



Environment, Agriculture, and Industrialization in Europe

Author(s): E. L. Jones

Source: *Agricultural History*, Vol. 51, No. 3 (Jul., 1977), pp. 491-502

Published by: Agricultural History Society

Stable URL: <http://www.jstor.org/stable/3741717>

Accessed: 13-05-2015 09:51 UTC

REFERENCES

Linked references are available on JSTOR for this article:

http://www.jstor.org/stable/3741717?seq=1&cid=pdf-reference#references_tab_contents

You may need to log in to JSTOR to access the linked references.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Agricultural History Society is collaborating with JSTOR to digitize, preserve and extend access to *Agricultural History*.

<http://www.jstor.org>

ENVIRONMENT, AGRICULTURE, AND INDUSTRIALIZATION IN EUROPE

The purpose of this paper is to redirect attention to some consequences of Europe's natural-resource endowment and topographical layout for its agriculture and early industrialization. Some hypotheses will be stated (rather categorically) concerning the implications of environmental and agricultural diversity for the patchiness of rural industrialization, and for the subsequent reduction of the patches to smaller districts which offered, first, waterpower sites, and second, access to cheap coal for steampower. These considerations are nowadays rather played down by economic historians who have mostly left the integration of environmental phenomena with economic change in the hands of historical geographers, who in turn may hardly be said to have seized their opportunity. Among economic historians only the *Annales* school in France and in the English-speaking world a few individuals who are not professional economic historians have shown much awareness of the interplay of different ecosystems with the processes of long-term economic change.¹ Very recently Perry Anderson has admitted that Marxist historians have ignored the role of natural milieu in history,² without however doing much to repair the omission; while from the non-Marxist side we have just had the dismissive assertion from W. W. Rostow that, "down to the present day a good deal of controversy among economic historians on agricultural matters takes the form of

E. L. JONES is Professor of Economic History, School of Economics, La Trobe University, Victoria, Australia. This note was invited for the joint American Historical Association—Agricultural History Society meeting at Atlanta, Georgia, in December 1975 and was kindly read by Professor Rondo Cameron. The brief was simply to discuss environmental aspects of the history of European industrialization, hence the commentary by W. W. Rostow reported in *Agricultural History* 50 (January 1976): 327, which criticizes the failure to distinguish sharply what happened before 1760 from what happened afterwards is gratuitous. Professor Jones is indebted for comments to L. P. Cain and D. H. Whitehead.

¹ For example, W. M. S. Russell, *Man, Nature, and History* (London: Aldus Books, 1967) and Richard Wilkinson, *Poverty and Progress: An Ecological Model of Economic Development* (New York: Praeger, 1973).

² Perry Anderson, *Lineages of the Absolutist State* (London: NLB, 1974), 546, note 79.

. . . [regional] gamesmanship.”³ Rostow immediately proceeds to note the “fundamental fact” of agricultural variety within and among the early modern states of Europe and yet he makes little of the significance of this for differential performance in growth. “Gamesmanship” is not kindly chosen: “sparring” might be better. The specialists are admittedly not well agreed on the timing or distributions of productivity gains in English or European agriculture (let alone on their causes or consequences) but they are agreed on trying to discern spatial as well as temporal patterns in agricultural change, patterns which it is reasonable to suppose were rooted in large measure in inherent differences in production possibilities. A collective, though not a cooperative, effort is going forward to discover replicated patterns in the effects of agricultural change on industry. The distributions of early industry hardly seem to have been haphazard. Industry shifted from the locality-specific rural domestic to the highly locality-specific inanimately powered. This process was common to the European countries, although it was staggered in time among them. There seems *prima facie* justification for examining the role of environmental variables in these changing patterns. Given the low state of the arts of manufacturing and transportation as late as the start of the nineteenth century a fair degree of environmental influence on the economy may surely be expected.

As S. B. Saul has observed in a review article about Rostow’s new book, Rostow also makes little or nothing for the nature of economic growth of the link between the farm and the factory provided by cottage industry.⁴ He is not alone. Sir John Hicks labels handicraft industry as “barely distinguishable economically from trade” and shortly afterwards says there is “an exact correspondence” between it and trade.⁵ Yet while handicraft industry employs mostly working capital and very little fixed capital, unlike modern manufacturing industry, there is still an important economic and historical distinction between the “proto-industrial” phase of rural domestic manufacturing for the market and earlier cottage handicraft activity carried on for the household’s own consumption. Chronologically the distinction was not of course very exact. But there was all the organizational difference in the world between the clusters of product- and process-specialized cottage industries, which became denser and denser from the fifteenth to the eighteenth centuries, and mere domestic production for home

³ W. W. Rostow, *How It All Began: Origins of the Modern Economy* (New York: McGraw-Hill, 1975), 81.

⁴ S. B. Saul, “Steady Build-up or Sudden Leap?” *The Times Higher Education Supplement*, 4 July 1975.

⁵ Sir John Hicks, *A Theory of Economic History* (London: Oxford University Press, 1969), 141–43.

use. The elaborated form of cottage industry was a link between farm and factory. Indeed it may be urged that it was the involvement of putting-out merchants with cottage industry as well as the existence of small market-oriented manufacturers in England and Europe that made likely the "Industrial Revolution" substitution of capital (in the shape of textile machines) for labor whose marginal cost was rising steeply.

I am concerned here to draw attention back to environmental aspects of the intensification of rural domestic industry and its transition to the powered factory. Nevertheless I welcome the opportunity to disclaim the agrarian monocausalism which some writers have wrongly seen as implied by the recent work on so-called protoindustrialization.⁶ In particular I do not wish to appear to denigrate by omission the institutional arrangements that were apparently responsible for allowing increases in European farm output to outstrip population growth and to supply a surplus that could be traded against manufactures. So far from explaining growth solely by the engine of trading patterns induced by regional differences in agricultural performance, other than for limited expository purposes, I do not suppose that the engine would have done more than idle without institutional progress, nor have shifted into the higher gears of water and steam power without a long gestation of technology, nor indeed have run at all without cultural or disease patterns which prevented a rate of population growth too fast for the rate of growth of output to master.

The case for a link between the European environment, via agriculture, and industrialization was surveyed by Richard Tilly and Charles Tilly in their "Agenda for European Economic History in the 1970's."⁷ They stated that the "protoindustrialization of the European countryside . . . [was a] commitment of substantial numbers of rural people to industrial activity [which] long before the advent of factory production conditioned the economic policies of European states, the pattern of international influences, the prevailing demographic pattern and the later impact of full-scale industrialization on social life—in short, our entire agenda."⁸ Tilly and Tilly also referred to "the possibility that early modern agricultural expansion depended on protoindustry and the markets it created."⁹ This I would endorse with the important amendment that the crux was the enlargement of mutual, reciprocal

⁶ Cf. commentaries on Franklin F. Mendels, "Protoindustrialization: The First Phase of the Industrialization Process," *Journal of Economic History* 32 (March 1972): 287–94.

⁷ Richard Tilly and Charles Tilly, "Agenda for European Economic History in the 1970s," *Journal of Economic History* 31 (March 1971): 184–98.

⁸ *Ibid.*, 187–88.

⁹ *Ibid.*, 188.

markets: for industrial goods among the cash-cropping farm population and for grain among the workers in rural industries. The reciprocal production systems-cum-markets were based on ordered differences in the environment. Differences of topography, soil, and precipitation influenced the costs of crop production and gave rise, in most European countries, to one set of regions with comparative advantage in growing food crops and another where comparative advantage lay somewhere among the following options or combinations of options: pastoral husbandry, mining, lumbering, the export of labor as harvesters, domestic servants, construction workers, or mercenary troops, and cottage industry. Regional specialization promoted trade, transport, finance, and entrepreneurial facilities and functions. Regions specialized and groups of men increasingly specialized in the activities which brought the two sets of regional economies into conjunction, sometimes across national frontiers. More empirical evidence is obviously desirable on the role of this trade in stimulating the slow improvement and hence reduction in the real price of communications, and in warehousing, handling, and credit facilities. What there is accords with the impression that the early modern European countryside did gradually separate out into broad categories of regions with two sorts of ecosystem and economy, one agricultural, the other protoindustrial, linked by trade.

The Tilly and Tilly survey listed some hypotheses that seemed plausible to them on the basis of work already done.¹⁰ One hypothesis was that the expansion of rural industry tended to take place where there was (1) access to an urban market, (2) pastoral husbandry, and (3) a growing population. Before the nineteenth century, however, access to town-based putting-out services may have been more to the point than the urban market, which remained small in most countries. Further, while the correlation of rural industry with pastoral husbandry is a valuable insight, to understand the variety of experience at the time of transition to modern industry subtypes of ecosystem (hill regions, lowland heaths, clay vales, with or without either or both fast streams and coal) need to be considered. For the moment it is enough to note that Tilly and Tilly do point out the nonuniform distribution of rural industry as something requiring explanation.

Around the date of the Tilly and Tilly paper Franklin Mendels remarked that "modern industry tended to locate itself then, even when a change in product specialization was involved, in the regions where there had been handicraft industry before."¹¹ He accounted for this through the developmental legacy of rural industrialization, explaining

¹⁰ *Ibid.*, 189.

¹¹ Mendels, "Protoindustrialization," 246.

modern industries outside such areas in terms of later discoveries of raw materials or fuel, and explaining the failure of some areas of rural industry to evolve modern industry by their lack of the new fuels and raw materials, or less tractably by the absence of an appropriate socio-political framework. Mendels found it particularly difficult to handle the die-back of manufacturing in agriculturally "advanced" areas of England and Flanders because of "several broad changes in their spatial organization since the Middle Ages."¹² He mentioned various suggestions which had appeared in the literature, including my own hypothesis that the inception or intensification of rural domestic manufacturing for the market in some areas and the deindustrialization of other areas were two faces of the same process.¹³ The notion is that a shift in comparative advantage occurred in the late seventeenth and early eighteenth centuries as a result of improved food supplies coming onto a depressed market. The crop-growing areas most competitive in terms of the new farming systems became more purely agricultural, their manufacturing dying back, whereas less competitive areas sought other sources of income, especially industrial by-employment.

In a commentary on Mendel's paper David Landes referred directly to this interpretation and insisted that the "ruralization" of British industry goes back far earlier than the period alluded to.¹⁴ This is so, as I had stated. The late medieval expansion of industry into the English and European countrysides, away from the high-cost workmanship induced by the restrictive practices of the urban guilds, is a staple of the literature. I had merely offered one obviously partial and generalized explanation of a further marked shift in regional specialization in response to a shift in comparative advantage. But Landes went beyond the matter at issue and objected to the assumption by economic historians and economists of perfect rationality on the part of economic actors with its corollary that patterns of production would adjust to comparative advantage in the long run. He claimed that these assumptions run contrary to his own experience of human behavior. This raises a central methodological point, although economists will think it an elementary one. The "rationality" or maximizing assumption is merely an abstraction. It is as much use for identifying deviations from hypothesized expectations as for its intrinsic power to explain. Maybe a general historian could argue that some recent models set up by eco-

¹² *Ibid.*, 248.

¹³ E. L. Jones, "Agricultural Origins of Industry," *Past and Present*, no. 40 (1968): 58–71. See also E. L. Jones, "The Constraints on Economic Growth in Southern England, 1650–1850," *Contributions*, Third International Conference of Economic History, Munich 1965, vol. 5 (Paris: Mouton, 1974), 423–30.

¹⁴ Commentary on Mendels, "Protoindustrialization," 288, 290.

conomic historians in which feudalism is virtually conceived as a system in which obligations were freely traded have overextended the scope of the competitive model. I would be inclined to agree that too many gratuitously unreal assumptions have been imported from economics into the historical literature. However, as regards the adjustment of production patterns to comparative advantage, it is surely only in the long run that this may be expected to take place. The state of technology, institutions, and the market in preindustrial Europe would lead one to anticipate a glacially slow adjustment by twentieth-century standards, but logically an adjustment would be expected to occur.¹⁵

In Landes's view rural domestic industrialization was a function of an exogenous increase in demand. In his opinion manufacturers or putting-out merchants merely responded to this by tapping what was initially an elastic supply of underemployed labor—cottagers and small farmers and their families. But a simple response-to-demand thesis does not tell us why industrialization, whether cottage- or factory-style, took place. To explain that, the phases of rural industrial growth, their locations, and the implications of successive later concentrations in more limited areas are all potentially relevant. In that subtle book *The Unbound Prometheus* Landes does touch on these matters, but he makes exogenous demand the independent variable and industrial supply the dependent variable.¹⁶ It may instead be suggested, first, that some part of demand was endogenous to the rural sector in the sense of a gain from trade between the emergent farming and protoindustrial regions; second, that this division of regional economies was grounded in the different (agricultural) production possibilities of different types of environment; third, that the transformation of protoindustrial regions into regions of mechanized industry was heavily influenced by the nature (i.e., relative costs) of their available sources of power.

To take England first, it was the achievement of agriculture in the late seventeenth and early eighteenth centuries to feed the entire population and export a sizable volume of cereals. This was done with a smaller proportion of the population in agriculture than anywhere except the Netherlands (which was a cereal importer). The key change

¹⁵ For an observation on the lengthy lag of intraagricultural adjustments in seventeenth- and eighteenth-century England, see E. L. Jones, *Agriculture and the Industrial Revolution* (Oxford: Basil Blackwell, 1974), 79, and on broader adjustments of regional agricultural and industrial patterns, Jones, "Constraints," passim.

¹⁶ David S. Landes, *The Unbound Prometheus* (New York and London: Cambridge University Press, 1969), 137. Landes is here drawing on a paper by Max Barkhausen, "Government Control and Free Enterprise in Western Germany and the Low Countries in the Eighteenth Century," now available in translation in Peter Earle, ed., *Essays in European Economic History 1500-1800* (Oxford: Clarendon Press, 1974), 212-73.

bringing this about was the development of mixed farming. Fodder crops were grown on hitherto fallowed land and fed to animals the dung of which upgraded soil fertility and thus enhanced the yields of the following grain crops. In essence this was the clover-and-turnip revolution which was of course no revolution at all but a protracted diffusion of rotations of grain and fodder crops. An archdeacon took a rector to task for growing turnips even in the graveyard. "This must not occur again," he said. "Oh no, sir, next year it will be barley."¹⁷

Because the new farming techniques could best be established on certain types of land, mostly in the south and east, they gave rise to trade in foodstuffs with other areas. Food was exchanged against the wares of rural domestic industries from districts less successful at innovating mixed farming, notably in parts of the north and in the north-west Midlands. The growth of internal trade caused an expansion of warehousing, stabling, and credit facilities, and an increase of carriers, shopkeepers, and innkeepers.¹⁸ Probably increased efficiency in this trade sector was of great significance in economic growth, but compared with advances in production little is known about such aspects of the increasing efficiency of the market. Certainly the productivity gains from agricultural improvement enabled a smaller percentage of the labor force to feed the whole. Labor was released into manufacturing and into trade and distribution, although this should be thought of in terms of labor time since many men moved only partly out of agriculture, retaining their small farms or crofts. The innovations in agriculture no doubt turned the terms of trade in favor of regions which bought in cereals. For the same volume of manufactured wares they could buy more foodstuffs and support a larger population. Of course there may soon have been some check on this as the supply price of manufactures was brought down by a learning process and an extended division of labor whereby villages even specialized in different parts of the same product.

Rural industrial production for the market thus expanded in areas of the Highland Zone of England in the north and west and in the Lowland Zone on a few heaths and in some parts of the Midland clays. Industry got its footing on the clays where the soils were too heavy to allow mixed farming to become as efficient as on better-drained soils in the south and east. In general cottage industry was associated with

¹⁷ G. T. Warner and C. H. K. Marten, *The Groundwork of British History* (London: Blackie & Son, n.d.), 585, note 1.

¹⁸ See Alan Everitt, "The Food Market of the English Towns 1660-1760," *Contributions*, Third International Conference of Economic History, Munich 1965, vol 1 (Paris: Mouton, 1968), 57-72; and C. W. Chalklin, *The Provincial Towns of Georgian England* (London: Edward Arnold, 1974), 27, note 98.

pastoral husbandry. G. F. R. Spenceley has noted an exception in the case of the lace industry which grew up in arable parts of the southeast Midlands. Other pockets of industry, too, survived or were established in areas which were turning to mixed arable farming, for instance a spinning industry at Avebury and a cotton manufacture at Aldbourne, both in Wiltshire, but these examples were exceptional.¹⁹

The pastoral-industrial equation therefore holds. Its chief interest, and that interest is considerable, arises when the beginnings of rural industry are under discussion. A subdivision of the areas of cottage industry is however needed for understanding different regional experience in negotiating the path from cottage industry to factory industry, in England and Europe. We may consider a breakdown of proto-industrial areas according to available sources of power. In the English case, on the clays and lowland heaths of the south and east, with little or no alternative to "mother-and-daughter power," no escape from the spinning wheel or handloom, cottage industry contracted in the face of competition from machines. This was the case even when the competition came only from waterpowered machinery, for lowland streams offered scant head of water. Any upland area without adequate waterpower succumbed too. All these areas were progressively deindustrialized. The process of deindustrialization in these districts, which in a competitive farming economy could offer their populations little employment in agriculture to fall back on, was a prolonged one. Handicraft workers cut their prices to the bone in order to match machine production. Presumably the operators of water-driven textile mills in upland areas, where the scattered cottages of farmer-weavers had (as it were) slid downhill to the streamsides, also cut their prices when in turn they were faced with competition from steam. Coal beat them. Without it areas with waterpower alone followed handicraft districts into industrial oblivion.

The situation of most English coal fields in the Highland Zone meant that modern industry emerged within areas that had earlier switched successfully to mills powered by fast streams and which, in turn, lay inside the old areas of handicraft industry on uplands uncompetitive at cereal-growing. Modern industry reaped the direct benefits of being established among, and by, part of the populace long associated with cottage industry. Elsewhere, in the south and east, were the chief crop-

¹⁹ G. F. R. Spenceley, "The Origins of the English Pillow Lace Industry," *Agricultural History Review* 21 (1973): pt. 2, pp. 81-93. I am not persuaded by Spenceley's linking of lace-making and arable farming in Devon. For Wiltshire see documents in the Kemm Collection, Wiltshire Record Office, Trowbridge, and Ida Gandy, *The Heart of a Village: An Intimate History of Aldbourne* (Bradford-on-Avon: Moonraker Press, 1975).

growing regions, many of them with the remnants of industries which they had supported until the seventeenth or eighteenth century, and with pockets of clayland or heath on which handicraft industry had survived later still.

England's geological variety and hence her range of environments is exceptional. Interregional competition and specialization were more intense there than on the continent, where developments were however broadly similar. From as early as the sixteenth century cereals from plains in Poland, Hungary, and Austria were being exchanged against rural manufactures from (usually) higher ground in Saxony, Lusatia, and Bohemia. The plains even specialized in different crops. As Josef Petran has shown, the system of trading food against the products of by-employments, founded in the comparative advantage of plains and uplands, was international as well as interregional.²⁰ And not only upland and mountainous regions specialized in cottage industry, so did agriculturally poor lowland heaths of Jutland, North Germany, and the Netherlands.

Internal trade in Europe was hampered by more difficult terrain than in England, a less dense population, less readily navigable rivers, and river basins more decisively separated from one another. As Landes has observed, "nature had not been so kind as to Britain."²¹ In addition, despite revisionist work on the history of European agriculture, its technical development was in general delayed compared with that of England. Nevertheless the food supply crept up by means of imports from eastern Europe and America and the introduction of important crops like maize and potatoes.²² This eventually seems to have turned the terms of trade against agriculture. Otherwise we should expect to find that late-sixteenth-century symptoms of social disorder in the uplands, consequent, it is suggested, on their inability to produce or buy enough food or to achieve enough outmigration to the already occupied lowlands, would have been repeated in the late eighteenth century. After all, population was growing throughout Europe at both periods. That there was only a faint echo of the problems of the former period during the latter may be explained by the increase in overall food supply per capita referred to and the emergence of mechanisms whereby

²⁰ Josef Petran, "A propos de la formation des régions de la production spécialisée en Europe centrale," *Contributions*, Second International Conference of Economic History, Aix-en-Provence, 1962 (Paris: Mouton, 1965), 217–22. Cf. E. L. Jones, "Afterword," in William N. Parker and Eric L. Jones, eds., *European Peasants and Their Markets: Essays in Agrarian Economic History* (Princeton: Princeton University Press, 1975), 339–44.

²¹ Landes, *Unbound Prometheus*, 126–28.

²² See especially M. W. Flinn, "The Stabilisation of Mortality in Pre-Industrial Western Europe," *Journal of European Economic History* 3 (1974): 285–318.

the uplands could obtain a share of it; whereas in the sixteenth century the uplands had broken out with witchcrazes, banditry, and peasant revolt,²³ thereafter their populations increasingly and in general successfully adopted rural domestic industry as a means of producing goods to exchange for cereals.

Thus, as in England, there was competition between areas variously suited by natural endowment to changing agricultural techniques. Equally there was competition between areas variously suited to changing industrial power technologies. In Germany, to quote Max Barkhausen, "regions which had been backward in the past and were for the most part situated in hilly areas, became industrial regions and it was in such regions that modern industry and 'industrial society' had their origin, just as had happened in England."²⁴ The process was drawn-out, starting in the Middle Ages with mining and metallurgy.²⁵ German handicraft industry expanded into what Herbert Kisch has described as the "profitable void" of the countryside.²⁶ There was a definite further surge of rural domestic industrialization in upland areas of Germany during the second half of the seventeenth and first half of the eighteenth century, when food supplies were generally becoming more abundant. Poverty of communications in the hill country was apparently offset by wages that were low because it was outside the control of urban guilds. Much of the hill zone turned out to be so endowed as to facilitate an early transition to waterpowered industry, heightening the similarity with England.

In western Germany the pressure of demand against sources of labor and energy was nevertheless weaker than in England, perhaps because the European market was more restricted, more riven by the horizontal fissures in society which Landes has remarked on.²⁷ Yet the pressures were insistent enough by the late eighteenth century to give rise to supply bottlenecks, and to dispose of similar responses. The moment English devices like the waterpowered spinning jenny and the steam engine were obtained by industrial espionage they were eagerly adopted.²⁸ As early as 1809 the cloth-making Wupper valley could be

²³ See, for example, E. J. Hobsbawm, *Bandits* (New York: Delacourt Press, 1969), and H. R. Trevor-Roper, *The European Witch-Craze of the Sixteenth and Seventeenth Centuries and Other Essays* (New York: Harper and Row, 1969).

²⁴ Barkhausen, "Government Control," 262.

²⁵ See John U. Nef, *The Conquest of the Material World* (Chicago: University of Chicago Press, 1964), 75, 95, 100.

²⁶ Herbert Kisch, "From Monopoly to Laissez-faire: The Early Growth of the Wupper Textile Trades," *Journal of European Economic History* 1 (1972): 321.

²⁷ Landes, *Unbound Prometheus*, 127.

²⁸ Kisch, "From Monopoly to Laissez-faire," 399-400.

termed, "*ein England in Kleinen*," an England in miniature.²⁹ Change in continental Europe outside western Germany and Belgium was less inspired. The market was even smaller and more broken up. Spontaneous copying of English mechanization seemed less necessary and was slower to take place despite the general similarity of the preceding rural industrialization.

Even in Germany the English industrialization sequence was slightly modified. There were areas where rural industry emerged not because it was a substitute activity for high-cost cereal farming but because cheap food actually underwrote a low supply price of labor. The Wupper valley was one such,³⁰ while Bavaria, the crop-exporting state par excellence, actually had a higher proportion of its workforce in industry during the eighteenth century than any other German territory.³¹ These were however the exceptions. Rural handicraft production for the market in Germany and elsewhere in mainland Europe did mostly concentrate where for environmental reasons cereal production was likely to be high-cost. The populace employed in the old industries of the Sauerland, for example, on hills described by the comte de Mirabeau as "*froide, sterile, d'un aspect hideux*," was fed from nonlocal sources. The Prussian administrator Freiherr Vom Stein planned to establish a *Getreidemagazin* (grain store) in the Sauerland and urged improving the roads to ease the movement of grain in and manufactures out. But with the advent of steam, industry slid slowly north from the hills to the line of old trading towns along the *Hallweg* on a belt of fertile loess soils which made excellent farmland. By an accident of geology this loess strip conforms with the coal measures, unlike England where poor land usually overlay the coalfields. Details of modern industrialization relating to the recruitment and subsistence wage of labor, the raising of capital, the building of towns, laying-out of routes, and so forth, presumably differed between England and western Germany. Competition between hand- and water- and steam-power took mildly different forms; the costs of putting the factors of production together cannot have been identical. The differences are not our main concern. What is noteworthy is that broad similarities between the distributional sequence of industrialization in England and on the continent on the one hand and divergences between England and western Germany on the other may both be explained in large

²⁹ Norman J. G. Pounds, *The Ruhr* (1952; rpt. New York: Greenwood Press, 1968), 41.

³⁰ Kisch, "From Monopoly to Laissez-faire," 334, 383.

³¹ David Sabeau, review of Schremmer, *Die Wirtschaft Bayerns*, in *Journal of Economic History* 31 (June 1971): 528.

measure in environmental terms. That is to say, different production possibilities for agriculture influenced the areas where handicrafts were taken up, and indeed the areas that were deindustrialized, while different endowments of energy resources influenced where in the handicraft regions modern industry would evolve. Because of that the historian of economic growth must continue to babble o' green fields.