

12 Economics, geography and colonialism in the writings of William Petty

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Introduction

The consolidation of economics as an academic discipline is commonly associated with the crystallisation of a formalistic, ‘marginal’ methodology out of the discursive literature of classical political economy. Yet this was only the final phase in a long process stretching back to medieval, and even ancient, times, a process in which ideas now identified as economic were formulated in inseparable connection with branches of inquiry which were subsequently to become located within other social science disciplines. The relation of economics and geography in Western thought provides a prime example of the common roots of the different social sciences: in ancient times, that most economically-minded writer, Xenophon, was at the same time arguably its most geographically conscious as well; the topics of economics and geography were, in medieval times, both classed within the same *disciplina*, namely rhetoric; and when, in the early modern period, the demand arose for an education of a more practical and less doctrinal aspect, a notable response from within the scholastic system was the expansion of the rhetoric syllabus to accommodate more material of topical geographical, and inevitably also economic, interest (see Dainville 1940). An example of the enthusiasm with which this educational innovation was received is provided by the English writer William Petty, best known as a founding father of English political economy, who singles out the study of geography as first on the list of motives which prompted him to undertake his further education (PP Vol. II: 246¹).

Indeed, it has long been recognised that Petty’s writings provide ample illustration of the inextricably linked trajectory of early modern geographical and economic ideas. It is over a century, for example, since his editor commented that ‘Petty’s thought exhibits much affinity’ with that of Von Thünen, the acknowledged pioneer of spatial economics (Hull 1899: lxxv). Since that time, a number of historians of economic thought have drawn attention to what they perceive as Petty’s anticipation of the concept of locational rent (for references see below), and some have even declared that the roots of Petty’s economic methodology as a whole lie in his experience as a land surveyor (see, for example, McNally 1988: 46–48, Poovey 1994: 20–32, Poovey

1998: ch. 3 and Wood 2002: 161). But though a small specialist literature exists on the spatial-economic analysis of Cantillon, Steuart and Smith (Hébert 1981; Beckmann 1981; Stull 1986; Fernández López 2002), it appears that there has hitherto been only one systematic attempt from within the economics discipline to draw attention to the relevance of Petty's writings to the intellectual ancestry of modern spatial-economic analysis (Pinto 1997). This neglect contrasts with the substantial interest shown by a number of French authors, who, from within the neighbouring fields of geography and demography, have generated a whole literature on the spatial-economic dimension of Petty's thought – a literature which has yet to gain currency in the English-speaking world (see, in particular, Goblet 1930, Dockès 1969: 132–57 and Reungoat 2004: 121–34).

There was indeed ample reason why Petty should display acute consciousness of the spatial dimension of socio-economic activity, since it was he who supervised the most extensive land survey of his time, the celebrated 'Down Survey' of Ireland. In what follows, the spatial aspect of Petty's economic thought will be placed in the context of this biographical background, showing how this context, and in particular its bureaucratic-military and predatory colonialist aspects, drew him ineluctably towards ever greater confidence in his notorious scheme to transfer the bulk of the population of Ireland into England, in connection with which he drew together strands of economic and geographical thought that remain intertwined till today, most notably in the marginalist sub-discipline of spatial economics.

William Petty (1623–87) and his survey of Ireland

The peak of Petty's official career came when, quite early in life, he served in Cromwell's army of occupation in Ireland in the 1650s, initially as its Physician-in-Chief, from which position he moved on to become responsible for the survey of land expropriated from the Irish (see Goodacre 2005b for references to the primary and secondary literature). This expropriation was a central element of the programme of punitive measures proclaimed by the English parliamentary authorities against the people of that country, following its rebellion against colonial rule in the preceding decade. The initial plan was for mass executions of Irish 'rebels' – defined sufficiently broadly to include the great majority of all adult Irish males – as well as deportations and enslavements, and the complete 'transplantation' of the remaining Irish population from three of the country's four provinces to a kind of reservation in the west, largely in the province of Connaught. This last measure has been described as a scheme for the creation of an 'immense concentration camp' (Goblet 1930 Vol. I: 74, writing at a time when this term referred to British policy in the Boer War of 1899–1902). Though, as it transpired, neither the planned executions nor the 'transplantation' to Connaught were carried out on the massive scale initially envisaged, the expropriation and distribution of land went ahead, and, in this process, Petty's role was of pivotal importance:

not only did the army of occupation assign to him the crucial task of surveying the expropriated land, but he subsequently also became centrally involved in the process of actually distributing it to the occupying forces and other English beneficiaries.

The collapse of the Cromwellian regime and the ensuing restoration of England's monarchy in 1660 left Petty without an official position. Nevertheless, to the end of his days he never relinquished the ambition of relaunching his career on the high-flying course it had taken under Cromwell, and to that end he concocted a seemingly endless series of policy proposals for fiscal reform and related issues, in the vain hope that they might be entrusted to him. One of these schemes was a kind of reversal of the Cromwellian 'transplantation' policy – a scheme to transfer the bulk of the Irish population not westwards to Connaught but eastwards into England. The logic behind this scheme was quintessentially spatial-economic, embodying as it did his view that the key to economic advance was compactness of population, a view which he derived from his observations of Holland, which was, in his time, not only Europe's most densely populated country, but also its most economically advanced.

Petty also pointed out that his scheme would have the concomitant benefit of putting an end to Ireland's independent national life and anti-colonial traditions, since it would make it possible for the Irish to be 'transmuted into English', not only through their dispersion but also through a programme of state-sponsored intermarriage. The outcome would accordingly be a 'perpetual settlement' (or, in the term used by his editor in 1899, a 'final solution') that could at last 'cut up the roots of those evils' which 'have made Ireland, for the most part, a diminution and a burthen, not an advantage, to England' (TI: 551, 546 editorial comment, 558 s. 5). It was in his final work, his *Treatise of Ireland*, with its extensive calculations of the balance of this 'burthen' and 'advantage', in other words costs and benefits, that he advanced the most elaborate example of his 'political arithmetic', which was in turn the forerunner of all subsequent quantitative economics.

'Terms of measure'

Almost every historian of early modern economic thought has highlighted Petty's commitment to expressing economic relationships in quantitative terms – in his own words, 'to express myself in terms of number, weight, or measure' (PA: 244). However, it does not seem to have been noted that his use of the terms 'weight' and 'measure' had, in his time, a literal significance that would have been immediately evident to his readers: 'terms of weight' were a characteristic feature of the newly expanding body of quantitative information on economic subjects, particularly on imports and exports, while, more important in the present context, 'terms of measure' would undoubtedly have been taken to refer specifically to the measurement of physical space.

Petty wrote at a time when the demand of English landowners for estate and county maps, as well as local information generally, had been steadily increasing for nearly a century, and there was now, in addition, both a demand for, and an increasing supply of, the equivalent aggregate information at national level. One particularly relevant example, which exemplified the provision of information in terms of 'number, weight or measure' was a 'kind of yearbook' (Aspromourgos 1996: 55) published from 1669 onwards, Edward Chamberlayne's *Present State of England*. Not only does Petty refer to this work in his own writings (PA: 284, 308), but there are also connections of a more direct kind: Petty's work, the *Political Anatomy of Ireland*, appears to have been originally designed as a companion volume to this publication, whose 1683 issue includes the whole of his *Political Arithmetic* as a supplement (see PAI: 122 f., editorial comment, and Keynes 1971: 21–22).

The specifically spatial reference of the term 'measure' is vividly illustrated in Petty's attempts to convey a suitably awesome impression of the enormous scale of his survey of Ireland. To this end, he expresses the distance 'measured by the chain and needle' in terms of multiples of the earth's circumference; this distance was equivalent, he claims, to 'the measuring of as much land-line as would have near four times begirt the whole earth at its greatest circle', a multiple which he subsequently revises upwards to 'near five times', 'above five times', 'near six times', and finally 'eight times' – a progression which has aptly been described as 'Falstaffian', after Shakespeare's character whose tales similarly grew in the telling (*Reflections*: 12; BA: xvii; Fitzmaurice 1895: 314; PP Vol. I: 104; TI: 614 f.; Strauss 1954: 151; see also Andrews 1985: 80 and 69 n. 67).

Petty's pervasive use of units of spatial measurement in relation to different categories of economic activity is seen in its most explicit form in his discussions of the agrarian economy, both internally and in its relation to the economic influence of London. The measurements he suggests take the form of an assortment of radii, circumferences, and areas (square, circular and 'oval'), but they are all readily reducible, for comparison, to terms of radius. The perspective this reveals is now familiar, in the field of agrarian history, in studies of market areas (see Everitt 1967: 496–502 and Goodacre 1994: 21–34) – a perspective in which each spatial measurement or unit is associated with a particular economic category, concept or function. To use the jargon of the economic geography of today, Petty's units of analysis are not 'scale-independent'.

For example, the parish, though obviously, in the first instance, a unit of ecclesiastical administration, is frequently identified by Petty with the range of transactions within the subsistence economy, the terms 'parish' and 'village' being effectively used interchangeably in this context. He consequently sees the optimal dimensions as being the same in both cases: the ideal organisation of parishes should be such that 'none need go two miles to church', while he discusses the agrarian economy at base level (whether in terms of the parish or the village) as consisting of 'people living within a market day's

journey', which suggests much the same optimal range of around two miles, or, at any rate, less than about five, given that allowance must normally be made for portage (i.e. carriage by foot), as well as time for transactions. A substantial cash sale, in contrast, has a range of anything up to ten miles. The optimal range for tax collection is the intermediate distance of five miles – longer than that of the subsistence economy, since transport of goods is not involved, while, at the same time, short enough to allow for a return journey within a day. This latter concept, once again, forms the basis for a definition – a person's 'country' (TTC: 11; PAI: 180; TTC: 35 s. 15.10; VS: 116; PP Vol. I: 209 s. 6; see also Goblet 1930 Vol. II: 260 f.).

It is not only at the base level of the agrarian economy that Petty provides his categories of economic analysis with such explicit spatial specification; he also traces the various grids and sub-grids of economic activity all the way up to the metropolis, London, once again specifying each of them in terms of scale-specific economic (and in this case military) considerations. For example, he considers that the defence of London can be secured by a wall of twelve miles in circumference (later expanded to around twenty miles), which would be adequate, he remarks, evidently with an eye to siege conditions, 'to plant necessary garden stuffe [for] food, milk and cows'. Outside this zone, London's impact on grain prices may extend for a considerable distance, which he clearly assumes to be considerably more than twenty, and on one occasion specifies as forty, miles. He also speculates on a hypothetical situation in which London's population is increased sevenfold; in that case, he calculates, its agricultural provisions could be grown within a radius of thirty-five miles (PP Vol. I: 30 s. 10, 32 s. 6; TTC: 51 f. s. 13, 48 s. 5; PAL: 471 s. 2.)

Petty's experience as a land surveyor and cartographer is thus revealed in the most explicit way throughout his economic writings, giving them a pervasively spatial-economic character. Indeed, the payment of a map maker according to the extent of land mapped constitutes the purest and most elementary form of the transformation of spatial into economic categories. In this transaction, the act of summation of the extent of land measured is identical with the act of drawing up an account of payment due for work performed; thus, the tabular listings which Petty provides of the land he surveyed are, simultaneously, both geographical and accounting documents, a dual nature which is reflected in the term he uses to describe them – 'accounts of lands admeasured' (DS: 137–53, 143). Furthermore, the fact that the allotments of Irish land to the Cromwellian soldiery were in lieu of pay was, in a sense, the beginning of his lifelong quest for 'a par and equation between lands and labour' (as long since noted by Hull 1899: lxxi, discussing PAI: 181). Thus, it was second nature for Petty to perceive monetary units as identically interchangeable with units of the measurement of land, and to equate these, in turn, with units of labour; in other words, from his point of view, the fundamental categories of economic life could be immediately correlated with those of spatial measurement.

To emphasise the formative influence of Petty's survey of Ireland on his approach to spatial-economic analysis is not to deny that other intellectual influences were also at work in this connection. His medical training was evidently one such influence, and indeed not necessarily unconnected, since 'economic geography easily lends itself to the metaphor of anatomy/body' (Aspromourgos 2001: 15 and 22 n. 12), a theme which is the subject of a steadily expanding literature within the field of economic geography today. Furthermore, his call for the Irish to be 'transmuted into English' has been shown to rely on terminology and concepts drawn from early modern chemistry (McCormick 2006, 2007). Besides these wider influences, Petty's involvement with the promotion of experimentation by the Royal Society is also reflected in more immediate and practical ways in his spatial-economic analysis, as will be seen in the case of his approach to the mechanics of transport. But, while medical, mathematical, technological and mechanical influences gave form and character to Petty's spatial-economic analysis, it was, undoubtedly, above all his survey of Ireland which first set him on his lifelong course of 'grounding his economic and political theories on the facts of the map' (Lynam 1932: 418).

Petty and the spatial-economic analysis of rent

A prime example of Petty's spatial-economic analysis is a frequently cited passage concerning rent and the value of land. He divides the value of land into two components, 'intrinsic' and 'extrinsic'. The 'intrinsic' value, by which he indicates, in the first instance, its fertility, could, he suggests, be established by a massive land survey of England, which he proposes in terms which leave no doubt as to whom he regards as the best qualified candidate to be appointed as *supremo* of such a project. As for the 'extrinsic' value, this includes, most notably, the premium upon 'lands intrinsically alike near populous places, such as where the perimeter of the area that feeds them is great' (TTC: 49 s. 6). His most elaborate discussion of this issue relates to the 'the shires of Essex, Kent, Surrey, Middlesex and Hertford next circumjacent to London' (*ibid.*: 51 f. s. 13–16).

'Provisions,' he states with respect to this five-county area, 'must be cheaper or dearer as the way to London was more or less long, or rather more or less chargeable.' He then extends the discussion to embrace a further area lying beyond the five 'circumjacent' counties, and suggests that if the five-county area 'did already produce as much commodity as by all endeavour was possible, then what is wanting must be brought from afar, and that which is near advanced in price accordingly'. There is, however, an alternative to such importation, which is to increase the productivity of the land within the five-county area itself by means of 'improvements'; he gives a list of these, all of which are achieved 'by greater labour than now is used' ('digging instead of ploughing', etc.), and states that 'then will the rent be as much more advanced as the excess of increase exceeds that of the labour'. He concludes

that ‘the touchstone to try whether it be better to use those improvements or not is to examine whether the labour of fetching these things even from the places where they grow wild, or with less culture, be not less than that of the said improvements’.

Petty’s formulation of the issues he here addresses is somewhat ungainly, and is not susceptible to expression in consistent formal terms. However, he certainly provides a kind of ‘primeval soup’, to which all subsequent theories concerning rent and location can with justification trace at least some elements of their conceptual ancestry. Indeed, this passage and its equivalents elsewhere in his writings have received considerable attention in precisely such terms: Petty has been seen, for example, as the originator of the concept of ‘locational rent’ (Dockès 1969: 141, *rente de situation*; Routh 1975: 36; Hueckel 1986: 62 n. 33; Kurz and Salvadori 2000: 36). He has similarly been credited with anticipating the overlapping concept of differential rent (Beer 1938: 171; Desai 1967: 61; Roll 1938: 106 f.; Aspromourgos 1996: 161 f.), the concept of the extensive margin (Whittaker 1960: 59 f.), or a combination of these in the form of ‘a localisation of differential rents’ (Aspromourgos 1996: 192 n. 29).

From Petty to Von Thünen and beyond

In considering Petty’s discussion of the effect upon agricultural rent of distance from a central town, we have arrived at the archetypal topic of spatial economics, for this same issue is precisely the starting point of Von Thünen’s seminal work of 1826, *The Isolated State*. The celebrated opening paragraph of that work posits an isolated town supplied by a surrounding agricultural area, with land rents reaching their maximum nearest the centre, where the most perishable crops, or those with the highest transport costs, are grown, and declining to zero at the outermost limit of cultivation. The outcome is that the agricultural landscape is configured in a pattern of concentric rings, each devoted to a particular crop or range of crops (Von Thünen 1826: 1; for a fuller account, see Blaug 1962: 614–17).

The unrivalled profile enjoyed by Von Thünen’s ‘model’ in accounts of the history of spatial economics has resulted in the idea that the origins of the sub-discipline lie in a kind of primal bifurcation in economic theory: on the one hand, it is suggested, there developed an ‘Anglo-Saxon’ tradition of economics which, from Ricardo onwards, despatialised its analysis in favour of an exclusive focus on issues susceptible to definition in terms of time (interest, credit, and so on); on the other hand, there developed a ‘Germanic’ tradition, beginning with Von Thünen, which, conversely, detemporalised its analysis and focused on issues susceptible to definition in terms of physical space. This version of theoretical history apparently originates in the work of Walter Isard (see, in particular, Isard 1956: 24–27), the pioneer of the attempt to revive spatial-economic analysis in the ‘Anglo-Saxon’ world and founder of the discipline of ‘regional studies’, who famously criticised the marginalist tradition

in its 'Anglo-Saxon' form for having created a 'wonderland of no dimensions' (Isard 1949: 28). This perspective on the history of spatial economics achieved dominance among the economic orthodoxy (see, for example, Ohta and Thisse 1993, and, for more nuanced versions, Blaug 1979, 1962: 614–31), and remains implicitly endorsed by Paul Krugman, who, however, adds an extra leg to the narrative by claiming that the German theories were 'lost' until 'rescued' as a result of the 'increasing returns revolution' in economics (see Krugman 1995: 34; Fujita and Venables 1999: 25–26).

By thus eliding the history of spatial-economic analysis before Von Thünen, spatial economists are able to locate the theoretical origins of their sub-discipline entirely within the marginalist tradition. For Von Thünen's theory may justly claim to be the first economic theory to be framed in marginalist terms, an assessment confirmed by no less an authority than Marshall, who states: 'The term 'marginal' increment I borrowed from Von Thünen' – in other words not, as might have been expected, from Jevons or other early marginalist writers in the post-Ricardian 'Anglo-Saxon' tradition, but from the original 'Germanic' spatial economist (Marshall 1890: x n.), as noted by Hall in his editorial introduction to Von Thünen 1826: xi).

This seminal position of Von Thünen's theory in the emergence of marginalist economics helps to explain the effortless manner in which it is commonly resolved into neoclassical terms by spatial economists, for this amounts to no more than marginalism reclaiming its own. In one account, for example, his theory is credited with a complete set of neoclassical initial assumptions: 'both producers and consumers have perfect knowledge and act perfectly rationally ... [and] behave in an optimal fashion', to assure 'maximisation of profits' and 'to minimise their outgoings in meeting their consumption needs' (Dicken and Lloyd 1990: 17 f., 61–67). In the same vein, other accounts credit the theory with illustrating 'the simultaneous determination of goods and factor prices', 'the ability of markets to achieve efficient outcomes', interpolating further such anachronistic terms as 'unplanned competition' and 'perceived self-interest', until, eventually, the theory is hailed as a classic example of how to model unintended outcomes in the economy based on convincing micro-foundations, or, to use Krugman's favoured expression, a model of 'micro-motives and macro-behaviour' (Krugman 1995: 53, 77, 1996: 10–12; Fujita and Venables 1999: 16, 15–18, 133 f.; Krugman 1998: 7, borrowing his expression from the title of a 1978 book by Schelling.)

This retrospective incorporation of Von Thünen into the theoretical heritage of the orthodoxy has the effect of obscuring what is actually new in his theory. For, as has now been seen, its innovative features do not lie in raising new questions, introducing new explanatory factors, or drawing new conclusions, for in all these respects he had in fact long been anticipated by the 'Anglo-Saxon' William Petty; indeed, if there had been no Von Thünen, it is possible to imagine that, in tracing the history of spatial economics back to its roots, we might now be making do with Petty's 'circumjacent' counties round London as an alternative 'brand name' (a term used by Krugman

1995: 37, discussing Blaug 1962 [1985]: 618–23). (Actually Smith, who had meanwhile further developed these ideas, would have served this purpose better than Petty, and Steuart even better still; see Stull 1986 [1993] and Beckmann 1981.) Rather, what is actually new in Von Thünen's theory is that, even without the formalistic makeover it receives in today's neoclassical expositions, it is already predicated upon an unprecedented degree of abstraction in its mode of analysis.

Von Thünen's abstraction of spatial and economic categories stands out particularly clearly when compared with the approach of Petty, whose ideas are expressed in terms of immediate, or 'real', places and activities – London, Middlesex and other named counties, 'digging instead of ploughing', and so on. In total contrast, Von Thünen emphatically abstracts the economic relationships in question from all such concrete reference, positing a featureless 'town' surrounded by an equally featureless 'plain', with constant fertility, constant transport costs, and so on. Spatial economists use the term 'isotropic' to denote such featurelessness – a term which is, significantly, borrowed from physics and chemistry, not from geography. Thus abstracted from any concrete historical, geographical or empirical reference, spatial economics, 'as conceived by [Von] Thünen, was deductive and abstract in its very foundations' (Blaug 1979: 23; see also *ibid.* 28 f.).

This process of conceptual abstraction by no means came to an end with Von Thünen. Further stages in the process may be illustrated by comparing his original diagram of agricultural rings, which still bears signs of its origin in the map, with the increasingly schematised graphical representations in subsequent editions of his work, and the yet more abstract diagrams in the work of later writers, culminating in the 'rent cone' of more recent spatial-economics.

In short, Von Thünen's spatial-economic analysis marked both the beginning of a new era in economic theory and also the culmination of a previous one. On the one hand, his theory did indeed provide the starting point for a process of further conceptual abstraction – a process which was to culminate in Paul Krugman's marginalist 'new economic geography' (for a critical account of which see Goodacre 2005a). On the other hand, the fundamental categories of spatial-economic analysis upon which Von Thünen draws were not generated within the marginalist tradition of economics pioneered by him, as hitherto widely assumed, but already had, as illustrated in the writings of Petty, a long and revealing pre-marginalist history.

The spatial-economic logic of Petty's final scheme

The logic of Petty's spatial-economic analysis led him inexorably towards ever greater conviction in the potential benefits of his scheme to transfer the population of Ireland into England. This process may best be explained by placing that logic in apposition to what Krugman identifies as the central concern of his 'new economic geography' – the 'three-way interaction between

increasing returns, transport costs, and factor mobility' (Fujita and Venables 1999: xi).

To begin, then, with the concept of increasing returns, this is, of course, deployed by Krugman in a formalistic and mathematical manner that has no parallel in pre-marginalist economic thought. Nevertheless, Petty's discussions of the advantages of the spatial agglomeration of economic activity, or 'living compactly', to use his own term (PA: 300 s. 8), clearly address the same range of issues. On many occasions, he explicitly associates the advantages of economies of scale, division of labour, and technological improvement with towns, or at any rate with compactness of population. These issues are, characteristically, raised in an immediate and concrete form, often being embodied in the advantages of Holland (see in particular *ibid.*: 255–58), sometimes in implicit contrast with the sparseness of population density in Ireland, these two countries representing, for him, 'polar cases' (Aspromourgos 1996: 189 n. 2.3) with respect to the effects of, respectively, compact and dispersed population.

The second element of Krugman's 'three-way interaction' is transport costs, a topic which was of direct interest to Petty, both in his practical activities and in his writings. His practical involvement ranged from the experimental construction of ships with twin hulls to the design of luxury wheeled vehicles, while in his writings he discusses a variety of practical and experimental issues in transport technology and mechanics, along with numerous other topical transport issues of his day.

When it comes to the third element of Krugman's 'three-way interaction', factor mobility, this is effectively reduced by Petty to the issue of labour mobility alone, since that other mobile factor, capital, was as yet very imperfectly conceptualised in his writings, being represented largely by valuable personal belongings; indeed, today's authority on Petty's value theory regards him as displaying 'no systematic conception of capital and profitability' (Aspromourgos 1996: 40 f., 1998: 197). The idea that labour could be perceived as mobile, or rather transferable, was nevertheless inseparable from the initial stages of – or at least the preconditions for – capitalist development, epitomising as it did the decline of the feudal order, in which the labouring population had been perceived as effectively an adjunct to the land.

Having thus placed some outstanding characteristics of Petty's spatial-economic analysis in broad apposition to the 'three-way interaction between increasing returns, transport costs, and factor mobility', the spatial-economic logic of his final scheme can be addressed in a more systematic manner, as a project to compact the population and thereby to increase the benefits of spatial agglomeration – or, in terms more akin to his own concrete mode of thought, to create another Holland in England.

Compactness, defined as the overcoming of the obstacles of distance, cannot, of course, be reduced to the issue of physical distance alone; on the contrary, precisely equivalent economic advantages may be gained by

reducing the mileage cost of transport, either by improvement of the means of conveyance or improvement of transport routes.

As for means of conveyance, much of the transport in the early modern agrarian economy was by portage, packhorsing, and, in the case of livestock, droving. None of these escapes Petty's relentless theorising: he discusses, for example, the biomechanics of human motion, or 'man in his motion or gression' (PP Vol. II: 34); he addresses issues of packhorsing in some of his discussions of mechanical experimentation (see, for example, PA: 249 f.); and he effectively assumes that the cost of the droving of livestock is zero, or even, in the case of a horse, negative, since 'an horse is such a commodity as will carry both himself and his merchant to the market' (TTC: 31 s. 41). Clearly, however, none of these means of conveyance was susceptible to any substantial improvement, and his more systematic attention to improvements in conveyance was directed towards inland navigation vessels – largely as an extension of his far closer involvement in maritime ship design – and, to a lesser extent, wheeled vehicles. (See, for example, DB: 5–6, 44–45, 103; PP Vol. II: 147–51, and ELC.)

As for the improvement of transport routes, Petty repeatedly calls for 'employing our idle hands about mending the highways, making bridges, causeways and rivers navigable' (Petty TTC: 42 s. 11, also 20). Indeed, the prominence which he gives, in his discussions of fiscal priorities, to improvement of the inland waterway network has led one commentator to include him among the pioneers of the 'canal lobby' which was to motivate the large-scale canal-building projects of the following century (Willan 1936: 28–51, 39 f.). Despite the attention they have received, however, Petty's calls for the improvement of inland navigation routes lack the elaboration and specific detail of his more enthusiastic policy proposals. This halfheartedness may perhaps reflect a conflation of this issue with the closely related subject of the advantages of Holland, bringing the whole question, in his eyes, almost entirely into the sphere of physical geography. For his calls for the improvement of inland waterways must surely have been encouraged, if not inspired, by Holland's 'rivers, dikes, bridges, wharves, cranes, carriage' (PP Vol. II: 186), and however much that country's average distance to water transport was reduced by the artificial means included in that list, its initial low value is clearly a natural endowment.

The advantages of the dense inland waterway network enjoyed by Holland, which Petty contrasts with the case of inland France, leads him to place great emphasis on the limits set to transport cost minimisation by natural constraints. Thus, he divides the 'impediments to a country's greatness' into the two categories of 'contingent and removable' and 'natural and perpetual' (PA: 247, 278, 298 (headings to chs 3 and 5)). Some transport issues, such as a country's average distance to the coast, clearly fall into the latter category (for Petty's suggested means of calculating such an average, see *ibid.*: 293 and, for discussion, Goblet 1930 Vol. II: 318–22 and Willan 1936: 5). However, even the 'contingent and removable' category evidently seemed to Petty to offer

little possibility of a medium-term, let alone a short-run, impact on the overall transport cost minimisation problem, despite the fact that, at one time or another, all possible means of such minimisation received his attention.

An alternative to transport cost minimisation as a means of compacting a country's economy and society is to raise its population through increased fertility, a topic in which Petty displays considerable interest (see, for example, PP Vol. II: 47–58 and, for relevant discussion, Furniss 1920; Riley 1985: ch. 3; Finkelstein 2000: 122–24 and 305 nn. 113–25; Reungoat 2004: part 4). However, such 'multiplication' of the population, to use Petty's term, is clearly, like the improvement of transport routes, a long-term measure at best.

It was in this way that the entire logic of Petty's spatial-economic analysis drew him steadily towards what, thus, appeared as a comparatively short cut to achieving the goal of compactness – the transfer into England of the bulk of the population of Ireland, to which, as his enthusiasm for the project gathered strength, he added the population of the Highlands of Scotland for good measure. At first, he pondered his scheme merely as a 'reverie' (PA: 285) but in the final years of his life he advanced it in the form of an elaborate policy proposal which he, at least, considered to be plausible; indeed, on at least one occasion, he managed to gain an audience with the monarch, in a vain attempt to arouse enthusiasm for the scheme at the highest level (see editors' notes to TI: 547 and PP Vol. I: 46).

In an extensive two-volume work on Petty's contribution to 'political geography' published in 1930 the French geographer Yann Morvran Goblet describes the spatial-economic logic underlying Petty's scheme in the following terms:

Petty, who was, at the same time, both economist and geographer, and a precursor of anthropogeography as much as of political economy, recognised that the constant obstruction placed by nature in the way of the development and efficiency of human activity is distance. And, since he sees no practical mechanical means to lessen the duration of transport, to bring nearer in time the parts of the state which are dispersed across space, to place in easy contact the producer and the consumer, the factory and the market, he seeks to suppress or deflect the effects of this insurmountable obstacle.

(Goblet 1930 Vol. II: 344; original in French²)

Conclusion: economics, geography and colonialism

Petty's survey of Ireland must surely be recognised as a pivotal episode in the history of the relationship between economic and geographical thought, an episode which, furthermore, places in the highest possible relief the inextricable connection of his spatial-economic analysis with the context in which he forged it, a context of bureaucratic-military officialdom and predatory colonialism. It is consequently fitting to conclude by attempting to explain why it

is that the strands of economic and geographical thought which he drew together remain unabashedly intertwined in the sub-discipline of spatial economics of today, in a form which, though of course vastly more elaborate and formalistic, nevertheless shares the same fundamental analytical categories.

The colonialist context of Petty's thought was a central preoccupation of the work of Goblet, who was, as the above quotation indicates, an adherent of 'anthropogeography', a methodology developed by the nineteenth-century German nationalist geographer Friedrich Ratzel. By Goblet's time, Ratzel's work had been reformulated in unrestrainedly populist terms by the founders of *Geopolitik*, notably Karl Haushofer, and was eventually incorporated into the propaganda of Nazism (Gyorgy 1944). Goblet's aim was to recapture what he saw as the positive achievements of Ratzel for the liberal intellectual tradition, a project which was, ultimately, disappointing theoretically, and resulted in his adoption of a somewhat esoteric position which failed to make a substantial impact (see Goblet: 1955). The fact that his theoretical project remains stranded in these intellectual episodes of the past has undoubtedly contributed to the neglect of his *magnum opus* on Petty.

This neglect is regrettable, since writers in the field of the history of economic thought as practised in the English-speaking world have all too often completely ignored the colonial context of Petty's writings, and Goblet's work might have served as a much-needed corrective to this shortcoming. Even today, Goblet's work remains unique in the insight it brings to the historical significance of Petty's population transfer scheme, pointing out, as he does, that it was grimly prophetic of what was actually to transpire in the two centuries that followed. For in that time Ireland was indeed to be emptied of the majority of its inhabitants as Petty had advocated, and reduced to a state where its language and traditional way of life were fighting for survival. This prompted Goblet to ask:

What politician has ever put forward a plan, be it never so formal and official, which has been realised so comprehensively, point by point, as the 'reverie' of Sir William Petty?

(Goblet 1930 Vol. II: 305; original in French)

As a reviewer of Goblet's work wrote at the time, the ingredients of Petty's scheme 'would be ludicrous if the next two centuries had not proved them to be in many ways prophetic' (Lynam 1932: 418).

Goblet's unusual methodological stance cannot fully explain the oblivion to which his work has been consigned by historians of economic thought; part of the explanation surely lies in the fact that his study of Petty implicitly challenges the comfortable assumption that the roots of today's economics lie in the Enlightenment movement in eighteenth-century European philosophy, as represented, above all, by Adam Smith. The question that needs to be answered is whether or not the Smithian tradition has ever really succeeded in surmounting the unappealing legacy of its unenlightened forebears, and in

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detaching the analytical categories bequeathed by those forebears from the goals for which they were forged. This question is posed in a particularly acute manner by Petty's writings, where we already find, in primitive form, much of the analytical apparatus still in use by economists today, with no attempt to disguise the fact that the sole purpose of that apparatus is to serve the interests of the bureaucratic-military officialdom and predatory colonialism that prevailed in his time. This context stands revealed in a particularly raw and unvarnished form in Petty's spatial-economic analysis, and nowhere more so than in the 'transplantation' scheme, whose elaborate calculations occupied the last months of his life. These calculations constituted not only a grisly swan song to his own failed career but also a harbinger of today's quantitative methodology in economics, a fact which emerges with particular clarity with respect to the sub-discipline of spatial economics, whose aim is to extend that quantitative methodology into the neighbouring discipline of geography.

Notes

- 1 The abbreviations for the works of William Petty used in this chapter are indicated in the References in square brackets following the titles. The works are listed in the order in which they are thought to have been written, with compilations (EW, PP, DB) at the end. Citations of TTC, VS, PAI, PA, PAL and TI refer to the page numbers in the 1899 Hull edition (EW).
- 2 Quotations in this chapter are newly translated by the present author from the French.

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References to Petty's major economic works cite the pages in EW, which has established itself as definitive.

Collections

- EW *The Economic Writings of Sir William Petty...* Edited by Charles H. Hull. 2 vols. Cambridge: Cambridge University Press. 1899.
- PP1, PP2 *The Petty Papers: some unpublished writings of Sir William Petty.* Edited from the Bowood Papers by the Marquis of Lansdowne. 2 vols. London: Constable. 1927.
- DB *The double-bottom or twin-hulled ship of Sir William Petty.* Documents introduced and edited by the Marquis of Lansdowne. Oxford: printed for presentation to the members of the Roxburghe Club. 1931.

Individual works (in roughly chronological order)

- BA "A brief account of the most material passages relating to the survey managed by Doctor Petty in Ireland, anno 1655 and 1656". Apparently written around 1656. Included by Larcom in DS: xiii-xvii.
- DS *The History of the Survey of Ireland commonly called the Down Survey...* Edited by Thomas A. Larcom. 1851. Apparently written in 1659-60.
- Reflections* *Reflections upon some Persons and Things in Ireland, by Letters to and from Dr. Petty...* London: John Martin, etc. 1660.
- TTC *A Treatise of Taxes and Contributions...* London: printed for N. Brooke. 1662. In EW: 1-97.
- VS *Verbum Sapienti.* Written 1665. First published 1691. In: EW: 99-120.
- PAI *The Political Anatomy of Ireland.* [Apparently written in 1671, but first published in 1691.] In EW: 121-231.
- PA *Political Arithmetic...* [Written in around 1671-2, but first published in 1690.] In EW: 233-313.
- PAL *Another Essay in Political Arithmetic, Concerning the Growth of the City of London...* London: H. H. for Mark Pardoe. 1682. In: EW2, 451-78.
- ELC "Experiments to be made relating to land carriage proposed by the learned Sir William Petty Kt." *Philosophical Transactions* 1684, 14 (161): 666-7.
- TI *A Treatise of Ireland.* Written in 1687. First published in 1899 in EW: 545-621.

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