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By JÜRGEN KOCKA

I

Capitalism and bureaucracy are key concepts in Max Weber's analysis of western civilization. Nevertheless, in discussing the relation between them, and their contribution to western "rationalization", his conclusions were ambivalent. According to him, bureaucratic administration is

> characterized by formal employment, salary, pension, promotion, specialized training and functional division of labor, well-defined areas of jurisdiction, documentary procedures, and hierarchical sub- and super-ordination". [It is] capable of attaining the highest degree of efficiency and is in this sense formally the most rational known means of exercising authority over human beings. It is superior to any other form in precision, in stability, in the stringency of its discipline, and in its reliability. It thus makes possible a particularly high degree of calculability of results for the heads of the organization and for those acting in relation to it. It is finally superior both in intensive efficiency and in the scope of its operations, and is formally capable of application to all kinds of administrative tasks . . . . [There is a] continual spread of bureaucratic administration. This is true of church and state, of armies, political parties, economic enterprises, interest groups, endowments, clubs, and many others.[1]

On this basis Weber argued that modern capitalism could not do without bureaucratic administration, both inside the large firms and in the society at large, and stressed the anti-traditional rationality of both capitalism and bureaucracy.

On the other hand, Weber was well aware of the basic differences between capitalism and bureaucracy, and of the possible conflicts between them. In capitalist economies, it is primarily the invisible hand of the market which allocates resources and provides for co-ordination; in bureaucratic organizations resource allocation and co-ordination are performed by the visible hand of hierarchies. While officials are appointed on the basis of formal qualifications and examinations, according to general rules, workers and employees in the market economy are hired according to less formalized and more market-oriented criteria. While officials hold tenure and enjoy seniority rights in matters of promotion and income, the position and rewards of both employers and employees in the market economy are less secure, less predictable, more dependent on the market, and on measurable achievements. While capitalist success implies risks, innovation, individual initiatives, and quick adoption to

* A revised version of the Tawney Memorial Lecture, 1980.

[1] Max Weber, *Economy and Society. An Outline of Interpretive Sociology* (New York, 1968), III, p. 1393; I, p. 223.

change, bureaucratic administrations are successful if they handle individual constellations as cases of general and well established rules, react as expected, and fulfill the criterion of appropriateness. While Weber was fascinated by the superior efficiency of bureaucratic organization, he also feared that the universal spread of bureaucratic structures could stifle capitalist dynamics and entrepreneurial innovation—besides political leadership and individual self-realization, in general.[2]

German industrialization before 1914 would seem to be a suitable context within which the relationship between capitalism and bureaucracy can be discussed in a more concrete way. German industrialization was undoubtedly capitalist in character, as were all other instances of industrialization before 1917. Most strategic decisions about the allocation of factors of production were made by private entrepreneurs, using profit and capital accumulation as major yardsticks. They managed privately owned firms which were connected with each other principally through market mechanisms. Wage work on a contractual basis clearly dominated, and the tensions and conflicts between capital and labour structured many aspects of German society.[3]

On the other hand, and in sharp contrast to the situation in Britain and the United States, the rise of public bureaucracies preceded capitalist industrialization in Germany. Leaving regional differences aside, industrialization in Germany (measured by accelerated growth, the rise of the factory system and wage labour, accelerated re-distribution of the labour force, urbanization, and the formation of a wage workers' class) started in the 1840s, more than half a century later than in Britain.[4] At this time, however, the large German states, particularly Prussia, Saxony, and Bavaria, had well established, powerful public bureaucracies, strikingly similar to the type later analysed by Max Weber. They had originated under absolutist rule, in the seventeenth and eighteenth centuries. No revolution had broken their continuity. In the late eighteenth and early nineteenth centuries the king's servants had curbed the monarchical powers of patronage by making appointment conditional on formal qualifications, and by acquiring seniority rights, tenure, and pension rights. They had thereby turned themselves into civil servants similar to the type described by Weber. Constitutional reforms at the beginning of the nineteenth century increased the power of the high civil service, by limiting the monarch's power without creating strong parliaments or other representative institutions. The higher civil servants gained power, status, and some exclusiveness of a post-aristocratic type, which was based not directly on birth, but on delegated authority and formalized education—access to which was, of course, not available to the lower classes, but not restricted to the offspring of the traditional élites either. Given the relative economic weakness of most of Germany, the immaturity of her bourgeoisie, and the underdevelopment of her representative institutions, it was the higher civil service which took the lead in the "reforms from above" which moved the larger

[2] M. Weber, 'Parlament und Regierung im neugeordneten Deutschland', in *Gesammelte politische Schriften* (Tübingen, 2nd ed. 1959), pp. 294-431, esp. 308-39. Cf. W. J. Mommsen, *The Age of Bureaucracy. Perspectives on the Political Sociology of Max Weber* (New York, 1974), pp. 47-71, 95-115.

[3] There is a good introduction in English by K. Borchardt in *The Fontana Economic History of Europe*, IV: *The Emergence of Industrial Societies* (1973), pt. 1, pp. 76-160.

[4] For a short chronology see R. H. Tilly, 'Capital Formation in Germany in the Nineteenth Century', in *Cambridge Economic History of Europe*, VII, 1 (Cambridge, 1978), pp. 386-7.

German states from the corporate-absolutist Ancien Régime to the nineteenth-century civil society, which even in twentieth-century Germany would still display the effects of its bureaucratically guided genesis. Of course, there were other proponents of change, notably the emerging bourgeoisie, particularly in the west. And it is also worth emphasizing that higher civil servants, contrary to what they often thought and said of themselves, were not merely representatives of the "common good": they had special interests of their own, and they were not independent from powerful social classes, in particular the land-owning class. It is also true that the process of reform which they promoted had important limits: in the last analysis, emancipation cannot be attained by decree; and in the long run the policy of the bureaucracy tended to slow down and hinder processes of change whose dynamics threatened to get out of bureaucratic control. Yet in spite of all this the fact remains that the higher civil servants, under pressure from a competitive international system, impressed by West European models, and concerned to enhance their state's and their own positions, became the sponsors of bureaucratically led reforms from above, whose relative success was mutually related to the failures of revolution from below in nineteenth-century Germany. At the same time, the trend was not uniform throughout the nineteenth century: the bureaucratic impact on economic and social change was strongest in the early decades, and in the last thirty years or so, it started to grow again.[5]

In 1852, in addition to some 134,000 members of the armed forces, there were about 63,000 civil servants in Prussia, or nearly 1 per cent of the labour force. Around 1910, there were 1·2 million public employees in the German Reich (including military persons), or about 4 per cent of the labour force. Rough comparison seems to show that about 1890 the proportionate importance of goverment employees in Germany was about twice as great as in Great Britain.[6] Of course, only a small minority of these civil servants had the political power and educational background stressed above. But most of them, down to the postal employees and policemen, shared, albeit in varying degrees, important aspects of the civil service status: a specific legal status under public law, special privileges in and loyalities to the state, high esteem, and a favourable image associated with power, a sense of duty, hierarchy, formalized procedures and security. They were, so to speak, part of the state and its authority, not merely private citizens.

[5] H. Rosenberg, *Bureaucracy, Aristocracy, and Autocracy. The Prussian Experience, 1660-1815* (Cambridge, Mass. 1958); R. Koselleck, *Preußen zwischen Reform und Revolution. Allgemeines Landrecht, Verwaltung und soziale Bewegung von 1791-1848* (Stuttgart, 1967; 2nd ed. 1975); J. R. Gillis, *The Prussian Bureaucracy in Crisis, 1840-1860. Origins of an Administrative Ethos* (Stanford, 1971); J.Kocka, 'Preußischer Staat und Modernisierung im Vormärz: marxistisch-leninistische Interpretationen und ihre Probleme', in H.-U. Wehler, ed. *Sozialgeschichte heute* (Göttingen, 1974), pp. 211-27. On Bavaria: E. Weis, *Montgelas, 1759-1799. Zwischen Revolution und Reform* (München, 1971). A classic treatment is O. Hintze, 'Der Beamtenstand', in *Soziologie und Geschichte* (Göttingen, 2nd ed. 1964), pp. 66-125. For the later part of the nineteenth century see H. Rosenberg, *Große Depression und Bismarckzeit. Wirtschaftsablauf, Gesellschaft und Politik in Mitteleuropa* (Berlin, 1967); H.-U. Wheler, 'Der Aufstieg des organisierten Kapitalismus und Interventionsstaates in Deutschland', in H. A. Winkler, ed. *Organisierter Kapitalismus. Voraussetzungen und Anfänge* (Göttingen, 1974).

[6] Figures for 1852 in G. F. Kolb, *Handbuch der vergleichenden Statistik der Völkerzustands- und Staatenkunde* (Leipzig, 1860), p. 160; for 1910: Hintze, 'Der Beamtenstand'. p. 68. For German-British comparisons see P. Flora, 'Quantitative Historical Sociology', *Current Sociology*, XXII (1975), p. 99, based on M. Abramovitz and V. Eliasberg, *The Growth of Public Employment in Great Britain* (New York, 1957); J. P. Cullity, 'The Growth of Government Employment in Germany, 1882-1950', *Zeitschrift für die gesamte Staatswissenschaft*, CXXIII (1967), pp. 201-17.

Althoughly poorly paid, civil service positions were much sought after, at all levels of the hierarchy and demand for these positions usually exceeded supply.[7]

Bureaucratization preceded industrialization, and bureaucratic structures, processes, and values therefore profoundly shaped the process and character of industrialization in Germany, in contrast to Great Britain and the United States. This can be demonstrated in terms of the role of public economic policy, the government's share of capital stock and of the total product, the role of businessmen and officials in local reform movements, the role of public authorities in the reaction to social protests, and in many other ways.[8] This article, however, is restricted to two related issues, two small aspects of German industrialization, which are representative of much broader processes: industrial organization and management on the one hand, and the emergence of a white-collar employee class on the other. Considering these two themes, what difference did the bureaucratic tradition make? How did it influence the economic and social change occurring with industrialization? Through which mechanisms and with what results?[9]

II

It is well known that entrepreneurs and managers in the early factory system, were faced with severe problems of coordination and control, selection and motivation, discipline and organization, which had been unknown to the masters of craft shops or to the merchants in the putting-out systems. Early entrepreneurs and managers, nevertheless, looked back to traditional models in order to solve those problems.[10] In Germany, it was logical to use the bureaucratic models which belonged to the stock of tradition.

[7] Besides the titles in note 5 above, see W. Naudé, 'Zur Geschichte des preußischen Subalternbeamtentums', *Forschungen zur brandenburgischen und preußischen Geschichte*, XVIII (1905), pp. 364-86; A. Lotz, *Geschichte des deutschen Beamtentums* (Berlin, 2nd ed. 1914). Also see J. Caplan, ' "The Imaginary Universality of Particular Interests": the "Tradition" of the Civil Service in German History', *Social History*, IV (1979), pp. 299-317.

[8] According to W. W. Rostow, *Politics and the Stages of Growth* (Cambridge, 1971), p. 15, government expenditures as percentages of GNP were 13·2 in Germany (1891), but only 8·9 in the United Kingdom (1890). This is supported by the comparative figure in W. L. Woytinsky, *Die Welt in Zahlen*, VI (Berlin, 1927), pp. 123-6: in 1913, annual government expenditures per capita amounted to $25·8 in Germany, $18·3 in Great Britain, and $12·7 in the USA (US Dollars). But such a British-German difference is not apparent in S. Kuznets, *Modern Economic Growth* (New Haven, Conn., 1966), pp. 236-7. The government's share of the total German capital stock was 18% in 1850/4, 24% in 1880/4, and 20% in 1910/13, according to W. G. Hoffmann et al. *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts* (Berlin, 1965), p. 44. On the bureaucracy, the military, and social protests see A. Lüdtke, 'The Role of State Violence in the Period of Transition to Industrial Capitalism: the example of Prussia from 1815 to 1848', *Social History*, IV (1979), pp. 175-221; R. H. Bowen, 'The Roles of Government and Private Enterprise in German Industrial Growth, 1870-1914', *Journal of Economic History*, X (1950), pp. 68-81; W. Fischer, *Wirtschaft und Gesellschaft im Zeitalter der Industrialisierung* (Göttingen, 1972), pp. 60-213.

[9] I have dealt with single aspects of this problem in different places: J. Kocka, *Unternehmensverwaltung und Angestelltenschaft am Beispiel Siemens, 1847-1914* (Stuttgart, 1969); Kocka, 'Vorindustrielle Faktoren in der deutschen Industrialisierung. Industriebürokratie und "neuer Mittelstand" ' in M. Stürmer, ed. *Das Kaiserliche Deutschland. Politik und Gesellschaft, 1870-1918* (Düsseldorf, 1970), pp. 265-86; Kocka, 'Family and Bureaucracy in German Industrial Management, 1850-1914: Siemens in Comparative Perspective', *Business History Review*, XLV (1971), pp. 133-56; Kocka, 'Bildung, soziale Schichtung und soziale Mobilität im Deutschen Kaiserreich' in D. Stegmann, et al. eds. *Industrielle Gesellschaft und politisches System* (Bonn, 1978), pp. 297-314. The following remarks try to summarize some results and to put them into a larger context.

[10] See S. Pollard, *The Genesis of Modern Management. A Study of the Industrial Revolution in Great Britain* (1965), pp. 37 ff.

There were, in practice, many channels through which bureaucratic patterns spread to the developing factory system and its management. Various interdependencies between government agencies and early enterprises continued after the mercantilistic period. Government departments staffed by technically trained men, responsible for building and administering roads and canals, continued to exist and grow. Civil servants acted as entrepreneurs, and the government continued to run some enterprises, especially in mining, and later in the railroad sector. Civil servants played a leading role in the system of technical and industrial education begun in the 1820s, and also in early scientific and industrial associations. Engineering expertise was concentrated in the Prussian technical administration and in special military units. In 1850 the Prussian engineering corps consisted of 4,000 men and 220 officers. Competent civil servants and military men were hired by the private railroads and other firms which paid higher salaries than the government.[11] No doubt they brought bureaucratic patterns, styles, and values with them into the growing private enterprises. In addition, the early entrepreneurs and their employees often shared the preferences and stereotypes which dominated the social climate and the culture of their time. The broad recognition and, by and large, favourable public image of German civil servants were mentioned above.

The bureaucratic impact on industrial organization can be usefully examined in terms of the experience of one firm. The Siemens & Halske electrical manufacturing firm was founded in Berlin in 1847; it was not only the pioneer in the field of electrical engineering and installations, but has succeeded in staying ahead of the competitors until the present day. The number of the employees in Germany (i.e. excluding its foreign branches), was 600 in 1872, 4,000 in 1895, and 57,000 in 1912.[12] Bureaucratic traditions were clearly visible within the Siemens management. A substantial minority of the salaried employees were former Prussian civil servants. The founder, Werner Siemens, had received part of his training in a technical military school in Berlin and had spent 15 years in a military career before starting his own business. As early as 1855 shop rules were formulated and written down. (Such written and general rules of shop discipline were applied in other German factories at least as early as the 1830s.[13]) The

[11] For the active role of Prussian civil servants around 1800, see F. Redlich, 'The Leaders of the German Steam-Engine Industry During the First Hundred Years', *Journal of Economic History*, IV (1944), pp. 121 ff.; F. Zunkel, 'Beamtenschaft und Unternehmertum beim Aufbau der Ruhrindustrie, 1849-1880', *Tradition*, IX (1964), pp. 261-76. For technical and industrial schools and associations, see P. Lundgreen, *Techniker in Preußen während der frühen Industrialisierung. Ausbildung und Berufsfeld einer entstehenden sozialen Gruppe* (Berlin, 1975); K.-H. Manegold, *Universität, Technische Hochschule und Industrie* (Berlin, 1970); *Chronik der Kgl. Technischen Hochschule zu Berlin, 1799-1899* (Berlin, 1899); R. Rürup, 'Die Technische Universität Berlin, 1879-1979', id., ed., *Wissenschaft und Gesellschaft. Beiträge zur Geschichte der Technischen Universtät Berlin, 1879-1979* (Berlin, 1979), pp. 3-47; P. Borscheid, *Naturwissenschaft, Staat und Industrie in Baden* (1848-1914) (Stuttgart, 1976); F. Schnabel, *Die Anfänge des Technischen Hochschulwesens* (Karlsruhe, 1925); C. Matschoss, 'Geschichte der Königlich-Preussischen Technischen Deputation für Gewerbe', *Beiträge zur Geschichte der Technik und Industrie*, III (1911), pp. 239-53. For an example of a civil servant hired by a private railroad company see V. v. Unruh, *Erinnerungen aus dem Leben*, H. v. Poschinger, ed. (Stuttgart, 1895). U. v. Bonin, *Geschichte des Ingenieurkorps und der Pioniere in Preußen* (Berlin, 1877 and 1878).

[12] For a history of the Siemens enterprises see G. Siemens, *History of the House of Siemens*, 2 vols (Freiburg/München, 1957). The following paragraphs on the basis of Kocka, 'Family and Bureaucracy'.

[13] For an example from 1837 see W. Fischer, *Der Staat und die Anfänge der Industrialisierung in Baden, 1800-1850* (Berlin, 1961), p. 357. For an earlier example of written office rules, see W. Köllmann, *Friedrich Harkort* (Düsseldorf, 1964), I, p. 187.

Siemens company quickly developed a system of written and generalized instructions which provided fixed lines of communication within and between the offices. The sources show a well developed sense of hierarchy, and sometimes read like the files of a contemporary administrative agency. This high degree of bureaucratization cannot be explained merely as managerial response to the operational requirements of the enterprise; it also resulted from the acceptance of traditional organizational models developed outside industry.

The influence of bureaucratic patterns from outside the firm was also evident in the status and self-image of the early salaried employees at Siemens. Their remuneration by monthly salaries, which were based in part on seniority, their actual job security, vacation privileges, and the non-manual nature of their work differentiated them clearly from the wage earners. In these respects they were comparable to civil servants. Indeed, they were called *Privatbeamte*, and they regarded themselves, somewhat inaccurately, as a private kind of civil servants bearing delegated authority and deserving certain privileges.[14]

It should be noted, however, that the bureaucratic tendencies within the management of the early Siemens company were clearly limited by several interrelated factors, more so than in later and larger companies. The strength of family traditions within this organization set a limit to its bureaucratic character.[15] The power of the owner-entrepreneur and his closest aides was such that they could cut through the hierarchical lines and break through established patterns of communication. The relatively small size and rapidly changing nature of the young enterprise set limits to the repetitiveness of its operations, to the generalization of its processes, and to the institutionalization of its functions.

As far as bureaucratic patterns were adopted, however, they made a direct contribution to the success of the business. Bureaucratic controls stressing accuracy, punctuality, and regularity tended to check the more traditional, irregular, and slow performance of the still prevailing artisan-type first-generation factory workers, and thus helped to increase the efficiency of work. In this respect, capitalist industrial needs and bureaucratic rationality joined hands in suppressing and changing more traditional forms of behaviour.[16] Furthermore, the bureaucratic impact manifested itself in the civil-service ideology of the salaried employees, and thus served the success of the enterprise. Especially since sufficient instruments of direct control (sophisticated accounting techniques, easy communication over long distances) did not exist, the civil-servant ethos of employees was in the interest of management. This ethos implied, as a sympathetic observer has put it, "integrity, a sense of duty, unselfish

[14] For details see J. Kocka, 'Industrielle Angestelltenschaft in frühindustrieller Zeit', in O. Büsch, ed. *Untersuchungen zur Geschichte der frühen Industrialisierung vornehmlich im Wirtschaftsraum Berlin-Brandenburg* (Berlin, 1971), pp. 317-67.

[15] The first clerks and administrative employees at Siemens were relatives of the founder. The three branches of the firm, in Berlin, St. Petersburg, and London, were led by three brothers: Werner, Carl, and William Siemens. Co-ordination of this multi-national structure, in the first decades, was achieved through the private correspondence of the three brothers. Family cohesion was used to solve managerial problems, in a quite unbureaucratic way. On the relations between capitalist enterprises and entrepreneurial families in general see E. J. Hobsbawm, *The Age of Capital* (New York, 1975), pp. 230-2, 237-40; J. Kocka, 'Familie, Unternehmer und Kapitalismus. An Beispielen aus der frühen Industrialisierung', *Zeitschrift für Unternehmensgeschichte,* XXIV (1979), pp. 99-135 – English translation in *German Yearbook on Business History,* I (1981, forthcoming).

[16] Similar problems, though without reference to the bureaucratic impact, are discussed in E. P. Thompson, 'Time, Work-Discipline and Industrial Capitalism', *Past & Present,* 38 (1967), pp. 56-97.

diligence, public spirit, an unbending sense of justice, and unpretentious loyalty".[17] To the extent that this was more than mere rhetoric, such attitudes and self-images of the early employees fulfilled a function which, during the early industrialization in Britain, was partly performed by professional ethics.[18] They checked the widespread unreliabilities and fraudulent activities of poorly controlled employees whose loyalty was decisive for the early company. Moreover, their civil-service self-images made it impossible for the white collar employees to consider joining hands with protesting wage earners. They clearly identified themselves with management and regarded the blue collar force as different and inferior. In later years at least, management maintained some of the white collar privileges just because that helped to provide for stability and loyalty.

This is not the place to follow the history of the Siemens firm in any detail. There were crises of growth in the 1880s, when the disadvantages of bureaucratic organization became more visible: a certain slowness of response, organizational bottle-necks, and over-formalization. But under the leadership of the second generation, after 1890, new growth set in; the firm started to select professional managers, largely graduates from the technical universities; and thorough reforms of the management structure took place, which *both* built on the bureaucratic traditions of the firm *and* altered them.

Not only did the top management adopt a more systematic approach and subject itself to some impersonal, general rules. Also on the middle management levels, within the huge white collar departments and in the management of the factory, bureaucratic tendencies became more manifest than ever before. The sales departments and field offices, while behaving flexibly in the market, internally worked according to most detailed, centrally issued regulations. They were organized like public administrations, and most of the activities performed in them were highly specialized and routinized. By 1910, Siemens & Halske introduced a revised shop organization. The planning and control of the factory work now took place in new planning offices in advance, clearly separated from the operations on the shop floor. Production and operations were increasingly standardized. A painstaking system of written prescriptions and controls, using forms and cards of different colours to an unprecedented extent, was introduced to rationalize the production process. It seems that Siemens, like other large German enterprises, adopted elements of "Taylorism"—without using the name—even before these American principles of industrial organization were propagated in Germany in the last years before World War I.[19]

The number of salaried employees increased both in absolute and in relative terms. The ratio of non-manual to manual workers was 1:11 in 1865, 1:7 in 1890, and 1:3·5 in 1912. In many respects the status of the 12,500 Siemens salaried employees of 1912 had become more similar than before to the status of employees in public bureaucracies. Most of them (except those at the top) received salaries in which achievement criteria played a smaller and seniority a larger role than in previous years. They were treated according to general rules about recruitment, remuneration, promotion, fringe benefits, and controls.

[17] Hintze, 'Der Beamstenstand', p. 77.

[18] Pollard, *Genesis of Modern Management*, pp. 129 ff.

[19] H. Homburg, 'Anfänge des Taylorsystems in Deutschland vor dem Ersten Weltkrieg', *Geschichte und Gesellschaft*, IV (1978), pp. 170-94.

Generalized qualifications (degrees from technical, commercial, and general schools) had gained some emphasis in the process of recruitment. Most of them performed highly specialized, routinized functions within a rigid network of regulations and in hierarchically structured departments and offices.

Such changes indicated increasing bureaucratization, which resulted from different factors: from the mere expansion of the enterprise as such; from the technological refinement and the accuracy required by expensive and complicated machineries; from the increased application of science; and from the requirements of more sophisticated accounting and sales methods. Although influences from outside public bureaucracies continued to play some role, this development around the turn of the century was largely the product of changes occurring within the enterprise. While up to 1890 the bureaucratic features of the Siemens management had largely resulted from outside influences, they were now reinforced by an internally generated process of industrial bureaucratization.

There remained, however, many limits to the bureaucratization at Siemens. On the top management level informal and personal factors continued to play a role. The top decision makers were not constrained by the network of bureaucratic roles which they gradually imposed on the administrative departments and shops. Many important decision-making processes took place through informal channels of communication. Non-hierarchical patterns of co-operation between departments were consciously stressed. An internal price system was established and elements of the market were incorporated into the organization of the firm. Financial, success-related incentives determined the income of the highest ranking officials. Conscious policies of decentralization were applied. And there remained clear differences between the status of the employees and a fully developed civil service status—whatever the employees wished and demanded. Tenure and seniority rules were ultimately dependent on the firm's success. Some employees experienced lay-offs in depressions, even at Siemens. Graduation from certain schools did not guarantee an "appropriate" position in the firm, while careers remained possible on a self-made basis (though they seem to have become less frequent). Nepotism in promoting employees was possible, and could be very functional.

Of course, these details derive from a single case study. The Siemens firm may have been influenced by the bureaucratic tradition more than others, due to the biography of its founder, its close contacts with such large institutions as the post office and railroads, and needs of electrical engineering for particular accuracy and scientific preparation. But what we know about other firms points into a similar direction, though often to a lesser degree. This is especially true for the railways, which in the United States pioneered modern management methods, and which in Germany were under strong government influence from the beginning.[20] Starting in the 1870s there is a lively and growing literature on

[20] For the United States, see A. D. Chandler, Jr. 'The Railroads: Pioneers in Modern Corporate Management', *Business History Review*, XXXIX (1965), pp. 16-40. The history of German Railroad management in comparative perspective still needs to be written. Cf. C. W. F. Schmeidler, *Geschichte des Deutschen Eisenbahnwesens* (Leipzig, 1871); B. Stumpf, *Geschichte der deutschen Eisenbahnen* (Mainz/Heidelberg, 3rd. ed. 1960). For a case study, see *Das Bergisch-Märkische Eisenbahn-Unternehmen in seiner Entwicklung während der ersten 25 Jahre des Betriebes* (Elberfeld, 1875). A Cologne electro-technical firm is studied in depth by G. Schulz, *Die Arbeiter und Angestellten bei Felten & Guilleaume* (Wiesbaden, 1979). Also see W. Treue, *Die Geschichte der Ilseder Hütte* (Peine, 1960).

business management and administration, and a reading of the manuals, journals and the like tends to support the picture I have drawn from the Siemens case study.[21] Nevertheless, our conclusions must remain somewhat hypothetical in character.

As a result of the specific conditions of German industrialization, bureaucratic patterns strongly influenced the development of industrial management. First, they were largely induced from the outside, although they directly contributed to the managerial success of the early firms. Later on, under new technological and commercial conditions, bureaucratization continued, more as a result of changes within the enterprise than as a result from external influences. While being modified and adjusted, existing bureaucratic structures and dispositions could be utilized by German large-scale enterprises in later periods of growth, even though they had to be adjusted to new strategies and operations.[22] Within these structures, the need for systematic management, for increasingly professional personnel with formal training from outside schools, for accuracy and rational organization could more easily be met.[23]

In countries without strong bureaucratic traditions, this building of adequate large-scale organizations in an advanced stage of industrial capitalism must have been a much more difficult process. Recently, the hundred largest German manufacturing and mining firms in 1887 and 1907 were compared with a similar British list. The differences of size, degree of diversification, and extent of functional integration are striking.[24] There are many reasons for this much discussed German-British difference. One of them might be the easier availability of organizational and managerial skills on the German side—due to the structures and traditions discussed in this article. But it should be stressed again that bureaucratic structures and techniques always were just one dimension of industrial management. In order to be functional they had to be checked by and amalgamated with other patterns, especially with personal, family-based managerial techniques and with market incentives and mechanisms. The top management positions in particular continued to work according to pre-bureaucratic patterns. In the last analysis, all the limits to bureaucratization in the industrial enterprise resulted from its market dependence and particular achievement orientation, and the fact that private property remained its major source of legitimate power which could successfully refuse to yield to the pressures of bureaucratization.

III

The distinction between manual (wage) workers and non-manual (salaried)

[21] J. Kocka, 'Industrielles Management. Konzeptionen und Modelle in Deutschland vor 1914', *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte*, LVI (1969), pp. 332-72.

[22] For the concepts see A. D. Chandler, Jr. *Strategy and Structure* (Cambridge, Mass. 1962), pp. 7-17.

[23] J. Kocka, 'Les entrepreneurs salariés dans l'industrie allemande à la fin du XIX^{e} et au début du XX^{e} siècle', M. Levy-Leboyer, ed. *Le patronat de la seconde industrialisation* (Paris, 1979), pp. 85-100.

[24] J. Kocka and H. Siegrist, 'Die hundert größten deutschen Industrieunternehmen im späten 19. und frühen 20. Jahrhundert. Expansion, Diversifikation und Integration im internationalen Vergleich', in N. Horn and J. Kocka, eds. *Recht und Entwicklung der Großunternehmen im 19. und frühen 20. Jahrhundert* (Göttingen, 1979), pp. 55-122, esp. 84-9; J. Kocka, 'The Rise of the Modern Industrial Enterprise in Germany' in A. D. Chandler, Jr. and H. Daems, eds. *Managerial Hierarchies. Comparative Perspectives on the Rise of the Modern Industrial Enterprise* (Cambridge, Mass. 1980), pp. 77-116, esp. 99-110. On England see the contributions in the same volume by L. Hannah.

employees can be observed in all industrializing societies. And a good deal of sociological literature has been devoted to the distinction between blue collar and white collar, *Arbeiter* and *Angesttellte*, *ouvriers* and *employés*.[25] I want to argue that this virtually universal distinction was particularly sharp and socially relevant in nineteenth- and early twentieth-century Germany, and that the particular sharpness of this "collar line" was partly due to the bureaucratic impact on German industrialization.

It has already been mentioned that, in the early stages of industrialization and *within factories*, management differentiated clearly between salaried persons and wage earners, with respect to type and amount of payment, job security, and early welfare benefits. In the German industrial enterprises so far investigated, salaried employees and wage workers differed more clearly than in comparable American enterprises of the same period. The distinction between wage workers and salaried employees may have been equally visible in nineteenth-century English firms, but neither in the United States nor in Britain did technicians, supervisory personnel, salesmen, clerks, or office employees conceive of themselves as '*Privatbeamte*' ("private civil servants").[26]

To explore the significance of the emerging distinction between blue- and white-collar work and workers, it is necessary to consider it in general terms, rather than as a manifestation of the experience of individual enterprises. And in what follows I shall take draftsmen, technicians, and engineers as examples. Bureaucratic traditions contributed to the formation of these groups, and the school system served as an intermediating link.

Starting in the 1820s, Prussia and other German states had established a series of public industrial and technical schools, *Gewerbeinstitute* and *Gewerbeschulen*. There were several motives behind this initiative, but most important was the government aim of promoting industry, the national wealth and the state's power. In the early years, access to these schools was easy, due to the virtual lack of entrance examinations and to the many available scholarships. In the first fifty years of the Berlin *Gewerbeinstitut*, for example, about 3,500 technicians graduated there, and most of them went into salaried positions within private firms, as foremen, draftsmen, supervisors, engineers, and managers.

But around the middle of this century some of these schools experienced a thorough process of academization. Practical training, until then a central part of the courses, was reduced; mathematics became more important, specialization increased. The teachers sought the relatively autonomous status of faculties. Entrance qualifications were raised: elementary school background had sufficed in the 1830s, but by 1870 *Abitur*—graduation from a *Gymnasium* or a similar secondary school—was a condition for application. Stipends were reduced, and fess were raised. Access for the sons of lower class families became more difficult. The characteristic name of the institution evolved inexorably from industrial

[25] F. Croner, *Soziologie der Angestellten* (Cologne, 1972); S. Braun, *Zur Soziologie der Angestellten* (Frankfurt, 1964); G. S. Bain and R. Price, 'Who is a White Collar Employee?', *British Journal of Industrial Relations*, x (1972), pp. 329-39; S. Pollard, 'The Rise of the Service Industries and White-Collar Employment', in B. Gustafsson, ed. *Post-Industrial Society* (London, 1979), pp. 17-43.

[26] J. Kocka, *White Collar Workers in America, 1890-1940. A Social-Political History in International Perspective* (1980), pp. 92 ff., 268 ff.

school to industrial institute to industrial academy, and finally, in Berlin in 1879, to technical college or technical university (*Technische Hochschule*).[27]

All these changes were part of a complex process in which industrial production techniques became more scientific. By raising standards and altering their courses, the schools responded to increasing demands from industry, and they supplied qualified employees who then introduced more systematic and partly scientific methods to the firms which hired them. Thus, from the 1850s on we find construction bureaux in the large German machine building firms, and laboratories in the metal producing and chemical industries. But on the other hand, detailed research suggests that the supply of academically trained graduates ran ahead of manifest demands from industry: schools did not just respond to existing demands but created them. Behind the academization of those schools we partly see at work the teachers', the administrators' and the graduates' wishes for social upgrading.

In the early stages of German industrialization the social prestige of businessmen, managers, and employees in the private economy seems to have been low. Admittedly, the low status of early businessmen, compared with more traditional positions and élites, was not peculiar to Germany. But perhaps the remedy chosen was. In Germany, education was a very important criterion of social standing; formalized, examination-proved qualifications served as an important platform for claims to positions, status, income, and power. There existed a close fit between the type of graduation a person had achieved, and the type of career to which he or she was entitled; in fact, the great importance of titles, so often observed, and ridiculed, by foreign visitors, symbolized this close fit which did not have a parallel in nineteenth-century Britain or America; in Germany, all this was part of the bureaucratic legacy. Consequently, a high degree of functional specialization and hierarchical differentiation characterized the German school system, which was in any case run by civil servants. Now, in the third quarter of the century, technical schools were integrated into this system, the teachers and graduates of those schools thus entered the system of titles and positions, which in Germany ranked besides landed property and noble birth as an important source of esteem and recognition. In contrast to becoming a landed rentier or a scholar, this route to social upgrading did not deprive industry of human resources, talents and energy—on the contrary.[28]

This bureaucratically guided German process of academization served as a basis on which the profession of engineers emerged, clearly separated from craftsmen, artisans, foremen, and the like. Until then there was no clear separation between mechanics, technicians, and engineers in terms of self-identification, job profiles, and semantic classification; the word "engineer" had usually referred simply to members of the specific military formation responsible

[27] P. Lundgreen, 'Industrialization and the Educational Formation of Man-Power in Germany', *Journal of Social History*, IX (1975/6), pp. 64-79; P. Lundgreen, *Techniker in Preußen während der frühen Industrialisierung. Ausbildung und Berufsfeld einer entstehenden sozialen Gruppe* (Berlin, 1975); Kocka, *Unternehmensverwaltung*, pp. 166 ff.

[28] Details and evidence in J. Kocka, 'Bildung, soziale Schichtung und soziale Mobilität', pp. 297-309. Most recently on the 'Berechtigungswesen' see R. v. Westphalen, *Akademisches Privileg und demokratischer Staat. Ein Beitrag zur Geschichte des Laufbahnwesens in Deutschland* (Stuttgart, 1979); K.-H. Manegold, 'Technology Academized: Education and Training of the Engineer in the 19th century', in W. Krohn et al. eds. *The Dynamics of Science and Technology* (Dordrecht, 1978), pp. 137-58.

for the construction of roads, bridges, and war machines. However, around the middle of the nineteenth century, the meaning of "engineer" changed. It became a collective name for non-military technical men with at least some theoretical training, engaged in non-manual work.[29]

The close connection between the academization of technical schools and the formation of the engineering profession is exemplified by the origins of the most influential engineering association, *Verein Deutscher Ingenieure (VDI)*. This originated in 1856 from an alumni association of the Berlin industrial academy. Its statutes stressed higher technical education and theoretical background as a major attribute of the *Ingenieur*.[30] There seems to have been no parallel development in nineteenth-century England. At least in the British machine tool industry, on-the-job apprenticeship remained at the centre of the engineer's training. And in that respect the separation between non-manual technical employees and skilled mechanics, was, in England, less clearly demarcated than in Germany. Again, semantic differences tend to corroborate this finding. While the German word "*Ingenieur*" like the French "*ingenièur*" clearly excluded manual workers, even the most skilled mechanics, the English word "engineer" could include certain types of skilled blue-collar workers as well.[31]

It would be easy to elaborate this line of argument by exploring the relationship between changes in the educational system and the changing pattern of group, strata, and class formation, in the late nineteenth and early twentieth centuries.[32] However, in terms of the present article, I should like, instead, to discuss one other mechanism through which bureaucratic influences contributed to the emergence of a distinct white collar class, and indirectly to the relatively clear delineation of the blue collar working class, in Germany.

By the 1880s, in spite of what has been said so far, the dividing line between blue collar and white collar workers, *outside* the single firms, remained fragmented and vague, peripherical to public opinion, and politically somewhat irrelevant. Different white collar groups—retail clerks, technicians, bank employees—did not share a sufficient range of experiences or attitudes to display a common consciousness, join common organizations, or engage in common actions. Outside individual enterprises, the semantic distinction between *Arbeiter* and *Angestellte* or *Arbeiter* and *Privatbeamte*, although not unknown in the 1880s, was not very common.

By the beginning of World War I, however, the picture had radically changed. Books, pamphlets, periodicals, and public debates dealt with the *Angestelltenfrage*; the term "*Angestellte*" had been fully established; associations of different white collar occupations had begun to join hands and had started

[29] H. Schimank, 'Das Wort "Ingenieur",' *Zeitschrift des VDI*, LXXXIII (1939), pp. 325-31. On early engineers in general, see U. Troitzsch, 'Die Rolle des Ingenieurs in der Frühindustrialisierung—ein Forschungsproblem', *Technikgeschichte*, XXXVII (1970), pp. 289-309.

[30] *Verein Deutscher Ingenieure, 1856-1926* (Berlin, 1926), p. 51; L. U. Scholl, 'Bürokratisierung und Professionalisierung Zur Genesis technischen Beamtentums im Staatsdienst am Beispiel des Königreichs Hannover', *Technikgeschichte*, XLVI (1979), pp. 117-38; L. V. Scholl, *Ingenieure in der Frühindustrialisierung. Staatliche und private Techniker im Königreich Hannover und an der Ruhr (1815-1873)* (Göttingen, 1978).

[31] R. C. Floud, *The British Machine Tool Industry, 1850-1914* (Cambridge, 1976); P. L. Robertson, 'Technical Education in the British Ship-Building and Marine Engineering Industries, 1863-1914', *Economic History Review*, 2nd ser. XXVII (1974), pp. 222-35.

[32] Kocka, 'Bildung', pp. 303 ff.

common action; and something like a white collar movement had developed, encompassing white collar groups from different occupations and industries, setting them clearly apart from the blue collar workers and those self-employed. Of course, the different types of white collar workers continued to differ in many ways, and they continued to adhere to specific occupational or sectoral identities. Nevertheless, the concept "*Angestellte*" now began to refer to a real social group with some sort of common consciousness, shared interests, internal communication, common organization, and clear visibility.[33] What had brought this about?

Among other influences, changes in the occupational structure played a part, while the rising challenge of a blue collar working class movement also served as an additional stimulus for white collar employees to stress the one thing they had in common—the fact that they were not manual workers. But the major factor behind this early formation of a relatively distinctive white collar class was clearly connected with the bureaucratic tradition. It was very much in tune with the German tradition of reform from above, with the power and the self-consciousness of the civil service, and with the general values and expectations of many citizens that (at least since the 1870s and 1880s) the government increasingly intervened in the economy and in social relations in order to manage tensions and mollify conflicts which mainly resulted from the advancement of industrial capitalism. This increase in state intervention stimulated an articulation of interests along previously vague lines of social differentiation—a development which was designed to influence government decisions, and which in the process contributed to the clarification of those previously vague lines of differentiation and to the formation of social groups.

The public insurance system, enacted in the 1880s, was the most important issue with respect to which white collar workers developed something like a common identity apart from blue collar workers and employers alike. Bismarck's compulsory health, accident, and old age insurance schemes were designed to include both industrial blue collar workers and a large majority of white collar employees whose annual incomes were below a certain limit. Payments and benefits were graded according to income levels, length of membership, and other criteria, but the schemes did not differentiate between wage workers and salaried employees. However, the law permitted occupational groups to contract-out of some of the public schemes if they formed organizations of their own to set up voluntary insurance schemes which met certain criteria.

Not surprisingly, some groups of salaried employees felt sufficiently different from and superior to the mass of the workers to choose this alternative. And the first attempt to organize salaried employees from different occupations and sectors resulted from this: The "Deutscher Privatbeamten-Verein" was founded in 1881; it included bookkeepers, engineers, bank employees, office workers, and others, and it provided for an insurance scheme imitating as much as possible the benefits civil servants would enjoy after retirement.[34]

[33] For a recent over-view see D. Schulz, 'Die industriellen Angestellten. Zum Wandel einer sozialen Gruppe im Industrialisierungsprozeß', in H. Pohl, ed. *Sozialgeschichtliche Probleme in der Zeit der Hochindustrialisierung (1870-1914)* (Paderborn, 1979), pp. 217-66; G. Hartfiel, 'Germany', in A. Sturmthal, ed. *White-Collar Trade Unions* (Urbana, Ill. 1967), pp. 127-64; on the history of the concept 'Angestellte' see J. Kocka, 'Angesteller', in O. Brunner et al. eds. *Geschichtliche Grundbegriffe. Historisches Lexikon zur politisch-sozialen Sprache in Deutschland*, 1 (Stuttgart, 1972), pp. 110-28.

[34] Kocka, *Unternehmensverwaltung*, pp. 515 ff.

This initiative remained within narrow limits, but in the late 1890s a much larger movement with similar purposes and far reaching effects got off the ground. By then many white collar workers earning less than 2,000 marks a year had been included in the public old age pension scheme, together with the mass of industrial workers. The majority of employees' organizations, under the lead of three commercial employees' associations but also including organizations of technicians, foremen, bank, and general office employees, started to agitate in favour of taking all *Angestellte* out of the general insurance scheme. They demanded a separate public insurance system for *Angestellte*, more appropriate to their special needs, by which they allegedly differed from blue collar workers. They agitated for an insurance system modelled—as much as possible—after the pension schemes of civil servants. They were ready to pay a slightly higher premium, wanted higher benefits, and required specific conditions. In the course of more than ten years of increasing agitation in favour of such a law, a whole set of different ideologies and rhetoric was developed in order to justify the claim that white collar employees were different from and superior to blue collar workers. And in these years a common identity of *Angestellte* across occupational lines crystallized in spite of many continuing differences. As a result the separation between white collar workers and blue collar workers became more manifest. The concepts of "*Privatbeamte*" and "*Angestellte*" became fully accepted, sharply defined, and popular.

In 1911 the desired law was enacted, although financial exigencies meant that benefits remained far behind those of civil servants. At bottom, the demand for legal privilege succeeded because it secured support from different middle-class parties and the government, hoping thereby to ensure that the rapidly growing mass of salaried employees would remain outside the strong socialist camp and committed to the existing order.[35]

There were similar legal developments in Austria,[36] but not in England, France, or the United States. In Germany it was now of legal importance whether an employee qualified as white collar employee (*Angestellter*) or not. Labour and social legislation, enacted in the following years, frequently differentiated between *Arbeiter* and *Angestellte*, incorporating the definition of the 1911 law (slightly revised and enlarged in later years). The more often laws differentiated this way, the more relevant the line between blue and white collar workers became in terms of real life chances. At least until 1933, and to some extent even today, the distinction counts for more in Germany than in other countries, in terms of social and labour legislation, industrial relations, union structures, political behaviour, collective mentalities, public symbolism, political language, and in many other respects.[37]

[35] E. Lederer, *Die Privatangestellten in der modernen Wirtschaftsentwicklung* (Tübingen, 1912); Lederer, 'Angestelltenorganisationen und -sozialpolitik', *Archiv für Sozialwissenschaft und Sozialpolitik*, XXXV (1912), pp. 263 98; Kocka, *Unternehmensverwaltung*, pp. 516-19, 536-44.

[36] G. Ortruba, 'Zur Geschichte der "Angestellten" und ihrer wachsenden Bedeutung in Österreich bis 1918 (im Vergleich zu Deutschland)', *Österreich in Geschichte und Literatur*, XXI (1977), pp. 74-122.

[37] Kocka, *White Collar Workers in America*, pp. 251-84. Recently, some British historians have started to play down the role of pre-industrial structures and traditions (such as the bureaucratic one) in the history of German society. They also underestimate the resulting differences between German and British social, political, and cultural developments. See G. Eley, 'Capitalism and the Wilhelmine State', *Historical Journal*, XXI (1978), pp. 737-50; R. J. Evans, 'Introduction: Wilhelm II's Germany and the Historians', in R. J. Evans, ed. *Society and Politics in Wilhelmine Germany* (1978), pp. 11-39; D. Blackbourn and G. Eley,

This had far reaching social and political consequences. For example, there seems to have been a mutually reinforcing relationship between the sharpness of the blue collar/white collar line on the one hand, and the relative small importance of the division between skilled and unskilled blue collar workers on the other. Compared with Britain and the United States, it would seem that the division between an upper stratum of skilled manual workers and the mass of unskilled or little skilled blue collar workers was less pronounced in Germany, in the late nineteenth and early twentieth centuries, in terms of union structure, political behaviour, perhaps even life styles and cultures. It may not be just a historiographical peculiarity, but rather a function of social reality that there has been no debate about a German labour aristocracy. And I would argue that the German debate about the *Angestelltenfrage*, the socio-political division between white collar and blue collar workers (which was, of course a political debate—would the employees join the socialist camp, why did they not?) was a functional equivalent of the British labour aristocracy debate. It has been lively in Germany since about 1910 and nearly absent in Britain or the United States.[38]

This is not the place to discuss the problems of the labour aristocracy. It is, however, relevant to emphasize that Germany's early social welfare legislation, itself part of the German tradition of bureaucratic reform from above, created the circumstances in which different types of salaried employees stressed what they had in common as against the blue collar working class. The private civil servant ideology both motivated and legitimated their demands. This ideology of bureaucratic origin offered them a powerful if utopian model for collective self-identification which was neither dichotomic nor functional but hierarchical. It cut across functional and occupational differences between them, playing them down; at the same time it accentuated the gulf, the social distance, between them and the mass of the workers and lower class people in general; it defined the salaried employees as belonging to a middle stratum, clearly marked off from the lower class, and also differentiated from the employers and the élite. In addition, the private civil servant ideology stressed *specific* aims and claims. It was not accidental that salaried employees were mobilized by insurance issues. As private civil servants they did not only claim clearly delineated status, but also security, protection against market fluctuations, and against risks in general. Bureaucratic, rather than capitalist, traditions had imprinted their aspirations and mentalities. Later on, in the first third of the twentieth century, both their marked claims for status, and their quest for security beyond the market came into sharp conflict with the reality of advancing capitalism and its crises. The resulting resentments and protests were particularly strong, not without anti-

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Mythen deutscher Geschichtsschreibung (Frankfurt, 1980). It seems that they have not taken into consideration the kind of evidence presented above, and the body of literature from which it derives. They claim to have destroyed various "myths of German historiography", but in reality have produced new ones.

[38] E. Lederer and J. Marschak, 'Der neue Mittelstand', *Grundriß der Sozialökonomik*, IX, I (Tübingen, 1926), pp. 120-41; E. Fehrmann and U. Metzner, *Angestellte in der Sozialwissenschaftlichen Diskussion. Ein Literaturbericht* (Köln, 1977). Also see the comparative remarks in E. J. Hobsbawm, 'The Labour Aristocracy in 19th-century Britain', reprinted in *Labouring Men. Studies in the History of Labour* (1968), pp. 296-97. Cf. the comparison between Germany, England and France by W. Mangold in J. Kocka ed. *Angestellte im europäischen Vergleich* (Göttingen, 1981, forthcoming). See also the articles on English white collar workers in the same volume by G. Anderson and G. Crossick.

capitalist overtones, and more pronounced than they would have been without the bureaucratic tradition.[39]

IV

This has been a very crude picture leaving aside many differentiations and qualifications. In particular, regional differences have been ignored, even though they have been stressed in the recent debate on industrialization.[40] But in the discussion the bureaucratic conditions of industrialization, the use of the national context and international comparisons may be more justified than in the analysis of some other dimensions of industrialization.

In the German case, and at the level of industrial organization and white collar workers, bureaucratic structures and traditions seemed to have facilitated economic rationality and effectiveness. And in this respect the experience would support Weber's fascination with the virtues of bureaucracy rather than his fears of bureaucratic ossification. On the social historical side however, the bureaucratic tradition contributed to a degree of inequality not fully explicable in terms of capitalist industrialization *per se*. And this conclusion would need to be examined by analysing other dimensions of German industrialization from similar viewpoints, and by a more sustained comparison with other countries.

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[39] C. Dreyfuß, *Beruf und Ideologie der Angestellten* (München/Leipzig, 1933), English translation: *Occupation and Ideology of the Salaried Employees* (New York, 1938); H. Speier, *Die Angestellten vor dem Nationalsozialismus. Ein Beitrag zum Verständnis der deutschen Sozialstruktur, 1918-1933* (Göttingen, 1977).

[40] S. Pollard, ed. *Region and Industrialisation. Studies on the Role of the Region in the Economic History of the Last Two Centuries* (Göttingen, 1980).