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0521827264 - German Industry and Global Enterprise BASF: The History of a Company

Werner Abelshauser, Wolfgang von Hippel, Jeffrey Allan Johnson and Raymond G. Stokes

Excerpt

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Introduction by the Editor

1. FROM NEW INDUSTRY TO THE NEW ECONOMY

The corporate history of BASF (Badische Anilin- & Soda-Fabrik, founded in 1865), spans an era of German and international economic history that began with the rise of the “new industries” as of the late nineteenth century and continues today in their confrontation with the new economy. BASF is one of the pioneers of that “second economic revolution,” whose significance in the eyes of Douglass C. North, a founding father of New Institutional Economics, far surpasses that of other economic turning points such as the Industrial Revolution. Ever since BASF was created in the midst of this revolutionary upheaval, it has had a hand in actively laying the groundwork and shaping the conditions of this stage of western economic life. The company embodies a special symbiosis between business and scientific research, one that has constituted the essence of economic value-added – and not only at BASF – from the outset but also increasingly in the economy at large.

The new industries of the late nineteenth century long ago became mainstays of the German economy. They now determine the tempo of growth, sustain the labor market, and influence what happens on the stock market. They are responsible for the leading role of exports as well. It is certainly no exaggeration to say that the future of the German economy (and many others) in the postindustrial age depends on the fate of these industries and on their competitiveness on the world market. That link makes the history of a company that is now nearly 140 years old an important chapter in a still unfinished epoch of economic history. Like most companies of new industry, BASF is among the pioneers of expanding global and transnational market relations. This expansion started in the first decades of the company’s existence. By the outbreak of World War I, the dimensions and dynamics of the world market had already developed to a level not achieved again until the second half of the twentieth century. Though the process known today as globalization was repeatedly interrupted by two world wars and the Great Depression, its intrinsic coherence remained intact. This point becomes clearer from the company’s history than from a macroeconomic perspective. BASF developed at the forefront of the process but was also drawn deep into

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the accompanying twentieth-century crises that characterized the economic and political development of that period.

The corporate history of BASF therefore promises more than only a glimpse into the functioning of an industrial organization that has held its own on the market since 1865. It reveals a good deal about the reasons for the extraordinary economic dynamics of the German empire and the enormous expansion of the world economy before World War I. It permits one to probe the origins and spread of the knowledge society, in which science and research-based innovation have become the key determinants of economic growth and social development. By the same token, BASF's history stands at the center of Germany's wartime economy during two world wars and highlights both its strengths and weaknesses.

BASF's history also includes the era of IG Farbenindustrie AG, the trust formed in the complex 1925 merger of the chief German manufacturers of chemicals, pharmaceuticals, and dyestuffs. It was regarded as a pillar of National Socialist arms policy and a key factor in the Nazi party's push for autarky after 1933. For the interval from 1925 to 1945, it is not a matter of seeing the story of IG Farben as a surrogate for BASF's discontinuous corporate history. Such substitution is impossible for the very fact that BASF did not exist as an actor in those years. The Upper Rhine works group that subsumed its core factories had neither a managing board nor any other legally relevant body to exercise discretionary authority within IG Farben. Moreover, BASF was split as a business unit because the corporate structure of IG Farben drew a sharp line between Ludwigshafen and Oppau, a boundary formed by two largely independent and, in some ways, even competing divisions. Instead, the idea is to reconstruct BASF's history within the greater context of the corporate group. The way in which the corporate culture of BASF emerged and developed through institutional competition within IG Farben, especially in light of the politicoeconomic circumstances after 1933, underscores that culture's persistence, vitality, and ability to survive.

But the foremost advantage of writing the history of IG Farben from the perspective of BASF is that the group's entanglements in the Nazi regime's arms policy and pursuit of autarky – specifically in the system of forced labor in Auschwitz – can be followed and understood more discerningly than hitherto possible. Without insight into the role of IG Farben in Ludwigshafen, Oppau, and Leuna, one cannot decipher fundamental driving forces of the Third Reich's economy. Paradoxically, this assessment also applies to a quite different episode of German history, the “economic miracle” after 1945, and not only because of the dual-use structure of chemical production. Just as it was the skills of IG Farben's Upper Rhine operating group that enabled the trust to support Germany's course of politicoeconomic autarky by technical means after 1933, so it was that BASF soon stood again in the front ranks of those who facilitated West Germany's startlingly quick return to the world market. BASF has since been among the transnational companies of

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German origin whose efforts to succeed at the leading edge of economic and technological progress are paradigmatic for Germany's entry into the new economy of the twenty-first century.

To penetrate to the heart of BASF's corporate history, however, one must examine the way in which the company itself functions, must delve into its corporate governance, financial system, industrial relations, system of qualification, and relation to other companies in the same sector and to the economy at large. What is the structure of BASF's social system of production and how is it changing? This question is central in each of this book's four sections, which divide the presentation of BASF's corporate history into phases of development. The answers in the "Farben period" (1865–1900) are unlike those arrived at during the major syntheses (1900–1925) that molded BASF's high technical standard and technology-centered corporate culture. The answers during the IG Farben period and its aftermath (1925–1952) clearly differ from those given by the new BASF, which emerged in 1952–3 out of what was left of its operations in the IG Farben group. Equally important is the question about the decision-making processes involved. What were the bases, methods, and results that together constitute the strategic response the company makes to the development of its markets?

From the outset, we authors were aware of how difficult it would be to address issues pertaining to specific epochs and still keep the whole picture of BASF's corporate history in focus. We therefore agreed that the unifying element of our presentation would be the social system of production, of which corporate culture can be considered the overall expression. The rules and norms that shape how people think and behave in an organization – those strengths and weaknesses acutely affecting a company's success – are not created by some abstract biological process of organizational aging but rather mostly by incentives and rewards provided by the market. They also determine the latitude for pursuing entrepreneurial strategies and limit the discretionary freedom of top management. The separate eras in the history of BASF have each helped bring about and shape the organization's corporate culture in a specific way, yet that culture's abiding continuity allows the company to transcend such temporal boundaries.

BASF's interest in having independent historians analyze its corporate history ideally matched our desire to use BASF's history in order to answer pressing questions posed within the rapidly expanding field of corporate history. They go far beyond the interest in the Nazi period that the public has shown for some years now. The emergence of New Institutional Economics as one of the most dynamic schools in the discipline of economics has brought entrepreneurs and managers to acknowledge the significance of institutions as cornerstones of corporate culture and as foundations for their own scope of action. This perception is sharpening top management's cognizance of corporate history quite apart from anniversaries and memorials. History matters!

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BASF not only funded the study of its corporate history, it also assisted in any other way it could. The work is therefore based on a broad range of sources. Of course, BASF's own archive was the primary source consulted. The organization granted our request for unrestricted access to all the material. It even released files that had not yet been catalogued, mainly the minutes of managing board meetings of BASF AG from 1953 to 1975, which furnish a complete record of the decision-making process behind the organization's corporate policies. For subsequent years, BASF applied the rules governing public archives, under which their documents remain closed for thirty years, even for research purposes. The company facilitated our work by providing the project with a competent and committed team of historians and archivists directed by Dr. Lothar Meinzer. We sincerely thank him and his colleagues in the archive: Dr. Susan Becker, Jutta Kissener, Dr. Christiane Pfanz-Sponagel, Dr. Kristina Winzen, and Annette Wolpert. However, we authors alone are responsible for the results of the work. We state unmistakably that BASF is the subject of this study and was not itself involved in the scholarly investigation of its history. On the contrary, the company gave – and strictly honored – its express pledge not to influence the work of the authors and the editor. The present study is anything but self-aggrandizement on the part of BASF. To suspect otherwise would be a gross misunderstanding.

The authors and the editor are also indebted to those outside BASF who were involved in bringing about this work. We are grateful to Anne Stokes (Glasgow) and David Antal (Berlin) for providing the English translations of the contributions by Wolfgang von Hippel and Werner Abelshauser, respectively. I have enjoyed working with the staff at Cambridge University Press in New York, Dona Hightower Perkins read the manuscript, Michie Shaw managed the production, and Frank Smith gave the project his full support. At home, Matthias Band, Lars Heidemann, Christel Schwigon, and Frank Werner fought the battle of indexing while managing the files making for the corrections to various drafts of the manuscript. We express our sincere appreciation to all of them.

Bielefeld, May 2003

Werner Abelshauser

I

Becoming a Global Corporation – BASF from 1865 to 1900

Wolfgang von Hippel

At the beginning of the twentieth century, the Badische Anilin & Soda-Fabrik (BASF) was “without question the largest chemical factory in the world,”¹ at least in the field of organic chemical production. The firm’s history – and especially its early history – mirrors to an unusual degree the development of an entire industrial sector, the coal-tar dye industry.

The coal-tar dye industry came into its own as the most important “new” industrial sector in Germany during the second half of the nineteenth century, prior to, but also alongside the electrical industry. Through the increasingly scientific basis of its production, it proved an important force for economic modernization in imperial Germany. Furthermore, within the space of just a few decades, the industry was able to secure a virtual international monopoly owing to its capabilities in production and sales of synthetic dyestuffs. In fact, on the eve of World War I, it manufactured more than 80 percent of world production and accounted for 90 percent of world trade in the field. What is more, the industry had also expanded into new areas of production. The largest firms had already incorporated into their planning and production programs promising new areas such as pharmaceuticals, photographic supplies, and the synthesis of rubber and ammonia.

When the German coal-tar dye industry first started out, its rapid rise to a commanding position in the world economy could not have been predicted. After all, the starting conditions in England were certainly far better, in terms of supply of raw materials and availability of capital, but also in terms of application of industrially proven technical processes (e.g., the soda industry). Markets, on the other hand, were favorable everywhere and helped bring about the industrial expansion of synthetic dyestuffs production. In the international marketplace of textile production, in particular, the new dyes faced competition only from natural dyestuffs, which were generally more expensive. They soon demonstrated their superiority over these traditional products in their range of colors, the ease with which they could be used in the production process, and, to an ever-increasing degree, in colorfastness, too.

¹ Weltausstellung, 68.

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So it was that, by the twentieth century, the coal-tar dye industry developed in a close symbiosis with one of the leading branches in early industrialization, the textile industry. The prospect of high profits provided sufficient incentive for a substantial number of producers in England, France, Germany, and Switzerland to move into the new area.² However, the market, which was contested with increasing bitterness, allowed firms to operate successfully in the long term only if they:

- 1) had chosen a production site that was advantageous both from a technical and a commercial point of view;
- 2) were able either to translate rapid progress in scientific and technological knowledge into industrial innovations within the shortest possible time, or else had secured an effective position of scientific and production leadership through a systematic research program;
- 3) possessed the wherewithal to build up a healthy market for their products, thus establishing the most important precondition for profitable large-scale production.

The second and third of these points, which are closely linked with the effectiveness of systems of education, training, and science and with economic and social attitudes, eventually proved especially important for the astonishing success of the German coal-tar dye industry as a whole, and for BASF in particular.

In the first decades of its existence, BASF concentrated on the manufacture of synthetic dyestuffs and products associated with them. The company was able to achieve a leading market position internationally in this area and thus laid a solid basis for further expansion. Around 1900, a number of developments took place both within and outside of the firm, which signaled that even greater changes would take place, changes that would require substantial investment and a corresponding increase in share capital. In the firm's major area of interest, dyestuffs, key breakthroughs came in the form of full-scale industrial production of synthetic indigo (1897) and the discovery of the indanthrene dyes (1901). In the field of inorganic production, the process for liquefying chlorine (1888), the contact process for sulfuric acid (1890/98), and the electrolytic manufacture of chlorine all set the stage for new technological directions that led eventually to synthesis of ammonia and, with that, a fundamental change in the product spectrum of the company. In the area of sales, the first "small" community of interest

² The most important overviews of the history of the chemical industry in Europe and North America are in the works of L.F. Haber and, from the standpoint of technical development in particular, Hohenberg, *Chemicals*. For the dyestuffs industry (with particular emphasis on its scientific development), see more recently Travis, *Rainbow Makers*, and also the contributions in Homburg, Travis, and Schröter, *Chemical Industry*. For Germany in particular, see Beer, Emergence, and Wetzel, *Naturwissenschaften*.

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(“*Dreibund*”) between BASF, Bayer, and Agfa (1905–16), an initiative established in competition with the similar agreement between Hoechst, Cassella, and Kalle (“*Dreiverband*”), had as its goal a restructuring of the market and of market strategies and had, therefore, a pronounced impact on internal firm organization.

However, if there was a stronger pattern of change around 1900 than was previously the case, this does not mean that the first 35 years of the history of the BASF firm were a period of idyllic calm. Contemporary actors, who anticipated an uncertain future, experienced the beginnings of the coal-tar dyestuffs industry much more often as a new departure. Despite all of the tensions, vicissitudes, and occasional complaints, it was also a departure that was experienced and generally acted out with optimism and positive expectations, and, in retrospect, appears largely as a success story.

I. THE PREHISTORY

Friedrich Engelhorn – Pioneering Entrepreneurship

Even though corporate structures and the anonymous forces of the market seem to play a huge role in the development of modern big business, what we now term “human capital” (something frequently valued as the decisive resource of the economy) remains extremely important. This human capital includes, in particular, the senior management of firms, mostly owing to the extensive responsibilities they carry. During early and high industrialization, when the economy and society underwent especially dramatic change, the personal element was at its most important. The pioneer role of the “dynamic entrepreneur” (J.A. Schumpeter) in Germany’s move into the period of high industrialization is exemplified especially well in the life and works of Friedrich Engelhorn (1821–1902), the founder of BASF.

Besides the problems of raising capital, the expansion of coal-tar dyestuffs production posed unusual technical and commercial challenges. The purchase of raw materials that had previously been scarcely in demand had to be organized, efficient production methods and the necessary technical apparatus had to be developed, and the new products had to be sold to a customer base that was frequently traditional in its orientation. Thus we find among the successful founders of coal-tar dye factories not only dye merchants and master dyers but also pharmacists and trained chemists. Additionally, however, there were also men who were active in a number of different business fields, men who have been characterized as all-round entrepreneurs.³

Friedrich Engelhorn belongs to this last group.⁴ He was born in Mannheim on July 17, 1821, the third son and fourth child of the brewery master

³ Kocka, *Unternehmer*, 45f.

⁴ Engelhorn’s biography is dealt with extensively in Schröter, *Engelhorn*.

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and later wine merchant, Johann Engelhorn, and his wife, the daughter of a nearby innkeeper. In social terms, therefore, he was a child of the urban middle class.

When his parents sent the nine-year-old boy to a well-respected grammar school in Mannheim, it seems likely that their motivation in his case, as in that of his elder brothers, was not only to provide an opportunity for an excellent education, but also to provide opportunities for the boys to enter new professional territory outside the family tradition. (One of his brothers became a publisher, the other an attorney.) Nevertheless, Friedrich's school career ended early. In 1834, before the end of his third year, he left the grammar school to take up an apprenticeship with an established Mannheim gold and silversmith. In 1837, the sixteen-year-old apprentice went on a nine-year journey that took him to a number of different places, including Frankfurt, Munich, and Vienna, and later to Switzerland. He ended up in France, where he visited Lyon, known as the metropolis of silk processing, and, in particular, Paris, the European center for practically all luxury goods.

In 1846, he returned to Mannheim, where in March 1847 the young "gold worker," "bijou maker," or "jeweler" (as he called himself) obtained citizenship and guild rights in the city. He opened a workshop and, a few months later, married the daughter of a Mannheim brewer, Marie Brüstling. This was in every sense a "good match," particularly because her dowry secured the basis for his professional independence.

Thanks to his many years spent abroad in much larger cities of central and western Europe, Engelhorn had seen with his own eyes many of the major developmental trends of his age. Now at home in an environment in which the beginnings of intensive industrialization could be detected, he set his sights beyond his craft from the beginning. During the revolutionary year of 1848, together with a Belgian engineer and another member of the Mannheim middle class, he founded a limited liability company known as "Engelhorn & Cie.," in order to produce and sell "portable gas" (i.e., bottled gas). Engelhorn was the largest financial contributor to the company, and he began trading by the end of the year, this in spite of the fact that the Belgian partner proved unreliable and the Mannheim partner died unexpectedly.

In entering into his first large-scale business enterprise, the one-time goldsmith demonstrated characteristics that would help ensure his remarkable success in the coming decades. In addition to decisiveness and stamina, he also showed a willingness to take calculated risks on the basis of clear insight into the long-term possibilities of a given project. In 1848, on the basis of existing experience, it was beyond question that the industrial manufacture of gas for lighting was a safe venture. The same was true at the beginning of the 1860s for the newly discovered aniline dyes. After all, gas lighting was already widespread in the 1840s, especially in England and the United States, and Engelhorn had come into contact with this personally during his itinerant years, in Vienna and Paris at least. In the Upper Rhine area, artificial

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lighting had been introduced in the spa town of Baden-Baden in 1845, and – after some teething problems – in 1846 in the capital of the Grand Duchy of Baden, Karlsruhe. In 1849 the leaseholders in the latter sought to include Mannheim in their lucrative business. The potential competitive situation between these newcomers and Engelhorn was resolved at the beginning of 1851, when together with him they formed the *Badische Gas Lighting Company (Badische Gesellschaft für Gasbeleuchtung)* that took over a long-term and profitable lease of the Mannheim gas works (which the city had commissioned them to build). Engelhorn, who brought his bottled-gas works and its customers into the firm, served as its local commercial and technical director for the following decade and a half. In 1865, however, he sold his share of the company to business partner Friedrich August Sonntag, turning his full concentration to the new dyestuffs business.

After all, as early as 1859/60, gas works director Engelhorn – by now a wealthy, respected, and politically active member of his parent city's middle class and on the best possible terms with the local financial and economic elite – was clearly on the lookout for favorable investment opportunities. An indicator of this was his, admittedly quite short, financial engagement in a machine factory and the founding of a commission and freight company (Engelhorn & Co.) in New York on September 15, 1860. The managing director of the latter was Friedrich's younger brother Louis, who, through unlucky speculation, soon drove the firm into bankruptcy. Engelhorn, however, remained much closer to home in his own business dealings, especially when in 1860 he decided to build an aniline and dyestuffs factory next to the Mannheim gas works.

A Massive Market – The Beautiful World of the New Dyestuffs

The discovery of the first aniline dyes, which drew notice from far and wide, and the unusually high profits that their production promised thanks to lively demand from the outset naturally did not remain hidden from Engelhorn. Only relatively few effective dyestuffs were available on the domestic market, and all of them were from “dye plants,” plants “whose roots, wood, bark, stems, leaves, flowers, or fruits contain dyes which are subject to technical application, or else can deliver this after suitable processing.”⁵ One of the most important of them was Turkish red, which came from the madder root native to the Levant and which, beginning in the sixteenth century, was cultivated in western and central Europe. Another was the blue and black dye that was extracted from woad and that through the addition of other dyes could give brown or green tones.⁶ Also important for yellow shades were

⁵ Meyers Konversations-Lexikon, vol. 6 (1894), 188.

⁶ For this and the following, see Lauterbach, *Geschichte*; Georgievics, *Handbuch*, 466ff; Reckel, *Aufstieg und Fall*.

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buckthorn (Persian berries), dyer's luteolin, or reseda, dyer's broom, and dyer's safflower. Orseille, a red dyestuff, was raised in only mediocre quality from lichens in central Europe. But better quality and larger quantities were available only from Madagascar, Zanzibar, South America, and the Canaries. In any case, the discovery of America and of the sea route to India and the Far East decisively enriched the range of available dyestuffs. These new geographic discoveries brought with them access to a large number of previously unknown plants and trees such as turmeric (Indian saffron), fustic wood, redwood, logwood or campeachy wood, sandalwood, and quercitron or flavin (the bark of the North American dye oak). At times, the new goods managed to drive out previous products, as for instance in the case of indigo. Cultivated primarily in India, indigo, with its strong dye content, effectively destroyed the competitiveness of domestic woad, or wild indigo, cultivation, which had its main focus in Thuringia.

Many of these vegetable dyes, however, turned out to be not especially light or colorfast. Intensive methods (such as extraction and fermenting) therefore had to be employed to get superior, more concentrated and pure materials from the natural starting materials. These included plants, woods and even insects (such as the cocheneal scale insect, which came from Central and South America for the most part and which provided the expensive red carmine). The madder root, for example, contained only about .5 to 1.5 percent dyestuff, which in a natural state was mixed with a large number of brown-colored contaminants. What is more, the techniques that had to be used to manufacture and apply dyes were complicated and time-consuming. The Turkish red dyeing process using madder, for instance, required up to twenty separate operations, which took about six weeks to complete. In addition, there was no standardization of colors, and impurities led to unwanted shades. The reliability of the dyeing process thus remained limited, even in the case of dye masters with lengthy experience. On top of this came the problem that various materials – in particular textiles such as wool, cotton, silk, and mixed fabrics, but also leather and paper – had to be treated initially through the so-called mordant process (especially using metal oxides) so that the dye would take. The dye process, just as the dye-printing process for cotton, thus remained a craft that required a good deal of experience and tacit knowledge. It also produced a pronounced tendency toward extreme secrecy with regard to individual dye recipes.

Given these difficulties, the synthesis of an artificial dyestuff in the chemical laboratory by the 18-year-old Englishman William Henry Perkin in 1856 created a sensation. For the first time, there arose the attractive possibility of producing dyestuffs independently of certain plant-based raw materials, in almost any quantity desired and of a standardized quality. Moreover, it could all be achieved without the risks associated with cultivation and uneven harvests, or longhaul transport.