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The Charmed Circle: von Thünen and Agriculture around Nineteenth Century London

P. J. Atkins

ABSTRACT. Von Thünen's model of land-use is very popular in the teaching of agricultural geography in schools and universities despite its demonstrable shortcomings. Concentric rings of land-use were not evident even around early nineteenth century London and there are other reasons why the model is not an appropriate context for the explanation of the location of horticulture and milk production at this time. A re-evaluation of over-simplistic methods of teaching von Thünen's ideas is necessary.

Johann Heinrich von Thünen's model of the agricultural land-use in his hypothetical 'Isolated State' has become familiar to both school and university students in the last twenty years. In a sense this is surprising when one considers that the model was formulated from the practical farming experience of von Thünen in early nineteenth century Mecklenberg, so far removed in both time and space from the familiar realm of current British agriculture. The model is very far from being a spent force, however, and continues to be one of the most popular employed in teaching geographical analysis, despite serious problems derived from its static nature, its lack of rigour in specification, and its reliance upon partial equilibrium analysis (Morgan, 1973). This sustained popularity is partly the result of the elegant simplicity of the model apparent from a superficial examination of its principles, but other factors have also been important. The late date of a full translation of von Thünen's work into English (Hall, 1966) delayed the assimilation of his ideas into the canons of geographical orthodoxy. The seal of approval was quickly granted, however, for the 'Isolated State' fitted neatly into the model-based paradigm of the 1960s, and distance, its main organising principle, was of course one of the talismans of the vintage 'spatial organisation' approach to human geography.

Von Thünen himself was not naïve enough to expect the spatial simplification innate in his abstract model to be a true and accurate reflection of the complex reality in any one place. The testing of his ideas against the real world has therefore proved problematic. Rural land-use structures reminiscent of Thünian principles have been identified at a

variety of scales (Chisholm, 1979), but scholars have also described the many ways in which agriculture deviates in its practices from the predictions of von Thünen (Gregor, 1970). They have also attempted to unfreeze the rigid temporal framework by engaging in evolutionary analyses of ring patterns through time (Grigg, 1982; Norton, 1979; Peet, 1969; 1970). Criticisms of the model's utility have focussed upon matters such as the problem of equifinality, where apparently similar ring patterns may have evolved in different ways, thereby highlighting the dangers of inferring process from spatial form (Haggett *et al.*, 1977), and upon the unrealistically crude normative economic and behavioural assumptions made by von Thünen in order to simplify his task (Harvey, 1966). Relatively little comparative empirical work has been done, however, to elucidate the extent to which von Thünen's original notions were applicable in countries other than his own, under technological conditions similar to those of Mecklenberg in 1826. It is the main aim of the present paper to address this issue by examining two of the land-uses around nineteenth century London which, *a priori*, one would expect most closely to conform to the predictions of the model because of the perishability of their products: namely market gardening and liquid milk production.

It is not the intention here to suggest that von Thünen is a straw man unworthy of our scrutiny. The steady flow of research papers on the subject indicates that scholars are still inspired by his work. Nor is it my purpose to reject his model as inherently untestable. Neat concentric rings of land-use may prove elusive, but one might reasonably expect some basic approximations of Thünian processes and principles to have been operative.

Predictions

There is no need here to rehearse the expositions of von Thünen's model which abound in the literature (Chisholm, 1979; Clark, 1967; Grotewold, 1959). Suffice it to say that there are two core concepts: crop location and intensity of production. The cropping sub-model argues that, under the uniform environmental conditions of the Isolated State, each product will have an optimum location with respect to the market dictated by its competition with other products on the basis (amongst other things) of their respective perishability, suitability for transport, and bulk to value ratio. This competition is mediated through the relationship between the cost of transportation to market and the 'land rent' generated by growing a crop on a particular piece of land. Land rent in this context refers to the residual net income left to the farmer for the sale of his/her produce, after deducting the cost of production. The significance for farmers of this concept is that land uses have different potential land rents for a location according to their characteristics, and the rational decision-maker will therefore choose an enterprise combination bearing opportunity costs in mind.

The intensity sub-model, on the other hand, emphasises the relationship between the yield of an individual product and inputs such as labour or the application of manure. There is an incentive for farmers fortunate enough to have ready access to market to intensify their inputs in order to pay for the higher cost of land near the town. They may do so by substituting other factors of production for land, the scarce factor, and/or by adopting a system of production with a greater potential for intensification. There is, however, no necessary implication that successively distant zones of land-use should be less and less intensive as the margin of cultivation is approached. Von Thünen's ring of firewood and timber close to the central market explodes that particular myth.

According to von Thünen both market gardening and milk production should be concentrated on land immediately adjacent to the built-up area in what he called the 'free cropping zone':

Delicate horticultural products such as cauliflower, strawberries, lettuce, etc., would not survive long journeys by wagon. They can, moreover, be sold only in small quantities, while still quite fresh. All these products will be grown near the Town. Gardeners will therefore occupy land immediately around the Town.

Next to fruit and vegetables, milk is a prime necessity for the Town; and as this is a difficult and costly product to transport and is, besides, highly perishable, particularly in warm weather when it quickly becomes unpalatable, milk too will be produced in the first ring. The price of milk will rise to the point where the land used to produce it cannot be more profitably devoted to any other product. (Hall, 1966, p.9).

Von Thünen anticipated a 30km radius for this zone, the outer limit of which was dictated by the distance over which manure, street-sweepings and other town waste could profitably be transported to enrich the land. Neither bare fallowing nor crop rotation were practised.

Horticulture around London

There was never at any stage in the eighteenth and nineteenth centuries anything approaching a complete circle of market gardens around London. As Fig. 1 shows, there was a tendency for horticulturalists to congregate in certain pockets of the urban periphery, the most favoured location being on the flood plain of the River Thames upstream from Westminster to Twickenham, where the loams and gravel soils were easier to work, better drained, and 'warmer' than the London Clay of neighbouring areas. Proximity to the river itself was also important, to expedite the cheap and rapid export of market garden produce and the bulk import of cowshed and stable manure as a return cargo. Ready access to this source of purchasable fertility was a key factor in the market gardening system near London: anything up to 40 tonnes per hectare were applied by gardeners keen to intensify their enterprises to the utmost (Evershed, 1871). There was no problem in obtaining the raw material, because in the mid nineteenth century about 250,000 tonnes of cattle dung and 200,000 tonnes of horse manure were produced in London each year. This high intensity of manuring over a long period of time amounted to 'a remaking of the soil' (Fussell, 1947).

An intensive, complex and technically advanced system of horticulture was in operation in London's suburban market gardens in the early nineteenth century, more sophisticated no doubt and on a larger scale than anything experienced by von Thünen. J. C. Loudon (1835) identified ten types of commercial gardening, most of which were to be found within a 25 km carting range of London. We shall discuss a modified version of his typology.

Market gardens were by far the most important class of horticultural enterprise in terms of the area of ground they occupied and the value of their produce. Their distinguishing feature was the exclusive use of the spade for cultivation, and the absence of crop rotation. A very wide range of vegetables and fruits was grown, often with several crops per year, and sometimes with a mixture of tree crops and under-crops in the same field.

Close to London the degree of intensity of cultivation was at its height. Expensive, exotic and out-of-season species such as asparagus, artichokes, melons, celery, pine-apples, herbs and salads were forced in hothouses and hot-beds, such as those of the famous Neat House gardens near Tothill Fields, 5km south-west of Westminster Abbey, where irrigation water from the River Thames was used in addition to heavy dressings of manure (Roberts, 1941). The high cost of this sort of production seems to have been justified by the prices received in a London market as yet virtually untouched by imports of fruits and vegetables grown in more favourable foreign climates. The intensification was necessary because of the high cost of land close to the built up area, which was of course often ripe for urban development.

Further from the building frontiers lay what Charles Whitehead (1878) later called the 'charmed circle' of ordinary spade cultivation. Here the variety of crops grown was immense, with a concentration upon the most delicate vegetables requiring skilled attention, such as asparagus, sea-kale, French beans, celery, radishes, lettuces, and mustard and cress. This zone in the eighteenth and nineteenth centuries saw the emergence of a degree of product specialisation by area, in response to soil type,

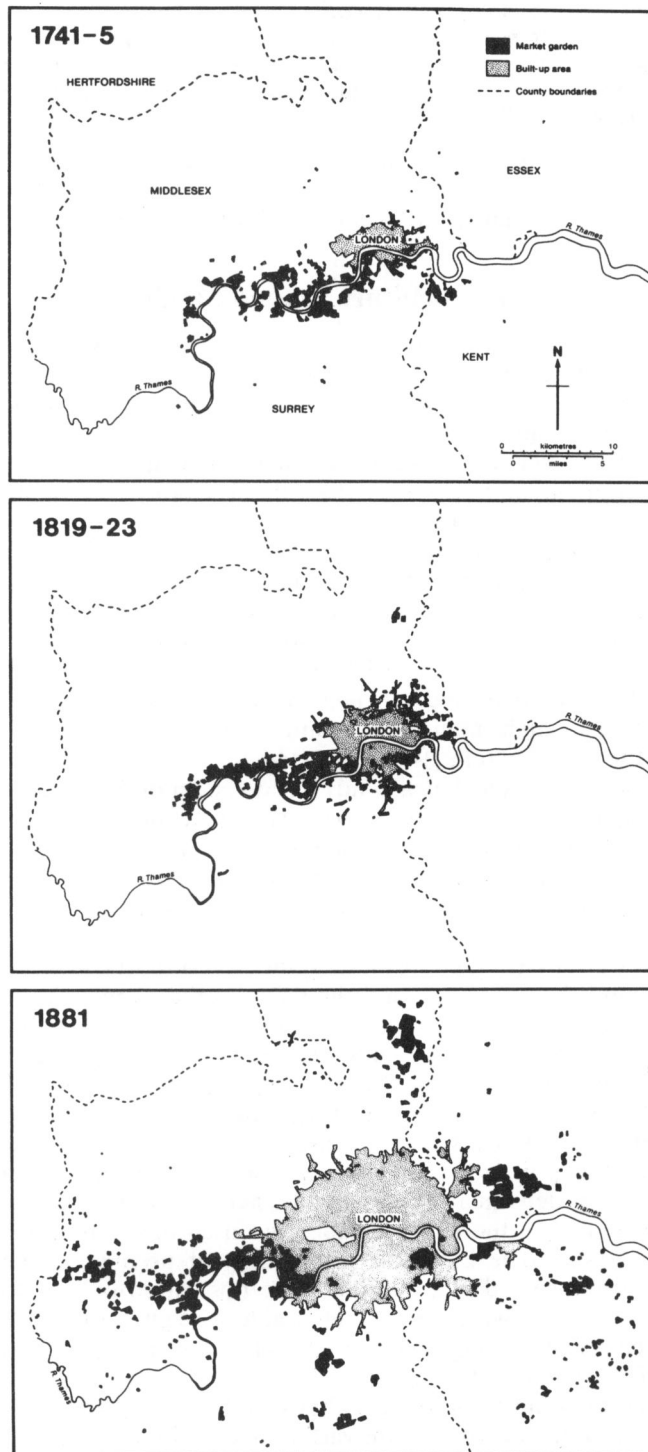


Fig. 1.—Market gardens near London: 1741-5, 1819-23, and 1881.

SOURCES: J. Rocque (1746) *An Exact Survey of the Cities of London and Westminster*; C. & I. Greenwood (1819-23) County maps of Middlesex, Essex and Surrey (no information for Kent); Ordnance Survey (1881) 6" maps.

microclimate and entrepreneurial skill. Battersea was famous for its cabbage and cauliflowers, Camden Town for watercress, Deptford and Lea Bridge for high quality onions, Mortlake for asparagus, Charlton for peas, and the finest sea-kale was grown on the Jamaica Level. One of the more notable district specialisations was that of Mitcham, where the rich soil encouraged hundreds of acres of herbs for medicinal, culinary and perfumery use, such as peppermint, thyme, basil, and lavender.

Land beyond the 'charmed circle' was devoted to less intensive plough cultivation of the more bulky and less perishable vegetable crops such as peas, beans, onions, brussel sprouts, broccoli and cauliflower, while the outermost ring of London's horticultural hinterland produced the less valuable vegetables grown in ordinary rotations by 'farming gardeners', including cabbage, potatoes, turnips and carrots. Soft fruit was common in the outer zones, and was often combined on frost-free land as an undercrop with a tree crop of hard fruit such as apples, because of the complementary nature of their labour requirements. Tree crops were not common close to the city due to the long time lag, up to 15 years in the early nineteenth century, between planting and a return on investment.

One of the criticisms commonly levelled at von Thünen's model is that it purveys an unjustifiably static image of the agricultural landscape. This is certainly a disadvantage for the study of horticulture in the Thames Valley, because the map of market gardens, orchards and nurseries was evolving before, during and after the period of von Thünen's lifetime (1783-1850). Fig. 1 shows no great change of pattern of dispersion from 1741-5 to 1820, apart from a nibbling away at the immediate urban periphery and a greater concentration in Fulham, but from 1820 to 1881 and after there was a clear tendency for the centre of gravity of production to shift outwards. This was a response to three things: firstly the greatly improved road transport links to the London markets, which allowed the exploitation of soils in west Middlesex as well suited to market gardening as those on the banks of the Thames further east; secondly a pioneering of new areas such as the Lea Valley (after 1880) and north London (Cheshunt, Enfield, Tottenham, Finchley, etc.) with the introduction on a large scale of greenhouses after about 1860; and thirdly an out-migration of growers displaced from the urban fringe by urban development.

Proximity to the built-up area brought with it the advantages of access to market, to supplies of manure and to a pool of cheap casual labour, but there was also a double disadvantage of high rents (few of the horticulturists were owner-occupiers) and urban nuisances. Pollution was a particular problem in a coal-burning age with little conscience about the environment, and this nuisance was compounded by frequent trespass on fields by the public, to the extent that one Deptford farmer complained in 1877 that on summer Sunday evenings his land was "somewhat like a fair" (Atherall, 1975).

The most significant challenge to horticulture in the London region came from competition with other land uses. Brick fields sometimes ousted growing, but this displacement tended to be short-lived because, once the brickearth had been extracted, the topsoil was usually replaced and cultivation was again possible. More serious was the demand for land, especially the sort of flat, well-drained land found on the Thames flood plain, by housing, industry, communications, and institutional uses. The threat was not fulfilled, on any significant scale, until the last third of the nineteenth century, but then the capitulation was swift.

The most intensive and highly specialised gardens tended to resist change most successfully because they were best able to match the potential returns from building. In order to achieve this they were increasingly forced to substitute capital, labour and skill for land, the scarcest factor of production. In the latter half of the nineteenth century this entailed a heavy expenditure on expensive plant, especially greenhouses and heating equipment, and meant a greater reliance upon the crops which could be forced most profitably, particularly grapes, tomatoes, cucumbers and flowers (Bear, 1899). Inevitably the amortisation period for this sort of investment was prolonged and introduced a built-in element of geographical inertia to the spatial pattern of growing under glass in West

Middlesex and the Lea Valley. The sheer scale of enterprise achieved by some growers during this period, with attendant economies of scale, tended to discourage smaller competitors and potential newcomers to the trade.

In an imperfect and uncertain world it is unlikely that either landlords or their tenant horticulturalists will have acted entirely rationally in maximising returns from their land. Landowners often must have regretted the premature loss of a gardener able to pay a high rent, because the speculative expectation of a building development was often disappointed, especially during downswings in the building cycle. A long hiatus between the harvest of the last crop and the letting of any new buildings would have meant a considerable loss of revenue.

One potential mismatch between the ripeness of a plot for development and its ready availability was the grower's tenurial contract with his landlord. A long lease on land near the building frontier was clearly not in the latter's interest, and short tenancies and verbal agreements tended to be the norm in close proximity to London. Further out, leases ranged up to 21 years, and occasionally more, but frequently they included a 'resumption clause', by which the landlord could resume possession at will.

This tenurial system must have created a degree of uncertainty for the individual grower. Yet on balance it operated in the mutual interests of both the landlord and tenant. The landlord on the one hand was able to prolong the high rent yielded by gardening until the optimum moment for building development: few other land-uses afforded this opportunity. The tenant on the other hand was able to prolong his occupation of the land where it might not otherwise have been possible had the landlord been legally required to offer a long lease. Some gardeners seem even to have specialised in growing cash crops in the short intervals before development, and others appear not to have been concerned by what might seem intolerable conditions of tenure. One West Ham market gardener is known to have been on a quarterly tenancy which lasted from 1870 to 1885. (Atherall, 1975, p.9).

Other circumstances combined to undermine the profitability of London's suburban horticulture in the latter half of the nineteenth century. The rising real cost of labour encouraged a substitution of the plough for the spade and therefore reduced the competitive advantage of the intensive small-scale grower. The decline of the number of cowsheds from the 1870s and the rising importance of the motor car in the twentieth century meant a steady reduction in supplies of cheap organic manure, a vital sustaining input for the previous 200 years. Finally, and perhaps most importantly, there was the ever increasing competition of imports of fruit and vegetables from overseas and from other horticultural regions in Great Britain, such as the Vale of Evesham, Kent, and Bedfordshire (Atkins, 1985), where the costs of production were much lower. This amounted to a decentralisation of production from a market-orientated industry with ready access to the customer, to an industry dispersed according to the comparative advantage of local environmental conditions or other factors of location. Never again would the Home Counties growers dominate as they had done before the full connection of the railway network.

Milk production in and around London

At the turn of the nineteenth century the spatial distribution of milk producers around London was no more convincingly in accord with the predictions of von Thünen than that of market gardeners. In fact the locations of the two groups were complementary, with the cows huddled mainly on the pastures of north London, especially in the parish of Islington and neighbourhood, in a sector which was adjacent to, but quite separate from that of the river-orientated belt of horticulture. The rationale for this mutual exclusivity in space was environmental. The heavy, cold, impermeable London Clay soils of north and north-west London were unsuitable for garden crops, but they could support relatively rich grassland.

It is dangerous, however, to infer the pattern of milk production from a map of the grassland around London. Pasture near the capital was used for horses and for fattening cattle as well as for milk cows, and hay was a very profitable alternative product to animals. Moreover, as the nineteenth century wore on, there was a tendency for cows to be kept indoors for increasingly long periods of the year, and from about the 1820s a system developed whereby some beasts never breathed the air of the world outside their cowsheds until they went sent for slaughter (Atkins, 1977). What in the late eighteenth century had been a semi-pastoral activity on the urban fringe, although admittedly at a greater intensity of input/output than the contemporary rural dairy farming, was transformed by 1850 into a largely urban-based enterprise, having only tenuous connections with the countryside. Von Thünen recognised the likelihood of stall-feeding but cannot have envisaged the sheer scale of London's population of town cows. One estimate in mid-century put the total at 24,000, probably their all-time peak.

Cowkeepers had moved to the city or had started their business in order to be near their market. Theirs was a very perishable commodity before the innovations of clean milking, cooling devices and pasteurisation. Another important factor was their losing battle with the developers for pastures which had become prime building land. The southern third of Islington parish was built upon in the period 1830-50, and the remainder was lost to milk production by 1890. In 1810 Richard Laycock, the most famous of the capitalist cowkeepers, had 500-600 cows on 225ha of pasture in Islington and neighbouring parishes, but by 1860 his successor, John Nicholls, was left only with Laycock's yard, now isolated in the built-up area, and some pastures in Hornsey, 8km to the north (Atkins, 1977). The zero-grazing system was an intensification out of necessity as much as choice.

Fig. 2 illustrates the distribution of cows in and around London in the year 1870. The greatest concentrations were to be found within the built-up area, especially in the East End, and there was a clear distance decay of production potential away from the city. This urban farming now seems incongruous in view of the modern exclusion of noxious trades from the built-up area, but it was a characteristic feature of the Victorian city before the last quarter of the nineteenth century. The period after 1875 saw a steady decline of milk produced in the town for three reasons. First, cattle disease became endemic in London's cowsheds after 1842: rinderpest, pleuro-pneumonia and foot-and-mouth disease added costs to a trade which gradually became less profitable. A second additional cost was the result of an increase in sanitary control of cowhouse structure and the output of manure. This began with the efforts of John Simon in the City of London in 1853 and was consolidated by a centralised control for the whole metropolis imposed in 1879. Finally, the competition of milk produced cheaply in provincial dairying areas and railed to London became a significant threat in the 1870s. The first railway milk sent to the capital had come from Essex in 1845, but did not obtain a real foothold in the market for 30 years because of the technical problems of unsuitable rolling stock, the absence of a method of preventing the milk going sour en route, and the unsympathetic nature of railway company policies with regard to freight rates and timetabling (Atkins, 1978).

By 1900 dairy farming in and immediately around London was a shadow of its former self. Its decline had come more or less at the same time as that of suburban horticulture, although the factor of competition from provincial producers was their only shared disadvantage. The location of milk production, like that of market gardening, was shifted away from London by an apparently irresistible centrifugal force. In both cases this was not just a shunting outwards of concentric rings of land-use, as one might expect in a dynamic version of von Thünen's model (Peet, 1969; 1970), but a dissolution of any remaining vestigial resemblance to the Isolated State.

Discussion

There are a number of reasons for doubting the relevance of von Thünen's model as a framework for the explanation of milk production and horticulture near London in the early nineteenth century.

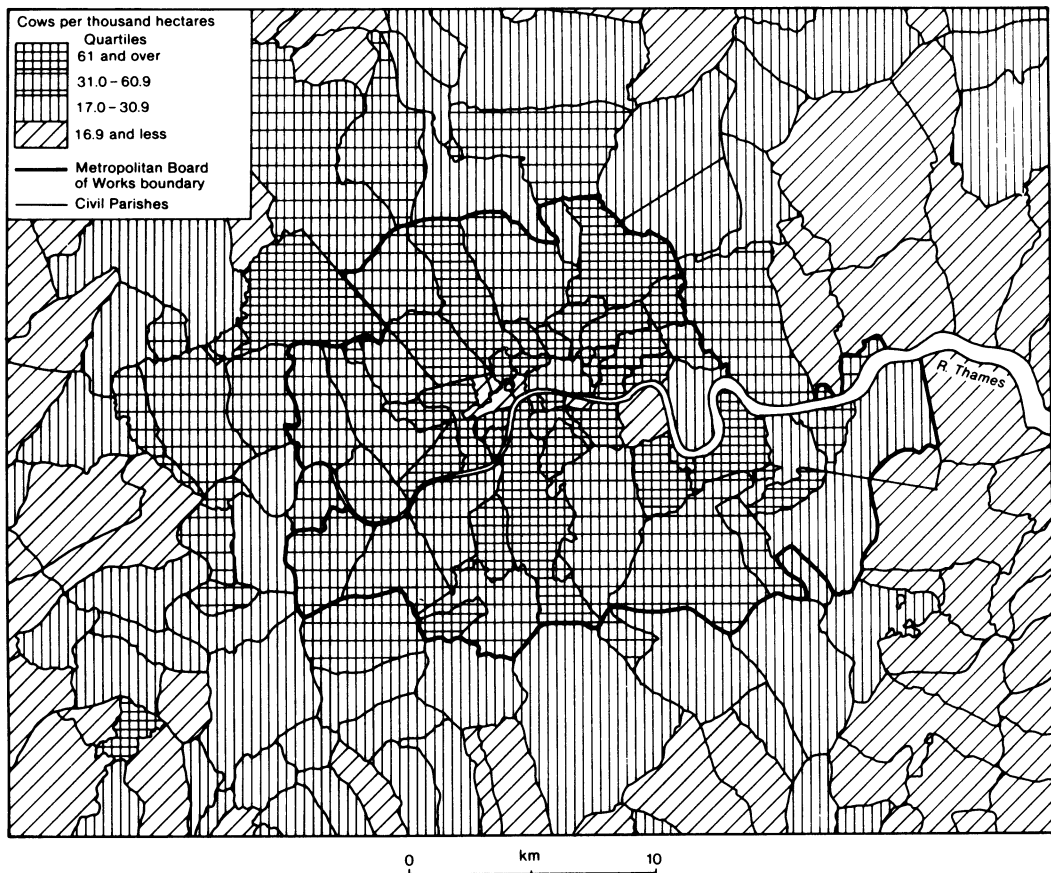


Fig. 2.—Distribution of cows in and near London, 1870.
SOURCE: Agricultural Returns.

The spatial structure of land-use at this time was not ring-like; indeed one can point to a close correlation of enterprise with soil type to the north and west of London which is more reminiscent of Ricardian than Thünian principles (Kain, 1979). The ordering of cropping zones did not accord with the expectations of the model either, although this cannot be deemed a damning criticism because it is arguable that these expectations could not have had universal validity anyway for several reasons. Firstly, it must be recognised that the circumstances of agriculture around each city will to a degree depend not only upon its own unique requirements for food and cash crops, but also upon its size and purchasing power. A greater degree of specialisation would have been expected around London than around Rostock for instance. Secondly, Lösch (1954) has shown that the formation of rings is not an inevitable consequence of von Thünen's principles in all cases, and further he demonstrated that even where rings are formed, various permutations of cropping zones are possible. Von Thünen's Isolated State was therefore a special case of a broader family of models. Thirdly, the land-use map of the Thames basin was constantly changing, and a single time-slice sample in the early nineteenth century gives an unrepresentative idea of dynamic processes. Von Thünen's model was enriched by his own personal experience of agriculture and marketing, but much of the empirical data he adduced was not reliable for long after 1826. A decline in the demand for timber, a reduction in transport costs, and other such developments had several consequences: the

mix of crops likely to be grown altered, as did their ordering with distance from market; there was a shunting of rings outwards; and in some cases there was a break up of the rings altogether. Overall it is a tenable argument that the predictions of the cropping sub-model, based as they were upon empirical conditions in Mecklenberg in the early nineteenth century, are of less importance than the underlying principle of competition.

The spatial complexity of the 'free cropping zone' around London was greater than predicted by von Thünen. His discussion was brief and did not do justice to the 'zones within a zone' apparent, especially in horticulture. Moreover, his static conception could not accommodate the dissimilar behaviour of milk producers and market gardeners when displaced from their land. The gardeners tended to migrate a short distance further out from the built-up area, and there is evidence of individuals having to move more than once as development caught up with and engulfed their new gardens. The cowkeepers, on the other hand, responded by moving into the urban area or at least by tolerating and adjusting to life in London.

Von Thünen's model assumed a static urban area. No account was taken of the possibility that displacement by building might be a threat to agriculture, and one of the major incentives for intensification was therefore neglected. The model conceived of competition between agricultural land-uses, but not between agriculture and other land-uses. This is not a fatal flaw because several writers have shown that Thünian principles may be expressed in a bid-rent framework which may be extended to explain urban land-use and processes at the urban-rural interface. Sinclair's (1967) modification of the model, which sought to explain the presence of underutilised land in the inner urban fringe, where future building is likely to take place, is not strictly relevant to the London of 150 years ago. There were no significant tax incentives for keeping land idle as there are today. On the contrary, one of the reasons why market gardening continues to flourish under conditions of uncertainty in close proximity to an expanding urban area seems to have been the chance it offered landowners to maintain the cash flow of rent from their land until the most propitious moment for development. No other form of land-use could match the dual characteristics of high intensity and rapid return on capital which garden crops exhibited.

On the whole parallels between present day peri-urban agriculture and the situation around nineteenth century London are limited to obvious interactions such as urban nuisances and enhanced marketing opportunities. Against these must be set the reduced tolerance in our own day of animal husbandry in residential areas, and the declining availability of a reserve army of cheap casual labour. In reality the contexts are so different as to make cross temporal comparisons dangerous.

The predictions of the intensity sub-model have been partially confirmed within the two sectors of agriculture examined in this paper. There was nothing innate in either horticulture or milk-production, however, which determined their location in close proximity to their market beyond a combination of historical accidents, which made the transport of perishable items over long distances an unprofitable business, and which made large quantities of town manure readily and cheaply available in the immediate urban hinterland. Once the impediment was removed and the advantage diminished, market gardening and dairying were subjected to a centrifugal movement of their respective locations.

That distance, mediated through transport cost and perishability, should have had an influence upon agricultural land-use in the early decades of the last century is hardly an unexpected finding. Indeed one could argue that in the pre-railway age it is a factor of such obvious importance that its confirmation is of trivial significance. Of greater interest would be an evaluation of the changing balance between distance and environmental conditions in the mind of the land-use decision-maker, or an analysis of the spatial pattern of land use in some metric other than simple linear crow-fly distance. A study of the role of distance in the supply of goods from the town to the farm would also be interesting:

most assessors of von Thünen's model focus their attention upon the cost of moving agricultural produce to market and neglect the contraflow of materials. It is conceivable, for instance, that the availability of manure was the key locational influence for much of London's horticulture rather than the freight on marketable produce, although the two were intertwined because an empty cart returning from market is an inefficient use of transport.

A fundamental principle which is only implicit in von Thünen's discussion is the nature and extent of demand for agricultural produce (Jones, 1979). The price- and income-elasticity of demand are crucial since the amount of consumption under variable conditions of standard of living and retail price will affect the relative competitiveness of land-uses for land accessible to market. Changing tastes and improved purchasing power must have been influences upon agriculture, especially in the latter part of the nineteenth century, but disappointingly little has been done by geographers to elucidate the locational effects of changes in the demand side of the supply/demand equation.

These are all reasons why von Thünen's is an inadequate structure for the analysis of land-use near London. On the other hand, we have been focussing our attention on his abstract model, and have not considered his own discussion of the deviations likely to be found in the real world. Von Thünen's work, if read in its entirety, shows a remarkable degree of flexibility and pragmatism. At one point, for instance, he declares that in reality "farming systems would not succeed each other in regular succession, as in the Isolated State, but would be jumbled up among each other: the farm of fertile soil, on a river, 100 miles from the Town would belong to the third ring, that 10 miles from the Town, with sandy soil, to the sixth" (Hall, 1966, p. 174).

Both the disciples and the detractors of von Thünen have been too literal and rigid in their interpretation of his ideas. They have also been selective, and perhaps it is time we did justice to von Thünen by teaching his writings with their subtlety and richness left in, if we are to teach them at all. In order to reduce reality to a core of simplifications which may readily be assimilated by the student, it has been common to crush the life out of much of the geographical literature on models. This approach has its dangers for learning: how often has one attempted to amplify the principles of agricultural location to a class which considers its knowledge of that subject complete because it has heard of, though rarely fully understood, concentric rings of land-use? There are also dangers of misunderstanding because the search for spatial patterns is based upon a naïve mapping of abstract principles, derived from an hypothetical environment, on to a real world where local technological, social and economic circumstances may be quite inappropriate.

Von Thünen's model is not a sufficient explanation of the complex reality of the 'charmed circle' around London before 1870. If we must teach abstract normative models, and not everyone would agree that they have even a residual value, then perhaps it is time that we re-orientated our teaching towards a dialectic between the orthodox textbook interpretation of the classic writers like von Thünen and Ricardo and selected deviations, as exemplified in the present paper, in order to give the student a better understanding of the discourse between abstract theory and reality.

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