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Punctuated Equilibria: Three 'Leaps' in the Evolution of the German Vocational Training System[1]

Abstract: Punctuated Equilibria: Three 'Leaps' in the Evolution of the German Vocational Training System. Germany's vocational training system evolved into its modern form in the four decades between 1897 and 1937. This evolution did not occur smoothly, but in three bursts of activity, each under a different political regime. After the 1897 *Handwerk* Law established a partial model for overcoming incentives problems associated with training skilled workers, between 1907 and 1912 the German state organized a 'coalition of the willing' among German engineering and machine-tool firms in order to extend the same model to parts of industry. In the mid-1920s, the major German industrial groups took the initiative to standardize vocational profiles and training schemes. Finally, in the mid-1930s German industry and key national ministries cooperated to give standardized certifications for industrial vocations legal standing on par with those in handicrafts. As a result, hundreds of thousands of young Germans began entering apprenticeships for skilled work.

Key Words: Vocational training, industry, handicrafts, *Kaiserreich*, Weimar, Nazism

Introduction

In the late 1930s the German system of industrial vocational training assumed its modern form. A 1938 decree of the Ministry of Education put industrial apprenticeships on the same legal footing as those in handicrafts. With this step the Nazi state gave its sanction to efforts industry was already undertaking to create hund-

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reds of nationally standardized industrial *Berufe*. After a three- or four-year training, combining an apprenticeship and study in a vocational school,[2] each young worker would earn a *Lehrbrief*, a certificate of his training. And thanks to 'a great cooperative endeavor' started a few years earlier by industry, the Ministry of Economics, and the Labor Administration, hundreds of thousands of young Germans were now entering industrial apprenticeships each year. By 1939, German industry was offering more training positions to young (male) Germans than there were (male) students leaving school. Certification and standardization together produced a mobile high-skills workforce. This vast expansion of skilled positions promised to lift German workers out of the proletariat into the middle class: whatever the regime's intentions, this amounted to a de facto Nazi program of upward mobility.

Even if these capstones were placed on the German vocational system during the Third Reich, the Nazis were hardly the sole, or even particularly important, progenitors of the system. Rather, a partial blueprint had been sketched forty years and two regimes earlier, in the 1897 *Handwerk* Law. Over the ensuing four decades, this basic model was extended to apply uniformly throughout the country and to include industry, not just handicrafts. These crucial expansions did not follow a smooth, linear path, however. Instead, they occurred in three bursts of intense reform, one in the last peacetime years of the *Kaiserreich*, one during the relatively stable, middle years of the Weimar Republic, and the final one, as sketched above, during the antebellum Third Reich. If the basic model was available as early as the turn of the century why did it take 40 years to implement fully? And why did the extension to industry occur how and when it did, in concentrated bursts – or, to borrow the language of evolutionary biology, 'punctuations'[3] – between 1907–12, 1925–29, and 1934–39?

The 'Apprenticeship Crisis' and the Progressive 1897 *Handwerk* Law

To answer these questions we must first briefly sketch the state of vocational training in the late 19th century, above all the fundamental problem it faced, as well as the blueprint of a solution contained in the 1897 *Handwerk* Law. During the first decades of the *Kaiserreich*, when the new country's institutions were still proving themselves, so much seemed in flux, and national self-assurance mixed with anxiety. Youth was a focus of particular concern.[4] Without proper guidance, school-leavers might fall into bad moral habits or, even worse, under the sway of the burgeoning Social Democratic movement. Even more troubling to the authorities than these political risks, were the economic dangers, as recent research has emphasized.[5] Without a well-trained workforce, German firms – Germany itself – risked falling

behind increasingly dynamic foreign challengers, not just in Europe but in the Japan and the United States.

The worries were most acute in handicrafts, where the talk since the 1870s had been of an 'apprenticeship crisis.' Recent work in the fields of New Institutional Economics[6] (NIE) and Varieties of Capitalism[7] (VOC) illuminates the causes of the crisis, suggesting that at its root was an incentives problem. The North German Confederation's liberal industrial code of 1869, which the German Empire adopted in 1871, had finally abolished the last remaining guilds. These, while already in decline, had nonetheless still regulated apprenticeships and overseen certification of masters, however inadequately. In the absence of any authority to retain their apprentices at the end of their training period, masters were now even more likely than before to exploit their charges as cheap labor. With ever greater frequency, apprentices, seeing few prospects in being trained and tempted by the initially higher wages and less onerous supervision in large industry, broke their contracts early. Consequently, industrial employers had little way of judging the skills of those they hired away from *Handwerk*. As NIE and VOC suggest, the incentive problems handicapping German vocational training in the first decades of the *Kaiserreich* were problems of *any* liberalized labor market.[8]

The solution came in 1897, in the form of a revision to the industrial code governing handicrafts. Contrary to earlier scholarship, which regarded the *Kaiserreich*'s handicrafts policy and in particular the *Handwerk* Law as a politically motivated attempt to shore up the backward-looking, defensive strata of craftsmen,[9] Hal Hansen has convincingly demonstrated that economic, market-friendly motives shaped the Law's final form.[10] Most importantly, the Law reestablished at the regional level a modified, modernized form of handicraft guild less than three decades after it had been abolished. For the older scholarship, this move away from a purely liberal economic order could only have had (conservative) political motives. And some figures in the Reich and Prussian governments did intend the Law to work in this direction. New Institutional Economics and Varieties of Capitalism approaches, however, attuned to the informational and incentives problems of any economic order, put the 1897 bill in a completely different light. Drawing on models in the southwest German states of Baden and Württemberg, the reestablished, modernized guilds could establish standards for training, supervise apprenticeships and new apprenticeship contracts, and certify the results of qualifying exams. The legislation was meant not to protect *Handwerk* from competition, but rather to give artisans a chance of succeeding in the market. The system of standardized certification gave youths and handicraft masters the incentive to engage in vocational training. For the former, the certificates were portable, and hence valuable, attestations of the skills they had acquired. For the masters, the certificate system, coupled with new apprenticeship

contracts, meant that they could count on their apprentices not running away and that, even if they could not retain them after their exams, any journeymen they hired from outside would have a similar level of training. The only apparently illiberal restoration of guilds thus provided a means of partly overcoming the disincentives to train and be trained inherent in a completely liberalized labor market. The reestablishment of modernized guilds belonged, at least in part, to a liberal economic strategy on the part of a German state intent on creating a high-skills workforce.

Yet if this model of collectively certifying training provided a blueprint for the future of the entire German vocational system, its realization in 1897 was only a partial success. This Law established a patchwork of regional guilds but no national framework for agreeing on and enforcing collective training standards. Over the subsequent years, the restored bodies made efforts to forge ever-broader associations, but this was slow going. A much more significant limitation of the 1897 reforms, however, was the fact that they applied only to handicrafts and not to industry. As a result, the main employer of skilled labor and the trainer, by 1907, of fully one-third of all skilled workers[11] played no role in collectively setting and certifying skill levels. This was partly due to the mistrust between handicrafts and industry,[12] and partly to industry's ambivalence about the future role of the skilled worker (see below). These limitations, however, should not obscure the 1897 legislation's real successes. In the short term, it began to alleviate the 'apprenticeship crisis' in *Handwerk*. In the long term, the 1897 legislation's certification procedures would provide a model for a general solution to the incentives problem of creating a mobile high-skills workforce, one that would be complemented by steps industry took in the 1920s, and then fully implemented throughout the German economy starting in the late 1930s.

The First Punctuation, 1907–12: The Prussian Trade Ministry and Industrial Self-Organizing

Given the growing importance of industry for Germany's economy, the failure to include industry in the legislation loomed as a potentially serious problem in the future. Before the mid-1920s, however, it was not industry that most assiduously pushed for a national policy on creating a well-trained industrial workforce, but government authorities, in particular the Prussian Trade Ministry. In the period 1907–12, the Prussian ministry sparked the earliest concerted action by industry – or at least *some* in industry. To understand this initial burst of activity, we must first look at the concerns of government authorities surrounding youth and worker training and then at those of industry. By the second half of the decade, pressure was gro-

wing for more decisive steps in Prussia's policy toward young workers. The comprehensive occupational survey of 1907 produced sobering results for those, such as the leaders of the Prussian Trade Ministry, who wanted to expand Germany's skilled workforce. The first such survey since 1895, it revealed the dramatic changes Germany's rapid industrialization was causing in the workforce, especially the rising numbers of unskilled and female workers.[13] The percentage of skilled *Facharbeiter* had declined from 65 to 58 percent.[14] At the same time, the highest levels of Prussian government were taking a greater interest in the political implications of the 'youth question'. Alarmed by the SPD's increasing inroads among the young but rejecting repressive measures, Prussian Minister President Bülow and Interior Minister Bethman Hollweg called on their cabinet colleagues in late 1907 to develop a 'positive' youth cultivation policy.[15]

How precisely to achieve this general aim became the object of bitter debate within the Prussian government over the following three years. On the one side, conservatives in the Culture, Interior, and War Ministries wanted to imbue the young with patriotism and religious values, inoculating them against the allures of socialism. To this end, they proposed making mandatory Continuation Schools (*Fortbildungsschulen*), which gave 14- to 16-year-olds vocational training, and shifting their focus from practical training to political and moral indoctrination. Opposing this group were the Ministers of Trade and Agriculture. While they agreed that socialism must be combated, they insisted that the best way to do so was indirectly, by giving young people a stake in society. The schools' emphasis should be on "education for proficiency, for pleasure in productive work, and for sympathy for the importance of our (…) polity, the traditions and institutions of which give every citizen a secure existence and the opportunity freely to exercise his creative abilities."[16]

The values learned by training for skilled work – "industry, care, conscientiousness, perseverance, attention to detail, honesty, patience, self-discipline, devotion to a clear goal standing outside ourselves" – would also constitute a form, indeed the best one, of "citizenship education," the trade minister argued. By encouraging individual economic development, one would strengthen social stability. Moreover, economic success per se, and not political education, was the most important purpose of these schools. "[O]ur commerce, our artisanate, and our industry" all depended on the practical training the continuation schools provided.

This clash within the Prussian government prompted the Trade Ministry to become even more active in advancing its own vision of political order and economic progress. Partly in response to the conservatives' charge that the Continuation Schools were not reaching enough young people, the Trade Ministry in 1907 proposed a bill compelling all municipalities with more than 10,000 inhabitants to establish compulsory institutions.

Although disagreement over conservatives' demands that these schools include more religious instruction ultimately scuttled the bill in 1911, the Trade Ministry continued with its piecemeal efforts to extend vocational schooling.[17] It also played a catalytic role in industry's first steps to organize its own vocational training, as we will see below.

The Trade Ministry's success in keeping the number of unskilled workers as low as possible and creating a broad class of skilled workers depended on the cooperation (or at least tolerance) of important social actors, including the unions and industry. The unions, especially the socialist *Freie Gewerkschaften*, with their eye on political matters such as strike laws and collective bargaining arrangements, tended to overlook vocational training until the Weimar period.[18] Above all, if Germany's rapidly growing industry did not commit itself to the skilled *Facharbeiter*, no amount of public support would matter in the end. In the decades before the outbreak of the Great War, however, considerable ambivalence about its future production methods and kind of workforce characterized German industry.

Rapidly evolving labor demographics, mounting domestic political and international economic challenges, and – crucially – the availability of alternative models of industrial production undercut consensus. In regard to their workforce and production methods, German industrialists were, to use Charles Sabel's and Jonathan Zeitlin's distinction,[19] not merely maximizing, but also strategizing actors – they did not simply accept the institutional environment as it was, but tried to shape it as well.

Even more than in *Handwerk*, the incentives problem inhibited worker training in industry. In handicrafts, at least firms could integrate instruction and production to a far greater extent than could industry, and the firms' small size and still relatively intimate setting allowed the masters to bind at least a minimum number of apprentices to them, reining in somewhat the poaching problem.

In the 1890s industrial firms began paying more attention to the worker question, though their views were anything but uniform. The growing gulf between handicraft production methods and those used in industry, with its greater reliance on expensive machinery, made it more challenging to rely on recruiting skilled workers from handicrafts. The often explosive growth of new industries and firms – Siemens' workforce alone increased by 400 percent in the decade after 1895[20] – raised questions about how the new workers were to be integrated into increasingly massive production facilities, how they were to be trained and to work, and who would supervise them. If previously hiring the sons of employees allowed firms to count on a disciplined core workforce,[21] the influx of immigrants from Germany's rural reservoirs made this increasingly difficult. The sheer growth of German industry began to turn a surplus of labor into a deficit.[22] In the two-and-a-half decades before World War I, unemployment averaged 2.6 percent.[23] Even with the infusion of cheap, lar-

gely Polish foreign labor, employers could no longer count on a virtually unlimited pool of inexpensive laborers. Economic good times and the resulting low levels of unemployment contributed to a much more rapid turnover of the workforce, especially among the unskilled, but also among trained workers looking to move up.[24] Such poaching between employers significantly raised the costs of worker training. The increased contacts between workers in different firms and regions could also add to employers' political headaches, by paving the way for unionization.[25] In light of both the economic problem of screening and retaining capable workers and the political one of keeping unions out, employers at their inaugural job-placement conference in 1901 identified a "well-trained, reliable, and capable labor force that is as little subject to fluctuation as possible, as an absolute necessity of an industrial economy."[26]

The pressure to make better use of the workforce came not only from these domestic changes, but also from an increasingly competitive international environment. If German manufacturers had in the meantime restored their reputation damaged by the devastating critiques of their shoddy work made at the 1876 World's Fair, they now faced an array of competitors, especially from the US, in precisely the key areas of the 'second industrial revolution': electronics, chemicals, and machine tools. In the 1890s and 1900s, the pressure from foreign competitors became considerably fiercer. In particular, US firms such as General Electric and Westinghouse in the electrical industry, DuPont in chemicals, and a host of smaller firms in machine-tools began to threaten German companies' positions domestically and in world trade.[27] While the German electrical giants Siemens and AEG, for example, had dominated world sales into the 1890s without serious challenge, by 1913, US companies nearly had matched their output.[28] American innovations in mass production threatened German quality production with cheap prices (and sufficient quality). It also appeared to offer some German manufacturers an attractive model of their own future.

In the two decades before World War I, no consensus response to these challenges emerged. The 1897 reconstitution of craft guilds mobilized parts of manufacturing industry, but also divided it. The legal privileging of *Handwerk* led immediately to demands for equal treatment of the growing number of workers trained by industry. However, the issue revealed divisions among industrialists about how equal access should be guaranteed, and even whether it mattered. A survey conducted for the industrial umbrella organization CVDI in 1913 produced

> "very meager results (…) Industry generally, except for the engineering branch, where the question has already been thoroughly discussed, is still cool to the whole thing and is reluctant to commit itself by expressing a [pub-

lic] opinion before having come to its own judgment (…) The majority of respondents are of the view that there are enough apprentices in industry, and that these apprentices are well-trained."[29]

Efforts to improve the training of industrial workers had to overcome more than mere apathy, however. A rival view of Germany's industrial future – a vision of rationalization drawing largely on US technology and principles – challenged the emphasis on skills. During the nineteenth century, US ingenuity and conditions – a vast middle class with unusually homogeneous consumer tastes, seemingly unlimited natural resources, a scarce supply of skilled labor, and the influx of millions of unskilled immigrants – helped to spawn an 'American system' of mass production.[30] Quickly trained workers used single-purpose machines to produce interchangeable parts that were then combined into cheap, standardized goods for a mass market. In the other rapidly industrializing power – Germany – manufacturers facing similar challenges of shortages of skilled workers and an abundance of the unskilled began employing US special machines in incipient mass consumer industries such as sewing machines and bicycles.[31] Even more resolutely, however, they embraced the spirit of the US innovations. Enterprising German engineers, such as Georg Schlesinger of the Ludwig Löwe machine-tool company, became the prophets of Frederick Winslow Taylor's gospel of efficiency through centralized, systematic control. German industrialists' and engineers' growing enthusiasm for 'scientific management' could lead easily to a denigration of the 'human factor' in production. On account of these clashing visions, as Gary Herrigel puts it, "there was tremendous ambiguity concerning the kind of production strategy producers seemed to be pursuing, even within individual firms."[32]

Within industry, machine-producing and metal-working firms remained the most committed to a skilled workforce and stood at the forefront of efforts to institutionalize industrial training. By their very nature, these firms were closer to crafts: more dependent on individualized work and less capable of standardized mass production. After 1900, the number of engineering companies maintaining their own training workshops and company schools for apprentices, though still only a small minority, also grew rapidly.[33] By 1907, while *Handwerk* still trained the bulk of all apprentices, industry's share had already risen to a third.[34]

More important in the long term than these steps by individual companies was the effort to create common standards for worker training, even in the absence of a legal framework. Perhaps because of the ambivalence even within firms, though, industrialists did not take the initiative. Rather, the Prussian Trade Ministry did. The *Handelsministerium* prodded the Association of German Engineers, the Machine-Builders Association, and others in 1908 to establish the *Deutsche Ausschuss für technische Schulung* (DATSCH) – the German Committee on Technical Education.[35]

Though founded for the purpose of establishing and disseminating uniform norms for engineers' education, DATSCH's purview quickly expanded to include the entire vocational training system. Anton Rieppel and Fritz Frölich, directors of the large engineering firm MAN and longtime advocates of industry's vocational training, were among the most forceful promoters of a broader mandate.[36] By the fall of 1909, DATSCH had put apprenticeship training on its agenda.[37] One of its main goals was to agree on clear vocational descriptions and uniform training methods for engineering firms throughout Germany. The very first of DATSCH's 'guiding principles' from 1912 expressed the nature and significance of what the Association now perceived as its main task, as well its motivation:

> "The mechanical industry is compelled to an ever greater degree, especially as a result of competition with foreign [industry], to perform high-value work. This requires constant progress in the education and training of young skilled workers. For this reason, it is one of the most important tasks of industry to ensure good training of a sufficient number of apprentices and to secure its due influence over the shaping of apprentice training. An orderly apprentice training also promotes the education of the worker as national citizen."[38]

This program to standardize industrial vocations and training schedules on a national basis constituted, alongside the 1897 *Handwerk* Law's policy of certifications, the other key piece to the German vocational system.[39] However, the two pieces would only be combined and put into practice in the 1930s. For the time-being, the engineering firms organized in DATSCH remained marginal voices within industry, their standardizing project more an aspiration than a reality. Likewise, the Prussian Trade Ministry, which was unable to gain general assent from the Prussian leadership for its position on the most effective youth policy, faced strong headwinds. Under these conditions, the burst of activity between 1907 and 1912 could only be limited to a 'coalition of the willing': self-organizing by some machine-tool and engineering firms on the initiative of the Prussian Trade Ministry.

The Second Punctuation, 1925–1929: Industry's 'Reframing' of Its Workers and the Creation of Standardized *Berufe*

Ten or fifteen years later, surprisingly, not much had changed. Germany had experienced four years of war and bitter defeat, of course, and the *Kaiserreich* had given way to the Weimar democracy. Yet in the early 1920s German government still did not pursue a unified policy on vocational training. Industry and *Handwerk* remai-

ned at odds over control of training. And besides, German industry was as divided and ambivalent as ever about its skilled workers.

In politics, the conflict was no longer one within the Prussian administration, but between the newly emboldened and empowered SPD and unions, on the one hand, and the middle-class parties and employers on the other. Still, the outcome – the lack of a comprehensive public policy – was the same. Though both sides agreed that there should be national legislation regulating vocational training, they were at an impasse over whether unions should have a say in supervising training.

Many German industrialists were, if anything, even more enamored of mass production and rationalization – the alternative to skilling – after the war than before. The mass production of war matériel, the use of unskilled women in war industries, and wartime and postwar interest in optimization had all contributed to a mania for '*Rationalisierung*' that continued into the early 1920s.

Change came in the mid-1920s. It came this time not from the Prussian ministry but from within industry itself, and it came abruptly. In the years after 1924, German industrialists increasingly began to see their workers differently. Detailed studies of firms in the electrical and mechanical industries have revealed that a reevaluation of the skilled worker took place within companies in the mid-1920s.[40] In June 1924, the National Productivity Board (RKW) devoted a session to the "training of young workers in the broadest sense," one of the earliest public discussions of the issue. The first speaker, the head of the Association of German Engineers (*Verein Deutscher Ingenieure*), Conrad Matschoss, distinguished between the new US, 'Fordist' style of production and its German counterpart. The former trained its workers as quickly as possible for a particular, constantly repeated activity; the latter aimed to develop 'quality workers'.[41] Another participant, Dr. E. Toussaint, a professor of engineering at the Berlin Technical University and industrial consultant, assailed the view that developments in the mechanical industry would eventually make the trained worker 'superfluous'. Anybody familiar with the issue, he insisted, would "long since" have recognized that the opposite would more likely be the case and that it would be only a matter of shifting trained and capable workers to new positions. "In many cases," Toussaint concluded, "the most thorough exploitation of the machine could only be guaranteed if a thinking *Facharbeiter* used it."[42] As these comments suggested, many perceived the interest in the skilled worker to be a new, or at least newly urgent, phenomenon. The director of the new Working Committee for Vocational Training (to be discussed below) put the matter in historical perspective:

> "The fact that the vocational training of the workers is closely related to the productivity of the economy has been recognized for decades, if only at first from small circles, and practically useful work has been derived from

this knowledge. New is the sudden dissemination of these insights and the systematic way and energy with which these tasks are tackled, which have appeared so forcefully on the level of economic and social-political issues."[43]

Why, though, did the turn to the *Facharbeiter* take place when it did, in the mid-1920s, and why did it take the form it did, that is, as a relatively sudden paradigm shift and conversion? The scholarly inattention to these issues means that our answers can be only fairly speculative. The extension of wartime policies, the postwar inflation, and, from late 1922, hyperinflation had temporarily permitted a remarkably smooth transition to peacetime production, but only by cloaking German industry's true conditions in the haze of a depreciating currency, thereby giving their exporters a (constantly growing) advantage.[44] In addition, the German demobilization policy, which prevented companies from releasing workers and perpetuated binding wage-mediation procedures, had had significant effects on wage development, productivity, technical innovation, and investment strategies. It thus further clouded employers' perceptions about future conditions.[45] The necessarily painful adjustment, which in the other belligerent nations had occurred soon after the war's end, took place in Germany only from 1924 on. At that point, a new currency and an agreement on reparations restored monetary stability to the country, and demobilization restrictions were also removed.

With German companies having to sell their goods in a hard currency for the first time in years, competition in export markets stiffened considerably.[46] German employers had to take stock of their position in new domestic and international environments. By the mid-1920s, the unskilled worker had come to seem increasingly burdensome to German employers in several respects. Throughout the postwar period, but especially after the end of inflation, the untrained workforce had exhibited turnover rates higher even than before 1914, in some regions and industries reaching annually well over 100 percent.[47] Thanks to the massive influx of unskilled workers into unions and to the greater bargaining power of the latter, significant wage compression occurred between unskilled and skilled laborers after the war. The relative rise in unskilled workers' wages made investment in worker training all the more attractive.[48] Based on their experiences in the war, industrialists had concluded that the unskilled worker was also far more likely than the skilled one to be politically radical and hence a potential source of disruption to the factory's smooth operation. The alternative to a high-skilled workforce, then, seemed increasingly unattractive.

With near certainty, the most salient feature of the new international economic situation, the one to which both the German educated public and its employers paid the most attention in the middle years of the 1920s, was the spectacular growth of the US economy and its new forms of mass production.[49] The stream of Ger-

man industrialists who visited the stations of US success after 1924 returned to their own country with two basic lessons.[50] German industry would have to adopt some important innovations from the US; however, for a number of reasons, Germany also would have to pursue its own kind of rationalization. Numerous references in the burgeoning discussion at this time about German 'quality work' suggest that the US system of production served as spur for the German industrialists to reconsider where their relative advantage lay.[51] German industry would prosper or at least survive, not by competing with the US in the mass production of cheap goods, but in the more skilled manufacturing of higher-quality products.

German industry's turn to the skilled worker, which occurred suddenly and with an apparent urgency, bears the marks not of a gradual accumulation of evidence and shifting of views, but rather of reframed thinking.[52] Industrialists began to see their niche in the world economy and hence their workers differently: the worker changed from being a potential liability to the source and guarantor of German 'quality work'.

This new view of the skilled worker not only stirred discussion of Germany's comparative advantage in the global economy, it also spurred German industry to cooperate to put training on a firmer, standardized basis. Its initiatives took place against the backdrop first of delays in national legislation on vocational training, and then its postponement. By the middle of the decade, observers had serious doubts whether the laws ever would be enacted, although negotiations continued. Leading manufacturers, inspired by these new convictions regarding the importance of the skilled worker, decided to act regardless of the legislative outcome. One initiative within industry, DINTA (*Deutsches Institut für technische Arbeitsschulung*), has been extensively studied for its conservative political thrust, but the more important projects of a revived DATSCH and its Working Committee on Vocational Training (*Arbeitsauschuss für Berufsausbildung*) have received hardly any attention. The creation of the Working Committee can be regarded as one of the decisive institutional steps in the creation of the modern German vocational training system.

The Working Committee grew out of DATSCH's earlier activities in worker training. After the war-induced interruption of its activities, DATSCH picked up where it had left off, with the content of practical training of skilled workers. Borrowing materials from leading companies, the DATSCH staff developed course plans for such central vocations as machinist, constructive machinist, prototype-carpenter, and former. After a lull in the early 1920s, DATSCH's sales to firms of these vocational teaching materials nearly quadrupled between 1924 – when industrialists began to reevaluate their skilled workers – and 1931, jumping from 40,000 to 150,000 *Reichsmark*.[53]

DATSCH's activities, especially after the war, focused on establishing standard training and work procedures for the most important industrial vocations. These in

turn prepared the ground for its founding in the summer of 1926 of the Working Committee, which nonetheless represented a true watershed in the creation of the German vocational system. The Working Committee went far beyond DATSCH's earlier efforts in two significant ways, in regard to its supporters and to its mission. Unlike the pre–1914 DATSCH, the Working Committee had the backing of the National Association of German Industry and the Association of German Employers' Organizations, the two most important industrial employer groups. When the leading handicrafts organizations joined the Working Committee in 1927, thus burying decades-old differences with industry over control of vocational training, all of the major employer groups were now engaged.[54] Unlike the creation of DATSCH in 1908, the founding of the Working Committee in 1926 did not depend on an initiative from the government. Still, the Prussian Trade Ministry kept close tabs on the *Arbeitsausschuss* and acted as a go-between and trusted arbiter.[55]

In addition to the participation of the most important economic interest groups, the sense of mission and the comprehensive mandate of the Working Committee distinguished it more clearly from the earlier efforts of DATSCH. In the inaugural issue of the Working Committee's journal, *Technical Education (Technische Erziehung)*, which became the flagship of the movement, the chairmen of the new body, the major industrialists Ernst von Borsig and Gottlieb Lippart, argued for the central role of the worker in the production process:

> "In the widest circles it has gradually come to be recognized that the competitiveness of our industry depends not only on the technical and organizational perfecting of the production apparatus, but to no lesser degree on the best-possible use of the available human forces. Everywhere one recognizes that the most valuable good possessed by Germany, robbed of so many natural resources, is human labor power."

However, even more important was investing in the *development* of human capital:

> "It is not enough, though, that one uses most economically the people who are integrated into the production process; rather, it is above all necessary that the abilities of those who are to participate in the production process are raised to the maximum and developed in the most versatile way even before they enter the economic system."[56]

The chairmen underscored the sweeping and systematic mandate of the Working Committee, "which will comprehensively treat all the great questions of the vocational training of an industrial worker which are suited for a centralized regulation." In an article entitled "Our Aims," the director of the Working Committee, F. Schürholz, delineated more concretely the work ahead. The very first requirement, the

prerequisite for all further systematizing, was to 'define' all vocations. Only on the basis of such a clarification could the substantive coordination of training be undertaken and vocational 'profiles' created that would describe (and prescribe) the relevant activities of each job as well as the apprenticeship training necessary. Perhaps most crucially, the qualifying exams, "which influence the quality of the training and determine the extent of the demands made of the testee," needed to be made largely uniform throughout the country.[57]

Though Schürholz proposed the standardization of training and testing in the context of a commentary on the draft of a law on vocational training, it soon became clear that German industry's goals in this regard did not depend ultimately on legal measures. When the proposed law finally foundered in 1928, the Working Committee and DATSCH continued, and even accelerated, their work.[58] Over the following years, they turned out dozens of vocational profiles, training plans, and exams for the most important industrial vocations, in particular, those of the machine-tool and engineering industries, which had spearheaded industrial vocational training ever since the founding of DATSCH in 1908.

The efforts from the mid-1920s by German industry and handicrafts, with the support of key government ministries, to systematize training procedures mark a decisive turning point in the formation of the overall German vocational system as it exists to this day. Through them, industry and handicrafts overcame their earlier animosity and cooperated to create standardized industrial vocations on a nationwide, not just regional, basis. They thus addressed some of the lacunae of the 1897 *Handwerk* Law. But if the Working Committee's standardizing began to deal with the informational problems plaguing industrial apprenticeships, it left unanswered questions of monitoring training and certifying results – which were of great relevance to employers' and apprentices' incentives.

The Third Punctuation, 1934–1939: Nazi Politics and the Completion of the German Vocational System

Nearly a decade later, in the mid-1930s, even the traumatic experience of the Great Depression had not altered German industry's basic commitment to building a high-skills workforce. What had changed, most crucially, was the political climate. The new, totalitarian regime facilitated the completion of the vocational system through both centripetal and centrifugal tendencies. As part of the Nazis' efforts to 'coordinate' the economy, the regime compelled industrial groups to merge into the Organization of the Producing Economy (*Organisation der gewerblichen Wirtschaft*), which the Economics Ministry recognized as the official representation

of industry's interests.[59] As contradictory as the judgments in the scholarly literature are about the overall effects of this merger and affiliation with the Ministry of Economics,[60] in the realm of vocational training, as we shall see, industry acted with even greater unity than before. As for the Nazis' intentions for the economy, they regarded the economy primarily as a means to the end of preparing Germany for war. Purely domestic goals – whether creating a consumer society or fostering upward mobility through training – were secondary and possibly mutually contradictory. Given Germany's limited resources, the Nazis tended to look favorably on efforts to improve the quality of the country's workforce in order to ready the country for war. Of even greater importance than the regime's pressure to conform and to give the workers skills, however, were the effects of its divisive elements. Various party agencies, above all the hyper-active Robert Ley's Labor Front, acted on their own to obtain influence over worker training. These encroachments spurred industrialists and officials in the Economics and Labor Ministries and Labor Administration to circle the wagons and cooperate even more closely.[61] In response to the Labor Front's continuing meddling in the field of vocational training, Economics Minister Schacht in September 1935 cemented the already close relationship between industry and the Economics and Labor Ministries. Citing "the significance of the technical-economic training for the economy," Schacht, in conjunction with the Minister of Education, gave DATSCH official status as his advisory body.[62] In 1938, DATSCH was given an even more secure position when it was re-baptized as the Reich Institute for Vocational Training.

Under these circumstances, employers' associations led the way in reviving and extending the project of the previous decade to create a standardized vocational training system. In the spring of 1934, as the first signs of an economic turnaround manifested themselves, the president of the Reich Estate of Industry had made known his organization's conviction that "today more than ever quality-work" – and hence the training of apprentices – was of signal importance for the long-term recovery of German industry.[63] In November of the same year, a DATSCH committee on vocational counseling gathered in November 1934 for its inaugural meeting.[64] In a sign of the increasingly close links between industry and the government ministries, Johannes Handrick, the national head of vocational counseling in the Labor Administration, chaired the industrialists' committee. The committee quickly focused on 'clearly distinguished vocational profiles'. Resuming the work of the Working Committee and DATSCH from nearly a decade earlier, the committee decided, was now 'an urgent task'. Work on vocational profiles as the pivot of a coordinated system of vocational training and counseling took center stage. A lead article in the February 1935 *Technical Education* on "The Vocational Profile" posited that "[t]he significance which the most complete possible inclusion of all vocational activities in the form

of vocational profiles has for the planned training of apprentices and hence for the entire economic praxis – this cannot be overstated." The profiles would provide the most basic guidance for the apprenticeship training. Of far greater importance, however, than their significance in directly improving the quality of individual training, according to the article, which echoed the arguments made in the mid-1920s, was their role in overcoming the informational and coordination problems undermining collective action. For the standardization of the profiles and also of the training and the exams based on them would permit the smooth flow of labor around the country. Only with such guarantees of standard quality could every apprentice be certain that he might be hired by other employers, in other regions. And only then could employers be confident in hiring someone trained elsewhere.[65]

Not only did it solve the information problem, but the cooperation itself also strengthened the employers' organizations, such as the Chambers of Trade and Commerce, and the mutual expectations that made firms' compliance more likely. Even as several Nazi laws restricted the freedom of workers to move from job to job and region to region, industry and the Labor Administration were cooperating to create a system of mobile skilled labor.

In its work on vocational profiles, DATSCH began where the Working Committee had in the mid-1920s, with the centrally important skilled metalworking positions. Drawing on the latter's work, it concentrated initially on skilled vocations, all of which required a three- to four-year apprenticeship. Only later in the decade would it take on the trickier task of standardizing the "several thousand" semi-skilled positions that spanned a much greater range of training schedules. By the spring of 1935, DATSCH could publish its first 10 profiles.[66] These limited themselves to describing the 'task area' and both the necessary and the desired 'capabilities' of the workers.

In the course of the same year, DATSCH committees began to engage in a flurry of activity, extending the work on standardization to the other aspects of vocational training. That encompassed practical training in the firm, courses in the vocational school, and the completion exams.[67] Important issues – such as the exact relation of the 'basic vocations' of training to the more specific positions in the economy and the proliferation and nature of training for semi-skilled vocations – remained subject to lively debate. Nonetheless, the participants regarded their work as an 'evolving enterprise' and carried on. By early 1936, DATSCH had published two-dozen profiles of the most important 'basic vocations'.[68]

An historic agreement within industry lent all of this standardizing work immediate practical relevance. In July 1935, the Reich Group Industry and the Association of Chambers of Industry and Trade agreed to establish for the first time industry's own formal vocational certification system, independent of that of handicrafts, which

since the 1897 revision of the Commercial Code had had a monopoly on certifications.[69] The vocational profiles, training plans, and completion exams being developed at the time were to be incorporated formally into the 'apprenticeship contract' between the firm and the trainee. This step by industry, taken with the approval of the Economics and Labor Ministries and in expectation of a future legal regulation of the matter, began to draw to a close the long-running dispute between industry and handicrafts over the latter's monopoly over accreditation, a dispute which, as we have seen, had not prevented the two sides from cooperating in the late 1920s on the Working Committee. A 1938 decree of the Reich Education Minister would finally put the industrial completion exams on the same legal footing as *Handwerk's*.[70]

Within several years in the mid-1930s, the industrial training system had acquired not only standardized content, but also full-fledged formal accreditation. Close monitoring by local Chambers of Industry and Trade prevented serious free-riding and ensured that firms in fact took on their fair share of apprentices. A decade after German industry had become fully conscious of the potential value of the skilled worker and had initiated a project to standardize training, a second round of these efforts in the mid-1930s, including now means for monitoring and certifying training, effectively had launched the 'German skills machine'.

In the years 1934/35, industry not only made crucial advances in reviving and extending its project of standardizing vocational training system, but it also began offering an increasing number of apprenticeships, not least thanks to the concurrent organizational work. The rise in the number of open positions employers registered with the labor offices from its nadir in the years 1931/32 and 1932/33 no doubt reflected a number of factors. The general improvement in economic conditions from 1933 onward made employers more willing to offer apprenticeships. Yet the rapid increase from fewer than 130,000 positions in 1932/33 to 219,000 the next year and nearly 300,000 in 1934/35, when unemployment still hovered well above 10 percent, surpassed the number of apprenticeships offered in the best years of the Weimar recovery (255,000 in 1927/28) and cannot be attributed to the general economic climate alone.[71]

Even more important than the improved atmosphere between the two sides, however, the creation of common standards of vocational training and of a certification system altered companies' willingness to train workers as a result. In an essay in *Technical Education* in July 1936, a leading representative of the Reich Group Industry emphasized the decisive role of the organizational work: "[F]or industry until now clear legal bases for an impeccable training and education of the industrial youth have been lacking. A responsible attitude on the part of many industrial firms has always existed […] But today for the first time the conditions have been created which allow German industry to solve these tasks on its own."[72] The response of Ger-

man industry would be so strong, in fact, that by 1939, it would offer more apprenticeships (583,000) for young men than there were job-seekers (555,000).[73]

Conclusion

The 1897 Handwerk Law offered a partial solution to the problems of vocational training in a liberalized economic order. Its system of certification overcame the informational and incentives problems facing both employers and apprentices. However, the 1897 legislation was only a limited success in that it established regional, not national, standards and, even more importantly in that it left out the most important and dynamic part of the economy, industry. Subsequently, three periods of intense activity built on and extended the 1897 model, creating by the late 1930s the modern German vocational system.

After 1907, the Prussian Trade Ministry encouraged those parts of industry that were already committed to a high-skills workforce, above all, the engineering and machine-tools firms, to cooperate and agree on national standards. The 1907 census, which showed a growing proportion of unskilled workers, and the rising worries about 'youth', especially in the face of the Social Democrats' seemingly unstoppable growth, prompted the Trade Ministry's action. Divisions with the Prussian government as well as within German industry limited the former to this targeted encouragement.

In the mid-1920s, German industrialists' encounter with the awesome American mass-production economy convinced them that they needed to focus on higher-quality, niche markets. This urgent reorientation prompted many German employers to think of – almost to see – their workers differently: a *Facharbeiter*, a skilled worker, could be a great asset. With a bill on vocational training thwarted by political fighting, all the major industry groups launched a project to standardize vocations and the training for them on a nationwide basis. They thus began to realize what the Prussian Trade Ministry and engineering firms organized in DATSCH had aspired to twenty years earlier. In this work, German industry had the support of the Prussian Trade Ministry and was soon joined by *Handwerk*.

Nearly a decade later, the political atmosphere of the Third Reich conduced to put all the pieces together. Industry again took the initiative and together with key government ministries produced dozens more standardized vocations and training regimens. By 1938, industry had also established the legal and institutional means to monitor training and award accreditation for both industrial and handicraft vocations. Over the next decades millions of young Germans would stream into skilled work.

Notes

1 This article draws on David Meskill, Optimizing the German Workforce: Labor Administration from Bismarck to the Economic Miracle, New York 2010. I would like to thank the participants at the University of Vienna workshop on "Work – Employment – Vocation" in February 2012 for their comments on my presentation, as well as Alexander Mejstrik and an anonymous reviewer for the *Austrian Journal of Historical Studies* for their incisive critiques of the paper and helpful suggestions for improving it.

2 As important as it has been down to this day, this combination of hands-on apprenticeship and theoretical schooling – the "dual system" – is not the focus of this article since it did not address the central challenge in creating a skilled workforce: getting the incentives right.

3 In the 1970s Stephen Jay Gould and Niles Eldridge introduced the idea that biological evolution did not occur through small, incremental changes. Rather, long periods of stability were occasionally interrupted by bursts of dramatic change: "punctuated equilibria." Since the 1980s, the concept has become influential in political science. See Frank R. Baumgarten and Bryan D. Jones, Agendas and Instability in American Politics, 2nd Edition, Chicago 2009 [1993]. Kathleen Thelen's How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States and Japan, Cambridge 2004, an impressive study of vocational training systems in Germany and three other countries, takes issue with the punctuated equilibrium argument, claiming instead that institutions do, in fact, evolve in slower, more complex ways. In the case of Germany's vocational training system, there are undeniably elements of both. This paper focuses on periods of dramatic change partly because it aims to reassert the importance of sudden change in response to Thelen's substantial challenge. The differences also arise from our particular areas of interest. Thelen focuses on the (additive) incorporation of *different interest groups* into the training system: first, industry, then unions. In contrast, I emphasize, especially in the crucial period in the mid-1920s, the (disruptive) shift in thinking *among industrialists* about their workforce.

4 Derek Linton, "Who Has the Youth, Has the Future": The Campaign to Save Young Workers in Imperial Germany, Cambridge 1991.

5 David Blackbourn, The Long Nineteenth Century: A History of Germany, 1780–1914, New York 1998, 261; David Meskill, Optimizing the German Workforce: Labor Administration from Bismarck to the Economic Miracle, New York 2010, 42-66.

6 Douglass North, Institutions, Institutional Change, and Economic Performance, New York 1990; Oliver Williamson, The Economic Institutions of Capitalism, New York 1998.

7 Peter A. Hall/David Soskice, eds., Varieties of Capitalism: The Institutional Foundations of Comparative Advantage, New York 2001.

8 For background, see Hal E. Hansen, Caps and Gowns: Historical Reflections on the Institutions that Shaped Learning for and at Work in Germany and the United States, 1800–1945, Ph.D., Wisconsin 1997; Meskill, Optimizing.

9 Hans-Ulrich Wehler, The German Empire, 1871–1918, London 1997.

10 The alternative interpretations of the 1897 law – whether designed as a political measure to enhance particular interests or as an economic measure to resolve systemic problems – exemplifies the different approaches of the articles collected in this issue of the ÖZG. The majority of them focus on the partisan interests and strategies that helped to create or sustain vocational boundaries for the sake of material interests or status, whether among upwardly mobile Bengalis striving for colonial employment in 19th century India, or the leaders and 'mothers' of the SOS Children's Villages after 1945. This article, on the other hand, suggests that at least in some cases we should also study the systemic, or functional, role played by vocational distinctions. To put the point in somewhat less functionalist terms: while vocational boundaries and institutions may be the object of disputes over wealth, power, and status, they may also result from efforts to address collective – that is to say, non-partisan, general, and genuine – problems facing the economy.

11 Gerhard Adelmann, Die berufliche Ausbildung und Weiterbildung in der deutschen Wirtschaft 1871–1918, in: Hans Pohl, ed., Berufliche Aus- und Weiterbildung in der deutschen Wirtschaft seit dem 19. Jahrhundert, Wiesbaden 1979, 9-52.

12 Hansen, Caps, 363-64.
13 In the intervening twelve years, the number of women working in industrial jobs had increased by 40 percent, from one and a half to more than two million. See the article, Die Berufswahl im Handel und Gewerbe, by Alfred Kühne of the Trade Ministry in the journal *Die Fortbildungsschule* from 26 May 1910, which reflects the great impression that this survey made.
14 Thomas Nipperdey, Deutsche Geschichte, 1800–1866, Arbeitswelt und Bürgergeist, Munich 1991, 296.
15 Edward Ross Dickinson, Citizenship, Vocational Training, and Reaction: Continuation Schooling and the Prussian „Youth Cultivation" Decree of 1911, in: European History Quarterly, 29/1 (1999), 109-147, 118.
16 Quoted in ibid., 119.
17 The efforts were continued, for example, by subsidies to communities setting up such schools and by changes to the industrial code allowing authorities to compel local government to establish schools. Ibid., 120, 139-40.
18 In 1918, the unions admitted they had paid previously too little attention to vocational training. Roland Ebert, Zur Entstehung der Kategorie Facharbeiter als Problem der Erziehungswissenschaft: Historische Studie zur Berufspaedagogik, Bielefeld 1984, 262; for similar comments at the 1919 Nürnberg union conference, Friedrich Ebert Stiftung, ADGB NB 532, 30 June 1919.
19 Cited by Gary Herrigel, Industrial Constructions: The Sources of German Industrial Power Cambridge 1996, 25, who applies it to Germany at the turn of the century.
20 Calculated according to the figures in Heidrun Homburg, Rationalisierung und Industriearbeit: Arbeitsmarkt – Management – Arbeiterschaft in Siemens-Konzern Berlin, 1900–1939, Berlin 1991, 710.
21 Heilwig Schomerus, Die Arbeiter der Maschinenfabrik Esslingen: Forschungen zur Lage der Arbeiterschaft im 19. Jahrhundert, Stuttgart 1977, 163.
22 See Oliver Grant, Migration and Inequality in Germany, 1870–1913, Oxford 2005, for a pathbreaking, statistically sophisticated analysis of the massive changes in the German labor market at this time.
23 Anselm Faust, Arbeitsmarktpolitik im deutschen Kaiserreich: Arbeitsvermittlung, Arbeitsbeschaffung und Arbeitslosenunterstützung, 1890–1918, Stuttgart 1986, 24.
24 Ibid.; Schomerus, Die Arbeiter, 76; David Crew, Town in the Ruhr: A Social History of Bochum, 1860–1914, New York 1979.
25 Schomerus, Die Arbeiter, 77.
26 Quoted in Faust, Arbeitsmarktpolitik,19.
27 On competition in the electrical industry, see Homburg, Rationalisierung, 360-61; on the machine-tools industry, see Thomas von Freyberg, Industrielle Rationalisierung in der Weimarer Republik, untersucht an Beispielen aus dem Maschinenbau und der Elektroindustrie, Frankfurt am Main 1989, 35-54; on the chemical industry, see Peter Hayes, Industry and Ideology: I.G. Farben in the Nazi Era, Cambridge 2001, 7, 9; for German industry generally, see Alfred D. Chandler, Scale and Scope. The Dynamics of Industrial Capitalism, Cambridge 1996, 393-502.
28 Homburg, Rationalisierung, 360. In 1913, Germany produced 35 percent of the world's total electrical goods; the US, 29 percent.
29 See the pamphlet put out by the CVDI in 1914, containing the text of a talk by Otto Brandt, Fabrik und Handwerk, in which he discusses this survey, in BAB, 8099/18 (VDMA).
30 David A. Hounshell, From the American System to Mass Production, 1800–1932: The Development of Manufacturing Technology in the United States, Baltimore 1985.
31 Ebert, Zur Entstehung, 153.
32 Herrigel, Industrial, 88.
33 Linton, "Who Has," 35. In 1912, for example, five of 18 major machine-tool firms with large numbers of apprentices had their own training workshops.
34 Adelmann, Die berufliche, 19.
35 For the Trade Ministry's role in the founding of DATSCH, see the LGA's letter to the Ministry on the shortcomings of the VDI from 3 April 1908; the letter from the Trade Ministry to the VDI on 6 May 1908 along the same lines, in GStA PK, I. HA, Rep. 120 Ministerium für Handel und Gewerbe, E I

gen, Nr. 20, Adhib 1, 3-9. Also, the VDI's letter from 17 November 1908 to the Trade Ministry, saying that it had decided "in accord with the suggestions of the Trade Ministry" to invite representatives of the various groups to a meeting on 3 December 1909 to consider industry's role in vocational training, in ibid., 10. On the Trade Ministry's ongoing interest in DATSCH as well as the institutional and financial support it lent, see the multiple updates from DATSCH to the Trade Ministry and requests for assistance, in ibid.

36 See the transcript of DATSCH's very first meeting, on 3 December 1908, at which Rieppel repeatedly pressed industry to do more vocational training, a call that found the enthusiastic support of the Trade Ministry representative. GStA PK, I. HA, Rep. 120 Ministerium für Handel und Gewerbe, E I gen, Nr. 20, Adhib 1, 32-35. At a meeting in February 1909, Frölich advocated expanding DATSCH's purview to vocational training. Ibid., 39-40. On Frölich's dynamic leadership, see Gerald D. Feldman, Iron and Steel in the German Inflation, 1916–1923, Princeton 1977, 47.

37 GStA PK, I. HA, Rep. 120 Ministerium für Handel und Gewerbe, E I gen, Nr. 20, Adhib 1, 97.

38 Adelmann, Die berufliche, 30.

39 Again, I am ignoring the "dual system" of training and schooling because it was not relevant to the incentives issue.

40 Homburg, Rationalisierung; von Freyberg, Industrielle.

41 Arbeit und Beruf, 17 (10. September 1924), 329. Matschoss went on to warn against "exaggerations" in either direction.

42 Ibid., 330.

43 Technische Erziehung, 1 (August 1926), 1.

44 Alfred Chandler puts it succinctly: "For almost a decade after 1914 German industrialists simply could not plan ahead." Alfred Chandler, Scale and Scope: The Dynamics of Industrial Capitalism, Cambridge 1996, 503.

45 Günther Mai, Arbeitsmarktregulierung oder Sozialpolitik? Die personelle Demobilmachung in Deutschland 1918 bis 1920/1924, in: Gerald Feldman et al., eds., Die Anpassung an die Inflation, Berlin 1986, 202-236, esp. 232.

46 Charles S. Maier, Recasting Bourgeois Europe: Stabilization in France, Germany and Italy in the Decade after World War I, Princeton 1988 [1975], 482.

47 See Homburg, Rationalisierung, 335-43, on the extent of the problem and on companies' concerns about the related costs. She reports on a study of the Berlin metal industry, which showed that while turnover had reached 50 percent annually in 1913, after the war, it increased, and, in particular, after 1923, it rose "continually," reaching 150 percent annually by the summer of 1925. Also, see Freyberg, Industrielle, 242.

48 Thelen, How Institutions, 68-70.

49 For a good assessment of the impact of US economic growth on German thinking in the 1920s, see Mary Nolan, Visions of Modernity: American Business and the Modernization of Germany, New York 1994, 58-82. As perhaps the most striking indicator of the scale of US growth, it can be noted that in 1925 the United States produced nearly 100 times as many automobiles as did German firms (3.5 million vs. fewer than 40,000; Nolan, Visions, 37-38). In one of Germany's most dynamic industries, the electrical, its share of global production had fallen between 1913 and 1925 from 35 to 23 percent, while the US share had soared from 29 to 49 percent. (Freyberg, Industrielle, 50).

50 See Carl Koettgen, Das Wirtschaftliche Amerika, Berlin 1925.

51 See, for example, the comments of psychology professor Hans Rupp, writing in the cover story of the January 1928 issue of *Technische Erziehung* (already partly cited above): "In rationalization of work, of the firm, of sales organization, other countries, especially America, are equal or, thanks to the far greater company capitalization, partly superior to us. In terms of the quality of the work and the workers, by contrast, we need fear no competition. However, other countries are already striving to catch up, and we must devote the greatest attention to the thorough and economic training [of young workers]."

52 By framing I allude to the role of conceptually organized contexts in decision-making, as analyzed by Daniel Kahneman and Amos Tversky. See Daniel Kahneman, Thinking, Fast and Slow, New York 2011, 31. One might also speak of a *Gestalt*-switch or paradigm shift.

53 Wolfgang Muth, Berufsausbildung in der Weimarer Republik, Stuttgart 1985, 352.

54 The *Handwerk* organizations were the German Chamber of Handicrafts and Business (*Deutscher Handwerks-und Gewerbekammertag*) and the National Union of German Handicrafts (*Reichsverband des Deutschen Handwerks*). The reason for handicrafts' newfound willingness to cooperate with industry, according to Muth, Berufsausbildung, 377, was the national government's draft of a vocational training law that handicrafts, like industry, deemed unsatisfactory. Additionally, the industrial employers' obvious determination to cooperate on vocational training may have suggested to handicrafts that compromise was now their best option.
55 See, for example, GStPK, I. HA, Rep. 120, Anhang, Nr 1034.
56 Technische Erziehung, 1 (August 1926), 1.
57 Ibid., 2-3.
58 See, for example, the report in the May 1928 edition of *Technische Erziehung* (45) summarizing the deliberations in the *Arbeitsausschuss*: "In the further committee meetings, especially of the steering committee, the wish was expressed to make the attempt for the time being, *irrespective of the conclusion of a vocational training law and of its final form* [emphasis added, DM], to reach agreement between industry and handicrafts on a regulation of the qualifying exams for apprentices."
59 For the details of these reorganizations see Lotte Zumpe, Wirtschaft und Staat in Deutschland, 1933 bis 1945, Vadoz 1980, 123-34.
60 While John Gillingham, Industry and Politics in the Third Reich: Ruhr Coal, Hitler, and Europe, Stuttgart 1985, argued that the *Gleichschaltung* "greatly strengthened" the employers (Gillingham, Industry, 34), Peter Hayes, Industry and Ideology: IG Farben in the Nazi Era, Cambridge 2001, citing David Schoenbaum, suggested the merger actually fragmented and vitiated industry (Hayes, Industry, 76).
61 Meskill, Optimizing, 141-182.
62 See the announcement in: Technische Erziehung, 10 (October 1935), 119.
63 Technische Erziehung, 5 (May 1934), 56-57.
64 Technische Erziehung, 12 (December 1934), 143.
65 Das Berufsbild, in: Technische Erziehung, 2 (February 1935), 13-14.
66 Technische Erziehung, 4 (April 1935), 46-47. These were for machine mechanic, toolmaker, fine mechanic, corer, steel former, iron former, metal former, model carpenter, iron mechanic, and high-voltage electrician.
67 See the frequent reports "From the Work of the Special Groups," in the now expanded Technische Erziehung.
68 See the list of the vocations in: Technische Erziehung, 5 (May 1936), 53.
69 See the text of the agreement in BAB, R 12 I/307, *Reichswirtschaftskammer* to the *Reichsgruppe Industrie*, 17. Juli 1944 [sic]. The latter requested a copy after its own had been destroyed in an air raid. The precise origins of the agreement have not been explored.
70 Dieter Langewiesche a. Heinz-Elmar Tenorth, eds., Handbuch der deutschen Bildungsgeschichte. Bd. V, 1918–1945, Munich 1989, 276; as Kathleen Thelen puts it, this measure united industry's standardization with the accreditation system handicrafts had enjoyed since 1897 (Thelen, How Institutions, 237-38).
71 All numbers were taken from Reichsanstalt für Arbeitsvermittlung und Arbeitslosenversicherung, Zehn Jahre Reichsanstalt für Arbeitsvermittlung und Arbeitslosenversicherung, Berlin 1937, 39.
72 Technische Erziehung, 7 (July 1936), 78.
73 Meskill, Optimizing, 161. The figures for female school-leavers and apprenticeship positions still showed a substantial deficit of the latter, revealing the central position of the male skilled worker in the German skilling program. In 1939 there were 220,000 training positions for 456,000 girls, a ratio of one opening for 2.1 people. But even if women did not take center stage, their place was more than marginal. Over time the ratio of openings to female applicants would improve. Just two years later, in 1941, there were 714,000 female school leavers and 416,000 positions, a ratio of 1:1.7.