1912 it was said of the Prussian interior minister von Dallwitz that it was essential for him to keep unruly Berlin in its place with the help of the suburbs. He could not rid himself of the fear that a Social Democrat majority would take over the whole region (Wermuth, 1912, p. 343). Industrial decentralization, indeed, was equated with political anarchy, and was therefore suppressed: "How could the state, representative of private property interests, in the age of imperialism safely permit industrial development? Or the banks give free rein to their land companies? How much horsetrading had to take place over each piece of land needed for canal building, even though expropriation rights existed?" (Lange, 1967, p. 465).

## AEG IN THE INNER CITY

The position of the giant Berlin firm Allgemeine Electricitäts-Gesellschaft (AEG) was pivotal, when seen against this contradictory background. Their response to the forces of extreme competition, political inertia, worker exploitation, and the dynamic shift to industrial efficiency seems remarkably sophisticated and "modern." Yet their factory architecture, although unique, suggests a forceful and intrusive presence within the society.

The firm's leader, Walther Rathenau, felt that "Modernity is foolish, but antiquarianism is rubbish; life in its vigour is neither new nor antique, but young" (Anderson, 1968, p. 198). Quite unlike his chief rival von Siemens, Rathenau was less an inventor than an organizer and production process expert. Both he and Siemens had been buying up the weaker competition at the turn of the century; however, by 1902, using foreign patents, new small firms were eroding their lucrative monopoly in generators and lamps (Lange, 1967, p. 127). It was in 1903, when competition in all industries was at its fiercest, that F.W. Taylor's *Shop Management* was published in Germany and its methods, first combined with the remarkable homegrown ones by Georg Schlesinger of Ludwig Loewe, were immediately taken up by AEG. But production efficiency was not enough for Rathenau and his colleague Paul Jordan. They were the first to sense that product ap-

pearance and a more reticent image were important weapons both politically and in the marketplace. Consequently, from 1907 to 1914, they undertook a massive program of design, building, and reorganization that combined the newly developed production techniques with a commitment to the visual transformation of the whole *Industriekultur*—the manufacturing image.

The consequences of this program, spearheaded by the architect Peter Behrens and inspired by the debates of the Deutsche Werkbund, are well known; product and factory design, graphics, letterheads, and symbols collectively represented the first serious attempt since William Morris to reconcile the contradictory demands of industry, society and art. But whereas the manufactured products—the famous lamps and small appliances—signaled a radical understanding of, and confidence in the machined aesthetic, the architecture of the new AEG factories presented a highly assertive picture of industrial power, revealing a fundamental divergence between the design of factory-produced items and the design of buildings. Essentially, the new large assembly plants—the Kleinmotorenfabrik, the Hochspannungsfabrik, and the Turbinenhalle—like all buildings, were molded by the particular locational demands of the client, which in this case seriously constrained Peter Behren's attempts to depart from the nineteenth-century tradition of factory design.

In particular, two factors of location, when combined with Behrens' inability or unwillingness to acknowledge the need to mask the inordinate power of the firm, marked the AEG factories. The first factor was the still-endemic scarcity of newly converted land around the periphery of Berlin. Very little progress had been made by 1907 in obtaining state sanctions and infrastructure to break the Prussian policy of containment, so the few available sites were both expensive and geometrically constricted. This was especially the case with the two locations chosen by AEG, each of which was surrounded by intensive housing and industrial facilities constructed in the 1890s. The Kleinmotorenfabrik (1910–1913) and the Hochspannungsfabrik (1909–1910) were to be built on the Voltastrasse (Figure 4) as extensions to the existing AEG complex south of the Humboldthain (Rogge, 1978, pp. 15–16). This meant that each building had to be fitted between a narrow developed street front, existing nineteenth-century tenements, and crowded industrial facilities to the rear (Figure 5). The famous Turbinenhalle (1909) was planned for the corner of Huttenstrasse and Berlichigenstrasse in the even older industrial district of Moabit, where AEG had recently acquired an interest in Ludwig Loewe's Union Elekricitäts-Gesellschaft. The whole block was by this time completely occupied, necessitating the demolition of an existing turbine factory to clear a site that was destined to be completely enveloped by the new structure (Figure 6).

The second factor of location seems almost paradoxical, given the progressive élan of the electromechanical sector and of AEG in particular, but it explains why the firm seemed so unconcerned about consolidating and expanding its inner-city facilities on difficult and expensive land. In spite of substantial improvements in machinery and procedure, the winding of electric motors and the assembly of the new AEG–Curtis turbines were still, in 1913, predominantly manual operations. The Ackerstrasse plant alone, in 1906–1907, employed 6,000 workers who were confined to a shop floor of less than 7 $m^2$ per employee (Rogge, 1978, p. 12). A photograph of the interior of the Kleinmotorenfabrik, taken between 1910 and 1912, shows row after row of workers standing elbow to elbow at their workbenches (Figure 7). In Moabit, by 1906, 1,600 men were engaged in the assembly of turbines in a single hall (Kraftwerksunion, 1979). Given the pathetic state of transit facilities, a location close to their enormous labor pool, crowded into the tenements of Moabit and Wedding, was essential to the AEG operation. So constraining

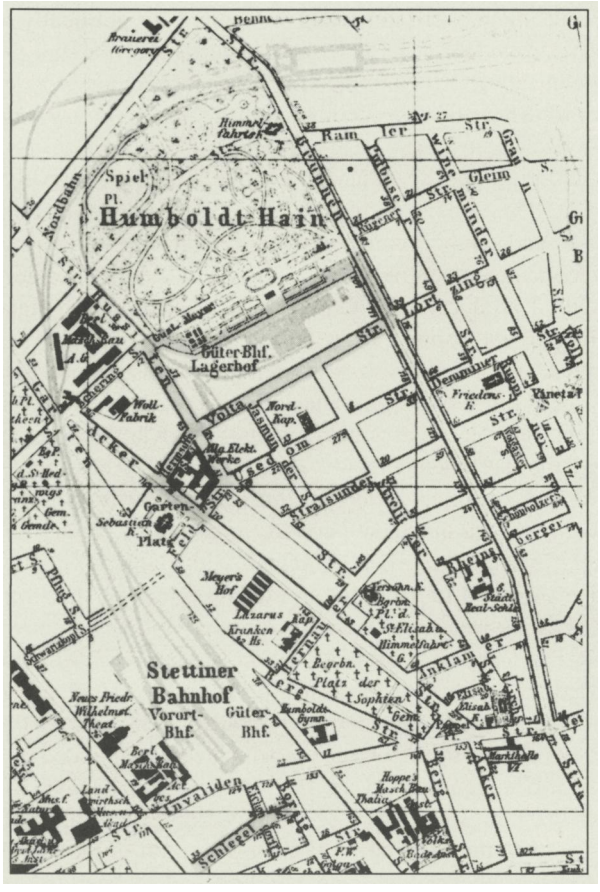



FIGURE 4. Location of the AEG factories in Wedding, from a map of 1896. (Source: AEG Berlin)

FIGURE 5. Bird's-eye view of the AEG complex south of the Humboldthain. The Voltastrasse is at the bottom. (Source: AEG Berlin)

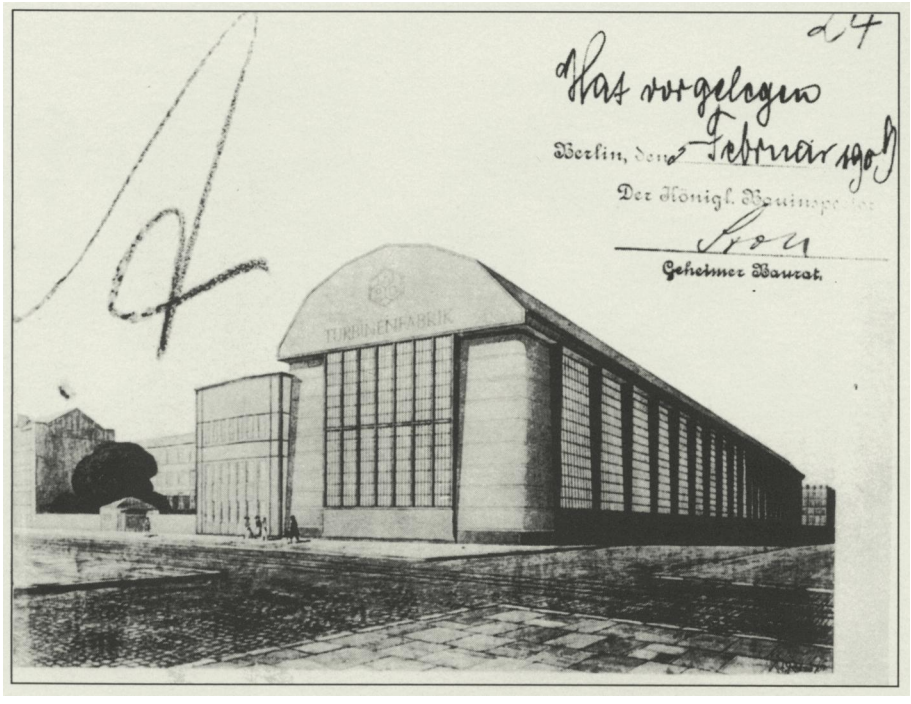



FIGURE 6. Peter Behrens' own 1908 drawing of the Turbinenhalle. The impression of empty adjacent land is misleading. (Source: AEG Berlin)

FIGURE 7. Interior of the Kleinmotorenfabrik, photographed between 1910 and 1912. (Source: AEG Berlin)

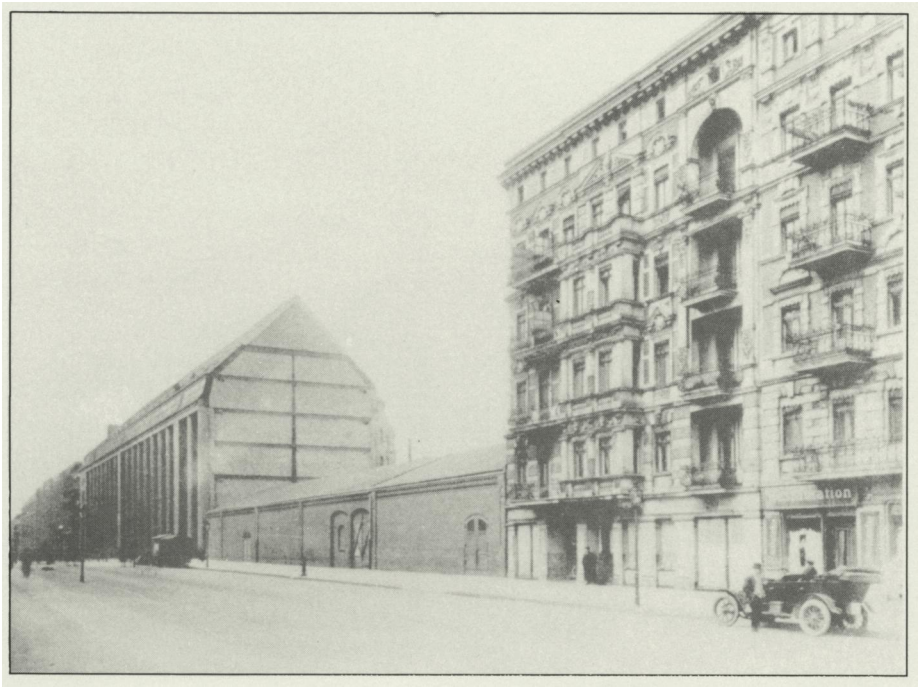


FIGURE 8. The old and new Kleinmotorenfabrik in the Voltastrasse, photographed in 1913. (Source: AEG Berlin)

FIGURE 9. The Voltastrasse facade of the Kleinmotorenfabrik. (Source: AEG Berlin)

were the physical context and excessive land rent that the new factories, despite their great areas of glass, could be little more than huge multistoried sheds, overpowering in their bulk and urban intrusiveness (Figure 8). The predicament faced by Peter Behrens, therefore, was to reconcile the mandate he received from Rathenau and Jordon with the inevitable monoliths that could only continue to evoke the sense of nineteenth-century industrial hegemony. His ambiguous recourse, rationalized in several pronouncements about the conflict between nature and culture, was to the notion of "corporeality," an attribute that he felt elevated architecture above the realm of engineering (Anderson, 1968, pp. 202–205). Behrens argued that corporeality was the representation of "cultural monumentality;" this led him to deal with the great bulk of the AEG factories by *emphasizing* their huge presence rather than reducing it. He therefore chose to add weight to the Huttenstrasse pylons of the Turbinenhalle—against the vehement objection of engineer Karl Bernhard that they were structurally useless—and to distend the brick piers of the Kleinmotorenfabrik to form a colossal rhythm along the narrow Voltastrasse (Figures 9 and 10). Behren's *Industriekultur,* in spite of—or rather precisely because of—its powerful signature, was already obsolescent, reflecting the old style of labor and social relations that many industrialists, out of self-interest, were already beginning to regret.

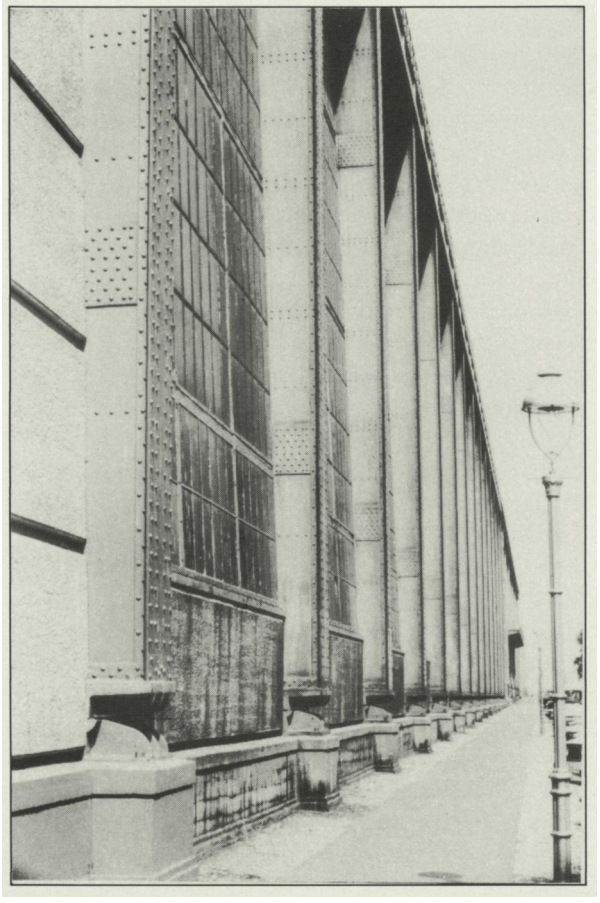


FIGURE 10. The Berlichtigenstrasse facade of the AEG Turbinenhalle.

## CARL BENSCHEIDT: THE COMPETITIVE PERSONALITY AND SUBURBAN OPPORTUNITY

Modern architecture could not blossom in the inner city because the problems to be resolved were new ones occurring within the practically immutable context of expensive land and inflexible urban structure. Without some concerted action, necessarily on the part of the state, to bring about less restrictive development opportunities, the old solutions persisted. It was not that the nineteenth-century city determined architecture, but it seriously hamstrung experimentation; the radical spirit of modernism, already beginning to thrive in other aspects of art and cultural life, had yet to make significant inroads into building design.

This pattern was finally broken, not in the industrial metropolis, but on the edge of Alfeld-an-der-Leine. It was here, beginning in 1910, that plans were made to build a modest precision machine and shoe-last factory, the Fagus-Werk. The events that affected the Fagus-Werk are an intricate weave of the talents, disposition, and ideals of those involved, as well as being a product of broad-ranging socioeconomic circumstance. The unlikely character of the town, a cultural backwater, and of the client, a canny but tight-fisted conservative, only serve to emphasize the vision with which Walter Gropius was able to mold the crucial opportunities of location and the emerging industrial instincts into this, his first independent work.

Carl Benscheidt, the founder and owner of the Fagus-Werk, had been a long-time employee of the local shoe-last firm of C. Behrens A.G. until he virtually took over as director in 1896. With little formal education, and plagued by ill-health as a youth, Benscheidt possessed a complex personality. On the one hand, he decidedly belonged to the old school, displaying iron self-discipline which, through his rigorous vegetarian existence, enabled him to survive until the age of ninety (Barner, n.d., pp. 3–11). He made great demands of his employees, and, as we shall see, he was ambivalent about their welfare when it came to spending money on providing a decent work environment. He was, nonetheless, generous with words: "Our wealth," he proclaimed in an unwitting Marxian parody, "will not be found in our property, but in the skill and know-how of our workers. Every man trained in the shop is our real capital" (Fagus, n.d.).

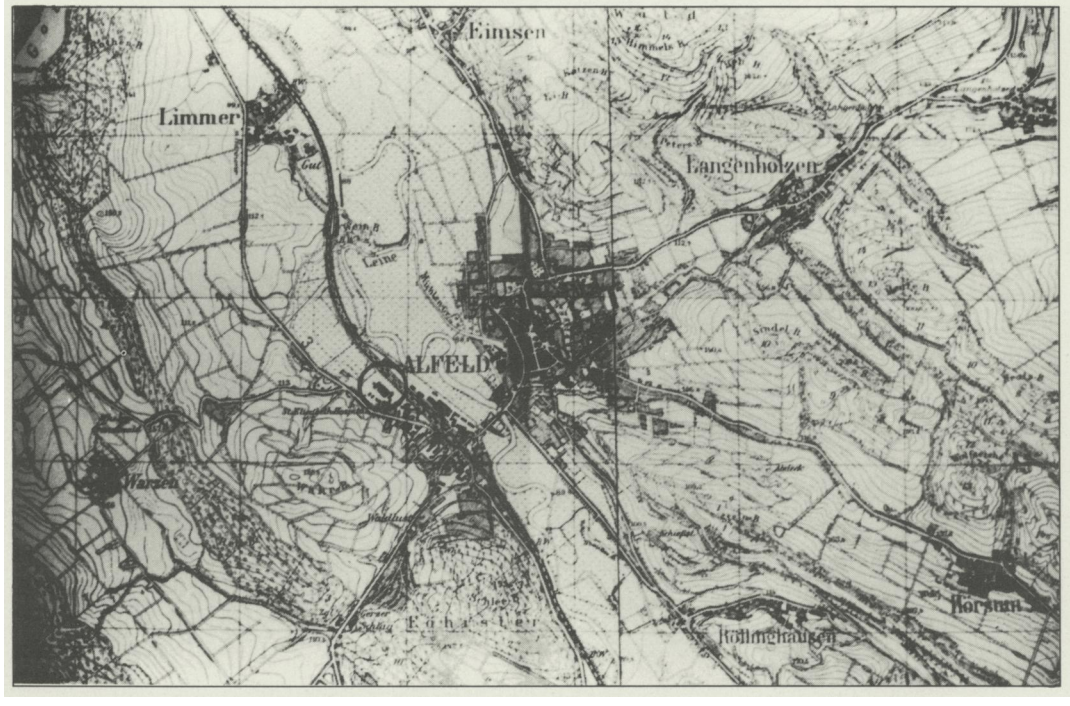
On the other hand, when it came to matters of production, Benscheidt displayed a creativity that belied his otherwise provincial traits. He constantly sought out, or personally invented, the latest in industrial techniques and machinery. His experiments at C. Behrens, employing the most advanced technology, had transformed the firm from obscurity to world leader in shoe-last manufacturing by 1900 (Niemann, 1983, p. 17). By this time, C. Behrens had embarked on a program of building expansion, for which Benscheidt was given the primary responsibility. It was he who, fatefully, approached Eduard Werner, an experienced industrial architect from Hanover, to design the new factory, which turned out to be an efficient but unremarkable brick structure completed in 1902.

Then, after consolidating his obvious success, Carl Benscheidt left Behrens in 1910 at the age of 53, under conditions that are not entirely clear but were probably crucial to what followed. It seems likely that he found his leadership eclipsed when the son of the founder became old enough to take over the firm, a matter that apparently caused some unpleasantness. In any event Benscheidt was determined to set up his own rival company in Alfeld in competition with his old firm that had enjoyed a virtual regional monopoly for some time. Over the years he had befriended Fred Cox, a director of the United Shoe Machinery Corporation of Boston who had wanted to establish a shoe-last

factory in Germany. Cox invited Benscheidt and his son to visit the United States in the spring of 1910, promising the chance of some capital as well as an inspection of American production methods and planning (Barner, n.d., p. 9). They took up Cox's offer and returned, apparently full of new ideas and with one million marks of venture money. This was not a great deal considering the plans that Benscheidt had in mind, namely to finesse his former employer by sheer technical and promotional superiority.

Benscheidt resolved to begin modestly, with respect to the size of his new operation, but to use only the best in precision machinery and to expand when conditions permitted later on. The first building was to house about 75–80 operatives and technical staff, and to be about a quarter the size of C. Behren's factory. Nevertheless, given the complex nature of the manufacturing process, a fairly sizeable technical-administrative component was to be incorporated from the start (Wilhelm, 1983, pp. 43–44). In searching for a site for his factory Benscheidt did not have many alternatives if he were to invest as little as possible of his precious capital in land. The old town lay completely east of the river Leine, but the regional highway and railway ran parallel to the west bank, serving a loose outer cluster of industries that included the Behrens factory and some scattered housing and institutions (Figures 11 and 12). This was the only feasible industrial area in Alfeld; it was close enough to town to afford convenient access for workers on foot or by bicycle, yet it was separated from the town by the river, and it was well served by regional transportation. (The official Alfeld Land Use Plan (1913) designated the area for "mixed use"—i.e. housing and industry.) It was here that Benscheidt acquired three hectares of

FIGURE 11. Alfeld about 1918. The Fagus-Werk is circled at left center. (Source: Stadtarchiv Alfeld-an-der Leine).



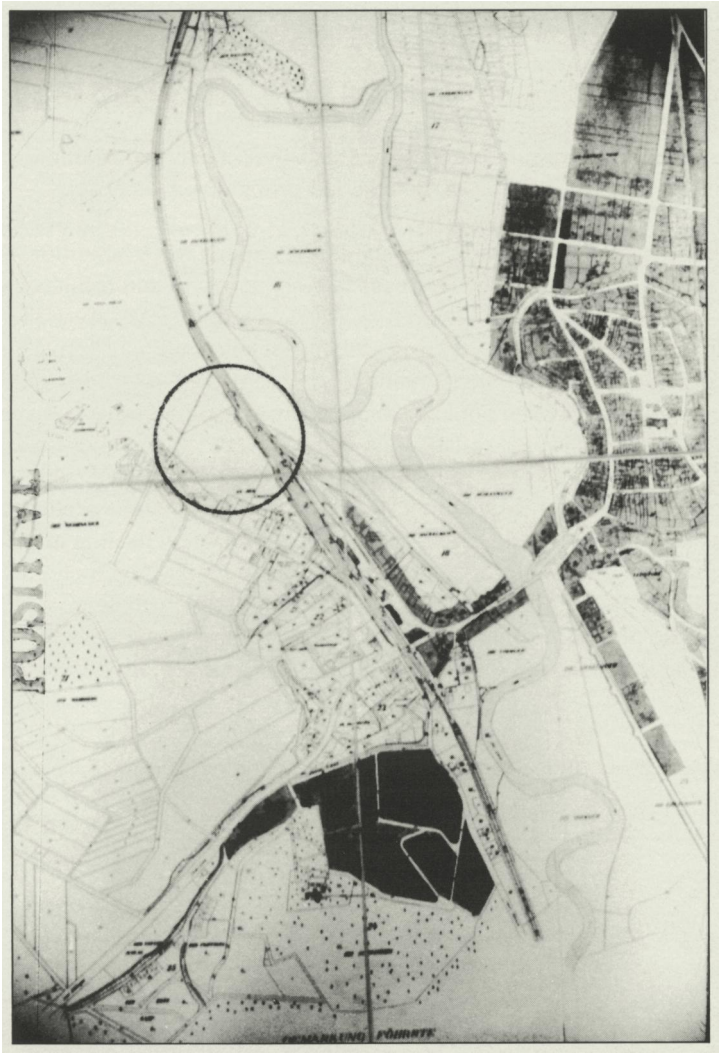


FIGURE 12. 1913 Land-use plan of Alfeld. The Fagus-Werk site is circled. (Source: Stadtarchiv Alfeld-an-der Leine)

virtual swampland between the railway and the Hanover road, almost directly across the tracks from his old firm. He was so concerned to save money that he bought only a few meters of road frontage, leaving the St. Elizabeth Hospital to intervene between his land and the highway.

Benscheidt decided to name his new venture after the *Fagus silvatica*—the red birch—from which his shoe-lasts were to be made, and which grew profusely in the Leine valley. The manufacturing process itself was a difficult one, given the complex form of the lasts, requiring high-precision lathes, a well-lit, clean environment, expert operatives, and close supervision. Benscheidt himself had already devised a completely horizontal process while with Behrens, but was unable to exploit it fully in their multistoried shop. He commissioned Eduard Werner again, in October 1910, and worked closely with him to prepare

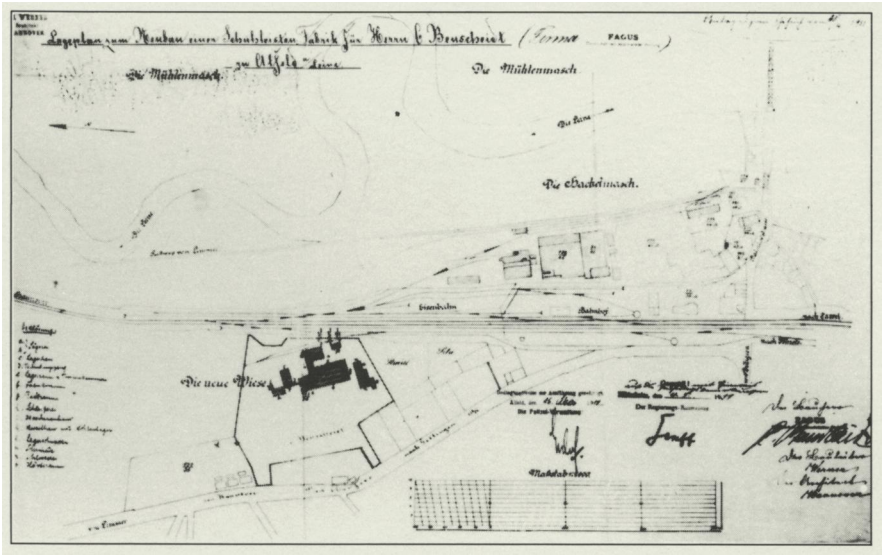



FIGURE 13. Eduard Werner's original site plan of the Fagus-Werk. (Source: Bildarchiv Foto Marburg)

the new factory layout for the Fagus-Werk (Weber, 1961). Quite unlike the AEG in Berlin, Benscheidt could afford to be lavish with land, having bought, for very little, sufficient to carry out his future expansion plans and to allow ample separation from the few adjacent activities. In effect, the factory, isolated as it was from the street, could be functionally and visually disengaged from the Alfeld community. Its major link was at the back, where a spur line could be joined to the railway, and the buildings were informally arrayed along the prospect towards C. Behrens A.G. across the tracks (Figure 13).

Given this virtual absence of geometric constriction, Eduard Werner was free, in his consultations with Benscheidt, to deal with the factory requirements in an entirely programmatic way, sorting out the various components of his layout strictly according to the division of labor and the flows of materials and products through the process. The varied nature of the specialized spaces required, the stringent environmental needs of the drying room, the top lighting in the main workshop, and the nonindustrial characteristics of the technical/administrative facilities precluded the use of a single, large, flexible space. Instead, an informal horizontal arrangement of attached, rectangular, but externally differentiated volumes was devised, to be situated close to the railway site boundary, and occupying in total only about one-eighth of the site (Figure 14). But the layout was also affected by more than manufacturing utility; it was affected by the desired control of labor and the factory's symbolic relationship to the community. The function, skill, and status of the employees roughly followed a threefold classification: laborers, warehousemen, and sawyers; precision-tool operatives; and technical–administrative staff. Each group had its own standardized procedures, supervisory personnel, and allotted place in the factory, which was spatially divided from the rest along the north-south axis of the complex. Thus, in direct accord with the principles of Taylorism, surveillance and control of employee activity could be decentralized to semiautonomous zones. But Werner distributed the zones in such a way as to give visual prominance to the technical–

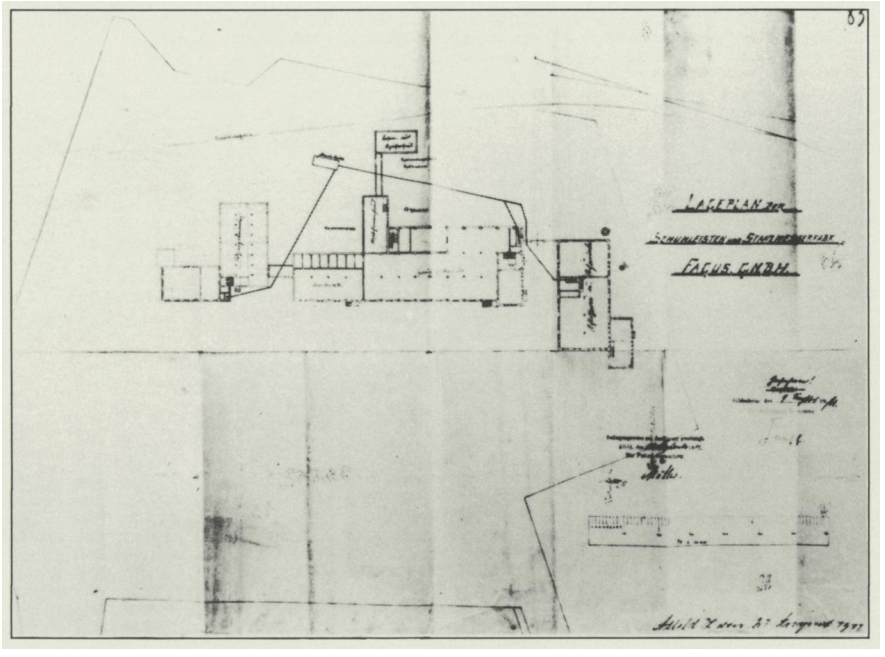


FIGURE 14. The first layout of the Fagus-Werk, drawn by Eduard Werner. (Source: Bildarchiv Foto Marburg)

administrative wing, with respect to the views from the community to the south and east, and to the public entrance from the Hanover road. The manufacturing process itself, while not quite concealed from public view, was visually subordinated to the three-story L-shaped office building.

## GROPIUS AND BENSCHEIDT: THE EFFECTS OF A LIMITED MANDATE

Eduard Werner's competence seems to have satisfied Benscheidt with respect to the more straightforward programmatic aspects of the Fagus-Werk. The architect clearly knew what he was doing when dealing with supervision, machine layout, material flows, lighting, and practical construction matters. Even his elevational treatment was a departure from the traditionalism he had recently employed in Behrens' factory. With the exception of the proposed warehouse, to which Werner chose to give an unusual local timbered expression, his drawings display a rigour and unpretentiousness not apparent in his previous work (Figure 15). But unfortunately for Werner, his client required more than he could offer in the way of architectural treatment. While Benscheidt was hardly motivated by a high aesthetic purpose, and was certainly not prepared to lavish his limited capital on appearance, he wanted the Fagus-Werk to present a distinctive "tasteful" image. It seems unlikely that he wished to show, in the appearance of his factory, his ostensible concern for industrial progress, or the well-being of his employees. For instance, he was not above contravening local regulations by insisting that his workers' eating room (it could not be graced by the term 'dining room') be located in the basement (Wilhelm, 1983, pp. 44–45). In any event, by a chance decision, he asked the young Walter Gropius to "dress up" Werner's drawings.

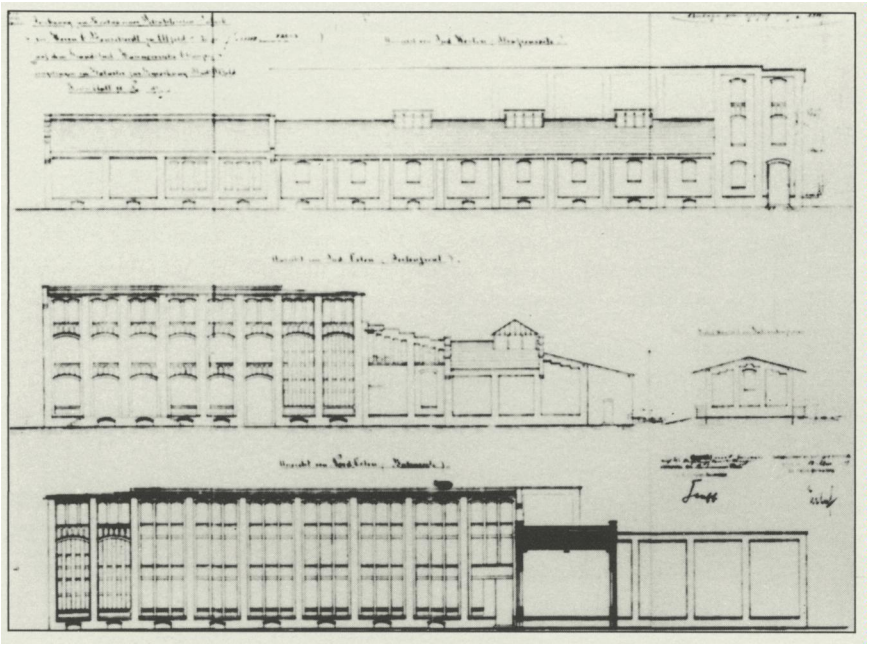


FIGURE 15. Sectional and elevational drawings of the Fagus-Werk, by Werner. (Source: Bildarchiv Foto Marburg)

Gropius had spent the first three years of his professional career in the Berlin atelier of Peter Behrens where he worked on various industrial projects including, possibly, the Turbinenhalle itself. Deeply concerned, like Behrens, with the relationship of art to industry, he was influenced both by the Hegelian concept of the inseparability of artistic form and content and by Alois Riegl's ideas on the necessary connection between art and the *Zeitgeist*—the contemporary spirit. Thus armed, Gropius was drawn into the vitriolic politics of the Werkbund and, while still an employee, became deeply critical of Behren's approach to factory design.

The limited nature of the opportunity presented by Benscheidt—indeed his working relationship with the young architect over the ensuing months—hardly matched the visionary enthusiasm Gropius was just then developing about the transcendent association of art, industry, and society. The day-to-day episodes of the Fagus-Werk were prosaic, especially when compared to the grand scale and verve of the AEG enterprise.

Gropius encountered some difficulty in finding work during the first months of his independent practice, in spite of his writing hundreds of letters to prospective clients (Weber, 1961, p. 30). The first contact with Carl Benscheidt came, in December 1910, through Gropius' brother-in-law, who was an official in Alfeld. According to the recollection of Ernst Neufeld, a colleague of Gropius at the time:

> Werner's project was very orderly, but lacked any architectural dash. Gropius somehow heard about this and said to his brother-in-law, "Tell me, couldn't I get a job like that? Could you perhaps do something for me?" So (the relative) went to old Benscheidt and said, "Herr Benscheidt, I have a young brother-in-law in Berlin who was an architect with (Peter) Behrens, the biggest man in Germany. Now wouldn't it be good, *for the sake of public relations* if your factory had something special?" Benscheidt replied "Alright, I'm only just starting out, and

> every penny is important, but tell your brother-in-law to make me a proposition." (Wilhelm, 1983, p. 134)

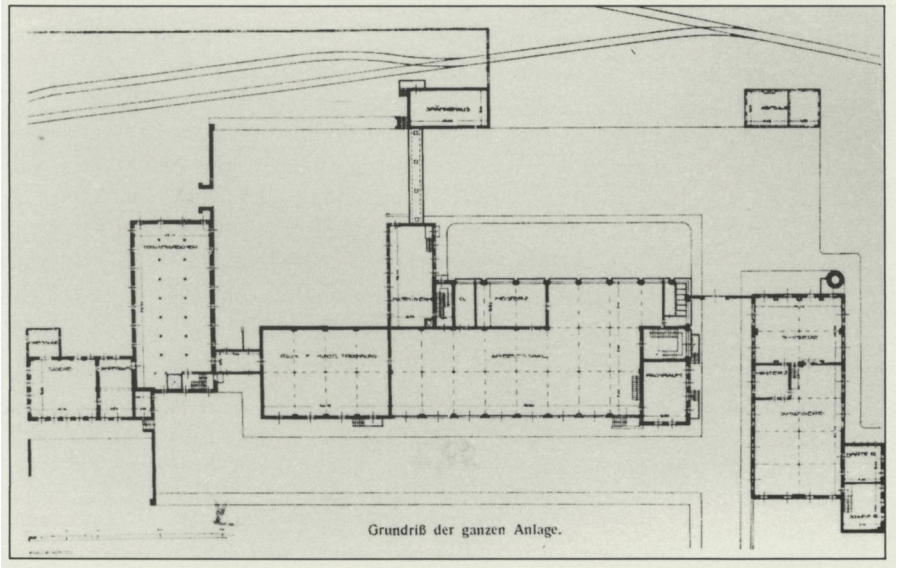
Finally, after considerable deliberation, and the virtual completion of Werner's drawings for the crucial first phase, Benscheidt wrote to Gropius on March 13, 1911:

> You are to undertake the architectonic, artistic design of our projected factory, for which the construction plans have been prepared by the architect Werner of Hanover. You should complete the plans and detailed drawings necessary for the construction and official approvals. In this regard you should respect the layout and structural proposals of Herr Werner, and do your best to give the whole project a tasteful appearance. (Fagus, 1911a)

The subsequent correspondence between architect and client does not show Benscheidt to have been an accommodating patron, nor to have offered serious direction to Gropius about the kind of appearance he required. In fact, the young architect found it difficult to persuade the industrialist to accept his ideas, many of which had to be abandoned. There is no record of inspired discussion about Gropius' new philosophy of the expressive potential in what he believed was an emerging industrial–social partnership. While Benscheidt seemed keen to build a factory that was up to date and efficient, his views about modernity were limited to industrial efficiency and public relations, and were colored by a fear of wasting time and money. He was especially impatient with any suggested changes to Werner's layout and construction decisions (Figure 16). Ironically, the great glass wall that Gropius proposed to clad the three-story administrative block, and which was to more than fulfil Benscheidt's narrow mandate, was especially contentious (Figure 17). In a letter dated May 15, 1911, the industrialist showed both his concern and general attitude:

> We have to consider that the maintenance of such big windows in a small place like Alfeld will present all kinds of problems. The local painters do not have the equipment, for instance, to

FIGURE 16. Walter Gropius' plan for the first phase of the Fagus-Werk. (Source: Industriebau 1917)



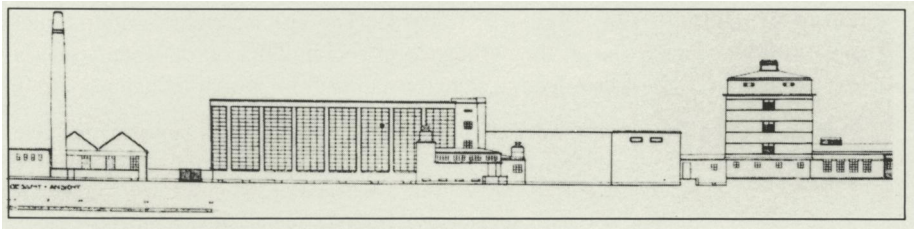


FIGURE 17. Elevation of the first phase of the Fagus-Werk, by Gropius, from the east. (Source: Industriebau 1917)

> deal with these kinds of windows, although you are aware that they will need painting every two to three years. (Fagus, 1911b)

Benscheidt was shocked when a local firm gave him a cost estimate of 5000 marks for the windows. It was not until the Düsseldorf firm Fenestra submitted a lower tender, based on the advertising value of the windows, that the industrialist finally conceded (Wilhelm, 1983, p. 136). Nevertheless, it is certain, given what we know of Benscheidt's personality, and the correspondence between him and Gropius, that the Fagus-Werk was not to be sacrificed to a purely architectural cause. On the contrary, it seems clear that Gropius' ideas were acceptable only in so far as they gave the impression of a benevolence and taste that did not in fact exist. The vehicle for such an impression was not so much the factory itself, the zone allocated for shop-floor employees, as the technical–administrative zone, to which Werner's scheme had given public prominence. Here, for the first time, were assembled the features necessary to purge industry of its authoritarian reputation, if not its actual authority.

## IDEOLOGY AND THE NEW INDUSTRIAL CULTURE

Because Peter Behrens had chosen to seek the resolution of art and industry in *Korporealität,* whereby, perhaps unwittingly, the social function of industry was still expressed as being assertively dominant, his factories already represented an archaic phase in the rapid evolution of German manufacturing from economic marginality, to patriarchal dominance, to the emergence, with the final establishment of scientific management and industrial psychology, of a more complex, manipulative relationship with employees and society alike. Social dominance, in a word, was succumbing, in the first decade of the century, to the essentially public relations campaign of *Sozialpartnerschaft*—social co-operation—for which the fortress-like factory was hardly a corresponding metaphor.

The early writings of Gropius show that he regarded this apparent shift in attitude, on the part of some industrialists at least, as a source of philosophical inspiration. Gropius and his associates were steeped in late nineteenth-century aesthetic theory, which was devoted to the discovery of the metaphysical spirit of the times. This spirit, in the case of architecture, was deemed to lie less in the empirical study of social relations than in the transcendent artistic potential of form, materials, and purpose. Gropius seems, at first, to have adhered to this idea, even though he favored, as did many of his contemporaries, "practical simplicity" over "false Romanticism" (Gropius, 1910). But then several of his papers and lectures, produced when he was designing the Fagus-Werk (between the beginning of 1911 and 1914) dealt directly with specific empirical and political questions

(Gropius, 1911a, 1911b, 1912, 1913, 1914). The crucial theme—often couched in the same phrases—is pervasive: the avoidance of social upheaval depends upon the physical transformation of the workplace, a transformation from which industry could only profit:

> Work must have palaces constructed, that not only give the factory labourer, the slave of modern industry, light, air, and cleanliness, but also a sense of the value of the great concept that drives it all. . . . If this consciousness were to be awakened in the individual worker, then perhaps the social catastrophe that daily threatens us from the tumult of economic life can be avoided. Farsighted organizations have known for some time that work increases with the contentment of labour, thereby raising productivity in the factory. The sophisticated industrialist, then, will do everything possible to enliven the stifling drudgery of factory life, and to soothe the stress of work. (Gropius, 1911a)

The "new" industrialist, therefore, was not the culprit, but the potential saviour of a society in turmoil. By acting intelligently in his own interests, an alliance with the interests of labor could be forged, not by autocratic means, but rather by the subtle partnership that was the essence of scientific management. But Gropius was still faced with reconciling such conciliatory pragmatism with the high ideals of art that he refused to abandon:

> The field of art, that is the monumental art of genius . . . begins where transcendental vision impregnates knowledge and representation. Art accomplishes nothing by representing the conscious world, with its naive impulses; it is *rooted* in spiritual needs and fulfils the spiritual needs of man. *In principle* it has nothing in common with material needs. The purpose of art is the representation of high transcendental ideals, by material means of expression that belong to the conscious world of space and time. (Gropius, 1911a)

Thus, like Behrens, Gropius believed that *Zweckmässigkeit*—practicality—while essential, was certainly not enough. On the other hand, the transcendental vision that was the wellspring of true art was not to be imposed on contemporary reality, but inspired by it; only thus would it be possible to adhere to the spirit of the times. But then, by insightful—and rather expedient—rationalization, Gropius seems to have transformed this spirit, at least in part, into the self-serving public image that industry wished to project, thereby deriving his own vision from the most compromised of motives. A few weeks before being appointed by Benscheidt he wrote:

> The promotional responsibilities of the architect must eventually be recognized. His creative activities in particular must come to terms with the *promotional intentions* of the farsighted industrialist; they can lend a distinctive quality to the factory which mirrors the character of the whole enterprise. (Gropius, 1911b)

It could perhaps be claimed that if the Fagus-Werk represents the crucible of modern architecture, then it was born, not primarily out of avant-garde radicalism, but from pragmatic conciliation, an expediency that was to separate architecture from the mainstream of the artistic upheaval of European Modernism. It was not, finally, only Gropius' adherence to prevailing theories of art, but also industrial power, which led him to argue for proletarian well being on the shop floor while promoting the interests of industrial capital, which confronted Gropius daily in the forceful presence of Carl Benscheidt. The avoidance of social chaos (and therefore of the disruption of the old order) was apparently synonymous in his mind with his interpretation of the autonomous cause of art, which sought a grand reconciliation of the schisms in everyday life:

> From a social point of view, it is not a matter of indifference if the contemporary factory worker labours in the desolation of ugly industrial barracks, or in well-proportioned space. He would

> be happier to participate in the production of those things that benefit everyone in an artistically inspired workplace, confronted by an innate beauty that enlivens the monotony of mechanical labour. In this way both the spirit of the worker and the whole productive efficiency of the firm would grow. (Gropius, 1911b)

It was not the invocation of high artistic ideals anchored in practical and political reality that distinguished Gropius from his older contemporaries in the Werkbund. Many of them held similar views, given their position as advisors to a powerful elite that was in the process of recognizing, on the one hand, the pecuniary merits of a decent work environment mirrored by a humane public image, and, on the other, the dangers of proletarian unrest. Moreover, the artistic theories of Hegel and Alois Riegl were widely regarded as the main conceptual weapons in a campaign by architects to dislodge the virtual monopoly held by engineers in factory design. *Zweckmässigkeit*—spatial efficiency, structural economy, air, light, and cleanliness—were attributes of nature, rather than culture; it was the material, not the essence, of the *Zeitstil,* and therefore fell short of the more spiritual demands of architecture. But while these views were widely endorsed in the architectural salons, they had not, until the Fagus-Werk, found convincing expression in construction. But soon the factory—the object of protest, the laboratory of technical and economic progress, and the potential advertisement of ostensibly benign, cooperative intentions—was to become the first artefact of this cause.

## ARCHITECTURE, URBAN LAND AND INDUSTRIAL POWER

The Hegelian essence proclaimed by the members of the Werkbund could no more find expression in the mere assembly of new architectural leitmotifs than it could in straightforward practicality. Any iconographic analysis of the Fagus-Werk will reveal that none of the "new" motifs—the flat, barely projecting roof, the curtain-wall membrane, even the open columnless corners—was without precedent. Instead, the factory depended for its breakthrough upon the inspired integration of constructed space and external space, an arrangement that still carries a message of congenial symbiosis between the world of manufacturing and society at large. This impression is due primarily to the very absence of the characteristic that Peter Behrens sought to impose—corporeality (Figures 18–21).

Corporeal architecture, in a historical sense, is the architecture of the inner city. Its social message is the unequivocal exclusion of the street mob from the proprietory domain that extends to the boundary between confined public activity and enclosed private territory. This is almost as true for the Kleinmotorenfabrik as it is for the Palazzo Strozzi, in the sense that the Berlin industrial hegemony had by that time nearly attained the assertive aura of Florentine aristocratic privilege. But architectural corporeality also carries a more subtle yet equally powerful message, one that reinforces the association between solidity and urbanness: the equation in the subconscious of facadal mass with capital intensity. The weight of stone, brick, and ornament occupying the site perimeter becomes a kind of metaphor for the great volume of construction that it encloses and conceals from view.

Suburbanity, on the other hand, is essentially the substitution of construction capital by land (cf. Hoch, 1969; Waterhouse, 1983); one activity is separated from another less by sheer mass than by space that absorbs the outside shape of internal function and neutralizes the impact of external intrusion both upon, and from, surrounding activity. It has been sensed, long before Frank Lloyd Wright and Walter Gropius, that the villa

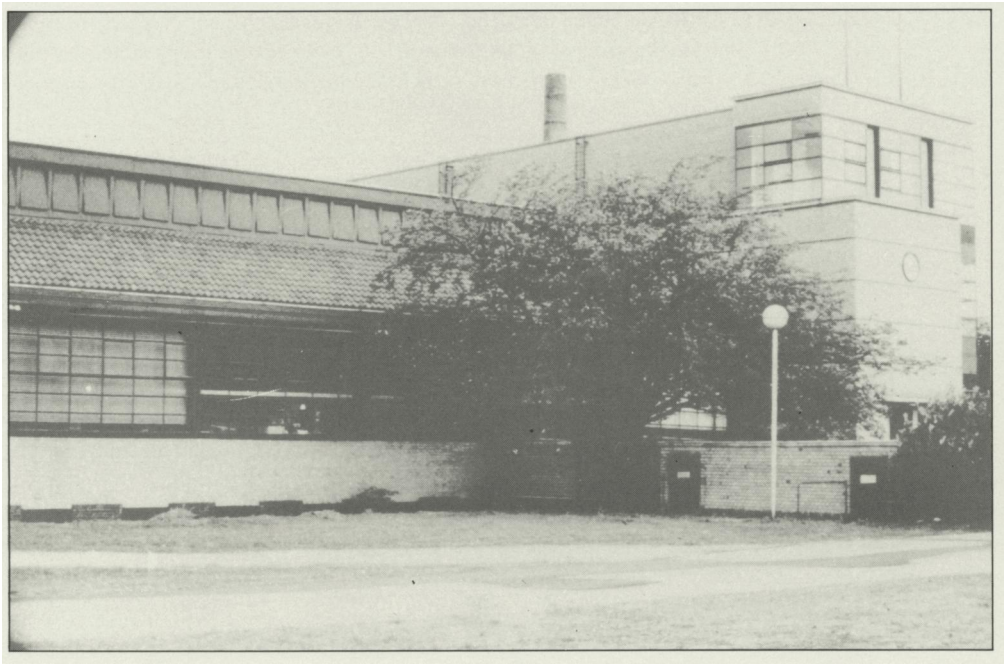
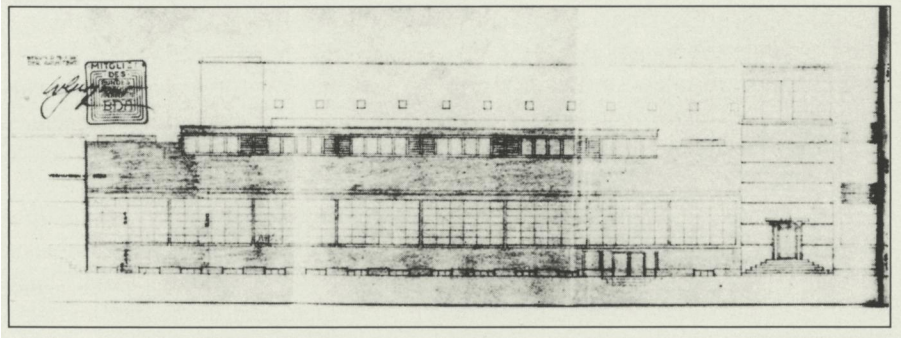


FIGURE 18. View of the Hanover Street front of the Fagus-Werk.

and the factory, otherwise so incompatible, were identical in their need to occupy the kind of spatial cushion that is peculiar to the loose development of the urban hinterland. Only there was it possible to deal, simultaneously, with the customized demands of internal organization and the necessary amelioration of outside effects. But it took the intuition of Wright and Gropius to realize—quite independently of each other—that the absorptive, neutralizing qualities of suburban space were the key to the invention of an architecture capable of matching the land-intensive patterns of human organization that were then beginning to engulf the industrial city.

FIGURE 19. Drawing by Gropius of the west elevation of the Fagus-Werk (1913). (Source: Bildarchiv Foto Marburg)



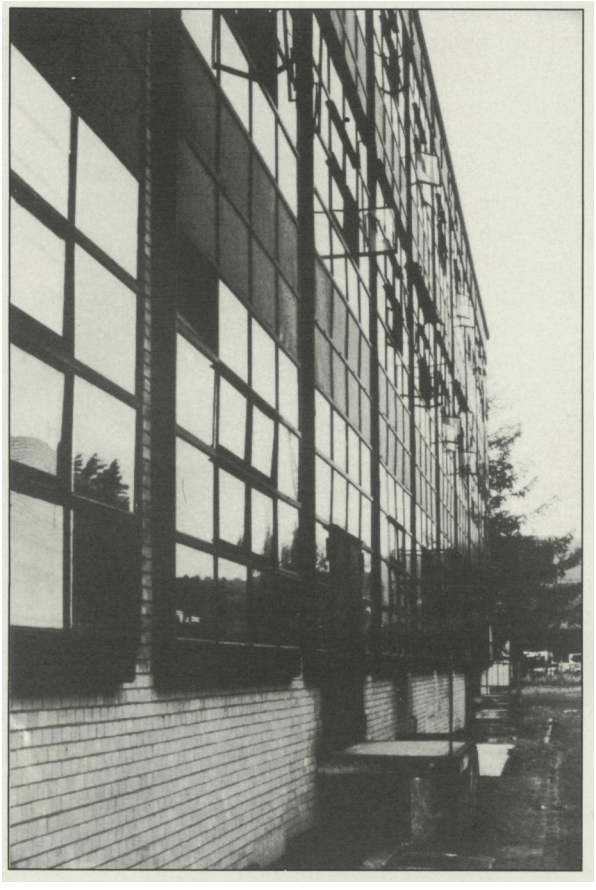
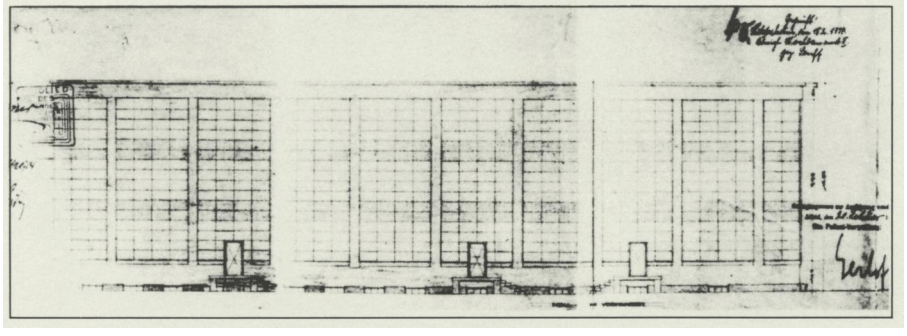


FIGURE 20. South side of the administrative block of the Fagus-Werk.

FIGURE 21. Drawing by Gropius of the administrative block of the Fagus-Werk (1913). (Source: Bildarchiv Foto Marburg)



For Gropius, the corporeal facade was not only a redundancy in the context of suburban space, or an artefact that excluded light and air. It also precluded, in a cogent symbolic sense, the essential mediation of industry and society that formed both the core of his own political philosophy and the promotional demands of industry itself.

The immediate significance of the Fagus-Werk was therefore derived from its apparent neutralization of industrial assertiveness; it was absorbed by the spatial cushion that surrounded and penetrated the transparent threshold, simultaneously disengaging, but not excluding, the factory from the wider community of Alfeld.

There seems to be a contradiction in the fact that Gropius' achievement occurred under such less-than-auspicious circumstances—a provincial environment, the limited scope afforded by Werner's drawings, and the intransigence of Carl Benscheidt himself—whereas the resources and encouragement of the AEG were at the disposal of Peter Behrens in Berlin. It appears that, in these two cases at least, architectural inspiration was affected less by the financial circumstances and sophistication of the client than by the imperatives of urban structure. If this is indeed so, then a closer alignment of architectural and urban analysis might help to clarify some current questions.

The deeper significance of the Fagus-Werk, nevertheless, concerns the appropriation and debasement of architectural ideals. The major social and political questions of the time were seriously addressed in the early writings of Walter Gropius, who believed that the deepening rift in German society could not be mended by material concessions alone. Spiritual unity, fostered by an architecture that did not represent any special interest, but contained the sense of a higher order, was the key to social unity. Industry did not so much subvert this appeal, which was soon to become integral to modernist thought, as inspire it and to put it to use from the beginning. It is conceivable that the eventual establishment of the new architectural syntax depended upon its double role as ideological message and decoy, which would explain why it would be disparately applied, first by the Constructivists and the Weimar architects, then by corporate and industrial capital alike. With time, however, the syntax no longer obscures reality, but exposes it, as society's recognition of the location of power grows with day-to-day experience. The camouflage thus becomes a badge; in the process any vestige of ideological content is either forgotten, or becomes disreputable by association. But the multiple, contradictory demand placed upon architecture still prevails, stirring further rounds of invention.

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